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HADRIAN'S WALL NMP PROJECT
BRAMPTON TO BIRDOSWALD

NATIONAL MAPPING PROGRAMME REPORT

Fiona Small

AERIAL SURVEY
AND INVESTIGATION

ENGLISH HERITAGE

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NATIONAL MAPPING PROGRAMME BAMPTON TO BIRDOSWALD CUMBRIA AND NORTHUMBERLAND

Fiona Small

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SUMMARY

This report reviews the results of part (Block 5) of the Hadrian's Wall World Heritage Site National Mapping Programme (NMP). The Hadrian's Wall NMP project aims to map all archaeological sites visible on aerial photographs and covers a band up to 15km wide encompassing Hadrian's Wall and the World Heritage Site (WHS) setting zone (Kershaw 2002). The project has been divided into six stages, and Block 5 comprises ten Ordnance Survey quarter sheets (equivalent to 250 square km) extending from Warwick Bridge (NE of Carlisle) in the west to Gilsland in the east. The results of the project will inform the World Heritage Site management plan.

The monumental remains of the Roman frontier have been the focus of studies for nearly four centuries. In contrast remains of other periods have tended to be overlooked resulting in a poor representation and understanding of both pre and post-Roman remains in this region. The broad approach of this survey redresses to a degree some of the Roman bias in the region's archaeological record, and added further Roman sites. The survey identified a number of sites and themes which would benefit from further research. Of particular interest are the potential prehistoric or Roman settlement sites identified on aerial photographs. The project also highlights the need for more specialist oblique aerial reconnaissance in the upland areas.

From the results of the survey four main topics have been considered and discussed in detail in this report. These are prehistoric and Roman settlement, new discoveries in the Roman military zone, medieval survivals in a post medieval landscape, and Second World War remains.

CONTRIBUTORS

The following members of the English Heritage Aerial Survey and Investigation team (Swindon) contributed to the air photo interpretation and transcription of this project, – Sharon Bishop, Edward Carpenter, Fiona Small and Cathy Stoertz. We would like to thank the York Aerial Survey team who provided valuable guidance and advice during the course of the survey. Yvonne Boutwood, Pete Horne and Helen Winton commented on this report.

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English Heritage would like to thank the Cambridge University Unit for Landscape Modelling (ULM) for the kind loan of photographs from their Air Photo Library.

Thanks to Northumberland County Council and Cumbria County Council for providing Historic Environment Record (or Sites and Monuments Record) data and allowing us to consult photographs held in their collections.

We would also like to thank Tim Gates for the use of both maps and site gazetteer from his survey of the Northumberland National Park.

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INTRODUCTION

The Hadrian's Wall World Heritage Site Mapping project covers 69 Ordnance Survey quarter sheets between Maryport and Bowness on Solway in the west and Newcastle upon Tyne in the east, following the entire length of Hadrian's Wall. It covers a band up to 15km wide encompassing both the Hadrian's Wall frontier works and the World Heritage Site (WHS) Setting Zone. For project management this area has been split into 6 blocks (Kershaw 2002).

The management plan for the World Heritage Site (English Heritage 1996) stresses the need to take a holistic view of the Wall and its setting and the need for a proper research strategy, and a single comprehensive database for the Wall (EH 1996, 5.1.5). A number of surveys, most recently the Research Agenda Strategy for Research and Archaeology in NW England (Brennand 2007), also identified major deficiencies in the knowledge of particular periods and site types. The NMP project aims to address this by interpreting and transcribing all archaeological features visible on aerial photographs with a possible date range from the prehistoric period through to the twentieth century. The aim of this project was to provide a comprehensive data set and recommendations to inform the management plan for the World Heritage Site. Improving technology now allows this to be in the form of a Geographical Information System (GIS) and NMP data is an excellent vehicle for the population of a GIS database (Kershaw, 2002).

This report is concerned with the section designated as Block 5, comprising ten 1:10,000 scale OS quarter sheets (equivalent to 250 square km) which includes a 20km length of Hadrian's Wall and the associated military zone between Brampton in the west and Birdoswald fort in the east. This area therefore covers the most westerly upstanding masonry remains of Hadrian's Wall and vestiges of substantial earthworks of the wall ditch, the Vallum, Stanegate and the Military Way, as well as traces of the earlier turf wall phase of Hadrian's Wall. Westwards the frontier features survive as very low earthworks or as sub-surface remains visible as cropmarks. Within this survey area there is evidence for masonry, earthwork and cropmark remains of six forts and six camps.

The abundant visible remains of the former Roman frontier, concentrated in the narrow military zone to the south of the Wall, were the focus of intensive study by historians for over 400 years. Many of these sites, though ruined and eroded, are extensive with considerable earthworks and masonry still extant. Consequentially, this period in the regions history is relatively well known. In contrast, there is relatively little research into the pre-Roman settlements in the area. Some of these earlier sites may be incorrectly identified as Roman where they survive as earthworks in close proximity to a major Roman site. In addition, very little is known about the affects the Roman frontier had on the indigenous population, or how it influenced subsequent settlement patterns.

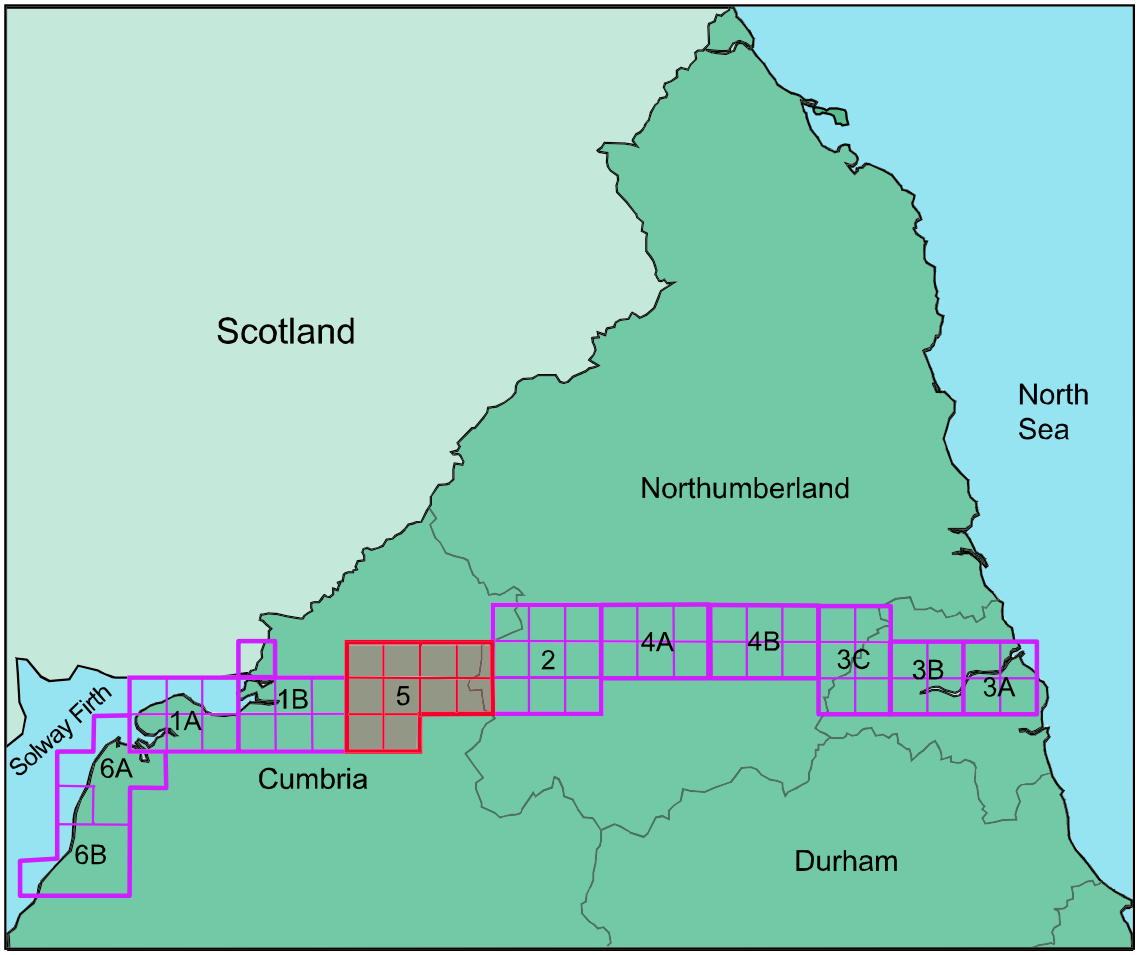

Figure 1. Hadrian's Wall NMP project area block 5 (Red shaded) with other blocks outlined in purple

This report is a brief synthesis and aims to characterise the range of archaeological sites identified within this survey block. This will present the results in the context of the varied terrain encountered and offer some comparison with the findings of adjacent areas.

Aerial Photographic Sources

All readily available aerial photographs came from two main collections: The National Monuments Record (NMR) and Cambridge University Collection of Air Photographs (CUCAP) administered by the Unit for Landscape Modelling (ULM).

The RAF verticals, supplemented by the other collections provided complete coverage of the project area from 1945 to 1994. Though varying in quality and scale, these photographs provided the core material for the air photo interpretation. The earlier RAF

vertical photographs in particular provided a comprehensive pictorial record of the entire area immediately post World War II, recording wartime structures and sites. These photographs also represented the only sources for the more remote and less frequently photographed parts of the survey area.

In addition to the printed vertical photographs, there are digital photo mosaics of RAF vertical photographs of the course of Hadrian's Wall in the 1930s. This set of photographs was invaluable due to their early date and clarity, revealing many Roman and non-Roman features prior to more intensive ploughing which started during the Second World War.

The use of early RAF photographs taken in the 1930s and 1940s enabled identification of a number of additional features within the Roman military zone surviving as faint earthworks that have since been plough-levelled. This highlights the importance of early photographs taken for non-archaeological purposes.

Recent oblique photographs of several sites have revealed details such as prehistoric cord rig that could not be seen on the best vertical photographs of the same sites. This raises the question of how many other sites may have been overlooked because they have not been targeted, and highlights the need for a programme of reconnaissance, for example in the north of the survey area.

Documentary Sources

A range of documentary evidence was used during the mapping, interpretation and subsequent analysis and recording. Regional overviews and published survey results were consulted. The main sources for individual monuments were the NMR AMIE database, NMR WebGIS and Historic Environment Record (or Sites and Monuments Record) data from Cumbria and Northumberland. Between 1988 and 1993 the Royal Commission on the Historical Monuments of England (RCHME) surveyed and mapped at 1:2500 scale all surviving earthwork and masonry remains of the entire Wall and their interpretations were recorded in the AMIE database. Additional information was obtained from Ordnance Survey, RCHME and English Heritage field plans and notes. Sketch maps and a site gazetteer from Tim Gates' (2004) survey of the Northumberland National Park were used for a small area on map NY66SW.

Historic mapping information was obtained from paper copies of OS 1:10,560 scale maps, and the 1st-4th edition OS maps (1843-1939) were consulted digitally through the EH WebGIS.

British Geological Survey (BGS) drift editions of the geology maps for the survey area, Bewcastle, Sheet 12 (1968) and Brompton, Sheet 18 (1980) provided information on the

underlying geology, vital for identifying the types of mineral extraction recorded across the survey area as well as offering some explanation for the variable occurrence and visibility of sites.

Methodology

The project was carried out to National Mapping Programme (NMP) standards and therefore set out to identify, interpret and transcribe all archaeological features on aerial photographs. This includes all features dating from the Neolithic period to the twentieth century, visible as cropmarks, soilmarks or earthworks. The background, philosophy and approach to English Heritage's National Mapping Programme are explained in Understanding England's Historic Landscapes: An Aerial Perspective (Bewley 2001).

Digital OS 1:2500 scale tiles and 1:10,000 scale contour data were used for rectification of aerial photographs typically offering an accuracy of +/-3m to the 1:2500 base map.

Copies of the transcriptions and the associated monument records are available from the NMR in Swindon. Summary versions of the AMIE records appear on the English Heritage PastScape web site.

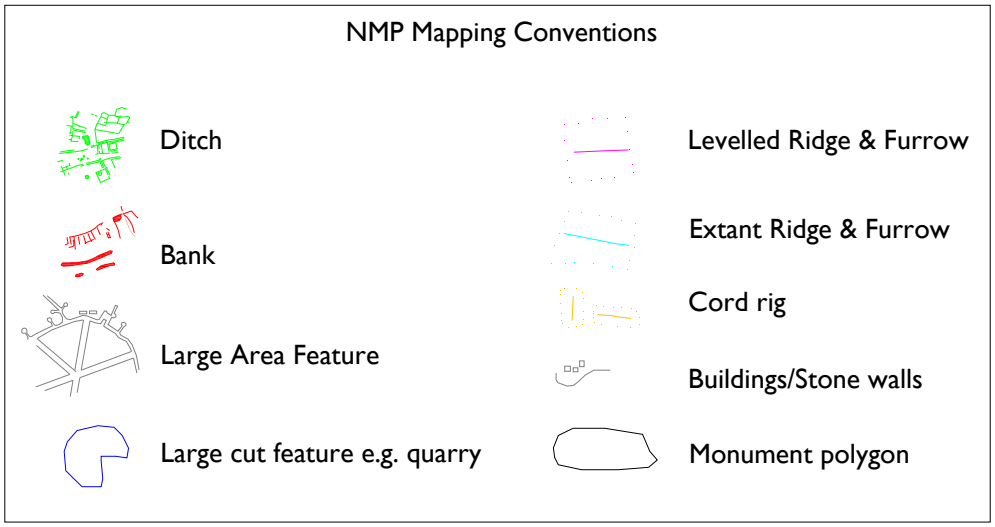

Figure 2. NMP mapping conventions. NB. Cord rig is depicted in a different colour from standard ridge and furrow for the purposes of this survey. See Appendix 3 for a detailed description of methodology.

THE PHYSICAL LANDSCAPE OF BLOCK 5 – BRAMPTON TO BIRDOSWALD

Block 5 is defined for project management purposes and therefore does not form a coherent topographical zone; rather it incorporates a range of topographic and landscape areas. The diversity in topography and landuse has affected the range of archaeological sites encountered as well as their survival.

The study area is bisected from north-east to south-west by the course of the River Irthing which meets the River Eden at Warwick Bridge. The ground rises steadily, west to east, from 5-10m above OD at the eastern edge of the Solway plain, to 200-250m above OD on the western flank of the Pennine ridge (Figure 3). This topographic change reflects the underlying geology. The higher ground to the east is dominated by Carboniferous limestone and sandstone inter-bedded with coal measures. This is overlain by a thick layer of glacial boulder clay and glacial till which was formed during the last period of glacial retreat into a rolling landscape of low ridges aligned NE-SW.

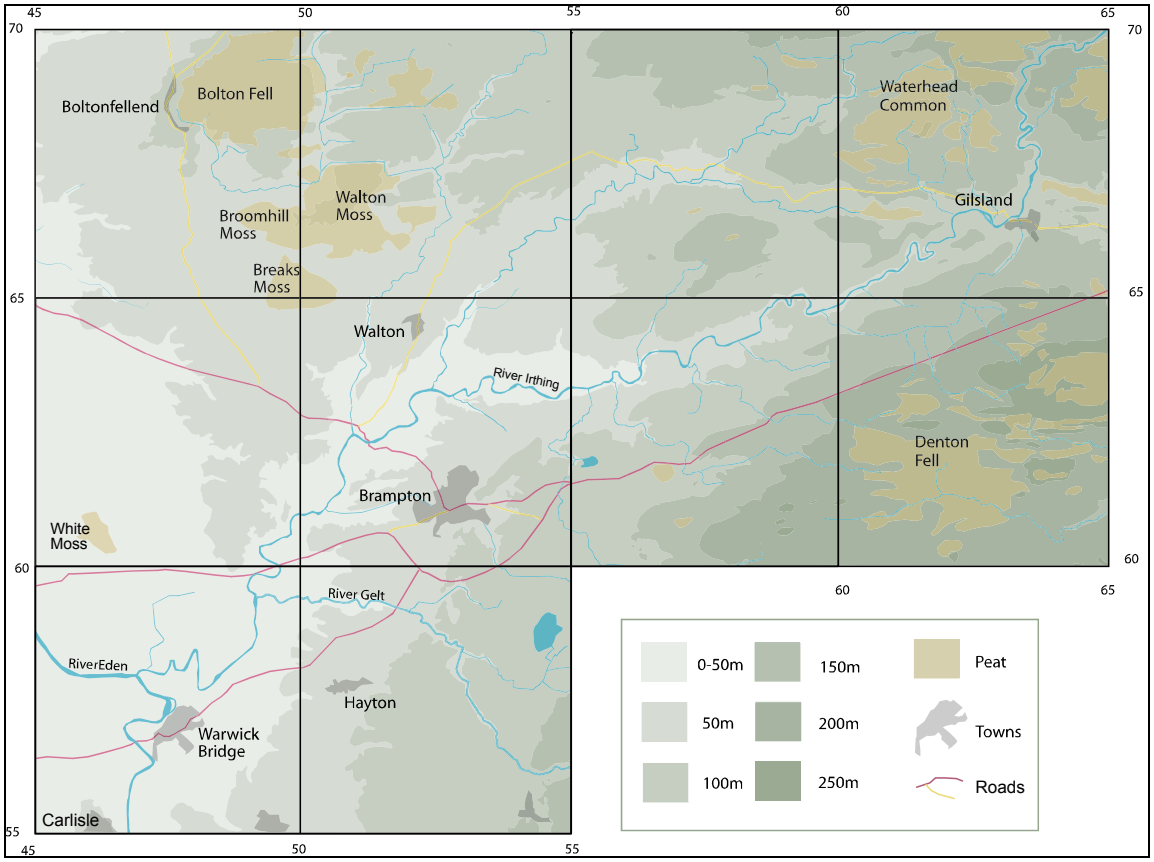

Figure 3. Map of survey area with topography showing contours at 50m intervals and peat deposits. Contour data and background map derived from Ordnance Survey 1:25,000 sheets English Heritage 100019088. 2008

There has been widespread mineral extraction in the eastern part of Block 5 exploiting the coal seams; the landscape of the eastern half of the area is dotted with the remains of numerous small to medium scale mining operations visible as open cast mines, pits and spoil. Stone was quarried throughout this region for construction, and limestone in particular for lime production. The stone for the construction of Hadrian's Wall was quarried locally, and Roman inscriptions have been found in a few quarry locations. One example is that of the eroded traces of a Roman quarry inscription known as the Rock of Gelt found near Brampton overlooking the River Gelt. This refers to Apr(ilis?) from a vexillation of II Legion Augusta under command of an optio called Agricola (de la Bédoyère, 1998). Another example of Roman quarry graffiti is at a quarry in the cliff overlooking the northern side of the River Irthing to the south of Birdoswald fort. To evaluate possible Roman quarrying associated with the wall and environs, all quarries visible on aerial photographs were mapped within a 2 km band either side of the Wall.

In the eastern part of the survey area, the soils are generally acid and waterlogged with areas of raised peat bog and areas of poor peaty soils, all with low fertility. The dominant vegetation is unimproved grassland with rough pasture, with some arable in the lower regions. Large areas were exploited in the medieval to post medieval period for small-scale peat extraction. The two highest regions, Denton Fell and Waterhead Common are used for coniferous Forestry Commission plantation. In contrast, the soils within the Irthing river valley comprise freely draining slightly acid soils suitable for both pasture and arable. Generally, with the exception of the concentration of Roman remains around Hadrian's Wall few new archaeological sites were seen in this eastern region.

The northern and north-western parts of the survey area, which encompass the region from Boltonfellend and Walton Moss in the west to Waterhead Common in the east, are characterised by poorly drained acid peaty upland soils with widespread raised peat bogs. This area consists of a mixture of unimproved and semi-improved grass and moorland, though a considerable amount appears to have been improved and taken into agriculture in the medieval to post medieval periods. Much of this was under pasture in the 20th century, with extensive traces of narrow straight post medieval rig still visible as earthworks on RAF and OS photographs. With the exception of this post medieval rig and post medieval and modern peat extraction, very few archaeological sites were identified on aerial photographs in this region.

The south-western part of the survey area, extending westwards from Brampton to Whitemoss, and south-west to the edge of Carlisle, is characterised by undulating ground descending to the lower lying areas at the edge of the Solway Plain. Here the soils are generally more freely draining and slightly acid in nature. The favourable soils and situation has resulted in a long history of settlement and cultivation in this area. There is a mix of arable and pasture with signs of prolonged ploughing. A small number of eroded earthwork sites are recorded on photographs taken in the 1930s and 1940s, but most have been plough levelled or heavily denuded where they occur within agricultural land. The soils and vegetation are generally more responsive to cropmark generation and a

number of previously unknown prehistoric settlements have been discovered through aerial photography.

The range of topographies and land use in this region affect the survival and visibility of archaeological sites from aerial photographs. In the upper regions there are fewer sites recorded, but this may be partly due to difficulties of prospection, whilst in the lower fertile regions, sites have been levelled through more intensive ploughing, but are more likely to be visible as cropmarks where arable crops occur.

Only a few sites have been recorded in the semi-improved grassland and unimproved moorland areas to the north and east, but this may be due to the rough vegetation which reduce the effectiveness of the survey with only the more substantial sites visible. Also, this area is generally only covered by high-level vertical photography which proved less good for the identification of low earthworks. Extensive post medieval cultivation, seen as narrow ridge and furrow, may also have masked or obliterated potential sites.

RESULTS FROM THE NMP SURVEY

This is an area where the archaeological and historical record is relatively uneven and comprises abundant material from the Roman remains associated with the Roman military frontier, with additional material focussed on medieval sites such as Lanercost Priory and the handful of mottes, and later remains of post medieval bastle houses. Though there are records of isolated surface finds, the representation of sites from the prehistoric, especially the Iron Age, is recognised to be low across the whole of the north west of England. (Higham and Jones 1985, Bewley, 1994, Haselgrove, 2002, Gates, 2004, Hodgkinson, 2000, and Brennand 2007).

The value of NMP methodology is that it identifies all possible archaeological sites with a potential date from the Neolithic to the modern periods and puts them into their archaeological and geographical context. One of the drawbacks with this kind of survey is that it can only record monumental remains large enough to be seen on an aerial photograph, and so, for example, excludes Mesolithic and Palaeolithic sites.

The NMP survey has enhanced the record in a number of ways:

- It provides a single digital depiction and systematic record of the extent and form of the remains.

- There are significant discoveries, including a number of new Roman camps.

- Addition of information to the form and extent of the Wall, Vallum, Military Way and Stanegate.

- Widening the scope of survey has improved the record and includes remains of medieval, post medieval cultivation and modern military sites up to 1945.

The statistics do not appear to indicate a large improvement in knowledge to existing sites (updating and adding information to 77 sites), but the NMP survey recorded in the region of 550 new monuments. Approximately 35% of the new sites were classified as prehistoric. Most are visible as cropmarks and are typically confined to the lower-lying areas to the west bordering on the Solway where soils and terrain lend themselves more readily to cropmark formation. The interpretation of these sites was usually based on morphological characteristics because of the lack of comparative dating evidence from excavations in this region. The new sites include a number of settlement enclosures, probably Iron Age or Roman in date, two field systems, a pit alignment, a trackway and several areas of earthwork cord rig. Based on size, three sites are thought to be ploughed out Bronze Age round barrows. The remaining 65% of the new records relate to post medieval quarrying, peat cutting, and land improvement in the form of narrow ridge and furrow. These tend to be found in the northern mosses, and the middle and eastern parts of the survey area rather than the low-lying land where there are more prehistoric sites visible as cropmarks.

Within the Brampton – Birdoswald area, along the Wall and immediately to the south, the NMP survey identified forty-one individual Roman sites or features with no existing AMIE record. However, the majority of these sites represented sections of the Wall itself, wall ditch, Vallum, Stanegate and the Military Way so strictly speaking many are not 'newly discovered' sites. Most were visible as earthworks on early photographs, but had subsequently been plough-levelled. With the exception of the traces of road to the fort at Bewcastle to the north of Birdoswald, no other Roman military sites were identified to the north of the line of Hadrian's Wall. South of the Wall three previously unrecorded camps and two potential camps were identified. Most significant was the discovery of the plans of the tent encampments within camps at White Moss. These are discussed in Section 6 of this report.

In contrast to the post medieval remains, very few medieval sites were recorded (less than 1 % of the total records), and these mainly comprised ridge and furrow and hollow ways. A further ten sites were more broadly classified as medieval or post medieval and included more ridge and furrow, hollow ways and traces of small-scale peat cutting.

Remains from the Second World War accounted for a small percentage of the newly discovered sites. The majority of these were associated with RAF Crosby on Eden (now Carlisle Airport) which is recorded from RAF photographs taken between July 1945 and April 1948.

PREHISTORIC AND ROMAN SETTLEMENT

Background

This section concerns possible remains from the late Bronze Age, Iron Age and Roman periods. The report for the Bowness on Solway to Carlisle (Block 1) section of the Hadrian's Wall NMP Project (Boutwood, 2005) includes a discussion of the background to earlier studies (e.g. Collingwood, 1933) and highlights the scarcity of dating evidence for this period in the Solway Plain. Pollen studies indicate a degree of deforestation in the area from around 4000 BC and widespread clearance by the end of the 1st millennium BC (Wilmott 2001). The handful of excavated Mesolithic and Neolithic sites, Bronze Age finds, cairn fields, traces of plough marks beneath the Wall and the small number of hillforts indicates a level of human activity in this part of north-western England throughout the prehistoric period (Wilmott 2001). However, very few later prehistoric settlements sites have been identified in the region.

In the 1960s, George Jobey undertook an extensive survey of rectilinear settlements of the Roman period in Northumberland. Though his study area only overlaps slightly with the eastern edge of this survey block, the site types, backed by some excavation and his observations on associated field systems provide a useful comparison.

Aerial reconnaissance has been one of the most successful research tools in the quest for prehistoric settlement in the north-west. The first significant surveys were undertaken from 1974 (Higham and Jones 1975, Bewley 1994). Sites seen as cropmarks were broadly dated on morphology alone. Whereas the earlier surveys focused on the typology of these sites, the Hadrian's Wall NMP mapping for the Solway area made a major contribution to the interpretation of the sites within the landscape by showing that these were not isolated sites, but settlements linked by linear boundaries into a cohesive landscape.

Much of the area described in this report lies outside areas referred to by the most of the recent studies of the Solway Plain to the west (Higham and Jones 1974, Bewley 1994, Boutwood 2005, Haselgrove 2002, and Hodgkinson 2000). A number of NMP surveys have been carried out by English Heritage on the eastern flank of the Pennines including parts of the Millfield Basin, Howgill Fells, Till-Tweed, Cheviots, and North York Moors. However, no comparable survey has been undertaken on the western side of the Pennines. This means that there is reduced resource to draw on for reference when identifying new sites. Particularly in the less improved areas in the northern and eastern parts where fewer sites have been identified.

Tim Gates surveyed the later prehistoric and Roman landscape immediately to the east of Block 5 between 1998 and 2001 (Gates, 2004). Analysis of targeted aerial photography identified numerous new sites and provided a greater understanding of the morphology and possible chronology of these sites within the wider landscape. The results of Gates's

work were a useful resource for the Hadrian's Wall NMP survey as they include morphologically comparable sites identified from aerial photographs.

Work by Bewley, 1994, Haselgrove, 2002, and Hodgkinson, 2000, using aerial photography, systematic field walking and targeted excavation, has contributed to an increased number of potential prehistoric settlement sites, but dating evidence from excavations has consistently produced Roman dates. The relative absence of dateable pre-Roman remains could be attributed to reliance on ceramics and artefact types which are known, typically, to be largely absent from sites from particular periods in parts of the north-west of England (Brennand 2007). Some Roman sites have earlier aceramic phases, and identification is hampered further by the acidic soil conditions typical to the NW of England, resulting in low survival of bone artefacts. This all contributes to a low number of diagnostic sites from these already under-represented periods (Brennand 2007). Detecting signs of Romanisation in the few excavated late pre-Roman Iron Age sites has proved difficult and is usually represented by small quantities of low quality Roman pottery and other objects (Brennand 2007).

Therefore, in this region, in particular, there are problems with dating of enclosures based on morphology alone. Harding (2004) noted that pre-Roman settlement could be dispersed homesteads with rectilinear or curvilinear enclosures containing one or more round houses. A small number of similar dispersed enclosures were identified during the Hadrian's Wall NMP survey, though only three sites had traces of hut circles and none had been excavated. Harding observed an absence of villas in the north-west region, and that Roman rural settlement is frequently indistinguishable from the pre-Roman settlements. This is supported by evidence from the excavations of sites morphologically classified as potential Iron Age settlements by Bewley (2004) which all produced Roman dates from the 2nd to 4th centuries AD. None could be specifically dated to the Iron Age, perhaps indicating a degree of continuity of settlement forms in this region through the Iron Age and into the Roman period (Blake 1960, Bewley 1994).

When studying settlement within the Iron Age/Roman period in the north-western region of the frontier zone one must consider what degree of influence the Roman occupation had on the indigenous population and their settlements. It is thought that the effects were minimal when compared with the southern and midland regions of Britain (Harding 2004). The military zone possibly produced markedly different conditions for the local population than in southern parts of Britain where the developing market economy was flourishing under Roman occupation. It is arguable, with land possibly confiscated, peoples displaced and mobility restricted; there would be little benefit, and a lot to be lost on the arrival of the Romans (Harding 2004). However, it is entirely possible that the Wall had the opposite effect of encouraging markets by controlling rather than restricting movement and trade.

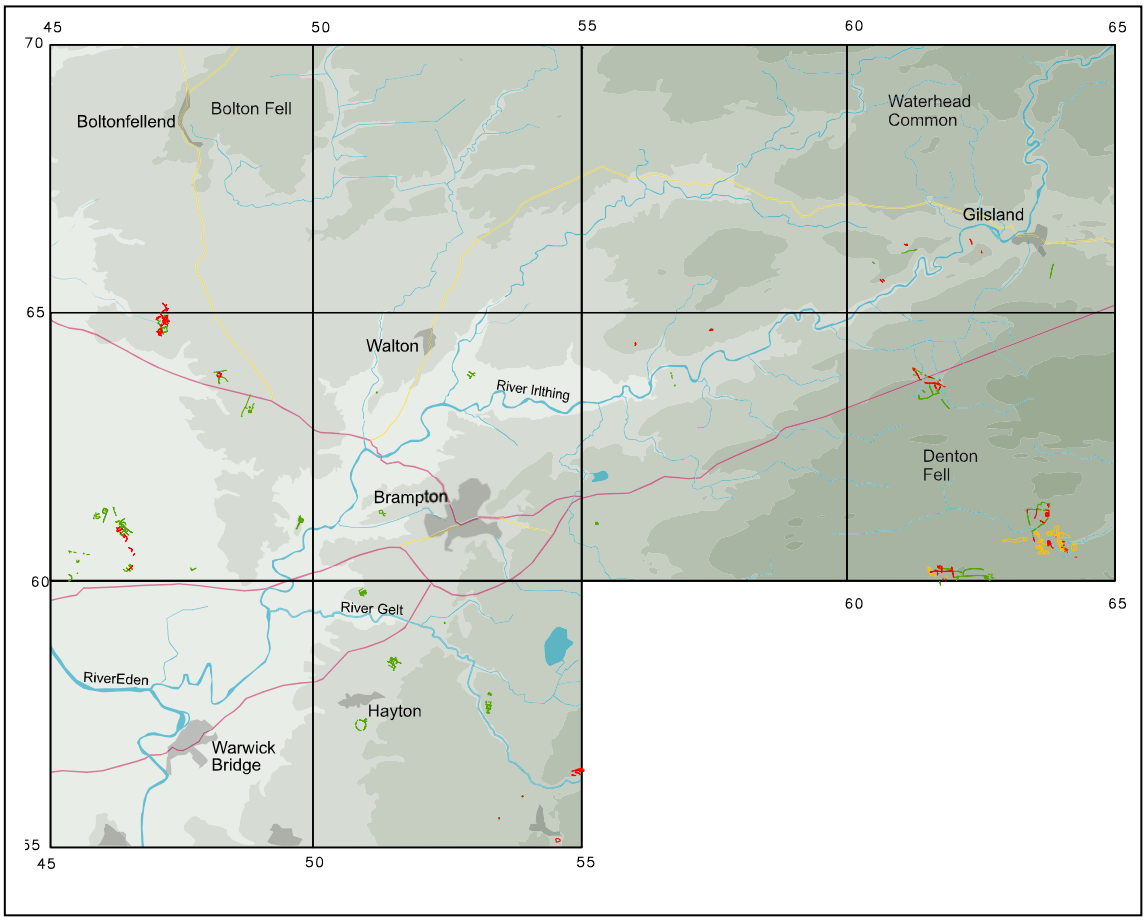

Figure 4. Distribution of all prehistoric and Romano British sites mapped from aerial photographs. Contour data and background map derived from Ordnance Survey 1:50,000 sheets English Heritage 100019088. 2008

Introduction to Prehistoric sites

The NMP survey recorded a number of previously known prehistoric sites, though prior to the survey most had never been accurately mapped. These include a small number of possible Bronze Age round barrows, cairns, field systems and patches of cord rig. The project yielded a number of new sites with a potential prehistoric date. Most of these sites are single isolated enclosures (Figure 6) but some have more complex forms. Unlike those recorded during the NMP Solway survey, none seem to form large settlements or complexes linked by linear boundaries. With the exception of a group of earthworks on Denton Fell and Hartleyburn Common, all other potential prehistoric enclosures are located in the south-western region in close proximity to the River Eden, and are visible as cropmarks.

Possible prehistoric curvilinear enclosures

Three of the newly discovered sites are large curvilinear enclosures and are suggested to be possibly Bronze Age or even Neolithic in date (Figure 5, Figure 6 sites 26-28). All lie in close proximity to the River Eden on low lying ground. The first of these (Figure 6, site 26) is to the south of the village of Hayton, on a gentle west facing slope between 80m and 85m above OD between the River Eden and the River Gelt. Seen for the first time on English Heritage photographs taken in July 2006, this site is probably later prehistoric in date (Neolithic, Bronze Age or perhaps early Iron Age) (Barber pers comm). The enclosure ditch is substantial with a variable width, measuring between c. 2- 4m across. It appears as an incomplete enclosure of approximately 190m in diameter, though it is not possible to say whether there are any intentional interruptions in the enclosure ditch rather than failure of the cropmark and the breaks caused by the presence of modern hedge lines. This site is similar in size to that of another Cumbrian enclosure adjacent to the stone circle known as Long Meg and her Daughters which, like that at Hayton, is also located close to the River Eden. The Long Meg enclosure, also discovered from aerial photographs, is sub-circular and measures c. 220m x 190m and has been suggested to be Neolithic or early Bronze Age based on its relationship with the stone circle (Soffe and Clair 1988).

The second large curvilinear prehistoric enclosure was seen to the south-east of Warwick Bridge on photographs again taken by English Heritage in July 2006. This site lies at 30m above OD, 750m to the east of the River Eden. The enclosure appeared as an incomplete irregular arc defined by a single ditch between 2-4m in width and an approximate diameter or 90m. (Figure 6, Site 27)

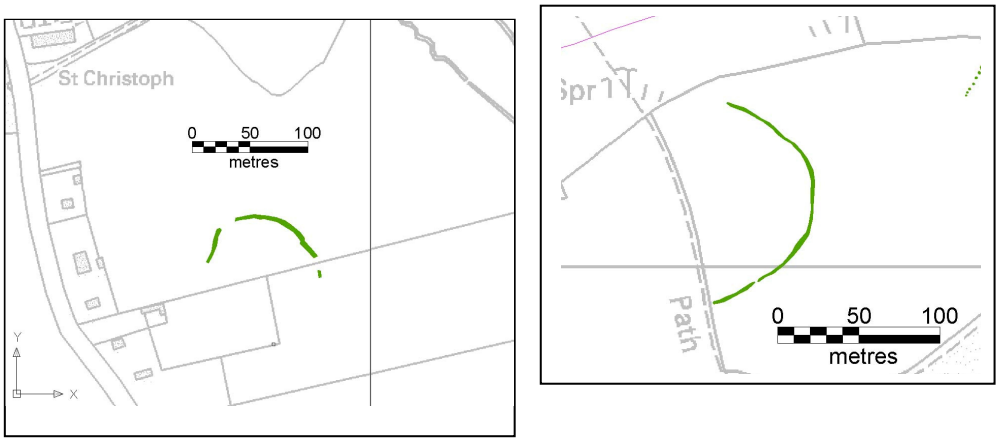

Figure 5. Possible prehistoric enclosures at Warwick Bridge and Moss Side. OS background map: English Heritage 100019088. 2008

The third potential (though slightly dubious) curvilinear prehistoric enclosure is visible as an incomplete faint cropmark lying 880m north-west of the River Eden on a slightly raised

area to the west of White Moss, immediately to the south-west of the site of the Roman camps at White Moss. This enclosure had a diameter of c.122m. This site may be geological in origin. (Figure 5 and Figure 6, Site 28).

Possible Iron Age/Roman Sites

The NMP survey identified 23 individual rectilinear enclosures between Brampton to Birdoswald. All but two are plough-levelled and, based on morphological characteristics, could be Iron Age or Romano-British in origin. Most of these sites are single isolated enclosures but some have more complex forms. The following sections will look in detail at some of the more complex sites.

Where conditions (soil, drainage, topography and agricultural practice) are more favourable, a number of potential prehistoric or Roman sites were recorded from aerial photographs in the south-western part of the survey area. All but one of these sites was seen only as cropmarks. In total there were ten enclosures recorded and mapped for the first time through this survey, and a further seven enclosures identified prior to this through RCHME/EH aerial reconnaissance and reconnaissance recording programme, but mapped for the first time as part of this survey.

Few Iron Age/Romano-British settlement sites are known in this region, and to the north of the line of Hadrian's Wall, these sites become even scarcer. Only five possible prehistoric sites were identified to the north of the line of Hadrian's Wall within the Block 5 survey area. With the exception of one site located near Birdoswald, all are on lower-lying ground to the west rather than in the upland areas. The question is, is there really an absence of sites or rather a matter of poor detection of sites?

Topography, geology and resultant vegetation undoubtedly affect settlement patterns. The zone to the north of Hadrian's Wall is typically more marginal, with a prevalence of peat moss and semi-improved upland. Analysis of pollen samples during the Lowland Wetlands survey of Cumbria indicate evidence of low level agricultural activity and deforestation in the area of Bolton Fell moss in the early part of the 1st Millennium BC (Hodkinson, 2000). The results of pollen analysis around Birdoswald Roman fort indicate that most woodland clearance was carried out during the late Iron Age, and that immediately prior to the construction of the turf wall phase of the Roman frontier works the landscape was a patchwork of arable, rough moorland and relict woodland. By the time of the construction of the stone phase of Hadrian's Wall large areas to the north of Birdoswald were wet moorland; a direct result of active deforestation (Wilmott, 2001).

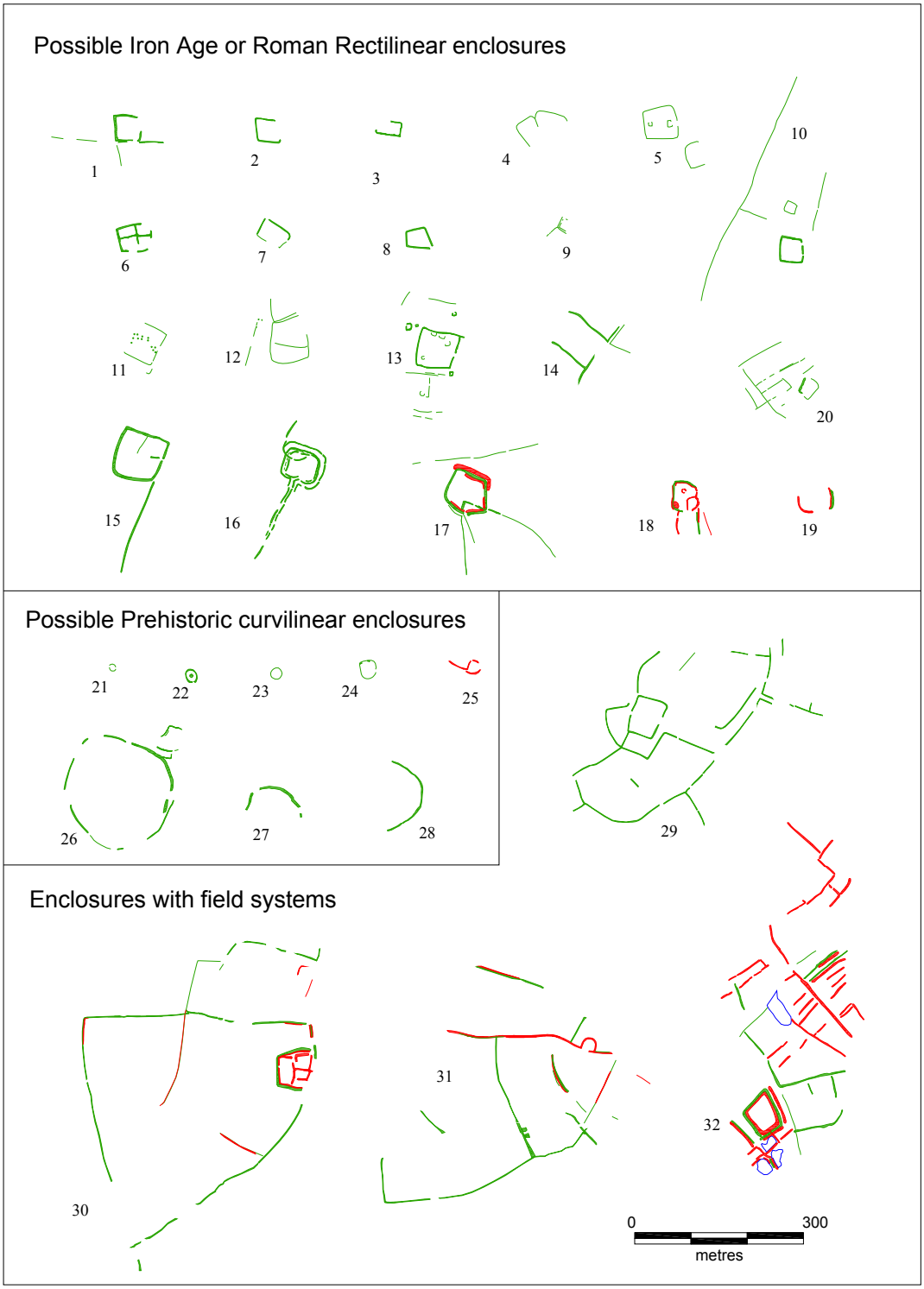

Figure 6. All enclosures thought to have prehistoric or Roman origins. The details of these sites are tabulated in Appendix 1

It is arguable that the more remote upland regions would be less desirable for settlement, but temporary settlements for summer grazing or hunting could have existed. Detecting these sites would appear to be the issue. Rough vegetation in unimproved upland areas obscures archaeological features resulting in under-recording of upland sites. New sites were found in moorland situations across England and Scotland when infra-red linescan imagery (IRLS) from the RAF was consulted in the 1990s by the RCHME and the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS). This method can detect sites obscured by dense vegetation which are otherwise invisible from the air using conventional photography. In England one third of the sites recorded by the IRLS were new discoveries. At Fylingdales Moor, North Yorkshire extensive previously unrecorded archaeological sites were revealed on the moor when the vegetation was lost in a widespread moorland fire (Stone, 2006).

The timing and extent of the peat growth in certain areas is unclear area so it is uncertain whether many prehistoric sites have been obscured by peat cover. Considerable drainage and reclamation of the mires, which took place from the medieval period onwards, may have affected preservation and condition of any sites under or on the peat. This improvement was accelerated in the 1840s with the widespread availability of clay drainage pipes and public funding (Winchester 1987). Systematic enclosure and large scale improvement of these marginal lands, throughout the 19th and 20th centuries, has resulted in widespread humification of the peat and de-watering of the lower deposits (Winchester 1987). A large proportion of the northern region of the survey area lying to the north of the Wall is covered by the remains of post medieval cultivation in the form of narrow straight ridge and furrow which is recorded on RAF and OS photographs. It is possible that earlier sites were levelled and/or are masked by this episode of ploughing. The combined effects of a predominance of pasture and waterlogged soils also result in conditions where cropmark formation is less likely.

The perceived absence of archaeological sites in these areas has led to a lack of aerial reconnaissance. The majority of specialist oblique photographs in the survey area are focused on Hadrian's Wall and the Roman military sites within the military zone. Recent English Heritage reconnaissance has detected other sites by targeting non-Roman remains, but the area to the north of the Wall still remains largely un-photographed because of the apparent low monument density. To the south of the Wall recent oblique photographs of the Curricks settlement in the SE of the survey area revealed extensive earthwork remains of prehistoric cord rig that could not be seen on the good quality vertical photographs of the site. This does suggest that further subtle earthwork sites in the upland areas to the north of the Wall may well lie undetected and would benefit from a programme of targeted reconnaissance.

The Curricks and other prehistoric sites on Hartleyburn Common, Northumberland and Denton Fell, Cumbria

The most significant and well-preserved earthwork site recorded during the course of this survey is the scheduled enclosure on Denton Fell known as the Curricks. The site is located immediately to the east of a forestry plantation, the edge of which is marked by the county boundary between Northumberland and Cumbria. It has not been excavated, but is variously thought to be an Iron Age settlement reused as a medieval farmstead or shieling (Sainsbury, 1979), or a Roman steading (Jobey, 1960). The OS and RCHME surveyed the site and concluded it was a small Iron Age/Roman farmstead with a possible medieval shieling built into the bank near the entrance. This site is similar to a number of Roman farmsteads identified and excavated in the 1950s by George Jobey (Jobey 1960, 1-38). He identified 24 of these rectilinear settlement enclosures which shared common morphological elements. Most are enclosed by an outer rubble core wall retained by large upright stones. Some had an outer ditch, occasionally with up-cast material outside this. Main entrances were frequently to the south-east, some with large orthostats. Like a number of Jobey's sites, the Curricks enclosure has internal sub-divisions, and the interior appears to be sunken between the dividing walls. At his sites Jobey interpreted these as sub-divisions of internal space into a domestic area with traces of dwellings, usually circular stone huts, and a sunken cobbled yard area with structures associated with storage and stock management. Some sites had cobbled paths through the yards to the dwelling huts (eg.Woolslaw, Northumberland) or in the case of Riding Wood, Northumberland, had two enclosed yards and a central raised causeway(Jobey, 1960). At the Curricks there is a broad dividing structure which runs north-south through the enclosure which may have functioned as a causeway between the domestic compound and farm yard. To date, however, no hut circles or any other structures have been identified within the site.

Figure 7 .The Curricks – a possible Iron Age/Romano British farmstead with part of the associated field system. North is to the bottom of the photograph. NMR 14111. NMR NY6361/1 (17697/26) 13-MAR-2002 © English Heritage (NMR)

The RCHME field survey of the Curricks carried out in 1966 recorded ditches extending a short distance to the north and south of the main enclosure. RAF aerial photographs taken in 1946 showed the site prior to the planting of the forestry on the Cumbrian side of the county boundary. Recent analysis of these aerial photographs demonstrates that these ditches extend westwards to form a large polygonal sub-divided enclosure which is probably a field system attached to the settlement. It is possible that the field system is a later addition to the site, perhaps contemporary with the suggested medieval re-use. Interestingly, the southern part of this large enclosure crosses a short length of the Kellah Burn, perhaps to provide a source of water for stock. The few Northumbrian Roman field systems with settlements are often associated with later rectilinear buildings (Jobey, 1960).

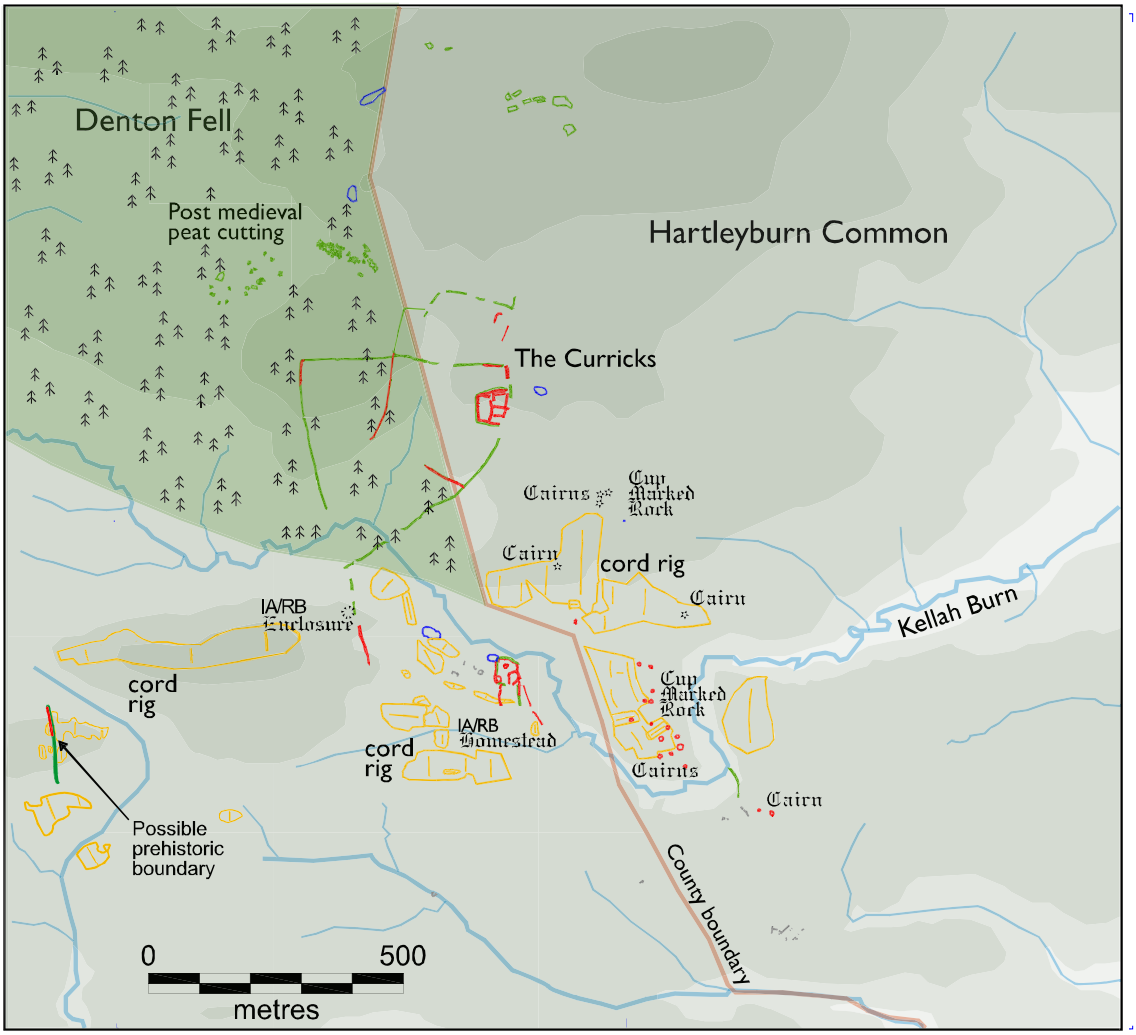

Figure 8. The Curricks settlement with adjacent enclosures, boundaries, settlements and cord rig (rig depicted in yellow). Background map and contour data derived from Ordnance Survey 1:25.000 sheets English Heritage 100019088. 2008

This highlights the frequency of re-use and the degree of caution which should be exercised when attempting to phase elements of these sites. Interestingly there is no apparent relationship with the county boundary (established by 1843) which cuts through the site.

The name Curricks almost certainly results from the medieval or post medieval phase, as it means a small stone enclosures used by shepherds as lookout (Durham County Council and Northumberland County Council, 2008).

The Curricks settlement and its adjacent field system are by no means isolated features; they lie within a landscape of settlements, cairns and the scattered earthwork remains of small patches of cord rig, some of which could be contemporary with the settlement.

The earthwork remains of a second probable farmstead enclosure, thought to be Iron Age/Roman in date, are situated some 450m due south of the Curricks on a prominent position overlooking the Kellah Burn. This enclosure is smaller and more curvilinear than the Curricks settlement enclosure and has at least one hut circle. A small curvilinear enclosure in the south-eastern part of the larger enclosure appears to represent the earliest phase based on its position and relationship with the ditches which make up the rest of the enclosure. A third possible enclosure to the north-west is noted by the OS, but only appears as a hollow on the aerial photographs. South-east of the Curricks two possible prehistoric cairn fields have been recorded but it is not clear if these contained burials, are the result of stone clearance or a combination of both activities (Beckensall 2001). A number of cup marked stones have also been recorded near the Curricks settlement (Beckensall 2001).

The patchwork of cord rig to the south of the Curricks, and surrounding the second smaller settlement, were seen as well-preserved earthworks during a field visit for the project in June 2007. Significantly, this cord rig could only be seen on low-level oblique photographs taken of the settlements in 1992, 1995, 2001 (Tim Gates) and 2002 (English Heritage). No trace could be seen on the vertical photographs of the area, despite some being of very high quality. This raises the question of how much more cord rig and other low level earthworks remain to be discovered through specialist oblique photography in other areas of upland in this region.

There is no evidence for the settlements or the areas of cord rig being contemporary or associated in any way. Dating by proximity can be fraught with problems if there are no demonstrable physical links to establish phasing (Clare, 1982). On the western edge of the area around the Curricks are the earthwork traces of a linear boundary ditch with hints of a bank on its western side. This feature appears to cut through the remains of prehistoric cord rig, and so probably post-dates it, but the boundary itself may also be prehistoric in date. The proximity and shared alignment with the western boundary of the enclosures attached to the Curricks site may also be of significance. This form of ditched boundary is unusual in this particular region and shares characteristics with another boundary to the east know as Black Dyke (NY77SE 70) which is thought to run between the North and South Tyne rivers (Boutwood pers comm). The Black Dyke is undated, but may be Iron Age in date, re-used as a parish and field boundary in the medieval and post medieval periods.

A comparable site to the Curricks at Temon on the northern edge of Denton Fell, Cumbria

Earthwork remains of a small D-shaped enclosure (24m x 26m) and apparently associated field-like enclosures are situated on the northern edge of Denton Fell between Temon Cleugh and Marbleflat Beck, south of the farm at Temon. This site has no known previous record either in the SMR or in the NMR, and the only existing monument

record in the vicinity is the 16th century bastle house which survives as part of the outbuildings of Temon farm, which is itself 17th century in origin.

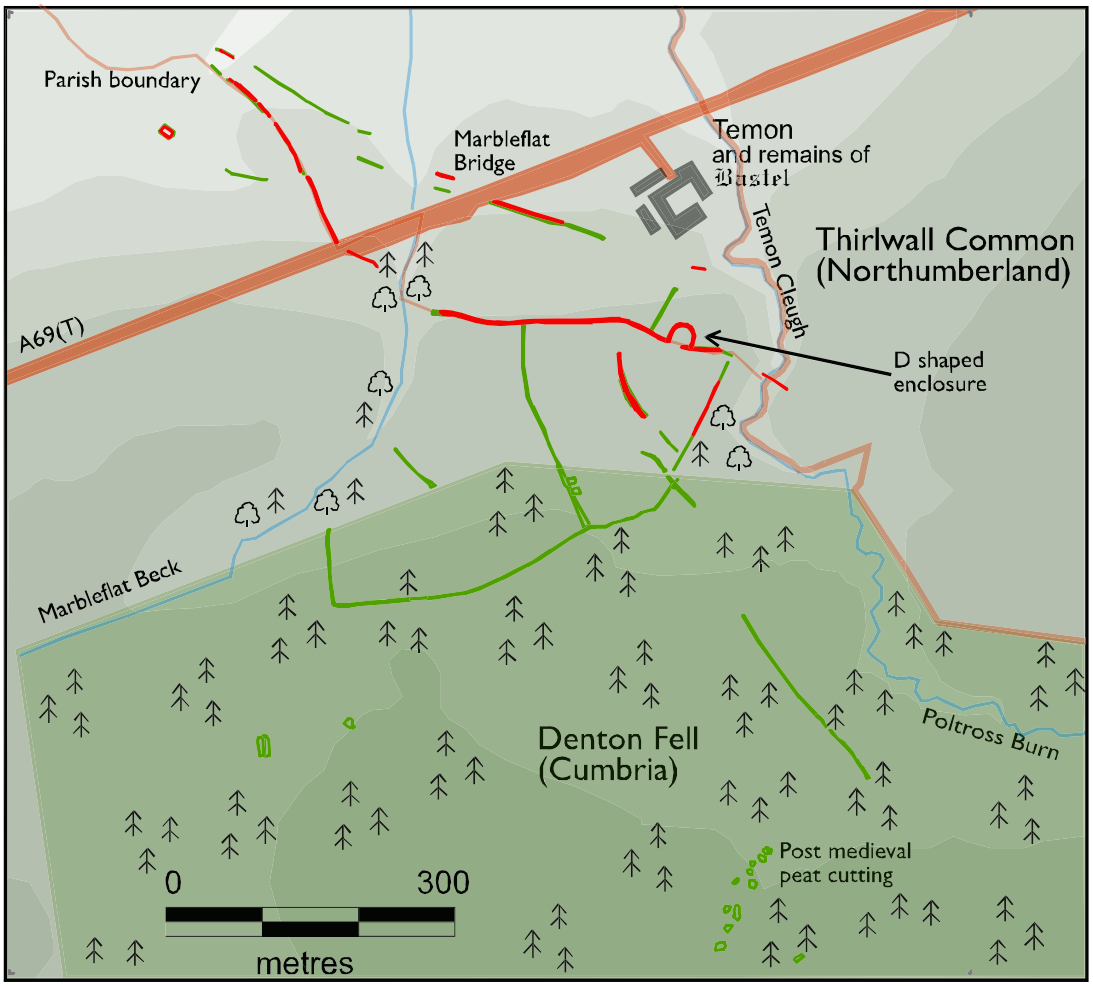

Figure 9. Features at Temon illustrating the D-shaped enclosure and associated fields and boundaries to the south of Temon Farm and extending to the north-west beyond the course of the A69. Background map and contour data derived from Ordnance Survey 1:50.000 sheets English Heritage 100019088. 2008

The unusual D-shaped enclosure is attached to a linear bank that marks the Parish boundary between Upper Denton and Nether Denton. The situation of the D–shaped enclosure attached to a linear boundary has parallels elsewhere, for example a probable post medieval stock enclosure seen at Roachburn to the south (see Figures 21 and 22)) or the post medieval stock enclosure attached to a sodcast boundary bank at Greenlee Lough (on Tim Gates 1999 photography) to the east of this survey area..

Morphological comparison suggests the field systems at Temon and the Curricks could be medieval or post medieval, though there is a marked difference in the form and size of the enclosures attached to each of these field systems. There are traces of probable post medieval cultivation ridges confined to the northern half of the enclosures, including the

small section to the north of the A69. The rig does not appear to continue into the area of formerly unimproved moorland, now planted with forestry to the south of the later field boundary which cuts east-west across the entire site.

The Temon Farm and Curricks sites would benefit from further fieldwork to ascertain date and function. It should be noted that the plan of the newly discovered site at Temon Farm is from vertical photographs taken in 1946 and 1972, and the condition of the features may well have deteriorated in the intervening years.

Highberries – A possible fortified Iron Age Settlement and field system

This large trapezoidal enclosure and field system is located between the farms of West Highberries and East Highberries at a point marked simply as Highberries on the OS map. Based on the morphology alone this site could be Iron Age, Roman, early medieval or late medieval in date. Because of this uncertainty this description and discussion is also included in Section 7.1 of this report where medieval sites are discussed. The reason for this is that the site exhibits morphological similarities with medieval moated sites, although these are not common in this region. However, this site shares similar characteristics (a ditch flanked by banks) with possible late Iron Age/Roman sites such as the Curricks and a number of the sites identified by Jobey in Northumberland (Jobey, 1960).

This site is recorded as a slight earthwork on RAF vertical photographs taken in May 1946, and can still be seen as a cropmark on recent vertical photographic imagery available on-line (Microsoft: Live Local). However, there is no previous record by the OS, SMR or NMR. The name of the adjacent farm, Highberries, is interesting. 'Berries' could be a derivation of byrig (Old English –dative of burh) a fortified stronghold in the Saxon period, but frequently referring to a much older earthwork of a fortified site. The earliest reference to the name is of Le Heyberys in the1320 Calendar of Inquisitions Post Mortem (PRO) and it is subsequently recorded as Heyberis in the Cumberland Lay Subsidy. By 1775 it was known as Highberries in the Parish Register (Armstrong, A M et al 1950 and 1952).

The enclosure is defined by a ditch flanked by banks and measures approximately 56m by 67m. There is no obvious entrance but there is a possible hollow way leading in from the south through traces of fields. There are extensive remains of what appears to be an associated field system extending to the north of the site which is partly overlain by medieval or post medieval ridge and furrow. The course of the relict field boundaries continues in the current field pattern illustrating the influence of earlier land division on today's landscape.

Just over 1km to the south-east of Highberries there is another enclosure (Figure 10b) which though five sided and slightly larger (76m x 78m), has a similar ditch and bank

arrangement to that of the Highberries enclosure. This site is visible as a cropmark and has been tentatively dated on morphology to the Iron Age/Roman period.

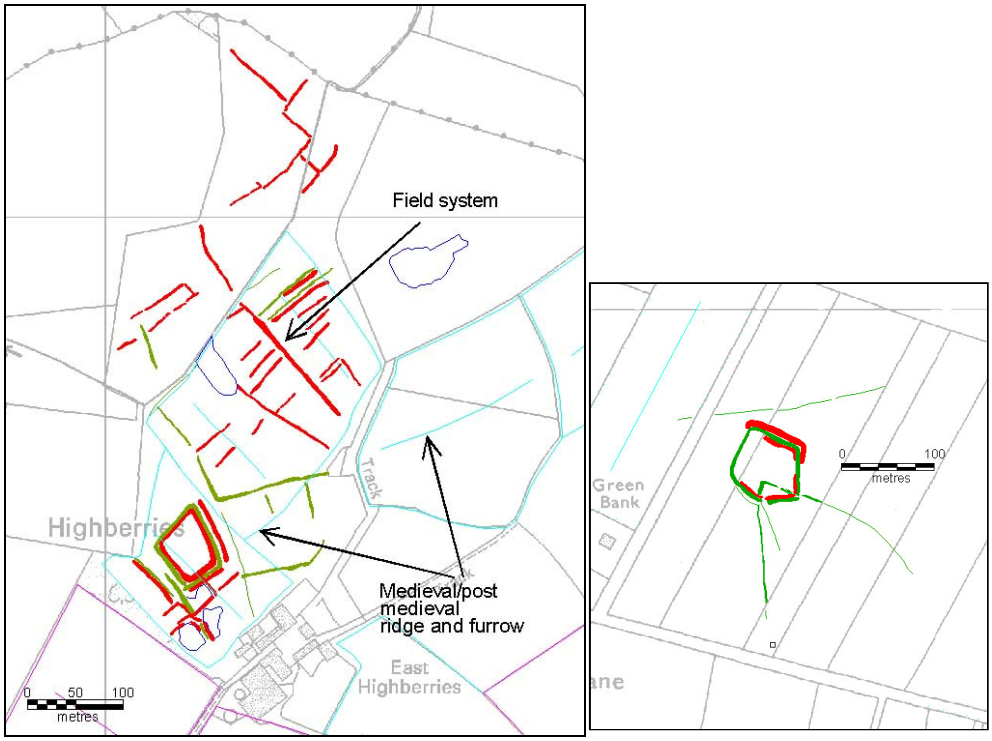

Figure 10a. Illustration of Highberries (NMR 1453725) and 10b) a nearby polygonal enclosure (NMR 972802). OS background map: English Heritage 100019088. 2008

Enclosures and field system west of Hayton

To the west of the village of Hayton there are the cropmark traces of a complex site with multiple enclosures, probably later prehistoric or Roman in date. The site lies on the edge of a low rise on the eastern side of the River Irthing, and covers an area of at least 430m x 175m. The northern end of the site is cut by the course of the A69 trunk road and it may extend further to the north. A rectilinear enclosure measuring 65m x 54m with opposing entrances, one originally to the outside, and one into the larger enclosure. Attached to this larger enclosure are the traces of ditches or boundaries which could also be seen extending outwards from the enclosure ditch as well as a double-ditched track to the south-east which also forms an entrance into the site. This is not a new discovery, but previous records for this site only describe the northern part. Details of the southern part have been added from recent photographs taken in 2006 by English Heritage. It is likely the site represents a large settlement or a farmstead and associated fields.

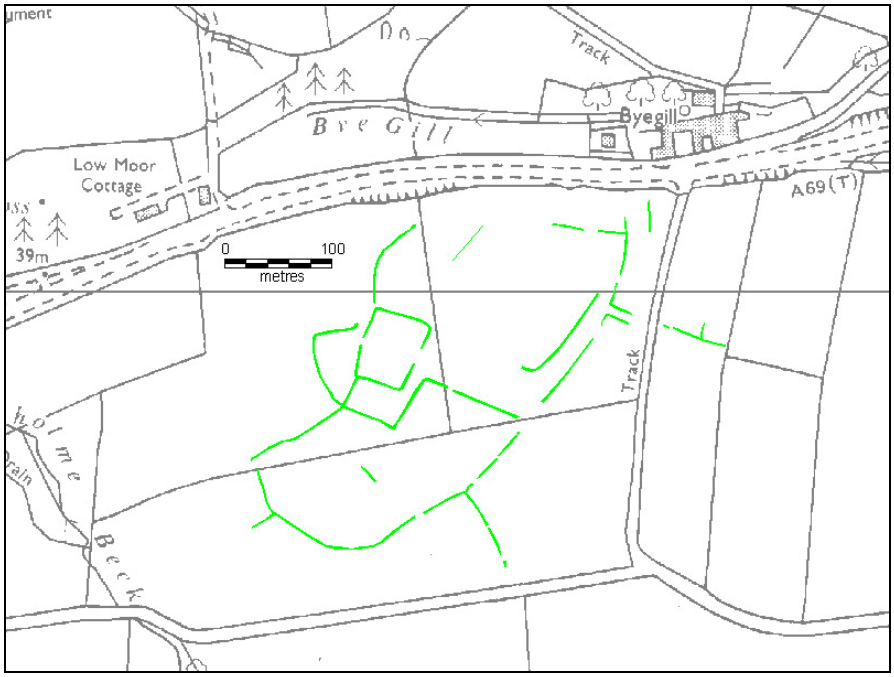

Figure 11. Cropmarks of possible later prehistoric or Roman enclosures and trackway to the west of Hayton. OS background map: English Heritage 100019088. 2008

Field System at White Moss

As already mentioned above, excavations elsewhere in the Roman military zone have identified the traces of pre-Roman ploughing and cord rig lying beneath Roman structures. To the east at Greenlee Lough, cord rig was found beneath the 1st or 2nd century marching camp, and at Chesters several areas of cord rig were seen on aerial photographs to be cut by the Roman aqueduct at points along its 10km length (Gates 1999). The remains of extensive cord rig, recorded as earthworks to the south of The Curricks settlement on Denton Fell and Roachburn, are discussed above.

The remains of a possible co-axial field system were recorded as cropmarks during 1995 RCHME aerial reconnaissance to the north-east of White Moss between Hadrian's Wall and Stanegate. The main part of the field system lies to the south of the Wall and appears to be cut by the course of the Vallum, presumably predating it. The field boundaries extend from the Vallum to Hadrian's Wall, but could not be seen to the north. However just north of the wall there is evidence of spoil or up-cast material from the Wall ditch surviving, as well as several medieval or post medieval quarries which may mask, or have destroyed, remains of fields to the north of the Wall. Ditches and tracks also cut through the Roman features further confusing the picture. Adjacent to the Stanegate there are parts of fields, on the same alignment to those to the north, but these could not be traced continuing to the south

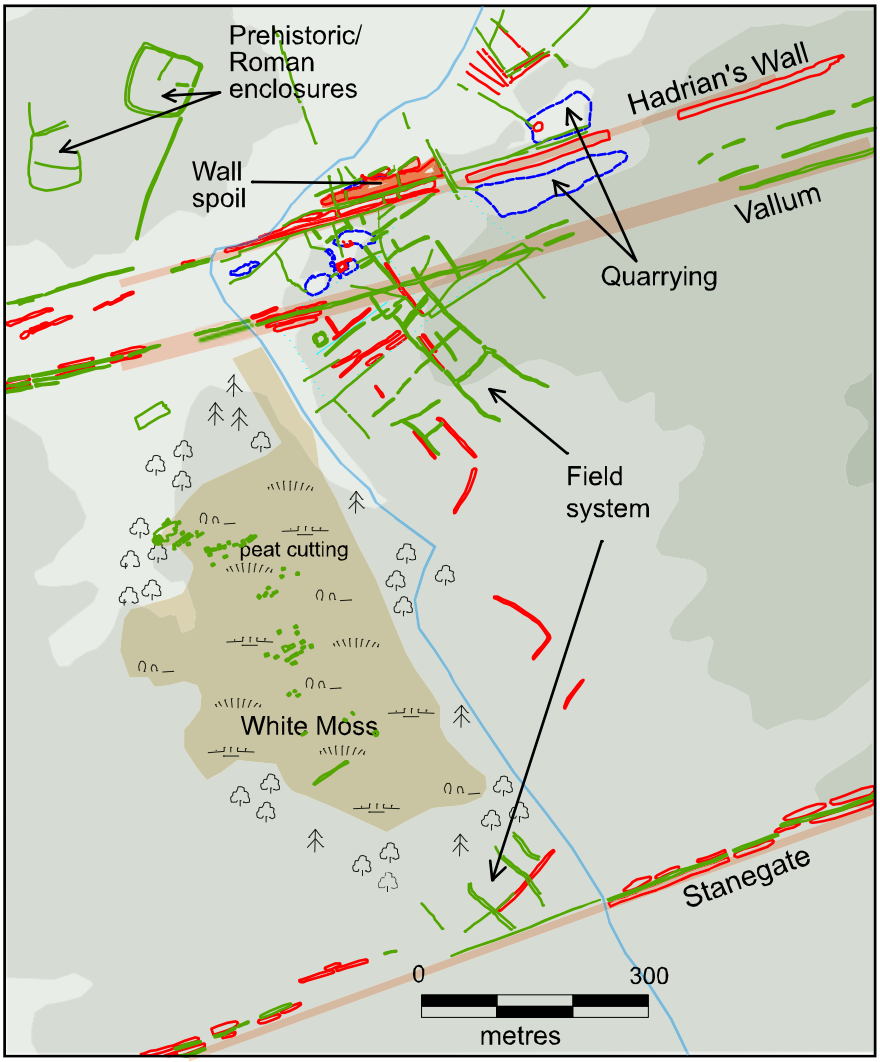

Figure 12. A probable prehistoric field system to the east of White Moss in relation to Hadrian's Wall, the Vallum and Stanegate. Background map and contour data derived from Ordnance Survey 1:50.000 sheets: English Heritage 100019088. 2008

Three further examples of traces of possible associated fields or boundaries, associated with possible Iron Age/ Romano-British settlement enclosures, were seen as cropmarks within the western half of the survey area. There are also cropmarks of a double ditched trackway with traces of associated linear boundaries which could be prehistoric in date (Figure 6, sites 1, 10 and 20).

Summary for prehistoric and Roman settlement

This is a region recognised for its low number of prehistoric sites, specifically settlement sites from the later prehistoric periods. The few potential prehistoric sites subsequently excavated have generally produced finds of Roman date. Common sense and environmental evidence indicate clearance and agricultural activity in the pre-Roman period, but the actual evidence for settlement is sparse. This could be due to cultural

factors affecting the structures and assemblages of artefacts left behind or the environmental conditions and modern agricultural practices affecting survival and visibility of the remains. There are examples where excavation has proved to be the only means of discovery of prehistoric remains such as field systems, which lie beneath later features (Gates 1999). It is also likely that there has been some continuity in settlement form from the later prehistoric into the Roman period making it harder to classify sites based solely on their morphological traits. The Hadrian's Wall block 5 NMP survey has identified a number of new potential prehistoric settlement sites, and it is hoped that future investigation of these sites will add to the work already undertaken in the Solway Plain (Higham and Jones 1985, Bewley 1994, Hodgkinson et al 2000, Boutwood 2005, Brennand 2007) and improve our understanding of this period in the north-west of England.

NEW ROMAN FEATURES IN THE MILITARY ZONE

Hadrian's Wall, and the concentration of well preserved contemporary military remains has been the subject of study by historians and archaeologists for at least 400 years. Despite this, the Hadrian's Wall block 5 NMP survey has added a number of significant new finds to the known Roman military remains.

The Wall

This block of the NMP survey of Hadrian's Wall includes the most westerly surviving masonry ruins of the Wall, at Banks to the west of Birdoswald fort. Traces of the earlier turf phases of the Wall extend west and east on either side of Birdoswald fort. This was replaced by a later stone wall aligned to the north of the fort (See Figure 13). To the north of the Wall, traces of the associated defensive ditch can be seen in places, and traces of up-cast spoil from this ditch are also visible in this section of wall between Willowford and Banks.

The Vallum, Military Way and Stanegate

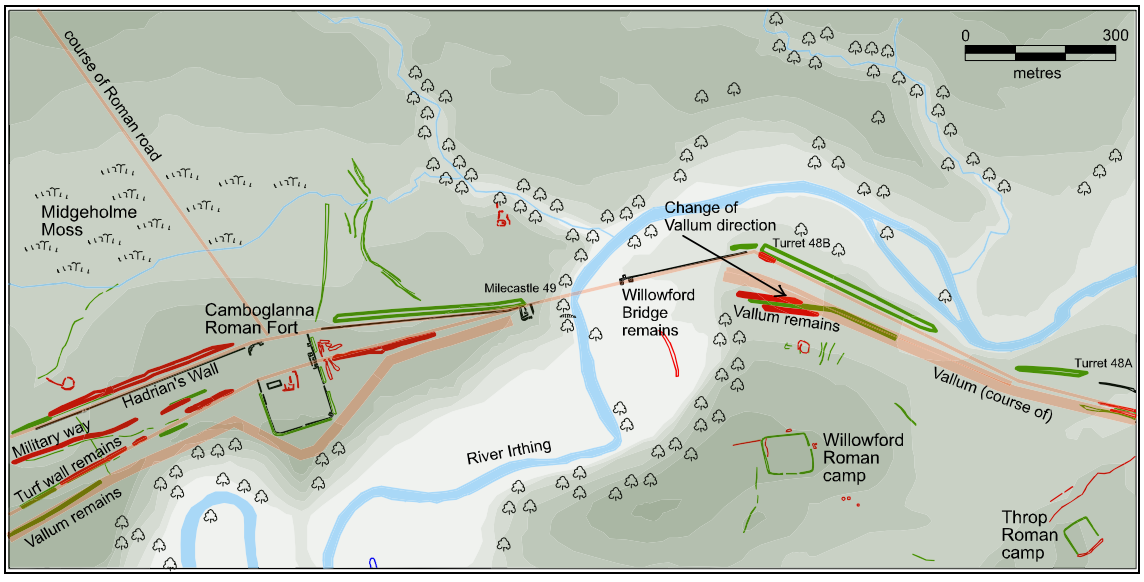

Figure 13 Vallum and Wall at Willowford Bridge illustrating the deviation of the Vallum to the south of presumed course immediately to the east of the remains of Willowford Bridge, the Roman crossing of the River Irthing. Background map and contour data derived from Ordnance Survey 1:50,000 sheets: English Heritage 100019088. 2008

The Vallum survives as an earthwork from Nether Denton eastwards, its condition varying from field to field depending on the extent of plough damage. The course of the Vallum, Stanegate and Military Way have been identified and recorded for much of their lengths. Where levelled, the projected routes of each of these features have been marked on OS

maps. However, the remains of the Vallum were found to deviate from its assumed course east of the Willowford Bridge, turning south at a point further east than originally thought (See Figure 13).

At Crosby on Eden the Vallum could be seen as a fragmented cropmark, and the ditch is flanked in places by the indistinct traces of up to four parallel ditches. It is not clear if these ditches date from a later period or are part of the original Vallum defences. They could be the result of the presence of the Military Way which is present at this point between the Wall and Vallum (See Figure 22). Along much of the Wall and Vallum the earthwork and cropmark traces of probable medieval or post medieval tracks cut across and along the remains, and it is probable that some of these additional parallel ditches relate to later activities between the Wall and Vallum.

The Military Way ran the length of the Wall linking forts. The road known as Stanegate pre-dated this as the only east-west route to the south of the Wall (Wilmott, 2001). Parts of both of these roads are visible only as very faint cropmarks, though on some early RAF vertical photographs traces appear as very low and much eroded earthworks. A small length of the Military Way was seen between the Vallum and Wall to the west of Birdoswald Fort. Traces of Stanegate were seen south of the Wall and Vallum as slight earthworks and cropmarks between Boothby fortlet and the camps at White Moss, the most continuous section visible as a cropmark passing between the runways of RAF Crosby-on-Eden, now Carlisle Airport. (See Figure 22)

Roman camps and forts – new discoveries

Between Brampton and Birdoswald the sites of six camps and five forts have previously been identified surviving variously as earthworks, masonry structures and cropmarks, or through excavation. However, the NMP survey has been able to add a number of significant new finds to the known remains of Roman military activity. Most of these discoveries were in areas where the remains have been plough-levelled, but survive as sub-surface remains, visible as cropmarks on recent aerial photographs.

Of significance were the discoveries of five previously unrecorded camps. Two of these were seen at Crosby on Eden and Warwick Moor Wood (north of Carlisle), and three were seen at White Moss where the plans of several tent encampments were identified by the rows (or "streets") of refuse pits representing several phases of temporary camp. Other sites of interest are the earthwork remains of the discredited camp at Abbey Park Wood (Figure 15 No. 7) and a rectilinear platform at Dovecote Farm which warrants further investigation.

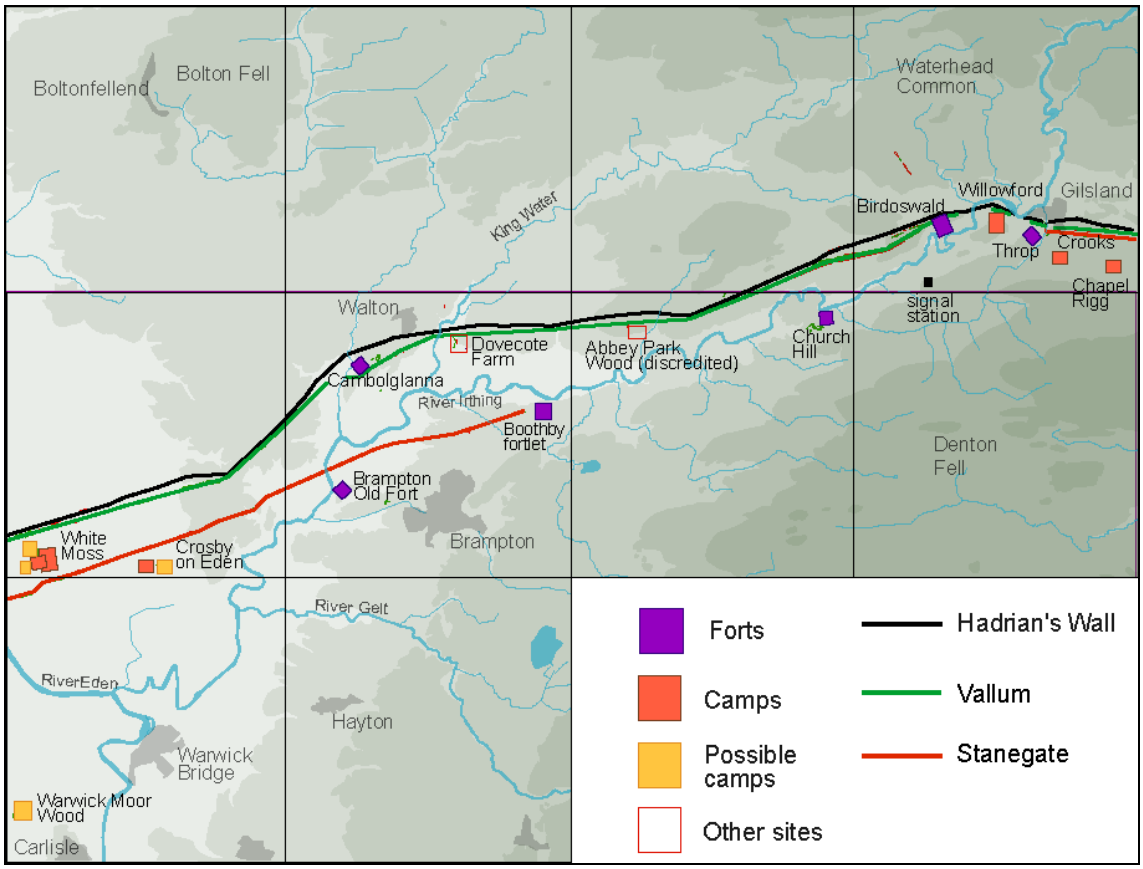

Figure 14. Distribution of all Roman forts, camps and potential new camps/forts mapped from aerial photographs. Background map and contour data derived from Ordnance Survey 1:50.000 sheets: English Heritage 100019088. 2008

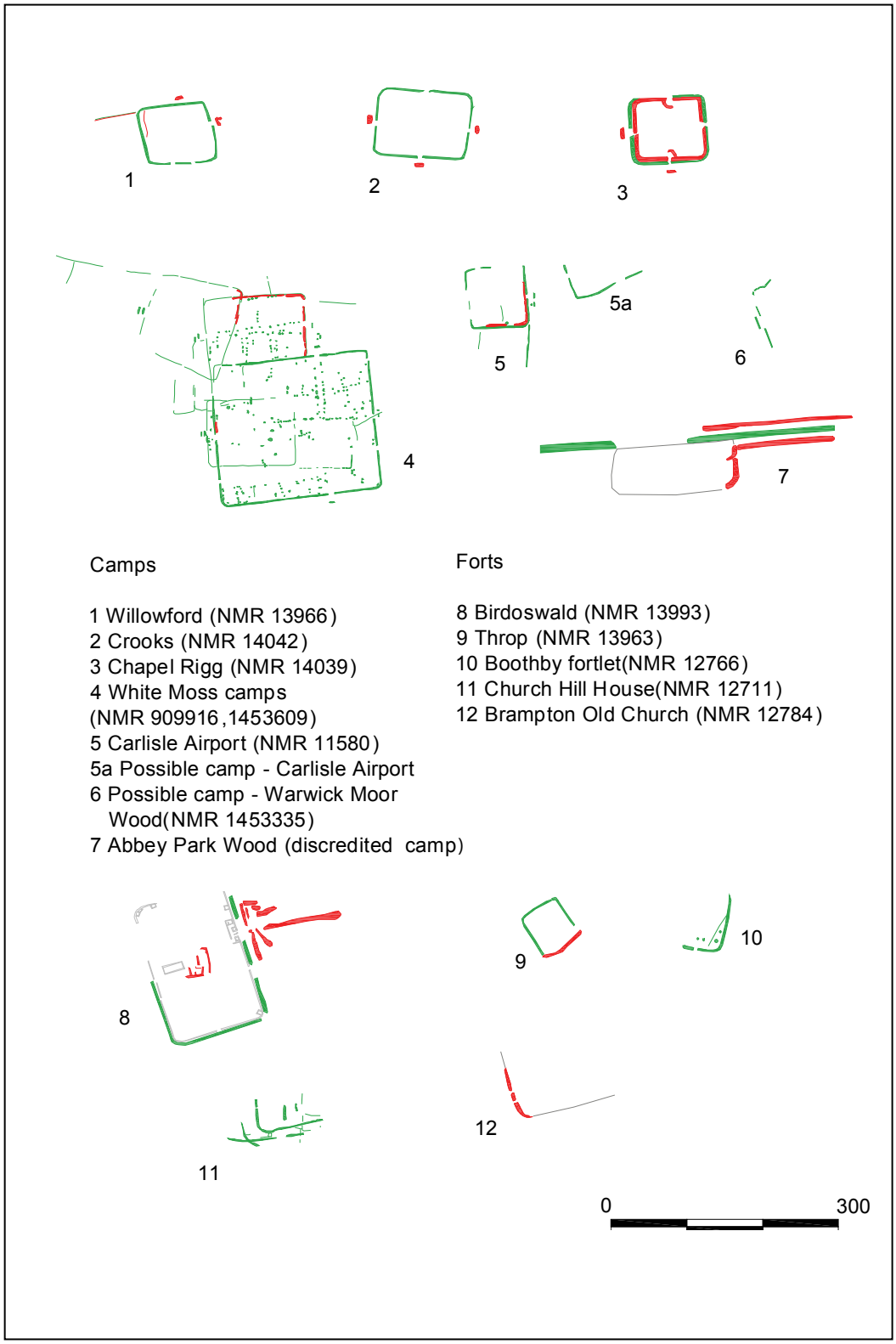

Figure 15. Roman camps and forts visible on aerial photographs between Gilsland and White Moss

White Moss (Moss Side) Camps

Several phases of Roman camp are situated on slightly raised ground overlooking the River Eden and the Solway Plain to the west. The cropmark remains of two superimposed camps, and an annexe to the larger camp, were initially identified by St Joseph (Cambridge University Committee for Aerial Photography - CUCAP), and subsequently mapped and recorded as part of the RCHME Roman camps volume (1995) using CUCAP photographs taken in 1962 and NMR photographs taken in 1984.

Significant new information is recorded on NMR photographs taken in August 1995, after the RCHME Roman Camps volume had gone to press. These photographs not only show the known camps in greater detail, but also reveal remains of at least three further superimposed camps with their entrance structures clearly visible. Attached to the northern side of largest camp is an annex. The faint traces of the inner bank as well as the enclosure ditch extend along the northern and eastern sides. Ditch fragments of two of these 'new' camps are noted on the RCHME survey, but were not visible in enough detail on the photographs available at the time to indicate that they were fragments of enclosures.

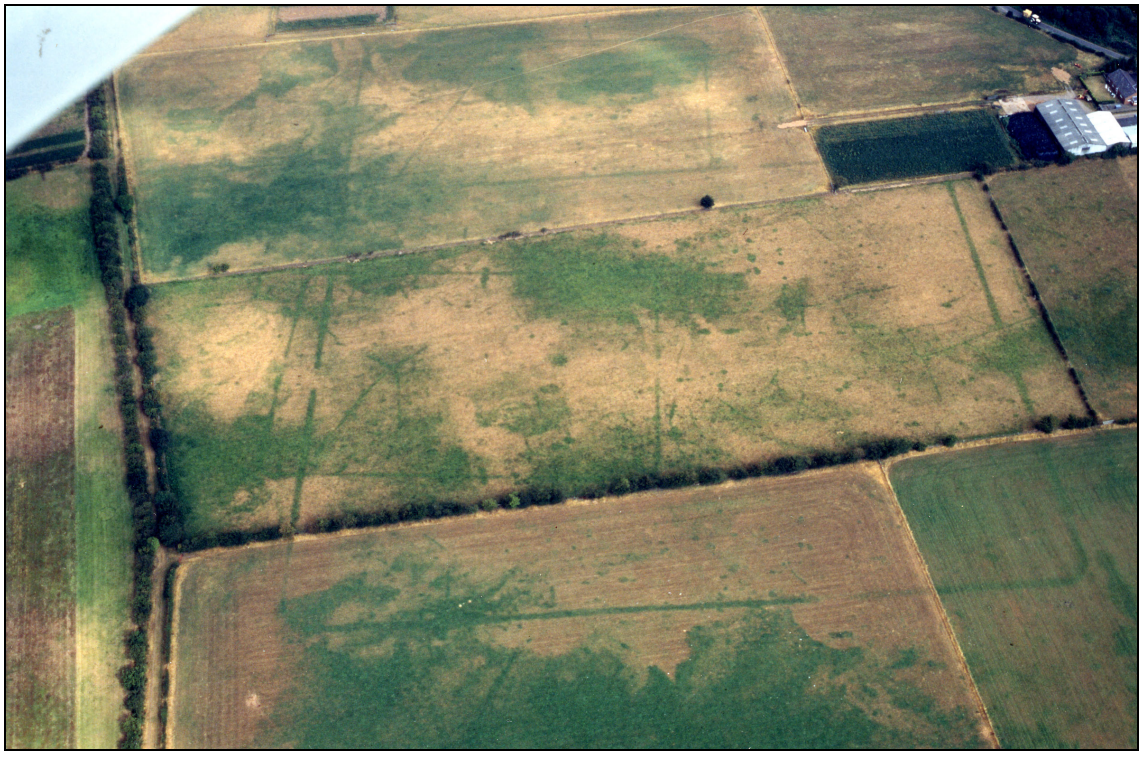

Figure 16. The cropmark traces of the White Moss / Moss Side camps with lines of refuse pits visible. NMR NY4560/10 (12761/05) 15-AUG-1995 © Crown copyright. NMR

The re-use of a site for subsequent camps was a common practice, especially when the location was chosen for its strategic position, and sometimes two or more contemporary camps are constructed adjacent to one another (Milner 1993). Prolonged occupation of a temporary camp of tents was impractical because of amongst other issues, the problems with contamination of water supplies from latrine and refuse pits and the general churning up of a campsite. Often it was easier to quickly construct a new camp than to take time to clean out and refurbish an old one (Milner 1993). Another factor was the size of the camp. It was dangerous to occupy a camp outsized in proportion to the defending force, so it was regular practice to build a smaller camp within or offset on the site of a larger camp (Milner 1993). Re-use of camp sites is suspected to be more common, but with the exception of practice camps where there appears to have been little effort made to remove the old camp structures, there appears to have been widespread levelling prior to the construction of subsequent camps. Because of this, multiple camps only tend to be seen when the site is revealed as a cropmark or has been excavated.

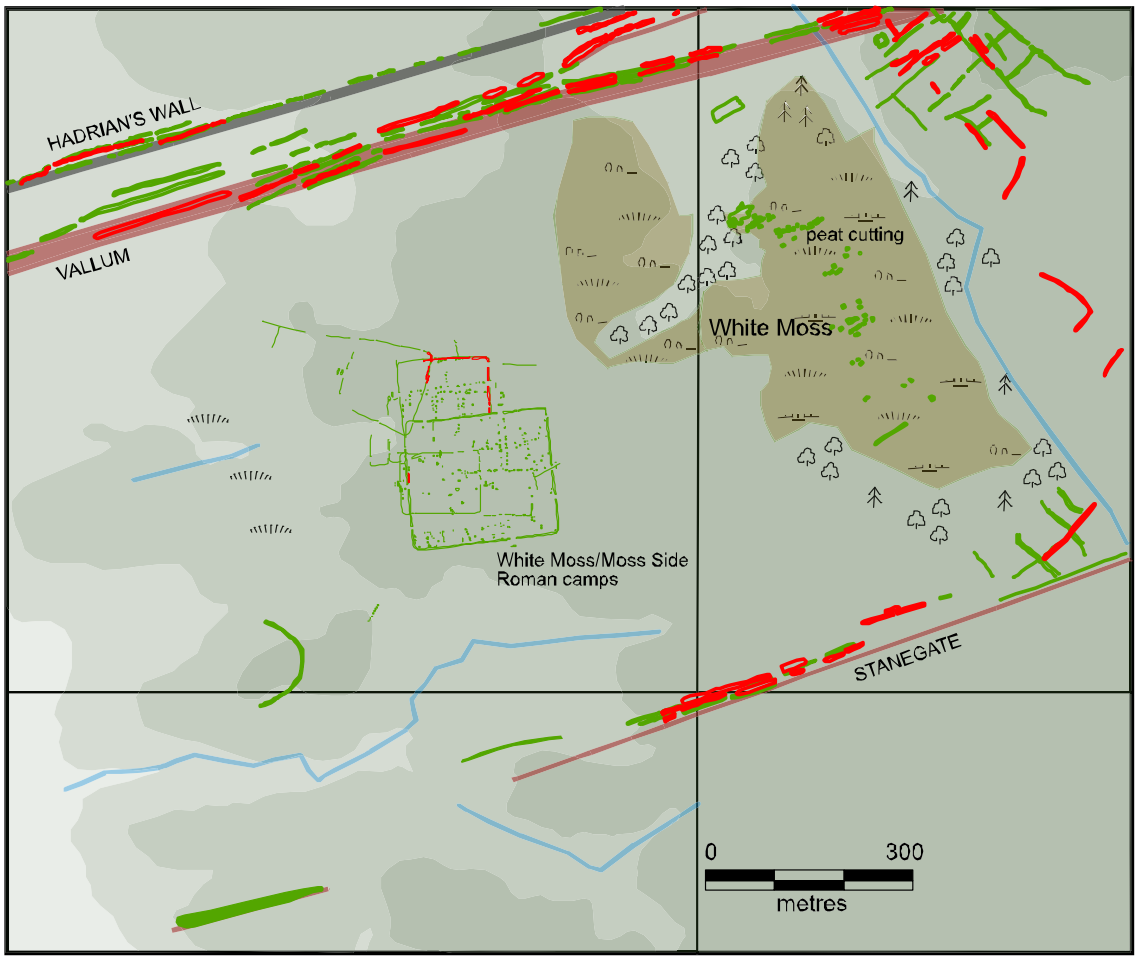

Figure 17. White Moss/Moss Side Roman camps visible as cropmarks between Stanegate and the Vallum. Background map and contour data derived from Ordnance Survey 1:50.000 sheets: English Heritage 100019088. 2008

The camps of White Moss are located on an area of slightly elevated ground above the 30m contour equidistant between Hadrian's Wall and the Vallum to the north and the course of Stanegate to the south. With good views westwards towards the River Eden and the Solway Plain, this appears to be a desirable camp location. This is also evident from the repeated use of the site revealed by the cropmarks of the ditched outlines of the various camps. The cropmark traces of numerous pits have been interpreted as the refuse pits dug by the occupants of each tent. The pattern of pits reflects the ordered lines of tents, and represents at least two separate camp plans. Excavation of similar lines of pits at the temporary camps at Inchtuthil, Scotland (Pitts and St Joseph 1985) confirmed their use as rubbish pits, each one representing the position of a single tent. The tents would have lined either side of the 'road' with a refuse pit in front of it. Analysis of the layout of tents at Inchtuthil suggested that the standard plan of streets found within a fort is also found at tented camps. The same pattern, though somewhat fragmented and confused by the different phases, is visible at White Moss.

Figure 18. Plan of the camps multiple phases of camp at White Moss with lines of tents marked by the double lines of pits visible as cropmarks.

Traces of a number of large pits were identified just within the northern defences of the annex camp at White Moss. Excavations of a Roman camp in Scotland, at Lochlands near Camelon, identified several shallow pits filled with ash thought to be either from cooking

pits or ash pits for nearby ovens in the intervallum (the area immediately within the camp defences). Other larger pits at the edges of the camps in the intervallum zone were thought to represent latrine pits. Along with ovens, these were located away from, and generally downwind of, the main encampment, (Pitts and St Joseph 1985) thus avoiding risk of fire, smoke and smells.

The cropmarks visible on the most recent photographs of White Moss camps taken in 1995 not only reveal the outer defensive ditches of the known and potential new camps, but also the outer ditch traverse structures of at least nine entrances belonging to these camps. These are visible as short lengths of ditch positioned opposite and outside the break in the camp ditch designed to protect the entrance and impede attack. These entrance structures included parallel banks, but no trace of these was seen. However, slight cropmark traces of the inner bank to the outer defences of the annex camp, and a fragment within the western ditch of the main camp were seen on the 1995 aerial photographs.

Other potential camps identified from aerial photographs at Crosby on Eden, Warwick Moor Wood and Dovecote Farm.

In addition to the three probable new camps at White Moss there were two further 'new' camps and a potential new camp or fort identified from aerial photographs during the course of this survey.

Two kilometres to the east of White Moss another camp is partially obscured by one of the runways of Carlisle Airport, (formerly RAF Crosby-On-Eden). Immediately to the north-east of the known camp there are traces of a second incomplete enclosure, possibly a camp, seen as a very faint parchmark on 1946 RAF photographs (Figure 15, Site 5a and Figure 24 below).

Another possible new camp is in a golf course close to Warwick Moor Wood to the north-east of Carlisle. The western side of the enclosure with an entrance and apparent outworks are partially visible as a very faint cropmark on photographs taken in 1995. The northern side is less clear and could not be mapped and is therefore not included in Figure 15, Site 6, but its course has been highlighted in Figure 19 below.

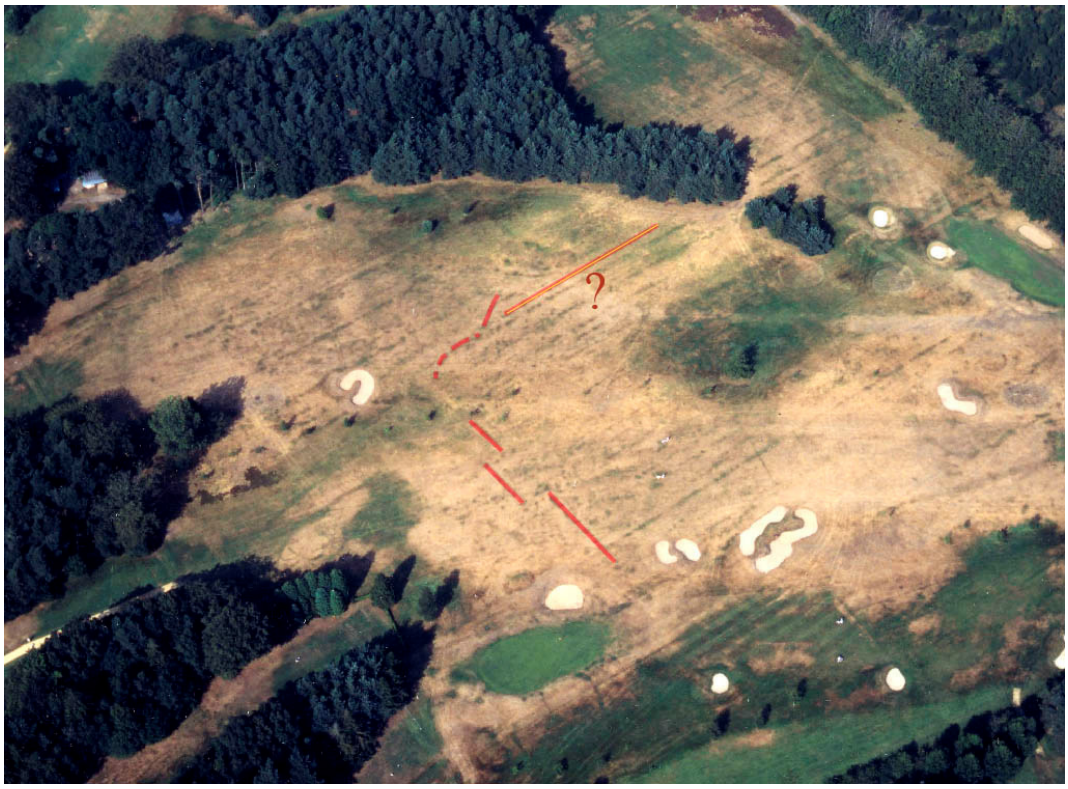

Figure 19. A possible Roman Camp within a golf course at Warwick Moor Wood visible as a faint parch mark and highlighted in red. The northern side (highlighted in orange) is less clear. NMR NY4555/18 (12764/25) 15-AUG-1995 © Crown copyright. NMR

RAF vertical photographs from 1951 have revealed the earthwork remains of part of a rectilinear platform at Low and High Dovecote Farms in the parish of Walton. The western side of a platform measures approximately 65m in length and has a rounded right-angled corner. The, now levelled, medieval/post medieval ridge and furrow could be seen stopping short of and apparently respecting the feature. The site lies at a strategic point on the edge of a tongue of rising ground close to the confluence of the River Irthing and a tributary, the King Water. It is situated approximately 45m to the south of the course of the Vallum and 225m to the SSW of Turret 55A on Hadrian's Wall. This site therefore sits within the zone where there is an apparent 'gap' in the distribution of known forts and camps along the Wall. Whether this represents a Roman, medieval or later site can really only be ascertained by further field investigation.

Abbey Park Wood/Craggle Hill Camp – (a discredited Roman camp)

This supposed camp is known as Abbey Park Wood camp or Craggle Hill (Figure 15, Site 7). It is situated immediately to the south of the Wall mid-way between the forts of Birdoswald and Camboglanna. This camp was first identified during fieldwork carried out by the Ordnance Survey Archaeological Division in 1972. Following fieldwork carried out

by an RCHME Archaeological Field Investigator in 1981 it is now thought that it is unlikely to be Roman camp, at best being a practise work. This resulted in the site being discredited and excluded from the 1995 gazetteer of Roman camps – *RCHME: Roman Camps in England.*

The earthwork remains of the eastern side and one inturned entrance are recorded on OS vertical photographs taken in 1972. The site lies within an 11km long stretch where there is an apparent absence of both camps and forts along the Wall. The nearest known camps are 7km to the east at Willowford and 11km to the west at White Moss. The camps at Crosby on Eden lie a little closer (10km to the west), but these are situated to the south of Stanegate rather than close to the Wall. This would appear to be out of keeping with the known distribution of camps and forts in this region of the frontier illustrated in Figure 14. Though discredited, this enigmatic site represents the remains of an enclosure situated close to the Wall with evidence of an elaborate entrance typically seen on Roman camps.

Discussion

The quality of new discoveries such as the potential new camps and the additional details and structures identified at existing sites along the Roman frontier have proved both surprising and important in view of the long history of research on the Wall and its environs. In particular, the discoveries at White Moss have been one of the most rewarding finds, possibly representing one of the best examples in England of a tented encampment plan within a Roman camp. The survey has again highlighted the value of continued aerial reconnaissance as well as analysis of existing photographs held in air photo collections. The potential Roman sites identified during the course of the Hadrian's Wall block 5 NMP survey would benefit from further investigation.

MEDIEVAL SURVIVALS IN A POST MEDIEVAL LANDSCAPE

Social and economic factors played their part in shaping the medieval settlement pattern and agricultural regimes in the north of England. However, it is arguable that topography and climate, and to a certain extent geology, have been the biggest influences on settlement and landscape in the region covered by this report. Over a very short distance the landscape goes from the Vale of Eden, bordering the Solway Plain in the west, rising as one moves eastwards, with relatively sheltered valleys bisecting areas of semi-improved and exposed unimproved upland. It is in the valleys and more sheltered areas where the medieval settlements have tended to develop, with more temporary seasonal sites such as shielings occupying upland pasture and, where geology dictated, settlements associated with mining. These marginal settlements have through history tended to be short lived as they are typically more sensitive to changes in climate or economy (Roberts and Wrathmell, 2003). The relatively poor climate and shorter growing season do not lend themselves to widespread arable cultivation of crops other than oats, and in the medieval period there appears to have been a greater reliance on cattle and sheep which were grazed in the uplands in the summer months (Winchester 1987).

In this survey block, in contrast to areas on the eastern side of the Pennines, there are only a few isolated areas of probable medieval ridge and furrow. These were confined to the south-eastern edge of the survey area at Roachburn. This rig survives as earthworks, but very little could be seen to have the true reverse 'S' form typically associated with medieval cultivation, and most may prove to be later in date (See Figure 21). All the other, and somewhat extensive, cultivation remains are probably post medieval in date. This is typically straight and narrow rig produced from mechanical ploughing methods and is a visible legacy of Parliamentary enclosure in the late 18th and 19th centuries when widespread improvement and ploughing took in large tracts of more marginal land. The extensive remains of this straight narrow ridge and furrow and lengths of sod-cast banks and drainage ditches are found throughout the survey area, much still surviving as earthworks into the late 1940s to 1960s.

On the higher ground to the north and east there are areas of wetland with considerable peat deposits – known as 'mosses', of which there are a number of smaller examples on the western edge of the uplands. The medieval common right to dig peat for fuel, known as Turbury, was managed by allocating defined areas to tenants, and became more important in the later medieval period due to dwindling woodland resources (Winchester, 1987, 90). Traces of small-scale peat extraction thought to be post medieval (though possibly having medieval origins) are visible on a number of the peat mosses. These are visible on aerial photographs as rectangular or larger polygonal depressions where the peat was cut to the depth of half a metre or more. The largest concentrations are seen at Waterhead Common, Denton Fell and White Moss. Bolton Fell is the largest moss in the area, but the peat here has been commercially cut since the 1960s and only a tiny part of this SSSI (Site of Special Scientific Interest) remains (Hodgkinson et al, 2000). Some traces of earlier small-scale peat extraction may therefore have been lost. Around the edges of

the moss traces of cutting extend into the peat from the ends of individual plots of land behind the houses of the long strung out village of Boltonfellend. Much of this extraction is probably post medieval. There are similar areas of cutting on Walton Moss, Broomhill Moss and Breaks Moss.

In the eastern region there is a considerable amount of post medieval mineral workings, in the form of both quarries and small coal mines. A number of coal seams outcrop at the surface in this area and these have been exploited over time resulting in lines of surface quarrying and small mines following a seam.

The settlement remains from the medieval period identified from aerial photographs are sparse. There are surviving high status fortified sites in the area. At Brampton there are earthwork remains of the castle motte on the summit of Castle Hill on the eastern side of the town. The motte has a kidney-shaped platform thought to be the bailey. To the south-east at Staith there are earthwork traces of a sub-circular banked enclosure with a large possible annexe to the north and it is possible that this is a second fortified medieval site.

Further medieval settlement evidence is indicated by the two moated sites in the Irthing Valley. These are of interest because moated sites are not common in the Hadrian's Wall corridor (Boutwood pers comm). The larger moated site at Denton Hall has the earthwork remains of fishponds to the east of the house and moat (NMR 12668). To the north-east the, at Nether Denton, are remains of an earthwork thought to be a small moat.

Highberries – A possible medieval moated settlement and field system

This large trapezoidal enclosure and field system is located between the farms of West Highberries and East Highberries at a point marked simply as Highberries on the OS map. Nothing is know about this site and it could be Iron Age or medieval in date. Because of the uncertainty surrounding the date of the site this description and discussion is also included in section 5.4 Prehistoric/Roman sites. The basis for this is that the site exhibits morphological similarities with medieval moated sites in the north of England, but also shares similar morphological characteristics (a ditch flanked by banks) with sites believed to be late Iron Age in date such as the Curricks settlement described in section 4.5.

The enclosure is defined by a ditch flanked by banks and measures approximately 56m by 67m (Figure 20). There is no obvious entrance but there is a possible hollow way leading in from the south through traces of fields. There are the remains of what appears to be an associated coaxial field system extending to the north of the site which is partly overlain by medieval or post medieval ridge and furrow.

The site is recorded as a slight earthwork on RAF vertical photographs, and was seen as a cropmark on recent satellite imagery (Microsoft: Live Local). However, there no record of any such site recorded by the OS, SMR or NMR which one might expect with the close proximity of the site to Hadrian's Wall and the antiquarian interest in such sites as these.

The name of the adjacent farm, Highberries, is interesting. 'Berries' could be a derivation of byrig (Old English –dative of burh) a fortified stronghold in the Saxon period, but frequently referring to a much older earthwork of a fortified site. The earliest reference to the name is of Le Heyberys in the1320 Calendar of Inquisitions Post Mortem (PRO) and it is subsequently recorded as Heyberis in the Cumberland Lay Subsidy. By 1775 it was known as Highberries in the Parish Register (Armstrong, A M et al 1950 and 1952).

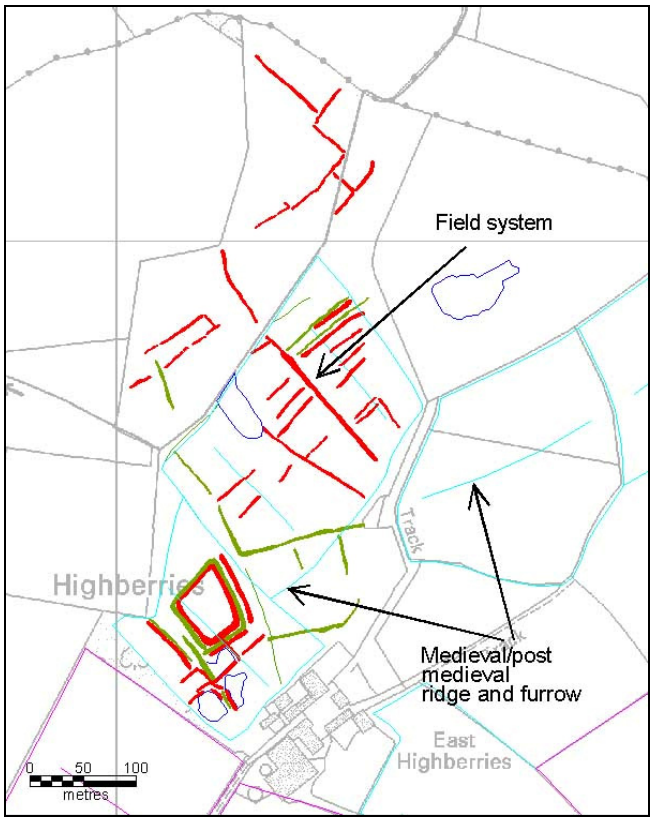

Figure 20. Illustration of Highberries enclosure and field system (NMR 1453725). OS Background map: English Heritage 100019088. 2008

A possible medieval field system survives as earthworks on the south-eastern edge of the survey area at Roachburn; comprising at least three elongated ditch-defined enclosures with further boundaries extending to the north. These appear to differ from the enclosures formed by post medieval sod cast banks. Attached to or abutting the boundary of one of these elongated fields was a sub-circular bank-defined enclosure which may be a post medieval stock enclosure, other examples of which have been encountered elsewhere in the NMP survey (Boutwood pers comm). A small mound situated close to this enclosure is thought to be a stack stand, a common feature in this region used for drying fodder in the post medieval period. Whether these features are

contemporary with the larger enclosures is not certain. The western-most of the main enclosures appears to overlie an area of what is thought to prehistoric cord rig, and the western ends of the enclosures either abut or are cut by a broad incised trackway which is probably medieval in date. A rectangular enclosure, possibly a stock enclosure, measuring approximately 28m x 24m attached to the southern side of the trackway appears to be overlain by medieval or post medieval ridge and furrow but may also be medieval.

Figure 21. Earthwork remains of ridge and furrow, a drove way and other features at Roachburn overlain by post medieval and modern field boundaries and farm. NMR NY 6160/4 (17697/22) 13-MAR-2002 © Crown copyright. NMR

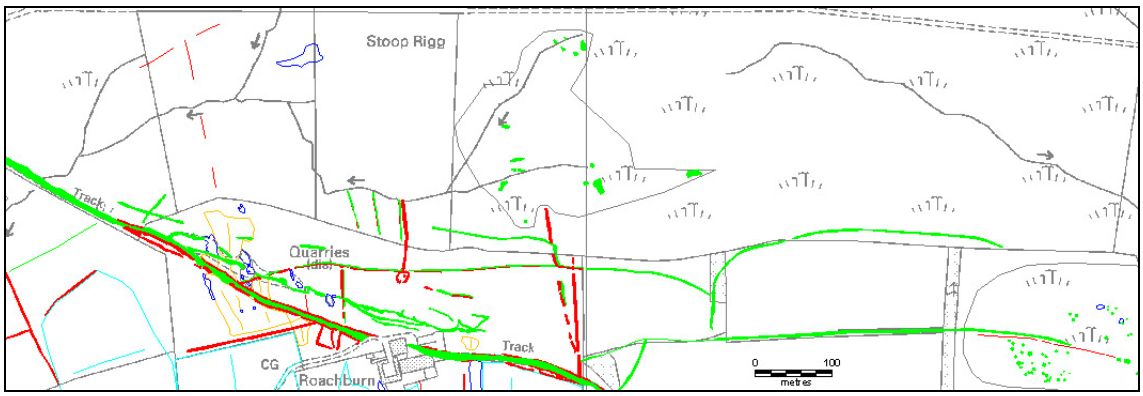

Figure 22. Elongated enclosures or fields at Roachburn which to overlie prehistoric cord rig. OS background map: English Heritage 100019088. 2008

The trackway widens slightly before disappearing beneath the modern farm buildings. The concentration of stock related features and the faint traces of two possible long buildings to the south suggest the presence of an earlier farm which may well lie beneath the site of the current farm. This apparently complex sequence of possible prehistoric, medieval and post medieval features is confused by numerous small linear quarries. Further work, in particular analytical field survey, is required to understand the sequence of these earthworks.

Discussion

The evidence for medieval settlement and cultivation within the survey area is generally sparse. With the exception of the sites at Roachburn, medieval sites are located in the lower lying parts of the region and include the motte and bailey at Brampton, earthworks at Denton Hall and possibly Nether Denton, as well as ecclesiastical sites such as Lanercost Priory. Unlike adjacent areas to the west and east no examples of medieval village earthworks were visible from aerial photographs, though there were a few areas of potential medieval ridge and furrow cultivation recorded. Documentary research and survey work suggests the presence of villages in the lowlands and river valleys with a pattern of dispersed settlement focused on seasonal stock rearing or perhaps mineral extraction in the upland areas. This is supported by the identification of a few possible medieval settlement remains, in the form of isolated farmsteads and shielings, in the more marginal eastern reaches of the survey area. It is likely that modern settlement on the lower regions and river valleys obscures earlier settlement remains and many sites have experienced some degree of continued use into the post medieval period.

WORLD WAR II AND THE MILITARY PRESENCE IN THE NORTH-WEST

Vertical photographs taken by the RAF from 1946 -1951 made up the largest part of the sources consulted during the course of this survey. They provided a photographic record for virtually the entire survey area for the years immediately after the Second World War. Although this area is further away from areas under immediate threat from invasion, i.e. the southern and eastern coastal regions of the British Isles, there is still evidence of the wartime emergency. The 1940s and 1950s aerial photographs are an invaluable resource, providing a pictorial record of post-war Britain, capturing images of wartime structures which were rapidly removed once they were no longer needed. Unfortunately, no photographs taken during the war were available in this area; in other regions these wartime photographs highlight how much Britain had been transformed by the mantle of war and how much was decommissioned and removed within months of the end of the war. The 1946 RAF photographs held by the NMR, are the earliest comprehensive aerial coverage of this area and a considerable amount of military structures may have already been removed. They therefore do not provide a comprehensive contemporary picture. However, in conjunction with the numerous diverse documentary resources the aerial photographs are a vital source for this period.

The most prominent wartime site is that of Crosby-on-Eden military airfield, now Carlisle Airport, situated to the south of Hadrian's Wall, west of Irthington. This airfield is one of only four mapped for the project along Hadrian's Wall, the others being Anthorn in the Solway, Ouston to the west of Tyneside and RAF Woolsington, now Newcastle International Airport. Both the proximity to Carlisle and the flat terrain at Crosby-on–Eden would have played a significant part in locating the airfield in a region where suitable sights would have been difficult to come by.

The military airfield opened in 1941 as an Elementary Flying Training School used first as a Hurricane Operational Training Unit (OTU) including the 59 OTU (flying fighter aircraft) and 9 OTU (fighters). In August 1942 the unit transferred to coastal command as a Beaufort Conservation Unit. In August 1944 the 109 OTU formed with Dakota transport aircraft used to support the Arnhem landings (Birtles, 1999). By this stage the airfield had temporary accommodation for base personnel and three tarmac runways with hard standings, three type T2 hangars, three Bellman and three blister hangers (Birtles, 1999). Much of this infrastructure is recorded on RAF photographs taken in 1946 and includes the accommodation and service blocks, water storage tanks and air raid shelters and other ancillary structures such as gun emplacements and the runway beacon approach system.

Figure 23. Crosby-on-Eden Airfield May 1946. RAF 106G/SCOT/UK40 3402 04-MAY-1946 English Heritage (NMR) RAF Photography

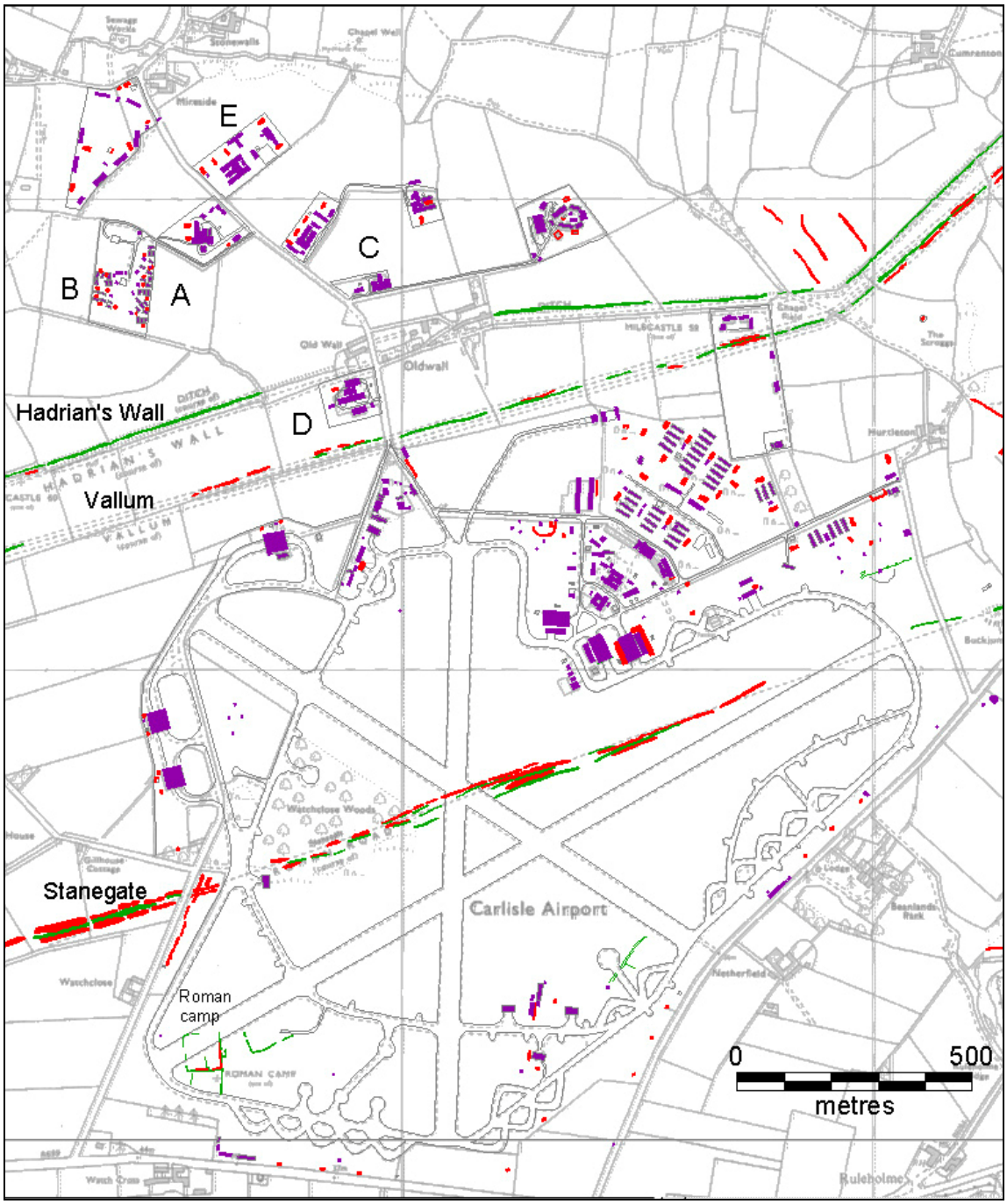

Figure 24. Crosby-on-Eden Airfield showing the plan of the Airfield and peripheral buildings (in purple). The cropmark traces of Hadrian's Wall, the Vallum, Stanegate and a Roman camp can be seen amongst the airfield structures. OS background map: English Heritage 100019088. 2008

One of the last wartime services took place at the airfield on the 14th August 1945 when 300 young holocaust survivors from Prague, who were to be resettled at Troutbeck Bridge, were received at the airfield (VJ Day being declared on 15th August) (Birtles, 1999).

To the north of the main airfield perimeter, beyond the course of Hadrian's Wall, a number of groups of wartime military buildings associated with the airfield are situated on either side of the road between Oldwall and Laversdale. Supplied with its own emergency water supply tank and air raid shelters, each group of buildings appears to have served a separate function within the running of the airfield. Several have been identified based on their layout and combination of buildings with the assistance of Roger J C Thomas (English Heritage, Military Support Officer). These are illustrated in Figures 23 and 24.

The Airfield HQ buildings (A on Figure 24) were located 580m north of the airfield's main gate, and were identified by the sweeping circular drive leading to a large main building with a path lined with white painted stones and a flag pole outside. Numerous small accommodation blocks were connected directly to the HQ to the west (B on Figure 24). Two separate sick quarters were identified, one (D on Figure 24) possibly replacing the other (C on Figure 24) to be closer to the airfield. These typically had ward buildings, an isolation block; and a mortuary building set a distance away from the other buildings. The complex also had its own air raid shelter and water supply tank.

Across the road from the HQ there was a complex of communal and recreation buildings (E on Figure 24) including the main mess hall building, the gymnasium, cinema and outdoor tennis courts. And on the northern side of Laversdale the most remote part of the airfield buildings (F on Figure 24) has been identified, based on location, to be the women's accommodation blocks, as typically women's quarters were more isolated.

A small number of other Second World War military features were identified to the south and east of the airfield. South-east of Brampton at Howgate Head a camp, comprising a number of accommodation blocks, was noted on 1946 RAF photographs. A small group of buildings, also believed to be military, were situated to the north-west of Brampton at Kirkby Moor, and a wartime observation post was located on Capon Hill to the south of the town.

The extent of these wartime features hint at the militarised landscape which developed over a short period and must have had lasting impact on this region. Not only was prime agricultural land taken up in the construction of the airfield, but the population of the area would have markedly increased in number, many perhaps billeted locally. The airfield straddles the course of the Stanegate, the Roman military road, which is visible as a cropmark through most of the airfield between the runways and continuing south-west towards Carlisle. In the south-western corner of the airfield the cropmark remains of at least one Roman camp, and beyond the airfield perimeter to the west the cropmark remains of the camps at White Moss were also seen from aerial photographs. (Figure 14, sites 5 and 5a, Figure 23 and 24) The coincidence of the Roman military remains of the Wall, Vallum, Stanegate and camps around and within the airfield at Crosby-on-Eden perhaps hints at a broadly comparable episode of military influence and intervention that this region has experienced.

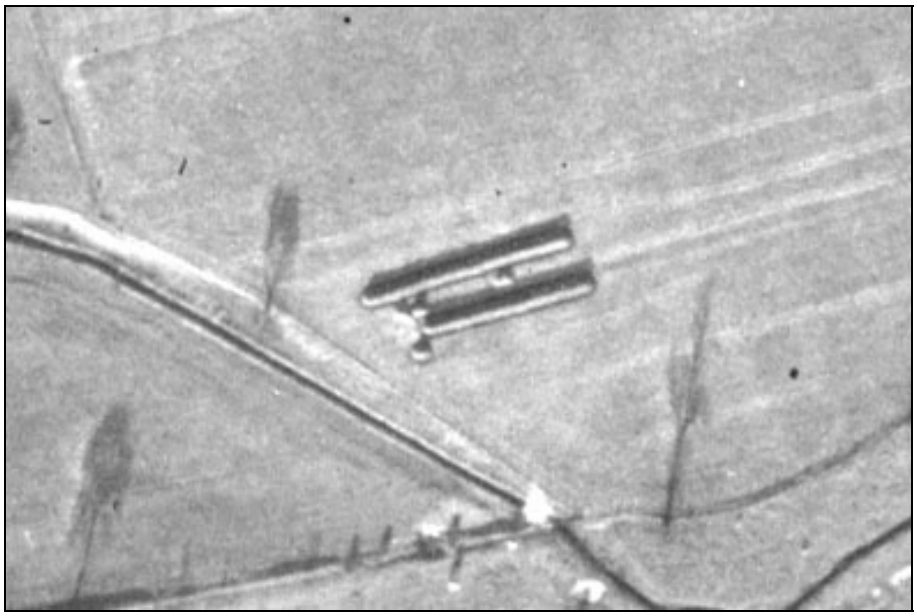

Figure 25. Potato clamps near Brampton visible on RAF photographs. Extract from RAF 540/645 3036 11-DEC-1951 English Heritage (NMR) RAF Photography

Evidence of non-military wartime and post-war measures of food production and storage were seen on aerial photographs in the form of numerous potato clamps, most of which were located in the south-western part of the survey area on the better agricultural land.

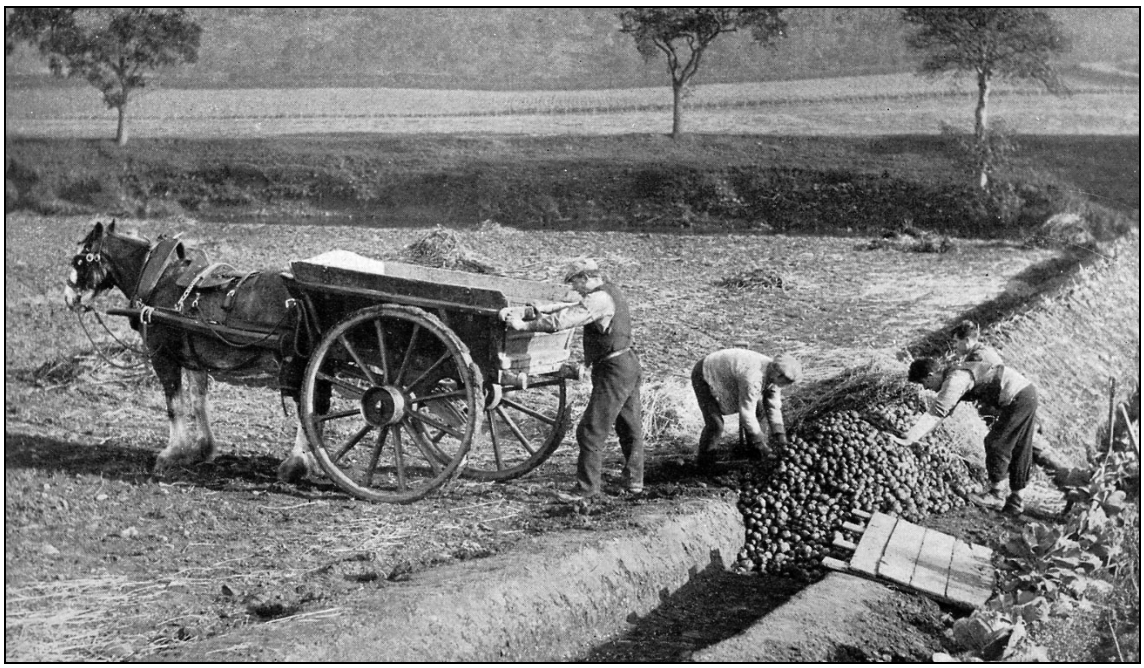

Figure 26. Potato clamps being constructed in wartime Scotland. Illustration from HMSO Ministry of Information booklet: Land at War. © Crown copyright

These were defined by long earthen mounds and were recorded in the database but not mapped as part of the NMP survey. The north of England and southern Scotland were the main potato producing areas during the war, as the cooler climate reduces the risk of

viral diseases developing. Harvested in October those not shipped south were packed into clamps - prepared trenches covered with straw to protect them from the winter frosts.

Summary

Although this survey did not contain the complexity and range of wartime features mapped during the course of other recent NMP projects on the southern and eastern coastal regions of England (Hegarty and Newsome 2007, Carpenter 2008), it still highlights the impact of the Second World War on Britain's rural landscape. In particular, Crosby-on-Eden airfield with its ancillary structures gives an insight into the multiple functions and rapid evolution of the site through the war.

The airfield would have had far reaching effects on the local population, as it would require requisitioning of farmland and bring in large numbers of service personnel from elsewhere. The presence of the airfield itself would have brought the war closer to this otherwise quiet region making it a possible target for enemy attention. After the war the airfield became Carlisle Airport, the war having effectively changed the local economy for the foreseeable future.

FURTHER RESEARCH AND RECOMMENDATIONS

The National Mapping Programme has consistently demonstrated the value of reviewing historical and specialist aerial photographs for archaeological survey and discovery of new sites. This is especially true in upland areas where visibility and access for ground based survey techniques can be difficult, and where aerial survey can achieve greater and faster returns over large areas. However, the results are dependent upon the existence and quality of the aerial photographic resources in a particular area. The NMP survey will therefore help to target further specialist aerial reconnaissance in the region.

This survey, like others before it, has identified a need for further specialised fieldwork and excavation to attempt to identify sites from the under represented prehistoric and post-Roman periods in this area. Securing the date of regionally diagnostic artefacts and site types could not fail to benefit the identification of future discoveries as well as the known sites seen on existing aerial photographs. In particular, the Curricks and Temon settlement enclosures and field systems would benefit from further investigation to ascertain their origins.

The sites of three potential new Roman camps owe their discovery to aerial reconnaissance and illustrate how vital a resource aerial photography is to continued discovery. All of three of these sites warrant further investigation as do the pits within the camps at White Moss. These appear to be one of the few, and certainly the best examples of such pits from contemporary tent encampments within Roman camps in England. To be able to date and sequence the various superimposed camps would be an exceedingly valuable project, especially if the some light could be shed upon the dates and life-span of each camp on the site in relation to the overall Roman occupation and the Hadrianic campaign.

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APPENDIX 1. PREHISTORIC/ROMAN SITES

Site No	AMIE UID	MORPHOLOGY	FORM	PHOTOGRAPHIC SOURCE
1	947426	Rectilinear enclosure (45m x 46m) and ditches, possibly fields	CM	NY 4555/6 (12761/26) 15-AUG-1995 NMR
2	927430	Sub-rectangular enclosure 33m x 40m	CM	NY 4658/2 (13421/30) 24-JUL-1984 NMR
3	1453339	Rectilinear enclosure 43m x 23m	CM	OS/71038 114 10-APR-1971
4	12775	Roman farmstead – Polygonal enclosures (adjacent to farmstead **(excavated)**)	CM	BC 057 06-JUL-1948 CUULM
5	12855	Two rectangular enclosures – 60m x 56m and 43m across with internal buildings	CM	NY 5161/3 (1140/381) 07-JUL-1977 NMR
6	927427	Rectilinear enclosure with sub-divisions 47m x 58m	CM	NY 4659/2 (12306/15) 15-JUL-1992 NMR
7	1453445	Rectilinear enclosure 53m x 35m	CM	MAL/76061 091 08-JUL-1979
8	928558	Sub-rectangular enclosure 33m x 39m	EWK	NY 5561/5-6 (RXB 3406/20-21) 07-FEB-1986 RAF 106G/UK/1392 3227 10-APR-1946
9	1454251	Rectilinear enclosure 25m wide and ditch	CM	DI 53-54 06-JUL-1949 CUULM
10	11636	Possible Ro settlement – 2 rectilinear enclosures and associated ditches, possibly fields.	CM	DS 050 CUULM
11	1454260	Rectilinear enclosure with internal pits 64m x 52m	CM	DS 47-48 11-JUL-1949 CUULM
12	1452080	Rectilinear enclosure with sub-divisions 76m x 57m	CM	NY 4661/3 (CUC 13412/7) 29-MAR-1984 CUULM

13	1453436	Settlement – rectilinear enclosure (69m x 64m) and possible round houses and fields.	CM	MAL/76061 091 09-JUL-1976
14	1456126	Rectilinear enclosure, may be fields or perhaps geological. 62m wide	CM	NY 5263/1 (2171/388) 26-JUL-1984 NMR
15	11600	Rectilinear enclosure (discredited Roman camp) with sub-divisions and boundary. 84m x 84m	CM	NY 4661/3 (CUC 13412/7) 29-MAR-1984 CUULM
16	927851	Double-ditched sub-rectangular enclosure and trackway. 83m x 70m	CM	NY 4961/7-10(CUC 13417/3-6) 23-JUL-1984 CUULM NY 4961/2 (2171/373) 26-JUL-1984 NMR
17	927802	Polygonal banked and ditched enclosure with linear ditches. 78m x 76m	CM	NY 4861/1-3 (CUC 13412/8-10) 29-MAR-1984 RAF 106G/SCOT/UK/40 3266 04-MAY-1946
18	14140	Homestead enclosure with annex and hut circle	EWK	NY 6360/10 (13890/84) 16-MAY-1995 NMR
19	12639	Enclosed settlement 25m x 15.5m with post med re-use	EWK	CUC TY MT01A 36 01-MAY-2001
20	928538	Rectilinear enclosure and adjacent fields or enclosures	CM	NY 5059/4 CUC 13417/07 23-JUL-1984
21	1456120	Ring ditch 12m diameter	CM	NY 5160/6 (20595/1) 28-JUL-2006 NMR
22	1453358	Round barrow 18m x 24m, Oval with central pit.	CM	NY 4556/6 (12662/12) 15-AUG-1995 NMR
23	1453373	Round barrow 20m diameter	CM	OS/90149 027 15-APR-1991
24	1454233	Circular enclosure (33m diameter)	CM	DO 42 09-JUL-1949 CUULM
25	1449463	Curvilinear enclosure and ditch	CM/LE	RAF 106G/UK/1392 3298 10-APR-1946
26	1453325	Curvilinear enclosure 190m diameter	CM	NY 5057/3 (20595/10) 28-JUL-2006 NMR
27	1453706	Curvilinear enclosure 90m diameter (incomplete)	CM	NY 4756/3 (20595/13) 28- JUL-2006 NMR

28	11642	Curvilinear enclosure 122m Diameter. (incomplete)	CM	NY 4560/15 (12761/10) 15-AUG-1995 NMR
29	927434	Rectilinear enclosure and associated polygonal enclosure, ditches (? fields) and trackway. 68m x 55m	CM	NY 4957/15 (2171/382) 26-JUL-1984 NMR NY 4957/21 (20595/05) 28-JUL-2006 NMR
30	14111	The Curricks – sub-divided rectilinear enclosure and field system	EWK	RAF 106G/UK/1392 3214 10-APR-1946
31	1452601	D – shaped enclosure and field system	EWK	RAF 106G/UK/1392 4174 10-APR-1946
32	1453725	Highberries enclosure and field system	CM	RAF/106G/SCOT/UK/40 3252 04-MAY-1946

NB. Form refers to the form of the remains visible on the aerial photographs.

CM =cropmark, EWK = earthwork and LE = levelled earthwork

APPENDIX 2. METHODOLOGY AND ARCHAEOLOGICAL SCOPE OF THE SURVEY

Methodology

The objective of the National Mapping Programme (NMP) is to enhance our understanding of past human activity by identifying, interpreting and transcribing archaeological features dating from the Neolithic to the twentieth century that are visible as cropmarks, soilmarks or earthworks on aerial photographs. The background, philosophy and approach to English Heritage's National Mapping Programme are explained in Understanding England's Historic Landscapes: An Aerial Perspective (Bewley 2001).

For this survey 2255 aerial photographs from English Heritage's National Monument Record (NMR) and the University of Cambridge's Unit for Landscape Modelling were consulted.

Photographs with relevant archaeological features were scanned and then rectified using AERIAL 5.29 Photograph Rectification programme designed by John Haigh at the University of Bradford. Control information was from digital copies of Ordnance Survey 1:2500 scale maps with a typical level of accuracy of +/-3m and digital terrain models were created from the Ordnance Survey Land-Form Profile digital height information. The resultant rectified photographs were imported into Autodesk Map 2004 and archaeological detail was transcribed using the appropriate layers and conventions.

New archaeological features were recorded in the National Monuments Record database, known as AMIE. Existing AMIE records were updated or revised where more information could provide a better understanding of the site. These records also include a reference to the relevant Cumbria or Northumberland HER record. Each English Heritage monument number is attached to the relevant transcription within Autodesk Map along with basic period, classification, form and photographic source. On completion of AMIE recording the site data is transferred to the English Heritage in-house Geographic Information System (WebGIS).

Copies of the transcriptions and the associated monument records are available from the NMR.

Archaeological scope of the survey

Earthworks, plough levelled features, buried remains and structures

Cropmarks and soilmarks of cut features such as ditches and built-up features such as banks have been mapped whether they are extant or have been levelled and only show

as cropmarks or soilmarks. Buildings and structures of archaeological significance not recorded on the OS base map were also mapped.

Roman remains within the military zone

The extensive Roman remains within the military zone of Hadrian's Wall were mapped to the NMP standards. However, monument recording in AMIE deviated from standard NMP methodology. Normally all existing monument records are amended, but given the high number of existing AMIE monument records for sections of the Wall, Vallum, Military Way and Stanegate, a more streamlined approach was adopted. A single new monument record was created in the AMIE database for each element (Wall with the Wall ditch, Vallum, Stanegate and Military Way) on each particular OS quarter sheet linked to the parent record for that feature and the collection record for the project.

Mineral extraction and industrial archaeology

The survey aimed to provide a basic, comprehensive overview of the extent and character of industrial remains in a landscape context. The remains of quarries and extractive pits within 2km of the Wall in the Roman military zone were mapped. These were dated as post medieval unless a particular quarry had been dated through Roman finds or Graffiti. The extensive small to medium scale post medieval coal mining in the east of the survey area were recorded along with associated railways and tramways and inclines which had not been marked on the OS base map. Also recorded were the traces of medieval/post medieval small to medium scale peat cutting on the peat moss deposits, and post medieval clay extraction and associated brickworks.

Ridge and furrow and field boundaries

Areas of medieval ridge and furrow were mapped indicating the extent and direction of the furrows. Also recorded were the extensive remains of what is believed to post medieval ridge and furrow which appears much narrower and straighter in nature than the medieval rig. The traces of former field boundaries identified on earlier editions of OS maps were not recorded, but the numerous sod-cast bank boundaries thought to be post medieval in date were mapped.

In addition, areas of prehistoric cord rig were also mapped, but were depicted using different layers and colours in AutoCAD to distinguish it from the medieval and post medieval ridge and furrow.

Twentieth century and military sites

All twentieth century wartime features have been mapped; these included Airfields, buildings, and defensive structures. Other wartime civilian features such as potato clamps and allotment gardens were noted but not mapped.

APPENDIX 3: SOURCES, PROJECT RESULT AND MONUMENT STATISTICS

Sources

The National Monuments Record was the main source of photographs and the project loan included a total of 2255 prints comprising 643 specialist oblique and 1612 vertical prints (loan numbers 881 and 881A).

The oblique photographs ranged in date from 1952 through to 2004, the majority of these were NMR copyright, but the collection also included 60 prints copyrighted to CUCAP, 57 prints Barri Jones, 62 prints Tim Gates, 43 prints Cumbria County Council, and a small number from other sources including Cumbria Lancashire Archaeology Unit and Newcastle University. There were also a small number of RAF military oblique photographs.

The vertical photographs held by the NMR were from three major sources – RAF, Meridian Air Maps (MAL), and the Ordnance Survey (OS). These vertical sources dated from 1940 through to 1994.

A further 372 prints were kindly lent by the Air Photograph Library of Cambridge University Unit for Landscape Modelling. These comprised 99 vertical and 273 oblique prints.

Apart from those already held by the NMR, vertical and oblique photographs held by Cumbria HER were consulted at the end of the project. These photographs provided a small number of significant discoveries and increased the understanding of a few key sites mapped from photographs held by the NMR.

Results and Statistics

The NMP survey of this area has added in the region of 535 new monuments to the existing sites already recorded in the NMR AMIE database. The largest component by far was sites of post medieval date, 379 monument records (72.2% of all new records) and were mostly records of quarries and narrow ridge and furrow. The traces of this form of ploughing for land improvement could be seen extending through the more fertile valley regions as well as the areas of improved and semi-improved farm land. Though clearly visible on the RAF and OS vertical photographs from the 1940s to 1970s, less and less is visible on more recent photographs as traces are removed by modern ploughing and improvement.

The remaining 147 (29%) newly discovered sites were mostly classified based solely on morphology due to the lack of supporting dating evidence derived from field work and excavation in this region.

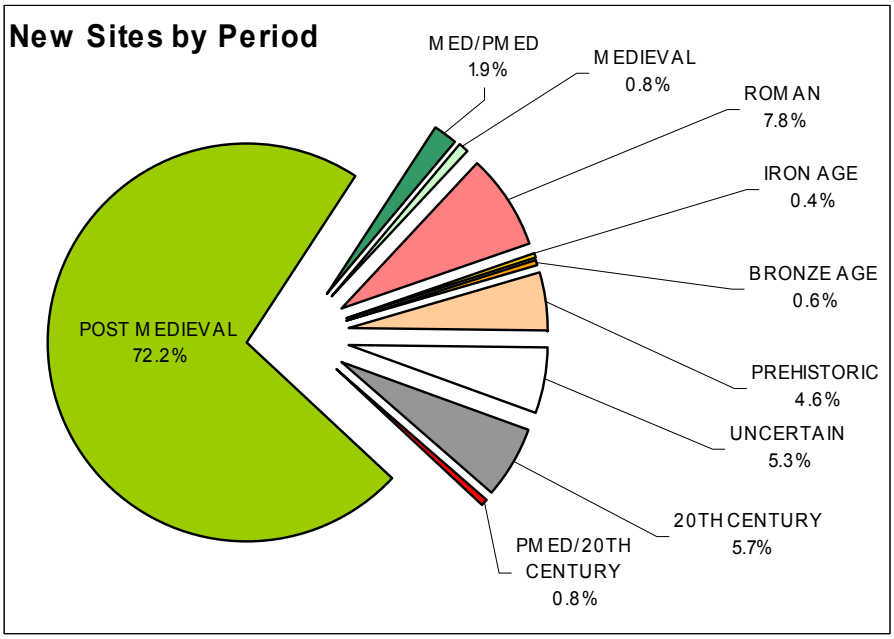
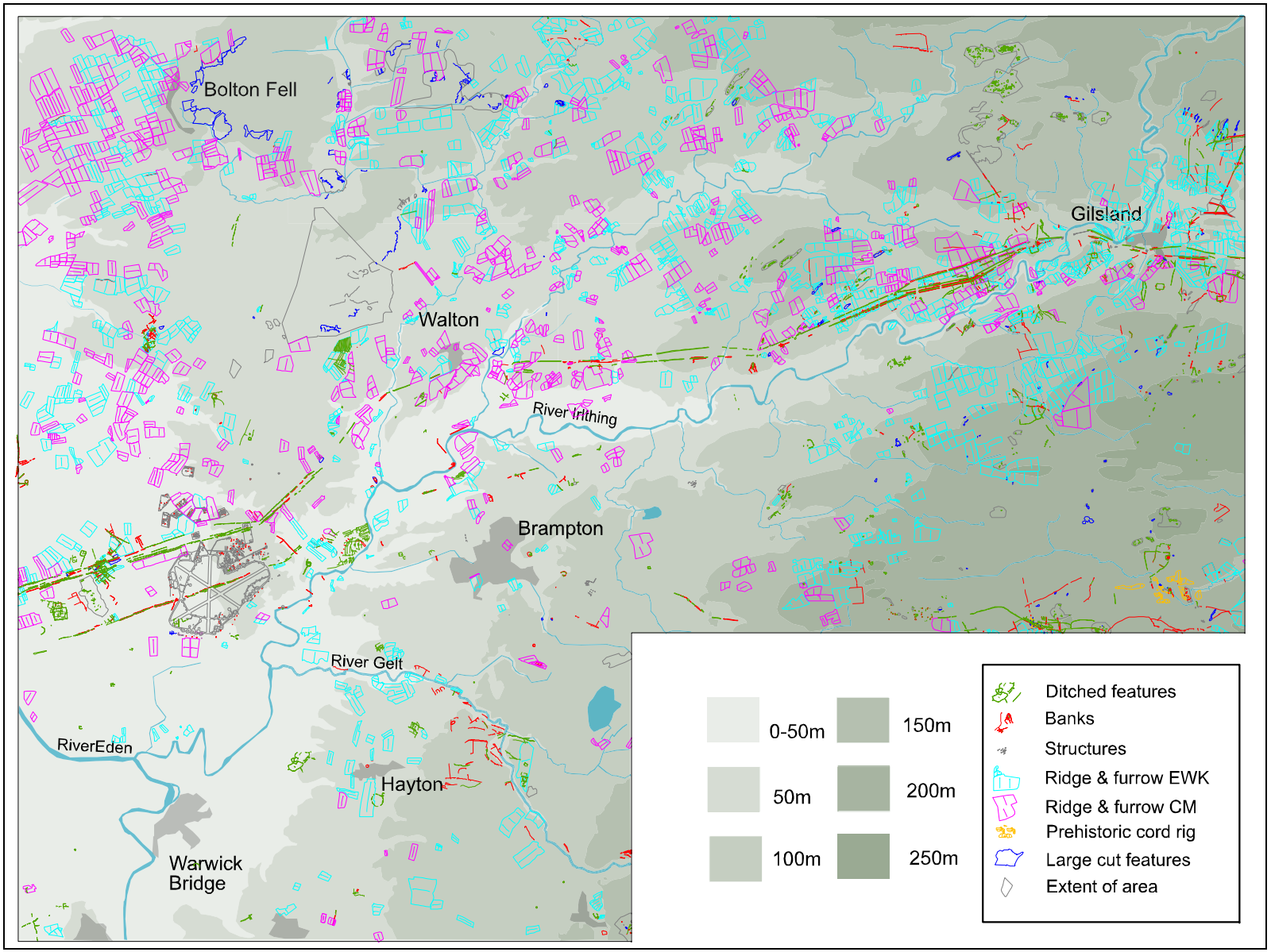
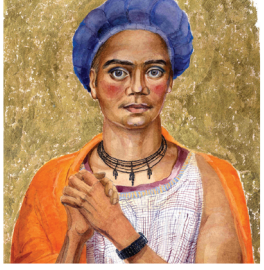


Figure 27. Distribution of all new records by period.

APPENDIX 4: ALL ARCHAEOLOGICAL FEATURES MAPPED FROM AERIAL PHOTOGRAPHS





ENGLISH HERITAGE RESEARCH DEPARTMENT

English Heritage undertakes and commissions research into the historic environment, and the issues that affect its condition and survival, in order to provide the understanding necessary for informed policy and decision making, for sustainable management, and to promote the widest access, appreciation and enjoyment of our heritage.

The Research Department provides English Heritage with this capacity in the fields of buildings history, archaeology, and landscape history. It brings together seven teams with complementary investigative and analytical skills to provide integrated research expertise across the range of the historic environment. These are:

* *Aerial Survey and Investigation*
* *Archaeological Projects (excavation)*
* *Archaeological Science*
* *Archaeological Survey and Investigation (landscape analysis)*
* *Architectural Investigation*
* *Imaging, Graphics and Survey (including measured and metric survey, and photography)*
* *Survey of London*

The Research Department undertakes a wide range of investigative and analytical projects, and provides quality assurance and management support for externally-commissioned research. We aim for innovative work of the highest quality which will set agendas and standards for the historic environment sector. In support of this, and to build capacity and promote best practice in the sector, we also publish guidance and provide advice and training. We support outreach and education activities and build these in to our projects and programmes wherever possible.

We make the results of our work available through the Research Department Report Series, and through journal publications and monographs. Our publication Research News, which appears three times a year, aims to keep our partners within and outside English Heritage up-to-date with our projects and activities. A full list of Research Department Reports, with abstracts and information on how to obtain copies, may be found on www.english-heritage.org.uk/researchreports

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