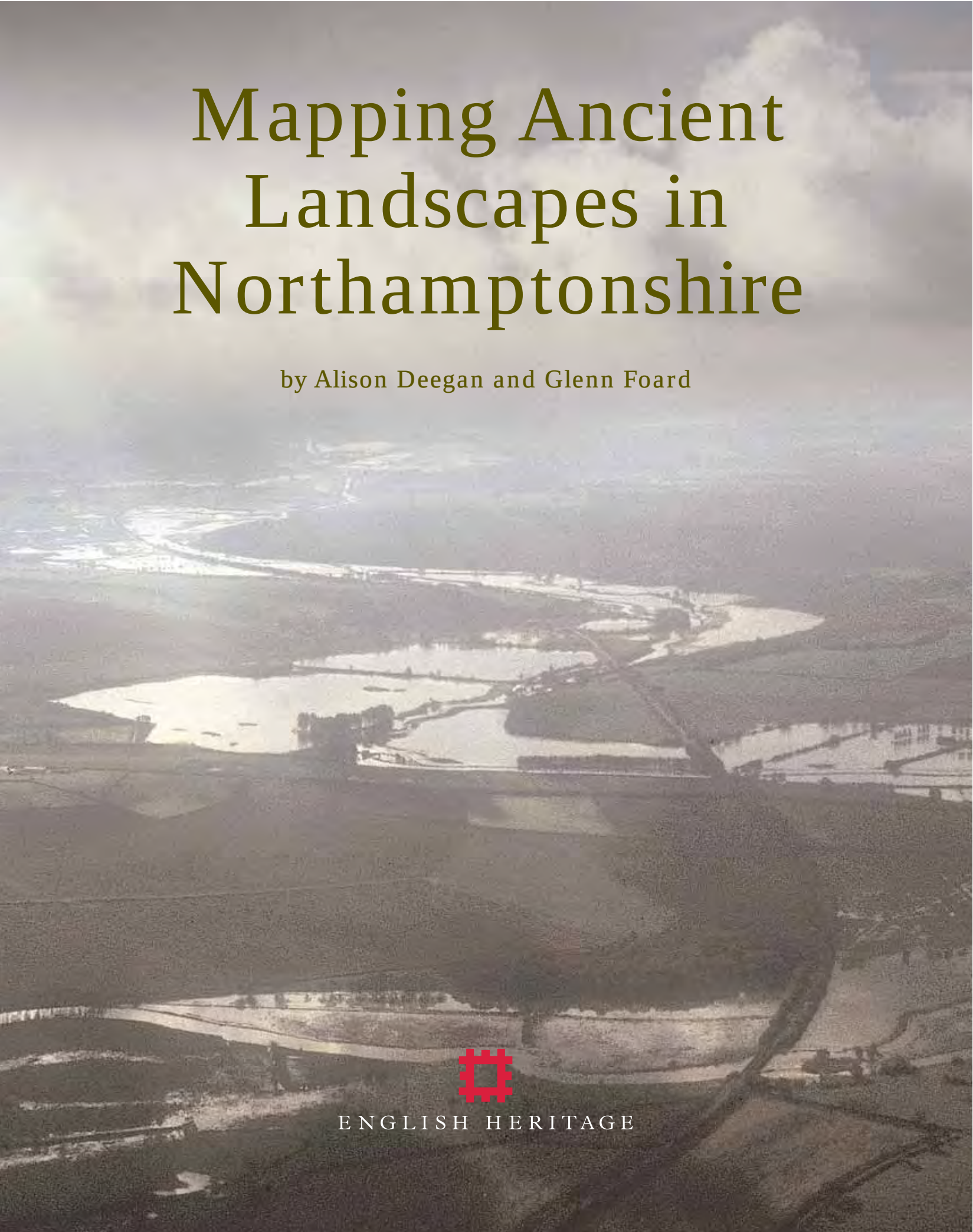
Mapping Ancient Landscapes in Northamptonshire

by Alison Deegan and Glenn Foard



ENGLISH HERITAGE

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Contents

Contributors

Graham Cadman	Historic Environment Officer, Historic Environment Team, Built & Natural Environment, Northamptonshire County Council
Alison Deegan	Air Photo Interpreter, 8 Malt Kiln, Clayton, Bradford BD14 6QP
Glenn Foard	Archaeological Consultant, 40 Brixwoth Road, Creation, Northamptonshire NN6 8NQ
Alex Gibson	Reader in British Prehistory, Department of Archaeological Sciences, University of Bradford

Abbreviations

ADS	Archaeology Data Service
BGS	British Geological Survey
CAA	Civil Aviation Authority
CUCAP	Cambridge University Committee for Aerial Photography (now ULM)
DoB	Defence of Britain project
EIA	Early Iron Age
GIS	Geographical Information System (computerised mapping)
HLC	Historic Landscape Characterisation
LBA	Late Bronze Age
MPP	Monuments Protection Programme
NA	Northamptonshire Archaeology
NCC	Northamptonshire County Council
NMP	National Mapping Programme
NMR	National Monuments Record
NMRC	National Monuments Record Centre
NRO	Northamptonshire Record Office
OAU	Oxford Archaeological Unit
RAP	Raunds Area Project
RCHME	Royal Commission for Historical Monuments of England
SSEW	Soil Survey of England and Wales
SMD	Soil Moisture Deficit
SMR	Sites and Monuments Record (Northamptonshire's, unless specified otherwise
SSEW	Soils Survey of England and Wales
VAP	Vertical Aerial Photograph
ULM	Unit for Landscape Modelling (formerly CUCAP)

Periods

These dates are approximate ranges only. Dates represent calendar years, ie the equivalent of calibrated radiocarbon dates (source: Monarch Recording Guidelines Version 3.1 30 June 1998 English Heritage Internal Document).

Mesolithic 10 000 BC–4000 BC
Neolithic 4500 BC–2200 BC
- Early Neolithic 4500 BC–3000 BC
- Middle Neolithic 3500 BC–2700 BC
- Late Neolithic 3000 BC–2200 BC

Bronze Age 2500 BC–700 BC
- Early Bronze Age 2500 BC–1500 BC
- Middle Bronze Age 1600 BC–1000 BC
- Late Bronze Age 1000 BC–700 BC

Iron Age 800 BC–AD43
- Early Iron Age 800 BC–400 BC
- Middle Iron Age 400 BC–100 BC
- Late Iron Age 100 BC–AD43

Later Prehistoric 4000 BC–AD43
Roman AD 43–410
Saxon AD 450–1066
- Early Saxon AD 450–649
- Mid Saxon AD 649–870
- Late Saxon AD 870–1066

early medieval AD 410–1066
medieval AD 1066–1540
post-medieval AD 1540–1901

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The authors would like to thank the wide range of individuals, too numerous to list, who have contributed in one way or another to the original collection of data or who have worked directly on the Northamptonshire NMP project. First, there are the various private pilots, together with flying instructors and staff at the Northamptonshire School of Flying, who made the original Northamptonshire County Council (NCC) reconnaissance programme possible between the mid-1970s and late 1990s. Of these particular mention must be made of Derek Richardson and the late Derek Cowley, who gave hundreds of hours of their time to the flying programme. Thanks are also due to the various other aerial archaeologists who have contributed to the aerial archaeological record of the Northamptonshire landscape. Also we must acknowledge the various assistants who worked at NCC on the cataloguing and mapping of the material from the late 1970s onwards, most notably Phil Markham who was the first project assistant on the Northamptonshire NMP project, John Robinson Aerial Archaeological Assistant from 2000 to 2002 and for one block of mapping, Rog Palmer. Christine Addison, SMR Officer at NCC, has played a key role in managing the data and, during the 1990s, assisting with the management of the project and of staff employed on the project. Various specialists have given advice and made specific contributions to the text. These are Damian Grady for his update on English Heritage's reconnaissance programme for Northamptonshire in chapter 2; Frances Healy and Jan Harding for their advice on the prehistoric aspects of the Raunds Area Project for chapter 4; Jeremy Taylor, for his comments on the original draft of chapter 6; David Hall who made available the extensive records of his countywide field-walking survey and for his contributions to chapters 7 and 8. Last but not least, we must acknowledge English Heritage, the former RCHME, and NCC, each of which have provided resources for the reconnaissance and mapping programmes, and most importantly the various staff of those organisations who have helped to see the project established and who have overseen its implementation, especially Bob Bewley and Simon Crutchley.

The geological, permeability and amenability to cropmark data used extensively in chapters 2 to 6 are derived from geological, landuse and Historic Landuse Characterisation data supplied by the copyright holder, Northamptonshire County Council.

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Summary

Aerial reconnaissance and the National Mapping Programme project in Northamptonshire have recovered and mapped evidence of archaeological activity of widely varying character, from field systems through settlement remains to funerary monuments, and ranging in period from the Neolithic to the 20th century.

This volume presents research and analyses of the project's results. The introduction is followed by two chapters that consider the reasons for the biases in the distribution of aerial photographic evidence. The first of these chapters reviews the history of aerial reconnaissance and mapping in Northamptonshire. The second considers the impact of soils, geology and past and present land use on the survival and visibility of earthworks, cropmarks and soilmarks.

The subsequent analyses of the project's results are presented primarily by period. First there is a discussion of the monuments and landscapes of the Neolithic and Bronze Age in the context of results from archaeological excavations, and in particular from the Raunds Area Project. This is followed by a review of the wider evidence for these periods in Northamptonshire and the Midlands by Alex Gibson.

Reflecting the wealth of information revealed by aerial archaeology for these periods, a large proportion of this volume in concentrated on the Iron Age and Roman periods, in an attempt to characterise the settlements, boundaries and communications across different landscape zones. The three chapters on the Anglo-Saxon, medieval and post-medieval landscapes, and on 20th-century military remains review the contribution of the aerial archaeological evidence and consider whether this was maximised by the project.

The final chapter assesses the methodology that evolved during the course of the project and its impact on data creation and subsequent data manipulation, interrogation and dissemination.

The Northamptonshire National Mapping Programme data is archived by and disseminated through the National Monuments Record, Northamptonshire Sites and Monuments Record and also the Archaeology Data Service, York.

Résumé

Dans le Northamptonshire la reconnaissance aérienne et le projet de Programme de Cartographie National (*National Mapping Programme*) ont recouvré et cartographié des indices d'activité archéologique de types extrèmement variés qui vont de systèmes de champs à des monuments funéraires, en passant par des vestiges d'occupation, et qui couvrent une période allant du néolithique au vingtième siècle.

Ce volume présente les recherches et analyse les résultats de ce projet. L'introduction est suivie de deux chapitres qui examinent les raisons de la disparité dans la répartition des indices de la photographie aérienne. Le premier de ces chapitres examine l'histoire de la reconnaissance aérienne et de la cartographie dans le Northamptonshire. Le second étudie l'impact des sols, de la géologie et de l'usage de la terre, passé et présent, sur la survivance et la visibilité des levées de terre ainsi que des traces dans les cultures et dans le sol.

Les analyses des résultats du projet qui ont suivi sont essentiellement présentées par période. D'abord, une discussion des monuments et des paysages du néolithique et de l'âge du bronze dans le contexte des résultats des excavations archéologiques, et en particulier du projet de la région de Raunds. Elle est suivie d'une étude, signée Alex Gibson, des indices plus étendus concernant ces périodes dans le Northamptonshire et les Midlands. Une grande partie de ce volume se concentre sur l'âge du fer et la période romaine, reflétant en cela la richesse des renseignements révélés par l'archéologie aérienne pour ces périodes, dans une tentative de caractériser les occupations, les limites et les communications à travers différentes zones du paysage. Les trois chapitres consacrés respectivement au paysage anglo-saxon, médiéval et post-médiéval et aux vestiges militaires du vingtième siècle examinent la contribution des témoignages archéologiques aériens et considèrent si elle a été mise en valeur par le projet. Le dernier chapitre évalue la méthodologie dans son évolution au cours du projet et son impact sur la création de données et sur la manipulation, l'interrogation et la diffusion de ces données.

Les données du Programme National de Cartographie du Northamptonshire sont archivées et diffusées par l'intermédiaire des Archives des Monuments Nationaux (*National Monuments Record*), des Archives des Sites et Monuments du Northamptonshire (*Northamptonshire Sites and Monuments Record*) et également par le Service de Données Archéologiques (*Archaelogy Data Service*).

Traduction: Annie Pritchard

Zusammenfassung

Luftaufklärung und das National Mapping Programme in Northamptonshire haben Nachweise archäologischer Aktivitäten von Feldsystemen über Überreste von Siedlungen bis hin zu Grabmälern verschiedenster Art ermittelt und kartiert, die vom Neolithikum bis in das 20. Jh. reichen.

Dieser Band legt die Forschungsarbeit dar und analysiert die Ergebnisse des Projekts. Der Einführung folgen zwei Kapitel, in denen die Gründe für die Gewichtung- bei der Verteilung der fotografischen Nachweise im Luftbildmaterial dargelegt sind. Das erste Kapitel bringt einen Überblick zur Geschichte der Luftaufklärung und Kartographie in Northamptonshire. Im zweiten Kapitel werden die Auswirkungen untersucht, die Erdreich, geologische Gegebenheiten sowie die derzeitige und frühere Landnutzung auf Überdauern und Sichtbarkeit von Erdarbeiten, sowie von Bewuchs- und Bodenmerkmalen haben.

Die nachfolgenden Analysen der Projektergebnisse werden vorrangig auf Grundlage von Zeitabschnitten präsentiert. Angefangen mit einer Diskussion der Grabmäler und Landschaften in Neolithikum und Bronzezeit anhand archäologischer Ausgrabungen, insbesondere im Rahmen des Raunds Area Projekts. Dem folgt ein Überblick umfassender Zeugnisse für diese Zeiträume in Northamptonshire und den Midlands von Alex Gibson. Ein Großteil dieses Bandes konzentriert sich auf Eisen- und Römerzeit unter Bezugnahme auf die reichhaltigen, dafür von der Luftbildarchäologie gelieferten Informationen, um damit die Siedlungen, Grenzlinien und die Kommunikation über verschiedene Landschaftszonen hinweg zu charakterisieren. Die drei Kapitel über die angelsächsischen, mittelalterlichen und nachmittelalterlichen Landschaften und die militärischen Überreste aus dem 20. Jh. untersuchen den Beitrag, den die Ergebnisse der Luftbildarchäologie geleistet haben und ob diese durch das Projekt bereichert worden sind. Das letzte Kapitel bewertet die Methodologie, die sich im Projektverlauf entwickelt hat, sowie deren Auswirkung auf die Schaffung von Daten sowie die nachfolgende Manipulation, Abfrage und Verbreitung derselben.

Die Daten des Northamptonshire National Mapping Programms werden von National Monuments Record, Northamptonshire Sites and Monuments Record und vom Archaeology Data Service archiviert und verbreitet.

Übersetzung: Ingrid Price-Gschlössl für First Edition Translations Ltd, Cambridge

1
Introduction

by Glenn Foard

The aim of the National Mapping Programme (NMP), established in 1992, is 'to enhance our understanding about past human settlement, by providing primary information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century.' (Bewley 2001, 78). The Northamptonshire NMP project (hereafter described as *the project*) was one of a handful of projects within NMP that were conducted at a county level, rather than in house by English Heritage, at that time. The project has dealt with 3,250 square kilometres, centred on the modern county of Northamptonshire, but as the mapping dealt with complete Ordnance Survey 1:10 000 quarter sheets it also included small areas of eight adjacent counties and two unitary authorities (Fig 1.1).

The project and this publication are the work of a number of individuals. One of the authors (Deegan) has been responsible for a substantial part of the mapping (from 1999), conducted most of the analysis, has written the greater part of the text and prepared all the illustrations. The other (Foard) was been responsible for the aerial reconnaissance programme, designed the mapping methodology, undertook digital mapping in the 1980s but, though contributing to discussion on the other themes, has written only this introduction, 'Aerial Reconnaissance in Northamptonshire' and the greater part of the chapters concerning the Anglo-Saxon and medieval to post-medieval evidence. Both authors have edited the full text. The assessment of the Neolithic and Bronze Age research, '*Ex Tenebris Lux*' was contributed by Alex Gibson, Reader in British Prehistory, Department of Archaeological Sciences, University of Bradford and Graham Cadman, Historic Environment Officer, NCC wrote 'Studying Modern Military Remains'. The publication texts were researched, drafted, discussed and developed between December 2002 and December 2005. Specifically, 'Aerial reconnaissance in Northamptonshire' was first drafted in May 2002; 'The significance and limitations of the project data' in October 2002; 'Monuments and landscapes in the Neolithic and Bronze Age' and '*Ex Tenebris Lux*' in September 2003; 'Late Bronze Age, Iron Age and Roman settlements and landscapes' in July 2004; 'The contribution of aerial photography to Anglo-Saxon studies' July 2005; 'The contribution of aerial photography to medieval and post-medieval studies' in August 2005; and 'Studying modern military remains' in December 2002.

The majority of the NMP mapping was undertaken in the 1990s by Philip Markham, with substantial work by John Robinson and some additional work by Christine Addison and Rog Palmer.

The archive of aerial archaeology data generated by the project is available online via the Archaeology Data Service (ADS). It is also locally available at the Northamptonshire Sites and Monuments Record (SMR), where it has been integrated with the other evolving resources. These resources include the photographic index and the archive of Northamptonshire County Council (NCC) aerial reconnaissance, comprising most of the 20,000 black and white photographs and colour transparencies in the SMR. The majority of the NCC aerial reconnaissance photographic archive, including most of the negatives, is also available at the National Monuments Record (NMR).

Northamptonshire lies in the East Midlands, encompassing most of the catchment of the River Nene as well as parts of neighbouring river system of the Welland, and a small part of the Ouse, all of which drain north eastward to the Wash (*see* Fig 1.1). The county extends almost to the former fen edge in the east, while in the south-west it stretches into the upper reaches of the Cherwell, part of the Thames catchment, and on the west crosses the national watershed into the very upper reaches of the Avon, part of the catchment of the River Severn.

The character of the county is determined in large part by the alternating bands of permeable and impermeable

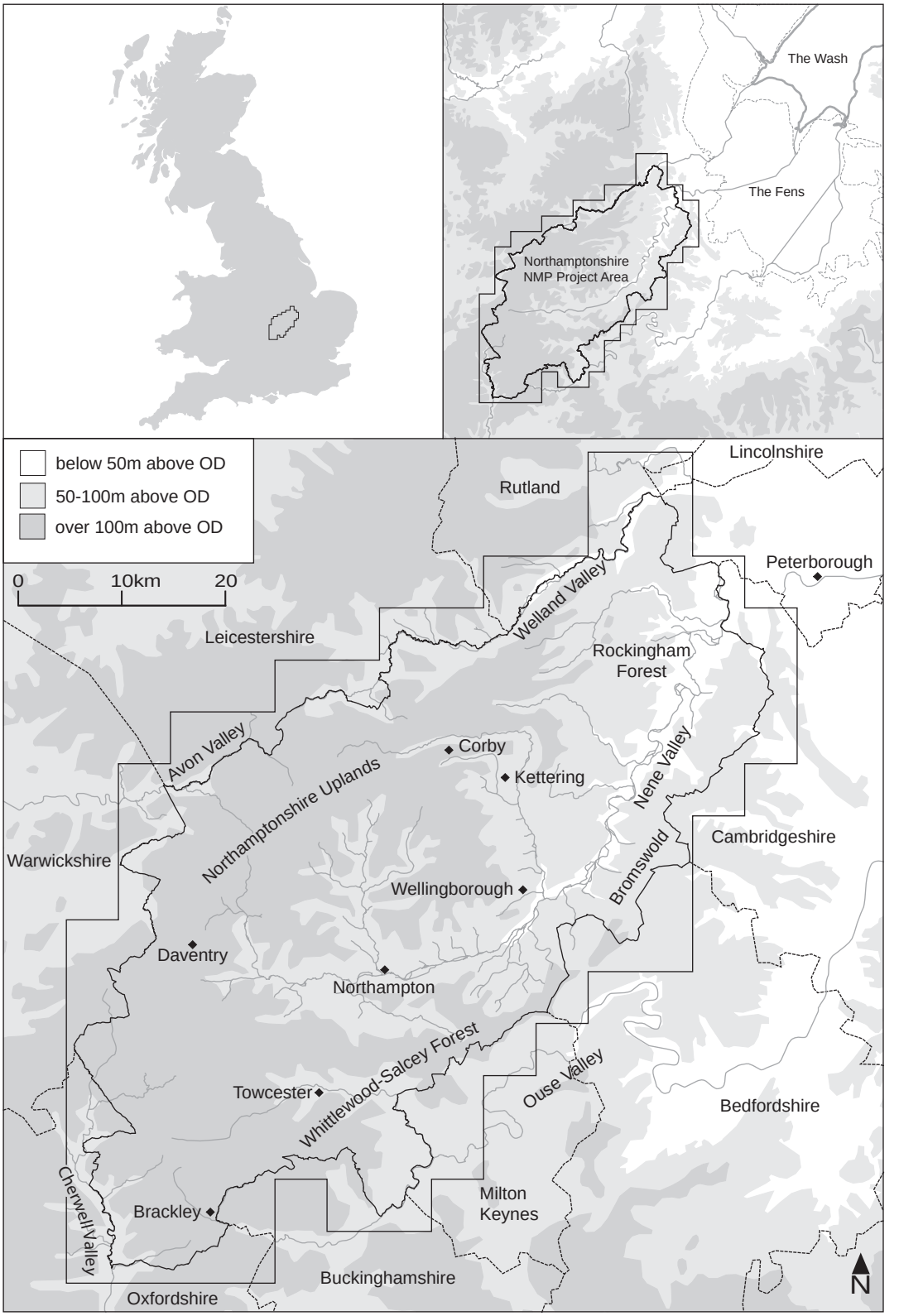

Fig 1.1
Location plan of the Northamptonshire NMP project.

Jurassic rocks, which trend south-west to north-east, and dip gently south eastward (*see* chapter 3, Panel 1). As discussed in chapter 3, this underlying geological framework has been a major influence on the visibility of archaeological sites from the air, alongside other significant factors, which also bias the distribution of evidence.

Human activity in the county has tended to focus on the permeable geologies, particularly in the Neolithic and Bronze Age (*see* chapter 4). Even in the Iron Age and Roman period the character and density of settlement and land use appears to have been greater on the better soils than on the heavy clays, even though settlement and fields extended at this time across all geological types (*see* chapter 6). The concentration of settlement on the permeable geologies was repeated in the Anglo-Saxon period, as a result of a late Roman retraction from the clay land. Although the late Anglo-Saxon and medieval periods saw a massive expansion of arable onto the poorer clay soils, settlement became highly nucleated and remained on the permeable geologies. On the extensive tracts of boulder clay woodland persisted, particularly in Rockingham and Whittlewood-Salcey Forests. It was also the clay land townships that proved most vulnerable to desertion and conversion to pasture in the centuries after the massive recession that accompanied the Black Death and other plagues, from the mid-14th century onwards.

The modern county of Northamptonshire is one of the most intensively studied of England's historic landscapes. Since at least the early 1960s, it has been subject to intensive investigation through field-walking and aerial survey by local amateur and professional archaeologists (eg Hollowell and Brown 1971; Hall 1972). It has also seen nationally important detailed studies of particular historic landscapes, most notably in the Raunds Area Project and the Whittlewood Project (Jones and Parry 2003; Parry 2006; Harding and Healy 2007). Also, like many other counties, from the 1960s onwards it has seen a large number of excavations, large and small, undertaken in response to mineral extraction and development threats. In addition a major contribution was made in the 1970s and early 1980s by the Royal Commission on the Historical Monuments of England (RCHME), which published an archaeological inventory covering the whole county (RCHME 1975, 1979, 1981, 1982, 1984, 1985). The past history of archaeological investigation the current state of knowledge of the archaeological record for the county has recently been subject to a major review (Tingle 2004).

The first aerial archaeology conducted in the county was from the late 1940s onwards as part of the national reconnaissance programme of the Cambridge University Committee for Aerial Photography (CUCAP). This was greatly enhanced by locally based reconnaissance, particularly by Hollowell in the 1960s and early 1970s, and then by a sustained intensive campaign of reconnaissance from 1974 to late 1990s by NCC, with funding from RCHME and subsequently from English Heritage (*see* chapter 2). The latter included the integration into the Sites and Monuments Record (SMR) of all aerial survey results. There was manual plotting of cropmark data by RCHME as part of their research for the Inventory (RCHME 1975, xxi), while from 1977–9 NCC manually plotted all new sites at 1:2 500 scale using the mobius network technique. Following a critical assessment of aerial archaeology in the county, computer-aided techniques of transcription, using Aerial software, were adopted by NCC in the early 1980s (Foard 1980b; Haigh 1993). The resultant digital files were archived from the mid-1980s and in the early 1990s these aerial data from previous mapping were integrated into the MapInfo Geographical Information System (GIS) system, which was applied to the SMR in 1991. During the 1970s and early 1980s the development of both the reconnaissance and mapping programme benefited greatly from discussion with colleagues through the Aerial Archaeology Research Group.

In the light of this intensive reconnaissance and digital mapping programme, Northamptonshire was selected as one of the first phase of NMP projects in 1994. Although at this time NMP was paper-based and conducted at scale 1:10 000, Bewley recognised the potential of the computerised approach being taken and the Northamptonshire project was allowed to continue the mapping in digital form, at high resolution (scale 1:2 500), with the integration of the data in the SMRs GIS, and output for RCHME computer generated as acetate overlays. The project was thus the first attempt for a single county to systematically computer map at high resolution all aerial archaeology data in a consistent and accurate manner and to bring together the evidence from all available photography into one coherent whole in GIS, with referencing of every graphic object to its original source photograph (Northamptonshire Heritage 1994). However, it should be noted that, as the methodology was developed and the

mapping undertaken over many years, with a number of individuals involved and before regular training was provided nationally for NMP staff, there is a degree of inconsistency within the dataset, which has only partly been mitigated by efforts at enhancement over the last five years during the analysis phase.

The vast majority of the aerial archaeology evidence collected by reconnaissance and mapped in the project is of cropmarks. The soilmark data are restricted largely to recently ploughed medieval and later earthworks of deserted settlement and ridge and furrow. The exception is the area of former medieval woodland, where extensive soilmarks mainly of medieval charcoal burning, and restricted areas of prehistoric and Roman settlement field systems have been recorded. Earthwork data are restricted largely to the extensive ridge and furrow, which was not systematically mapped in the project because the NMP methodology was not considered adequate to the task; and settlement remains of medieval and later deserted settlement, although, as with the soilmarks, small numbers of earlier sites have been identified in the former woodland areas. Industrial monuments of the 19th and 20th centuries were not systematically photographed or mapped, although in parallel to the NMP work was undertaken by Cadman on military remains in the county of the 20th century as part of the Defence of Britain project, drawing upon the NMP mapping (*see* chapter 9).

The project examined all aerial photographs for the county available in the NMR, including the RAF vertical aerial photographs, and in the CUCAP collection that were available at the time of mapping. However, by far the greatest archive of photography used was that produced by NCC itself between 1974 and 1996. Just one element of the collection of 20,000 or more images was not consistently exploited: the large number of colour transparencies. These are mostly duplicates of black and white photographs taken during NCC reconnaissance for lecture purposes, but some are now realised to be the best or only record of a few sites and so significant information contained on some slides may not have been included in the NMP mapping. In addition there is a small amount of other material that, at the time, was not held in the SMR, NMR or in the CUCAP collection and was not examine for the project – most notably air photographs taken by Upex.

The methodology applied in the mapping process aimed to achieve a wholly digital and fully referenced dataset linking together in GIS all the NMP data with relevant elements of the SMR's record system, both spatially in GIS and via the photo index, with every element of the aerial data fully linked to its source photo. All relevant air photos in each collection were examined, and where significant features were recognised, the best photographs were selected for interpretation and rectification.

For the greater part of the project the detail was traced onto acetate and this interpretation then rectified in AERIAL version 4. The digital files for each rectification were archived and the data imported into MapInfo in an 'applots' table with the NCC photo reference and other metadata appended to each graphic object, providing a base dataset combining all rectified data. From 1999 onwards AERIAL version 5 was used, enabling a scan of the original photograph to be rectified, registered in MapInfo and then archived for future reference, with the interpretation then being digitised on screen in MapInfo. As with the previous method, the resulting data from each photo were then integrated into the 'applots' table. The applots table thus provides a fully referenced base dataset integrating all rectified aerial photographic data generated by the project. It therefore typically has complementary data from several photos for any site, often with overlapping data with the same feature slightly displaced owing to the errors inherent in the rectification process. From this table data were then extracted according to form (cropmark, soilmark, earthwork or structure) onto separate interpretive tables where the information was integrated, with reference to the original photographs, to produce a final interpretation each site. Thus it is possible to view separately, or to overlay and compare, each form of data for the same site and to relate this to other GIS datasets from the SMR and elsewhere, enabling a final interpretation to be compiled for the MORPH classification system. Wherever possible each separate element identified in MORPH was drawn in the interpretive tables as separate graphic objects with the MORPH number appended. This procedure has produced a highly flexible dataset with integrated metadata that

enables all elements of the record and its interpretation to be tracked to its source and to be compared to every other element in the SMR. For a full review of the methodology and its implementation, reference should be made to the Management Report, which is available online via the ADS.

This system has enabled the data generated by the project to be made available to all users of the Record, through the SMRs GIS, progressively as each photograph was interpreted and mapped. The NMP data have thus been available for management and research purposes since 1994, and have had a substantial influence on both the interpretation and the management of the historic environment of the county for the last decade, representing arguably an even more important outcome from the project than the publication of the present volume of overview and analysis.

The Northamptonshire project has produced a database recording the location, size, morphology, interpretation and date of 14,142 archaeological sites linked to graphic representations of those sites, plotted at a nominal scale of 1:2 500. In addition, the project has produced a large number of graphic objects that record selected ridge and furrow, modern and geological features and sites. Of the 14,142 sites recorded, approximately 57% were new to the NMR at the time of mapping, based on the number of records with no concordance to the NMR. However, on the same basis, as would be expected given the history of post-reconnaissance work in Northamptonshire, less than 15% of the records were new to the county SMR.

Aerial reconnaissance and the NMP project have recovered and mapped evidence of archaeological activity of widely varying character, from field systems through settlement remains to funerary monuments, and ranging in period from the Neolithic to the 20th century. The quality and quantity of the evidence are seen to vary enormously by period, as well as by the region of the county. There is a particular wealth of information regarding Iron Age and Roman landscape and also of funerary monuments of the Bronze Age, but some other aspects, particularly Anglo-Saxon archaeology, are significantly under-represented (*see* chapter 7). The results of the project are presented here primarily by period, but with introductory chapters that consider the reasons for the biases in the distribution of evidence by period and region. The first of these chapters reviews the history of aerial archaeology in Northamptonshire, while the second considers the distribution of aerial archaeological evidence across the county, explaining where this reflects the underlying distribution of past human activity and where it is the result of subsequent destruction or the relative responsiveness of each period and type and each region of the county to the production of cropmark, soilmark and earthwork aerial data.