RCHM
ENGLAND

THE NOTTINGHAMSHIRE MAPPING PROJECT

A report for the National Mapping Programme

Final version 1999

The draft version of this report was submitted in 1997, and revisions were made during 1998 and 1999.

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Event Name: RCHME: Nottingham shire NMP
Event UID: 1074556

ACKNOWLEDGEMENTS

This project was funded in its initial year by grants from RCHME and Nottinghamshire County Council. In subsequent years the RCHME provided grant aid.

Chris Cox, Air Photo Services Ltd, 76 The Green, Lyneham, Wiltshire managed the mapping stage of this project and assisted with the Introduction. Valuable contributions were also received from the following: Rog Palmer, Air Photo Services, 21 Gunhild Way Cambridge; Daryl Garton, Trent and Peak Archaeological Trust, University of Nottingham; Virginia Baddeley and Mike Bishop, Nottinghamshire County Council; Staff at Royal Commission on the Historic Monuments of England especially R. Bewley, P. Horne, D. MacLeod and the staff of the NMR, Air Photographs and Kate Howell Archaeological Services WYAS, Wakefield, West Yorkshire.

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1. INTRODUCTION

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1.1 BACKGROUND TO THE PROJECT

Early in 1991 the Royal Commission on the Historical Monuments of England (RCHME), Nottinghamshire County Council (NCC) Sites and Monuments Record (SMR), and Air Photo Services (APS) discussed the requirement for air photo interpretation and mapping to a consistent standard over the county of Nottinghamshire.

Discussions took place in the context of ongoing threats to the archaeological resource - from industrial and residential development, aggregate extraction, and landscape re-development. These activities highlighted the requirement for both local and national archaeological records for the county to be current and comprehensive. Production of a consistent record of air photo derived archaeological data to a 1:10 000 scale was identified as a high priority by both the county SMR and the RCHME. Previous detailed air photo transcription projects had been spatially and intellectually confined to specific areas and periods.

1.1.1 RCHME POST-RECONNAISSANCE GRANT FUNDED MAPPING

The air photo interpretation and mapping was begun in the first quarter of 1991 by Air Photo Services with a grant from the RCHME. From its inception to its re-specification for incorporation into the National Mapping Programme (NMP) in December 1993, the project operated under the auspices of a RCHME post-reconnaissance mapping grant, with financial and material contributions from NCC SMR.

From mid-1991 until late 1992 the project had been undertaken on an intermittent basis. There was not at this stage, an agreed written specification, the project stood alone, as a county-specific survey.

During this initial phase, nineteen OS 1:10 000 quarter sheets covering the south-west area of the county were mapped from oblique aerial photographs. Interpretation notes were entered systematically to a computer database (Dbase3).

1.1.2 THE NATIONAL MAPPING PROGRAMME

The nation-wide inception of the NMP in 1992 required incorporation of the survey into a standardised mapping project specification and management structure (RCHME 1995). This involved:

- Formalisation of archaeological scope and recording strategy
- Quantification and qualification of all available photo sources
- Definition of budget and timescales
- Appraisal of staff requirements
- Integration of the MORPH2 database and associated documentation
- Specification and quantification documents were produced by Air Photo Services (Cox 1993 a&b).

The mapping and interpretation of the 19 quarter sheets completed for the post-reconnaissance mapping project was upgraded under the NMP specification. The data recorded on the first 19 quarter sheets were retrospectively entered to the MORPH2 database during November 1992.

The mapping of adjacent county overlaps was undertaken as part of the ongoing mapping strategy. The concordance to the NAR (now part of the NMR) and the retrospective completion of map note sheets to fulfil the newly defined NMP criteria was undertaken during 1995 (Cox 1993a, 17).

Funding was transferred formally to the NMP during 1993, but material contributions have been ongoing from the County SMR in the form of SMR information, officer time and SMR map copies.

The survey was commissioned from APS by the RCHME on a part-time basis, governed by the availability of funding. It was undertaken over defined blocks of time between 1993 and 1997 through a period of RCHME organisational restructuring and very tight financial constraint.

The mapping phase was completed within budget by December 1996. All recording was completed by January 14th 1997. The timescale differs from that proposed in the project specification (see Cox 1993a:17) due to the constraints imposed by the limitations of funding.

1.2 THE PROJECT AREA - TERRITORIAL EXTENT

The survey area was defined as the whole quarter sheets covering Nottinghamshire and its borders with South Yorkshire, Derbyshire and Leicestershire. This project area abuts that defined for the National Forest NMP Project to the south. The quarter sheets along the Lincolnshire and Nottinghamshire border were divided between this project and the Lincolnshire NMP Project so as maintain the integrity of the Trent Valley landscape (Kershaw 1998).

The project area was originally identified as 103 OS 1:10 000 quarter sheets. The decision to exclude the quarter sheet SE70SW was taken by RCHME and APS in January 1993 as there were no oblique photographs and the majority of the sheet lies within the former

county of Humberside. In total 102 OS 1:10 000 quarter sheets were mapped for this project (Figure 1 and Appendix 1).

1.3 OBJECTIVES

- A comprehensive multi-period mapping programme covering the entire county was devised to:
- Enhance and consolidate and existing national and local records.
- Provide a framework for archaeological research and management issues on both a local and national level.

The survey was undertaken in accordance with the general objectives of the NMP as laid down in the National Mapping Programme of Archaeological Recording from Air Photographs (page 7). These were to identify and transcribe 'all probable and possible archaeological features showing as crop marks and soil marks and previously un-surveyed earthworks..... up to the National Archaeological Record terminal date of 1945'. The Nottinghamshire NMP did not exclude previously surveyed earthwork monuments from mapping, and this was later formalised within the NMP Sphere of Interest (RCHME 1995:11.2).

The survey aimed to record all aerially-derived archaeological sites and landscapes consisting of both plough-levelled and upstanding remains dating from the earliest prehistoric times to 1945, including industrial and military remains as appropriate and visible on the specified photo sources. It was appreciated that archaeological evidence solely derived from air photographs may be difficult, if not impossible, to date accurately, and provision was made for this factor within the computer-based recording system.

1.4 COUNTY-SPECIFIC SPHERES OF INTEREST

Specification of the archaeological scope of the Nottinghamshire survey and county-specific requirements for deviation from NMP standard procedures was agreed between RCHME, the NCC SMR and APS.

Standard NMP specifications were adhered to, except in the following instances.

1.4.1 MEDIEVAL AGRICULTURE AND SETTLEMENT

APS considered that it was good practice to record all visible medieval landscape elements, whether extant or levelled, along with an assessment of their present condition, via the MORPH2 database.

The visible extent of ridge and furrow and headlands, levelled or flattened was recorded using standard NMP conventions. Ridge and furrow was not mapped where the utilisation of this convention would detract from the mapping of underlying or overlying, ditched

and banked archaeological features. In these cases such relationships were noted in the free text memo field of the MORPH2 database.

1.4.2 MODERN MILITARY SITES

The limited nature of the vertical photography available for consultation precluded the reasonable assessment of pre-1945 modern military sites especially airfields. In general the latter were outlined, by appropriate convention on inked maps to indicate extent but were not recorded in the MORPH2 database.

1.4.3 INDUSTRIAL SITES

The limited nature of the vertical photography available for consultation precluded the reasonable assessment of pre-1945 industrial remains. Parts of the county are rich in the remains of 19th and 20th century industry but these were generally not recorded by this project. Evidence of Medieval and Post-Medieval mining remains was mapped when identified.

1.4.4 DIGITAL DATA TRANSCRIPTION

An additional objective of the survey was to ensure the production of an accurately positioned archaeological record which accurately reflected the morphology, size and location of features within the limitations of 1:10 000 scale mapping. This was considered good practice, particularly whilst entering specific morphological and spatial data to the detailed MORPH2 database, to ensure an accurate record and facilitate later analyses. To meet this objective, APS specified that all photo interpretations would be digitally rectified where appropriate.

Digital transcription was also considered necessary in the light of the then rapid development of digital mapping and presentation techniques, and their potential for future data manipulation and storage. The digital preservation of all rectified interpretations provides a manipulable archive for future use in either Geographical Information Systems (GIS) or Computer Aided Design (CAD) systems, and allows easy replication and combination of the data with other sources as they become available. In order to accomplish this aim APS specified that all sites were, where possible, to be transcribed digitally using the Bradford Aerial Photographic Rectification System (AERIAL, Version 4.20). The resulting hundreds of digital data files are archived by APS, and accessible via a unique 4-figure National Grid Reference based reference.

1.5 NMP SOURCES

1.5.1 AERIAL PHOTOGRAPHS

The following sources of aerial photographs were consulted for this project:

The National Monuments Record air photo collection (previously National Library of Air Photographs), NMRC, Kemble Drive, Swindon.

The Cambridge University Committee on Aerial Photography (CUCAP), The Mond Building, Free School Lane, Cambridge.

NMR collection photographs were provided on loan from the NMR. CUCAP photographs were consulted on site and kindly loaned to APS when requested.

1.5.1.1 OBLIQUE PHOTOGRAPHS

At the time of the quantification assessment the CUCAP collection held 2,887 oblique aerial photographs covering the project area, these were generally taken for archaeological recording purposes although a small minority were panoramic views and of limited use to this project. This figure was derived from a manual coversearch undertaken by APS in 1991. At this time all information was held on record cards. These cards were searched on grid reference. The record cards were checked for more recent information during the course of the project.

At the time of the quantification assessment 12,258 oblique photographs pertaining to this project area were held by NMR. This figure was derived from coversearch information provided by the NMR in 1991. Not all items held were available for loan - notably the colour slides. Within the timescale of this project it was not possible to consult these items.

The oblique aerial photographs held at NMR were taken by numerous different photographers including those derived from the flying programmes undertaken or funded by the RCHME Aerial Survey (previously Air Photographic Unit). D N Riley's RCHME funded reconnaissance primarily covered the north and north-east of the county and parts of the Trent Valley in accordance with his research objectives during the 1970s and 1980s. These photos provide a very comprehensive and cohesive body of archaeological information. CUCAP has covered the Trent Valley intensively, providing a comprehensive record of sites seen as cropmarks. Areas in the south of the county and in the middle Trent Valley have been covered by J Pickering. The south-western areas of the county had not been covered so well by regional flyers or the RCHME, and remain in need of further targeted reconnaissance.

Other sources of oblique aerial photographs have been identified. Namely NCC SMR, TPAT, National Rivers Authority and Sheffield University Archaeology and Prehistory Department. Many of the photographs held with these and other collections are duplicated in the NMR collection. However, the timescale and budget constraints of this project has not permitted a more exhaustive search and examination of all collections.

1.5.1.2 VERTICAL PHOTOGRAPHS

In 1984 NCC commissioned a county-wide vertical photography survey from CUCAP. The extent of the survey closely matches the geographical limits of this project. This survey formed the greater part of the vertical resource consulted. Until 1977 vertical photographs covering areas of archaeological interest previously attributed record cards were referenced on those cards. As such they formed part of the oblique photograph quantification and were consulted for this project.

Other sources of vertical photographs were identified for consultation by the quantification assessment notably the NMR and NCC collections (Cox 1993b:10), however, these were not examined for this project. This decision was made during discussion between Chris Cox and Dave MacLeod in December 1994, entirely on the grounds of financial constraint upon the project.

1.5.2 NATIONAL MONUMENTS RECORD

NMR maps and associated paper-based documentary records available at the date of mapping were supplied by RCHME. They were consulted concurrent to photo interpretation and concorded with the MORPH2 record. Much of the aerially-derived data in this record was collated from other sources such as Riley (1980) and Whimster (1989), and also included information from the Ordnance Survey record cards.

1.5.3 NOTTINGHAMSHIRE SITES AND MONUMENTS RECORD

SMR data were supplied by NCC as copies of the 1:10 000 SMR map sheets. The associated documentary information on disc was available for the last block. The data were consulted concurrent to photo interpretation and concorded with the MORPH2 record.

Nottinghamshire SMR contains transcriptions from photographs held by the NMR and CUCAP. These are represented as variable quality sketch plots on the SMR 1:10 000 map record sheets. The plots include both archaeological and geological features, which were often not differentiated in the mapping.

This SMR also provided film copies of quarter sheets for initial drafts of the NMP mapping (pencil copies).

1.5.4 SOUTH YORKSHIRE SMR

South Yorkshire SMR supplied text printout from their computer database.

1.5.5 DERBYSHIRE SMR

Derbyshire SMR supplied copies of 1:10 000 overlay sheets containing SMR numbers and sketch plotted AP transcriptions undertaken by Sarah Whitely for the SMR.

1.5.6 LEICESTERSHIRE SMR

Leicestershire SMR supplied printout from their computer database of SMR entries.

1.5.7 LINCOLNSHIRE SMR

Lincolnshire SMR supplied written SMR information and numbers.

1.5.8 THE EXCAVATION INDEX

The Excavation Index produced by RCHME was consulted throughout the project. The brief information derived from this source aided dating and interpretation and allowed a more reasonable assessment of validity for those landscapes mapped from the aerial photographs consulted, but also known to have been investigated on the ground.

1.6 METHODOLOGY

1.6.1 MAPPING METHODS

Mapping was undertaken in 5km x 5km blocks relating to OS 1:10 000 scale quarter sheets.

The methods of transcription and recording applied were based upon mapping methods used as standard by APS and the recording requirements of the NMP. Archaeological data were interpreted and transcribed from aerial photographs to transparent overlays in all cases. The interpreted information was, where necessary, rectified and re-scaled using the Bradford Aerial Photographic Rectification System (currently running as AERIAL 4.20) or Mobius network controlled manual transcription methods as appropriate to the nature of the data and quality of mapping control information. Transcription accuracy was within ±5m for computer-rectified sites, and ±10m for manually transcribed sites, within the published tolerances of OS mapping accuracy at 1:10 000 scale. All control points were derived from 1:10 000 scale film and paper based map copies.

For all quarter sheets completed since November 1995 all relevant information from digital and manual mapping was collated onto the film base maps provided by the SMR with reference to the original photo overlay and/or photographic sources. Final inked drawing were produced on stable polyester translucent overlays.

1.6.2 CONVENTIONS

The cartographic conventions used during this project were devised for the NMP and conform to the 1:10 000 scale conventions as detailed in Guidelines and specification manual for the National Mapping Programme (Version 1.0) (1995: Section 6). Pen sizes 0.18 and 0.25mm were used as appropriate.

1.6.3 RECORDING AND DATABASES

Initial interpretation records consist of the standard NMP map and site note sheets which form part of the project archive. The site notes also contain a full record of all aerial photographic sources used for archaeological interpretation.

From November 1992, all site details and descriptions were entered into the MORPH2 database by the photo interpreter, on completion of each new quarter sheet transcription.

The foundations of the MORPH2 database may be found in Edis et al (1989).

The material for this project was input according to the standards set by the manual A Morphological Classification System for Mapped Archaeological Data (RCHME draft 1993). In addition, for each site recorded from oblique photographs the references for the relevant aerial photographs were recorded in the free text memo field. This field was also used to record the presence of levelled ridge and furrow, overlying or underlying sites, where not recorded on the NMP map.

The complexes, groups and site numbers attribute to the mapped data were recorded on a paper copy of each quarter sheet. These copies form part of the project archive.

These recording standards were applied retrospectively to the nineteen quarter sheets constituting the post-reconnaissance mapping project i.e. SK42SE, SK45NE, SK45SW, SK45SE, SK52NW, SK52NE, SK53NW, SK53NE, SK53SW, SK53SE, SK54NW, SK54NE, SK54SW, SK54SE, SK55NW, SK55NE, SK55SW, SK55SE, SK62NW, SK62NE.

1.6.4 ARCHIVE AND PUBLICATION DETAILS

Project data will be archived with the NMR. There are currently no plans for publication, but articles based on this work have been published and presented (Deegan 1996, 1998).

1.6.5 PERSONNEL

The project was initiated under the guidance of Robert Bewley. It was supervised by Dilwyn Jones until 1992, and by David MacLeod, both from the RCHME Aerial Survey (York) until its conclusion. Photo interpretation, mapping and recording was undertaken by Chris Cox from 1991–1994 and subsequently by Alison Deegan at Air Photo Services. Quarterly progress reports were submitted according to NMP specifications. A project liaison group met at intervals to discuss progress and related issues. Representatives of the County SMR, RCHME, English Heritage (EH) and APS attended these meetings.

1.6.6 TIMETABLE AND PERSON DAYS

The mapping phase ran from mid 1991 to January 1997 with frequent interruptions in productivity due to external financial constraints. Subsequent to the mapping of the first 19 quarter sheets, which were not subject to time recording requirements, 318 person days were spent on the mapping and database recording phase, including post-transcription copying, data validation, sorting of photographs and staff training.

1.7 PREVIOUS INTERPRETATIVE WORK

Certain areas of the county had previously attracted extensive archaeological surveys.

1.7.1 MAPPING BY D. N. RILEY

In 1974 Riley (with Pickering) recorded the first indication of the levelled archaeological landscape on the Sherwood Sandstones from the air. In the following years, intensive reconnaissance revealed the greater extent of the landscape between Worksop and Retford, and northward to Doncaster. Riley appreciated the requirement to transcribe and map the gather information and to present it at a scale such that both the individual detail and the greater landscape could be considered.

These archaeological landscapes, which lie over the Sherwood Sandstone formation, were recorded from the air between 1976 and 1979. Riley interpreted and mapped his own photographs (now accessioned into the NMR) and some from CUCAP flights at 1:10 560 scale. In some cases where the photography afforded greater detail of the buried features, features were mapped at 1:1320 scale. The 1:10 560 scale plots were transcribed from the oblique photography by use of Mobius networks, and sometimes the four point or paper strip method. Computer-aided rectification was under taken for the larger scale plots (Riley 1980, 8).

The results of Riley's work were published as Early landscape from the air (1980). Mrs Majorie Riley kindly allowed APS to take photocopies of the original maps featured in the

publication. These proved to be a useful basis for the re-mapping and re-interpretation of the known sites in this area.

1.7.2 MAPPING BY DR R. P. WHIMSTER

Dr. Rowan Whimster (1989) studied the aerial photographic evidence regarding the levelled archaeology in the Trent Valley as part of a comparative study with the Welsh Marshes. His survey covered an area of 150 sq. km centred around Newark on Trent with a deliberate emphasis on the river gravels. The mapping programme was carried out between 1981 and 1985 under the auspices of the Department of the Environment (now English Heritage), the RCHME and CUCAP. The oblique collections of CUCAP and NMR were consulted by the project. Where photographic control permitted, sites were rectified by computer aided transcription. Interpretation was undertaken at 1:2500 scale for individual land units but also presented at 1:10 560 scale, copies of the resulting maps were made available to this project.

1.8 RESULTS

A total of 3,560 MORPH records were created by this project, 32% of which had been previously unrecorded in the NMR and SMR.

The project area encompassed a range of varied landscapes, the characteristics of these landscapes are fundamental to site visibility on aerial photographs. Section 2 will briefly discuss the geology, soils and modern landuse of each of the broad landscapes represented in the project area.

The remainder of this report concentrates on three main issues.

Nottinghamshire is perhaps unusual in the wealth of levelled Roman military sites and the remains of earthworks constructed during the English Civil War. Section 3 discusses the visibility of these and other defended sites from different periods on the photographs.

Monuments of ritual function are poorly represented over much of the project area, with a distributive bias towards the Trent Valley. Acknowledging the limitations of the record imposed by factors discussed in Section 3, Section 4 examines the potential problems in interpreting such features.

Two areas of Nottinghamshire - the Trent Valley and the Sherwood Sandstone have become increasingly well known for the extensive settlement remains recorded from the air (see Section 1.6.1 and 1.6.2). The contrast between the archaeology of these two areas is great, the Trent Valley reveals far more facets of multi-period activity than the Sherwood Sandstones. The Sherwood Sandstones are the subject of ongoing research, ground investigations and excavations which will have considerable implications for the

interpretation of the landscape from the air. Section 5 concentrates on the landscapes of the Trent Valley.

Section 6 examines the broad distributions of medieval sites recorded by this project.

2. LANDSCAPE AND ENVIRONMENT

The Nottinghamshire NMP project area consists of several, broadly homogenous landscape zones, influenced by underlying geology and soils (Figure 2). The western extent of the area consists mainly of a band of loamy soils overlying a belt of Magnesian Limestone. The city of Nottingham sits on an outcrop of a broad block of Permo-Triassic sandstones which extends northward to Bawtry. In this northern tip of the survey area the sandstone is overlain by fen peats and glaciofluvial drift now forming the floodplain of the River Idle. Pockets of clay deposits have formed at the interface between the soils of the limestone and sandstone blocks. Permo-Triassic mudstones bearing heavy calcareous clays or marls extend from Nottingham to the north-east of the survey area. This area of marls is cut by the Trent Valley. The river flows in a north-easterly direction through Nottingham bearing to the north at the confluence with the River Devon. The valley is characterised by gravel terraces, glaciofluvial drift and river alluviums.

The area to the south of the river and the city is characterised by heavy soils on the Jurassic and Cretaceous clays.

The distinctive landscape characteristics arising from these differing geologies provides a framework for the analysis of past land uses. However these differing landscapes are also variable in their amenity to the recording of ancient landscapes from the air (see Figure 3).

The main landscape blocks will be referred to as the

- East Pennine Fringe
- Sherwood Sandstones
- Mudstones
- Trent Valley
- South Nottinghamshire Wolds
- River Idle flood plain.

2.1 EAST PENNINE FRINGE

The limestone ridge of the Pennine Fringe forms the highest land in the survey area - a west facing escarpment with a gentle dipslope (Ragg et al, 1984). The hilly topography is characterised by steep-sided, tree-lined valleys and gorges such as Creswell Crags.

The depth of the overlying soils is variable. Jointing in the underlying limestone is visible in the cropmarks of some fields, where soil has penetrated the gaps between the bedrock. This can hinder the identification and interpretation of archaeological cropmarks. In areas of complex jointing the well-defined ditches of an enclosure may be more easily isolated from the geological features than the more ephemeral ditches of ancient field boundaries which may produce a biased overview of the ancient landscapes. The soils tend to be thinnest on hill tops and slopes, movement of soils down slope through agricultural or natural processes results in the build up of colluvium at slope bases which can effectively

mask the archaeological features in these areas. In general the soils of this landscape, predominantly of the Aberford association (511a), are well drained and conducive to crop changes over buried features.

The Rivers Poulter, Meden, and Ryton rise in this landscape and flow eastward across the Sherwood Sandstones. These form part of a more extensive drainage pattern of springs and small brooks, many of which flow south and westward into the Rivers Trent and Derwent.

Woodland cover is limited to the Medieval parks of Whitwell, Scarcliffe, Hardwick and Pleasey, Derbyshire. The valley sides are often wooded or at least overgrown and this can reduce the visibility and understanding of surviving earthworks.

The agricultural regimes in this area are generally pastoral with limited arable farming. Thus fewer cropmark sites are to be expected.

Much of the Pennine Fringe is dominated by the industry and housing associated with the extraction of coal from the deep coal measures lying beneath the Magnesian Limestone. A complex network of towns, mines and mineral railways extend from Nottingham northwards - Kirkby in Ashfield, Sutton in Ashfield, Mansfield, Shirebrook, Creswell and across the Sherwood Sandstones through Worksop to Harworth. This landscape is also subject to limestone extraction such as at Steetley, Derbyshire.

All these extractive industries have destroyed archaeological sites and result in a disjointed, fragmentary view of the older landscapes. This area is further disrupted by the route of the M1 motorway running roughly north to south along the western edge of the study area.

2.2 SHERWOOD SANDSTONES

The Permo-Triassic Sherwood Sandstones consist of the geologies previously distinguished as Bunter and Keuper (Ragg et al 1984). The Bunter sandstone produces a distinctive landscape topography of gently rounded convex hills. The soil associations, Cuckney 1(551b) and Delamere (631b), are light and very well drained. Surface drainage is minimal, and deep wells are required to reach the water table.

The Keuper Sandstones occur in thin beds amongst the marls of the Mudstone landscape, and are known locally as the waterstones. Numerous springs arise on these rocks and the water table is reached with shallower wells. This hydrology gives rise to characteristic streams which have cut into the soft rock creating steep sided valleys known as 'dumbles', particularly well represented to the south-west of Burton Joyce (SK6243). The Keuper sandstones carry soils associations more akin to those formed on the mudstone as well as the freer draining Cuckney 1 association.

The Sherwood Sandstone landscape is sub-divided by a number of tributaries sourced on the Pennine Fringe - the Rivers Ryton, Poulter, Meden and Maun. The River Ryton flows roughly eastward to Ranby then northward to join the River Idle at Bawtry. The Rivers Poulter, Meden and Maun flow in easterly and northerly directions to the edge of the sandstones converging just east of Elkesley to become the River Idle then flowing north, through East Retford to the confluence at Bawtry. The river channels and flood plains are heavily alluviated, in particular by the soils of the Enbourne association series (811a) in the valley of the River Ryton. These deposits often mask any archaeological features running to the riverbanks. Between Worksop and Ranby the River Ryton shares drainage with the Chesterfield Canal.

In 1086AD 12% of the land in the county of Nottinghamshire was given to woodland, in 1895 only 5.3% (Rackham 1986). Throughout these centuries the concentration of woodland was on the sandstones. The southern area of the sandstone block forms part of The Dukeries - reflecting the elevated status of the numerous parks forming the Royal Forest of Sherwood. The Forest was established during the reign of Henry I (1100-1135), though Rackham suggests the woodland may have had earlier Anglo-Saxon origins (1986:294). He also suggests that Sherwood was a predominantly heathland Forest - presumably of gorse and broom. There are elements of the ancient woodlands - Birkland and Bilhough, surviving in Thoresby Park including the Major Oak, estimated to be c. 600 years old. The forest then as today covered a considerable area of this sandstone block. Whether this was a deliberate utilisation of poor agriculture land or whether siting of the forest was predetermined by other considerations is unclear.

The area covered by the Forest today extends from the River Poulter to the Rainworth Water and on the more acidic sand pockets of the Delamare association (631b) further south. The Sherwood Forest landscape constitutes the parks of Welbeck and Clumber, Thoresby, Clipstone, Newstead Abbey and Rufford. These areas consist of managed forestry, woodland and open parkland - much now given to arable. The mix of woodland and arable ground cover produces a rather fragmentary view of the underlying ancient landscape. Earthworks surviving within the afforested areas are rarely visible through the trees although vertical photographs taken fortuitously just before replanting of a coniferous sector of Thoresby Park at Carburton Corner reveal the slighted remains of a group of enclosures [NT.58.21-23].

The landscape of the open parkland has undergone considerable modification under landscape and garden design. The River Poulter, originally the Millwood Brook was dammed to produce the Clumber and Great Lakes, and the River Meden was similarly modified to produce Thoresby Lake. These alterations to landscape are extant today and may mask archaeology or alter the relationships between ancient settlement and rivers.

The area north of the River Ryton and Chesterfield Canal (and extending into South Yorkshire) is noted for the extensive field systems originally discovered from the air (Riley 1980a).

The Sherwood Sandstones support an agricultural regime, predominantly arable with some pasture. The soils tend to the very acidic and are nutritionally poor but are easily worked (Ragg et al 1984:148). This area is much less densely wooded here. There is a general pattern of plantation strips or blocks occurring with some frequency across the landscape. There is no reason to presume these are the remnants of more widespread plantings. In some cases the associated name appears to confirm the integrity of the plantations - Fifty Acres and Hundred Acres and Long Plantation.

It has been suggested the vital difference in the water carrying capacity of the Bunter and Keuper sandstones may have been influential in the settlement of past populations - 'the difficulties of water supply precluded any considerable early settlement in the area [Bunter Sandstones] except along the rare streams' (Trueman, 1971:158). Ollerton, Edwinstow and Slipstone in the Maun Valley are cited as the rare examples of early settlement, whilst the settlements of Arnold, Calverton, Woodborough, Gedling, Lambley, Lowdham, Southwell and East Retford were positioned to exploit the water resources of Keuper sandstones. These settlements form a line running north-north west along the border of the sandstones.

With the growing reliance on the concealed coalfields, the foci for settlement migrated from the traditional open cast areas in the Pennine Fringe further east. Hence the coal-related settlements such as Worksop, Mansfield and Harworth were established on the otherwise sparsely populated Sherwood Sandstones.

2.3 MUDSTONE CLAYS

East of the Sherwood Sandstones lies a 10km wide block of Permo-Triassic Mudstone (formerly known as Keuper Marl), forming undulating hills overlain by marls. Numerous becks drain the area in the River Trent. The minor valleys are alluviated with soils of the Compton association (813e). Soils of the Worcester association (431) predominant in the landscape and are relatively impermeable and moisture retaining. On the mudstone there is insufficient differentiation between the fills of archaeological ditches and the natural soils to produce any discernible variation in the overlying vegetation in most conditions.

Much of this are is now under an arable regime. However the extensive survival of the medieval cultivation remains in this landscape suggests a predominantly pastoral economy since the post-medieval period. Extant and vestigial ridge and furrow can mask earlier archaeological landscapes (Palmer 1996). With a low potential for crop mark formation over buried archaeology, the possibility of this and similar landscapes to reveal much of the prehistoric activity of the area has been considered low. This has been borne out to a degree by this survey. In the past this lack of evidence has been interpreted as a reluctance of early farmers to work the heavier soils. However, on a similar landscape in Cambridgeshire, persistent reconnaissance by Palmer and Cox and fortuitously droughty summers have produced results to the contrary.

A relatively small percentage of the marl landscape is given to woodland compared to the Sherwood Sandstones. The surviving woodland is evenly distributed in small patches.

There is a fairly even distribution of small villages and hamlets across the area. It is known that many of these originated as larger medieval settlements, the remains of which may be preserved as earthworks around these villages on such heavy soils. However general activity, modern roads, tracks, gardens and building around these areas often obscures these village remains for the airborne observer/photographer. Additionally as they require particular lighting conditions they have not always been adequately recorded on the vertical photographs. The area is relatively free from industrial activity.

2.4 TRENT VALLEY

The Trent Valley consists of a narrow band, often no more than 500m across, extending from the south-west to the north-east in a broad arc of the Nottinghamshire NMP project area. The river has cut the valley into the underlying marls and clays which lay exposed to the west and underlie glaciofluvial drift to the east. The valley is heavily alluviated with some areas of older, exposed terrace gravels. The river describes a meandering route through the flood plain, often cutting out of the valley into the marls or clays to produce small cliffs. The mobile nature of a river at this stage of maturity is sufficient to pose a direct threat to archaeological sites. Changes in the meander of this river can lead to erosion, particularly into the geologies bounding the valley. The alluvial plain is rather flat, interrupted only by fossilised channels, and liable to flood. To protect the surrounding agricultural land and some settlement, river banks or levees have been constructed as far upstream as Nottingham - sometimes compromising the archaeology. A summary of the history of the Trent valley is given in Section 5.

The poorly drained alluvium with soils associations Wharfe (561a), Midelney (813a), Fladbury 1(813a), Fladbury 2 (813b), Compton (813e) and Clayhythe (872b) are not conducive to the formation of cropmarks over buried archaeological features. Alluvium deposited over earlier archaeological features will mask such sites. Archaeological ditches cut into alluvium will generally have deposits insufficiently different in moisture retaining properties to encourage differential crop growth. The slower ripening crops on discrete deposits of alluvial soils can be misinterpreted as evidence for archaeological sites and vice versa (see Section 4.1).

The gravel terraces, however have very well drained soils and contrast well to the often humic moisture-retaining fills of archaeological features. As such these areas have produced extensive and often very detailed evidence of the archaeological landscape of this area (see Figure 3).

The agricultural regime of the Trent Valley in this study area is generally arable with pasture on the wetter, more heavily alluviated areas of the floodplain. Thus the crops on

the gravels are ideal for revealing past landuse whilst the latter regime has promoted the survival of later earthworks.

Along the east bank of the Trent - from Gainsborough to Newark - the modern settlements are distributed along the A1133 road on glaciofluvial drift, Blackwood (821b) lying on the edge of the mudstones demarcating the edge of the flood plain. From Newark to Nottingham the modern settlements sit on the small cliff produced by the River Trent cutting southward into the clay. To the south of Newark the Vale of Belvoir is drained by the Rivers Devon and Smite into the River Trent.

Along the west bank, from Normanton-on-Trent to Nottingham, a series of terrace gravel islands are the foci for modern settlement. These well-drained islands were presumably equally as attractive to earlier settlers in the Trent Valley. The Nottingham conurbation masks considerable areas of this landscape.

A considerable area of the Trent Valley has been subjected to gravel extraction both in areas of exposed and covered terraces. Whilst loss of archaeological sites to such industry is irreversible, consultation of the historic vertical air photographs of the area may enhance the ancient landscape.

There has been further loss of this rich archaeological landscape to the power industry. The situation of the valley close to the coalfields has made it a prime location for electricity generating stations.

This landscape extends beyond the limits of this survey and has been covered by other RCHME surveys for the NMP- the National Forest Mapping Project (MacLeod 1995) and Lincolnshire NMP (Bewley (ed) 1998).

2.5 SOUTH NOTTINGHAMSHIRE WOLDS

The topographical character of the Wolds is not dissimilar to that of the Mudstone Clays. This survey only encompasses the fringes of this landscape which extends southward into Leicestershire, parts of which were encompassed by the National Forest Mapping Project (MacLeod 1995). Within the survey area this landscape is heavily influenced by the cut of the Trent Valley. The area is drained by an extensive system of brooks, draining into the Rivers Smite and Soar, in turn flowing into the River Trent.

As with the marl soils the potential for cropmark formation above buried features is low in this area. The soil associations Evesham 1and 2 (411a and b), Wickham 2 (711f), Denchworth (712b) and Ragdale (712g) are all slowly permeable clayey soils.

The prominently pastoral agricultural regime of the area has preserved very extensive areas of upstanding ridge and furrow. As mentioned above, ridge and furrow can mask

and preserve earlier landscapes but as that blanket is eroded such underlying features may encourage vegetation marks in times of drought.

Modern settlements in this landscape are more extensive than on the mudstones. There is some exploitation of the coal measures in this area though this activity does not have the deleterious effect on the archaeology as has been seen elsewhere in the project area.

2.6 RIVER IDLE FLOOD PLAIN

This area represents a very small and heterogeneous part of the project area but is sufficiently distinct from the other landscapes to warrant some comment.

In this landscape the Permo-Triassic sandstone is all but buried beneath other deposits. Some undulations in this geology have remain exposed, notably the Isle of Axholme lying to the immediate north-east of the study area. Deposits from ancient lakes and fens have covered the sandstone.

Deposits of glaciofluvial drift Wick 1(541r) and Blackwood (821b), observed between Bawtry and Rossington, South Yorkshire are well drained and their potential for cropmark formation has been known for many years. This area sees a northward continuation of the extensive early landscape observed on the Sherwood Sandstones. This area is bound to the west by fen peat of the Adventurers' 2 association (1024a).

Downstream of Bawtry the River Idle runs through a very low-lying area of fen peats – Altcar 2 (1022b) and Isleham 2 (861b); glaciolacustrine deposits - Foggathorpe 2 (712l) and Willingham (372) and marine alluvium - Downholland 3 (851c). Much of this area sits below high tide and the river is contained by extensive levees. These surrounding deposits are very poorly drained and the area is characterised by a rectilinear pattern of large drains fed by smaller ditches cut around each field unit. The deeper peats near Misson are often very acidic (Ragg et al 1984). The depositional history of this area is obviously complex and beyond the scope of this survey. A more detailed palaeo-environmental approach can be found in the Wetland Heritage of the Humberhead Levels study (Van de Noort et al: 1997). Given the drainage properties of the peat associations the potential for cropmark formation over buried archaeological sites is minimal.

The modern landuse is generally of a pastoral economy with some arable and areas of scrub and marshland. The modern settlements such as Misson, Finningley and Austerfield are concentrated on the freer draining glaciofluvial drift.

3. DEFENDED AND MILITARY SITES IN THE ARCHAEOLOGICAL LANDSCAPE: THE LIMITATIONS OF THE AERIAL PHOTOGRAPHIC RECORD.

3.1 PRE-ROMAN DEFENDED SITES AND SETTLEMENTS

A distinctive class of monument has been identified in certain forms of archaeological sites and enclosures of the later prehistoric periods. The massive scale of the enclosing ditches and banks of such features have been attributed a defensive role within the traditional framework for late Bronze Age and Iron Age settlement and society. Upon this was built a complex framework of the theoretical interaction between defended and non-defended settlements in the Iron Age (eg Cunliffe 1991). This discussion is not intended as a critique of the traditional framework, rather a consideration of the factors concerning the preservation and place of the monument type in the archaeological record.

MORPH NO OR SOURCE	MAP SHEET	SITE NAME	SITE TYPE	CONDITION
NT.39.2.1	SK65SW	Oldox Camp	hillfort	upstanding
NT.75.1.1	SK57NW	Markland Grips	Promontory fort	upstanding
NT.46.10.1	SK65NW	Combs Farm	Promontory fort	upstanding
NMR SK64SW1	SK64SW	Lodge Farm	?Iron Age camp	unknown
NMR SK78SW4	SK78SW	Castle Hill	hillfort	overgrown
NMR SK56SW7	SK56SW	Whinny Hill	hillfort	destroyed
Swarbuck & Turner 1978, NMR SK54NE4	SK54NE	Ramsdale Park/ Dorket Head	?settlement	?destroyed
NMR SK64NW10	SK64NW	Foxwood	hillfort	overgrown
Challis & Harding 1975, NMR SK75SW11	SK75SW	Burgage	hillfort	destroyed

Table 1. Late prehistoric defended sites, various sources

Hillforts and promontory forts are conventionally classified as the defensive sites of late prehistory. The corpus of defended sites recorded by this project is not as comprehensive as those identified by other surveys and survey techniques within the project area (see Table 1). Being to a great degree topographically determined in their location, such sites would be expected to show a distributive bias to those regions of the survey area affording naturally defended positions. Such topographical requirements are best accommodated in the landscapes of the Pennine Fringe and Keuper elements of the sandstones.

The survival of this monument type in the survey area is closely bound to the economic growth of those landscapes. The medieval beginnings of Nottingham Castle are believed to have obscured an Iron Age promontory fort (NMR SK 53 NE 2). The castle sits upon a truncated sandstone spur, which forms a c.30 metre cliff above the floodplain of the Rivers Trent and Leen. It is the suitability of the topography rather than archaeological evidence that underpins this supposition. More recently, urban development has seen the

gross destruction of sites such as the possible hillfort at Whinny Hill, now preserved only as a street name in the town of Mansfield Woodhouse (NMR SK 56 SW 7).

There are some problems inherent in the identification of even substantial earthwork monuments from the air. Surviving earthwork ditches and banks are often assimilated or fossilised into the modern rural or urban landscape, but obscured from the air by trees, hedgerow or walls. This is a particular problem in the recording of promontory forts, which are often represented by a single length of rampart.

Whilst these large earthwork structures may be less at risk from ploughing they encourage overgrowth and woodland colonisation and this impedes visibility from the air. For this reason the enclosed settlement in Foxwood at Woodborough and other examples could not be recorded by this project (NMR SK 64 NW 10).

There has also been an under representation of such earthwork sites on the specialist oblique aerial photographs for this project area. Only the Oldox camp and Markland Grips sites featured on the oblique photographs. Whilst only a limited selection of vertical photography was consulted for this project it was not felt that the failure to examine historic vertical photography was to the detriment of the archaeological record. The experience of other NMP projects has shown that rarely does the examination of historical vertical photographs result in the recording of previously unknown sites of this class of monument (MacLeod 1995:41). Most substantial earthworks in similar landscapes and environments would have been previously identified, and perhaps better recorded, on the ground.

The single hillfort of Oldox Camp and the two promontory forts at Markland Grips and Combs Farm were the only features of the late prehistoric defensive landscape identified on the aerial photographs consulted.

The earthwork remains of the hillfort known as Oldox Camp, Oxton, lie on a broad south-facing spur at 105 metres OD [NT.39.2.1]. To the north the land rises over 30 metres towards the isolated prominences of Robin Hood's Hill, Loath Hill and an unnamed hill. The hillfort was identified as a multi-vallate enclosure of internal area c. 1.1 hectare, with opposed north and south-facing causewayed entrances from the aerial photographs. Ground investigations revealed the enclosure was somewhat enclosed by the surrounding hills with no visual prominence in or over the surrounding landscape. The steep sides of the spur - particularly to the south and the east were well utilised by the builders of the enclosure with less substantial rampart remains on the gentler slope to the west. The enclosure was defined by at least four encircling banks in parts. The southerly entrance leads down the steep-sided Oxton dumble now containing a series of pools. The northerly entrance leads uphill towards the location of a tumulus purported to sit on the unnamed hill (OS 1:10 000 scale quarter sheet SK 65 SW).

The fort at Markland Grips, Derbyshire is more typical of the defended structures recognised in Pennine Derbyshire (see Hart 1981:fig.7.2) [NT.75.1.1]. Builders of

promontory forts utilised natural landscape barriers to defend parcels of land, constructing ramparts on vulnerable fronts. The Markland Grips fort lying at c.110 metres OD, is defined by natural ravines - Markland and Hollinhill Grips, and multi-vallate defences. Only the innermost rampart survives as an earthwork feature (NMR SK 57 NW 8). The combination of natural and built defences encloses an area of 3.5 hectares. Excavation of the rampart ditches confirmed an Iron Age date and provided some evidence for industrial activity (Hart 1981: 75).

No contemporary internal features were identified in either enclosure in the aerial photographic record. The interior of Oldox Camp was recorded by this project as masked by upstanding medieval ridge and furrow, though this was less easily discerned on the ground [NT.39.2.2]. The interior of Markland Grips was partially obscured but is known, from excavation to be severely truncated (Hart 1981: 75).

The Combs Farm promontory fort lies at the head of a spur at c.100 metres OD [NT.46.10.1]. The natural slopes to the north and east and constructed rampart to the west protected an area of 0.5 hectare. Excavation revealed a double-ditched rampart, the ditches being V-shaped in profile. This location affords a commanding aspect over the north and north-east. Dating evidence is limited to an antiquarian excavation report of finds pertaining to the Roman period (NMR SK 65 NW 2).

The Markland Grips promontory fort is better considered as part of a distributive pattern of defended sites extending westwards into the Pennines (see Hart 1981:74 fig. 7.2). The distribution of the other late prehistoric defended sites, bears a close correlation to the Keuper sandstone and western edge of the mudstones (Figure 4).

This area of the country represents the fringe of the concentration of British hillforts (Cunliffe 1991: 314 fig. 14.1). This is evidenced in the apparent scarcity of hillforts in central and northern Pennines, despite the abundance of topographically appropriate sites. However the recognition of 'defended sites' as a monument type across the landscapes of the project area is fraught with difficulties. Whilst the Pennines and the Keuper Sandstones may afford topographically advantageous sites, naturally defended locations on the Sherwood Sandstones and in the Trent Valley are more scarce. These landscapes are more likely to have been levelled by agricultural processes. All of the defended sites tabled above were identified primarily as surviving earthworks, except the ambiguous Dorket Head example.

Riley (1980) identified a low-lying enclosure at Moorhouse Farm, Tickhill, South Yorkshire as a 'marsh fort' of possible Iron Age date [NT.97.1.1]. The irregular 'kidney-shaped' enclosure is defined by a pair of ditches enclosing a maximum area of 1.5 hectares. Modern farm buildings partially obscure the presumed eastern side of the enclosure. The ditches, recorded as vestigial earthworks with some corresponding vegetative change, are spaced at 10 metres apart. However, no traces of banking could be discerned on the aerial photographs consulted.

The remains of the enclosure lie at 14 metres OD with the land falling towards Tickhill in the west but rising to 35 metres OD to the east. The site lies on well-drained soils, but to the immediate west lies a blanket of fen peat. Expansive field systems, probably Iron Age to Romano-British in date, are recorded to the immediate east of this enclosure. Little is known of the ancient landscapes on the poorer draining soils to the west.

This enclosure was unique with the Nottinghamshire NMP project area but a similarity was noted to elements of the landscape at Tattershall Thorpe, Lincolnshire. The Tattershall Thorpe enclosure lies on acidic gravels close to the Fen Edge in a similar low lying, poorly defended position. The irregular, curvilinear enclosure (3.57ha) is defined by parallel ditches set 15 metres apart. The traditional interpretation of the site as a defended space was rejected when no evidence for a bank could be distinguished during excavation. A function in stock-management is suggested for the site, substantiated by environmental evidence from the ditch fills (Chowne et al 1986).

This project recorded the Moorhouse Farm enclosure as a non-defensive enclosure.

Challis and Harding (1975) suggest the utilisation of a stockade, palisade and walling as well as earthwork ramparts may be indicative of a defensive function.

An Iron Age site at Scratta Wood, consisted of a 50 metre diameter stone walled enclosure with internal huts and partitions (Hart 1981). The site was monitored and investigated by Worksop Archaeological Research Group in 1959 during its destruction. No such sites were identified on the aerial photographs consulted. Presumably the distribution of stone built defences would have been geographically determined by the availability of that material. Within this survey area the major source of durable building stone is limestone from the Pennine Fringe.

Materials for stockading on the other hand would have been widely available and even deliberately managed (Garton et al. 1988). However palisaded or pit-defined enclosed settlements were rarely identified on the aerial photographs (see Section 5.3).

Moreover it would be difficult to distinguish palisaded enclosures of defensive function in a social context, from those simply providing protection for stock from wild animals from this evidence alone. Potential palisaded enclosures are discussed in Section 5.3.

There is little validity in discussing the three Iron Age forts recorded by this project as a cohesive and complete group. Comparison with the archaeological records has shown that this project did not consistently identify all such monument types. Masked and destroyed sites may be visible on the historic vertical photographs.

3.2 ROMAN MILITARY LANDSCAPE.

Defensive features of the Roman period were defined for this project as military installations and associated works. This definition does not preclude the possibility of continued occupation in the indigenous defended settlements.

MORPH NO.	MAP SHEET	SITE NAME	SITE TYPE	HECTARES Internal area
NT.44.6.1-3	SK65NE	Osmanthorpe	Fort - vexillation	8.8
NT.161.1.1-2	SK87SW	Newton on Trent	Fort - vexillation	>10.9
NT.191.1.1, 1.6	SK75SE	*Ad Pontem*	fort & annex	>?
NT.119.4.1	SK43SE	Sawley	fort	0.61
NT.99.8.1	SK69SE	Scaftworth	fortlet	0.33
NT.161.3.1	SK87SW	Newton-on Trent	temporary camp	?
NT.46.1.1	SK65NW	Farnsfield	marching camp	4.6
NT.40.4.2	SK65SW	Calverton	marching camp	7.5- 9.8
NT.40.4.3	SK65SW	Calverton	marching camp	1.7
NT.200.3.1	SK85NW	Holme	temporary camp	>9.2
NT.80.13.1	SK57SE	Gleadthorpe	temporary camp	3.2
NT.202.17.1	SK85NW	Langford	temporary camp	>5.6 or 26
NT.50.2.1	SK66NE	Ollerton	marching camp	>2.6
NT.191.1.1	SK75SE	Thorpe (*Ad Pontem*)	defended small town	>2.8
NT.202.34.1	SK85NW	Brough (*Crococalana*)	defended small town	8.3
NT.213.18.1	SK74SW	East Bridgeford (*Margidunum*)	defended small town	?
				LENGTH metres
NT.191.1.5.	SK75SE	*Ad Pontem*	road	550
NT.50.14.1-2	SK66NE	Ollerton	road	>980
NT.128.7.1	SK58NE	Oldcotes - Firbeck	?road	140
NT.99.9.1	SK69SE	Scaftworth	road	50
NT.209.4.1-2	SK74NE	East Stoke	road	600

Table 2. Roman military sites in the survey area.

The Roman military landscape of the survey area is apparently well represented by forts, fortlets, roads and temporary camps (Figure 4). This is in contrast to the pattern for the rest of country. There is a noticeable disparity between the comprehensive representation of forts across England and the concentration of known temporary camps in Shropshire, Nottinghamshire, Northumberland and Carlisle (compare Jones 1975: back insert with Welfare and Swan 1995:fig. 2). The bias in distribution towards the northern borders concords with the historical significance of those areas, but is probably accentuated by the survival of these sites as earthworks on agriculturally marginal land (Welfare and Swan 1995:3). However the concentration of such sites in Nottinghamshire may be seen as an artefact of survival and recording practice. Welfare and Swan have discussed the variables in survival inherent in the nature of temporary installations (1995:3).

In Nottinghamshire most of the military features of this period are now levelled. The potential fortlet at Scaftworth had been recorded as an earthwork on historic maps, the fort at Sawley survived as a vestigial earthwork at least until 1979 and the potential of sites at Brough, Thorpe and East Bridgeford had been recognised for a considerable time

(Thompson Watkin 1886). However many of the features pertaining to this monument type and period had not been apparent on the ground. The role of aerial reconnaissance has been pivotal in the discovery of these forts and camps. Such features are rarely confined to single land use blocks or fields, and as different crops produce responses at different times or even in different years - such sites are rarely presented in their entirety at one time. A single side of a temporary camp may not arouse the interest of the aerial photographer whilst a rounded corner is insufficiently diagnostic for valid interpretation. Thus it requires persistent reconnaissance, over many years, by observers familiar with the landscape, to reconstruct enough of the site for a firm interpretation. As such the bias towards Nottinghamshire in the distribution of temporary camps may be attributed to the persistent investigations of Riley and Pickering. The reward for a persistent and intelligent reconnaissance campaign has been evidenced by recent discoveries in Cheshire (Philpott 1998).

3.2.1 FORTRESSES, FORT AND FORTLET.

Features recorded and excavated at Thorpe on the River Trent have been interpreted as the evidence for the development of the military station of Ad Pontem recorded in the Antonine Itinerary (Rivet 1970). Despite a considerable history in the archaeological record, the quality of the aerial photo record of this area is poor. Proximity to the airfield at Syerston to the south may have restricted air access to this area. This late Claudian - early Neronian fort, is identified by an inner bank or rampart and two broad, near concentric outer ditches [NT.191.1.1]. The enclosed area of the fort is truncated to the west by the modern route of the A46(T) or Foss Way. Alluvial deposits mask any features extending west of the road corridor. There are conflicting interpretations of the three sides of a double ditched polygonal enclosure to the north of the fort [NT.199.1.6]. Burnham and Wacher (1990) record this feature as an annex whilst Wilson considered this to be the remains of a civilian settlement (NMR SK 75 SE 21). Excavations in 1963 revealed the fort had been abandoned and then re-occupied in the 2nd century AD. Initial settlement took the form of individual buildings along the route of the Foss Way. However, later phases of the settlement revealed successive town walls and ditches which on the aerial photographs detract somewhat from the integrity of the earlier military elements.

Large enclosures at Osmanthorpe [NT.44.6.1 - 3] and Newton-on-Trent [NT.161.1.2] were identified as vexillation fortresses (Welfare and Swan 1995, Riley 1980). The representations of the two fortresses are similar in many ways and are comparable to the Rossington vexillation fortress further north in South Yorkshire. The category 'Vexillation fortress' was used by St Joseph and Frere (1983) to describe the mixed fortresses of a certain size - 8-12 hectares. - comparable with Longthorpe, Cambridgeshire. Bishop and Freeman (1993:171) query its validity on the basis that the categorisation of forts by size is not reflected in the contemporary literature and that this category does not reflect a functionally distinct group. However this term shall be retained for the purposes of this

report in the absence of any valid alternative in the approved list of interpretations for the MORPH2 database.

The enclosed areas of the Osmanthorpe (8.8ha) and Newton-on-Trent (>10.9ha) fortresses are rectilinear, defined by narrowly spaced double-ditches, with characteristic rounded or 'playing card' corners. The Newton-on-Trent example abuts the limits of the present course of the River Trent but is protected on that side by a considerable drop to the river level. At this point the Trent cuts into the mudstone creating a cliff of some 15-20 metres. Immediately south of the fort the river has migrated westward, creating an alluvial plain between the cliff edge and the modern course of the river. It may be impossible to discern whether the cliff edge was used by the fortress builders as the fourth side of defences or whether the progressive erosion of the cliff edge has resulted in the loss of a constructed fourth side.

The fortress at Osmanthorpe similarly utilises a naturally defended position. The ditches of the fortress straddle a hilltop overlooking the valley of the River Greet - a tributary of the River Trent. The western third of the fortress area encompasses the highest ground of the convex-sloped hill. The land falls in all directions from 58m OD, by as much as ten metres within the limits of the fortress. To the north-west the land falls steeply towards Edingley Beck. The corner of the otherwise rectangular fortress was apparently deliberately truncated during construction to exclude this natural drop. Bishop and Freeman (1993:171) suggest this was also to avoid enclosing 'dead ground' within the defended area.

Both fortresses show evidence of related external features. Newton-on-Trent is circumvented by a series of staggered ditches [NT.161.1.1], whilst Osmanthorpe is encircled by an incomplete rectilinear ditched enclosure [NT.44.6.2]. Wilson (1984) suggests features of this form constitute temporary camps for fort construction workers. Alternatively, Jones (1975:110) suggests these outworks provided a defended area for vehicles or grazing stock. Internal double-ditched features at the Osmanthorpe enclosure have been variously interpreted as the remains of an earlier installation or a road (Riley 1980:332, Bishop and Freeman 1993:163) [NT. 44.6.3].

Fieldwork at Osmanthorpe, including excavation, undertaken by several parties has produced datable artefacts. Neither the results of field-walking nor the intrusive evaluation can be fully reconciled with the features interpreted from the aerial photographic record. However, a date in the second half of the 1st century is widely accepted for the fortress (Bishop & Freeman 1993; Hanson & Campbell 1986). The fortress at Newton-on-Trent is as yet undated.

The small fort at Sawley [NT.119.4.1] lies in the flood plain of the River Trent, just east from the Derwent-Trent confluence and c.1km west from the point where the Derby to Sawley Roman Road (Margary 182) reaches the river. Margary (1955) presumed the road served river traffic, though the presence of a possible ford nearby may also suggest a crossing point (1955:43, NMR SK 43 SE 14). The southern side of the enclosure was

masked by a river levee on the aerial photographs consulted. Excavations by Derbyshire Archaeology Society defined a near square feature with a possible traverse opening to the west (Goodburn 1976). This fort is as yet undated.

An enclosure at Scaftworth, Bawtry has long been interpreted as a Roman fortlet [NT.99.8.1]. St. Joseph and Frere (1983:135) define fortlets as accommodation for small detachments of troops with no administrative facilities, the distinction between fort and fortlet apparently being validated by the identification of the specific Roman term burgus in contemporary literature.

The enclosure lies on sandy loam just north of the confluence of the Rivers Idle and Ryton where the Idle flows in a more easterly direction. This feature consists of a triple-ditched enclosure, three sides are known and have been partially excavated, the fourth, north-west side is obscured by a river levee. The site was recorded as an earthwork in 1774 on mapping by the antiquarian John Chapman (Van de Noort et al 1997:411). This interpretation has endured intrusive investigations (e.g. Bartlett and Riley 1958). The positive identification of a section of the Roman road between Littleborough and Bawtry, which runs parallel to the north side of the enclosure appeared to validate this attribution (Margary 28a). Close to the fortlet this feature has caused parching in the crop [NT.99.9.1] whilst slightly further north excavations revealed a causeway across the wetter land (Frere 1992).

Recent considerations of the site have led to an alternative - non-military interpretation. The late date indicated by secure artefacts from the site is considered incongruous with the contemporary military situation in the north east (Van de Noort 1997: 427). Head et al (1997:291) suggest the associated artefacts - from the surface and excavation - are compatible with a site of domestic rather than military status, and that the ditch profiles - being U-shaped are atypical of military constructions. The morphology of the site is thought to be comparable with other domestic settlements becoming increasingly apparent within the Humberhead Level survey area (Chapman 1997:401).

Several examples of multi-ditched near square enclosures are known in Nottinghamshire - a good example is recorded within 1.3 km of the east of the Scaftworth enclosure [NT.101.1.1]. However, these are morphological distinct from the Scaftworth example. Few have enclosing ditches that are truly concentric and the corners are generally sharper than the Scaftworth example, details that may be lost at 1:10 000 scale mapping. There are few published aerial photographs of levelled fortlets with which to compare the morphology of this site - a fortlet at Gatehouse of Fleet, Kirkcudbright provides the closest parallel (Wilson 1982:100)

Swan and Welfare, suggest that the V-shape cut was not an inviolable rule for all Roman military ditches (1995:18). U-shaped ditches are known in military contexts, apparently as responses to specific circumstances such as high water table (Jones 1975:109). Before the constriction of the River Idle this would undoubtedly have been a factor of the Scaftworth environment. Jones also suggests archaeologists should be wary of taking the observed

ditch to be the original, stating ditch maintenance and re-cutting may obliterate earlier profiles (Jones 1975:109).

Whilst the debate continues this project maintains a military interpretation for this feature.

3.2.2 TEMPORARY CAMPS.

Nine temporary camps of variable validity were recorded by this project.

A temporary camp was first recorded at Farnsfield by Riley in 1976 and is the only excavated example in the project area to date [NT.46.1.1]. The site lies at 66 metres OD on a gentle north facing slope, the surrounding land falls away to the north-east but rises steeply to over 100 metres OD at the Coombs Farm promontory fort and Riddings Hill Farm to the south. The camp was recorded as a ditch defined rectilinear enclosure, the northern corner had been truncated by Longland Lane.

Excavations in 1978 revealed the enclosing ditch to be V-shaped in profile and more substantial than is usually associated with these temporary installations (Swarbrick and Turner 1982). At 2.8 metre wide and 1.8 metre deep it would appear that the ditch itself was part of the defensive system rather than being solely a source of material for a bank (Welfare and Swan 1995). The excavations provided artefactual evidence for a Romano-British date but afforded no further refinement.

Rectilinear, ditch-defined enclosures at Calverton [NT.40.4.1-3], Holme [NT.200.3.1] and Gleadthorpe [NT.80.13.1] recorded by this project had previously been interpreted as temporary camps with some confidence (Welfare and Swan 1995).

Two temporary camps were recorded at Calverton. The remains of a smaller camp [NT.40.4.3] lie within an area enclosed by the incomplete ditches of a larger camp [NT.40.4.2]. The alignment of the enclosing ditches of each camp is slightly at odds, possibly indicating non-contemporaneity. The north-eastern extent of the larger camp is masked by an area of marsh. A simple south-east facing entrance on the outer and simple north, east and south facing entrances were observed on the photographs consulted, though these are recorded with traverses elsewhere (Welfare and Swan 1995). Re-use of camps, with a reduction or expansion of enclosed areas is not unknown in the archaeological record - though in most cases, new camps were usually planned to make optimal use of the existing ditches and banks (Welfare and Swan 1995). In this case there is no physical relationship between the two camps. Possibly, the strategic advantage of the site rather than the convenience of an existing camp, whatever its state of repair prompted the re-use of this location. The site lies at 60 metres OD on a spur falling to the south and to Dover Beck, a tributary of the River Trent lying to the east.

By comparison the remains of a camp at Holme [NT.200.3.1] lie on river alluvium on low-lying land with no obvious strategic advantage. The camp is an incomplete rectilinear

enclosure with rounded corners. The southern extent is masked either by the modern road or possibly vestigial ridge and furrow that survived south of the road. The location of this camp within 1 km of the River Trent is possibly indicative of a contemporary crossing at a point close to the village of Holme (Welfare and Swan 1995:149).

A small, incomplete camp on the northern bank of the River Meden at Gleadthorpe near Warsop was first photographed by Riley in 1979 (1980:330) [NT.80.13.1]. A single ditch encloses the rectilinear camp. The north-eastern corner may extend into Gleadthorpe plantation. The visible effects of crop trials in the same area complicated interpretation and mapping. Other linear ditches recorded in this field may pertain to the field systems widely recognised in the sandstone landscape.

The two features identified by Welfare and Swan (1995) as temporary camps at Newton-on-Trent are represented by only a single side each on the aerial photographs consulted [NT.161.2.1 & 3.1]. These interpretations are based primarily on the association to the vexillation fortress less than 200 metres to the north. If the outer ditches of the vexillation fort are accepted as being the construction camp for the fort then that association is weakened. The more northerly ditch [2.1] is interrupted by a feature interpreted as a clavicular entrance, whilst the other [3.1] does form a corner in a manner characteristic of Roman military features. Interpretation may benefit from further reconnaissance of the area.

Two large, incomplete enclosures at Ollerton and Langford may be temporary camps (Figure 5). The Ollerton example is identified by a single complete side, two characteristic rounded corners and two incomplete sides [NT.50.2.1]. The Wellow Road and housing development may have destroyed the rest of the enclosure. The remains of a Roman Road (Margary 14) as well as linear ditches, enclosures and lengths of pit alignments are visible to the south of the camp [NT.50.14.2].

The Langford example lies to the immediate north-west of the Foss Way, the south-eastern corner potentially abuts or is cut by the modern road corridor [NT.202.17.1]. The site lies on glaciofluvial drift on slightly higher ground than the Holme camp, c. 3km to the north-west. One complete side and two characteristic rounded corners of the enclosure are visible.

3.2.3 SMALL TOWNS WITH MILITARY ORIGINS

The Roman small towns recognised at East Bridgeford, Thorpe and Brough have long been believed to have developed from the military stations of Margidunum, Ad Pontem and Crococalana listed in the Antoine Itinerary (Rivet 1970). As discussed above the archaeological evidence for the military origins of Ad Pontem was revealed during excavations in 1963.

Only a single section of broad ditch and bank is visible of the settlement at East Bridgeford on the Foss Way [NT.213.18.1]. Areas of the settlement to the west of the Foss Way were investigated from 1920 to 1936 by Oswald (Burnham and Wacher 1990:260). Oswald had identified the remains of a fort during his work, and although they dispute the structural evidence for his interpretation, Burnham and Wacher concede the possibility of a Claudian-Neronian military origin for the site (1990:260). Further excavations conducted by Todd from 1966 in advance of destruction by roundabout construction also failed to reveal structural elements of the proposed fort.

Cropmarks of a large rectilinear enclosure defined by broad ditches and internal and external features delineate the remains of the small town at Brough [NT.204.34.1]. The evidence for an early military station at the site appears to be limited to a few artefactual remains (Whitwell 1982:39).

Whilst the evidence for the military origins for the three Foss Way sites may be variable, all three settlements have substantial enclosing defences.

3.2.4 THE ROMAN ROADS

The evidence for Roman roads in their original form is understandably limited on the aerial photographs consulted. Many of the major Roman routes traversing the project area, such as the Ollerton to Blyth Road (A1) and the Foss Way, remain in use today. The directness, superior surveying and the enduring construction of the roads ensured that even in periods of infrequent usage they were still clearly delineated in the landscape for future use. As such the fabric of many of the original roads has been obliterated by modern routes.

Visibility of the original roads is generally limited to points where the modern route deviates from the earliest course of the road. At Ad Pontem the course of the modern Foss Way deviates slightly to the north west from its previously rigid S to NE route, thus the point of entry of the original road into the fort survives and can be seen in the cropmarks on the aerial photographs [NT.191.1.5].

The Roman road between Ollerton and Blyth had been identified along the route of the A1 in the parish boundaries. Surveying ditches and a compacted surface [NT.50.14.1-2] identified sections of a road extending southward from Ollerton. This may represent the northerly extent of an unlocated stretch of road between Ollerton and the River Trent at Gunthorpe possibly crossing the river to the site at East Bridgeford on the Foss Way.

Between Oldcotes and Firbeck a single ditch [NT.128.7.1], possibly defines the side of the road between Catcliffe to Oldcotes (Margary 189). Sections of the road have been identified and investigated at Catcliffe and the road agger is apparently visible in the vicinity of this ditched feature (Margary 1957, source unspecified). However there is no direct evidence to indicate this is the original route of the Roman road.

The circumstances of recording such features has tended to the fortuitous rather than planned. The sections of roads at Ad Pontem [NT.191.1.5] and Scaftworth [NT.99.9.1] were probably recorded and identified by virtue of their proximity to the fort and the possible fortlet respectively. Consultation of earlier vertical photography may reveal further evidence.

Only the linear features at East Stoke [NT.209.4.1-2], are interpreted as elements of a Roman road on morphological characteristics rather than known associations. Alternate sections of the route are revealed by crop response to the underlying surveying ditches and the metalled surface.

3.3 MEDIEVAL DEFENDED SITES.

The following defended sites of the early, late and unknown medieval periods were identified by this project.

MORPH NO.	MAP SHEET	SITE NAME	SITE TYPE
NT.158.4.1	SK77SE	Kingshaugh, Darlton	ringwork
NT.51.2.1	SK66NE	Jordan Castle, Wellow	ringwork
NT.216.10.1	SK74SW	Cranmer's Mound, Aslockton	motte and bailey
NT.80.6.1	SK57SE	Castle Hill, Cuckney	motte and bailey
NT.256.2.1	SK59SE	Tickhill	motte and bailey
NT.167.4.1-3	SK76NW	Egmonton	motte and bailey
NT.168.5.1-4	SK76NW	Laxton	motte and baileys
NT.168.4.1	SK76NW	Laxton	motte
NT.235.30.1-2	SK84SW	Westborough	motte
NT.63.1.2	SK67SE	Castle Hill, Bothamsall	motte

Table 3. Defended sites of the Medieval periods, excluding moated sites

The sites in Table 3 were recorded as upstanding or vestigial earthwork monuments. Thirty-two moated sites of the Medieval and Post-Medieval periods were also recorded and positively identified by this project. Twenty-six of the identified moats were recorded as upstanding or vestigial earthworks, only 6 examples were recorded as levelled sites.

The motte and baileys at Laxton [NT.168.5.1-4], Egmanton [NT.167.4.1-3], Wellow [NT.51.2.1] and Darlton [NT.158.4.1] are all located on the heavy soils of the mudstone landscape. The generally pastoral agricultural regimes of this landscape have doubtless been influential in the preservation of these monuments. The Medieval landscape and open fields around Laxton are particularly well preserved. The Bothamsall motte was constructed on a small hillock of mudstone, overlain by fine reddish loams, at the eastern edge of the Sherwood Sandstone landscape [NT.63.1.2].

The Cuckney motte and bailey lie on the south bank of the River Poulter on the western edge of the Sherwood Sandstone landscape [NT.80.6.1]. Later features obscured much of the bailey enclosure ditches, whilst the motte, known as Castle Hill, was difficult to

distinguish on the limited specialist oblique aerial photographs. Much of the aerial reconnaissance in this area has been concentrated on the levelled archaeological remains.

A cursory examination of historic vertical aerial photography of the Westborough motte, on the banks of the River Witham has revealed considerably more detail in the surrounding field than was afforded by the limited specialist photographs [NT.235.30.1-2]. Mapping and interpretation utilising this material may have substantially enhanced the existing record of this area. This would suggest that the failure to consult these sources has been to the detriment of the archaeological record of this monument type of the Medieval periods.

Any levelled remains of medieval or post-medieval defended sites, except six moated sites were not identified on the aerial photographs consulted. Whilst this may reflect the real situation, misinterpretation of levelled sites is a possibility. The broad ditched enclosures at Barton in Fabis and Gunthorpe on the River Trent are discussed in this respect in Section 4.1.1.

3.4 POST-MEDIEVAL DEFENCES IN THE TRENT VALLEY

Most sites of this period are attributed to the Civil War 1642-51. This period represents a move from strategies of pitched battle to siege warfare influenced by the advances in gunpowder technology. Much of the activity was concentrated in Nottinghamshire - around Newark in particular. Many of the defensive earthworks indicate influence from French and Dutch developments (Harrington 1992).

MORPH NO.	MAP SHEET	SITE NAME	SITE TYPE
NT.190.1.1	SK75NE	Muskham Bridge	fort – sconce
NT.194.12.1	SK75SE	Kelham Road	Fort
NT.194.15.1	SK75SE	Sandhills Sconce	Fort – sconce
NT.196.1.1	SK75SE	Hawton	Redoubt
NT.201.4.1	SK85NW	Crankley point	Fort
NT.231.8.1	SK73NW	Wiverton Hall	Battery
NT.190.7.1-2	SK75NE	Muskham Bridge?	battery
NT.194.17.1	SK75SE	Queens Sconce	fort – sconce

Table 4. sites of the Post-Medieval period, excluding moated sites.

Most of the post-medieval military sites recorded by this project are concentrated in the vicinity of Newark-on-Trent. Unlike the defensive landscapes of earlier periods this distribution is known to reflect the pervading political situation rather than a response to topographic factors. However, only a small number of the sites known in the archaeological and documentary records have been identified on the aerial photographs. Seven of the sites in table 4 were recorded in the vicinity of Newark-on-Trent; the NMR carries records for 32 Civil War military sites over the same three (1:10 000 scale) quarter sheets. Early vertical photographs of select areas from the Crawford Collection

held by NMR in the specialist collection indicates many more sites may be visible on the historic vertical coverage.

Many of these other sites are recorded as levelled in the NMR and it is unclear why so few have been identified as crop or soilmarks. A greater understanding of the survival of such monuments may illuminate on the representation of similarly temporary structures of early periods - such as the Roman temporary camps - on the aerial photographs.

3.5 MODERN MILITARY SITES.

The remit of this project did not extend to the recording of modern military sites, this was mainly determined by the aerial photographic sources consulted.

A double row of practice trenches was recorded at Balderton [NT.204.3.].

3.6 CONCLUSION

Consideration of all substantial earthwork enclosures within the project area in the archaeological record indicated a close correlation with topography offering distinctive positions. Field investigations at the Oxton Camp hillfort suggested that these were not necessarily defensive positions. Taken within the landscape context, the morphology of the enclosure is closer to that of the promontory forts than may first appear. The northern side of the enclosure in effect isolates the head of the spur, the slopes of which are emphasised by the other ramparts. The enclosure thus has advantage only over the narrow valley of the Oxton Dumble, and beyond the ramparts is vulnerable on most sides. That the enclosure is surrounded by more appropriately defended positions suggests its positioning within a natural basin was a deliberate act, possibly reflecting a non-defensive function. The relationships of such features to other elements of the Iron Age landscapes of the Trent Valley and the Sherwood Sandstones are unknown.

Several landscape foci are apparent in the distribution of Roman military sites.

The forts and camps at Sawley, Margidunum, Ad Pontem, and Newton-on-Trent are closely related to the modern course of the River Trent. In many cases the control or establishment of river crossings as well as the major road routes can be postulated to have motivated such positions.

Osmanthorpe vexillation fortress and the Calverton camp are both located in advantageous positions near the heads of important tributaries of the River Trent. However, the significance of these locations is unclear, particularly as with the Ollerton and Calverton Camps they form a cohesive group along the Keuper Sandstones, between the Sherwood Sandstones and the Mudstone landscape. This distribution coincides with

potential projection of the Blyth to Ollerton Roman road southward towards the River Trent at Gunthorpe (NMR Linear 332).

The Gleadthorpe temporary camp is unusual in that it is the only example recorded in the landscape of the Sherwood Sandstones. Whilst the soils of this fairly homogenous landscape have been shown repeatedly to be conducive to the formation of cropmarks over buried archaeological features, vast expanses of woodland prevent this being considered a true representation of Roman military sites in this particular landscape.

Dating evidence for each of these sites is unforthcoming. Excavations at Ad Pontem and Margidunum suggest military origins in the Claudian/Neronian periods, artefacts from evaluations at Osmanthorpe suggest a similar date for the fortress. However, the Scaftworth enclosure would prove to be a very late example, if demonstrated to have been for military purpose.

In the absence of any comprehensive dating for the military landscapes identified above, and with the current dearth of settlement evidence from the Mudstone landscape it is difficult to postulate on the impact of the military activity on the contemporary indigenous populations.

4. PREHISTORIC RITUAL AND BURIAL MONUMENTS - PROBLEMS OF IDENTIFICATION AND INTERPRETATION BY MORPHOLOGY.

Classifications based on the evidence of aerial photographs are by necessity based primarily on morphology. Only the evidence of more intrusive investigations can support more detailed interpretations on date, longevity, function and function change. Useful morphological interpretations are primarily based on how the observed elements of a feature may interact on a physical level to suggest the original function.

However, it may be proffered that the construction and design of sites of more symbolic function would have been less constrained by practicability. Materials, environment and culture would influence the morphology, the constraints of which may be more difficult to recognise in the archaeological record. Moreover formalised distinctions between the symbolic and utilitarian within our current understanding may not be applicable to the mind set and belief systems of millennia old communities. This precludes the prediction of the physical expression of those belief systems in the landscape and individual monuments. As a starting point the symbolic significance of each visible morphological element of the monument should be considered for morphological classification to be archaeologically useful.

Significant contributions have been made in the recording and identification of the constituent elements of the ritual landscapes of Britain by aerial reconnaissance and interpretation (e.g. Palmer 1976, Harding with Lee 1987 and Jones 1998).

The following monuments have been identified using traditional criteria of interpretation.

4.1 NEOLITHIC RITUAL AND BURIAL MONUMENTS

MORPH/NMR NO.	MAP SHEET	SITE NAME	INTERPRETATION	DIMENSIONS (M)		
				length	breadth	diameter
NT.6.1.1	SK53SW	Barton in Fabis	henge	-	-	80
NT.209.6.1	SK74NE	East Stoke	henge	-	-	90
NMR SK 74 SW 1	SK74SW	Bingham	henge	-	-	c.110
NMR SK 64 SE 59	SK64SE	Gunthorpe	henge	-	-	70
NT.6.2.2	SK53SW	Barton in Fabis	interrupted ditch	200	-	-
NT.210.1.1	SK74NE	Hawton	cursus	>130	20	-
NT.188.60.1-2	SK75NE	South Muskham	pit arrangements	180	20-	
NT.4.2.1	SK53NE	Wilford	pit arrangement	50	-	-
NT.69.10.1	SK63NW	Holme Pierrepont	round barrow	-	-	30
NT.194.4.5	SK75SE	Averham	long barrow	30	20	-
NT.199.32.1	SK75SW	Fiskerton-Morton	long barrow	40	30	-
NT.180.1.1-2	SK86SW	Collingham	long barrow	35	18	-
NT.202.2.1	SK85NW	Langford	long barrow	39	15	-
NT.201.9.1	SK85NW	Winthorpe	long barrow	-	35	-
NT.72.7.1	SK63NW	Bassingfield	long barrow	40	20	-
NT.183.3.1	SK86NW	Low Marnham	mortuary enclosure	-	50	-
NT.175.53.1	SK76SE	Cromwell	mortuary enclosure	60	40	-

NT.175.56.1	SK76SE	Cromwell	mortuary enclosure	-	25	-

Table 5. Neolithic ritual and burial monuments

4.1.1 HENGES AND RELATED MONUMENTS.

The following points are not intended to resolve the problems of morphological classification of ritual sites but illustrate the artificiality of categorisation and the potential variability in the ritual landscape. Harding with Lee's study (1987:26) on the identification of henges and related monuments in the archaeological landscape restated Atkinson's identifying criteria for henge monuments as "earthwork circles with bank and substantial internal ditch, one or two entrances, and late Neolithic and Bronze Age date".

Excavation and examination of a wide variety of sites known and identified as henge monuments has shown considerable variation in the overall shape (Harding with Lee 1987). The ditches enclose areas circular to sub-oval and almost polygonal shape. The latter suggests construction in straight segments. Discussion of the henge ditches was often neglected in the past as they were presumed to be the quarries of the banks with no active role in the symbolic activity of the monument.

More recently a consideration of artefact deposition and deliberate infilling have suggested a positive role for these elements of the monument. It is possible that this role was also fulfilled by alternative forms of cut features. As mentioned above there are observed variations in the ditch form - continuous and segmented, possibly originating from the interrupted ditch form of causewayed enclosures.

The function of the external bank of henge monuments was originally suggested to provide elevated areas from which to observe activities within the enclosure (Clark in Wainwright 1969:13). More recent studies have suggested the function of the bank and entrance(s) was to funnel vision - possibly to the internal activities and some external foci in the landscape (Harding and Lee 1987). Such a requirement could be satisfied by alternative structural features, evidence of which may not be manifest on the aerial photographs or even survive in the archaeological record.

Even embanked features are sometimes less apparent in the archaeological landscape than cut features. If substantially truncated, banks will have a weaker effect on overlying crop growth than would a levelled ditch. The moist fills and shade provided in the cut of a ditch are more likely to produce an observable change in overlying crops than are the truncated remains of a bank. Effective recording of upstanding features requires appropriate side-lighting, a consideration not easily reconciled with the requirements of cropmark photography. In heavily truncated landscapes - such as those with a long history of intensive arable farming, all traces of bank material can have been dispersed and no evidence discernible even through intrusive investigations. This inequality in the recording

of different feature forms must be considered when interpreting features on the presence or absence of defining criteria.

Harding with Lee identify a corpus of potential henge monuments with diameters ranging from c. 10 to 190 metres (1987: Fig 28 A). Wainwright further classified these monuments by, on his own admission, arbitrary size divisions (1969:118). Enclosures with diameters in excess of 300 metres were classified as 'earthwork enclosures'; those lying within the 30-300 metres range were classified as henges and the smaller examples as hengi-form monuments. Catherell (1976) presented a more statistically significant division between enclosures of diameters below and above 100 metres, whilst Harding and Lee (1987) refer to enclosures as small as 14 metres in diameter as mini-henges. However, there has been little discussion of any symbolic distinction between these differences in monument scale and the relevance of these artificial classifications to the understanding of the Neolithic belief systems. Although the character of the social organisation affording the labour investment required in the construction of massive earthwork enclosures remains unknown, it is generally accepted that the actual strategy of construction was as symbolically potent as the activities focused on the completed sites.

Communal participation in a variety of construction projects in the manipulation of the natural landscape - may have fulfilled the same symbolic and social requirements that prompted the construction of henge monuments. Thus this primary function may be expressed in a variety of morphological forms in the observable archaeological landscape. Similarly a single, constant function through the lifetime of monuments of great complexity and longevity cannot be presumed.

The defining criteria for the identification of henge monuments are not exclusive to ritual monuments, they cannot be used to identify symbolic over utilitarian function. Whilst imposed divisions between the ritual and utilitarian may impede the reconstruction of the social organisation of prehistoric communities, some form of categorisation is needed for the management of the archaeological resource. The effective management of the archaeological landscape necessitates that value statements on the 'importance' of sites on local, regional, national and world wide levels can be made. This is achieved primarily by classification and quantification of the different site types.

However there is a more fundamental obstacle to the positive identification of henge monuments solely from the aerial photographs. The morphological criteria for henge monuments are not exclusive to ritual landscapes nor are they exclusive to the landscapes of the late Neolithic and Bronze Ages. There has been no datable evidence from the ground to support the interpretation of the possible henge sites identified by this project.

A circular arrangement of pits was recorded on flat land, roughly equidistant between the Rivers Trent and Devon at East Stoke (Figure 6.1) [NT.209.6.1]. Harding with Lee (1987) did not consider this feature to be a henge but acknowledge its relevance in the Neolithic ritual landscape. The enclosure of 90 metres diameter is defined by two circuits of closely spaced pits. The pits of the internal circuit are so close as to appear as a near continuous

cropmark in some sections. The external pit circuit is incomplete. Presuming the site has been levelled and ploughed evenly this may suggest that the outer pits were originally shallower than the inner. There were only two aerial photographs of this site from a single visit. Thus in considering the validity of the interpretation of this monument as a henge the absence of evidence for an external bank must be considered in the light of the limitations imposed by the available photography. The admittedly limited evidence suggests that the extensive truncation of the site would preclude the survival of sufficient bank material to produce corresponding changes in the overlying crop.

It would appear that several of the pits were partially truncated by a gas pipeline lain during the 1960s but it is unclear if there was any archaeological supervision of the work, and the site remains undated. Excavations of similar arrangements of pits have shown them to have held timber uprights and this would appear to be the simplest interpretation for this group. However, until these pits are demonstrated through excavation to be post-pits, reconstructions of the site remain speculative. The different crop responses to the internal and external circuits of pits, presumed to indicate differential preservation may suggest different function. It could be speculated, for example, that the external circuit contained timber uprights, whilst the internal circuit were retained as cut features. These could be regarded as correlates to the bank and ditch of typical henge monuments. Moreover the labour investment required - in the selection and felling of appropriate timbers, the pit digging, the gathering of packing material and the erection of the timbers could be seen as the efforts of a communal project equable with henge construction.

The interpretation and mapping of a potential henge monument at Bingham (NMR SK 74 SW 11) was impeded by the poor quality of the aerial photographs. The photographs show soil marks suggestive of a circular enclosure - bank and ditch defined with possible internal features. This site was not mapped or recorded because its location could not be reconciled with the modern landscape as mapped by OS. The site appeared to be located at Bingham sewage works, although it is on the register of scheduled monuments. The archaeological potential of the area was apparently first brought to attention by reports of 2-4th century AD finds from the plough soil. The enclosure was not considered in the study by Harding with Lee (1987).

The modern settlement of Barton in Fabis, c. 450 metres south of the River Trent, partially masks a broad ditch presumed to define a large curvilinear enclosure described as a possible henge (Harding with Lee 1987). The width of enclosure ditch was recorded as exceeding 10 metres by this project (Figure 6.2) [NT.6.1.1]. The curve of the ditch appeared irregular and was possibly dug as several near-straight segments. A ditch-defined circular enclosure - a possible barrow, with a diameter of 20 metres was recorded within the area defined by the broad ditch [NT.6.1.2]. Parallel sections of interrupted ditch, interpreted by Harding with Lee (1987) as a causewayed enclosure, were recorded less than 100 metres to west [NT.6.2.2]. Causewayed enclosures are often considered to be the pre-cursors of henge monuments, and it is this relationship which appears to be the

sole factor identifying the ditch as a henge however this relationship has been challenged in more recent years (Barclay 1989:262). The site is undated, though early prehistoric activity in the area is attested by local finds. Such finds are unreliable indicators, particularly along the valley floor of the River Trent where the processes of erosion and redeposition need to be considered.

Despite the width of the ditch there is no evidence of an internal or external bank. There are no visible entrances, though substantial sections of the monument are masked. An alternate interpretation is not easily forthcoming, until recently there was no analogous site within the section of the Trent Valley in the project area. The association of the possible barrow does suggest a pre-Iron Age rather than later date.

The county SMR and this survey had identified a feature abutting a modern water channel within the village of Gunthorpe (SMR no.1820a). This feature was located c. 700 metres north of the present course of the River Trent on an island of well-drained sandy soils over gravel. The feature was observed as a broad arc of slower ripening vegetation, the eastern section masked by alluvium and the hedge line running along the drain. The photography of the site was of poor quality and the feature was interpreted as a relic meander and not mapped.

During the summer of 1996 the site was re-photographed by RCHME's aerial survey team in York. Conditions were suitable to define a clear outer bank and a ditch defining an enclosure c. 90 metres in diameter, with a causewayed entrance defined by square ditch terminals. Brief ground investigation suggested the centre of the monument is slightly domed. The eastern section of the monument was masked by alluvium and the hedge line running along the drain. This new photography prompted EH to investigate further and schedule the site (National Monument Number 29901). The scheduled site is identified as a henge monument.

However there are close morphological similarities between this enclosure and the ringworks of the later periods (see Section 3.3) (MPP 1988c). Gunthorpe was the site of an important ferry crossing in the medieval periods. Ringworks were often constructed to protect such positions (MPP 1988c).

4.1.2 CURSUS MONUMENTS.

A potential cursus was newly identified by this survey on the eastern bank of the River Devon at Hawton [NT.210.1.1] (Figure 6.4). The rectilinear enclosure (180 x 20m) is situated near the modern river course. The southern end of the enclosure was partially obscured by an old stream channel and other linear ditches [NT.210.3.1]. A large pit is recorded within the enclosed area and the ditches of two possible round barrows were identified c.240 metres to the south west [NT.5.1-6.1].

Two previously identified examples were discovered by aerial reconnaissance in the Trent Valley beyond this project area in Derbyshire (St Joseph 1966). The Twyford (c. 550 x 70m) and Aston-on-Trent (c.1370 x 100m) cursus, although incomplete are considerably more substantial than the Hawton enclosure. The MPP definition for cursus monuments is an enclosure with length either 10 times greater than width or exceeding 250 metres (MPP 1988b:4). Smaller elongated enclosures are classified as long mortuary enclosures. However, as both monument types are poorly understood and both have been shown to pertain to some form of burial activity within the Neolithic period the basis for this distinction is unclear.

A cursus monument was identified by Todd at Shelford on aerial photographs not consulted for this project (NMR SK 64 SE 16). This interpretation could not be substantiated from the photographs examined.

An elongated feature defined by two rows of pits lies just to the east of the Great North Road (A1) at South Muskham in the Trent Valley (Figure 6.5). The pits extend over 180 metres north to south but are interrupted in parts [NT.188.60.1-2]. The rows, set apart by 20 metres, were neither straight nor truly parallel. This feature is found within a complex multi-period levelled archaeological landscape and many pit alignments traverse the gravel terraces. However this pit arrangement was clearly distinguished from these features by the size of the pits and their irregular inter-spacing and alignment.

Whimster (1989: 80) suggested these features were post pits - which would suggest an enormous structure over 100 metres in length from the longest complete section. Pit-defined cursus monuments have been identified in Scottish contexts but as yet are not recognised in the archaeological record for England (MPP 1988b:5). Similar features have been identified in the proximity of henge monuments and barrows elsewhere in Britain-most notably at Thornborough South, North Yorkshire (Harding with Lee 1987:317,216). The South Muskham example lies in the proximity of a very substantial pennanular enclosure of unknown function, destroyed during the construction of the modern route of the A1(T) (Figure 7.4) [NT.187.50.1]. However the observed relationship between henge monument and pit avenue does not prove contemporaneity. It is unclear from the available evidence whether these features constituted a pit or upright defined enclosure, a similarly defined avenue, or whether the pit or uprights themselves were the focus for activity rather than the space they defined.

A short length of pit alignment [NT.4.2.1]. appears to abut an element of the Bronze Age cemetery [NT.4.1.5] at Wilford (Figure 6.3).

4.1.3 BURIAL MONUMENTS.

Despite performing a more tangible functional role in the ritual landscape the burial sites of the Neolithic period are of sufficient morphological variability to impede identification and interpretation. Many archaeologists have identified increasing numbers of potential

variations in the basic long mound tradition of interment - many have still to be validated by excavation (Loveday & Petchey 1982, Clare 1987). Some of these morphological forms have been identified by this project, though such interpretations are applied with caution.

Three ditch-defined oval enclosures were recorded at Fiskerton-cum-Morton [NT.199.32.1], Collingham sewage works [NT.180.1.1-2] and Bassingfield [NT.72.7.1] (Figures 6.11-13). These enclosures are of similar proportions and sizes. Circular enclosures were recorded within, and thought to be contemporary with the Fiskerton-cum-Morton and Collingham examples; such enclosures have been suggested to be associated with a Neolithic burial tradition (Jones pers comm). The enclosure ditches appeared to be too narrow to have provided sufficient material for mound construction. However, Petchey and Loveday (1982:48) note that upstanding examples have been identified in which the gravel extracted from enclosing ditches merely provided a cap for a turf-built mound.

In the absence of dateable evidence from these three examples alternative explanation for the observed morphological arrangement must be considered. All three examples are recorded within the complex multi-period archaeological landscape of the Trent Valley. The circular enclosures are of a size and form commonly identified with the remains of hut circles of the Iron Age and Romano-British periods. Several examples of hut circles within larger enclosures have been identified by this project (see Section 5.5.2.1). In the absence of any known excavated parallels, the more prosaic interpretation for these sites has not been ruled out.

All three examples are found on coarse loamy and sandy soils. The Fiskerton-cum-Morton enclosure is within 550 metres of the present course of the River Trent. The long axis of the oval enclosure lies nearly parallel to the river's meander. The Collingham example lies roughly parallel to and 200 metres from a tributary of the River Trent known as The Fleet. The Bassingfield enclosure lies c. 2 km south of the River Trent, but within 500 metres of the Polsner Brook. This enclosure lies parallel to the brook.

An ovoid ditch-defined enclosure recorded within the grounds of Langford Hall, also falls within the broad range of enclosure morphologies identified with Neolithic burial sites (Figure 6.10) [NT.202.2.1]. The enclosure was aligned nearly north-east to south-east with a ditch-defined entrance at the apex to the south-east. There is little evidence beyond the morphological association to substantiate any interpretation of this site.

The morphology of a trapeziform ditch-defined enclosure recorded at Averham was identified by the Lincolnshire NMP as a potential long barrow variant (Figure 6.7) [NT.194.4.5]. The site lies in an area now defined by the divergent channels of the River Trent. Several small circular enclosures - possibly the remains of round barrows were recorded in the immediate vicinity of this enclosure [NT.194.4.1-2]. These features are poorly represented on the aerial photographs and are located in an area of alluvial deposits.

There are several sites within the project area that have been identified as mortuary enclosures - some by previous interpreters of the photographs.

Whimster (1989:69) identified two ditch-defined rectilinear enclosures Elemesley Lodge, Cromwell as Neolithic funerary and ceremonial enclosures (Figure 6.14). The larger more northerly enclosure is rectilinear with well-rounded corners and opposed entrances central to the two shorter sides [NT. 175.53.1]. The second enclosure, less than 150 metres to the south is incomplete with rounded corners but no entrances [NT.175.56.1]. Although the two enclosures are aligned through their long axis the absence of evidence for entrances into the more southerly enclosure would suggest a considerably different function to the more completely known example and thus a more complex relationship between the two monuments. The circular enclosure in the same alignment has been excavated and positively identified as the remains of a Bronze Age barrow [NT.175.54.1]. These remains lie on a gravel terrace c. 1km from the present course of the River Trent.

Other examples in the project area have few diagnostic characteristics and are presumed to be incomplete.

A potential mortuary enclosure or long barrow, located c. 800 metres east of the present course of the River Trent at Winthorpe was partially destroyed by development (Figure 6.8) [NT.201.9.1]. The rectilinear enclosure has a single complete side, two rounded corners, and two long sides of unknown length. The aerial photographs of this site were of poor quality.

A similar, but substantially larger enclosure was recorded at Low Marnham (Figure 6.8) [NT.183.3.1]. The northerly extent of the feature was partially masked by spreads of alluvium associated with the river.

The only excavated and securely dated burial monument of the Neolithic period mapped by this project is a substantial circular enclosure. Investigation of the ring ditch on the gravel terrace at Holme Pierrepont produced Neolithic Grimston pottery (Guilbert et al 1994) (Figure 6.6) [NT.69.10.1].

4.2 BRONZE AGE BURIAL MONUMENTS

Burial during the Bronze Age is characterised by the homogeneity of the recognised burial monuments. Several different forms of Bronze Age barrows have been identified in the archaeological record - bowl, bell, disc, saucer and pond (Ashbee 1960). However, they are generally distinguished by above-surface structures that rarely survive intensive medieval or modern arable regimes. In the project area the manifestation of such features on the aerial photographs is limited to a few basic morphological forms.

In the absence of a super-structure most levelled burial sites of this period are recognised by a ditch-defined circular enclosure. This feature may have had dual symbolic and

utilitarian functions in both delimiting the burial space and providing material for a covering mound. Similar morphology results from the levelled remains of anti-aircraft batteries, post-mills and hut circles. Wilson (1982) established some means of differentiation between these functional types but they tend to rely on the ideal rather than normal conditions of air photo interpretation.

Some ring ditches have central pits that originally held cremations and associated items. These burials were generally sealed beneath a mound of material including the upcast from the surrounding ditch. These potentially diagnostic features may only become apparent in the overlying crop when the overlying mound is sufficiently truncated for the crop roots to penetrate through to the more water-retentive fills of the feature. However deep plough over a considerable time can disperse all traces of a covering mound and truncate the shallow cut of a cremation pit leaving only traces of the ring ditch to produce effects in the overlying crop.

Two circular features - a circular enclosure [NT.199.19.1] and a large circular pit [NT.199.20.1] were recorded by this survey at Fiskerton-cum-Morton (Figure 7.1). No internal features were identified within the former. Excavation of the ring ditch recovered only ephemeral traces of a burial suggesting there the features had been severely truncated (O'Brien 1979b:82). The pit, demonstrated by excavation and historical records to be a bomb crater, could otherwise have been misinterpreted as a pond barrow.

Central pits are not exclusively diagnostic of burials. Similarly placed pits could correlate with features associated with similar enclosures of different function - post-pits and hearths in domestic structures. Ill-defined cropmarks or poor and small-scale photography may prevent a distinction between the central cross-cuts of a post-mill and a burial. A series of four evenly interspaced post-mills were recorded along the River Trent between Kelham and North Muskham. All were identified by their clearly defined cross-beam slots. However, the enclosing ditch of one example [NT.187.5.1] intersected with the ditch of another - slightly smaller ring ditch with a central pit [NT.187.8.1] (Figure 7.2). It is possible, and has been observed elsewhere, that burial mounds may have been re-used for utilitarian purposes in later periods (Zeepvat 1980).

Secondary and even tertiary ring ditches distinguish the remains of barrows from other features types such as hut circles (Wilson 1982). This elaboration on the simple form may be a display of status or indicate later insertions of burials into the original monument. The latter may be distinguished if the ring ditches are not truly concentric (Wilson 1992). The isolated circular enclosure at South Muskham was thus identified as the remains of a burial monument by its concentric ring ditches [NT.188.28.1] (Figure 7.3).

Bronze Age burial monuments display a considerable range of internal diameter and ditch width measurements. Across that range there is considerable overlap with the size ranges of functionally distinct but morphologically similar enclosure types. The size range of hut-circles, constrained by technology and materials, coincides with that of the smaller burial

sites. Whilst enclosures with diameters as small as 14m have been identified as henge type monuments (see Section 4.1). The levelled remains of the barrow excavated at Cromwell (Elmesley Lodge) were substantial enough to be considered as a potential henge by Harding with Lee (1987: 221) [NT.175.54.1] (Figure 6.14). The large penannular ring ditch at North Muskham displayed similar ambiguity but has been destroyed, apparently without archaeological investigation [NT.188.50.1] (Figure 7.4).

Only in a limited number of cases have the interpretation for aerial photographs been validated by primary excavation evidence within this project area.

In 1992 a barrow cemetery at Holme Pierrepont was investigated [NT.69.5] (Figure 7.5). Three of a group of up to ten features were excavated and produced conclusive evidence of burials - cremation urns and bone (Guilbert et al 1994). However, the excavators were wary of extrapolating this interpretation to the other circular enclosures in the field. These were considerably smaller and could be considered in the context of the later field systems and enclosures superimposed upon the Neolithic and Bronze Age landscape (Guilbert et al 1994).

However, secondary evidence was used to support interpretation of non-excavated sites elsewhere. Salvage excavations at Coneygre Farm produced evidence for a substantial number of cremation burials - delimited only by pots, cists or decomposed organic containers (Allen et al 1987). These ephemeral features were not visible on the aerial photographs. A large sub-circular enclosure [NT.207.2.1] lying less than 200 metres to the south west of the cemetery was the only archaeological feature recorded in this area. In the absence of any alternative context for this enclosure - this was tentatively interpreted as the remains of a round barrow

Groups or clusters of circular enclosures were more readily interpreted than singular features. Barrow cemeteries including one of the more diagnostic forms of ring ditches could be more easily distinguished from settlement remains. The interpretation of a barrow cemetery at South Muskham was based on the inclusion of an incomplete double-ditched circular enclosure and a large ring ditch with a small internal circular enclosure, as well as the more ambiguous forms with internal pits [NT.188.36] (Figure 7.6).

In some areas the distribution of elements of the multi-period landscape suggested the influence of ritual or symbolic foci. Such a foci was recognised at Cromwell, with the concentration of the two potential Neolithic mortuary enclosures and an excavated Bronze Age barrow [NT.175.53.1, 56.1 and 54.1] (Figure 6.14). Two further potential round barrows and many much smaller curvilinear, rectilinear and double ditched enclosures were recorded within a 300m radius of the excavated barrow [NT.175. 28.4; 55.1; 49.1-3; 50.1-4; 51.1-2; 52.1-2].

Similar relationships have been observed between the location of Bronze Age burials monuments and Anglo-Saxon inhumations but it is unclear if the earlier monuments or the natural landscape context provide the foci for the later sites. At Holme Pierrepont

both Neolithic and Anglo-Saxon burials have been found in the vicinity of the excavated Bronze Age cremations (Knight and Howard 1995:38). It would be difficult to recognise the burials of these distinct cultures from the cropmarks evidence alone.

There is a danger that associations between elements identified as part of the prehistoric ritual landscape may be used to mutually support otherwise tenuous interpretations.

In areas of dense multi-period, multi-functional archaeological landscapes such as the Trent Valley the chronological relationships between the elements of those landscape cannot be reconstructed from the cropmark evidence. Whimster (1989:67) suggests the numerous ring ditches found across the gravels are early forms of open settlement rather than burial monuments but in reality, without excavation this is difficult to substantiate in these superimposed landscapes. Whilst 67 potential burial sites were identified by this project a further 183 examples of circular or sub-circular features were recorded simply as enclosures, though some have been grouped with sites of non-burial or ritual function.

4.3 IRON AGE BURIAL LANDSCAPE

Nine near square enclosures were recorded near the modern bank of the River Trent at Cromwell. Although the identified features were recorded on the gravel terrace localised deposits of alluvium may mask others. These features were interpreted as an Iron Age square barrow cemetery [NT.176.8] (Figure 7.7). This area lies less than 700 metres to the east of the ritual foci identifies at Cromwell (Section 4.2).

4.4 CONCLUSION.

It is clear from the preceding discussions that certain morphological forms, though distinctive are not exclusive to a single period and/or function. Similarly various different morphological forms are accepted as the representations of a single function within the same tradition.

A confident interpretation of the large, curvilinear enclosure at Gunthorpe may not be attained without further cartographic investigations, ground survey or even excavation. Similar works may elucidate on the incomplete enclosure recorded at Barton in Fabis which is situated in a similar landscape context. Even excavation may not confirm date and function for these features. The debate continues over the nature of the large curvilinear enclosure known as the Ferrybridge henge in West Yorkshire partially excavated by West Yorkshire Archaeology Service in 1991.

The evidence supporting the interpretation of the Neolithic long barrows is slight and to place any greater confidence in these interpretations would be misleading.

The discussion of Bronze Age burial monuments has indicated the extent to which non-morphological considerations influence interpretations. Such influences are rarely explicated in the archaeological record. In light of the dynamic and ever changing perspective afforded by continued aerial reconnaissance it may be appropriate in some cases to record the interpretation rationale.

There is some disparity between the density of Iron Age settlement activity thought to be in evidence in the Trent Valley and the single site of burial (See Section 5.5.2.1). The location of this cemetery may indicate a preference for riverside locations and thus other sites may be sealed by alluvium precluding their discovery from this method of prospection.

Chadwick (1999) has identified that the distinction between burial and ritual activity and utilitarian activity was not defined in later prehistory on the same basis as in earlier periods. In this case the non-utilitarian aspects of everyday life may be inherent in the utilitarian landscape and not readily identified from the evidence of cropmarks alone.

The sample of ritual monuments of the prehistoric periods is small and there is little justification in examining patterns of distribution. However the general bias towards the Trent Valley over landscapes within the project area is interesting. The absence of evidence for prehistoric ritual and burial archaeology in the Mudstone and Leicestershire Wolds landscapes reflect the heavy soils of this area and the paucity of information on levelled features in general. However cropmarks are well formed on the lighter, free draining soils of the Sherwood Sandstone and the relative rarity of the ring ditch form in this landscape may be significant.

5. THE TRENT VALLEY.

5.1 GEOMORPHOLOGY AND HISTORY OF THE TRENT VALLEY SYSTEM.

The dynamics of the Trent Basin are essential to the understanding of the archaeological landscapes represented in this area, however a full discussion of the development of the valley system is beyond the remit of this project.

A useful synthesis of the geomorphological history of the River Trent is provided by Archaeology and alluvium in the Trent Valley (Knight and Howard 1995) which details the reconstruction of the river dynamics from archaeological, geological and environmental data collected for two locations within this project area - between Holme Pierrepont and Colwick and between the Roman small town of Ad Pontem and Girton. The following period-based summary is drawn from this synthesis.

Through the Upper Palaeolithic into the Mesolithic periods the drainage regime of this valley was characterised by shallow, braided streams and mobile gravel islands. Floodplain terraces were produced by the down-cutting of these features forced by the low sea level. The vegetation was poor to consolidate, leaving deposits susceptible to wind erosion and re-deposition and resulting in the coversand formations now most apparent north of Newark.

Improvement in climatic conditions prompted gradual colonisation of the valley by mixed woodland species. This change in ground cover, and thus levels of water run-off, changed the character of the river to a single channel within a stable floodplain environment. Channels were cut into the floodplain, and the coversand deposits reworked into dunes.

The increasing impact of human activity during the Neolithic period, possibly encouraged by the continuing climatic optimum, was influential in the riverine environment. Continuation of the small-scale clearances instigated in the Mesolithic period was instrumental in the increasing deposition of alluvium and colluvium and possibly the impact of erosion events. Evidence from Colwick suggests in the Late Neolithic periodic major floods uprooted floodplain woodland and re-deposited material within the reworked floodplain gravels. A log jamb and human remains dating to the Neolithic were recently discovered below 4metres of alluvium in a palaeochannel some distance from the present course of the river in the parish of Langford (Garton pers. comm.). Recovery of such remains and ecofacts can indicate river courses at the time of deposition.

The increasing impact of human activity on the environment during the Bronze Age was concurrent with a decline in climatic conditions. The processes of deposition and erosion observed for the Neolithic, continued and increased.

The expansion of cleared land through the prehistoric and early historic periods significantly increased run-off and is thought to have precipitated increased alluvial

deposition, possibly extending to the fringes of the gravel islands. Such deposition would have sealed archaeological remains from earlier periods. At Littleborough and Staybridge archaeological investigations have demonstrated the incursion of alluvium into Romano-British occupation contexts.

Human impact on the riverine environment - modifications for agricultural and industrial purposes – increased through the historic periods. Projects undertaken to dam, drain and divert the drainage system and protect that infrastructure have greatly influenced the character of the channel.

Recognition of the dynamic nature of the River Trent and its variable impact on the valley landscape is essential to the understanding of the archaeological landscape as represented on the aerial photographs. The evidence for tree deposition during the Neolithic and Bronze Ages, together with the recovery of possible prehistoric canoes from Colwick, Holme Pierrepont and Shardlow in Derbyshire indicate the location of now redundant river channels (Knight and Howard 1995:37 and Figure 3.7). Investigations at Girton revealed a palaeochannel lying some 700 metres to the east of the present course of the Trent. This was possibly active in the Bronze Age (Knight and Howard 1995:66).

The distribution of levelled prehistoric archaeology recorded in the Trent Valley is generally limited to the gravel islands, as mapped by the Soil Survey of England and Wales (Figure 2 and 3) (SSEW 1983). Only occasionally were features buried in alluvium visible on the aerial photographs consulted. Areas of alluvium that do reveal archaeology, being generally close to the margins of the exposed gravel islands, are probably shallow or contain reworked gravel. Clearly such patterns of distribution reflect the limitations of this method of prospection rather than actual patterns of past settlement and activity. Moreover the complex history of the river, together with the restricted scope of ground investigations to date, precludes the accurate delimitation of the exposed, freer draining gravel islands for any particular period.

Along the northern and western fringe of the valley traces of medieval cultivation have been recorded either as vestigial earthwork or levelled remains (see Section 6). These features lie on deposits of alluvium and fine reddish loams.

5.2 PREHISTORIC ACTIVITY IN THE TRENT VALLEY

Human activity from the Mesolithic to the Bronze Age in this landscape is attested by the recovery of considerable quantities of artefactual material - mainly flint. Systematic field-walking programmes have revealed a negative correlation between the distribution of flint scatters datable to these periods and with the alluvial deposits. This relationship indicates that some alluvial deposition events have encroached areas of human activity and thus earlier artefactual and even structural remains may be sealed and preserved beneath the alluvium, as noted at Littleborough and Staybridge. (Knight and Howard 1995:78).

Neolithic and Bronze Age ritual activity has been tentatively identified from the air and is known from ground investigations (see Sections 4.1 and 4.2). A Bronze Age pile settlement is known from dredging of the River Trent near Clifton Grove in 1938 (NMR SK 53 NE 13, Allen 1997). Settlements of this form and location of are unlikely to be detectable through this method of prospection. Colluvial deposits with an Iron Age terminus ad quem at Site 4, Holme Pierrepont and Gamston indicate farming activity and thus suggest a contemporary settlement nearby (Knight and Howard 1995). As such the form in which evidence of Pre-Iron Age activity in the Trent Valley may take on aerial photographs is unknown.

Challis and Harding observed that palisaded enclosures were possibly precursors to the Iron Age ditched and banked enclosures (1975:131). Whimster identified the narrow ditch of a sub-circular enclosure at Cromwell as a buried palisade trench (1989:66). The enclosure (diameter 30m) intersects with broader ditched rectilinear enclosures [NT.175.41.1] (Figure 11.3).

Similarly narrow or fine ditches were recorded for a sub-circular enclosure (diameter 80m) less than 500 metres to the south-east [NT.175.57.1]. This example intersects with a wider ditched linear feature. Two other examples are identified to the north east of the Roman Town at Brough (diameter 60m) [NT.202.10.1] and on Langford Moor [NT.202.38.1]. The ill-defined internal features in both examples could be the remains of structures. However the Langford Moor and Brough examples are tenuous and appear in a landscape of soil patterning clearly reflected in complex cropmarks.

Interpretation based on the fineness of a ditch can be too subjective, particularly if there are no other features in the immediate locale with which to compare the cropmarks. There will undoubtedly be a bias against the recording and identification of more ephemeral features. A D-shaped palisaded enclosure (23 x 26m) recently excavated at Swillington Common, to the east of Leeds, West Yorkshire survived only as a series of post holes, mostly less than 1 metre in diameter (Howell pers comm). Although more substantial features in the immediate vicinity were visible on aerial photographs and the results of geophysical survey, the pits were not picked up by these remote sensing investigations. This enclosure is provisionally dated to the Iron Age.

5.3 THE EVIDENCE OF PRE-IRON AGE ACTIVITY IN THE TRENT VALLEY.

It is often stated that the aerial photographs of the Trent Valley are rich in the evidence of late prehistoric and Romano-British settlement and agricultural landscapes. Few, with the notable exception of Smith, have attempted to distinguish between the pre-Roman Iron Age and Romano-British settlement on this evidence, though many have acknowledged the challenge this poses (Smith 1977, Whimster 1989:84). The motivation to establish such a distinction is to see a more 'prehistorical' Iron Age in line with the new developing frameworks of the period (Hill 1989).

A culturally distinctive Iron Age in the Trent Valley landscape is attested by metalwork deposited in riverine contexts. Hallstatt-derived bronze swords have been recovered from the River Trent at Holme Pierrepont and Newark (Challis and Harding 1975:44). These artefacts, by the method of their entry into the archaeological record can reveal little about the location and form of contemporary settlement and communities. A single cluster of Iron Age burials were recorded on the banks of the Trent at Cromwell [NT.176.8] (see Section 4.3). The recovery of three possible Iron Age canoes from an ancient course of the River Trent, north-east of Holme Pierrepont Hall, also indicates activity during this period and illuminates the communication strategies of local communities (Knight and Howard 1995).

Few settlement sites of this period have been archaeologically excavated, and fewer are fully published. This situation is improving with the implementation of the Planning and Policy Guidance 16.

Archaeological features on the western edge of a gravel island, near Gamston have been investigated by TPAT (Knight 1992). These features were identified and recorded by J Pickering in 1977, the cropmarks were confined to a single field unit that is encircled by alluvium and the medieval agricultural remains. This project recorded a possible rectilinear field system and two rectilinear enclosures. [NT.72.10.1-5] (Figure 8.9). Geophysical investigations undertaken in advance of excavation did not identify any anomalies that corresponded to these features (Knight 1992). The excavations revealed a tentative sequence of pre-Iron Age ploughing, Iron Age open settlement, construction followed by abandonment of the smaller enclosure, establishment followed by redundancy of a field system and finally construction of the second enclosure possibly in the mid-1st century AD.

Summarised results from excavations at Holme Pierrepont report on the presence of four Iron Age settlement foci revealed in advance of gravel extraction (e.g. Knight and Howard 1995; O'Brien 1979a). The excavations at Sites 2 and 3 yielded evidence of continued occupation into the Romano-British period (Howard and Knight 1995). Further work in the area is expected.

Holme Pierrepont Sites 1 and 4 were recorded as short lengths of ditch, possible rectilinear enclosures, hut circles and pits on the aerial photographs [NT.69.3 and NT.72.3]. Site 2 is identified only be traces of perpendicular ditch, possibly defining rectilinear enclosures underlying levelled ridge and furrow but the cropmarks at Site 3 [NT.72.3] clearly define the plan of some of the underlying features. Other interpreters of air photo data have identified and mapped other features at these sites but the source of their information is not acknowledged (see O'Brien 1979a: Figure 2).

Elements of a late prehistoric and Romano-British settlement site at Gonalston were excavated in 1996 (Elliot and Knight 1996). The earliest feature identified, possibly late Iron Age in date, was over 160 metres of gently curving linear ditch - a possible land

boundary, cut by later settlement ditches. This project identified the later settlement as two contiguous, multi-ditched rectilinear enclosures [NT.32.4.1 and 5.1].

During 1991 to 1992 features at Aslockton on the edge of the Trent Valley and the project area were investigated by archaeologists during the laying of a new water main. The cropmarks indicated a complex system of enclosures and trackways [NT.216.4]. Pre-Iron Age to Romano-British features and remains were discovered during excavation at the site. The published interim report acknowledges the contrast between the layout of this site and others known to be of the same periods elsewhere in the East Midlands (Palmer-Brown and Knight 1993:147). Given the location and form of these feature they are perhaps best considered against the results of the Lincolnshire NMP (Winton 1998: Fig 5b). Recent reconnaissance by RCHME's aerial survey team has revealed more features in the vicinity of this site.

Past investigations at Rampton have revealed pre-Roman and Romano-British activity, and work is ongoing in the immediate vicinity (Ponsford 1993 and Garton pers comm)

Still within the Trent Valley but beyond the area of this project there have been extensive investigations of a rural Iron Age settlement at Fisherwick, Staffordshire (Smith 1978)

Settlement remains in the Vale of Belvoir were investigated in rescue conditions ahead of Gypsum extraction in 1970 (Todd 1975). Todd characterises the remains of huts, gullies and pits at Staunton Grange as a Roman rural settlement. Some of these features were dated by association to unstratified pottery recovered from the surrounding area and top soil. Although first and second century wares were identified the majority (90% of the total assemblage) were dated to between AD250 and 300 (1975:34).

Details of excavations at Kelham and Besthorpe are as yet unavailable and it has not been possible to correlate these sites with specific records from this project (Knight and Howard 1995).

The propositions for Iron Age antecedents to the Roman small towns at Ad Pontem, Brough and East Bridgeford are contentious (Whitwell 1982:27 and O'Brien 1979a:303). However the limited excavation evidence from these sites has little contribution to a morphology based investigation.

The remains of Medieval, post-medieval and modern industrial, settlement and agricultural activity such as the Manorial Earthworks at Rolleston, the deserted village at Little Carlton and the remains of Civil War fortifications are known in the Trent Valley [NT.198.50.1-10] (see Sections 3.4 and 6). Many survive upstanding along the valley edge and side although this does not preclude against the recovery of hitherto undiscovered sites. However much of the Trent Valley landscape consists of levelled sites with no attendant information. Many of these sites are thought to date to the Late-Prehistoric and Romano-British periods.

5.4 THE LATE PREHISTORIC AND ROMANO-BRITISH LANDSCAPES.

The levelled remains of three aspects of activity; structures, enclosures and boundaries and trackways are common features in the Trent Valley landscape.

5.4.1 STRUCTURES.

The remains of both curvilinear and rectilinear plan structures were identified in the Trent Valley landscape, subject to the problems of interpretation discussed in Section 4.2.

The structures' plans are not directly diagnostic of occupation in any single time period. The curvilinear forms or hut circles are generally associated with the round houses of the Iron Age. However Whimster has suggested that the remains of hut circles identified in the Trent Valley landscape could pre-date the Iron Age (1989:67). Hingley (1989:33) suggests this form may have persisted through the early centuries of the first millennia AD. The results of excavations at Staunton Grange indicate the round house form continued in use through the 3rd and 4th centuries AD (Todd 1975).

5.4.1.1 CURVILINEAR PLAN STRUCTURES

Hut circles recorded by this project and elsewhere are represented by an arrangement of pits or a continuous gully. Pit-defined remains are more easily reconciled with the structural requirements of a roofed, wattle and daub structure. The gullies are variously ascribed to drainage, structural, protection from stock and more esoteric functions. These structures were undoubtedly multi-functional and not restricted to domestic-type activities as demonstrated by results from excavations at Catterick Racecourse in North Yorkshire. A rectilinear arrangement of ditches revealed there, enclosed the remains of several round houses. Some of these structures were identified as dwelling places whilst another was clearly recognised as a specialised industrial area with a central furnace, stone moulds and copper waste (Moloney 1998). Clearly these are not distinctions that can be made from the evidence of the aerial photographs alone, thus all structures should be considered as the possible remains of any of a broad range of industrial, agricultural and occupational activities.

Most of the hut circles recorded by this project were recorded in association with more substantial features. The evidence for open settlement in the form of individual or isolated hut circles was limited. Such features may be rarely recognised from the air because of the subtlety of the crop response to small features defined by pits or shallow gullies. Some examples may have been misinterpreted as circular burial monuments or simply as enclosures (see Section 4.1.3.)

The traces of three pit-defined circular enclosures recorded at North Clifton may be the remains of an open settlement [NT. 162.2.1-2.3]. However the lack of cropmark evidence

for an enclosing ditch could be the due to the change of soil-type in the immediate vicinity of these remains.

A single pit-defined hut circle was identified amid an arrangement of rectilinear enclosures at Fiskerton-cum-Morton [NT.199.4.5]. Such small, indistinct features could be misinterpreted as a random group pits. Most of the features identified as hut circles by this project were defined by ditches or gullies.

The limitations of this medium in identifying such ephemeral features have been clearly exposed by archaeological excavation. At Site 4 Holme Pierrepont numerous hut circles revealed by excavation were not visible on the aerial photographs consulted although part of the surrounding rectilinear enclosure were recorded and mapped by this project (compare [NT.72.3] and Knight and Howard 1995:Figure 3.16). These limitations need to be heeded and absence of evidence avoided as a criterion for interpretation. The Site 4 investigations verified the Iron Age date of the settlement.

The aerial photographer is more likely to detect and thus record the ephemeral remains of these structures when they occur in an association with more substantial features than in isolation. This may introduce a bias into the record that could be misinterpreted as evidence of a trend in the development of settlements.

The association between hut circles and other features will be discussed below.

5.4.1.2 RECTILINEAR PLAN STRUCTURES

Villa type structures are a specific form of high status Romano-British settlement. They are generally of distinctive morphology and form in the East Midlands (Winton 1998).

Villa structures are known from excavations at Southwell, Thurgarton and Epperstone. Intrusive excavations in open areas of the historic town of Southwell revealed the remains of a substantial villa-type settlement. The villa identified at Thurgarton is thought to have been a timber structure constructed in the second century AD and later clad in stone (Whitwell 1982:111). The structure identified in the neighbouring parish of Epperstone is of similar date and has a small annexed room. There is no evidence for these structures on the aerial photographs consulted.

At Barton in Fabis localised variations observed in crop growth were attributed to possible underlying Romano-British structures in the last century (Watkins 1886:31). Contemporary excavations revealed a mosaic or tessellated floor. Investigations at the same site in 1951 revealed a possible winged-corridor plan villa - though much of the structure was apparently masked by modern farm buildings (Whitwell 1982). A circular stone-built structure of unknown function was also found in the vicinity. All the aerial photographs consulted post-date these excavations and reveal no further evidence for

the villa structure although short lengths of ditch in the immediate vicinity may be associated with the settlement [NT.8.2.1](see Section 5.5.2.1 and Figure 9.4).

Rectilinear-plan villa-type structures were clearly observed and recorded on sir photographs at Lockington Hemington (Leicestershire) [NT.116.5.2], Cromwell [NT.177.3.3] and Car Colston [NT.213.12.1]. The Lockington-Hemington and Cromwell examples were well presented in the context of possibly earlier and contemporary activity, whilst the form of Car Colston is preserved by extant robber trenches in the upstanding remains of the medieval landscape (O'Brien 1977).

Of these examples of Romanized dwelling types those at Southwell, Epperstone, Thurgarton and Car Colston lie above the gravel islands on the mudstones to the north-west, and in the case of the latter to the east of the River Trent.

Only three other examples of rectilinear enclosures were identified as the remains of structures by this project. A ditch-defined example (20 x 10m) at Cromwell located within a near-square enclosure has been variously interpreted as a timber hall of unknown date and a Neolithic mortuary enclosure (Figure 8.8) (Whimster 1989 and Jones pers comm) [NT.188.6.5.]. These remains are mis-aligned to the enclosing ditch and this may indicate non-contemporaneity.

Rectilinear arrangements of pits [NT.177.3.4] in close proximity to the Cromwell villa structure have been identified as a timber hall, probably associated with the villa building (Whimster 1989:79). The more detailed, larger scale mapping of the Trent Valley survey identified other examples in the same area. (Whimster 1989: Figure 59).

The transition from circular to rectilinear plan structures has been implicated in the progression from simple rural dwellings to more sophisticated habitation, induced by cultural contact with Romanized societies. However this is not consistently supported by the evidence of the archaeological record (Hingley 1989:35). Hingley notes that rectilinear forms have been identified in pre-Roman contexts (1989:35). Furthermore this morphology may reflect the requirements of a specific activity rather than a cultural choice such as the stabling of horses or the storage of grain.

These complex issues indicate that the presence and /or absence of these structural forms are inappropriate criteria for dating the period of use and that of associated features.

5.4.2 ENCLOSURES

Challis and Harding's statement 'Enclosures are a ubiquitous Iron Age trait' disguises their own hesitancy in proposing any definitive criteria for the actual identification of such features from the evidence of the aerial photographs (1975:130).

The enclosures recorded by this project in the Trent Valley may be placed within two broad contexts; single or visually dominant enclosures within small clusters of possibly contemporary features and as clusters of numerous enclosures. The first are referred to as simple enclosures, the second as complex enclosure groups.

The significance of enclosures and enclosed settlement in the British Iron Age has undergone considerable discussion in recent years. In Iron Age communities in Britain, Cunliffe (1991) recognised a developing, hierarchical Iron Age society in the archaeological evidence of the period. Hillforts - in all their variety, were identified as a 'specialised' form of settlement high in the hierarchy (1991:312). However the defensive role of such features remains implicit in archaeological nomenclature and Cunliffe's theories. This utilitarian interpretation of the boundaries of hillforts has often been extrapolated down the hierarchy to explain the enclosure of settlement during this period. Hingley (1990:96) suggested that within this hierarchical framework small-scale rural settlements would not have been subject to the same threats as the hillforts and thus such 'defences' would have been superfluous. Moreover as the current climate of archaeological thought is shifting away from the traditional, defensive role of hillforts so there must be a reassessment of the smaller-scale settlements.

Some archaeologists have regarded the enclosure of settlement in the rather one-dimensional aspect of protecting humans and stock from wild animals. The scale of boundaries recorded around some rural settlements, such as the 5 metres wide, 2 metres deep enclosure ditches recorded by Smith at Fisherwick - with associated banks would appear to exceed the requirements of such protection (1977:55).

In his statement "These informal clusters sometimes appear to be overlain and fragmented by more orderly settlement, thereby suggesting an earlier phase of open settlement….", Whimster reflects the linear developmental approach assumed for late prehistoric settlement (1989:67). However it has been shown that the transition from open to enclosed was not consistently one way (Hazelgrove in Hingley 1990). Rather boundaries are interpreted as a statement on social awareness. This framework implies enclosures were symbolic barriers to the external and unifiers to the internal populations. Thus the construction and destruction of boundaries would be of considerable social significance and could indicate periods of change and stability. It has been suggested that once constructed the enclosure developed into a symbol of status and prestige (Hazelgrove in Hingley 1990).

Various archaeologists have discussed the symbolic potency of enclosure boundaries and entrances (Hingley 1990, Hill 1989, 1993 and Bowden and McOmish 1987). Of primary importance in the recognition of the symbolism imbued in such features has been the initiation of a reassessment of the archaeological record of the Iron Age. This was prompted by the development in theories of 'structured deposition' in Neolithic ritual activity.

Within the traditional frameworks of utilitarian interpretations, ditches were assumed to be, most simply, the manifestation of quarrying for bank material and thus material recovered from such contexts was considered refuse, deposited gradually by anthropogenic and natural process. However consideration of the intention in the acts of deposition of artefacts and ecofacts, re-cutting and infilling, has greatly altered perceptions of the Iron Age. This reassessment has important ramifications for non-intrusive investigations as enclosure ditches are often the only visible expression of Iron Age activity on the aerial photographs.

However the results of excavation of Iron Age enclosures in the Trent Valley landscape such as those at Gamston, Holme Pierrepont and Aslockton present little in terms of temporally and functionally diagnostic features which could be extrapolated to unexcavated sites mapped from aerial photographs.

5.4.2.1 SIMPLE ENCLOSURES

The Simple Enclosures illustrated in Figure 8 were selected from visual examination of the map data. The selection is by no means exhaustive or objective and serves only to illustrate the variety and commonality between such features in this landscape.

Some of these simple enclosures have distinctive or elaborate entrances.

Two ditch-defined rectilinear enclosures at Carlton-on-Trent are linked by a length of trackway (Figure 8.1) [NT.175.9.1 and .5]. The track spans east to west the 90 metres between the enclosures and is c.15 metres wide. No further entrances into these enclosures were identified. The smaller and more westerly enclosure (70 x 50m) has evidence of several internal divisions and external features. The trackway constricts slightly at the narrower entrance of the smaller enclosure. The larger enclosure (70 x 70m) has no visible internal features though the remains of ridge and furrow overlie the area. The arrangement of these enclosures suggests contemporaneity. The differences in size and arrangement may reflect different functions, possibly in different aspects of stock management.

The curvilinear enclosure (c.60 x 50m) at Stoke Bardolph, has one straight side and a single projecting entrance [NT.241.10.3] (Figure 8.2). The south-east facing entrance, defined by parallel ditches set c. 10 metres apart extends some 50 metres from the centre of the straight side to the south-east.

A similar arrangement is noted at Hexgrave Park on the heavy soils fringing the Sherwood Sandstone landscape [NT.43.8.1.] (Figure 8.3). Splayed and slightly staggered ditch terminals define the south-facing entrance of the ditch-defined, sub-circular enclosure (diameter 30m). Parallel ditches projecting from the ditch terminals link the enclosure to a length of trackway c. 20 metres to the south-east [NT.42.8.2].

These entrance forms appear to meet the morphological criteria of the 'spectacle' and 'banjo' type enclosures (MPP 1988a: Figure 1). The MPP definition of Banjo enclosures distinguishes these from other forms by the arrangement of an inner ditch and outer bank. As discussed in Section 4.1.1. bank deposits rarely survive to sufficient depth to affect crop growth in intensive arable landscapes like the Trent Valley. Thus this criterion is inappropriate for many levelled sites.

The Stoke Bardolph and Carlton-on-Trent examples are situated on the relatively level river gravel terraces. However the entrance of the Hexgrave example leads up the hill slope into the enclosure which is a characteristic common of this type (MPP 1988a).

Cunliffe attributed this enclosure type to the mixed function of occupation and stock management - the distinctive entrance form being considered a specific functional adaptation for the efficient movement of domesticated animals whilst the MPP (1988) suggests they are settlement sites with elaborate entrances.

Excavated examples have generally produced evidence for Middle to Late Iron Age construction and occupation.

The rectangular enclosure at Bathley has a different form of entrance elaboration [NT.175.4.1] (Figure 8.4). The enclosure (70 x 50m) has rounded corners and an inturned entrance leading through the eastern side. The entrance, defined by parallel ditches extends c.30 metres into the enclosure. Similar forms of entrance were noted on two trapezoidal enclosures at Haughton [NT.60.15.1 and 17.1] in the Sherwood Sandstones landscape. The Bathley enclosure is also unusual in exhibiting evidence of a bank in the crop response. The traces of bank lie external to the enclosing ditch on the eastern side.

Although few of the other enclosures identified in this group have features as potentially diagnostic as these examples an easterly to southerly-orientated entrance is a common factor in the majority of examples. Of the seventeen examples where an entrance could be confidently identified, 15 had east to south facing entrances. The other two examples have south-west facing entrances.

In his study of the Thame and Trent valleys Smith (1977) suggested Iron Age settlements could be distinguished from the settlements of the Romano-British period by the simplicity of their ground plans. However the absence of evidence for complex internal structures and sub-division of internal space on the aerial photographs in not proof of absence of presence. Moreover for the group of Simple Enclosures simplicity of plan was inherent in the selection of this group for discussion.

A more detailed appraisal of the settlements selected as typical of each period suggests other unacknowledged criteria influenced Smith's interpretations (1977 fig. 2). Most of the enclosures he identified as typically Iron Age have broad ditches.

At Gamston the earlier, smaller enclosure has a substantial ditch up to 2.5 metres wide and up to 1 metre deep compared to the ditch of only 1 metre width defining the later feature (Knight 1992). The function of the smaller enclosure is unclear - although rich in varied artefactual and ecofactual debris no contemporary internal structural features were positively identified - leading the excavators to suggest it was dedicated to crop-processing or stock management (Knight 1992).

In light of new thinking on the Iron Age it is possible that the enclosing ditch was of real social significance to the Iron Age communities who built them and thus a potential criteria for the identification of activity of this date. Although it may be argued that width of cropmark does not necessarily reflect the width of the underlying ditch the NMP specification precluded against the recording of this potentially important detail. The recording of such details in text form may be a worthy consideration for future projects.

Considered retrospectively, some of the enclosures in this group clearly have proportionally wide ditches. The enclosing ditch of the banjo-type enclosure at Hexgrave Park was very substantial compared to the size of area enclosed and the nearby trackway and entrance ditches [NT.43.8.1] (Figure 8.3).

The enclosures at Bulcote [NT.57.3.1] (130 x 100max) and Rolleston [NT.192.12.1] (length 85m) define much larger areas (Figures 8.5 and 8.6). They appear to be of similar trapezoidal shape, although neither is complete. The ditches of each appear to be more than 5 metres in width and are certainly represented by much broader cropmarks than other ditches in the immediate vicinity. The irregularity of the ditch of the Bulcote enclosure suggests the ditch cutting may not have been a single action though this can only be verified by excavation.

Enclosures at Cromwell [NT.188.6.4], Norwell [NT.175.11.2] and Holme Pierrepont [NT.72.6.1] are also defined by relatively broad ditches (Figures 8.8, 8.7, 8.14). The Cromwell example is rectilinear whilst the others are curvilinear to D-shaped in plan.

Smith characterised Iron Age enclosures as rectilinear to curvilinear in shape, a description too broad to be diagnostic. Challis and Harding have identified D-shaped enclosures as Iron Age in date (1975:130). In the MORPH2 database D-shaped enclosures may have been categorised as curvilinear enclosures with 1 or 2 straight sides or as rectilinear enclosures with 1 or 2 curving sides depending on the degree of curvature. This plan is common amongst the simple enclosures.

Two examples of D-shaped enclosures lie in the same alignment to the banjo-type enclosure at Stoke Bardolph [NT.241.10.1 and 11.1] (Figure 8.2). Both have interruptions in their south-east sides that may be entrances. The three evenly spaced enclosures are offset from a north-east to south-west aligned ditch, possibly the remains of a trackway. The central enclosure is more curvilinear in form than the other two examples with the one straight side lying within 10 metres of the ditch. It may be that the form of this enclosure was constrained by the pre-existing ditch. Thus the morphology of a feature

may be constrained by factors other than function and cultural preference which may or may not be visible on the aerial photographs.

Two similar enclosures, both incomplete are located within 500metres of one another at Gunthorpe [NT.55.4.1 and 6.1] (Figures 8.11 and 8.12). Both have south-east facing entrances in straight sides - defined by slightly splayed ditch terminals. The remains of rectilinear enclosures are visible within the slightly larger example but their relationships to the enclosing ditch are unknown.

Small rectilinear enclosures are also noted within and straddling the enclosing ditch of a similarly shaped feature at Shelford [NT.56.7.1] (Figure 5.18). Again the relationship is unknown but in the latter case would appear to disprove contemporaneity of use.

The ditches defining a south-west facing entrance at Low Marnham may be the remains of a D-shaped enclosure [NT.183.16.4] (Figure 8.17). More complete examples are known at Grassthorpe (70 x 60m) [NT.183.28.1] (Figure 8.13) and Besthorpe (90 x 60m) [NT.179.3.1] (Figure 8.10) and South Muskham (70 x 55m) [NT188.10.1] (Figure 8.15). Smaller examples of more curvilinear form are known at North Muskham (30 x 25m)(Figure 8.16) and Cromwell [NT.175.29.1] (Figure 8.22).

The significantly larger irregular enclosure (c.130 x 120m) with straight and curving sides at North Muskham is defined by an interrupted ditch (Figure 8.19) [NT175.88.1]. It is not clear if these interruptions are real causeways across the enclosing ditch or simply a weak crop response to a continuous feature. Three sides of a rectangular enclosure and a large pit are positioned within the enclosure the relationship between these features is unknown.

The significance of the D-shaped and similar plans to those who constructed these enclosures is unknown. Entrances are often placed central to a straight side in these examples but this is not a consistent characteristic.

Other examples of simple enclosures within this landscape are generally rectilinear in plan with very rounded corners like the examples at Bulcote and Staythorpe mentioned above and those at Fiskerton-cum-Morton [NT.194.4 and 6] (Figure 8.20) South Muskham [NT.188.6.3] (Figure 8.21) and Cromwell [NT.175.44.2] (Figure 8.22).

A large number of the rectilinear enclosures are very simple in plan and associated with field boundaries. The three features at South Muskham are typical of this type (Figure 9.1). This type of enclosure was probably used for penning stock rather than human occupation and the form probably has a long history of use.

Smith claimed that internal round houses were a characteristic of the enclosures he identified as of Iron Age date. As discussed in Section 5.5.1.1, even if contemporaneity between a round house and enclosure can be demonstrated this does not necessarily confirm Iron Age occupation. It is not possible to do more than infer contemporaneity

between structures and enclosures from their spatial arrangements. At Fisherwick, Smith noted that the only round house identified, constructed within one of the enclosures, had been rebuilt at least three times in the same location near the centre of the enclosure (1978:95).

The possible hut circles within the enclosures at Grassthorpe [NT.183.28.2] (Figure 8.13); Holme Pierrepont [NT.72.6.2] (Figure 8.14) and Norwell [NT.1775.11.3] (Figure 8.7) and North Muskham [NT.188.10.1-3] (Figure 8.15) are the closest parallels to the spatial arrangements Smith noted at Fisherwick (Smith 1977: fig 2). Other simple enclosures may have similar features that are too ephemeral to produce a response in the overlying crop. Phosphate analysis undertaken at Fisherwick indicated stock animals were kept in the enclosed area around the house (Smith 1977).

However in many of the examples of simple enclosures the spatial relationships between enclosing ditch and the remains of structures are more complex. At Bulcote eight circular ditch-defined enclosures were recorded 50 to 100 metres to the north-west of the substantial trapezoidal enclosure (Figure 8.5) [NT.57.8.1-8 and NT57.3.1.]. The enclosures vary from <10 to 25 metres in diameter but the absence of any visible stylistic variation suggests an occupational rather than burial function. The southern section of the enclosure also intersects with a smaller, more angular enclosure of similar alignment [NT.57.1.1]. No structural remains were recorded within the enclosures.

At Fiskerton-cum-Morton and South Muskham the remains of hut circles are recorded within and beyond the enclosed areas (Figure 8.20 and .21) [NT.194.4.6, 7, 10-19 and NT.188.6.3].

The ditch of a trapezoidal enclosure at Cromwell [NT.175.44.2] intersects with the gully of a circular enclosure (Figure 8.22). Other internal structures lie very close to the enclosing ditch [NT.175.44.3-7]. Similar relationships are apparent between hut circles and the small D-shaped enclosure at Cromwell [NT.175.29.1] (Figure 8.23), two small near square enclosures also at Cromwell [NT.175.20.1-2 and 21.1-3] (Figure 8.24) and the polygonal enclosure at Kelham [NT.188.4.4] (Figure 8.25).

At the trapezoidal enclosure at Cromwell, the hut-circle appears to span an interruption in the enclosing ditch [NT.175.44.2 and 3]. This may indicate a form of entrance elaboration with a covered causeway across the ditch. However for the other examples these relationships and the added complication of internal or external banks appear to indicate non-contemporaneity between enclosures and those hut-circles. It is not possible to conceive of the relative chronology or deliberacy of these relationships from this evidence alone though there are excavated correlates.

At Gamston the ditch of the earlier enclosure cuts an arc of pits and slots - possibly the remains of an earlier structure (Knight 1992). Conversely excavations at Rampton indicated that mid to late second century AD post and stake defined huts cut a silted up,

ditch, possibly a boundary marker which had been in use since 30 BC (NAR 87 NW 17 source uncertain).

The relationships between these houses and enclosures though more complex than the model Iron Age farmstead proposed by Smith may correlate with the dynamism of Iron Age society proposed by Hingley and Hazelgrove (see Section 5.3.2). However on the evidence of large-scale excavation Cunliffe states, 'The actual enclosure, so dominant in the archaeological record, may have been a feature of transitory significance,' (1991:220).

Some of the simple enclosures form a very distinct group.

When visible on the aerial photographs the morphology and form of villa-status structures may be sufficient to identify a high status Roman settlement. However the remains of these buildings may not be visible for a variety of reasons and other criteria must be used to distinguish features associated with these types of settlement. In his study of a transect across north Lincolnshire, Jones suggested that large double-ditched enclosures were closely associated with villa-status settlements (1988).

Both the Cromwell and Lockington-Hemington examples discussed in Section 5.5.1.2 appeared to be enclosed by an outer compound. The feature enclosing the Cromwell villa was well defined but the eastern extent was difficult to distinguish from the complex enclosure system in the same location [NT.177.3.3] (Figure 9.2). The large rectangular enclosure was defined by a double-ditched boundary, with angular corners [NT.177.3.1]. The axis of the main villa structure was observed to be roughly central and aligned to these boundaries. There were traces of a smaller, rectilinear compound, also double-ditched, within which the villa also appeared fairly central. However the integrity of this feature and its relationship to the villa and larger compound are questionable [NT.177.3.2].

Slight traces of an outer compound are identifiable in the complex, multi-phase landscape around the villa structure at Lockington-Hemington [NT.116.5] (Figure 9.3). The straight linear ditches aligned with the axis of the structure may have defined a rectangular outer enclosure. However, a plan derived from aerial photographs published by O'Brien suggests the villa was enclosed by a polygonal compound (1979a:Figure 3).

The remains of the partially excavated villa at Barton in Fabis are not visible on the aerial photographs, however the discontinuous features linear features in the immediate vicinity could be the remains of a double-ditched outer compound [NT.8.2.1.] (Figure 9.4).

O'Brien identified complex cropmarks in the area to the south west of the Cromwell villa and suggested they marked the site of another villa-status settlement (1979a: Figure 4). This project recorded a double ditched enclosure (width 100m) of simpler plan with an internal enclosure and other linear features [NT.175.36.1 and 36.2] (Figure 9.5). No features were clearly correlate with the structural remains of a villa building.

Corresponding interruptions in the ditches of both enclosures roughly central to the eastern side may have defined an entrance.

As many as five double-ditched enclosures were recorded at Grassthorpe. The complete trapezoidal enclosure appears to have been the focus for the other enclosures [NT.183.25.3] (Figure 9.6). The other examples were incomplete and could be elements of a fewer number of larger enclosures [NT.183.25.2; 25.4; 32.1and 32.2]. Some elements of the cluster appear to be aligned with the ditches of a field system [NT.183.25.1]. The area of these enclosures has yet to yield evidence of a villa-type structure, and in the absence of alternative data the features cannot be securely dated, however they were fairly distinctive within this landscape.

A liberal interpretation of these potential villa-compounds shifts the bias in the distribution of high status settlement of the Romano-British period from the landscape of the mudstones to the gravel terraces and the valley floor of the Trent Valley landscape. However, as remote sensing investigations on the mudstones are less successful than on the gravels on the valley floor other examples may have eluded discovery.

5.4.2.2 COMPLEX SETTLEMENTS.

Many of the enclosures identified by this project within this landscape were grouped in complex linear and other arrangements and were less easily categorised by reference to their individual shape and form. In most cases these groups appear to have been of some longevity or at least to have undergone some internal reorganisation during the life span of the site. In this respect it proved difficult to distinguish 'real' units of land from those created artificially by the superimposition of linear boundaries from different phases. Moreover the complexity of the crop response is undoubtedly exceeded by the actual layout of the underlying features.

The most cohesive groups of enclosures are those clustered along trackways. Other clusters lacking any such foci are difficult to interpret as cohesive entities rather than disparate superimposed features.

At Sutton-on-Trent the enclosures of a complex, multi-phase linear system flank the western edge of a north to south aligned trackway [NT.182.1.3] (Figure 10.1). The eastern side is defined by rectilinear enclosures and a single ditch. The southerly extent of these features appears to be masked by alluvium but although the contemporary position of the River Trent is unknown it is possible that the trackway led to its banks. Further sections of trackway to the north of these features fork to the south-east and south-west [NT.182.1.1]. The south-easterly fork is roughly aligned with the more southerly section and may have been part of the same route.

The enclosures of this group appear to be generally rectilinear in form and of various dimensions between 20 x 20 metres and 45 x 45 metres. There are traces of pits to the

west of the enclosures and a possible hut-circle lying within an enclosure east of the trackway. Together these features probably represent a settlement of various activities including occupation and stock management with several phases of organisation.

Similarly at Cromwell the overlapping enclosures flanking the eastern side of the north to south aligned trackway probably represent several different phases of activity [NT.175.27] (Figure 10.2). The western edge of the trackway is defined by a single ditch which is abutted by perpendicular boundaries probably delimiting contemporary units of land. The eastern limits of this group of features are masked by alluvium. Eight possible hut circles were identified within this cluster. Several occur along the west of the road but others occur amongst the enclosures, either intersecting with enclosure ditches or between enclosures.

At Slake Lane, South Muskham superimposed rectilinear enclosures of various sizes flank an east to west aligned, trackway [NT.188.17] (Figure 10.3). The modern Slake Lane truncates the enclosures north of the trackway and the relationship between the two is not well defined. Several small hut circles are recorded amongst the smaller enclosures. Ditches extending further beyond the enclosures from the trackway may have enclosed paddocks and fields.

At Fiskerton-cum-Morton large rectilinear enclosures flank the western edge of a north-east to south-west aligned trackway. The eastern edge is defined by a single ditch and was possibly also abutted by enclosures in parts. The rectangular enclosures were characterized by their size and rounded corners [NT.199.22.2] (Figure 10.4). Further enclosures of similar form and alignment are located to the north-east but the trackway is poorly defined there. Again ditches extending beyond the enclosures may have delimited associated land units. These features are also traversed by a parallel arrangement of probably unrelated linear boundaries.

These examples are similar in form and arrangement to the settlement excavated at Site 3 Holme Pierrepont (Figure 10.5). Excavations revealed occupation from the Iron Age to the 2nd century AD at the site (O'Brien 1979a: 303). The later phases of occupation correlate with the broad east to west aligned trackway flanked by rectilinear enclosures visible on the aerial photographs. Although the trackway through this settlement is considerably wider than that observed through the above examples this site otherwise represents the closest excavated analogy to date. Knight and Howard (1995) suggested the later elements identified at Site 3 at Holme Pierrepont were characteristic of the rather low status Romano-British settlements in this landscape.

At North Muskham the group of rectilinear enclosures are offset from the well-defined crossroads extending approximately north to south and east to west [NT.175.80.10-15, 80.2 and 4] (Figure 10.6). These enclosures lie between the north-south aligned trackway and the present course of the River Trent and are partially masked by alluvium. The enclosures are apparently distributed with respect to units of land defined by ditches running perpendicular to the north to south-aligned trackway. In this example the main

focus for the settlement appears not to have been the road, although the two may have been contemporary in usage, but the river bank. Hut circles are visible within the larger units of land associated with the trackway and a small rectilinear enclosure may indicate the remains of a long rectangular structure (c.8 x 18 metres). The site also has evidence of later use in the remains of a mill base.

At Cromwell the enclosure cluster though complex appears well organised along a linear system [NT177.2] (Figure 10.7). The focus for this arrangement is unknown as the eastern extent of these features is masked by alluvium. The alluvium may mask a track or indicate the course of a contemporary channel of the river. Interestingly these enclosures encroach within the land enclosed by the villa compound [NT.177.3].

The distribution of the enclosures clustered at Normanton-upon-Trent is less uniform than that observed for the above examples [NT.184.16] (Figure 10.8). The enclosures are mostly rectilinear with rounded corners and range from 15 x 25 metres to over 50 x 50 metres. The northern section of the cluster does not have the level of complexity seen to the south and in the above examples. This cluster is nucleated around a forking trackway which may give it a superficially different character to the above examples.

However the organisation and form of the enclosures at Collingham are significantly different to the Holme Pierrepont type arrangement [NT.178.6.1-15] (Figure 10.9). Individual enclosures are clearly defined and range from rectilinear with rounded corners to irregular curvilinear plans. The visible elements of this group lie mainly to the south of a broad east to west aligned trackway with narrower tracks branching off through the enclosures. The visible extent of this group is comparable in area to that enclosed by the broad ditches of the Roman small town of Crococolana at Brough. There are however no close parallels to the Collingham settlement from the Nottinghamshire NMP. This group does bear comparison to the Saxon settlement site at Riby Cross Roads, Lincolnshire and some of the possible Anglo-Saxon curvilinear enclosure complexes recorded in the Yorkshire Wolds, particularly the example from Garton parish (Steedman 1994 and Stoertz 1997:fig 30.6). However the character of the spatial organisation of the features at Collingham are also similar to that recorded by the Lincolnshire NMP at the Roman small town of Segelocum (Winton 1999: Fig. 4.4.1). Segelocum, near Littleborough lies circa 20-25 km downstream of Collingham.

The arrangement of two groups of enclosures at South Muskham suggests a different attitude to spatial organisation [NT188.22 and NT188.67] (Figures 11.1-2). In the absence of any apparent foci these groups combine enclosures with land plots, paddocks or fields with the remains of huts visible in both. Both groups included a substantial enclosure similar to those described as D-shaped in the discussion of simple enclosures above [NT188.22.4 and NT188.67.1] (Section 5.5.2.1). Although it is difficult to ascertain the relative chronology of features within these groups it is clear that these enclosures are not related to the ditches of other enclosures and paddocks with which they intersect. Similar

relationships are apparent at Normanton on Trent [NT.175.42.1 and 36.1-2] and Cromwell [NT184.16] (Figures 10.8 and 11.3).

The cluster of features at Lockington Hemington appear to incorporate some of the distinctive simple enclosure forms, notable a double-ditched D-shaped enclosures and a rectilinear enclosure with an east-facing, out-turned entrance (Figure 9.3). These and other enclosures, paddocks and numerous remains of structures are cluster along a poorly defined approximately north to south-aligned trackway which coincides with the route of pit-alignment. These features are interestingly juxtaposed to the villa structure and compound less than 200 metres to the east [NT.116.5]. Despite their proximity there are no features visible that demonstrate a relationship between the two groups, although the pit alignment does veer to the east and may intersect the villa compound. O'Brien suggests the western group is either a pre-cursor to the villa settlement or that the two are contemporary and indicate a tenurial relationship (1979a:305).

5.4.3 SYSTEMS OF COMMUNICATION AND LAND DIVISION.

O'Brien suggested "recent studies of land boundaries have proposed the idea that the most stable element in the landscape may not be the homestead but the field and property boundaries" (1979a:307). Linear boundaries defined by ditches or pits are a common feature of the Trent Valley landscape. These may be remains of systems of land organisation and communication.

Ditches and corresponding banks have been employed to define boundaries from the Neolithic period to the modern day. Some of the linear features recorded by this project have previously been shown to be extant during the 19th century (Knight and Howard 1994:79). Thus, discussions of date and function require a broader perspective of the contiguous elements of systems, as detailed consideration of individual lengths of ditch is unrewarding. By contrast, pit-defined boundaries are generally agreed to be specific to the prehistoric and early historic periods (MPP 1989 and Wilson 1978).

5.4.3.1 PIT ALIGNMENTS IN THE TRENT VALLEY LANDSCAPE

Pit alignments are not however culture-specific. Archaeological excavations of some elements of the pit alignments at Ewart in the Milfield Basin, Northumberland produced evidence of a Neolithic construction date. In contrast, a series of aligned pits, closely related to the dyke systems at Cat Babbleton Farm in the Yorkshire Wolds, produced pottery dated from the late Iron Age through to the fourth century AD.

This project has identified several sets of pitted features as potential elements of the Neolithic ritual landscape [NT.4.2.1] [NT.188.60.1-2] (see Section 4.1.2). The distinction between these features and other pit alignments in the landscape was made on several points. The features at Cromwell are thought to be a cohesive and near complete entity

[NT.188.60.1-2] (Figure 6.5). The alignment of the pits did not appear to be centred through the individual pits. In addition, the two alignments were actually far from parallel and converged and diverged substantially at some points. These irregularities are not characteristic of most of the pit alignments across this landscape, which are generally more rectilinear and regular in plan.

A more rigorous case for culturally diagnostic pit alignments is made by the MPP (1989). Synthesis of the excavated examples has indicated that the shape of the individual pits in an alignment can be relevant to interpretation. The construction of round to oval-shaped pits can be seen to persist from the Neolithic through to the Romano-British periods. Pits of a more rectangular plan have generally produced evidence for Late Bronze Age to Middle Iron Age dates. However this morphological distinction can be rather subjective – Cardwell (1986) described the pits at Cat Babbleton Farm as 'sub-rectangular or ovate'; associated pottery sherds were dated to the late Iron Age and 2nd to 4th centuries AD. This morphological variation may be reflected in the pit profiles - the rounder form being generally of shallower sides whilst the rectangular examples, such as those excavated at Meadow Lane, Cambridgeshire have near vertical sides and flat bottoms (Pollard 1996).

Of the limited archaeologically excavated and published sites of the Trent Valley, few have yielded information on the nature and date of the pit alignments. The fills of a number of pits in alignment and a parallel ditch at Gunthorpe had been exposed and photographed from the air in advance of quarrying [NT.57.18.2]. Ground investigations by TVARC revealed a kiln and a Roman-date ditch (Wheeler 1968). The ditch is said to 'cross' the pit alignment but their stratigraphic relationship is unclear.

At South Muskham, archaeological investigations were instigated as a response to quarrying in 1968. The TVARC report (1968) on the findings of this site make no mention of the pit alignments that are seen on pre-quarrying aerial photographs [NT.188.43.1]. It is likely that these features had already been destroyed.

A small-scale excavation of two pits of an alignment at Long Bennington, Lincolnshire produced no dating evidence (Fearn 1993). This sample was too small to really illuminate the function of the pits or their association with the triple ditch dyke system in the immediate vicinity recorded by this project and extending into the Lincolnshire NMP area [NT.235.84.2].

Recent investigations at Gonalston, though centred on the remains of Romano-British enclosures, also featured a watching brief on seven closely interspaced rectilinear pits in a sinuous, linear arrangement (Elliot and Knight 1996). No firm date has yet been given for these pits - the excavators attributed them to the 1st millennium BC, however animal bone and wood debris retrieved from the primary fills may be suitable for radiocarbon dating.

The crop responses marking pits can often reveal their plan and thus the shape and inter-spacing can be determined from aerial photographs taken at suitable scale or height.

Wilson (1978:5) notes that the crop response to some pits weakens to the outer limits of the feature whilst others are sharply defined. This may reflect the differing crop response to fills of variable and constant depth.

The Nottinghamshire NMP specification could not accommodate the recording of this level of detail. As this information is of proven relevance it may be worthy of consideration for future projects.

As observed in the National Forest project area and in the Yorkshire Wolds linear boundaries of mixed form were recorded in this landscape (MacLeod 1995, Cardwell 1986). However only one descriptive form - ditch or bank or pit or foundation could be recorded in the MORPH2 database for each linear feature. By convention, this was generally the form with the greatest representation over the length of the feature. Thus many of the pit-defined boundaries mapped for this project could not be retrieved through the database and had to be sought visually from the mapping.

Various arrangements of pit alignments are known in the Trent Valley but interpretations based on unwarranted assumptions of contemporaneity between individual pit-defined elements are avoided.

In two areas within this landscape the arrangement of pit alignments is suggestive of cohesive but fragmentary systems of land division.

At Fiskerton-cum-Morton a system of pit alignments was identified from the north end of the gravel island at Rolleston possibly as far south as the Bleasby quarries [NT.199.29.1], [NT.199.4.1], [NT.207.23.2], [NT.207.9.1 and 13.1] (Figure 12).

Three near parallel, gently curving pit alignments lying on the gravel terrace on the north side of the river form the main axis of the system. These lie 450-600 metres apart between the present course of the river and the edge of the valley floor and reflect the meander of the modern course of the river at this point.

The most easterly pit alignment appears to run along the edge of the alluvial deposits - as mapped by the SSEW (1983). The central feature is defined by a pair of pit alignments and/or ditches lying 10-15 metres apart. The broad strips of land defined by the three linear features appear to be further sub-divided by east to west pit alignments. These were best represented in the area between Cooks Lane and Gipsy Lane. These features, as recorded, define the four sides of two land units and three sides of a third. If contemporary these features would have parcelled the land into fairly homogenous near rectangular units, measuring c. 450-650 by 300-350 metres. These boundaries may have extended beyond the limits of the gravel islands as they are defined today.

A similar arrangement of pit alignments was recorded 6 km to the north-east at South Muskham (Figure 13). Though fragmentary and less regular than the above example the system was visible over 2 km of the valley floor. In parts pits were recorded alternately

with short lengths of ditch. Only excavation may reveal the relationship between the pits and ditches as at Cat Babbleton Farm, Yorkshire Wolds where ditched features were demonstrated to re-cut the earlier alignments of pits.

The land units defined by the pit-defined and ditched divisions are less regular than those recognised at Fiskerton-cum-Morton but at 400-600 metres by 250 metres are of similar size.

Although these features are readily recognised as systems of land division, possibly served by pit-defined trackways in the Fiskerton-cum-Morton example, the motivation for the division is unknown.

Parallel pit alignments recorded to the south of Lodge Farm at Cromwell appeared to defined a broad avenue or droveway [NT.175.80.3] (Figures 9.1 and 13). This feature extends from within 200 metres of the present course of the River Trent, leading westward across the gravel terrace for a distance of over 550 metres.

Many of the pit alignments recorded by this project were identified as isolated and fragmentary features, particularly to the east of the River Trent. It may be that further intensive reconnaissance deliberately targeted away from the extensive enclosure systems may record the short lengths of linear features that constitute more cohesive systems. Reconciling the context of single pit alignments is essential to the interpretation of such features.

There is a general consensus that the pit alignments recorded by this project, and in many other landscapes, are not the remains of post-defined structures and features. Excavation, although limited does not substantiate the interpretation of such pits as post-holes nor Pickering's interpretation of the pits as boles for tree planting (1992:417).

Pit alignments are often regard as a functional alternative to ditches. Some Scottish examples of pit alignments are associated with continual banks, probably constructed from the pit up-cast. RCHME in A Matter of Time(1960:28) suggested that the up-cast from the pits was deposited between the dug features to produce a boundary of alternate pits and mounds. The close inter-spacing of some of the pits in alignments in this landscape does not support this idea. Unfortunately most of the English examples identified have been heavily truncated, precluding the survival of any such evidence. Investigation of two pits of an alignment at Long Bennington could not demonstrate the presence of a bank either in situ or as re-deposited material (Fearn 1993)

The relative efficiency of pit digging over ditch digging has to be questioned (Wilson 1978:5). The uniformity and precision with which pit digging must have been undertaken does not support this assertion. Thus the motivation to dig pits rather than ditches suggests alternative functional requirements that possibly could not be satisfied by ditches.

In The Emerging Past Whimster (1989) rightly asserts that important elements such as banks, fences and hedgerows may not survive in the archaeological landscape and the role of such features in the division of the landscape should be given due consideration. The 25 metres wide avenue at Cromwell would seem too broad to facilitate the movement of stock. Similarly the land units identified at Fiskerton-cum-Morton and South Muskham appear very large. It may be suggested that these pit-defined landscapes represent the temporary marking out of land in advance of hedgerow planting. However evidence from excavations at Gonalston and Meadow Lane Cambridgeshire suggests otherwise. The primary fills of pits excavated at both sites contained wood debris consistent with the management of hedgerows (Pollard 1996:106; Elliott and Knight 1996:164). Thus this would suggest that, in these cases, the hedgerows were well established before the pits were dug. Furthermore this would question the need to establish pit-defined boundaries in a landscape of established allotment.

Some archaeologists have looked to more symbolic interpretations of these features - "Pits and ditches … were themselves part of a symbolically constituted spatial text" (Hill 1989:21). As such these features may be regarded as correlates to modern signifiers such as the white lines in the middle of a road and that they are no longer decipherable should not be used to imply lack of symbolic significance.

The relationships between pit alignments and other features natural and anthropogenic, observed within the Trent Valley landscape have the potential to be illuminating. A frequent relationship is noted between some pit alignments and alluvial soils. As at Meadow Lane, Cambridgeshire several of the features recorded by this project appear to have been constructed in association with palaeochannels.

At Gunthorpe, close to the Trent and at Cotham on the River Devon pit alignments were recorded alongside the courses of now-redundant streams [NT. 55.3.1-3 and NT.211.6.1].

The Gunthorpe example and others, particularly those running through the parishes of Bleasby and Fiskerton-cum Morton were recorded along the limits of the alluvium on the gravel islands as mapped by the SSEW (1983) [NT.207.23.2 and NT.199.4.1]. The pertinence of these relationships in the prevailing environmental conditions at the time construction is unknown. The relationship of pit alignments and alluvial deposits as with any cut features is worthy of note in the light of the waterlogged deposits recovered from Meadow Lane, Cambridgeshire.

This again illustrates the requirement for a greater understanding of the changes in the landscape over the preceding millennia. To begin to understand the strategies of land management in the Iron Age and Romano-British periods it is necessary to understand the prevailing environmental conditions.

There are few examples of a visible spatial relationship between the pit alignments and the enclosures tentatively identified as Iron Age in Section 5.5.2.1

At Bulcote the ditches of the large trapezoidal enclosure are contiguous with an area defined by pits [NT.57.5.1 and 6.1] (Figure 8.5)

At South Muskham, the relationship between the elements of the pit alignments and D-shaped enclosure is confused by the cropmarks of field boundaries and possible paddocks [NT.188.23.1 and NT.188.22.1] (Figure 11.1). The projected route of the pit alignment runs through the enclosure.

At Bathley the ditches of an enclosure, with an in-turned entrance intersect with an alignment of pits [NT.175.74.1 and 75.2] (Figure 8.4). Their chronological relationship is not known.

The four lengths of pit alignment were recorded in the vicinity of the Cromwell villa may part of a system of land division as seen at Fiskerton-cum-Morton and South Muskham [NT.177.1.1-2] (Figure 9.2). Although contained by pits to the north and south neither the villa compounds nor the identified structures appear aligned to these linears. The complex enclosure group [NT.177.2.1-5] along the western edge of the outer villa compound is similarly delineated to the north and south by the pits.

The villa at Lockington-Hemington is also located within a landscape demarcated by pit alignments.

5.4.3.2 TRACKWAYS AND FIELD SYSTEMS

Linear ditches were far more prevalent than pit alignments in the Trent Valley landscape. Whilst in some areas the integrity of the landscape was such that the inter-relationship of such features suggested cohesive systems of land demarcation, in many areas the record was rather fragmentary. As such, it was often impossible to ascertain a relationship or non-relationship between features based on observations of respect, abutting, intersection and alignment. Furthermore, unlike the individual elements of pit alignments, there is nothing essentially diagnostic amongst forms of linear ditches as delineated by cropmarks. Map regression techniques may illuminate on some aspects of the landscape stratigraphy but cannot definitively date features. Thus the patterns of land division, isolated and identified in a multi-period landscape may be heavily influenced by the preconceptions of the forms that those systems should take rather than the archaeological reality.

In Section 5.5.2.2 certain forms of settlement, recorded in the Trent Valley landscape by this project were tentatively attributed to the Romano-British period. Although several criteria were identified to distinguish these settlements, the general basis for interpretation rests on the single analogous excavated site at Holme Pierrepont. As revealed at Site 3 Holme Pierrepont and discussed in Section 5.5.2.2, these interpretations do not preclude against earlier occupation at these sites.

The evidence for the local infrastructure of these settlements was generally limited to the evidence of the associated trackways. It is unlikely that such features and settlements operated in isolation but the integrity of the landscape is compromised by elements of the modern and natural landscape.

On the west banks of the river between Fiskerton-cum-Morton and Cromwell several of the trackways and associated settlements are aligned with the modern course of the river. They general lie either close to the rivers edge as at Rolleston [NT.192.9.1], South Muskham [NT.188.47.1], North Muskham [NT.175.80.4], and Sutton-on-Trent [NT.182.1.1-2] or closer to the edge of the valley floor such as at Fiskerton-cum-Morton [NT.175.22.2] and Cromwell [NT.175.27.1].

Other trackways and associated settlements are aligned near perpendicular to the modern course of the river and thus these other elements of the landscape. Trackways at Normanton on Trent [NT.183.16.1], South Muskham [NT.188.47.1 and NT.188.30.1], North Muskham [NT.175.80.4], Sutton-on-Trent [NT.183.3.1], Cromwell [NT175.34.1] and Kelham [NT.188.4.2] traverse the gravel islands between the river and valley edge.

It is tenable to assume some contemporanity in use and continuity of these features to a suggest network of trackways divided the valley floor north and west of the river into rectangular parcels of land, best represented between Kelham and Cromwell (Figure 13). This does not necessarily require that all trackways were established at the same time nor contemporaiety between the associated settlements.

Along the valley floor elements of this tentative system of communications are retraced in the present road network. Between South Muskham and Little Carlton, Slake Lane is aligned along the route of a levelled trackway with associated settlement [NT.188.17.3]. Slake Lane truncates elements of the trackway and settlement. Similarly Mill Lane, between the Great North Road and North Muskham runs parallel to the course of a levelled trackway [NT188.47.1].

Further North between Laneham and Sturton le Steeple the present pattern of communications has a similar rectilinear arrangement to that noted above. This incorporates the course of the Roman Road (Margary 28a) between Sturton le Steeple and Roman Segelcvm at Littleborough on Trent. This may reflect remarkable continuity in this landscape or simply coincidental responses to similar communication requirements.

The wider context of Roman communications in the Trent valley is complex.

The Foss Way, linking Cirencester and Lincoln enters the valley at Cotgrave and runs near parallel to and east of the modern course of the river through to Newark. Beyond Newark the road continues a north-easterly course towards Lincoln whilst the river flows northward. Branches or spur roads to this major Roman route are known of or suggested at several points along the valley.

An east to west aligned spur road is partially evinced in the archaeological record between the River Trent and the Foss Way at Norton Disney (Lincolnshire) (RR590 NMR SK 86 SW 49). The route of the road is preserved in the modern North Scaffold and West Brook Lanes. The approach to the river may be indicated by the remains of a potential Roman bridge discovered and removed from the river between Cromwell and Collingham in the early 19th century (NMR SK 86 SW 7).

To the south the location of the temporary camp at Holme near the riverbank may indicate a crossing in the vicinity (Welfare and Swan 1995:149). Less than 3 km to the south, material evidence for a further crossing was revealed during a period of low water levels in 1952 (NMR SK 85 NW 4). The timber piles were removed from the river at Winthorpe but remain undated.

The Roman remains recovered at Thorpe are identified with the known station of Ad Pontem and may indicate the location of a further river crossing. The site is also coincident with the projected intersection between the Foss Way and the levelled Roman road at East Stoke [NT.209.4.1-2].

These examples suggest destinations or origins on the west bank of the river unfortunately masked by modern settlement or heavily alluviated land, although they may also indicate strategic access points to the river itself.

The Thorpe crossing is thought to lead to the vexillation fortress at Osmanthorpe or contemporary settlement in the Greet Valley (Bishop and Freeman 1993). There are bands of gravel along the valley floor associated with 1st to 2nd century AD artefacts which may mark the route of the road but no such features were identified on the aerial photographs.

Less than 2.5 km south-west, in the parish of Syerston, the Foss Way intersects with Long Hedge Lane. Long Hedge Lane is believed to be a prehistoric trackway that has been fossilised by modern minor roads and in parish boundaries (Whitwell 1982). Extending from the River Devon at Alverton, the lane obliquely intersects with the Foss Way and runs towards The Nabbs - an island in the middle of the River Trent. The track has incised the deep descent to the riverbank (OS Provisional Edition 1:10 560 scale). Cartographic and documentary research on the Southwell Charters of AD956 suggests an early trackway extended from The Nabbs to Beck Dyke via Quern Hill, between the parishes of Bleasby and Fiskerton-cum-Morton (Lyth and Davis 1992). This may be a continuation of the Long Hedge Lane route.

Excavations at the Roman small town of Margidunum on the Foss Way indicated contemporary use of a bridal path now known as Bridgeford Street from the town to the river bank (Oswald 1927 in NMR Linear 335). Bridgeford Street approaches the river opposite the village of Gunthorpe. The medieval ferry known to have operated at the East Bridgeford to Gunthorpe crossing may have had a longer history (NMR SK64 SE 21).

The Gunthorpe crossing has been suggested as a route between the Foss Way and Chesterfield (NMR linear 335). No physical evidence for this feature was apparent in the valley, west of the river, but a route through Gunthorpe, Lowdham along the route of modern minor roads and along side Dover Beck would seem most likely. This road is known further north at Ollerton (see Section 3.2.4).

The evidence for more detailed land division associated with the settlements and/or trackways is more intractable. Field systems of the Romano-British period have been investigated at Gamston and possible field boundaries at Gonalston . The excavations at Gamston opened a window on a small section of a possible co-axial field system (Knight 1992). The ditched system defined small plots(10 x 30 m) of land and was dated to the late Iron Age to early Romano-British periods [NT.72.10.3].

Linear features extending beyond trackways and settlements at Rolleston [NT.192.9.1], South Muskham [NT.188.47.2], North Muskham [NT.175.80] and Cromwell [NT.175.27.2] may have defined contemporary units of land (Figure 13). This sparse evidence indicates land around the associated settlements was divided into long strips c. 100-200 metres wide which ran perpendicular to the trackways. Features not visible on the aerial photographs such as fencing and hedgerows would undoubtedly have further divided these units.

At North Muskham this rectilinear system is also defined by pit alignments and the avenue discussed above. In general though pattern of strip fields and trackways are incongruous with the units defined by pit alignments discussed in Section 5.5.3.1. This is best observed between Kelham and Cromwell (Figure 13).

5.5 CONCLUSION

This section has considered selected elements of the Trent Valley landscape. These elements represent only a small sample of the enclosures and linear features recorded but they illustrate significant aspects of both variability and homogeneity in morphology.

The interpretation of the archaeological landscapes recorded by this project in the Trent Valley has been hindered by the paucity of archaeologically excavated and published material, particularly with regards to dating those landscapes. However it appears settlement remains the Neolithic and Bronze Age communities known to have inhabited the valley were too ephemeral to be identified on the aerial photographs.

The selected enclosures are identified as either simple or complex forms. Some of the simple enclosures demonstrate a suite of traits such a broad ditches, elaborate entrances and D-shaped plans that have previously been identified as characteristics of Iron Age settlement.

The more complex groups of enclosures described are similar to the features at Site 3 Holme Pierrepont thought to be typical of a low status Romano-British settlement.

Several groups of features display chronological depth with superimposed simple and complex forms. Continuity is displayed at the excavated sites of Holme Pierrepont Sites 2 and 3, Gamston and Aslockton.

Rectilinear plan structures were generally limited to the known villa sites in the valley, curvilinear plan structures – the remains of round houses were identified as isolated features and within and around the simple and complex group enclosures. Contemporaniety between house and enclosure can be suggested for a few of these examples but in most cases the chronological relationships are unknown. Chadwick (1997) suggests that the continued preference for the round house form as demonstrated at Holme Pierrepont and Staunton, demonstrates some level of cultural resistance.

The nature of land division in these two periods is difficult to extract from the cropmarks of the complex multi-period landscape of the Trent Valley.

The numerous pit-defined linears are tentatively attributed to the Iron Age as some form of boundary markers not necessarily associated with the allotment of agricultural units. Other forms of land division either ditches, visible but un-dateable or hedgerows and fencing were probably also in use in this period. The spatial relationships between possible Iron Age enclosures and the pit alignments may be significant in understanding the nature of the boundaries they represented.

Communications in the Trent Valley in Romano-British period were complex and part of a much greater developed system. The evidence for the south and east of the Trent suggests these communications grew and developed from prehistoric networks. This is probably true of the network of levelled trackways observed north and west of the Trent despite the slightly planned character of their layout. The river would have been an important route in this system.

Land allocation for agricultural activity in this period may have been based on this framework of communications, but in general the evidence is sparse and limited to the immediate vicinity of the complex enclosure groups alongside the trackways.

The archaeology visible on the air photographs is undoubtedly only a small sample of what survives and has been previously destroyed in this landscape. Significant areas are masked by alluvium and it is here that many sites have been excavated in recent years (Garton pers comm). It is not tenable to construct models of settlement based on the evidence of the cropmarks alone.

6. POST-ROMAN TO LATE MEDIEVAL SETTLEMENT AND ACTIVITY

PERIOD	NO. OF MORPH2 RECORDS (OF WHICH ARE FIELD SYSTEMS OR RIDGE AND FURROW)
Early medieval	1
Late medieval	436 (347)
Medieval (unknown date)	178 (22)
Total medieval sites	615 (369)

Table 6. Medieval sites recorded by Nottinghamshire NMP project .

Medieval sites total 615 of the 3,560 MORPH2 records created by the Nottinghamshire NMP project. As Table 5 indicates 60% of these records relate to sites of ridge and furrow or field systems whilst further records identify field boundaries and headlands.

Just over 50% of all the records created by the Lincolnshire NMP project relate to medieval period sites (Bewley 1998: 9 and 15), whilst these periods are represented by only 17.25% of all the Nottinghamshire NMP records. This is despite this project's extended remit regarding the recording of ridge and furrow (see Section 1.4.1)

Although there are distinct differences in the cultural background and the survival of monuments between these two neighbouring counties there were also significant differences in the scope of the two projects. Due to financial constraints this project could not examine and interpret the substantial coverage of historic vertical photographs held by both NLAP, NMRC and the local collections as has been the practice of other NMP projects including Lincolnshire to date. This has undoubtedly had a significant impact on the recording of medieval upstanding remains in a county were the emphasis in specialist aerial reconnaissance has been on the cropmark landscapes.

Consultation of the historic vertical photographs will substantially enhance the existing record of surviving monuments of the medieval periods and improve or knowledge of those masked or destroyed over the last 50 years by development and expansion. For example a cursory examination of historic vertical aerial photography of the Westborough motte, on the banks of the River Witham has revealed considerably more detail in the surrounding fields than was afforded by the limited specialist oblique photographs consulted for the NMP mapping [NT.235.30.1-2].

Anyone using the analysis of medieval settlement and activity should bear in mind the potential lack of data (in comparison to other projects) because the historic verticals were not consulted.

6.1 EARLY MEDIEVAL REMAINS

The early medieval period is represented by a single mound at Farnsfield [NT.39.6.1] in the MORPH2 database. Investigations of this feature have revealed it to be an Anglo-Saxon burial mound (NMR SK65SW 4).

The MONARCH records indicate a somewhat broader distribution of activity in this period (see Figure 14). The evidence of early medieval settlements and structures, burial inhumations and cremation cemeteries and find spots suggest concentrated activity along the Trent Valley and across the mudstones and clays.

The reasons for the apparent absence of evidence for early medieval sites on the air photographs consulted are manifold and their explication essential to future analysis or investigations.

Primarily, as mentioned above, the photographic sources consulted for this project were not exhaustive and evidence may yet be found on the vertical photographs for features of this period.

In the absence of a firm archaeological framework of understanding for this period it is difficult to distinguish early sites from later medieval remains and many ambiguous sites were recorded as being 'medieval but of an unknown date. Similarly it is rarely possible to distinguish between the remains of early medieval settlement and Romano-British and even Iron Age sites from the morphology of a site alone.

The site of a Saxon settlement at Riby crossroads, Lincolnshire provides the closest model for such sites in Nottinghamshire. The air photo evidence for the site is characterised by numerous, loosely-nucleated, irregular curvilinear enclosures. A narrow trench cut through the area of cropmarks was excavated in advance of pipeline construction in 1991. These investigations revealed several phases of occupation from early to middle Saxon date including domestic and stock enclosures and possible Grubenhäusen or sunken buildings (Steedman 1994). In the Yorkshire Wolds, similar clusters of accreted, irregular curvilinear enclosures were found often in conjunction with possible Grubenhäusen. These too were identified as possible Post-Roman settlements (Stoertz 1997:59).

As described in Section 5.4.2.2 the complex group of enclosures at Collingham are similar to the Riby complex and the examples in the Yorkshire Wolds. However no evidence of Grubenhausen were recorded at Collingham or indeed elsewhere by this project. The morphology of the site at Collingham is also comparable to that of the Roman town of Segelocum near Littleborough.

Furthermore the continued or re-occupation of Romano-British sites in later periods as evidenced from investigations at Thurgarton (NMR SK64NE 10) indicates such distinctions may be over-simplistic.

There is a marked absence of MONARCH records for the early medieval period on the Sherwood Sandstones.

6.2 LATE AND UNDATED MEDIEVAL ACTIVITY

A broad range of late medieval sites and those of unknown medieval date were recorded by this project.

6.2.1 RIDGE AND FURROW

The majority of the late and undated medieval records are for the upstanding and levelled remains of ridge and furrow and field systems. Although this NMP project followed an extended remit regarding the recording of ridge and furrow this may not have been followed consistently at the start of the project (see Section 1.4.1). The attribution of these cultivation remains to the late medieval period was generally not informed by other evidence.

The areas of medieval cultivation are broadly distributed across the landscapes of mudstone and clay geology with a notable concentration on the heavy soils around Dover Beck (see Figure 15). There is a marked absence of evidence for medieval cultivation across the Sherwood Sandstones.

6.2.2 MEDIEVAL SETTLEMENT

The Nottinghamshire NMP identified specialised sites of this period such as abbeys, castles, motte and bailey groups(see Section 3.3), moats and post mills. There are also the remains of rural settlements, deserted and shrunken villages and farmsteads and individual elements of these such as tofts, crofts, building platforms, pits, fishponds, dewponds, hollow-ways and trackways. Many records identify other aspects of medieval cultivation remains such as lynchets, headlands and field boundaries.

The distribution of MORPH2 records for all these sites concurs with the broad pattern of distribution of MONARCH records for the earlier medieval period (see Figures 14 and 15).

The late and undated medieval period records for sites other than ridge and furrow and field systems are concentrated in several locales.

The becks draining the heavy mudstone clays are the foci of medieval remains in the landscapes between the Rivers Idle and Trent. Amongst these sites are the settlement remains and surviving open field systems of national importance at Laxton. The majority of medieval features in this area survived as earthworks on the latest photography

consulted. This high survival rate is probably due to the dominance of pastoral farming in the area in the post-medieval periods to the modern day.

Several medieval sites are located along the on the valley edge and floor of the River Trent between Gunthorpe and Sutton-on-Trent. A substantial proportion of these sites have been levelled in this landscape where crop cultivation predominates.

There is a significant concentration of upstanding and levelled medieval sites around the Vale of Belvoir. Again these sites are located close to the rivers and becks draining into the Rivers Smite and Devon. The motte and bailey group at Aslockton [NT.216.10] lie towards the centre of this group.

A smaller number of medieval sites are dispersed along the western edge of the county along the fringes of the Magnesian Limestone.

The sparsest distribution of late and undated medieval records is across the Sherwood Sandstones. The few sites identified are generally restricted to the valleys of the Rivers Meden, Poulter and Ryton. This is a trend mirrored in the distribution of the early medieval MONARCH records for settlements and structures, burial inhumations and cremation cemeteries and find spots.

6.2.3 THE SHERWOOD SANDSTONES.

The Sherwood Sandstones have attracted considerable attention from aerial reconnaissance and ground-based archaeological investigations in the past 25 years. Derrick Riley reconnoitred the area regularly and methodically over much of that period (see Section 1.7.1). Although much of the Sherwood Sandstone landscape is under woodland or scrub cover the soils are light and free draining and areas under arable cultivation readily produce evidence for underlying features. Thus the apparent absence of evidence for medieval activity in this area is unlikely to be through inadequacy of survey of the levelled remains.

Figure 2 illustrates that the density of MORPH2 records in this area is second only to that of the Trent Valley landscape. The majority of records plotted for this area relate to the expansive landscapes of levelled field systems and enclosures known as the 'brickwork' field systems. These landscapes have been the focus for much of the archaeological investigations in this area of the county (e.g. Riley 1980, Chadwick 1997 and 1999, Deegan 1995, 1996, 1998, D. Garton TPAT pers comm, Robbins 1997).

The soils on the Sherwood Sandstone geology are rather friable and subject to wind and plough erosion. It is possible that the remains of ridge and furrow would not have survived modern aggressive ploughing regimes and thus appear to be absent. However it is difficult to accept that more substantial medieval features such as mottes, baileys, moats

and village remains could so easily be completely destroyed. The early historic vertical photographs may record any such remains that survived into the post-war periods.

Dating evidence for the expansive field systems and enclosures recorded across much of the arable areas of the Sherwood Sandstones is limited. The area is generally under-developed and thus excavation in the current climate of archaeological funding is uncommon. Furthermore the recovery of culturally diagnostic material and environmental data is rare. However investigations of features at Dunstans Clump, Babworth and Scrooby Top, Ranby indicate late Iron Age and Romano-British dates for those elements of the landscapes (Garton 1987 and Robbins 1997).

Some archaeologists have considered a much later date for the 'brickwork' field systems. John Samuels (pers comm) has investigated pre-enclosure field systems of similar plan on the heavy clays in the vicinity of Mansfield Woodhouse that were mapped by Sanderson in 1835.

On the Sherwood Sandstones there are some anomalous boundaries in the post-enclosure landscape, such as the long field boundary which serves as the parish boundary between Ranskill and Torworth. The long field boundaries and others in the parishes of Torworth, Ranskill, Barnby Moor and Babworth are similar in form and alignment to the long boundaries of the 'brickwork' field systems. The survival of these features may indicate extraordinary continuity of elements the 'brickwork' field systems from inception through to the present day or more simply the coincidental adoption of similar strategies of landscape management at different times.

The absence of ridge and furrow across the Sherwood Sandstones may reflect a different economic strategy in the medieval period to the intensively cultivated environment east of the River Idle. Rackham (1986) suggests the origins of the Sherwood Forest lie in the early medieval period and that the predominant environment would have been heathland and woodland. Such resources could have provided timber, coppice and charcoal as well as grazing and hunting. The Sherwood Sandstones are however poorly supplied with water, which would have been influential in the positioning of settlements. As noted above most features identified with the medieval period are distributed along the river valleys.

Although the MORPH2 records of medieval settlement are very limited across the sandstones, a greater density of settlement is indicated by the documentary sources (as recorded in the MONARCH database). These lost villages and hamlets, although only approximately located are also clustered along the river valleys and on the Keuper Sandstones (see Figure 16). In contrast the single and clustered enclosures associated with the 'brickwork' field systems are more broadly distributed across the sandstone block between the river valleys.

The religious community and the Crown's hunting interests in the area undoubtedly heavily influenced the nature and character of medieval settlement. The Sherwood

Sandstone landscape became a focus for religious foundations such as those at Rufford Abbey, Newstead Grange, Welbeck Abbey, Wallingwells Priory and Worksop Priory.

6.3 CONCLUSION

The record of the medieval landscapes mapped by this project has been compromised by the constraints of funding. There is now an urgent requirement to rectify these shortcomings by assessment of the existing vertical sorties and targeted reconnaissance on the upstanding and levelled remains of this period.

However a broad regional analysis of the MORPH2 data has highlighted several points of interest such as the distinctive distributions of late and undated medieval remains and the paucity of positively identified early medieval sites.

The Sherwood Sandstones today remain a sparsely populated area, the relative density of known prehistoric and Romano-British sites compared to that of later settlement may inform on the relative economic and political pressures at these times.

7. CONCLUSION AND RECOMMENDATIONS FOR FURTHER WORK

This report has examined the contribution of a morphological approach to classification and interpretation to the understanding and characterisation of archaeological landscapes based on the results of the Nottinghamshire National Mapping Programme.

This study concludes that there is a dichotomy between monument classification and archaeologically meaningful interpretations. A project of this specification and scope can only really aim to achieve the former though this should not be done blindly without consideration of contribution to the latter.

The results of the NMP are the consolidation of the evidence available at the point of mapping and are thus subject to change with consideration of other sources of photographs, continuing reconnaissance and further field investigation.

7.1 CONTINUED RECONNAISSANCE

Reconnaissance within this project's area has been continually pursued by RCHME Aerial Survey both through the duration of the project and since the completion of mapping. The data in Appendix I indicates the approximate latest date of photography consulted for each OS quarter sheet.

Since completion of the mapping stage Aerial Survey has deliberately targeted arable areas shown to have a paucity of cropmark sites. These may be large targets such as the mudstones landscape or small-scale, specific areas of the Trent Valley and Sherwood Sandstones.

As yet there is no specific framework for the recording of earthwork features arising from this project to date. Discussions in Section 3 have indicated the necessity for some strategy to monitor the survival of the upstanding defended sites of both the Iron Age and Civil War periods.

The potential for continued flying even in well reconnoitred areas such as the Trent Valley to reveal new aspects of past landuse is well realised in the re-assessment of the now scheduled feature at Gunthorpe (Section 4).

Aerial reconnaissance is now targeted in areas previously designated Military Air Traffic Zones as in the past these have been inaccessible and poorly reconnoitred. This is a significant development for areas such as Finningley, South Yorkshire in the Nottinghamshire NMP area.

7.2 FURTHER MAPPING

A strategy has been devised to ensure the incorporation of new data with the results of the Nottinghamshire NMP within the RCHME (Stone 1998).

In 1996 a pilot project was established to investigate the feasibility of updating NMP mapping data from new RCHME photography. From the first quarter of 1997 new archaeological features from new photography were appended to the existing NMP mapping on separate overlays (now digital mapping). Records were created in the Monarch database for all new sites and those sites previously mapped for the NMP with substantial additions.

There are no plans to update this dataset with the information from photographs taken between the date of mapping and the first quarter of 1997.

The resource of the vertical photographic coverage has been identified as essential to the fuller recording and understanding of Iron Age and Civil War remains and most significantly the medieval landscapes across the whole county.

7.3 FURTHER AERIAL SURVEY WORK.

The work of the NMP has identified specific issues in cultural resource management not fully reconciled within this project's specification. Once identified these issues may be addressed.

In 1997 Chris Cox of Air Photo Services Ltd was commissioned by Nottinghamshire County Council to undertake a survey of the early extractive industries on the coal measures to the west of the county (Cox 1997). This project consulted older, vertical photography not available to the NMP project.

The NMP map data has also contributed to desk-based assessments within the county in advance of excavation (e.g. Keith et al 1997).

7.4 MORPH2 AND MONARCH

A MONARCH event record has been created for the Nottinghamshire NMP project (UID 1074556). The wholescale transfer of MORPH2 data to the NMR Monarch database is under discussion. As stated above some MORPH2 records do have correlate Monarch records.

7.5 ARCHAEOLOGICAL INVESTIGATIONS

In 1996 Daryl Garton at Trent and Peak Archaeological Trust requested data from the Nottinghamshire NMP for areas of the Sherwood Sandstones. The completed maps for selected areas were provided for integration with the results of field walking. The objectives of this study are to recover, examine and record the artefactual evidence, to look at hierarchies of scatters across the landscape and their correlation with the mapped cropmark sites (D. Garton pers comm).

7.6 THE NOTTINGHAMSHIRE CC

Copies of the map overlays and the MORPH2 database have been forwarded to the Nottinghamshire Sites and Monuments Record curated by the Planning Specialists in the Environment Department. Work is ongoing to assimilate the NMP data with existing records. A pilot scheme is planned to digitise six quarter sheets for use in a digital environment. The overlay maps have proved an interesting comparison for existing SMR data and are being consulted in the formulation of strategies for the Regional Research Frameworks (Baddeley pers comm). There is potential for the use of both the map and MORPH2 datasets in research applications.

7.7 FUTURE POTENTIAL

The Nottinghamshire NMP project area forms a substantial block neighboured by the National Forest NMP area to the South and the Lincolnshire NMP to east. Both the National Forest and Lincolnshire projects encompassed significant areas of the Trent Valley. The results from these projects may significantly affect the interpretations given for the artificially defined area of the river system discussed in this report. Similarly there now exists a large corpus of information on two major river systems in England - the Trent Valley and the Thames Valley, which may bear fruitful comparison. This assimilation of data across the NMP projects will become increasingly significant as the areas covered expand (see Bewley 1998:10-12).

APPENDIX 1

Nottinghamshire NMP quarter sheets and completion dates.

Map quarter sheet reference	Completed by
SK42NE	12/06/95
SK42SE	12/06/95 [3]
SK45SE	13/06/95
SK43NE	13/06/95
SK43SE	12/06/95
SK44NE	13/06/95
SK44NW	12/06/95 [3]
SK44SE	13/06/95
SK45NE	13/06/95
SK42SE	12/06/95
SK45SE	13/06/95
SK45SW	13/06/95 [3]
SK46SE	13/06/95
SK52NE	[1]
SK52NW	[1]
SK52SE	09/06/95
SK52SW	09/06/95
SK53NE	[1]
SK53NW	[1]
SK53SE	[1]
SK53SW	[1]
SK54NE	[1]
SK54NW	[1, 3]
SK54SE	[1, 3]
SK54SW	[1]
SK55NE	[1]
SK55NW	02/07/95
SK55SE	[1]
SK55SW	[1, 3]
SK56NE	[1]
SK56NW	10/06/95
SK56SE	[1]
SK56SW	10/12/92
SK57NE	06/02/95
SK57NW	06/02/95
SK57SE	20/02/95
SK57SW	20/02/95
SK58NE	28/06/95
SK58SE	27/06/95
SK58SW	27/06/95
SK59SE	20/07/95
SK62NE	12/06/95
SK62NW	[1]
SK62SW	09/06/95

Notes

[1] completed prior to December 1993 when these records commenced

[2] excluded from final project area see section 1.2

[3] no features were recorded for these quarter sheets and no overlays were produced

No photographs taken or accessioned to any of the sources after the completed by date for each quarter sheet will have been consulted for this project. Photographs accessioned to the NMRC after each loan was pulled will not have been consulted for this project. For comprehensive listings of photographs consulted please refer to the memo field of the MORPH2 database.

SK63NE	01/01/92
SK63NW	01/01/92
SK63SE	01/01/92
SK63SW	01/01/92
SK64NE	01/01/93
SK64NW	01/01/94
SK64SE	01/01/94
SK64SW	01/01/94
SK65NE	22/11/94
SK65NW	14/11/94
SK65SE	07/11/94
SK65SW	07/11/94
SK66NE	19/12/94
SK66NW	13/12/94
SK66SE	19/12/94
SK66SW	13/12/94
SK67NE	14/03/95
SK67NW	02/02/95
SK67SE	30/01/95
SK67SW	26/01/95
SK68NE	31/07/95
SK68NW	23/05/95
SK68SE	02/05/95
SK68SW	10/05/95
SK69NE	28/04/95
SK69SE	26/04/95
SK69SW	05/04/95
SK72NW	12/12/96
SK73NE	11/12/96
SK73NW	11/12/96
SK73SE	12/12/96
SK73SW	12/12/96
SK74NE	09/12/96
SK74NW	09/12/96
SK74SE	10/12/96
SK74SW	10/12/96
SK75NE	21/06/96
SK75NW	15/06/96
SK75SE	16/07/96
SK75SW	16/07/96
SK76NE	01/01/96
SK76NW	01/01/96
SK76SE	01/01/96
SK76SW	01/01/96
SK77NE	05/10/95
SK77NW	05/10/95
SK77SE	09/10/95
SK77SW	09/10/95
SK78NE	28/09/95
SK78NW	03/10/95

SK78SE	29/09/95
SK78SW	26/09/95
SK79NW	29/09/95
SK79SW	27/09/95
SK84SW	07/01/97
SK85NW	10/09/96
SK85SW	10/09/96
SK86NW	01/01/96
SK86SW	01/01/96
SK87SW	17/10/95
SE70SW	[2]

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Proc. Prehist. Soc.	*Proceedings of the Prehistoric Society*
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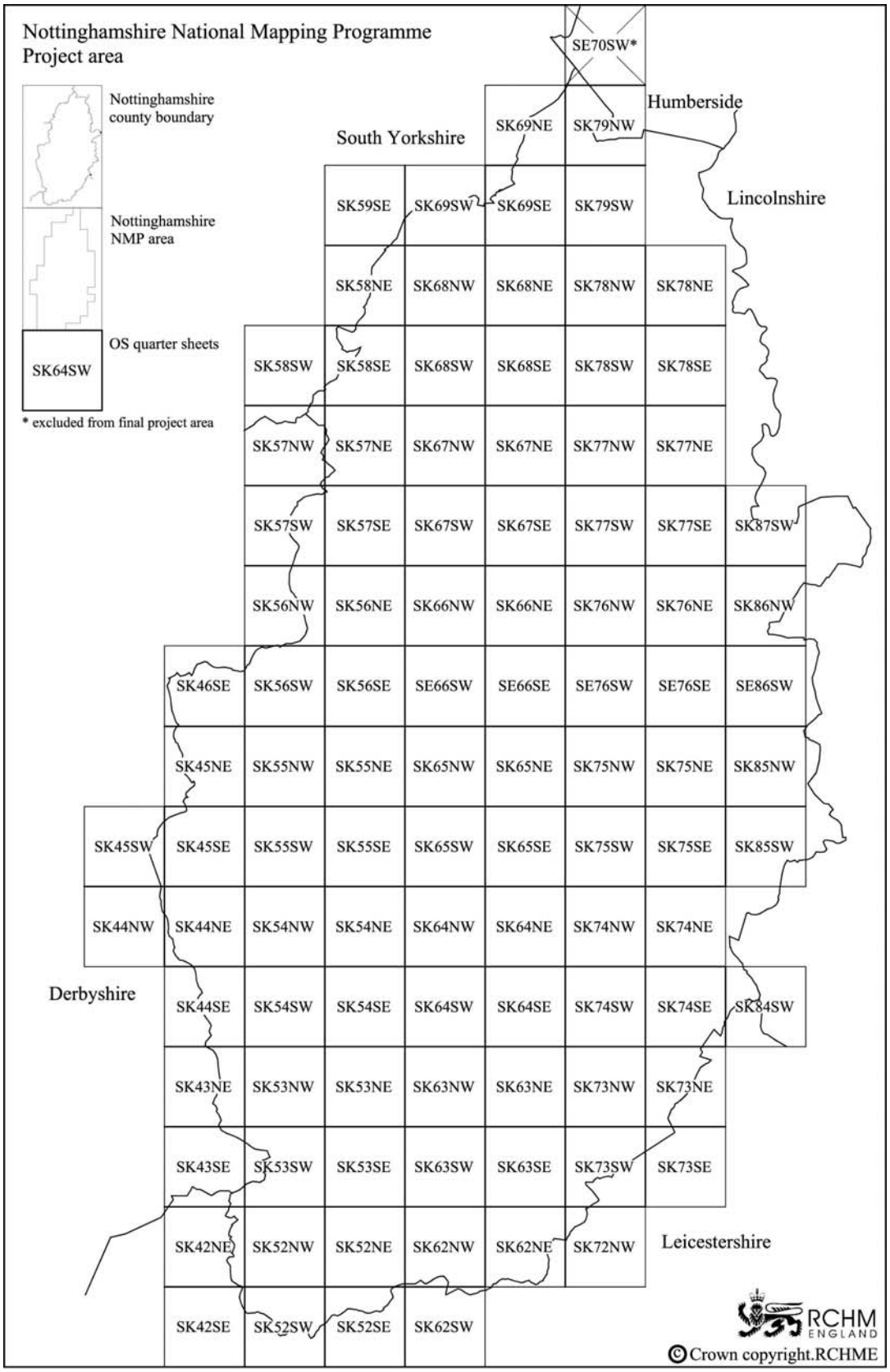

Figure 1. Nottinghamshire National Mapping Programme Project Area

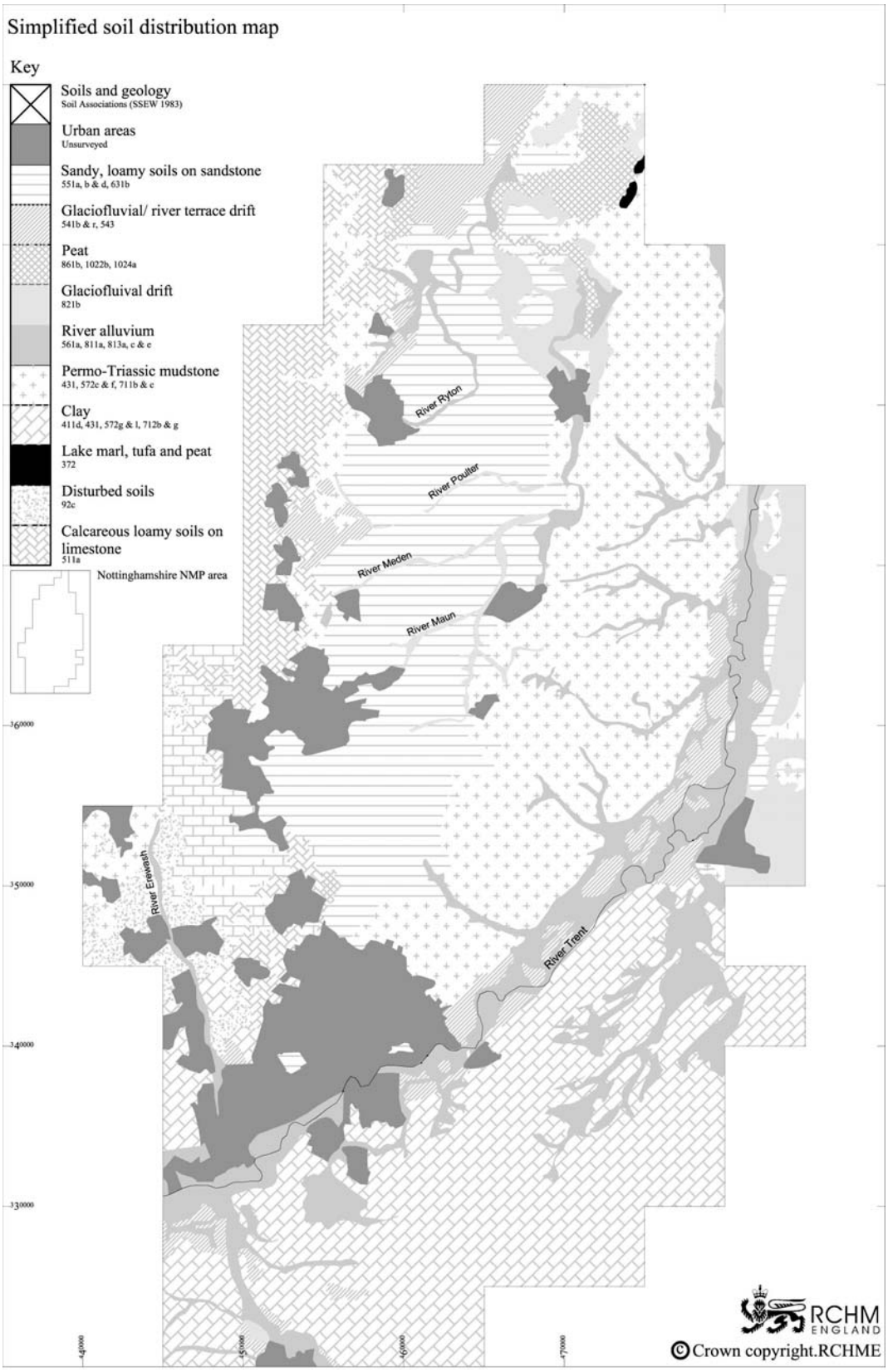

Figure 2. Simplified soil distribution map

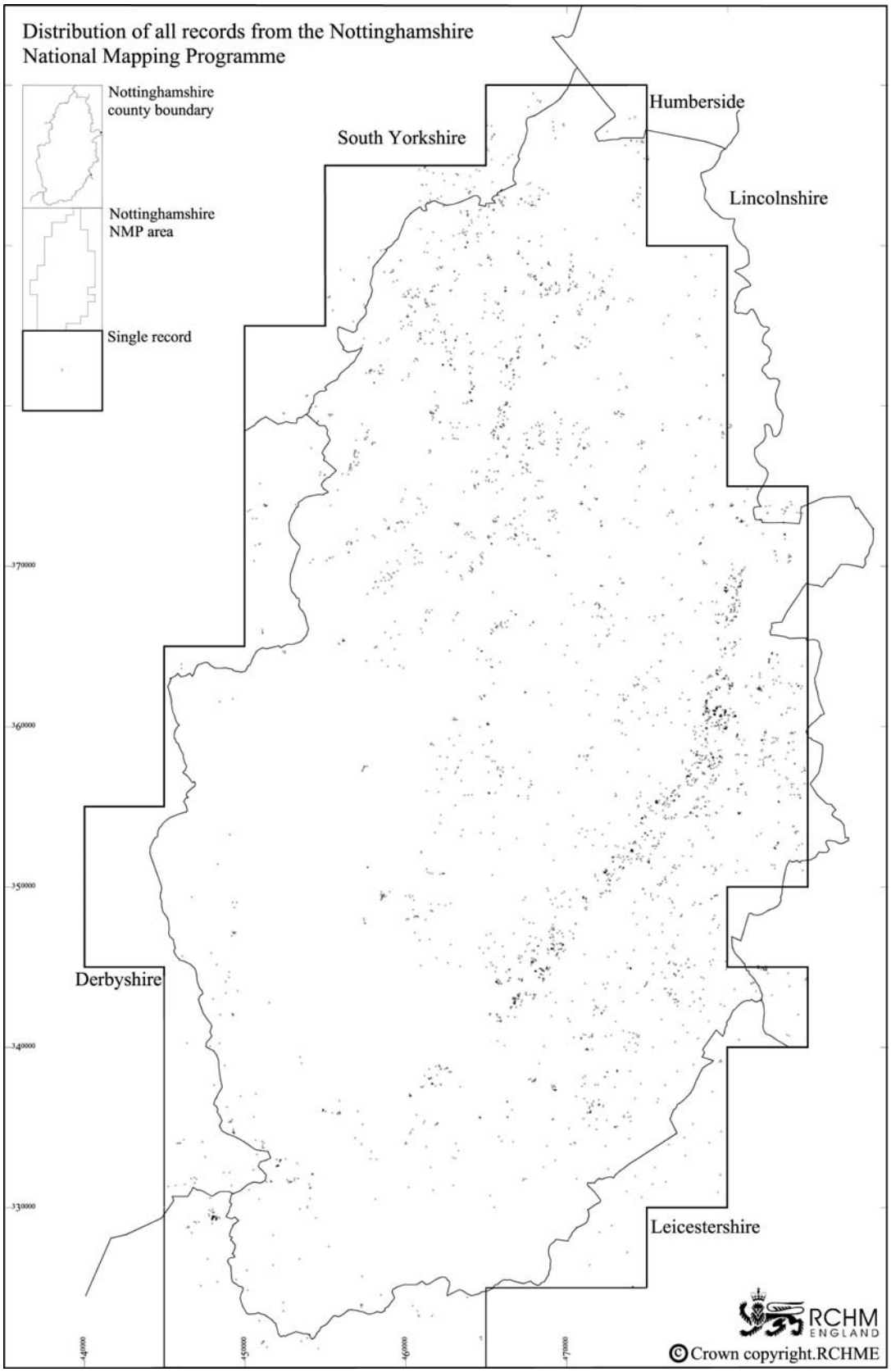

Figure 3. Distribution of all records from the Nottinghamshire National Mapping Programme

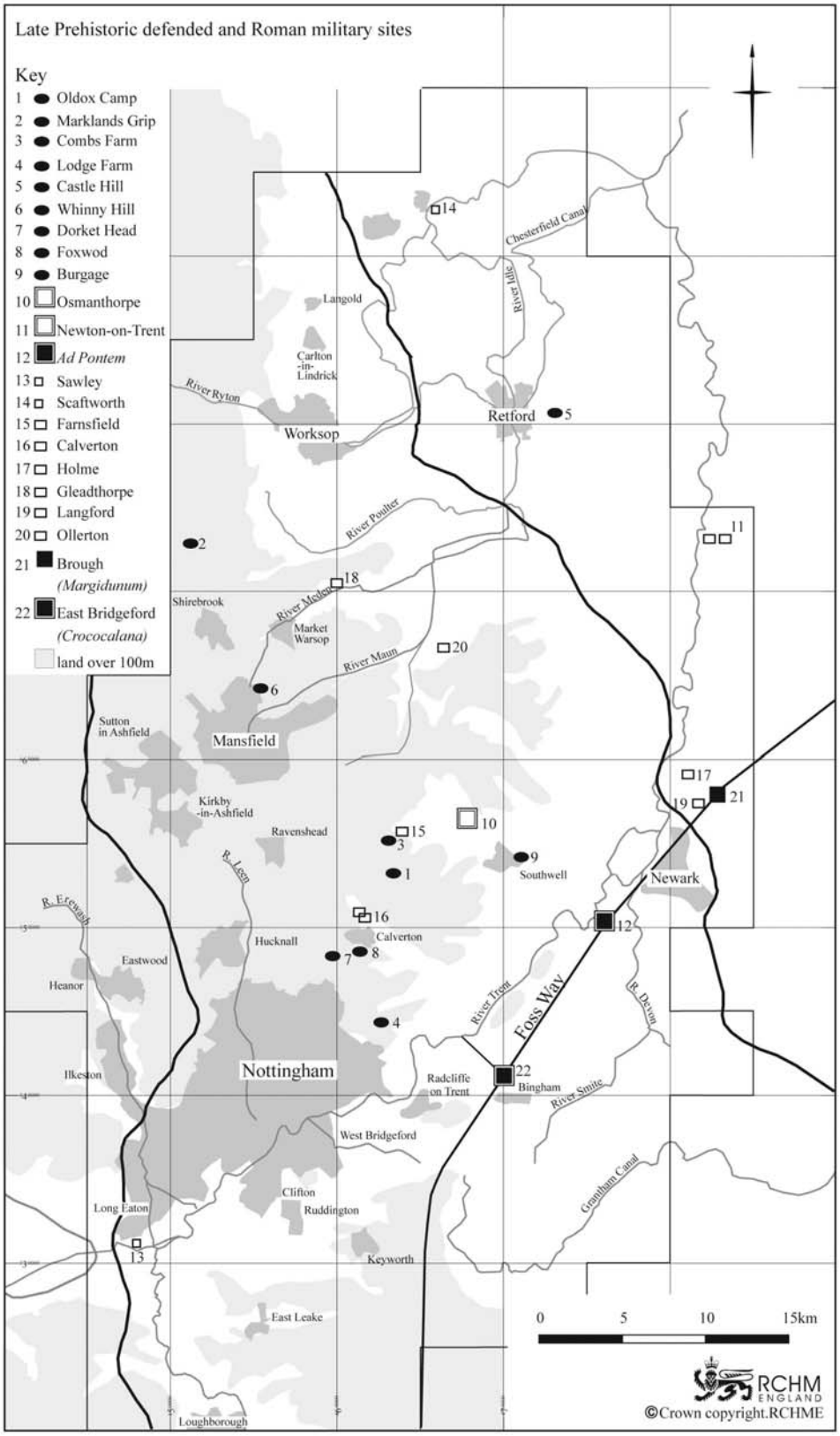

Figure 4. Late Prehistoric defended and Roman military sites

Figure 5. Roman temporary camps

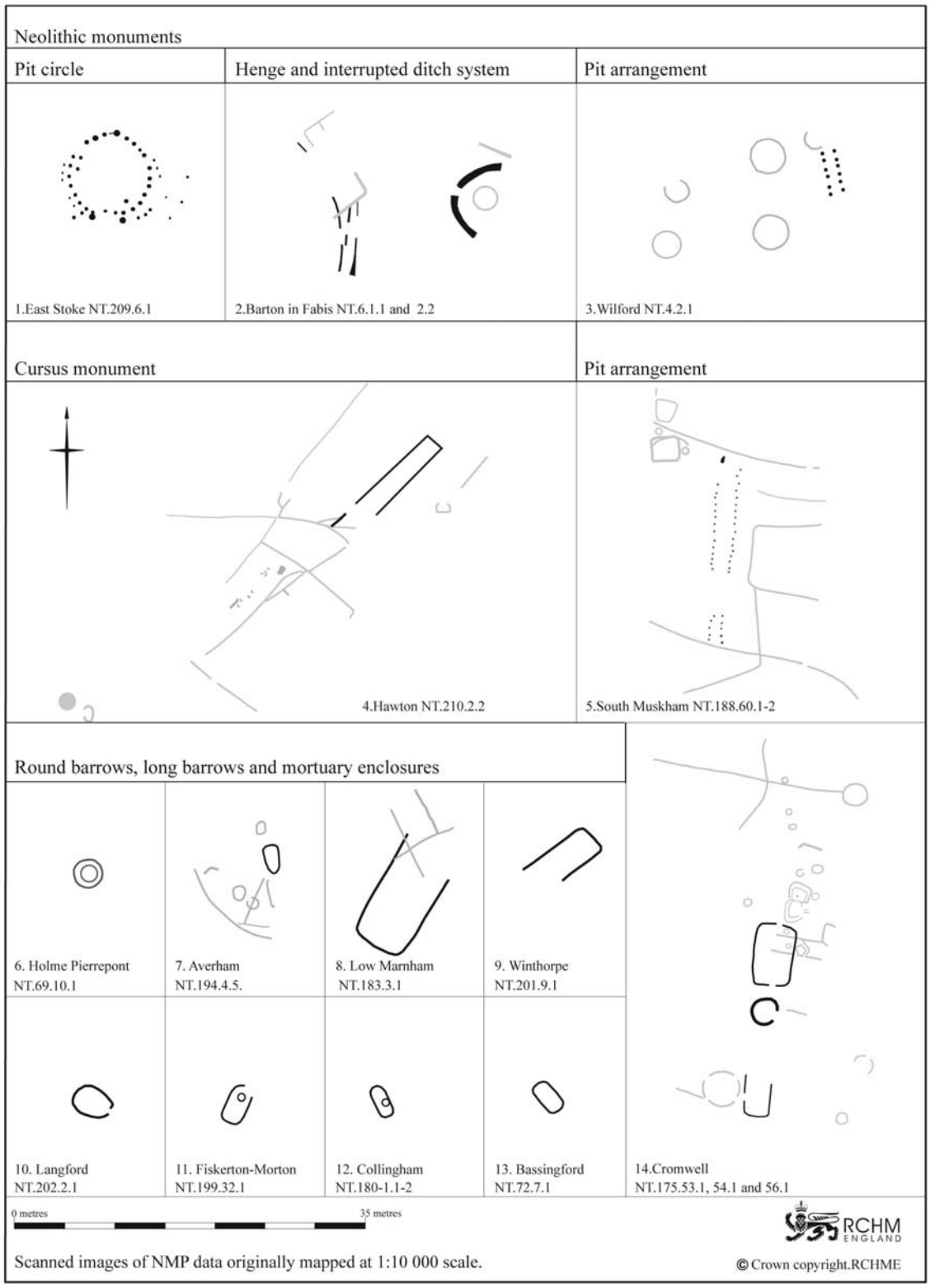

Figure 6. Neolithic Monuments

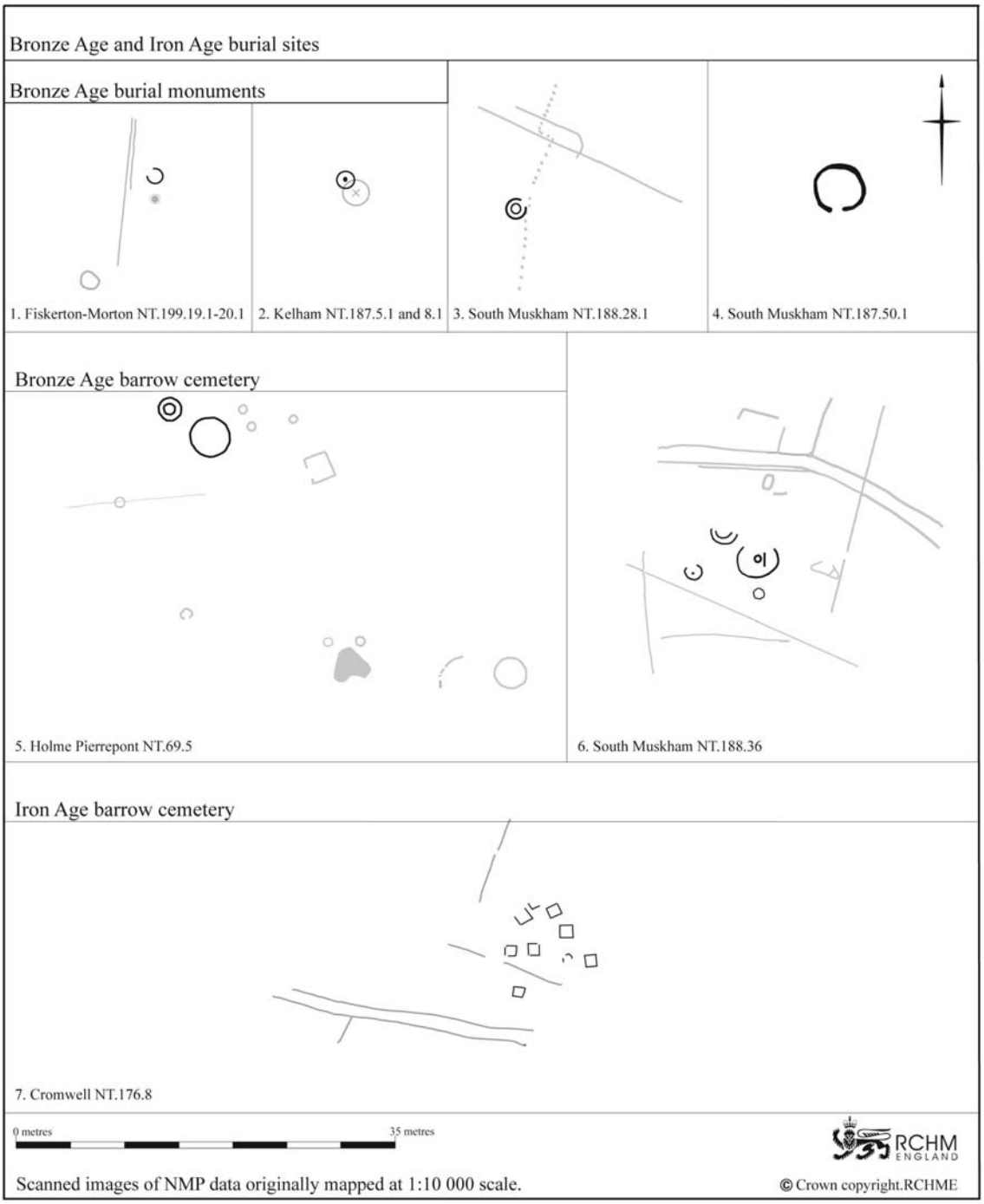

Figure 7. Bronze Age and Iron Age burial sites

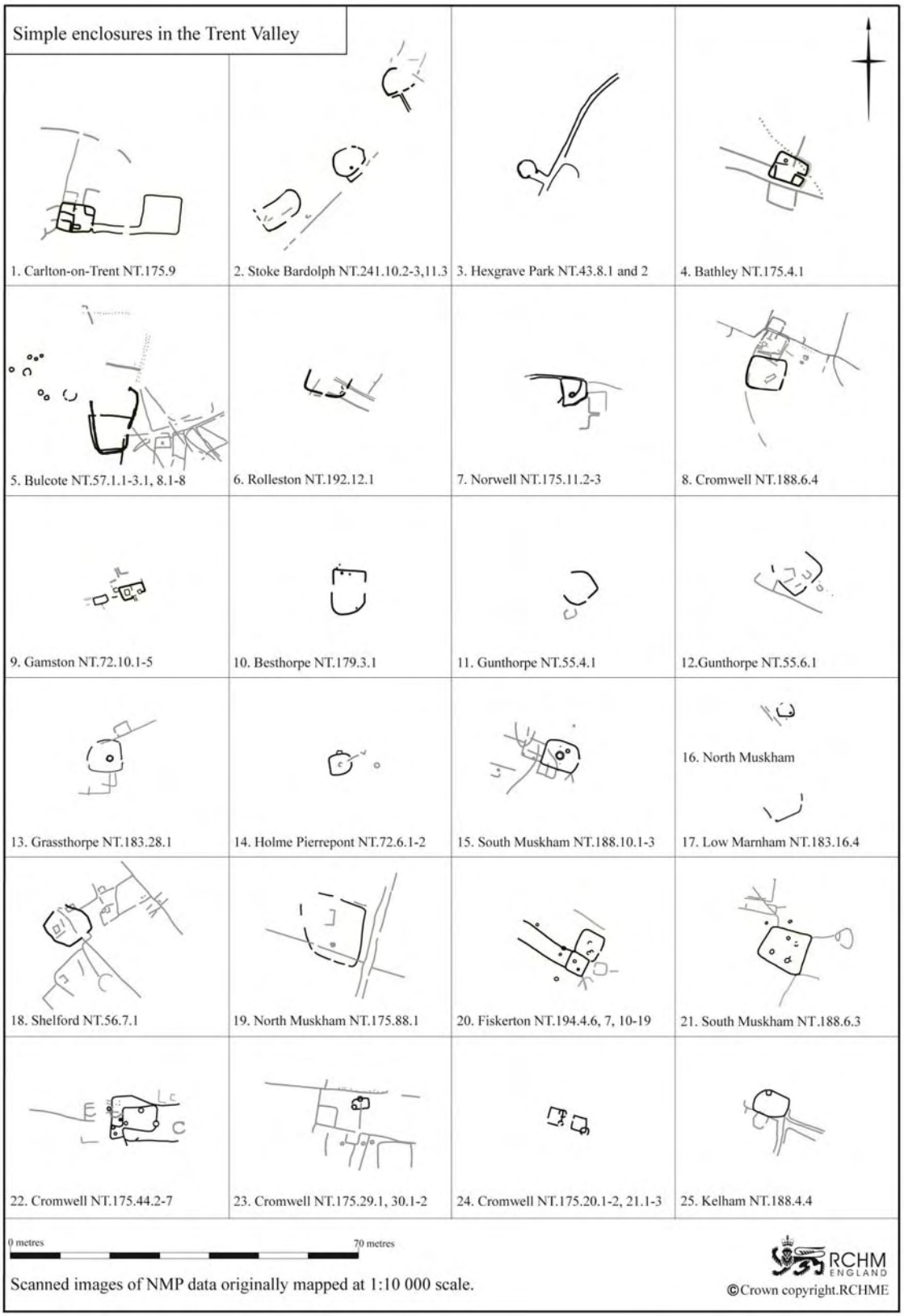

Figure 8. Simple enclosures in the Trent Valley

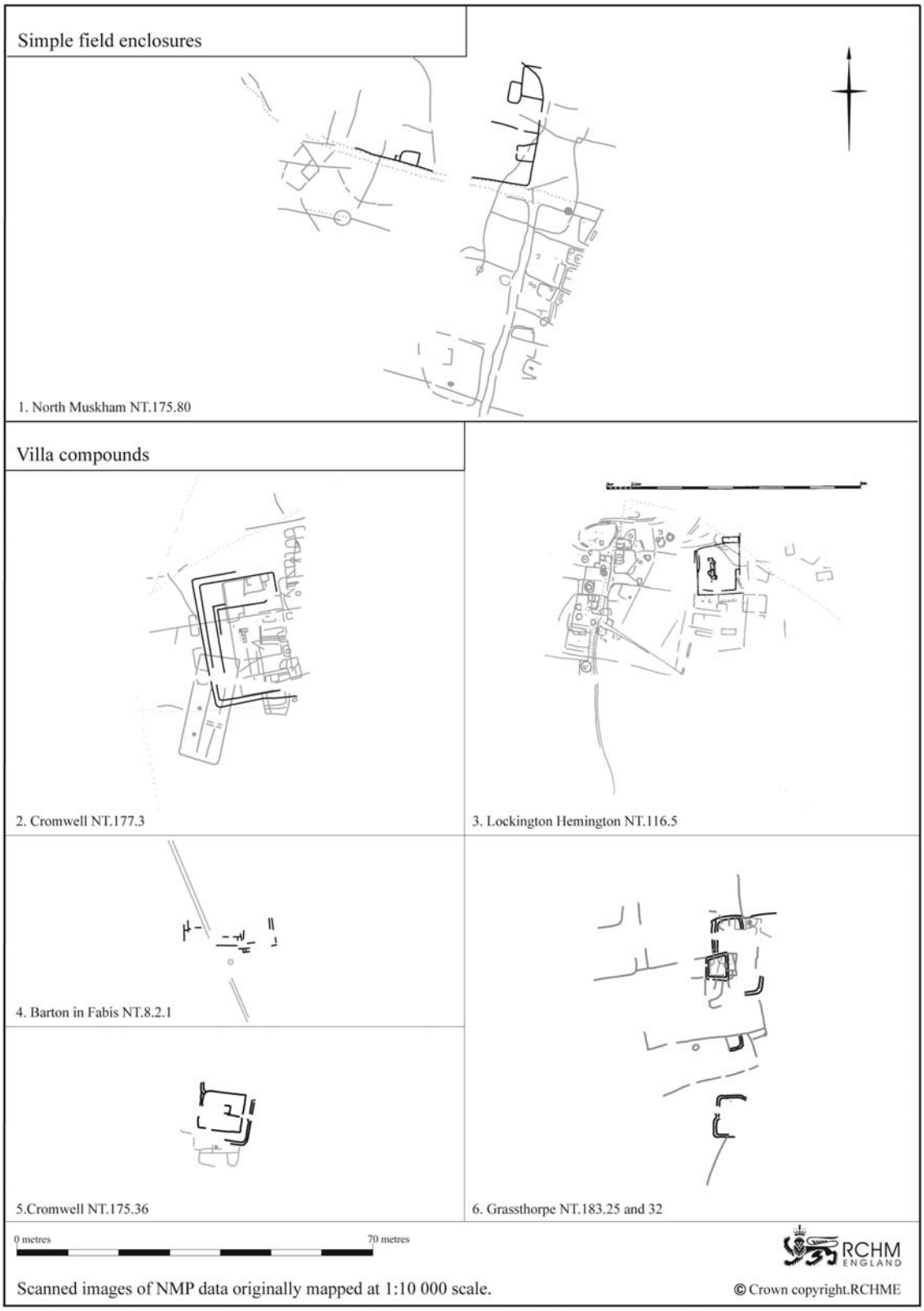

Figure 9. Simple field enclosures and Villa compounds

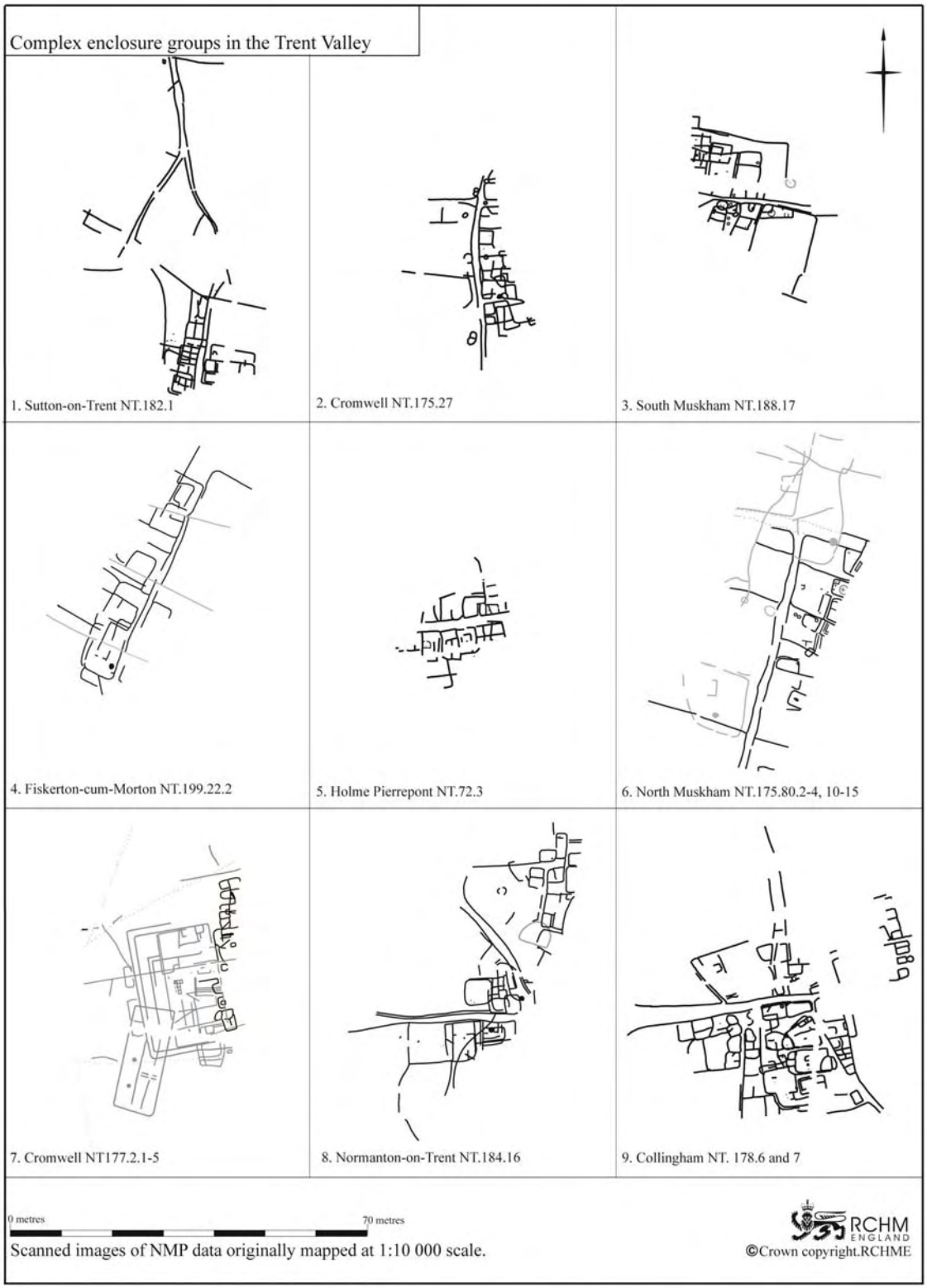

Figure 10. Complex enclosure groups in the Trent Valley

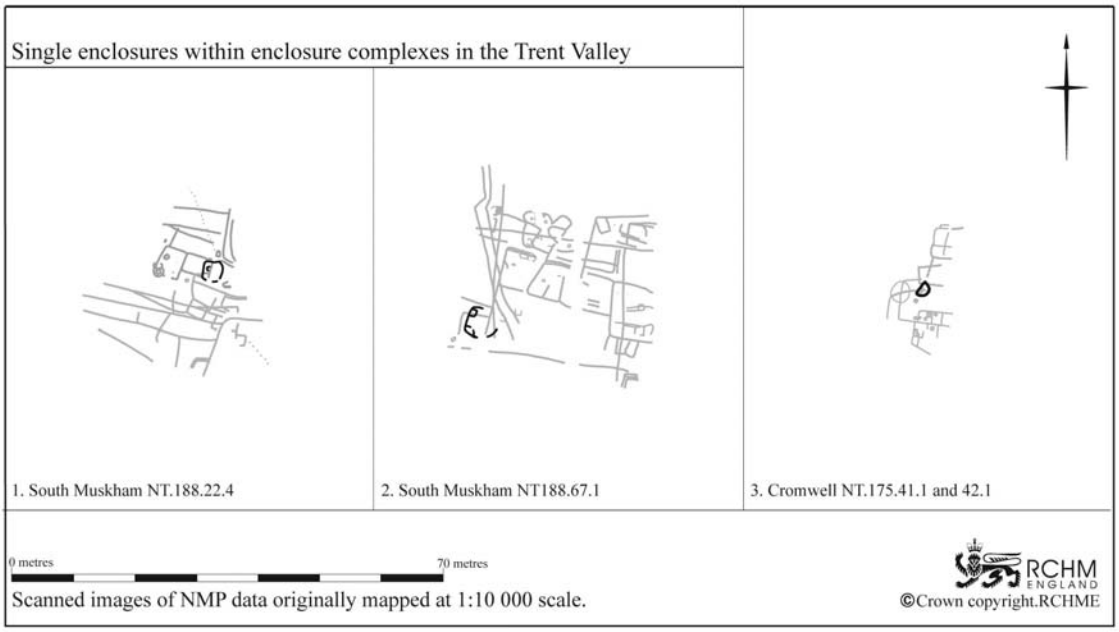

Figure 11. Single enclosures within enclosure complexes in the Trent Valley

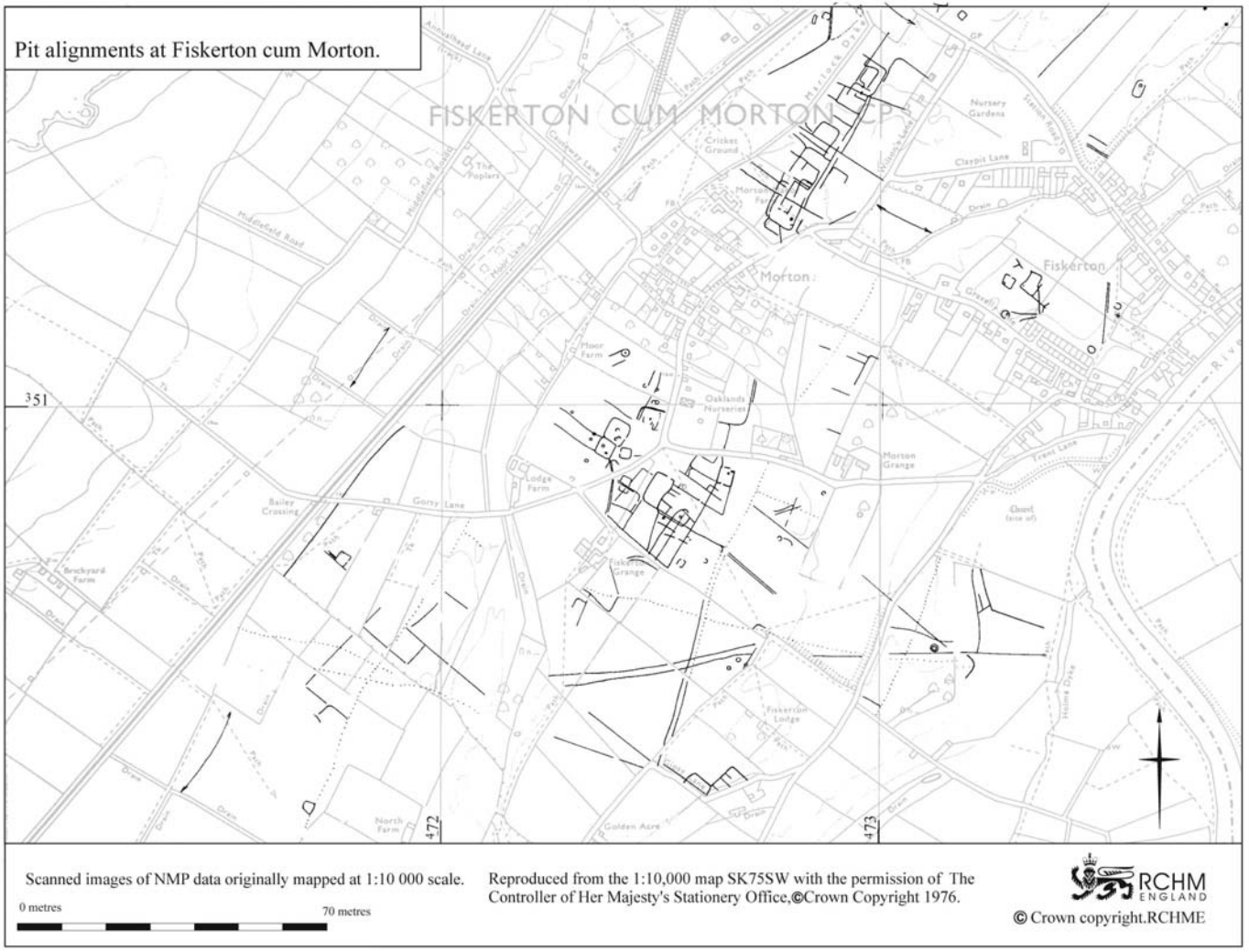

Figure 12. Pit alignments at Fiskerton cum Morton

Figure 13. The multi-period landscape between South Muskham and Cromwell

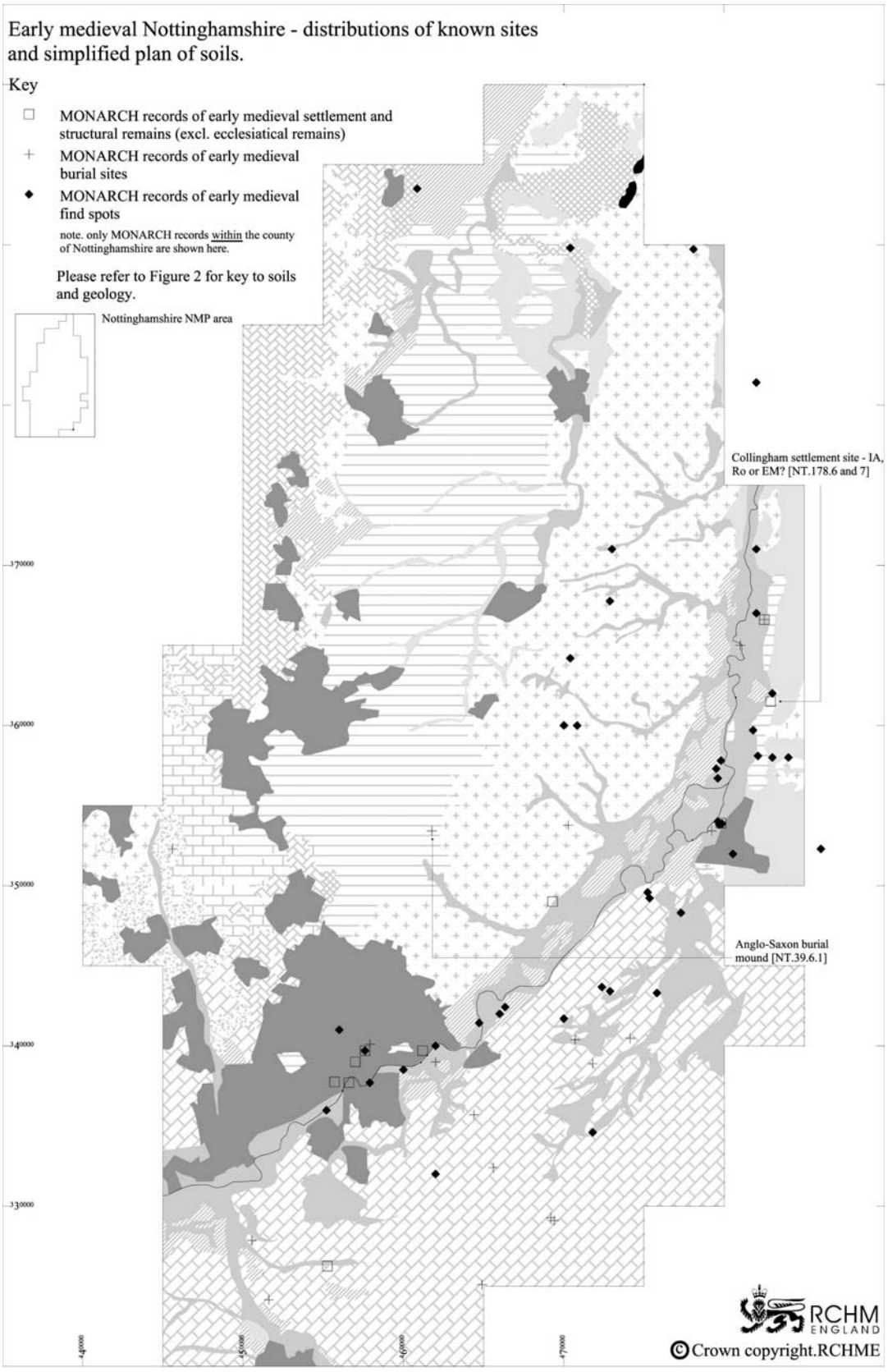

Figure 14. Early medieval Nottinghamshire - distribution of known sites and simplified plan of soils

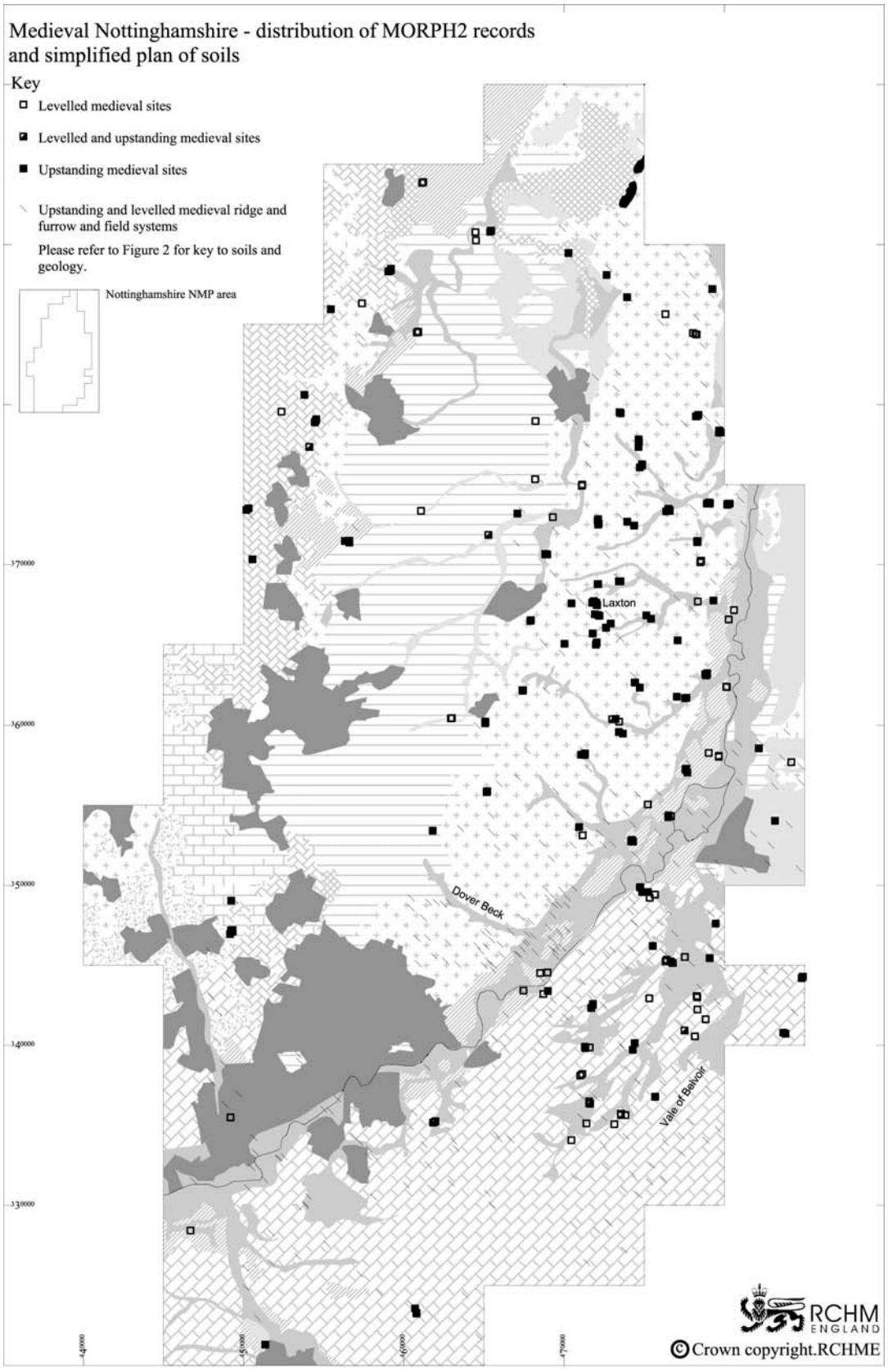

Figure 15. Medieval Nottinghamshire - distribution of MORPH2 records and simplified plan of soils

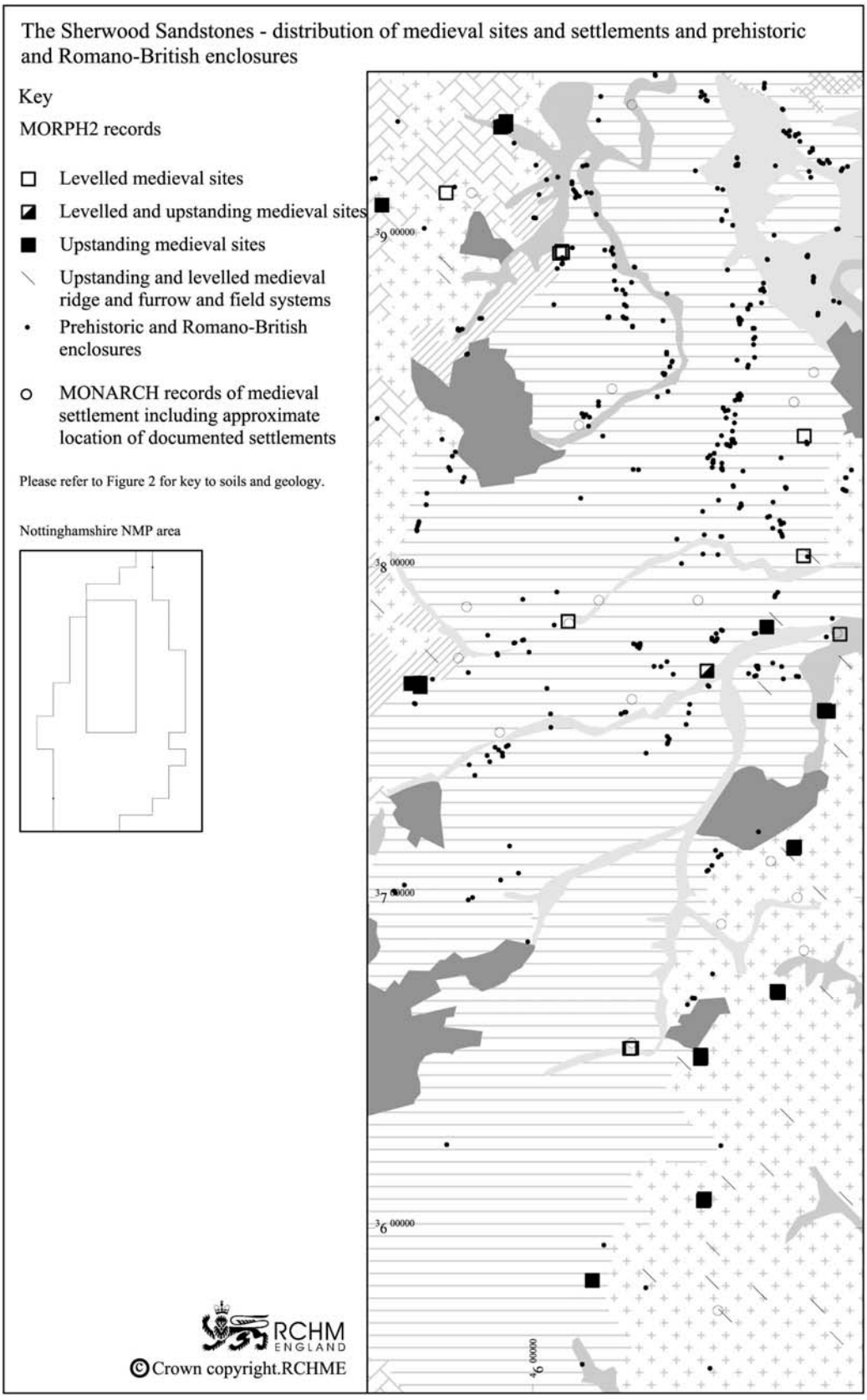

Figure 16. The Sherwood Sandstones - distribution of medieval sites and settlements and prehistoric and Romano-British enclosures

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