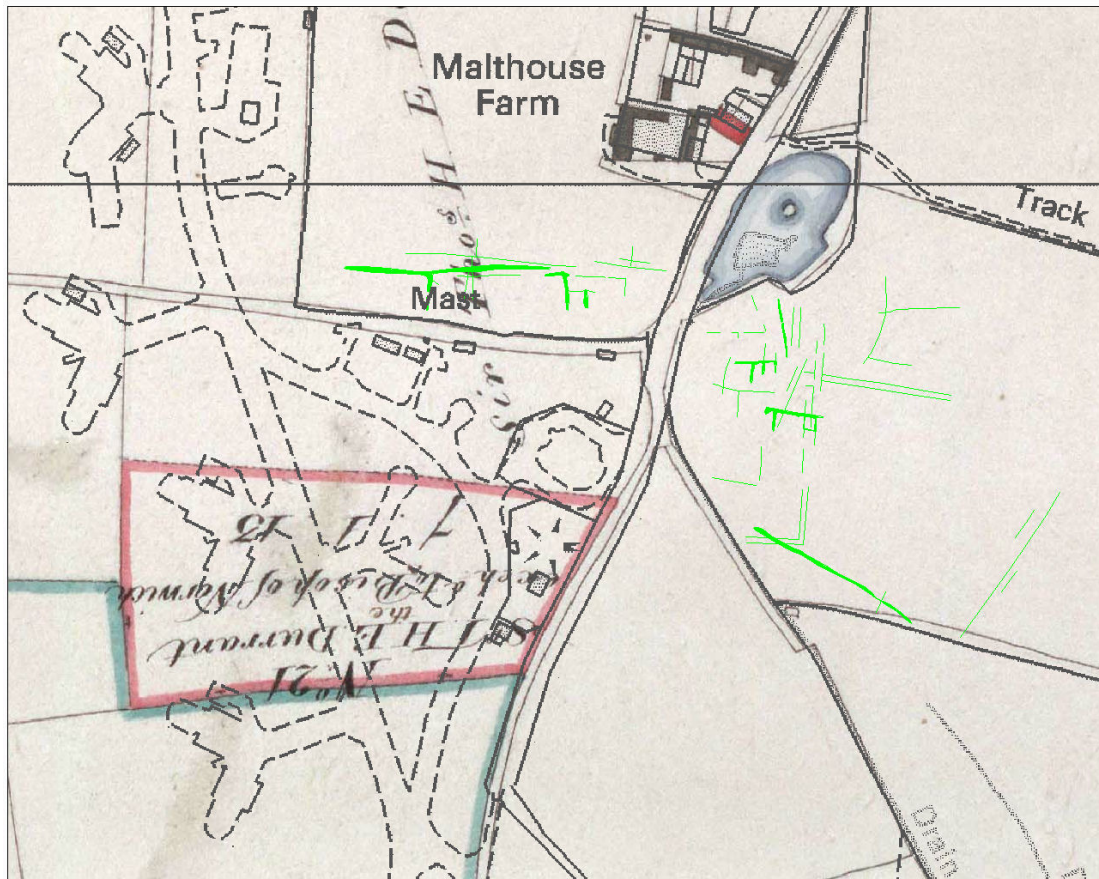


Former RAF Coltishall and its Environs
Results of an aerial photographic assessment
and mapping project



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Front Cover: NMP mapping of enclosures and ditches of potential later prehistoric/Roman and medieval to post medieval date overlain on the 1828 Scottow Enclosure Map (NRO C/Sca 2/27). Base mapping © Crown copyright and database rights 2012 Ordnance Survey 100019340. NMP mapping © NCC.

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Figure 1. NMP mapping of the archaeological features visible on aerial photographs at the former RAF Coltishall and environs.

Figure 2. NMP mapping of the archaeological features visible on aerial photographs to the north east and east of former RAF Coltishall.

Figure 3. NMP mapping of the possible archaeological features visible on aerial photographs within the central area of RAF Coltishall overlain on the 1828 Scottow Enclosure Map.

Summary

This aerial photographic assessment of the former RAF airfield at Coltishall (NHER 7697) has been commissioned in response to the intended purchase and development of the site by Norfolk County Council. The resulting digital mapping and archaeological interpretation will feed into future planning decisions and mitigation at the site and provide NCC with additional information concerning the potential sub-surface archaeological remains within the airfield perimeter that could be encountered during any redevelopment of the site. The mapping and interpretation will also provide a greater understanding of the historic environment in the area.

The presence of the airfield on all available modern and historic aerial photographs has undoubtedly affected the results of the mapping within the airfield perimeter. However faint vegetation marks potentially ranging in date from the later prehistoric period to medieval to post medieval period were tentatively identified within the site. Should the need arise, these will require further assessment and investigation to see if they do indeed relate to sub-surface remains. The project was also successful in characterising the types of archaeological remains that may survive within the perimeter of Coltishall airfield, but do not show on the available aerial photographs. The cropmarks within the surrounding arable land indicate that components of extensive later prehistoric and/or Roman co-axial field systems, enclosures and major boundary systems are potentially likely to continue into the airfield.

In addition, the GIS dataset and Access database records held by Norfolk County Council as part of the Norfolk Historic Environment Record (NHER) have been updated.

Acknowledgements

This project was undertaken by Norfolk County Council's Air Photo Interpretation Team, part of Historic Environment Service (HES), in consultation with David Gurney, Historic Environment Manager (County Archaeologist) (HES) and Sophie Tremlett, Senior Air Photo Interpretation Officer (HES). Thanks go to Alice Cattermole, Senior Historic Environment Officer (Records) (HES), Alison Yardy (HES) Ellen Bales (NMP), Ken Hamilton, Head of Archaeological Planning (HES), James Albone, Planning Archaeologist (HES) and Professor Tom Williamson, Head of Landscape Group in School of History (UEA) for reading and commenting on this report.

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NMP Mapping Conventions

The mapping conventions used in the air photo transcriptions in this report conform to the standard NMP methodology. Ditches, and other cut/negative features, are shown in green. Banks, and other positive features, such as mounds, or compacted features, such as roads, are shown in red.

Abbreviations

EH	English Heritage
EHA	English Heritage Archives, formerly NMR
ETD	Environment, Transport and Development's
HES	Historic Environment Service
NAPL	Norfolk Aerial Photographs Library
NCC	Norfolk County Council
NHER	Norfolk Historic Environment Record
NMP	National Mapping Programme
NMR	National Monuments Record, now EHA

1. Introduction

1.1 Background to the Project

In June 2012, the Norfolk Air Photo Interpretation Team (NMP) team, part of Environment, Transport and Development's (ETD) Historic Environment Service (HES), was commissioned to undertake a National Mapping Programme (NMP)-level aerial photographic assessment and mapping project of the area covered by Coltishall Airfield (Norfolk Historic Environment Record (NHER) Site 7697), centred on TG 2673 2284.

The work was required to provide information to feed into future planning decisions and mitigation at the site and to supply information concerning the potential sub-surface archaeological remains within the airfield perimeter that could be encountered during any redevelopment of the site. The mapping and interpretation will also provide a greater understanding of the historic environment in the area. Initially only the area of the airfield itself was to be included within the survey, however in consultation with David Gurney, Historic Environment Manager (County Archaeologist) (HES), it was decided that areas of archaeological features either immediately surrounding the airfield or potentially continuing into the area would also be included. This buffer area of arable land around the airfield itself also allowed for a more detailed picture to be constructed of the potential archaeological features underlying the airfield, but not visible on the aerial photographs due to the land use at the site, see Section 1.4 for details on the impact of the land use on the results.

The methodology employed by the project is substantially that which is currently employed in projects undertaken by the Air Photo Interpretation Team as part of English Heritage's National Mapping Programme (Appendix 1). This initiative, which has been active in Norfolk since 2001, aims to enhance our understanding of human settlement by providing primary information and syntheses for all archaeological sites and landscapes (visible on aerial photographs or other airborne remote sensed data) from the Neolithic to the 20th century (Horne 2009). To date, NMP has been completed

for approximately 40% of Norfolk, and work is ongoing. In consultation with David Gurney it was agreed that the aerial photograph mapping would not include the twentieth century remains, as sufficient information about the World War Two and Cold War monuments at the site is already available from other sources or will be captured and assessed through other studies (David Gurney (HES) *pers. comm.*).

Unfortunately, while the methodology of aerial photographic assessment, rectification, transcription, recording and interpretation followed the national standards of NMP, it was not possible to consult the full range of aerial photographic sources available nationally within the timeframe of the project. To date, the survey of Coltishall Airfield has been restricted to aerial photographs held by NCC's Norfolk Aerial Photographs Library (NAPL); additional photographs held by the National Monuments Record (NMR) collection at Swindon and by Cambridge University have not been consulted. Whilst it is possible that additional sites and/or components of sites may have been visible on the non-NAPL aerial photographs, it is felt that the broad date range of photography within the NAPL collection, combined with Google Earth coverage, is likely to have provided a fairly good picture of the archaeological remains, within the constraints produced by the land use within the airfield. However, as suggested in Section 3.2, further assessment of other aerial photograph sources may in due course be beneficial.

Further details of the sources consulted and the project methodology are given below (Section 1.3; Appendix 1 and 2).

1.2 The Study Area

Coltishall airfield is located approximately 2km to the north of Coltishall village, which is itself located approximately 10km to the north of Norwich. The site is predominantly within the parish of Scottow (North Norfolk District), with part of site extending south into the Coltishall parish (Broadland District). The site is located on a fairly flat area of land, forming a plateau close to the confluence of the River Bure and two minor tributaries. The geology consists of the sands and gravels of the Norwich Crag Formation, overlying solid chalk. These deposits are then likely to be sealed by either glacial sands and gravels

or Norwich Brickearth and recent archaeological work indicates some localised boulder clay deposits are also present (Watkins 2008).

The predominantly light, sandy and loamy soils of the area (Williamson 2005) are particularly conducive to cropmark formation when under arable cultivation, as is illustrated by the numerous cropmark sites recorded in the surrounding area (Figure 1) and is visible on available Google Earth imagery. However the non-arable land-use within the airfield perimeter means that potential sub-surface archaeological features may not be visible, see Section 1.4.

The airfield is located to the immediate south of eighteenth century Scottow Hall and Park (NHER 7699 & 56252). Historic maps, such as nineteenth century Scottow and Coltishall Enclosure and Tithe maps, indicate that the airfield itself overlies the former farmstead at Batley Green and an area of fields partly formed through piecemeal enclosure and reflecting some aspects of the medieval landscape, such as open fields (Tom Williamson, UEA, *pers. comm.*). The most distinctive feature of the pre-airfield landscape is the linear common or moor, named as 'Scottow Moor' on Ordnance Survey First Edition (1889 to 1891, 6 inch). This strip of land appears to lead towards a large pond to the immediate south of Manor Farm, and it is possible that it provided a shared water supply for stock, and is likely to be a fossilisation of the part of the medieval and early post medieval agricultural landscape through enclosure. This long linear strip of open land lies directly to the south of Scottow Hall and the gap in the woodland depicted on the Ordnance Survey First edition map (1889 to 1891, 6 inch) could suggest that this existing landscape feature was incorporated into the landscape design and 'visual grammar' of the Hall, providing a clear vista out from the Hall, while not being within the Park itself.

A brief assessment of the existing HER evidence, and that previously undertaken prior to development at the site (Watkins 2008), with particular reference to the aerial photographic evidence, indicates a wealth of archaeological sites in the area surrounding the airfield. The confluence of the River Bure and the tributaries, to the immediate west of the airfield, is unsurprisingly populated by numerous prehistoric ceremonial and funerary

monuments (NHER 31741). A Neolithic causewayed enclosure lies overlooking the river to the southwest of the airfield (NHER 7690). Several substantial barrows are recorded around the perimeter of the site, for example NHER 5788 (included within mapping) and NHER 36731 to the north. See Section 2 for discussion of possible ring ditches identified within the airfield itself.

Previous aerial photograph transcription to the northeast of the airfield recorded the possible presence of prehistoric multiple linear boundaries (NHER 36729). This major boundary, which appeared to be cut by the Roman road (NHER 2796), was partially excavated in 2005 by the Norfolk Archaeological and Historical Research Group (NAHRG). Although no dating evidence was produced it did prove the pre-Roman date of the features (Simms 2005, 2006). Although no parallel to this boundary has been excavated in Norfolk, comparison with similar features elsewhere would suggest that a Late Bronze Age or possibly Iron Age date is most likely (Albone *et. al.* 2007a). This boundary, of at least five parallel ditches, appears to curve around to the west at its southern end and heads towards the airfield, although no trace of it could be detected on the aerial photographs within the airfield itself, although this may be due to the land use, see Section 2. A geophysical survey may reveal further traces of this major boundary. It is interesting to note that the 1828 Enclosure map suggests that one small section of this boundary may have continued in use until this date (it appears to have been removed by the time of the 1839 Scottow Tithe map). See Section 2 for discussion of possible later prehistoric long-distance boundary ditches recorded to the west of the airfield.

To the north of the airfield and potentially continuing into the northern part of the airfield, see discussion in Section 2, is an extensive co-axial field system (NHER 57991, previously part of NHER 36731). This field system has previously been recorded as being of Roman date, however it must be noted that it exhibits many similarities with the plan of the Nova Scotia Farm co-axial field system at Ormesby which has been proven by excavation to have its origins in the Middle Bronze Age (NHER 12828) (Bates & Crowson 2004). However, it is not clear how much of it is of this date and some components

may be Iron Age. A Roman date for the field system also remains a good possibility and Roman finds have been recovered in the wider area, for example NHER 24886. The field system, or at least parts of it, appear to share the same alignment and similarity of plan to the enclosure and fields recorded to the immediate east of the airfield (NHER 36729), which has also been suggested as being Roman in date. Excavations on parts of this site revealed no conclusive dating material, although a number of prehistoric flints were recovered. It could be suggested that if the enclosure was Roman in date, then some Roman material would be expected, although only a small area was investigated (Simms 2005, 2006). It is interesting to note that the predominant alignment of the field system appears to be reflected in two major linear boundary ditches to the west of Coltishall airfield (NHER 57987-8), also suggested as being later prehistoric and/or Roman in date. These sites taken together could suggest a level of landscape-scale planning in this area, at least by the Roman period, but potentially as early as the Bronze Age.

Preliminary assessment of the aerial photographs of the land adjacent to the project area indicate that this area contains an extremely rich archaeological landscape of regional, and potentially also national, significance, in particular in the later prehistoric and Roman periods. The Google Earth imagery available online, in particular the July 2006 coverage, revealed numerous new ceremonial, funerary and settlement sites and cropmark complexes within the vicinity of the airfield. It also allowed for existing cropmark sites to be re-evaluated and their significance and interpretation re-assessed. For example a new Roman villa and temple complex, with evidence of stone and post-built buildings was identified approximately 650m to the south of the airfield (NHER 5789). The significance of the site, which was previously known only from NAPL oblique aerial photographs, but had received very little assessment or interpretation and the presence of a villa or associated buildings not recognised, could be fully appreciated once the evidence from vertical aerial photographic sources was also consulted.

1.3 Summary of Methodology

All available aerial photographic and other airborne remote sensed data held for the project area by the NAPL was viewed and assessed, as was imagery available via Google Earth. Additional sources, such as historic maps, were consulted where readily accessible and relevant. (See Appendix 2.)

Air photos were rectified using Ordnance Survey 1:2500 mapping, using John Haigh's AERIAL 5.29 rectification program. The accuracy of the base mapping should allow metrical precision of $\pm 0-3\text{m}$ (although see Section 1.4 below). Rectified images were inserted into an AutoCAD drawing containing base maps and other information relevant to the project. Features of interest were then transcribed at a nominal scale of 1:2500, using standard NMP layers to denote positive and negative features, monument extent, *etc.* The Access database records held by the NHER were then updated, and a GIS dataset provided to NHER staff in order to update relevant map layers. The records were all linked to an event record created specifically for the project: ENF129670. Hard and digital copies of this report will also be submitted to the HER for archiving.

1.4 Factors Affecting the Results of the Survey

As is the case with any archaeological survey, the results of the aerial photographic assessment and mapping project have been influenced by a number of different factors. The most significant in this particular case has been land use and, to a lesser extent, photo coverage.

The land use at the site is obviously characterised by its use as an airfield since 1939 and this had a major impact on the amount of pre-World War Two archaeological sites visible on the aerial photographs. The central area containing the network of runways and dispersals consists of grassland on all available aerial photographs. This is surrounded by a perimeter of military buildings, installations and hard-standing, in particular to the west of the runways. The type of archaeological features encountered in the surrounding fields, evidenced by cropmarks forming within arable over sub-surface ditches and pits, is not generally conducive to showing in these sorts of grass

conditions, other than in exceptionally dry and hot summers. Grassland conditions are normally more productive for revealing surface earthworks and underlying masonry (although the latter again often only under exceptional conditions), although no evidence of such features was identified on the aerial photographs. The only definite and clearly visible archaeological features visible within this grassed area related to the medieval to post medieval landscape features levelled in advance of the airfield construction, in particular those around Batley Green, see Section 2 for discussion. However, additional faint traces of vegetation marks of possible ditch-like features, some of which were also likely to be medieval to post medieval land allotment boundaries, were tentatively identified on Google Earth imagery dating to 2006 and 2007 (see Section 2 for details).

Due to the constraints that the twentieth century land use had on the results of the mapping, a small amount of mapping was also conducted around the perimeter of the airfield in adjoining blocks of arable land in order to reveal the potential character of sub-surface remains within the airfield itself that may not be readily visible on the aerial photographs.

As described above (Section 1.1), only aerial photographs held by NAPL have been consulted. These are listed below, and it is felt that these have provided sufficient coverage to provide an accurate map of the archaeological remains visible and conducive to aerial photographic identification methods, within the constraints of this type of the land use, see below, and also to provide a characterisation of those types of sites potentially present, but not visible on the aerial photographs. The NAPL photographs cover the period 1946 to 1994. While consultation of additional photographs might provide further information, it is not anticipated that they would significantly alter the existing mapping, due to the overriding restraints caused by nature of the land use.

2. Project Results

2.1 Later Prehistoric and Roman

Given the positioning of the airfield above the confluence of a major river and tributaries and the presence of other nearby examples (see Section 1.2), it may be expected that the airfield would contain evidence of prehistoric barrows, although it may be that these were positioned on the crests of the slopes and not on the plateau itself. Two possible ring ditches were recorded within the airfield. One example (NHER 57985) was tentatively identified from faint vegetation marks visible on 2006 Google Earth aerial photographs within the central part of the airfield. It must be stated that there is a high level of uncertainty over the origin and significance of these vegetation marks. The fact that these features appear to be showing as ditch-like features on grass within a recently active airfield means that further work, for example geophysical survey, would be required to establish whether these do relate to actual archaeological features. However, vegetation marks with a similar appearance elsewhere in the airfield, see below, were thought likely to relate to former medieval to post medieval boundary ditches depicted on historic maps, and it is therefore feasible that these marks also relate to an underlying ring ditch-like feature.

A second more clearly defined ring ditch-like feature (NHER 58311) was visible on 2006 Google Earth imagery at TG 2658 2280 and could easily be mistaken for the remains of a prehistoric round barrow. The feature was initially dismissed as relating to the twentieth century military activity at the site, as it had hard-standing and structural components relating to radar equipment, 'Replacement Precision Approach Radar' at its centre and its form is extremely regular – a perfect circle. Additionally it was showing extremely clearly when compared with the surrounding marks which related to relatively recently removed post medieval and pre-Second World War field boundaries. Previous experience of looking at earlier radar and radio-related sites on aerial photographs had suggested that some types of radar installations were surrounded by compounds and may have octagonal and/or circular wire

netting or mats, known as 'clutter' screens, which reduce the effect of surrounding vegetation on the radar equipment. Further consultation with Chris Morshead, Manager and Curator at the RAF Air Defence Radar Museum (RADRM) at Neatishead, and John Welton, Historian for 'Spirit of Coltishall Association', provided valuable additional evidence for similarly sized and located circular compounds or possible 'alignment rings' still in situ around equipment at other sites, for example at RAF Marham. The Precision Approach Radar (PAR) often served multiple airstrips and the encircling ring may have allowed for rapid realignment of the radar equipment to create precise measurements for whichever runway was being used (Chris Morshead, RADRM, pers. comm.). The ring ditch visible as a vegetation mark in 2006 must relate to a PAR realignment ring or associated circular compound dating to the use of the equipment during the relatively recent past, but not in situ on any of the available aerial photographs. Another circular parched area at TG 2612 2171 was also dismissed as relating to defensive activity, but the proximity and similar positioning of this mark to the nearby barrow (NHER 5788) must be noted.

As outlined in Section 1.3 the cropmarks in the arable land surrounding the airfield indicate extensive later prehistoric and/or Roman co-axial field systems, enclosures and major boundaries (NHER 36729, 57991 & 57987–8), some of which are likely to continue into the area of the airfield. The ditches of these field systems, enclosures and boundaries generally follow a northeast to southwest or northwest to southeast direction, although there appears to be some variation. The plan and density of the cropmarks, in particular in the land immediately surrounding the northern extent of the runway (for example NHER 36729 & 57991), suggests that these sorts of features are likely to continue into the area of the airfield. This is also hinted at by the presence of similarly aligned, but less extensive, ditches mapped to the east of the airfield (NHER 57982 & 57984). The long distance boundary ditch (NHER 57987) to the west of the airfield definitely appears to continue into the perimeter, but is not visible on the aerial photographs. Also potentially continuing into the northern part of the airfield runway is the intriguing prehistoric multiple-ditched boundary (NHER 36729), which appears to turn westwards towards the

airfield, but was not detected on the aerial photographs past this point. Further survey work (an earth resistance survey was carried out on the boundary to the east in 2003–5 (Simms 2005, 2006)) would be needed to establish whether it continues into the airfield. The land use within the airfield on the whole appears to have reduced the likelihood of identifying further traces of these types of fields and boundaries within the perimeter itself. However possible fragmentary traces were tentatively identified from vegetation marks (NHER 57094 & 58052), although see Section 1.4 for discussion of the problems inherent in their identification and interpretation.

2.2 Saxon to Post Medieval

The significance of the dense area of cropmarks, including partial enclosures, ditches and trackways to the immediate east and north of airfield (NHER 57983 & 57992) is uncertain. A number of these follow a similar alignment to boundaries recorded on the 1766 'Map book of the estates of Davy Durrant of Scottow' and the 1828 Enclosure Map, although only one section of boundary appears to relate to depicted feature – a small farmstead at TG 2735 2294 on the 1766 map. It is therefore probable that some or all the cropmarks represent medieval to post medieval enclosures and land divisions that have been removed through the process of enclosure. However, the morphology of the eastern parts of NHER 57983 in particular could feasibly also suggest a Roman date and Roman finds have been recovered from the wider area (for example NHER 39449, 39593, 40033). It is also worth noting that the site is on the same alignment as the Roman road (NHER 2796) approximately 850m to the north. It is therefore possible that these cropmarks represent more than one phases of activity. Whatever the date of these cropmarks, it seems likely that they continue west into the area of the airfield. Similarly boundaries that could feasibly be Roman and/or medieval to post medieval in date (NHER 58055) were also identified to the immediate south of the airfield. As with NHER 57983 some of these had clear relationships with medieval to post medieval boundaries depicted on historic maps, in this case the 1841 Coltishall Tithe map, whilst others followed a similar alignment to the major boundary ditches of possible later prehistoric and/or Roman date (NHER

57987-8) recorded to the west, and could therefore feasibly be of a pre-medieval in date.

The clearest potential archaeological features within the airfield itself were a series of vegetation marks which appeared to relate to underlying ditches and former field boundaries of medieval to post medieval date. These were visible on Google Earth aerial photographs dating from 1999, 2006 and 2007 within the central and northern part of Coltishall airfield (NHER 57995). As with other potential features identified within the airfield itself these were visible as relatively faint vegetation marks that appeared to be showing as ditch-like features on grass and rough vegetation within the recently active airfield. Consequently further work would be needed to establish if these do relate to actual archaeological features. However, some of these linear vegetation marks (and others appearing in a similar manner) correlated with features depicted on the 1766 'Map book of the estates of Davy Durrant of Scottow', the 1828 Scottow Enclosure map and the 1839 Scottow Tithe map, in particular in the area of Batley Green (where boundaries, tracks and buildings were removed in advance of the airfield construction in 1939). As with any NMP survey, boundaries or features visible on the aerial photographs that are well recorded on the available historic maps were omitted from the mapping.

It is therefore essential that the mapped features should be viewed against the historic map background to gain a full understanding of the aerial photograph derived evidence. For example the arrangement of parallel ditches recorded at TG 2720 2330 when viewed in isolation may have the appearance of part of a double-ditched enclosure, however when viewed against the 1828 Scottow Enclosure Map it is clearly forming part of depicted field pattern. In this case potentially forming part of a trackway running through alongside a long contiguous line of field edges and perhaps fossilised in the field pattern to the north. The majority of the features mapped appear to represent minor former divisions and boundaries within the wider pattern of medieval to post medieval fields and land allotments that are depicted on the historic maps, see for example TG 2681 2315 and TG 2678 2259, Figure 3. Given the nature of the land use since the conversion of the site to an airfield, it is feasible that some quite minor and temporary features, such as fence

lines, paddocks and even former cultivation strips, could have been showing as faint vegetation marks on the aerial photographs. However, without further investigation into the actual sub-surface remains surviving, it may be unwise to draw too many conclusions as to their significance and/or presence.

Whilst the majority of the features recorded within the airfield under NHER 57995 are felt to be of probable medieval or post medieval date, a few of the ditches did not follow the dominant alignment of the surrounding medieval to post medieval field pattern and therefore could relate to pre-medieval features, for example at TG 2681 2315 (see Figure 3). However, it is also worth noting that some of these features could not confidently be distinguished from recent tracks in the surface vegetation, but due to their similarity to other seemingly archaeological features, they were included in the mapping.

In a desk-based assessment prepared in advance of past development within of the airfield (Watkins 2008), it was suggested that a medieval manorial site was formerly located within the western part of the airfield. However this was based on map evidence from the 1828 Enclosure map which includes the text 'Scite of the Manor of Scottow and Little Hautbois' in fields held by the Bishop of Norwich adjacent to the main area of operational buildings within the northwestern part of the airfield. This appears to have been taken to mean that the original manorial building may have been sited at this location. However this phrase is repeated on the map within another land parcel to the east, also held by the Bishop of Norwich. It therefore seems more likely that this statement refers to the classification of the Bishop's lands, rather than the location of a manorial building *per se*. Other than the probable medieval to post medieval boundaries and divisions discussed above, no evidence of medieval settlement or manorial sites was identified on the aerial photographs within the airfield itself.

A potential medieval or Late Saxon to medieval date moat-like site (NHER 57986) was identified to the immediate west of the airfield. The site consists of a broad L-shaped moat-like ditch, up to 10m across, that is visible as a combination of cropmarks, soilmarks and earthworks on two dates in 1946.

Only two sides of the possible moat were visible, suggesting original dimensions of at least 75m across. The lack of obvious water supply to this site, suggests that it is unlikely to have been water-filled in the manner of a conventional moated site. The ditches either abut or are bisected by two modern roads, although it is feasible that the other sides of the possible moat lay alongside earlier and narrower courses of these roads and are consequently masked by the modern roads and verges. If this moat-like site visible on the aerial photographs does represent the remains of a manorial site, it is likely to relate to that of Lamas, as it sits on the eastern edge of this settlement. However, the church (NHER 7659) and seventeenth century Lamas Hall (NHER 7627), are both located further to the west within the main village. It is worth noting that Saxon and medieval finds have been located in the same field as the possible moat (NHER 25614), which could suggest an earlier focus for the settlement in this area, away from the current village. However it must be noted that consultation of aerial photographs dating to earlier in the Second World War than 1946 might establish whether these earthworks and vegetation marks alternatively relate to a defensive feature or training site associated with the airfield.

3. Conclusions

3.1 Project Results

As has been described above in Section 2, the project results have been successful in characterising the types of archaeological remains that may survive within the perimeter of Coltishall airfield, but which would have been hard to identify from aerial photographs due to the twentieth century land use at the site. The cropmarks within the surrounding arable land indicate that components of extensive later prehistoric and/or Roman co-axial field systems, enclosures and major boundary systems are potentially likely to have continued into the area covered by the airfield. The faint vegetation marks identified on relatively recent Google Earth imagery within the airfield itself, potentially ranging in date from the later prehistoric period to medieval to post medieval period, will require further assessment and investigation to see if they do indeed relate to sub-surface remains. At present there is too little conclusive evidence for a confident interpretation to be made.

As with all other NMP projects the resulting interpretative and descriptive database recording for the mapping is available through the NHER. The resulting mapping will also be added to the NHER MapInfo GIS environment and can be made available to other users in other GIS formats.

3.2 Recommendations for Further Work

As stated above in Sections 1.4, 2 and 3.1 the faint vegetation marks tentatively identified on the grass and rough ground surrounding the airstrips are of uncertain archaeological origin and significance. Further survey, in particular geophysical survey, and other investigations, such as trial trenching, of these possible ditch-like features would be beneficial if the site is to be redeveloped. Further survey work and excavation would also be beneficial in areas of the site where it is thought likely that archaeological features appear to continue into the site, most significantly the major boundary ditch (NHER 57987) and multiple-ditched boundary (NHER 36729), the co-axial field system (NHER 57991) and enclosures (NHER 57983). The project has also

provided evidence to suggest that the airfield does not include the site of a major medieval manorial site as previously suggested (Watkins 2008), although again this would need additional work and the whole site would benefit from detailed documentary and map-based research.

Preliminary assessment of the aerial photographs for the project area and the surrounding arable fields indicates that this area contains an extremely rich archaeological landscape of regional, and potentially also national, significance. The Google Earth imagery, in particular the July 2006 flight, combined with the oblique aerial photograph collection held by NAPL, provides clear evidence for the excellent cropmark responsive potential for this area. Despite the good coverage provided the NAPL and online available resources, consultation of additional sources held by the NMR and Cambridge University at some stage in the future could also be beneficial in terms of potentially enhancing our understanding of the site and refining the detail of the mapping. It is hoped that at some point in the future this can take place within the context of a more extensive NMP survey of North East Norfolk.

It was not within the brief of this mapping project to map or record the World War Two and Cold War military remains at the airfield, see Section 1.1. However, assessment of the aerial photographs would undoubtedly provide information on the defences, in particular temporary World War Two perimeter defences that may have been removed or altered by the 1946 RAF aerial photographs, which may not be sufficiently recorded from available military maps and records. The pre-1946 military vertical and oblique coverage, if held for this area, potentially within the NMR aerial photograph collection would be the best resource for looking at these defensive features in any detail.

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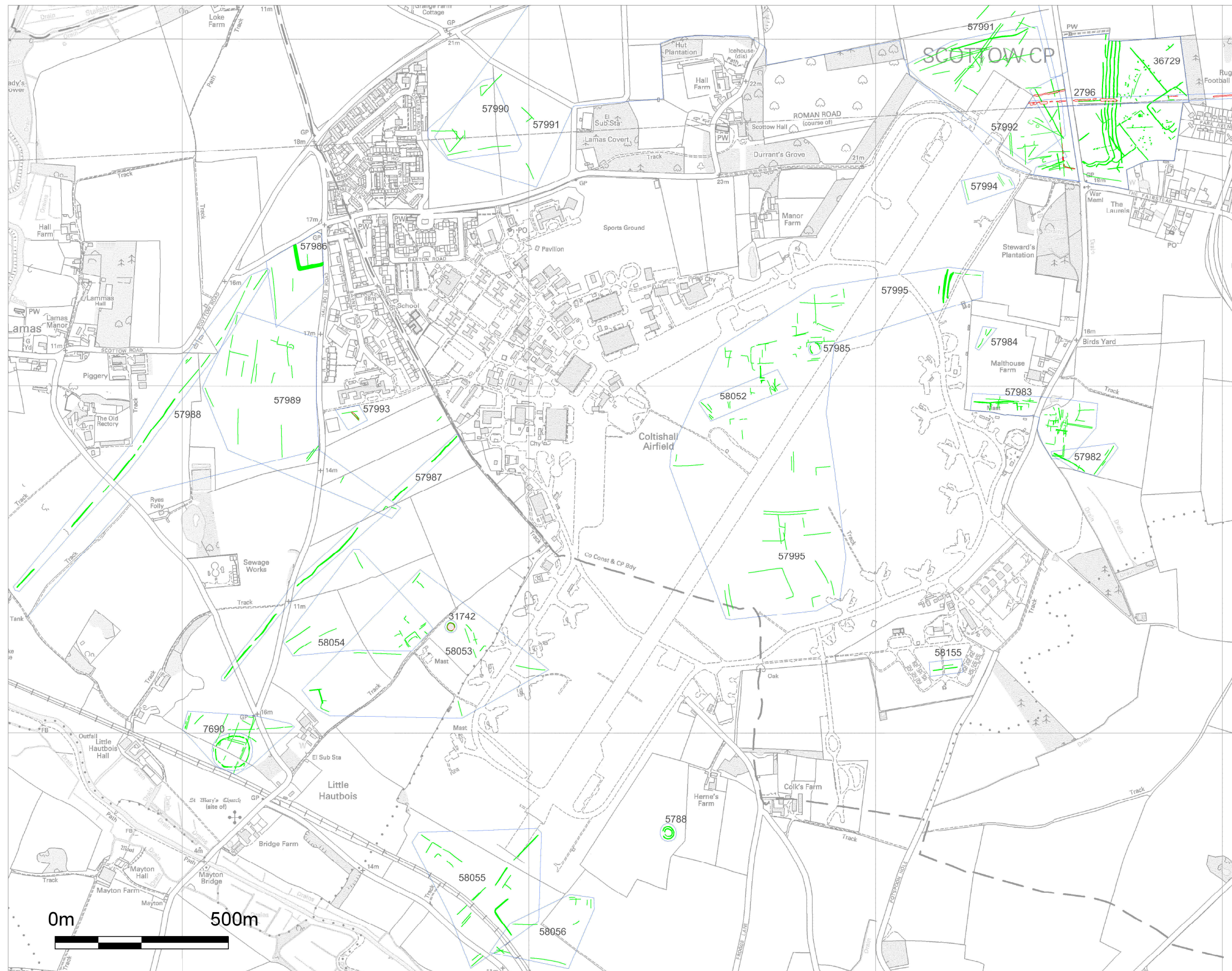


Figure 1. NMP mapping of the archaeological features visible on aerial photographs at the former RAF Coltishall and environs.

Base mapping © Crown copyright and database rights 2012 Ordnance Survey 100019340. NMP mapping © NCC.

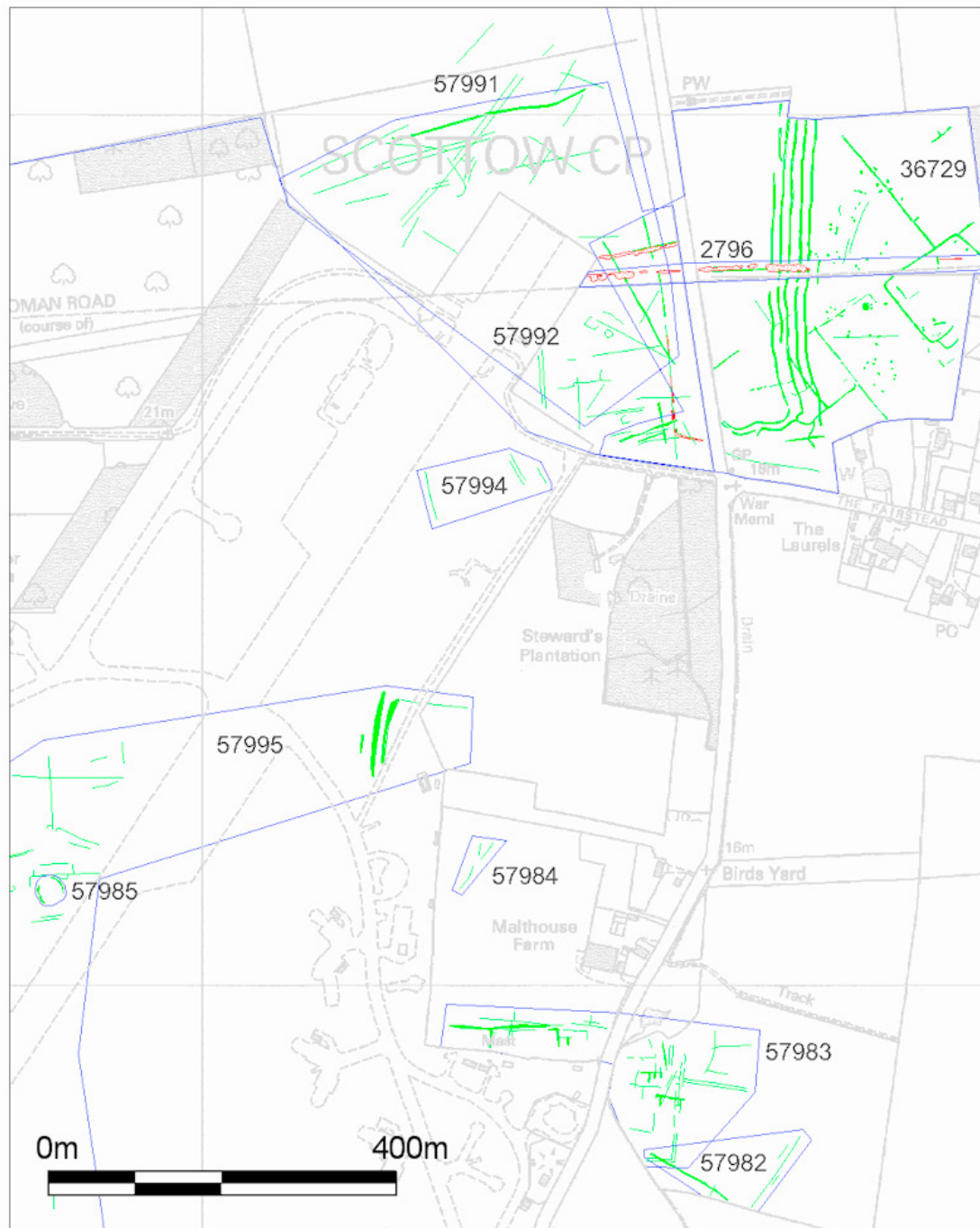


Figure 2. NMP mapping of the archaeological features visible on aerial photographs to the north east and east of former RAF Coltishall. Base mapping © Crown copyright and database rights 2012 Ordnance Survey 100019340. NMP mapping © NCC.



Figure 3. NMP mapping of the possible archaeological features visible on aerial photographs within the central area of RAF Coltishall overlain on the 1828 Scottow Enclosure Map (NRO C/Sca 2/27). Base mapping © Crown copyright and database rights 2012 Ordnance Survey 100019340. NMP mapping © NCC.

Appendix 1. Norfolk NMP Methodology

The methodology appended below is based upon that included in the project design for the Thetford-Norwich-A11 Corridor NMP project (Tremlett 2007), and subsequent revisions made in March 2010.

* Note military remains were not included within the brief for the Coltishall Airfield mapping and therefore differs from the normal NMP methodology. See Section 1.3 for explanation of this discussion not to include it within the mapping.

1. Archaeological Scope of the Survey

All archaeological monuments, both plough-levelled and upstanding, dating from the Neolithic period to the 20th century, including industrial and military remains up to 1945*, will be recorded. Those features adequately depicted by readily accessible historic maps, *i.e.* maps available through the Norfolk E-Map Explorer website, may be ignored. It should be noted that the NMP is intended to provide only assessment-level data, at a nominal scale of 1:2500. Highly detailed mapping of complex sites, whether structures, earthworks or cropmarks, will be undertaken only at the discretion of the NMP team and where time allows.

Plough-Levelled Features

All cropmarks and soilmarks representing features of archaeological origin will be recorded.

Earthworks

All earthwork sites visible on aerial photographs (whether previously surveyed or not) will be recorded. The transcription of earthwork sites may benefit from consultation of ground survey diagrams (mainly scale 1:1,000), particularly those of 135 monuments that were published in *Earthworks of Norfolk* (Cushion & Davison 2003). This information can be augmented and complemented where necessary by the aerial evidence. The earthworks will be recorded whether or not they are still extant on the latest aerial photographs. The accompanying exeGesIS database records will specify which elements of earthwork groups are surviving or plough-levelled.

Buildings

As a rule, the mapping will not include buildings other than where these are recorded as earthworks, masonry foundations or as cropmarks or soilmarks. Standing buildings that have been destroyed will be recorded when there is no other adequate record, although it is anticipated that a map record will already exist in most cases. These will be transcribed and the date and cause of their destruction, where known, will be recorded.

Industrial Archaeology

The survey will record evidence of industrial activity, such as salt-making, lime burning and brickmaking, where they can be recognised as pre-dating 1945 and only where the sites are not adequately already recorded by

map evidence. Small-scale extraction sites will only be recorded where they have archaeological relevance or have a bearing on surrounding sites.

Military Archaeology*

All former military sites and installations up to 1945 visible on aerial photographs will be recorded. Twentieth century military remains, such as airfields and camps, will be recorded to an appropriate level of detail, ranging from a dotted outline defining their extent, to the recording of the main structural components. Isolated military sites, such as pillboxes and searchlight batteries, will be mapped and recorded, again to an appropriate level of detail. Small, private air raid shelters, which are likely to be visible in some numbers in urban areas, will be mapped only as point data, linked to a single over-arching record for that city, town or zone.

Inter-Tidal Archaeology

Where encountered, these will be mapped to normal NMP standards.

Field Boundaries

Where recently removed field boundaries are visible as cropmarks on aerial photographs, they will not be plotted or recorded if they can be seen on the 1:10,000, 1:10,560 or available first edition Ordnance Survey maps. If they are extensive, and could be confused with the remains of earlier field systems, their presence and extent will be noted and in some cases mapped and recorded.

Ridge and Furrow and Water Meadows

Remains of ridge and furrow are not common in Norfolk. Where noted they will be recorded using a standard convention to indicate the extent and direction of the furrows. Areas of water meadows will also be mapped, using the bank and ditch layers.

Drainage Features

It is not within the usual scope of the NMP methodology to map drainage features. Where archaeologically significant, information can generally be derived from a detailed historic map-based search, for example using the Tithe and Enclosure maps available on the E-map Explorer website.

Parks and Gardens

Earthworks and levelled landscape features associated with historic parks and gardens will be recorded, including those listed in English Heritage's Historic Parks and Gardens Register and Norfolk County Council's Inventory of Parks, which are recognised as being of local or regional importance.

Geological and Geomorphological Features

Geological features will not be plotted unless their presence helps to define the limits of an archaeological site. Geological and geomorphological features may be noted in site records, as their presence in some instances can assist with an assessment of the archaeological potential of an area.

Areas of Extraction

Areas of former extraction will only be mapped where it is judged to be of archaeological significance, e.g. areas of medieval peat extraction.

2. Digital Transcription

Transcriptions will be undertaken at a nominal scale of 1:10,000. Whenever possible, archaeological features will be mapped from scanned images rectified in AERIAL, with control information derived from digital copy Ordnance Survey 1:2500 base maps. Where necessary, the digital terrain model function in AERIAL 5.29 will be used to compensate for distortion due to slope and terrain. A level of accuracy of +/- 3m should be achieved at this scale of mapping.

Rectified images will be imported into the AutoCAD or MapInfo drawing. Archaeological features will be transcribed onto the relevant drawing layer using the standard NMP line and colour conventions. Where deviation from these conventions is necessary or appropriate, the drawings will be changed back to NMP conventions before submission to the NMR. The original photographic scan and rectified image will usually be discarded, with the exception of complete scans of CUCAP aerial photographs which will be archived onto CD and given to CUCAP, as specified in the current NMP loan agreement. Where necessary, small amounts of additional detail may be added directly to the plot by eye.

3. Database Records

NMP Drawings

Attribute or Object Data tables will be created and incorporated into each MapInfo or AutoCAD drawing. A table called 'NORFOLK' will be created to include basic information on monument type, period and photographic references, plus any significant notes on the site. This will allow the creation of detailed and easily accessible drawings of particular periods and monument types. Whether in AutoCAD or MapInfo the information is attached to both the monument polygon and the mapped objects. Additional Object Data/Attribute Data tables may be used, as necessary.

NHER (ExeGesIS HBSMR)

Each individual monument or group of monuments (both new and previously recorded) will have a site record created or amended directly on the NHER ExeGesIS HBSMR database, obviating the need for a separate programme of data entry. Each record will include a written description and summary, an index of monument types and dates, locational data, and links to sources, events and other monument records, as necessary. This will then be publicly available on the NHER database, now accessible online via the Norfolk Heritage Explorer website. For this reason, grid references will not be included in the descriptive text for sites deemed to be 'sensitive' (e.g. Roman villas), although they may be given in the 'Notes' section of the record (which will not be viewable online).

MORPH Records

Where EH guidelines suggest that morphological recording is necessary, this will be carried out within the HBSMR database.

Event Records

An event record will be created for each project or area of mapping, providing information on the compiler, date of work, associated events and any other relevant information. The event record will be linked all its associated monument records. For large areas a record will be created for each Ordnance Survey 1:10,000 quarter sheet or part quarter sheet covered, linked to an overarching parent event record for the whole project.

4. Updated Methodology

Following a meeting with English Heritage (Pete Horne and Helen Winton) on 10 March 2010, the following revisions to the Norfolk NMP methodology were made.

Use of Rectified Images

The number of photographs rectified for each site should be minimised. Once the major elements of a site have been transcribed, it is acceptable for additional elements to be sketch plotted without the use of a rectified image.

Mapping at 1:2500 scale

Transcription will be undertaken at 1:2500 scale; any detail not clearly visible **and comprehensible** at a 1:2500 output scale should be omitted, *e.g.* internal features within buildings. Site-types with a conventional plan form may be adequately depicted in a simplified form (*e.g.* a Romano-Celtic temple may be depicted as two concentric square enclosures).

Small sites barely visible at 1:2500 scale (if at all) should be mapped 'as seen', or, where they are numerous and there are constraints on time, should be given a basic schematic depiction (this is particularly applicable for those with a regular/conventional plan). Where time is particularly limited, such sites could be mapped as point data (with the usual Object Data attached), as has been done for small air raid shelters in Norwich; however, this should first be discussed with the Senior Air Photo Interpretation Officer and/or HER Officer to ensure that an appropriate methodology is devised, to avoid confusion when mapping is used in the NHER MapInfo workspace.

The mapping is intended to inform a strategic overview, not individual site management or investigation. It should help people to understand what is visible on the photograph in broad terms, not record every detail.

Database Records

Database records should be shorter, simpler and focused on the strategic overview provided by the data, not the management or investigation of individual sites. Only that information considered mandatory for the NMP,

NMR and NHER need be included; additional useful information, if readily available, can be included if time constraints allow.

Descriptive Records

The descriptive section of the database records should be shorter and less detailed. For the most part, the Summaries currently written for NMP records contain most or all of the information required in the description, the only additional information needed being a grid reference and source references.

Statements regarding confidence at field or element-level are unnecessary. Greater reliance should be made on the experience of the team in making interpretative judgements, thus avoiding the necessity to justify or qualify interpretations.

The important information within the descriptive record (and Summary and indexing) is the main interpretation of the site, *e.g.* it is a field system, it is an enclosure, *etc.* The justification for having reached this interpretation, or details of elements that may not be part of the field system/enclosure, are not necessary.

Indexing

Indexing in the database should be more reliant on the use of top terms (*e.g.* FIELD SYSTEM, HEAVY ANTI AIRCRAFT BATTERY), without the need to index subsidiary terms (*e.g.* DITCH, GUN EMPLACEMENT).

Bear in mind which terms you are likely to search on and prioritise these when indexing.

When assigning monument types, it is important to be as specific as possible, and to add all appropriate monument types to maximize retrieval when database searches are carried out, although to a certain extent this will have to be dependent on the time available to record each site. The hierarchical nature of the thesauri means that when a specific term is used, it is not necessary to add monument types that sit above this term in the thesaurus hierarchy (*e.g.* if monument type 'inhumation cemetery' has been added, it is not necessary to also add the monument type "cemetery"). However, if there is doubt surrounding the interpretation of the archaeological remains, all relevant monument types should be added. Uncertainty can be recorded when monument types are added, using the confidence check box.

Interpretations of monuments are subjective, and monument records must be indexed to reflect this. Where there are several interpretations for a monument, all should be included in the indexing.

Any individual elements requiring MORPH recording will need to be indexed with an appropriate term.

When recording 20th-century military sites, bear in mind that the indexing of Monument types from the main thesaurus should be prioritised, as this is equivalent to that used by the NMR. Double indexing with more specific types available in the Defence of Britain thesaurus can be undertaken as well, but dependent on time constraints.

Period indexing should also be simplified. For example, a possibly Neolithic to Bronze Age ring ditch can be double indexed as 'Unknown' and '?Neolithic to ?Bronze Age'; there is no need to also index it as '?Neolithic' and '?Bronze Age'.

Only the evidence type visible on the latest aerial photographs should be indexed. For example, if an earthwork has been levelled by the date of the latest photographs, the monument type should be indexed with evidence type 'levelled earthwork' but there is no need to include 'earthwork' as a second evidence type.

Source References

It is not necessary to reference every photograph on which a site is visible. A selection of those that provide the best view of the site and that show the principal elements described in the record is sufficient.

Appendix 2. Sources

2.1 NAPL Collections

All of the available NAPL aerial photographs were assessed as part of the mapping project for the 1km grid squares TG 2521, TG 2621, TG 2721, TG 2522, TG 2622, TG 2722, TG 2523, TG 2623, TG 2723, plus that for adjoining squares where relevant. This included approximately 190 oblique photographs, predominantly those taken by Derek Edwards, the aerial photograph for Norfolk County Council from 1974 to 2000. RAF vertical coverage for the area dating to April, August, October 1946 was also consulted, as was Ordnance Survey vertical coverage from 1969, 1971 and 1994. The BKS colour vertical coverage from 1988 was also consulted.

For a full coversearch of the NAPL aerial photograph coverage for area please contact the

Norfolk Historic Environment Record, Union House, Gressenhall, NR20 4DR

Email: heritage@norfolk.gov.uk. Telephone: 01362 869282.

2.2 Google Earth Imagery

The Google Earth imagery (as available on 30 August 2012) was assessed for the project area. This included vertical aerial photographic and/or satellite imagery for the years 1999, 2003, 2006 and 2007.

2.3 Non-Photographic Sources

Historic Maps

'Map book of the estates of Davy Durrant of Scottow in Scottow, Coltishall, Great and Little Hautbois, Sco Ruston, Skeyton, Swanton Abbott and Tunstead' (1766)	NRO/MC 622/15/1
Faden's Map of Norfolk (1797)	
Bryant's Map of Norfolk (1826)	
1828 Scottow Enclosure Map	NRO C/Sca 2/27
1839 Scottow Tithe Map	NRO DN/TA 272
1841 Coltishall Tithe Map	NRO DN/TA 438
Ordnance Survey 1st edition 6 inch	
Ordnance Survey 2nd edition 25 inch	

