Historic England

West Wiltshire

National Archaeological Identification Survey Lowland Pilot Project Report

Jonathan Last, Edward Carpenter and Sally Evans

with Edward Caswell, Zoe Edwards, Alice Forward, Elaine Jamieson, Jeremy Lake, Neil Linford, Paul Linford, Andrew Payne, David Roberts and Nicky Smith

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SUMMARY
This report describes the results of the National Archaeological Identification Survey Pilot Project: West Wiltshire (A350 corridor), which comprised interpretation and mapping of air photographs and lidar, analytical field survey, geophysical survey, excavation and palaeoenvironmental study. The project (Fig 1) covered an area of 199 sq km in west Wiltshire between Chippenham and Trowbridge, centred on the Avon valley and the A350 road corridor. Wiltshire is often regarded as a county of chalk downland but the project area has a varied geology typical of the Avon Vales and Cotswolds National Character Areas. The relative lack of previous investigation compared to the adjacent North Wessex Downs and Cotswolds, combined with potential development around the major towns and the impact of arable agriculture, were factors in the selection of the project area.

The project created 783 new monument records in the National Record of the Historic Environment (NRHE) and amended a further 123. Equally significantly, it has greatly improved our knowledge of the character and condition of archaeological sites and landscape features in the area, with particular contributions to understanding rural settlement and land use in the Iron Age/Roman and medieval/post-medieval periods. Recommendations for scheduling assessment may also lead to statutory protection outcomes.

Archaeological mapping from air photographs and lidar identified, in particular, a number of previously unknown ring-ditches, most of which probably represent round barrows; numerous later prehistoric and Roman enclosures, revealed as cropmarks, some with associated field systems; large areas of ridge and furrow; and several examples of medieval or post-medieval settlement earthworks. Ground-based analytical earthwork survey focussed on the last of these, while geophysical survey and excavation mainly targeted the cropmark enclosures. At one site, however, all these techniques were productively combined, along with a survey of standing buildings, to investigate change in the post-medieval landscape.

The report provides a summary of the nature and distribution of archaeological remains seen on air photographs and lidar, and of the subsequent investigations using ground-based techniques. It describes the methodology, scope and sources of the project, assesses how the results have contributed to the aims, objectives and research questions set out in the Project Design, and sets them in the context of development-led work within the project area. Recommendations for further work are put forward and issues relating to heritage protection are discussed. The rationale of the project is that research and heritage protection are closely linked because improved understanding of the archaeology of an area will lead to better informed planning decisions and a greater likelihood that assets will be protected through schemes like countryside stewardship. A clear and compelling narrative is also more likely to engage a wider audience and raise local communities' awareness of their heritage.

CONTRIBUTORS

The report was compiled by Jonathan Last, based on the Aerial Investigation & Mapping Interim Report by Edward Carpenter and Sally Evans and fieldwork reports by Edward Caswell, Zoe Edwards, Alice Forward, Elaine Jamieson, Jeremy Lake, Neil Linford, Paul Linford, Andrew Payne, David Roberts and Nicky Smith, with additional contributions by Barry Bishop, Greg Campbell, Nicola Hembrey, J.M. Mills, Ruth Pelling, Michael Russell, Jane Timby and Fay Worley. Aerial interpretation and mapping was carried out by Edward Carpenter, Zoe Edwards, Sally Evans, David Knight, Matthew Oakey, Fiona Small and Helen Winton. Geophysical survey was carried out by Neil Linford, Paul Linford, Andrew Payne, Zoe Edwards and Edward Caswell. Earthwork survey was carried out by Elaine Jamieson, Nicky Smith and Edward Caswell with hachured plans produced by Sharon Soutar. Excavation was carried out by David Roberts with Alice Forward, Kevin Wooldridge, Paul Braham, Mike Emra, Martyn King, Sam Oates and Jonathan Parkhouse. Building recording at Catridge was led by Alan Wadsworth and Pam Slocombe, supported by Clive Carter, Alison Goodall, Sue Jones and Robert Jones.

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Cover Image: Aerial view of the Sandy Lane area, looking north-west (27265/23 05-JUL-2010 © Historic England)

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INTRODUCTION

Aims of the project

The National Archaeological Identification Survey (NAIS): Lowland Pilot Project, which began in June 2013, was one of two initial pilot projects initiated by English Heritage (now Historic England) as part of Activity 3A4 (Identification of terrestrial assets via non-intrusive survey) of the National Heritage Protection Plan (NHPP). The work covered an area of west Wiltshire (Fig 1) and was carried out by what is now the Investigation & Analysis Department within Historic England's Research Group, with the assistance of colleagues in the Strategic Planning & Management Department, Listing Group and Planning Group.

Despite a number of development-led projects in recent years (see below), the project area was relatively poorly understood, contrasting with adjacent regions that have seen more intensive archaeological research. The area is subject to potentially significant development pressure, especially related to housing, which is set out in the Wiltshire Core Strategy and Local Development Framework (Wiltshire Council 2015a), as well as increasing arable agriculture (Natural England 2014, 7). Together these provide a rationale for enhancing understanding of the historic landscape of west Wiltshire and its buried archaeology.

The project aimed to improve the recognition and definition of heritage assets in the project area as well as understanding of the wider historic landscape. Focussing on archaeological sites (earthworks and buried sites) rather than standing buildings, the project used as its basis archaeological mapping derived from analysis of air photographs and lidar. This informed the iterative application of targeted ground-based work including geophysical survey, analytical field survey, sample excavation and palaeoenvironmental investigation. Another key objective was to explore how to maximise the potential of various field techniques, given limited resources, in order to improve our understanding of the historic environment in an area where basic identification of heritage assets was felt to be poor. The methods and processes established during this project, the NAIS upland pilot project in Cumbria and Lancashire (Oakey *et al* 2015) and the ongoing South-West Cambridgeshire NAIS project will inform Historic England guidance for future projects of this kind.

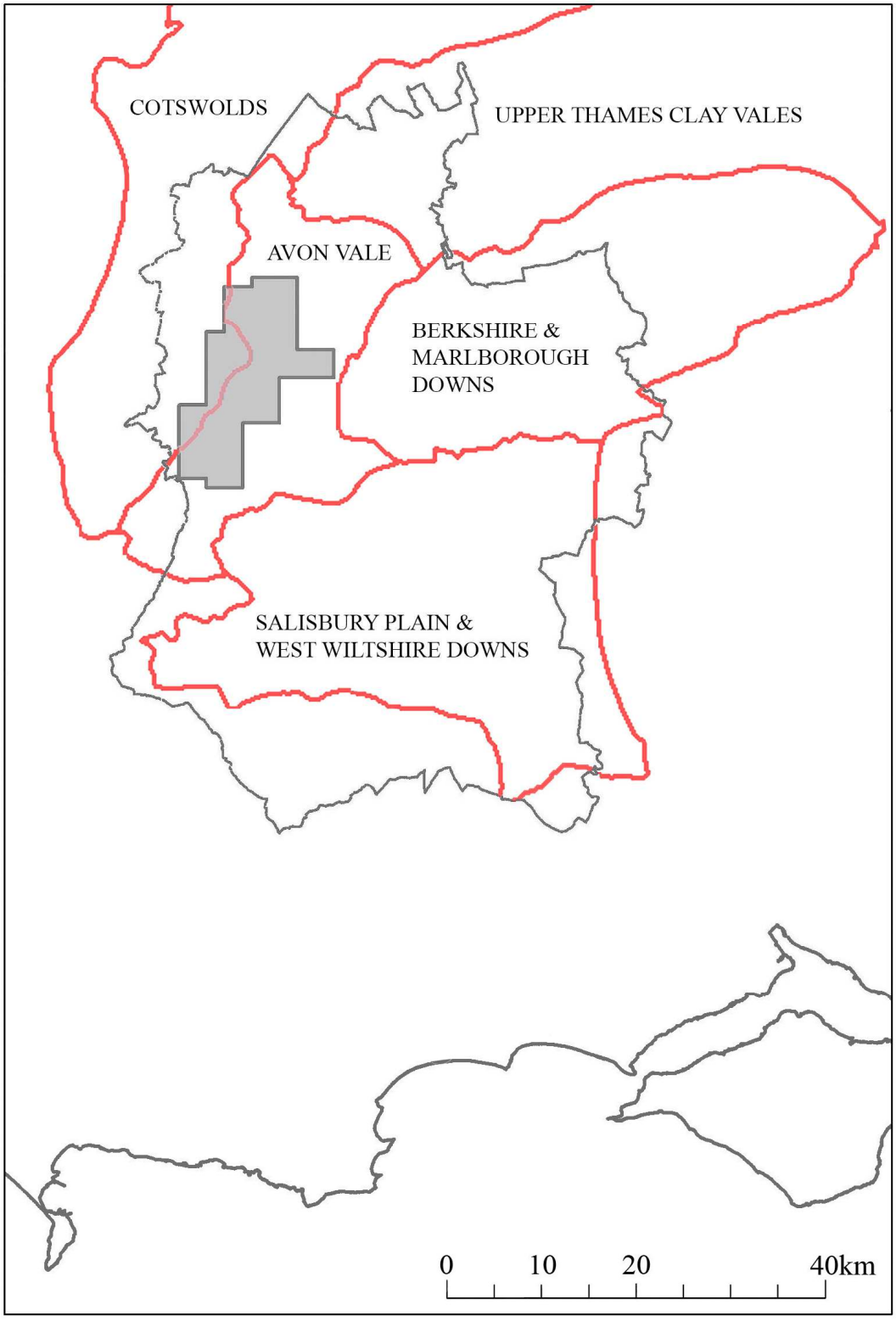

Fig 1: Location of the project area (shaded) within Wiltshire and in relation to National Character Areas (red)

The main products of the project, apart from this report, are digital archaeological mapping from air photographs and lidar, associated monument

records, survey and excavation data, and separate research reports which provide further details of fieldwork at specific sites (Caswell 2015; Jamieson 2015; Linford *et al* 2014; 2015a; 2015b; 2016; Smith 2015).

The project area

Geology and soils

The project area, which covers 199 sq km, is situated to the west and north-west of Wiltshire's main areas of chalk downland (Salisbury Plain and the Marlborough Downs) and to the south-east of the Cotswold hills. Centred on the valley of the river Avon, with an eastward extension around Sandy Lane, it is a geologically diverse area (Fig 2), with Jurassic rocks that are overlain by chalk further east cropping out in succession, including (from west to east) Great Oolite, Cornbrash, Kellaways and Oxford Clay Formation, Corallian Limestone and small areas of the Cretaceous Gault and Lower Greensand that fringe the Marlborough Downs. The Oolite and Cornbrash have been extensively quarried and mined for building stone, while the Oxford Clay around Chippenham was used for brickmaking. Within the Avon vale there are also areas of alluvium and valley gravels.

Overlying the oolitic limestone in the west of the project area is a banded mix of shallow lime-rich soils and less free-draining clayey and loamy soils (Fig 3); this fertile land is used for arable and pasture. The low-lying clay landscape in the central part of the project area (Geddes 2000, 42) has loamy and clayey soils that are seasonally wet due to their slow permeability. In contrast the land adjacent to the River Avon has freely draining rich loamy soils, though the underlying clay means the flood plain has naturally high groundwater levels. The clay lowlands are used largely for pasture, with arable occurring mainly at higher altitudes. In the eastern extension the smaller areas of more freely draining Lower Greensand and Corallian Limestone are overlain by slightly acidic sandy or loamy soils. The sandy soils over the greensand are typically used for arable, while the loams have more mixed use.

Landscape and land use

The entire project area lies within the catchment of the River Avon (Environment Agency 2012), often called the Bristol Avon to distinguish it from the other Wiltshire river of that name. The stretch of river within the project area (Fig 4) lies at a height of about 30–40m OD from where the land rises westward to over 120m OD on the Great Oolite south of Corsham and eastward to a high point of 180m OD on the Lower Greensand between Lacock and Sandy Lane.

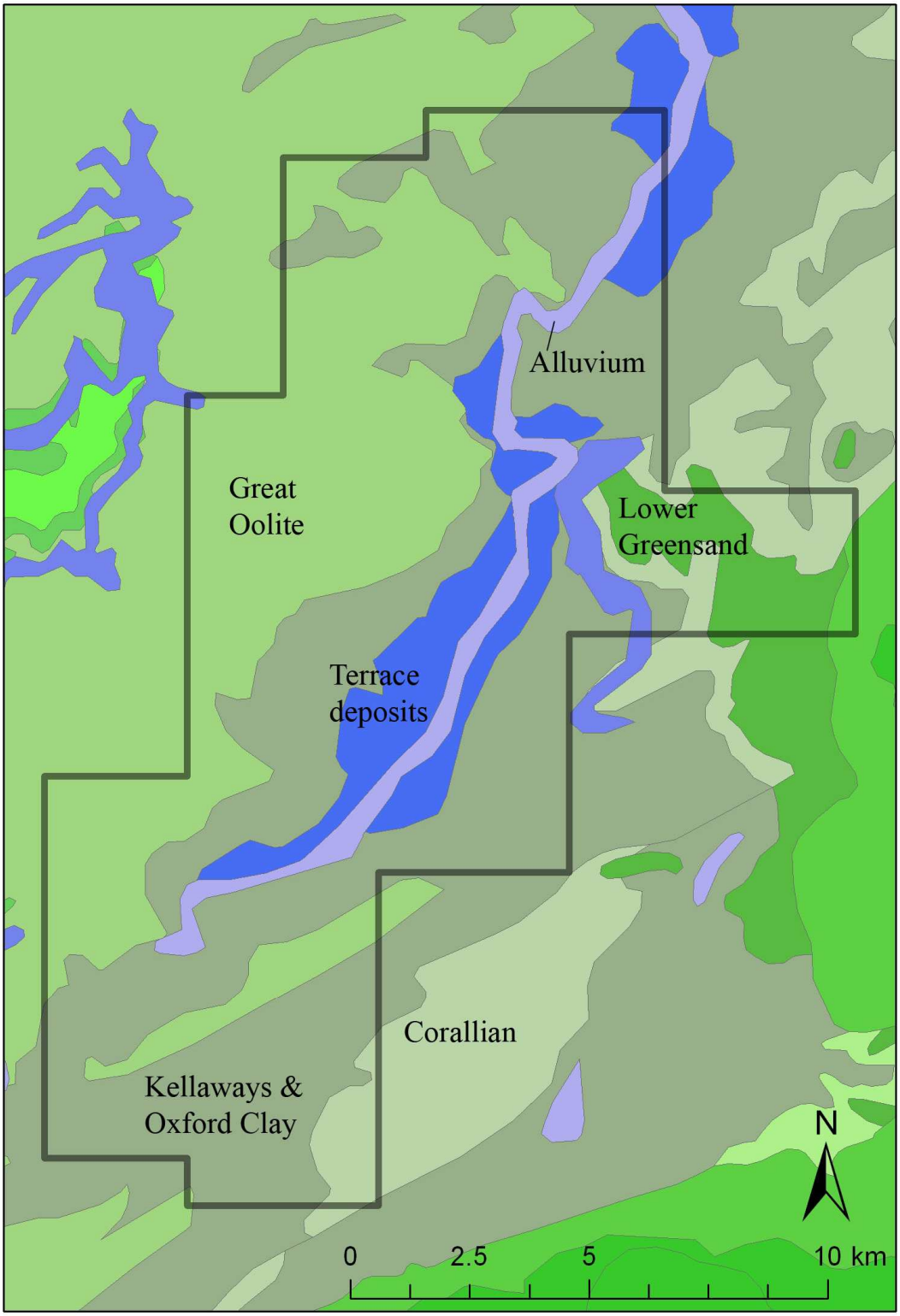

Fig 2: Simplified geology of the project area (reproduced with permission of the British Geological Survey ©NERC. All rights reserved.)

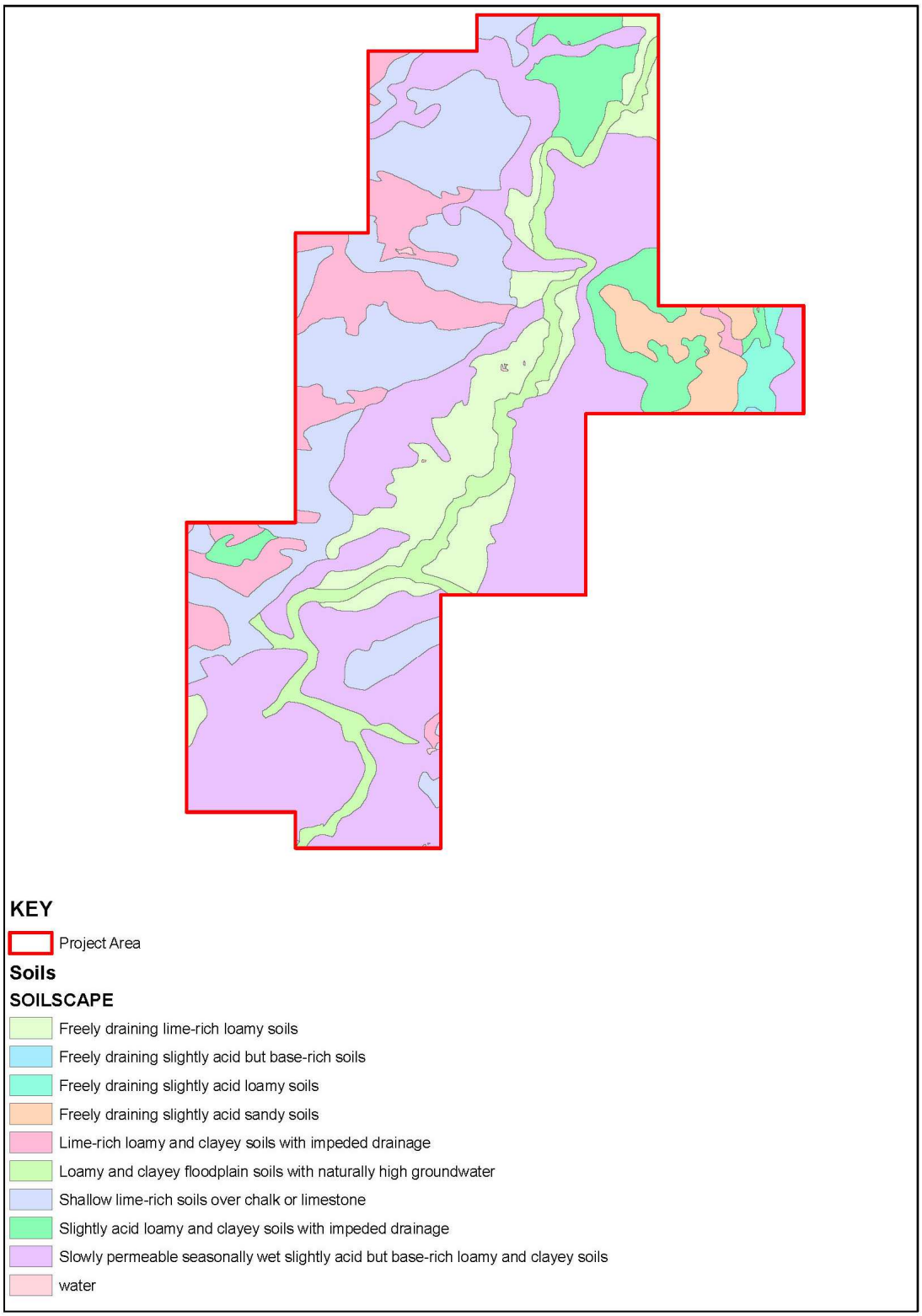

Fig 3: Soils in the project area (© Cranfield University (NSRI) and for the Controller of HMSO 2014)

This landscape is divided between two National Character Areas (NCAs), as defined by Natural England (Fig 1). About 80% of the project area lies within NCA 107 (Avon Vales), though the western edge is within NCA 117 (Cotswolds). The division between these two zones broadly follows a north-east to south-west alignment and reflects the geological division between the clay-dominated areas to the east and the oolitic limestone to the west. However, landscape character is also defined by the visible elements of the historic landscape, which not only provide clues to the recent history of human occupation in the area but have affected the survival and visibility of earlier remains, as discussed below. The key indicator of historic landscape character in rural areas is the modern fieldscape, which has been broadly categorised by landscape character assessments at different scales, and in much more detailed fashion by the process of Historic Landscape Characterisation (HLC), which is discussed further below (Sunley 2016).

The Avon Vales NCA is described as 'an undulating, low-lying landscape of mixed, predominantly pastoral agriculture and small limestone-built towns' (Natural England 2014, 3). Rural areas are characterised by 'small- and medium-sized fields with mostly hedgerow boundaries' (Natural England 2014, 6). Woodland is fairly sparse within the project area, which covers about 25% of the NCA, though 6% of the NCA as a whole is wooded. A number of large landscaped parks are found in the NCA; those within the project area include Bowden Park, Corsham Park, Lacock Abbey and Spye Park.

The Cotswolds NCA to the west forms 'the best-known section of the predominantly oolitic Jurassic Limestone belt that stretches from the Dorset coast to Lincolnshire. The dominant pattern of the Cotswold landscape is of a steep scarp crowned by a high, open wold; the beginning of a long and rolling dip slope cut by a series of increasingly wooded valleys' (Natural England 2013, 3). The small fraction of the NCA (about 1%) that lies within the project area is a relatively low-lying part of the dip slope with a mixture of grassland and arable. Field patterns in the Wiltshire part of the NCA comprise a mixture of small irregular fields signifying piecemeal, generally 16th-century enclosure of earlier open fields, with distinctive curved boundaries relating to medieval plough strips, and irregular enclosures of 18th century or later date with boundaries echoing the headlands of medieval open fields.

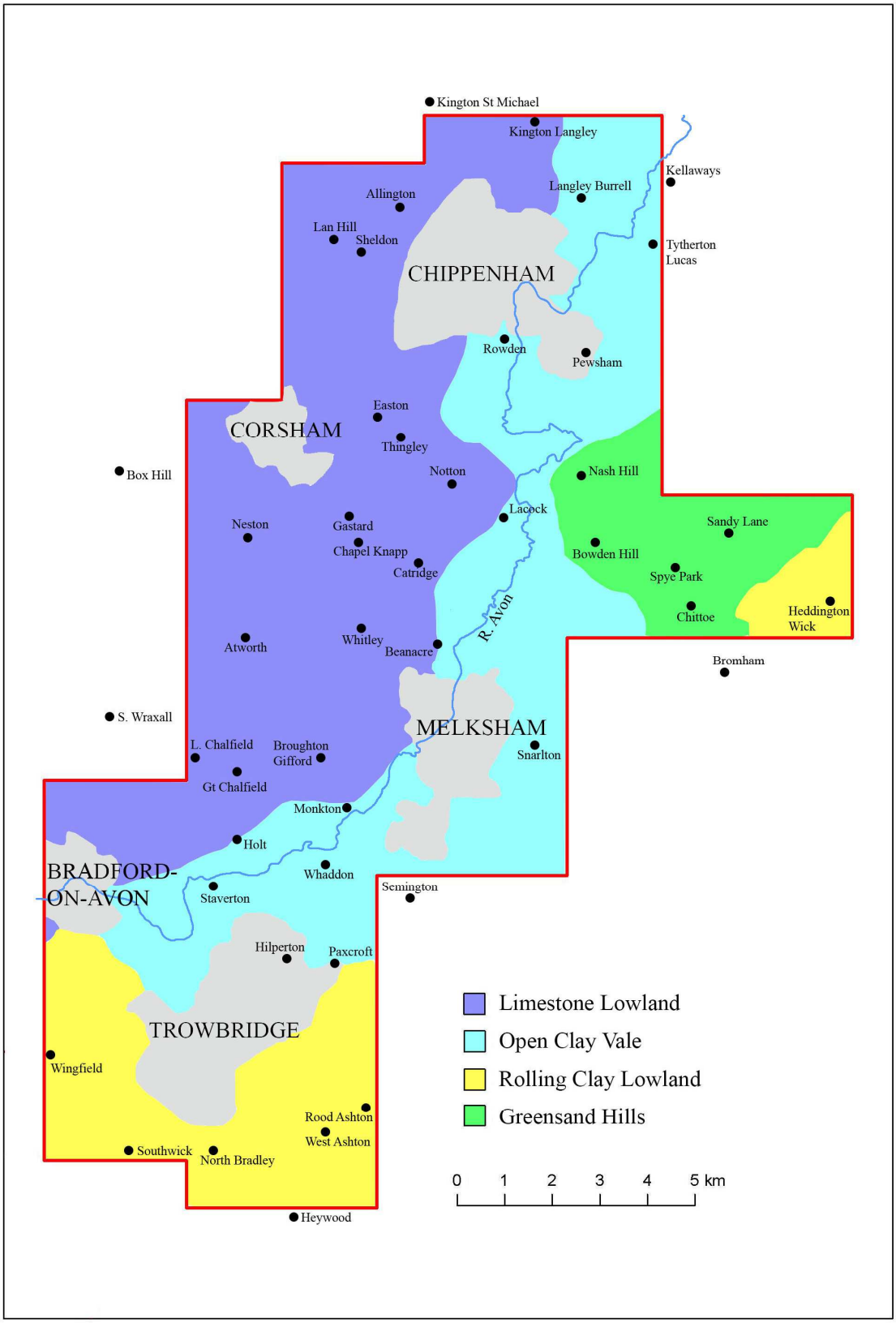

Fig 4: Local landscape character areas and places mentioned in the text

Fig 5: Looking east from the Avon valley at Lacock towards the greensand hills (© Historic England, J Last)

A number of local landscape character areas (LCAs) have also been defined for Wiltshire and its districts (Chris Blandford Associates 2007; Kennet District Council 2005; Land Use Consultants 2005; White Consultants 2004), details of which can be found in Appendix 1. These broadly divide the project area into limestone lowlands in the west, open clay vale in the north-east, rolling clay lowlands in the south, and greensand hills in the eastern extension (Figs 4–5). The local character areas usefully show how much variation there is within each NCA in the fieldscape and other features; for example, the variety of field sizes and shapes within the limestone lowlands, which is borne out by the results of the recent Wiltshire HLC project.

Land use is easier to quantify than landscape character, and this can be done using GlobCover, which was a project undertaken by the European Space Agency (ESA) using observations from the 300m MERIS sensor on board the ENVISAT satellite mission (ESA 2010, 25). The data is available via a web portal as a non-interrogatable raster download, with the land cover dating to 2009. As the dataset is global the outputs are fairly crude at a local level, with the area subdivided into 300m blocks for each of which the dominant land use is recorded. This is sufficient to reveal broad trends in land use but does not provide data at a resolution fine enough to indicate land use in individual fields.

Within the project area a number of land uses are apparent (Fig 6). The main categories are Rainfed Croplands (arable), Closed to Open Grassland (pastoral), Mosaic Forest–Shrubland/Grassland (pastoral), Mosaic Vegetation/Croplands

(arable) and Artificial Areas (urban). Rainfed Croplands are recorded across the project area but especially in the north-west, broadly reflecting the underlying oolitic limestone geology and the south-westerly extent of the Cotswolds NCA. On the clay lowlands within the Avon Vales NCA, Closed to Open Grassland is the main land use category.

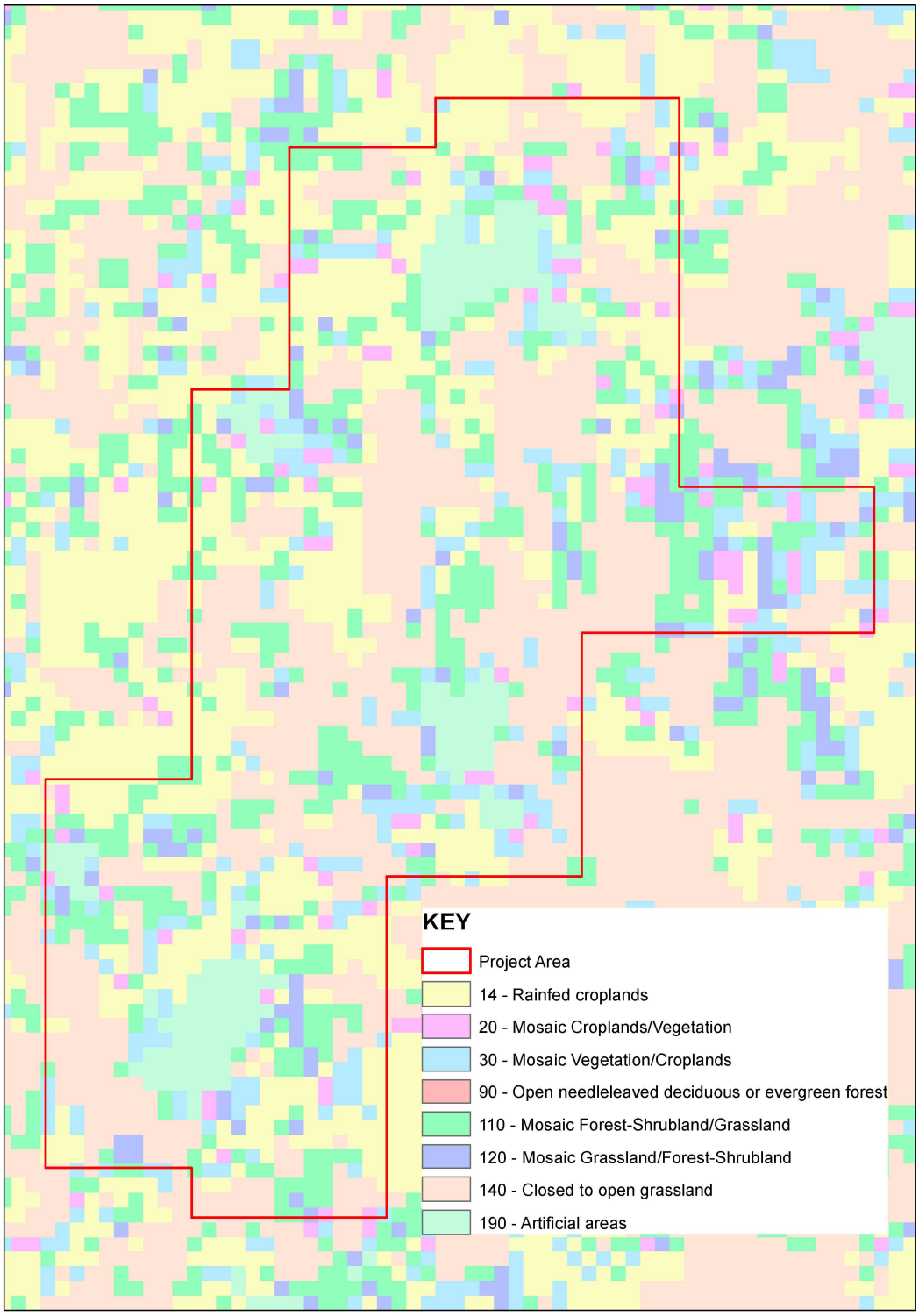

Fig 6: Land use in the project area (© ESA 2010 and UCLouvain)

Geology and landscape character have not only influenced the patterning of past settlement and land use, but also have an impact on the visibility of archaeological remains to different remote sensing techniques; both of these aspects are explored further below.

Settlement and communications

The A350, a primary route which connects the M4 to the south coast at Poole, runs from north to south through the project area. Most of the towns within the project area (Fig 4) lie on this road, including Chippenham and Trowbridge (two of the largest towns in Wiltshire), as well as Melksham. The remaining towns, Corsham and Bradford-on-Avon, lie further west on routes connecting the A350 to Bath. Within the project area the A350 largely follows the course of the River Avon, which rises in south Gloucestershire and flows southwards through Chippenham and Melksham before heading west through Bradford-on-Avon, eventually joining the Bristol Channel at Avonmouth. Trowbridge lies on the River Biss, a tributary of the Avon which rises on Salisbury Plain.

While north-south connections dominate the modern landscape, this was not always the case: the line of the Roman road between Bath and London via Silchester (route XIV in the Antonine Itinerary) crosses the project area from east to west. This was subsequently incorporated into the post-Roman defensive earthwork known as Wansdyke, or at least provided a link between fortified sections of the Wansdyke (see below), and though no longer a routeway, it remains a significant feature in the landscape (Fig 7). The project area includes an eastward extension along the line of this road that takes in a significant group of Roman remains, including the small town of *Verlucio*, around the modern settlement of Sandy Lane (Fig 8).

More recent east-west communication routes within the project area include the Kennet and Avon canal, constructed between 1794 and 1810, and the main line of the Great Western Railway, which opened in 1841. The canal runs through Bradford-on-Avon and Semington, where it joined the less successful Wilts and Berks canal, which ran up the eastern side of the Avon valley before turning north-eastward at Pewsham, from where a separate branch ran to Chippenham. Plans are currently afoot to replace the disused section between Semington and Melksham with a new canal. The railway followed a more northerly route through Chippenham and Corsham, and the project area includes the eastern end of the 3 km-long Box tunnel, one of the most significant structures on Brunel's London-to-Bristol line (see below).

Fig 7: The Roman road at the eastern edge of the project area, marked by the line of trees running from the right hand side of the photo (© Historic England, J Last)

Pressures for change

Urban development

Potential threats to the historic environment in the project area include development pressure, especially residential development focussed on the fringes of the major towns. This kind of change can, of course, provide significant opportunities to advance understanding of the archaeology of the region through development-led fieldwork, but only if properly resourced and driven by appropriate research designs. Thus the more knowledge there is of the likely character and condition of archaeological remains across the landscape, the easier it will be to plan for and manage the impacts of future development.

The Avon Vales NCA profile notes that there was much urban development in the late 20th century, and towns increased significantly in population, especially Chippenham which has prospered from its position on the London-to-Bristol railway (Natural England 2014, 7). Such development is more likely to have an impact on buried archaeology than on historic townscapes: 'Expansion – much of which follows the spine of the A350 – has been largely met by the demands for residential and light industrial uses at the outer areas of settlements, rather than within their historic cores' (Natural England 2014, 9). 'There has been marked expansion into the peri-urban zone around Trowbridge, Melksham [and] Chippenham…' (Natural England 2014, 26). The location and character of the Avon vale also make future development in the project area more likely: 'The

NCA is surrounded by high-quality designated landscapes which are strongly protected. This, and the construction-friendly landform of the Avon Vales, means that there has, since the Second World War, been intense pressure on the NCA for all forms of development, and this continues with the plans for a 21st-century expansion in housing in Wiltshire' (ibid). Some of this development is sprawling and unsympathetic to the landscape (Natural England 2014, 9) while 'past, current and projected development makes the NCA score poorly for tranquillity and intrusion' (Natural England 2014, 29).

The recent Wiltshire Core Strategy sets out a spatial vision for the next ten years of 'a sustainable pattern of development, focused principally on Trowbridge, Chippenham and Salisbury', which will be 'the primary focus of new housing development' (Wiltshire Council 2015a, 14 and 16). For Chippenham, where the strategy is 'based on delivering significant job growth' (Wiltshire Council 2015a, 61), this is detailed in a separate Site Allocations Plan (Wiltshire Council 2015b). In Trowbridge, urban extension is planned to the south-east (Wiltshire Council 2015a, 131) while a high level of residential development is already proposed in Melksham, including an extension to the east of the town (Wiltshire Council 2015a, 89). For the Cotswold towns of Bradford-on-Avon and Corsham the strategy aims for a more modest level of development (Wiltshire Council 2015a, 51, 70–1).

The impact of these plans in terms of archaeological understanding is a high level of development-led investigation around the fringes of the main settlements. The results of the current project can aid decisions about future development by providing initial information about the archaeological potential of as-yet undeveloped areas, and improving understanding of the significance of the sites emerging from development-led work by setting them in a wider landscape context. Alongside complementary techniques like Historic Landscape Characterisation, archaeological work may also assist decision-making related to planning and landscape architecture, helping ensure the resilience of the historic environment in the face of change.

Agriculture

Rural land use has also seen much change during the 20th and 21st centuries, and while more likely to involve attritional rather than wholesale loss of archaeological remains and historic landscape features, such impacts are harder to monitor than those governed by the planning process. For example, 'in 1918 about five per cent of the [Avon Vales] NCA was historic parkland. By 1995 it is estimated that more than half that had been lost' (Natural England 2014, 27). The Countryside Quality Counts report on the period 1999–2003 found that boundary features were generally maintained in the Cotswolds NCA but neglected in the Avon Vales. More recently, the early 21st century has seen a rise in arable farming in the latter area, reflecting a national decline in dairying

(Natural England 2014, 7). The new arable areas primarily grow oilseeds, beans and other crops, while cereals have declined in the same period. In the Cotswolds NCA too, there has been large-scale 'conversion of permanent pasture for sheep grazing to arable cultivation on the high wold and dip slope' (Natural England 2013, 36).

Cattle remain the most numerous livestock in the Avon Vales NCA, followed by sheep and then pigs, though all have declined in number since 2000 (Natural England 2014, 20). Agricultural intensification has also led to hedgerow loss and neglect (Natural England 2014, 19), though the local character area descriptions suggest there is considerable variability in this.

In addition current 'pressure for renewable energy has led to considerable interest in solar farms, by way of diversification in the farmed environment' (Natural England 2014, 26), although 'there is concern for the impact on the landscape should they become widespread and established' (Natural England 2014, 29). Indeed, recent planning applications for solar farms within the project area have spawned local protests and some have been refused.

While the solar schemes are subject to planning controls, other rural land-use change and ongoing agricultural impacts are not. The results of the project are therefore important both in terms of understanding what archaeological remains may be present in different areas, and how they are being impacted by farming practices, which can be assessed through the comparison of aerial images of different date (see below).

Water management

The Avon Vales NCA has a long history of river flooding, particularly affecting Chippenham and Melksham within the project area. The Wiltshire Core Strategy makes flood risk management and sustainable drainage central to new development and sees the River Avon corridor as key to flood management. Trowbridge is considered to be already well-served with green infrastructure to reduce flooding impacts (Natural England 2014, 10) while the Environment Agency flood management plan suggests none of the towns have significant flood risk except for Bradford-on-Avon, where improvements to channels and bridges would be impractical. In rural areas the plan is to determine where storage of floodwater may be feasible and which areas could benefit from increased flooding, for example developing water meadows, wet woodland or converting arable land to pasture (Environment Agency 2012). Such schemes are also likely to have impacts on the condition and visibility of archaeological remains in these areas.

Previous archaeological work

Like the 20th-century commentators who characterised Wiltshire as a county of chalk downland (Bradley 1909, 14–15; Pevsner 1963, 15), antiquarians traditionally focussed their archaeological efforts on the chalk as a result of the distribution of surviving earthworks. This is reflected in the areas investigated by Cunnington and Colt Hoare in the early 19th century, for whom the northern edge of the chalk effectively marked the limit of their study: 'With the chalky hills, our Researches after British Antiquities must cease; chance, and the plough may occasionally make further discoveries, and point out to us situations in the vales, into which, in times more civilized, the Britons, quitting their alpine residences, resorted; but to seek for them without some positive information, would be an endless, and unavailing task' (Colt Hoare 1975, 98–9). However, Colt Hoare did make an exception for his exploration of Roman sites and the Wansdyke (see below).

One possible consequence of the lack of early work in the project area is the relatively small number of scheduled monuments (SMs) (Appendix 2). The suspicion was that this reflected a lack of field investigation rather than a paucity of sites meeting the criteria for scheduling. One aim of the project was therefore to identify sites that may be worthy of designation, alongside a condition assessment of the existing SMs, several of which remain poorly dated and understood.

The project area includes nine SMs that are earthworks or buried sites, of which two are prehistoric (Lanhill long barrow near Chippenham and an earthwork enclosure in Great Bradford Wood), two Roman (a villa site at Nuthills and a section of road in Spye Park), one early medieval (a section of the Wansdyke east of Sandy Lane), and four medieval (the settlement earthworks at Sheldon and Whaddon, a moated site at Rowden Farm near Chippenham, and the monastic grange with surrounding archaeology at Barton Farm near Bradford-on-Avon). Three of these were on the Heritage at Risk register owing to arable damage or plant growth (see Appendix 2). The remaining 12 SMs, which were not assessed, are standing structures, of which seven are medieval in origin (including four bridges) and five post-medieval. Most of these are also listed buildings and in order to simplify their management it may be appropriate to de-schedule some of them in favour of their listing (H. Gordon, pers comm).

Before the project was undertaken, the NRHE database (accessible at www.pastscape.org.uk), recorded around 450 sites, monuments and find-spots in the project area, excluding standing buildings that post-date 1700 but including features of types that could be mapped from aerial photographs, i.e. gardens and designed landscapes (largely 18th century), railways, canals and quarries (mostly 19th century) and 20th century military features. Of these

records, about 23% were medieval, 20% were post-medieval (16th–17th century), 20% were 20th-century military (mainly WWII pillboxes) and 12% were Roman. The remaining periods and those of uncertain date (principally cropmarks) accounted for less than 5% each. Prehistoric records in general made up about 10% of the total, with the Mesolithic (3%) being relatively well represented within these.

Recent archaeological activity seems to have followed a similar pattern to earlier work in the county: a map of Archaeological Investigations Project (AIP) data still shows a relative lack of work in north-west Wiltshire compared to surrounding areas (Webster 2007, fig 1.13). Nonetheless, prior to the project the NRHE events database recorded over 200 investigations in the project area (combining multiple records for the same site as far as possible), many of which were assessed in the course of the project. In the PPG 16 era, development-led work outside the historic town centres has largely been restricted to magnetometer surveys and trial-trench evaluations around the fringes of Chippenham, Corsham, Melksham, Bradford and Trowbridge. However, some of these investigations have covered sizeable areas, for example the various phases of work at Paxcroft Mead, Hilperton, where Late Bronze Age and Roman occupation was revealed. Development-led fieldwork in various forms has now covered almost 1000ha within the project area, around 5% of the total area (Fig 8). This evidence is discussed further below in relation to the results of the current project.

While this project represents the first systematic survey of the archaeology of this part of Wiltshire, there have been smaller landscape survey projects within or adjacent to the NAIS project area, including Graham Brown's studies of Chippenham hundred (Brown 2001b) and Stanley Abbey and its estates (Brown 2012), and a lidar survey of part of the Bradford Hundred, undertaken by Bradford-on-Avon Museum with HLF funding, which was aimed at understanding the earthwork remains of ancient field systems in a partly wooded area to the north-west of Bradford (Canham 2014).

Archaeological research questions

A number of research questions were set out at the start of the project and refined during the course of the work, especially once the aerial mapping was complete, providing an overview that helped define the most relevant questions. Initially these were based on the research aims set out by the South West Archaeological Research Framework (SWARF) (Webster 2007; Grove and Croft 2012), of which the following have been addressed to a greater or lesser extent during the project, though these do not cover the full range of insights generated by the project:

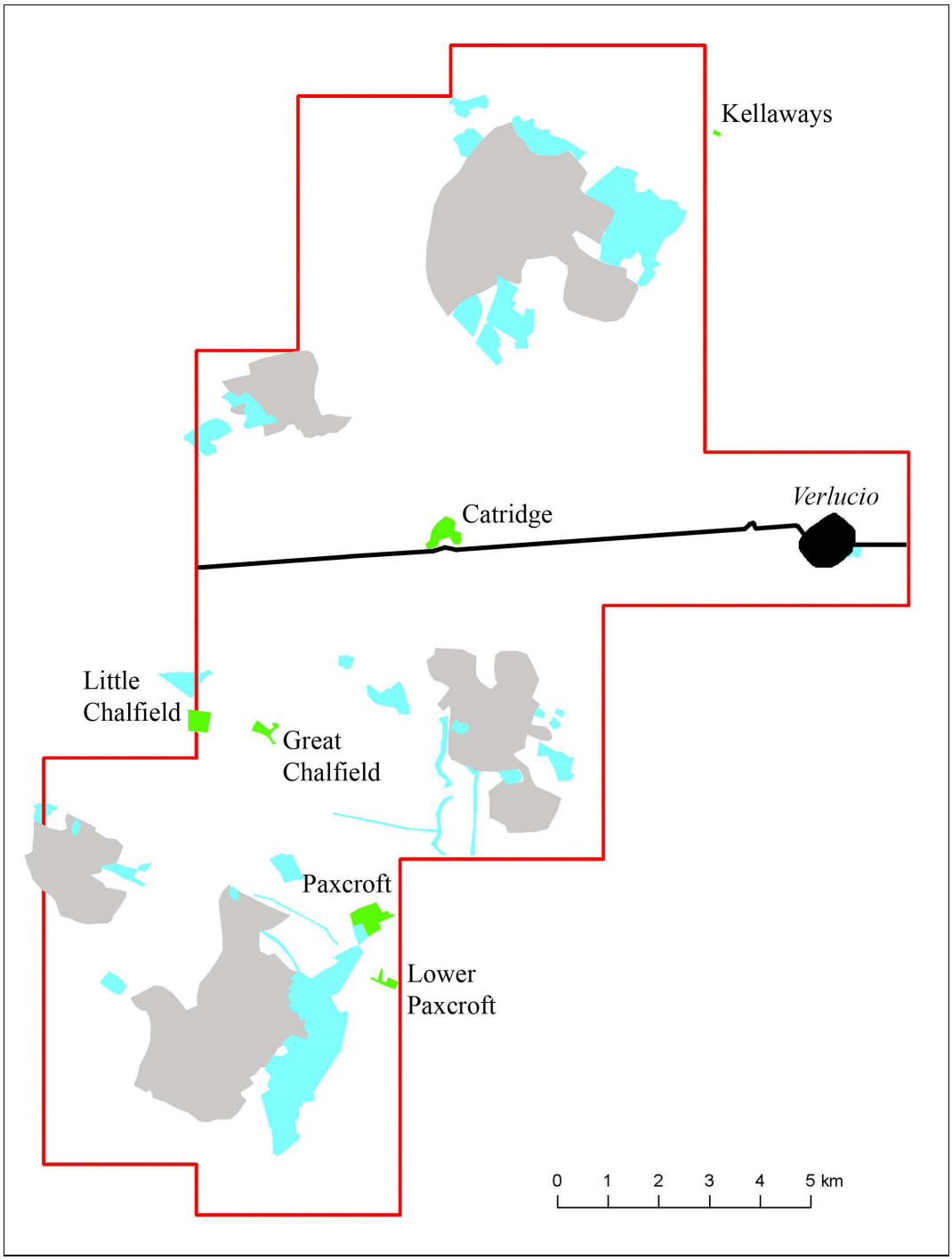

Fig 8: Location of project fieldwork (green) and major development-led archaeological projects (blue) in the project area. Verlucio and the Roman road are shown in black.

Theme A: Settlement Sites and Landscapes

- Improve understanding of non-villa Roman rural settlement (Aim 29)
- Address the long-running debates about early medieval landscapes and territories (Aim 31)

Theme B: Artefacts and the Built Environment

- Widen our understanding of later Bronze Age and Iron Age material culture (Aim 14)

Theme C: Environment and Dating

- Improving standards and techniques of environmental data (Aim 17)
- Development of field systems and intensification of agriculture in the Bronze and Iron Ages (Aim 21a)
- Medieval and post-medieval agriculture (Aim 21b)

Theme D: Social Identity and Change

- Widen understanding of monumentality in the Neolithic and Early Bronze Age (Aim 54)
- Improve understanding of the less-researched areas of post-medieval to modern defence and warfare (Aim 64)

Theme E: Economies and Subsistence

- Improve understanding of agricultural intensification and diversification in later prehistory (Aim 40)
- Assess the impact of the Roman empire on farming (Aim 41)
- Address the lack of knowledge of post-medieval to modern food production (Aim 43)
- Widen understanding of post-medieval and modern transport and communications (Aim 48)

Theme F: Widening Access and Interpretation

- Encourage works of synthesis within and across periods, settlements, monuments and areas (Aim 2)
- Encourage wide involvement in archaeological research and present modern accounts of the past to the public (Aim 4)
- Improve access to and synthesis of 'Grey Literature' (Aim 12).

Theme H: Methodologies

- Extend the use of proven methodologies for site location and interpretation, and encourage the development of new techniques (Aim 1)
- Address apparent ‘gaps’ in our knowledge and assess whether they are meaningful or simply biases in current knowledge (Aim 3).

METHODS

Aerial mapping

Archaeological mapping from aerial photographs and lidar formed the first stage of the project and informed choices and priorities for subsequent ground-based work. Mapping and recording for the project were undertaken by the Aerial Investigation & Mapping team (AIM) based in York and Swindon and adhered to the methodology established for the National Mapping Programme (NMP). The aim of NMP projects is to identify, interpret, map and record all archaeological features visible on aerial photographs and lidar as cropmarks, soilmarks, parchmarks, structures and earthworks, ranging in date from the Neolithic to the 20th century (for military features). Full details of methods, scope and sources can be found in Appendix 3. Monument types conformed to the Historic England Thesaurus and are listed in Appendix 4.

The main products of the aerial investigation phase comprised a GIS dataset created in AutoCAD and monument records created or amended in the NRHE database. The GIS data are available on request from the Historic England Archive while the NRHE monument data are publicly accessible on the PastScape website (with NRHE reference numbers provided in the text below). All data were supplied to the Wiltshire Historic Environment Record.

A combination of lidar and vertical photographs was felt to be most useful for the mapping and recording of earthworks in the project area. Very few earthwork sites had good oblique photographic coverage, possibly due to the impact of RAF Lyneham on aerial reconnaissance (see Appendix 3). The lidar was preferentially used where archaeological monuments survived as earthworks at the date of capture, whilst the historic verticals allowed the identification of features that have since been levelled. Additional oblique photography of earthwork sites would be helpful in revealing extra archaeological detail, especially in areas lacking lidar (see Fig A4). The lowest archaeological monument densities recorded by AIM occur towards the western edge of the project area, which has low numbers of vertical photographs (except around Bradford-on-Avon) and patchy lidar coverage.

Oblique imagery was largely used to map archaeological cropmarks, with some additional elements recorded from vertical prints. The usefulness of the historic oblique imagery was limited due to the large gaps in coverage and the bias towards urban areas. However, the project area was targeted in 2013 during optimal conditions for cropmark formation and provided excellent returns, showing the need to revisit and re-photograph the area over a number of years.

Earthwork survey

Analytical earthwork survey was undertaken by Assessment Team (now Historic Places Investigation Team) on selected sites where the origin, function and significance of earthworks and other structural remains could not be determined from aerial imagery alone. Ground surveys were usually carried out to Level 2 standard (as defined in Ainsworth *et al* 2007), providing descriptive and interpretative textual records. The cartographic element normally expected of Level 2 records was provided by using the existing AIM transcriptions enhanced, as appropriate, by schematic mapping using hand-held GPS (accurate to *c* 0.10m) or more traditional methods such as tape measures. Additional mapping was undertaken to record the position of unrecorded features, to inform proposed amendments to extents or details of designated sites, to supply information on new candidate sites for designation assessment or to highlight stratigraphic or other details not apparent from the aerial imagery. The results of the exercise were provided as updated and enhanced NRHE monument records, held within the NRHE database.

However, the nature of the earthworks and landholdings in the project area meant that it was not possible to systematically and rapidly check open areas containing large numbers of earthwork features recorded from the air. Later land-use has obliterated or masked the vast majority of pre-medieval earthwork features, while most land-holdings in the project area are small farms, which made arranging access extremely time-consuming. For this reason, the majority of the ground-checking had to be carried out using public rights of way, which was not ideal.

On the other hand, the most significant medieval and post-medieval remains (as opposed to blocks of ridge and furrow, isolated field banks, etc.) form coherent complexes which merited detailed studies rather than rapid 'sweeps'. More detailed surveys at 1:2500 or 1:1000 scale (Level 3) were therefore carried out at Catridge, Great Chalfield and Lower Paxcroft, where they were merited by the nature of research and management questions (see below). Earthworks at these sites were surveyed at a scale of 1:1000 using Trimble R8 survey grade GNSS receivers. The GPS data was processed using Trimble's Geomatics Office software. The position of the base station was adjusted to the National Grid Transformation OSTN02 via the Trimble VRS Now Network RTK delivery service. This uses the Ordnance Survey's GNSS correction network (OSNet) and gives a stated accuracy of 0.010–0.015m per point. Additional survey data was added using a Trimble Geo7X hand-held GNSS receiver and processed using Trimble's K-Matic V.1.6.1 software. This data was downloaded and transferred into AutoCAD 2008. The survey plot was completed in the field using graphical survey methods. A digital hachured plan of the final survey was produced in AutoCAD software and completed using Adobe Illustrator. Full details of the

methods employed at each site can be found in the relevant reports (Caswell 2015; Jamieson 2015; Smith 2015).

Geophysical survey

Available resources allowed geophysical survey to be carried out at a small number of locations, mainly cropmark sites where there was felt to be the potential to clarify and/or add detail to the aerial mapping; the exception was at Catridge where the application of geophysical methods was prompted by the discovery of stone wall foundations during excavation (see below).

Magnetometer data was collected at four sites (Paxcroft, Little Chalfield, Kellaways and Catridge) using an array of six high-sensitivity Geometrics G862 caesium vapour magnetometer sensors mounted on a non-magnetic sledge. This sledge was towed behind a low-impact All Terrain Vehicle (ATV) which also provided the power supply and housed the data logging electronics. Five of the sensors were mounted in a linear array transverse to the direction of travel 0.5m apart and approximately 0.2m above the ground surface. The sixth was fixed 1.0m directly above the central magnetometer in the array to act as a gradient sensor. The sensors were set to sample at a rate of 16Hz based on the typical average travel speed of the ATV (3.2m/s) giving a sampling density of approximately 0.2m by 0.5m along successive swaths. Each swath was separated from the last by approximately 2.5m, navigation and positional control being achieved using a Trimble R8 Global Navigation Satellite System (GNSS) receiver mounted on the sensor platform 1.75m in front of the central sensor.

Earth resistance measurements at Paxcroft and Kellaways were recorded over a series of 30m grids using a Geoscan RM15 resistance meter, a PA5 electrode frame in the Twin-Electrode configuration and an MPX15 multiplexer, to allow two separate surveys, with electrode separations of 0.5m and 1.0m, to be collected simultaneously. The 0.5m electrode separation is optimised for detection of near-surface anomalies in the upper 0.5m of the subsurface whilst the 1.0m separation is more sensitive to a depth range between approximately 1.0m and 1.25m.

At Catridge a 3d-Radar MkIV GeoScope Continuous Wave Stepped-Frequency (CWSF) Ground Penetrating Radar (GPR) system was used to collect data with a multi-element GX1922 vehicle-towed, ground-coupled antenna array. A roving Trimble R8 Global Navigation Satellite System (GNSS) receiver was mounted on the GPR antenna array to provide continuous positional control for the survey. Data were acquired at a 0.075m x 0.075m sample interval across a continuous wave stepped frequency range from 60MHz to 2.99GHz in 2MHz increments using a dwell time of 2ms.

Full details of the techniques employed at each site can be found in the relevant reports (Linford *et al* 2014; 2015a; 2015b; 2016).

Excavation

The limited resource for excavation was targeted on particular sites and features identified by aerial mapping, geophysical survey and/or earthwork survey at Paxcroft, Kellaways and Catridge, in order to provide information on date, phasing and function which could not be acquired by non-intrusive methods. The fieldwork was carried out during June and July 2014.

Historic England uses a single-context recording methodology integrated with Intrasis, a digital recording system created by the Swedish National Heritage Board and customised to meet Historic England's methodology. The excavations removed the minimum amount of archaeological deposits necessary to meet research objectives, whilst attempting to avoid biasing characterisation of the site through under-sampling. Cut features and layers were excavated. Linear features such as ditches were at least 15% excavated, and discrete cut features such as pits and postholes were totally excavated. All features, grid pegs, levels, sections, small finds and samples were 3D-recorded according to current Intrasis guidance.

Data from the evaluations were created on site and imported into the Intrasis project database which includes a GIS capability, allowing the collation of aerial survey, HER/NRHE, geophysical survey and excavation data to assemble a site synthesis. Intrasis data entry and record checking was undertaken at the project's 'forward operating bases' near each site.

A total finds retrieval and retention policy was adopted for all hand-excavated areas. Spoil was subject to a visual scan as it was removed. All finds work was carried out in line with the principles and techniques outlined in the *English Heritage Archaeological Recording Manual, Module 5: The Care and Recording of Finds* (2006, revised 2009). Objects and items defined as small finds were placed within specific number blocks depending on their origin as finds on site, finds defined in post-excavation or finds from samples.

The environmental sampling strategy for the project was based upon all well-sealed deposits being sampled in order to recover environmental material. In most cases a flotation sample of 40 litres was taken following the procedures laid out in the Recording Manual. Sampling methods and volumes and processing methods conformed with guidelines for environmental archaeology (Campbell *et al* 2011). Flotation samples were floated using a tank with a mesh of 250 microns for the flot and 500 microns for the residue.

ARCHAEOLOGICAL RESULTS

This section includes a full discussion of the aerial photographic and lidar results, along with the main results of the analytical field survey, geophysical survey, excavation and palaeoenvironmental work, more details of which are provided in separate English Heritage/Historic England Research Reports (Caswell 2015; Jamieson 2015; Linford *et al* 2014; 2015a; 2015b; 2016; Smith 2015). It also includes an assessment of previous work, especially recent development-led fieldwork.

The nature of archaeological evidence available from aerial photographs defined the distribution and types of archaeology recorded during the aerial mapping stage. This typically comprises relatively large ditched and/or embanked features which are visible above ground as earthworks, or as cropmarks of sub-surface features. Twentieth-century military structures are also routinely recorded, though these sites are largely short-lived and are often only seen on historic photographs. Although in some instances relatively slight earthworks have been noticed, some types of feature are not usually identified from the air, such as the small pits that mark Mesolithic and Neolithic domestic sites or the ephemeral traces of early medieval settlement. These biases are discussed further below. Where sites mapped from the air were not already recorded on the HER this is noted in the discussion below. As well as these new discoveries the project has also improved the accuracy and detail of records for many of the previously known sites.

Ground-based techniques were targeted on sites and features mapped and recorded from aerial sources in order to enhance understanding of extent, form, sequence, chronology and function. Fieldwork locations were selected from a longer list of possible sites based on practical considerations including permission from landowners, land-use or vegetation cover, and the resources (staff time) available to each team. The work focussed mainly on the following locations (see Fig 8):

- Catridge (Lacock parish): earthwork survey, excavation, geophysical survey, buildings recording
- Great Chalfield (Atworth): earthwork survey
- Little Chalfield (Atworth): geophysical survey
- Kellaways (Langley Burrell Without): geophysical survey, excavation
- Lower Paxcroft (Hilperton): earthwork survey
- Paxcroft (Hilperton): geophysical survey, excavation.

The archaeological landscape recorded during the project comprises evidence for changing patterns of settlement and land division from the prehistoric period to the present (Fig 9). Parts of the medieval and later landscape are fossilised in the current pattern of land use, as shown by the HLC mapping, but

there is also considerable evidence of changes in land use during these periods, seen in the extensive remains of ridge-and-furrow cultivation and earthworks of abandoned settlements. There is (mainly cropmark) evidence of a pre-medieval pattern of settlement and land division and examples of prehistoric monuments (mainly Bronze Age round barrows) are scattered throughout the project area.

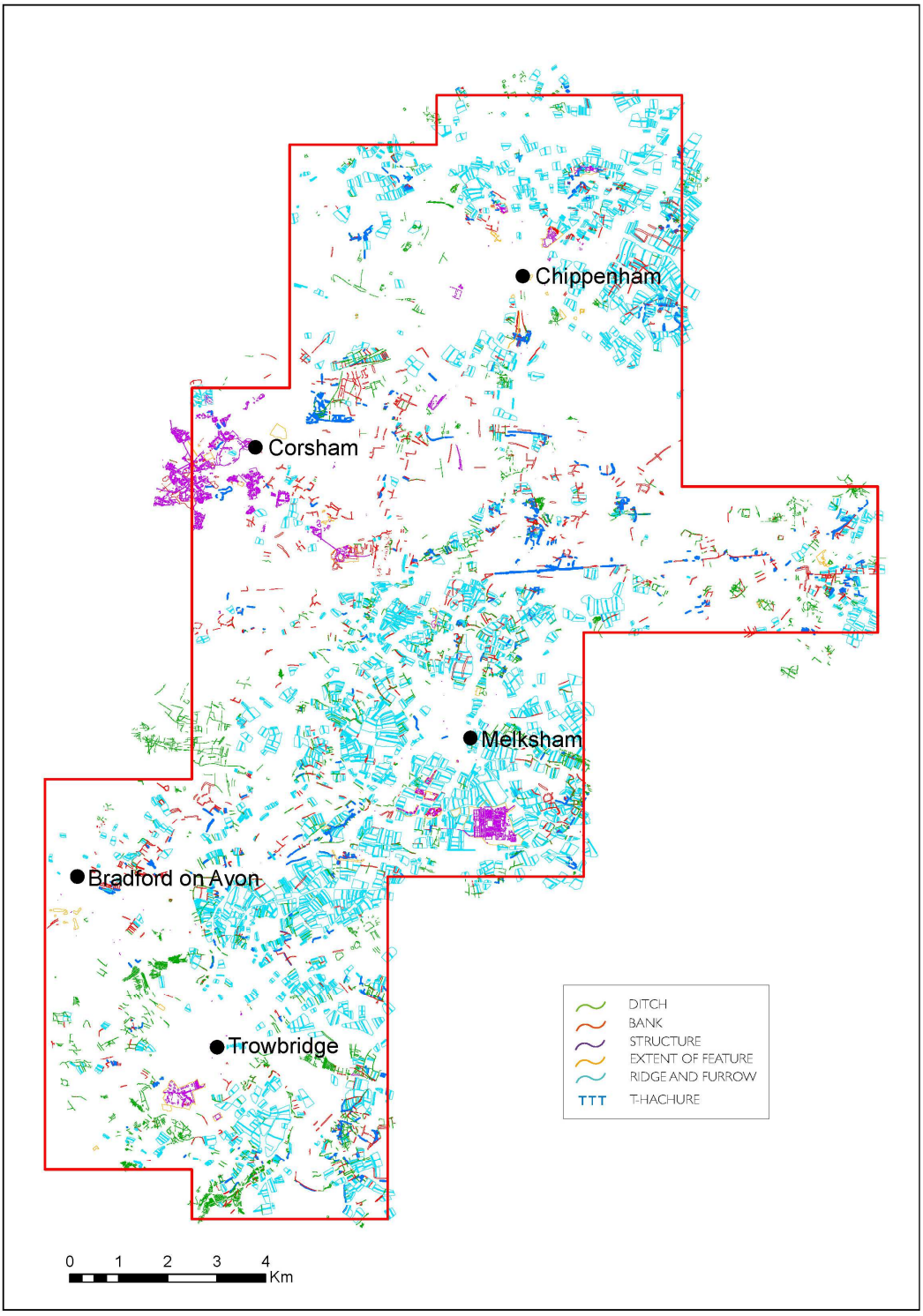

Fig 9: Results of the aerial mapping stage (© Historic England)

Early prehistoric occupation

The Pleistocene landscape

The Palaeolithic was not a focus of the project but the Bristol Avon is known to have significant Pleistocene sediments, though 'the stratigraphy and age of the gravels of the Avon are at present poorly understood' (Bates and Wenban-Smith 2005, 16). Within the project area there are extensive terrace deposits around Melksham and Chippenham (Bates and Wenban-Smith 2005, 17); although the only find from this stretch is a cordate handaxe from Hilperton, the scarcity of artefacts may well reflect a lack of investigation rather than a genuine absence of Palaeolithic remains (Bates and Wenban-Smith 2005, 24–5). Other HER records from the project area assigned to the Palaeolithic either need checking (flakes from Langley Burrell and Melksham) or appear erroneous (a 'Palaeolithic polished flint axe' from Wingfield).

Mesolithic, Neolithic and Early Bronze Age settlement

A Late Upper Palaeolithic point was found just outside the project area at Heywood, probably associated with a more substantial group of Mesolithic finds around Chippenham (Tucker 1985; 2003). Together with another group of finds in the Sandy Lane area these form part of a larger cluster around the Wiltshire/ Gloucestershire border (Webster 2007, 57). Whereas the finds from the Greensand fit a broader pattern found across southern England, most of the Chippenham finds come from the Kellaways and Oxford Clay Formation, close to the River Avon, a distribution that would probably repay further investigation. However, many of these sites are considered very minor, so the nature and chronology of activity remains unclear. An area to the south of Chippenham at Showell Farm where a Mesolithic scatter had been identified was subsequently investigated by test-pitting but no archaeological features were revealed (Young and Hancocks 2006).

Settlement evidence of the Neolithic and Early Bronze Age periods is also largely restricted to flint scatters and stray finds, which once again are most common in the north of the project area around Chippenham. Development-led investigations along the Chippenham Western Bypass revealed Neolithic and Bronze Age lithics as well as a few other features (Bateman and Enright 2000), while there was limited evidence of Late Neolithic and Bronze Age activity at Showell Farm (Young and Hancocks 2006) and Showell Nursery (OAU 1991). However, there is also a small group of Neolithic finds reported to the Portable Antiquities Scheme (PAS) from the southern part of the project area, while a pit containing five fresh Early Neolithic flints was excavated at Ashton Park, Trowbridge (Barber 2014a) and a Beaker pit was found at Staverton (Barber *et al* 2013, 18).

Because of its focus on sites identified from the air, the current project has added little to understanding of Early Bronze Age or earlier settlement in this region, which clearly remains an important question. However, the recovery of a transverse axe or adze from the excavation at Kellaways Farm, along with a few other residual Mesolithic or Early Neolithic flints indicative of a blade-based reduction strategy, adds one more site to the cluster around Chippenham, while a few pieces of struck flint from the excavations at Paxcroft, including two prismatic blades of Mesolithic or Early Neolithic date, as well as a shallow pit containing a sherd of Peterborough Ware, continue the low-density spread of early activity around Trowbridge.

Barrows in the landscape

Long barrows

The only definite Neolithic monument known in the project area is the scheduled long barrow at Lanhill, west of Chippenham (NRHE 208443; Appendix 2), which is part of the Cotswold-Severn group of chambered long barrows. It lies on the periphery of Darvill's Cotswold Hills sub-group, at the southern end of the distribution and on the edge of the high ground, although other clusters of Cotswold-Severn barrows lie to the east on the North Wessex Downs and to the south-west in the Mendips (Darvill 2004).

The monument, which is much restored, is trapezoidal in form and originally measured about 57m in length, 23m in width and up to 4m in height (Grant King 1966). It has an extremely chequered history: first mentioned by Aubrey in the 17th century and described as already 'considerably levelled' by Colt Hoare, it was excavated in several phases of work during the 19th and 20th centuries, the last following further significant damage to the barrow (Thurnham 1857; Cunnington 1910; Keiller and Piggott 1938; Grant King 1966). Academic interest has focussed primarily on the chambers and their human remains, with some innovative approaches: Keiller and Piggott produced facial reconstructions of some of the people buried there and used a full-size model of the chamber they had excavated to investigate how bodies were inserted through the porthole entrance, while a recent study has explored attitudes to disability among the people who used the barrow (Tilley 2015, 259–87). Radiocarbon dating of the extant human remains would no doubt be enlightening.

In terms of its setting, Lanhill lies in an area of piecemeal enclosure approximately 100m from the Hardenhuish Brook, and close to its source, though part of this watercourse has been straightened (Fig 10). Like many other long barrows, the monument is aligned east–west (McOmish *et al* 2002, 22): Grant King (1966, fig 1) shows the eastern forecourt and horns, which have

since been lost. It is not parallel to the contours, another common feature, but instead cuts across a very gentle slope that leads down to the stream. Lan Hill itself rises up from the opposite bank of the stream, which means that the barrow is relatively secluded in the wider landscape, perhaps emphasising its association with the Brook.

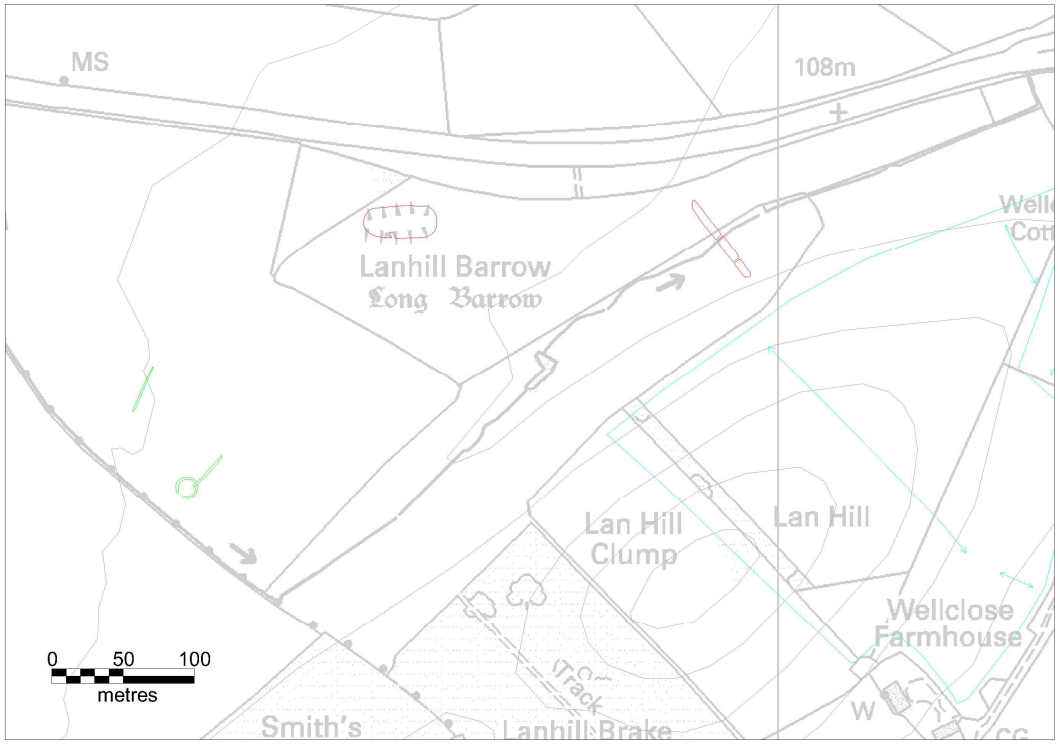

Fig 10: Lanhill long barrow and nearby ring-ditch (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

A riverine focus for Neolithic burial mounds is seen elsewhere in Wiltshire and on Cranborne Chase, Dorset (Field 2006, 102–4). While Lanhill fits this wider pattern, there are numerous watercourses in the project area that are not associated with long barrows. Why this particular location was chosen remains unclear, though it may be significant that the monument lies close to a notable scatter of Mesolithic sites around Chippenham (see above), and microliths have been found on Lan Hill; the location may therefore have had some ancestral significance.

The Avon vale also lacks other Neolithic monument types, such as causewayed enclosures, cursuses and henges. The one probable causewayed enclosure in the Avon catchment is at West Kington, some way north-west of the project area, which provides a clear contrast with the clusters of sites at the head of the Kennet, around Avebury, and the largely uninvestigated group in the Upper Thames valley, of which Down Ampney is closest to the project area (Oswald *et al* 2001). Why the Bristol Avon did not become a focus for monuments during the Neolithic is an intriguing question beyond the scope of this report, but it

may relate to differences in the significance of eastward and westward-flowing rivers in prehistory, something also seen in the distributions of riverine deposits of Bronze Age metalwork.

The only other candidate for a Neolithic monument in the project area is a spread oval mound at Great Chalfield, which lies close to a springhead and the former course of the Lenton Brook, part of a complex of mainly medieval and post-medieval earthworks in an area of piecemeal enclosure (1593698; see Fig 45 and Smith 2015). The mound measures approximately 45 x 25m in area and stands up to 0.7m high, yet it has previously been overlooked due to its indistinct profile and the absence of any surrounding ditch. The date and purpose of the mound are uncertain, but it does not appear to be a natural feature, since it is not consistent with the surrounding topography. It is possible that it is composed of upcast material from adjacent water management features but its location, size, plan and general form raise the possibility that it could be an oval barrow or short long barrow. Interestingly, the site lies on the boundary between areas of clay and limestone geology, a very similar location to the Lanhill long barrow.

Round barrows

The Lanhill long barrow may have been the focus for later ritual activity, as a small penannular ring-ditch (not previously known) is situated *c* 200m to the south-west (1580768; Fig 10), but whether this was a deliberate relationship is unclear. While some Wiltshire long barrows, such as West Kennet, remained significant in later periods, on Salisbury Plain there was no strong association between Neolithic and Bronze Age barrows; where 'co-location does occur, it is usual for just one or two round barrows to be associated with earlier mounds' (McOmish *et al* 2002, 43). However, relatively few Bronze Age round barrows have been identified in this part of Wiltshire compared to Salisbury Plain and other areas of the chalk downland and Cotswolds (Webster 2007, fig 4.2); they are generally dispersed across the project area, often paired but only occasionally in larger groups. While densities remain lower than in adjacent regions, this project has nevertheless doubled the number of recorded ring-ditches, and it is likely that further sites are masked by medieval earthworks or alluvium, or located on soils unresponsive to cropmark formation. Although most of the ring-ditches no doubt represent round barrows, other forms of small circular monument do occur, the most likely candidates being those defined by segmented, penannular or sub-circular ditches.

Analysis of the extant distribution pattern suggests that the highest ground was avoided in favour of lower slopes. This is similar to the pattern seen on Salisbury Plain where round barrows are rarely located on the highest points (McOmish *et al* 2002, 43) and there seems to have been 'an overriding concern with valley slope locations that provided good drainage and an association with

watercourses' (McOmish *et al* 2002, 46). In the Avon vale it is difficult to argue for a deliberate association between water and barrows since few locations are very far from water. However, some monuments are found in close proximity to the Avon itself, most clearly on the north bank between Trowbridge and Bradford-on-Avon, where a single penannular ring-ditch (1577441; not previously known) is situated within 30m of the river on a band of floodplain soils that has historically been subject to flooding (Fig 11). The nearest potentially contemporary monument lies 500m to the east (1577431; not previously known) and may be a very rare earthwork survival of a round barrow within the project area, although it requires further investigation to confirm the identification, given its location on what is mapped as the edge of alluvial deposits within prairie fields. If a genuine barrow, its position may reference the confluence of the River Biss with the Avon some 120m to the south-east. Also close to the Avon are a pair of conjoined ring-ditches at Frying Pan Farm, west of Melksham (1432364; one ovoid; Figs 12–13). A curving ditch connects the smaller western ring-ditch to the larger, roughly egg-shaped enclosure.

A number of other sites are further from the river but still lie on terrace sands and gravels. Around Melksham there is a pair of ring-ditches at Roundponds Farm (1579373; one incomplete), as well as the largest group of such monuments within the project area, near Boundary Farm (992885; Fig 12). This cemetery, in an area of recent field amalgamation, probably comprises the remains of seven levelled round barrows (several of the ring-ditches are penannular or incomplete) between 250m and 450m from the Avon, though the river appears to have been straightened here. Recent oblique photographs reveal that the site extends further north and east than was previously known. The barrows are overlain by extant ridge and furrow, meaning there is good potential for the survival of sub-surface features and also the possibility that geophysical survey could reveal additional components of the barrow cemetery; a recent survey around 100m to the east of the cemetery revealed no further ring-ditches but did find a rectilinear boundary or enclosure ditch and a possible pit alignment (Sabin and Donaldson 2015).

Further north on the riverine deposits are a ring-ditch south of Lacock (1579242) and a pair at Kellaways (1579099 and 1579101; see Fig 31), none of which were previously known. The latter lie almost 1km from the Avon but only 120m from the Cade Burna stream (a rare survival of the Old English name for a brook). Most of the other possible round barrows in the project area lie on limestone geology, but not far from the edge of the clay. These include two pairs of adjoining ring-ditches, one at Great Chalfield (992884) and the other at Hunt's Hall Farm, west of Holt, where an egg-shaped monument is joined at its narrow end to an incomplete, near-circular ditch (1578511; Fig 14). This has superficial similarities to a feature identified at Damerham, Hampshire, which is not thought to have contained a mound or mounds (M. Barber, pers comm).

Fig 11: Ring-ditch (left) and possible round barrow (right) between Bradford-on-Avon and Staverton (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 12: Possible Neolithic and Bronze Age features at Frying Pan Farm (top left) and round barrow cemetery at Boundary Farm (bottom right) (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 13: Cropmarks of round and oval barrow ditches close to the River Avon (bottom left) near Frying Pan Farm (23114_30 24-JUN-2003 © Historic England)

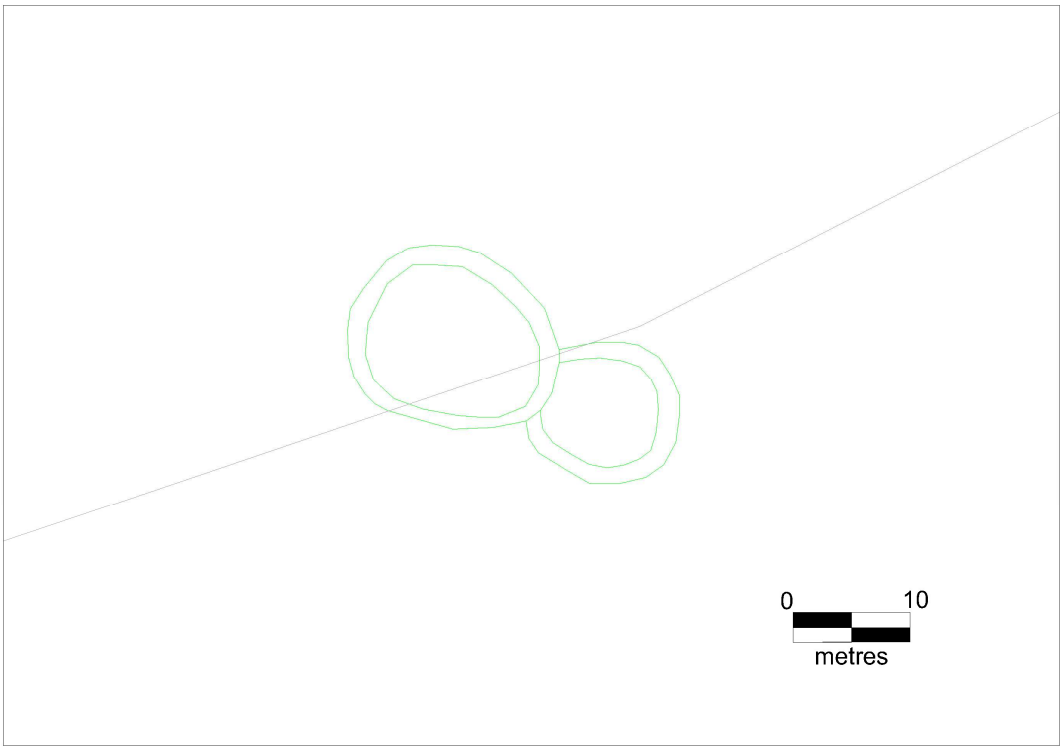

Fig 14: Cropmark ring-ditches on a slope above a stream near Hunt's Hall Farm (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Two non-joining pairs of ring-ditches, about 40m apart, are visible on river gravels near Thingley (1580141 and 1580145; not previously known) and at North Bradley (1577328; one incomplete). There are also single ring-ditches at Chiverling's Farm, west of Chippenham (1579844; slightly oval), and to the west of this (1579834), north-west of Notton (1580133; oval), at Studley Green near Trowbridge (1577551), at Hilperton Marsh (1578779), at Wingfield (992855), at Great Chalfield (1432368), east of Thingley (1580121), near Allington (6614), near Lanhill long barrow (as described above) and west of Kington Langley (1579178; incomplete). Only the first four of these were already recorded on the HER.

The only ring-ditch known on the clay is a previously recorded site at Broughton Gifford (1579369), while in the east near Sandy Lane are two further pairs, one on the Corallian Limestone (1578223 and 1578228; the former incomplete, the latter penannular) and the other on the Lower Greensand in Bromham parish (9916 and 9919). A third ring-ditch at the latter site with a diameter of 50m (10618) was tentatively identified as a later prehistoric enclosure but may be a large barrow. In the same area Colt Hoare's (1975) map of the Roman road marks a tumulus to the south of *Verlucio* which probably equates to an earthwork mound noted on lidar imagery (212037); however, excavation in 1840 found a cruciform structure which suggests it was a windmill mound (Mellor 1941).

Of 24 sites in the project area mapped as round barrows it is notable that more than a third comprise two adjacent monuments, while only one site (the Boundary Farm cemetery) has more than two; it would be interesting to compare the prevalence of paired barrows with adjacent regions. Also striking is the fact that three-quarters of the sites on the limestone are within 500m of the edge of the clay, perhaps suggesting they mark junctions between different environmental zones; viewshed analysis could determine whether they share particular topographic positions.

Ring-ditches have been revealed in development-led fieldwork within the project area, though excavated examples are few. Two small monuments at Showell Farm had internal diameters of 10.5m and 7m and were heavily truncated, with no surviving internal features; two radiocarbon dates from the primary fill of the larger monument, which had an entrance to the north-east, overlap in the 23rd and 22nd centuries cal BC (Young and Hancocks 2006). The site lies on terrace gravels about 1km west of the Avon but is closer to one of its tributaries, the Pudding Brook. The excavators report a 1949 aerial photograph that suggested the presence of a number of other ring-ditches on the development site; that these were not observed in the evaluation trenches is attributed to truncation, while the failure of the excavated ring-ditch to show as a cropmark is suggested to be the result of the Kellaways Formation not being conducive to cropmark formation. However, the survival of the excavated

features must call into question the interpretation of the 1949 cropmarks, which were not recorded during the current project. Also in Chippenham, a geophysical anomaly interpreted as a barrow ditch at Easton Lane did not appear during subsequent trial-trench evaluation (Wessex Archaeology 2012).

Elsewhere a possible Early Bronze Age ring-ditch was evaluated at Paxcroft Farm, Hilperton (Young 2005), while further small ring-ditches were detected by magnetometer surveys at Kingston Farm, Bradford-on-Avon (Sabin and Donaldson 2011) and east of Chippenham (Sabin and Donaldson 2010). At Roundponds Farm, Broughton Gifford, two cropmark ring-ditches recorded on the HER (but not during the aerial mapping stage of this project) did not correspond to any geophysical anomalies (Harrison 2014). This site lies *c* 400m west of the Roundponds Farm ring-ditches mentioned above.

Excavation has also revealed at least one placed deposit of this period that was apparently not associated with a barrow. This was a shallow pit near Clackers Brook, east of Melksham, which contained the articulated leg bones of a deer, accompanied by a barbed and tanged arrowhead (Hardy and Dungworth 2014, 123). Possibly in the same category is a Middle Bronze Age pit from Trowle Solar Park, Trowbridge, which was interpreted as 'a dump of domestic waste', but contained 500 sherds from a single vessel (Nichol 2015).

Later prehistoric and Roman fields and settlements

Field systems

Remains of later prehistoric or Roman field systems, often with associated settlement evidence, were seen as cropmarks across the project area, predominantly on the freer draining soils in the east and west of the project area. The more extensive field systems mapped during the project, around Kellaways Farm and South Wraxall/Great Chalfield, are discussed in detail below in connection with fieldwork at two associated enclosures. There is also more fragmentary evidence around *Verlucio* and west of Chippenham. There are very few examples on the claylands but also large areas of more amenable geology where none were identified. To what extent this reflects a genuine distribution or differences in the visibility of cropmarks is unclear. Although in some places conversion of pasture to arable has resulted in the ploughing flat of medieval and later earthworks, enabling earlier features to be seen as cropmarks (see below), there are large areas where this has not happened; therefore the full extent of pre-medieval field systems in and around the Avon vale is not known. Some areas where cropmarks were not seen, such as the limestone between Corsham and Atworth, may represent genuine gaps in the distribution of early fields, since the area does not contain large areas of extant ridge and furrow. However, in the clay areas where ridge and furrow dominate, development-led

investigations have revealed later prehistoric and/or Roman features that are not visible on aerial photographs (see below).

The fragmentary nature of cropmark field systems inhibits comparison with the extensive, so-called 'Celtic fields' on the chalk downs of Wiltshire and beyond (McOmish *et al* 2002, 51–6). Dating of such fields is also notoriously problematic (Dark and Dark 1997, 93–4; McOmish *et al* 2002, 52) and excavation or a clear stratigraphic relationship with other dated features is usually required. West of Great Chalfield, a north-south ditch perhaps demarcating the eastern boundary of field system 992877 (see below) intersects ring-ditch 1432368, while south of the Lenton Brook a possible continuation of the same boundary within field system 1578520 cuts the western ring-ditch of the pair recorded as 992884. However, while this might suggest a Bronze Age date for the field system, barrows were also utilised in this way in later periods. Less certainly, to the west of Chippenham, barrows 1579834 and 1579844 may have influenced the orientation of a later east-west boundary (1579835; see below).

Development-led projects have investigated field systems at a couple of locations, most notably at Showell Nurseries (Fig 15). Trial-trench evaluation by OAU (1991) dated the settlement enclosure to the north-east (1579977) to the later 1st or 2nd century AD, while 1st-century pottery came from the lower fill of the southern field boundary ditch and later 3rd-century material from the top fill of another enclosure ditch. Further south on the site, where a series of square-ish fields on a north-east/south-west alignment were mapped, each measuring about 80m across (1579975), only one ditch produced Roman pottery, which was of later 3rd or 4th century date; other features investigated here appeared to be prehistoric and post-medieval. Further evaluation in 2014 suggested a Late Iron Age/early Roman date for the fields in this area (Whelan and Howard 2014).

Multiple phases of intercutting small fields and trackways were also revealed during excavations at Showell Farm, immediately to the west; these were dated to the 1st to 3rd centuries AD (Young and Hancocks 2006). In the south of the project area, excavation at the Blacklands site in Staverton revealed a Bronze Age ditch, running parallel to a palaeochannel, which was followed by several phases of Roman field ditches on the same general alignment, spanning the 1st to 4th centuries AD (Barber *et al* 2013). It is notable that the dated ditches nearly all belong to the Roman period, though this does not rule out an earlier origin for some or all of these systems.

Fig 15: Enclosures of a possible settlement (top right) with field system around Showell Nurseries (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

On the very edge of the project area, geophysical survey of earthwork features at Upper Bearfield on the outskirts of Bradford-on-Avon revealed several ditches in rectangular blocks, possibly indicating Late Iron Age or Roman fields (Hawke 2005). These lie within the 12 sq km of the recent lidar survey, which revealed irregular and coaxial systems of small fields, undated but interpreted as probably prehistoric in origin and continuing in use during the Roman period (Canham 2014).

As to how these fields were used, Rippon's (2012) survey of the regional palaeoenvironmental evidence for the Roman period suggests that the proportions of the main domesticates from a range of sites in his Jurassic limestone hills *pays*, including Atworth villa and Showell Farm, are close to the average for the wider south-west region (meaning that sheep/goat are more common than the national average for the Roman period). Meanwhile cattle were far more significant than the regional average at several sites in Rippon's Jurassic clay vales *pays*, including Trowbridge (Graham and Davies 1993). Arable regimes on both the limestone and the clay were dominated by wheat but with significant amounts of barley in both areas and oats in the clay vales.

Bronze Age and earlier Iron Age enclosures

On a rise above the River Avon to the east of Bradford-on-Avon a small sub-rectangular enclosure, with internal dimensions of *c* 29 x 26m, unusually survives as an earthwork within Great Bradford Wood (208150; Appendix 2), which is semi-natural ancient woodland that has been subject to replanting. Identified as a Martin Down-style enclosure and therefore thought to date to the later Bronze Age, its precise date and nature remain uncertain (it is barely one-tenth the size of the type site on Cranborne Chase). The earthwork comprises an inner bank, ditch and outer bank; previous work suggested that the outer bank may be a later addition. The site is located within dense woodland and was not investigated on the ground during this project. Not far away at Kingston Farm, a square enclosure investigated during development-led work has been dated to the Late Bronze Age/Early Iron Age, though this is considerably larger in area (Reynish 2013).

There are also two possible hillforts or promontory forts, one of which has previously been investigated. The site at Budbury in Bradford-on-Avon, which is now under a housing estate but probably covers an area of around 2.5ha on a triangular spur above the river, was excavated in 1969 when the postholes of a rectilinear building were discovered, along with large quantities of Early Iron Age pottery of All Cannings Cross type (Wainwright 1970). On the other side of the vale the site at Nash (or Naish) Hill, near Lacock, is about twice the size of Budbury. Its discovery by A J Clark in the 1950s first demonstrated the potential of aerial prospection in the area (Annable 1958, 16). Analysis of lidar imagery for the present project shows an incomplete univallate sub-circular enclosure. The northern part of the hillfort is absent, either lost through erosion or constructed to utilise the abrupt northern edge of the hilltop. There are possible traces of a second outer bank in the south-eastern section of the earthwork. Within the fort a later, probably medieval, sub-division could be seen as a low eroded bank. The site lies in reorganised irregular fields, perhaps originally created by assarting.

Outside the project area but potentially relevant to the later prehistoric landscape of the Avon vale are two hillforts on the western edge of the chalk, at Oldbury and Oliver's Castle, both of which originated in the Late Bronze Age or Early Iron Age (Payne *et al* 2006), while to the west the large sites of Bathampton Camp and Solsbury Hill lie downstream from Budbury near Bath (Moore 2006). It is notable that there is little evidence for occupation continuing into the Middle Iron Age at any of these sites, except for some Glastonbury Ware from Solsbury Hill (Dowden 1962).

Cropmarks representing non-hillfort settlement or farming enclosures were widely dispersed across the project area, but generally seem more widespread in the north and east with localised clusters further south. While some are

associated with field systems, others seem to be isolated features. They include both rectilinear and curvilinear forms with single or multiple ditches. Only one site recorded during the aerial mapping stage of the project had evidence of any internal structures (1076256; see below). This probably largely reflects visibility from the air, as the geophysical surveys discussed below have shown, but in some cases the absence of structures may be genuine since not all enclosures necessarily functioned as settlements (for example, the excavated site at Kellaways: see below). The lack of internal structures also emphasises the difficulty of locating unenclosed settlements of the Bronze Age and Iron Age from aerial survey, though these can certainly be expected, as in the Cotswolds (Moore 2006, 55–6).

As with the field systems, without excavation it can be hard to determine when in the later prehistoric and Roman periods these enclosures originated. Some were tentatively assigned to a more specific period based on parallels with excavated examples elsewhere, including a small but apparently morphologically distinct group of large curvilinear enclosures (over 100m across) reminiscent of those found on and around Salisbury Plain and in the Danebury environs (McOmish *et al* 2002, fig 3.30; Carpenter and Winton 2011, fig 20; Cunliffe 2000, fig 4.22), which probably originated in the earlier Iron Age. This group includes a cropmark enclosure to the north of Bromham (1578325; Fig 16), which appears to intersect ditched boundaries or trackways. The enclosure lies close to three possible Bronze Age barrows but it is unclear if the association was intentional. Meanwhile, in the south-west of the project area a possible triple-ditched curvilinear enclosure was revealed during evaluation at Kingston Farm, Bradford-on-Avon, with pottery that has been tentatively dated to the Early or Middle Iron Age (Sausins 2012). Unfortunately, the relationship with the rectilinear enclosure mentioned above, which it appears to intersect, was not investigated during the evaluation.

Two other large curvilinear enclosures were seen as cropmarks on the higher ground north of Paxcroft Brook near Trowbridge (Fig 17). The one to the east (1578812) was investigated further during the project (see below), while the western enclosure (1578767) had previously been intersected by a water pipe trench, when pottery, pits and postholes dated to the Iron Age were observed. Possibly also belonging to this group of monuments is a large D-shaped enclosure further to the north-east. Measuring *c* 190 x 130m in area (1578817) this was partially investigated by geophysical survey which confirmed that the southern and western parts of the enclosure ditch were continuous within the survey area (Linford *et al* 2015a; A on Fig 18). There was little evidence of internal activity, however, with the exception of a group of pit-type anomalies and a possible ring-gully, although both could potentially be geological responses. To the south-west of these enclosures were fragmentary cropmarks of further ditches which evaluation in 1996 suggested might be part of an area of Late Bronze Age occupation (992858; Hawkes and Valentin 1996).

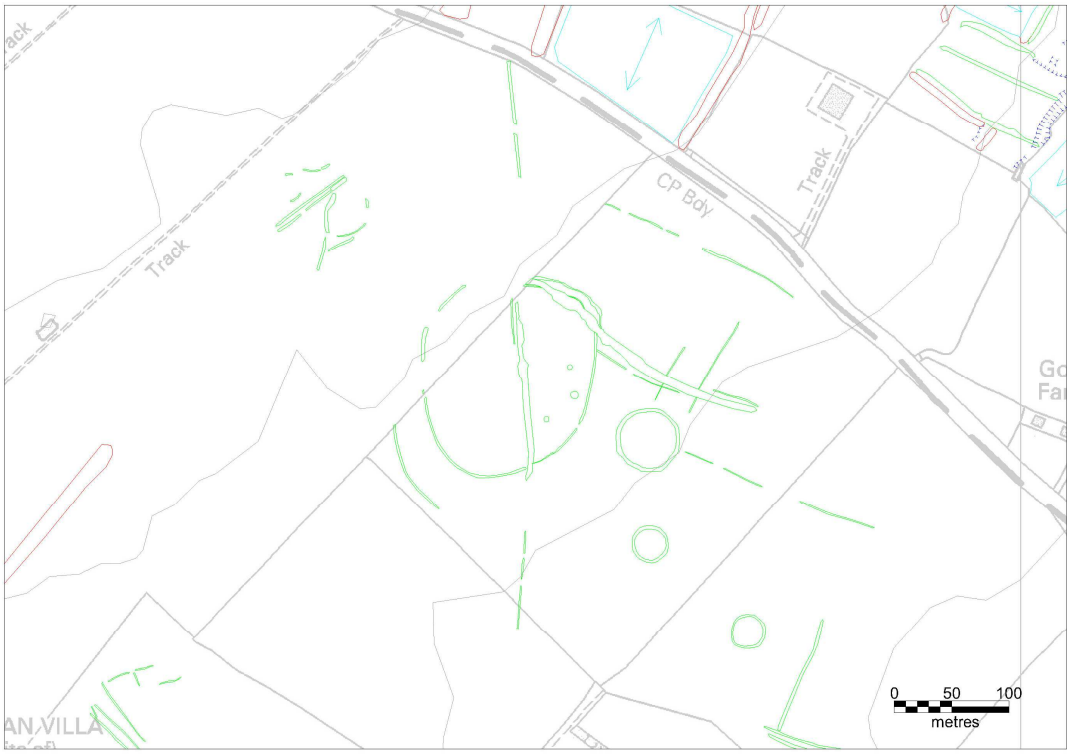

Fig 16: Cropmark enclosure and ring-ditches near Bromham (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 17: Two curvilinear enclosures and a rectilinear enclosure north of Paxcroft Brook (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Another large D-shaped enclosure with dimensions of *c* 150 x 110m was identified on lidar as a low earthwork in an area of piecemeal enclosure near Loves Farm, south-east of Melksham (1579857). However, no corresponding sub-surface features were noted when this location was subject to development-led evaluation (geophysical survey and trial trenching), although a cluster of features probably indicative of a small Roman farmstead was found just to the north (Wessex Archaeology 2014). The earthwork is therefore probably more likely to represent more recent field boundaries.

Small curvilinear enclosures are more scarce and of uncertain date but include examples at Nuthills villa and near Little Chalfield, both of which are discussed below. There is limited evidence from stray finds for activity of this period, with later Bronze Age metalwork sparsely represented in the PAS data for the project area. Finds include a palstave from Trowbridge, a spearhead from Melksham and a socketed axe from Allington.

Paxcroft (South)

Geophysical survey and excavation were undertaken to investigate one of the sub-circular enclosures which lies in an area of reorganised fields north of Paxcroft Brook (1578812; Fig 17, top right; B on Fig 18). Previous work, as detailed below, had been too limited in extent to adequately date or characterise the enclosure. Doing so provided a useful comparison with the rectilinear enclosure to the north that was also investigated during the project (see below).

The enclosure has a maximum diameter of about 120m and an area of 1.15ha; it was already recorded on the Wiltshire HER but the aerial mapping completed the circuit of the enclosure and added some further detail. Its western edge had previously been investigated during development-led work on the adjacent Trowbridge Rugby Club site (Sabin 2004; Young 2005). The natural substrate here was Cornbrash, overlain by a subsoil and ploughsoil; some periglacial frost cracking was also observed. A single evaluation trench showed the enclosure ditch was 2.5m wide and almost 1m deep; it contained two fills, the lower of which produced three sherds of handmade pottery in a calcareous fabric, interpreted as probably Middle to Late Iron Age.

The Rugby Club evaluation also investigated a smaller, sub-square enclosure, about 50m across, which is also present on the aerial mapping (992859; Fig 17 and C on Fig 18); one evaluation trench across the enclosure ditch produced a quantity of animal bone (cattle and sheep/goat) but no pottery, which it was suggested might indicate an Iron Age rather than Roman date. A second trench within the enclosure encountered a shallow ditch, also undated. The work also revealed a number of features not seen from the air, including the small ring-ditch mentioned above, two hollows tentatively interpreted as Anglo-Saxon sunken-featured buildings, and a number of undated ditches.

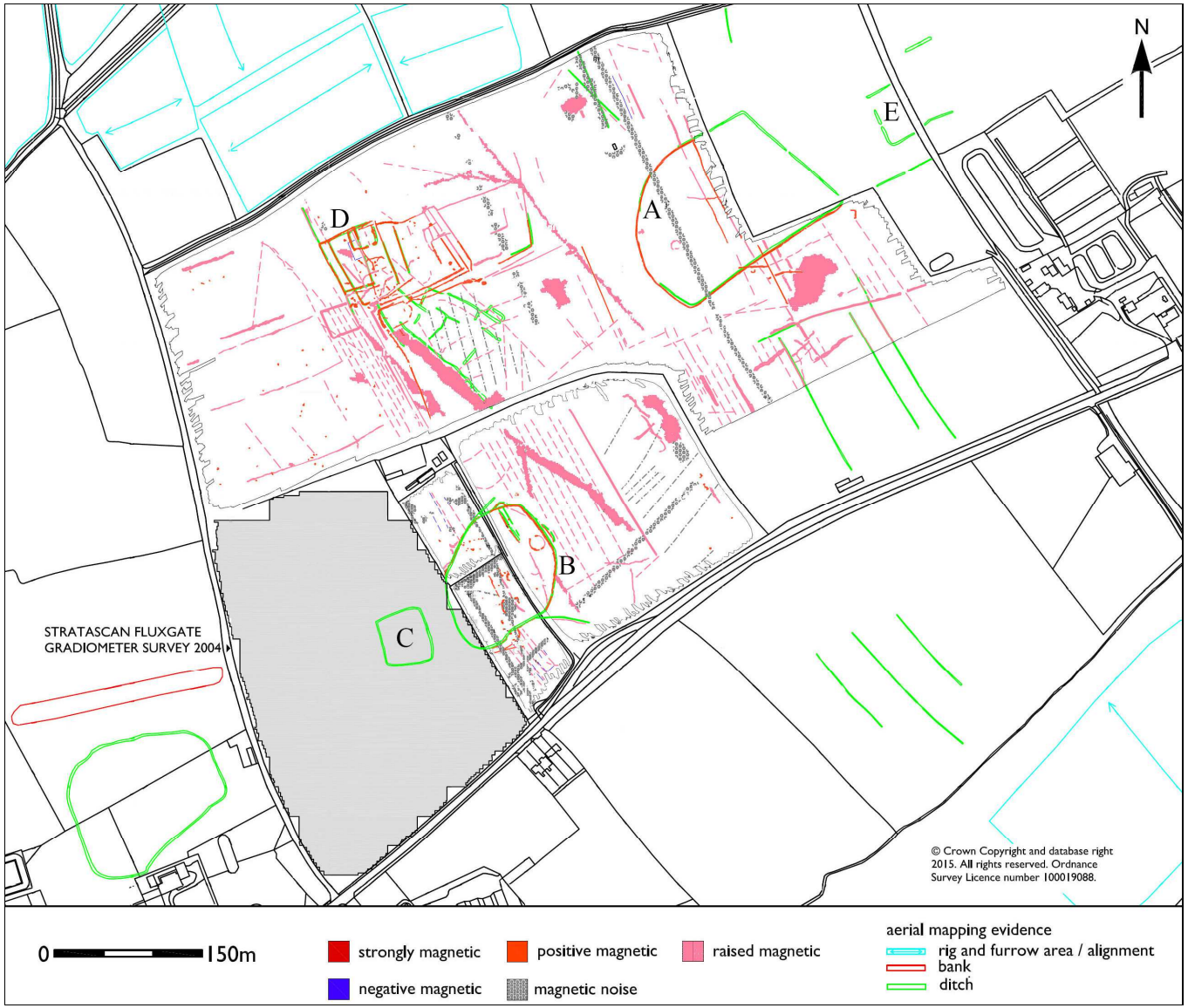

Fig 18: Graphical summary of significant caesium magnetometer anomalies and aerial mapping evidence at Paxcroft (adapted from Linford *et al* 2015a)

For the current project, access was initially available to the central part of the monument so caesium magnetometer (Fig 18) and earth resistance surveys (Fig 19) were conducted over this strip in advance of the excavation, while the eastern side was surveyed later using the magnetometer only (Linford *et al* 2015a). The enclosure was replicated as a series of curvilinear anomalies that corroborated the cropmarks and adjacent geophysical survey data (Sabin 2004). Additional details not seen on the aerial photography included a possible 5m-wide southern entrance to the enclosure with in-turned ditches, apparently flanked by an approach corridor or outwork that may have accentuated or screened the entrance, and more tentative evidence for causeways or re-cutting of the ditch to the north. Two overlapping anomalies may indicate that the eastern segment of the ditch circuit was realigned at some point.

The magnetometer survey revealed possible evidence for occupation, including a ring gully, probably a roundhouse, just inside the eastern perimeter (possibly with an entrance facing north-west), and more tentatively because of modern interference, a second possible ring-gully in the central strip. Possible internal subdivisions in the centre of the enclosure were also partially obscured by modern disturbance, while a linear anomaly to the east may indicate a partition of the enclosure, perhaps related to the separation of occupied space in the vicinity of the probable dwelling. A further large pit or quarry may be present in the centre, together with a number of other pit-like anomalies, although these might be due to geological variations (cf. Sabin 2004; Young 2005).

Two trenches were located in the central strip, across the southern and northern parts of the enclosure ditch (Fig 19). As well as the general objective of recovering evidence for the date and character of occupation at the site, and the surrounding environment, Trench 1 (15 x 15m) was positioned to investigate the entrance to the enclosure shown on the geophysical survey, while Trench 2 (10 x 4m) was located in an area where the survey suggested the ditch bifurcated or had been recut.

In both trenches the natural was Cornbrash, as at the Rugby Club site. The depth of subsoil suggested relatively recent (post-medieval?) build-up of these fields, which were higher than the large agricultural field to the east, perhaps related to the recent use of the area for horse paddocks.

In Trench 1 pottery from the lower fills of the main enclosure ditches to the west (Fig 20) and east of the entrance, which were up to 1.5m deep, demonstrates the construction of the enclosure in the Early Iron Age. After this the ditches began to be infilled with occupation debris, though the excavated terminal on the western side of the entrance was open for a period. Occupation material continued to be deposited in the secondary fills of the enclosure ditches. It is possible that the eastern ditch was remodelled at this time and no longer served as a functional boundary. Further south the possible outwork took the form of

two 'antenna' ditches, which may have contained hedgerows as they demonstrate no evidence for postholes and at around 0.2m in depth were not substantial enough to have functioned as barriers.

Fig 19: Graphical summary of significant earth resistance anomalies at the southern enclosure at Paxcroft and location of excavation trenches (adapted from Linford *et al* 2015a)

A pit just inside the enclosure entrance produced slag which provides evidence for iron-working in the locality, while other features produced smaller quantities in well-sealed Early Iron Age deposits. An isolated posthole just inside the enclosure produced a disproportionately large assemblage of pottery and animal bone, as well as a possibly contemporary flint core. Three other undated postholes were also excavated.

Trench 2 contained two Early Iron Age ditches which were overlain by a post-medieval feature. One of the ditches, which was 0.9m deep, is part of the main enclosure circuit at the rear of the site. Its secondary fill contained substantial cultural material, including a whole cattle skull and other faunal remains. A shallow curvilinear feature outside the main enclosure is of uncertain function and extent, not having appeared on the geophysical survey.

Fig 20: Western entrance terminal of the enclosure ditch at the southern enclosure at Paxcroft (© Historic England)

The Early Iron Age pottery assemblage, characterised by furrowed haematite-slipped bowls, shouldered jars, carinated bipartite jars and decorated wares, appears to belong to the All Cannings Cross group of the 8th to 7th centuries BC (Cunliffe 2005). A similar assemblage was found at Budbury hillfort (Wainwright 1970) while there are also parallels in the large assemblage from Potterne (Gingell and Morris 2000). The diversity of fabrics is of considerable interest and might indicate traded wares.

A small assemblage of flint from this site and the northern enclosure (see below) includes broad, thick flakes characteristic of Bronze Age industries, particularly

those dating to the later second or first millennia BC (e.g. Herne 1991; Young and Humphrey 1999; Humphrey 2003; McLaren 2009), and these might even be contemporary with the Early Iron Age occupation.

Twelve flotation samples were taken from the two trenches, mostly from ditch fills, along with two samples for coarse sieving. Four mollusc samples were taken from different locations within the primary fills of the enclosure ditch terminals in Trench 1. Charred plant remains comprised occasional cereal grains, including barley (*Hordeum vulgare*) and wheat (*Triticum* sp.), of which one glume base was identified as spelt (*Triticum spelta*); spelt wheat and barley are the mostly commonly encountered cereal types on Iron Age sites in Wessex. Charred seeds of weed taxa were also noted while charcoal was present in small quantities. The small faunal assemblage suggests the main domestic species were sheep/goat and cattle, with smaller numbers of horses and pigs also present, as well as red deer antler.

Together the open enclosure ditches and the possibly hedged 'antenna' ditches would have created a moderately imposing, albeit not defensive, entrance to the enclosure. There is likely to have been hawthorn and oak wood in the vicinity, as well as arable fields growing cereals around the margins of the settlement and areas used for grazing. The antler suggests more sizeable blocks of woodland in the wider area, though it could have been traded.

Paxcroft (South) is a relatively rare excavated example of a non-hillfort Early Iron Age settlement in the region. The aerial survey, geophysical survey and limited excavation collectively demonstrated that the site was a fairly large sub-circular enclosure with an elaborate entrance and an eastern subdivision containing a single roundhouse. The site appears to be relatively short-lived while the faunal, environmental and pottery assemblages are of moderate significance, though could be enhanced by a larger excavation. At 120m across the Paxcroft enclosure is comparable in size and form to Early Iron Age enclosures in the Danebury environs, including Meon Hill and Old Down Farm, both of which produced pottery of early All Cannings Cross type, as well as Little Somborne, which is probably rather later in date (Cunliffe 2000, 167–9).

Later Iron Age and Roman enclosures

Despite the presence of rectilinear ditched enclosures that appear to date to the later Bronze Age, as discussed above, it seems likely that most of those revealed as cropmarks across the project area belong to the later Iron Age and Roman periods. These enclosures vary in size from *c* 40 to 100m across, and several have an internal subdivision, usually separating off a third or a quarter of the interior. This may be a local characteristic as it is not seen in the sub-rectangular enclosures of the Cotswolds depicted by Moore (2006, fig 4.6). Examples at Chalfield, Kellaways and Paxcroft were further investigated during

the project (see below), the last of these (D on Fig 18) close to another (not subdivided) example which had previously seen some limited investigation (992859; see above). More fragmentary cropmarks may represent two further rectilinear enclosures in the Paxcroft area to the east of the D-shaped enclosure mentioned above (1578834 [E on Fig 18] and 1578902).

As with the field systems, some of these enclosures may have been sited in relation to earlier landscape features, such as the enclosure abutting one of the ring-ditches in the Boundary Farm barrow cemetery (1580617; Fig 12) or that adjacent to the pair of barrows at North Bradley (1577329; not previously recorded). Others suggest an element of landscape planning, such as the group of enclosures at regular intervals that flank the A350 on the western side of Chippenham. There are four complex sites in a linear arrangement, bounded to the south by a cropmark ditch that runs for *c* 1km on an east-north-east to west-south-west alignment (1579835; not previously recorded). The northernmost enclosure, at Manor Farm, Allington, has recently been investigated as part of a development-led evaluation, following a previous excavation in the 1980s (867439; Wilcox 1987; Sabin and Donaldson 2014; Field and Glover 2015). Geophysical survey and trial trenching revealed a large (110 x 75m) multi-phase enclosure containing buildings of Roman date, several of stone construction. The farmstead appears to have been occupied from the 2nd to 4th centuries AD. There is no clear evidence of an associated field system though a droveway or trackway runs past the eastern side of the enclosure while a small discrete enclosure measuring *c* 30 x 25m lies 200m to the south (1580864; not previously recorded).

Further south, each of the three other major sites may also be paired with a smaller subsidiary enclosure. At Allington Bar, a double-ditched enclosure measuring *c* 70 x 60m with an entrance to the south-east and associated field boundaries (994156; Fig 21) lies 250m south-east of a small enclosure measuring *c* 35m across (1578600). Five hundred metres south of this, at Frogwell, a subdivided enclosure (*c* 60 x 50m) has a series of possible fields or paddocks for livestock attached to its northern side (1579849; Fig 21) while 250m to the north-east is a curvilinear enclosure about 50m across (1456991). By Chiverling's Farm another subdivided enclosure (*c* 110 x 60m) is crossed by a farm track (1579848; Fig 22); this lacks evidence for associated fields but 250m to the north is an undivided enclosure about 45m across (1579843; not previously recorded). Another rectilinear enclosure south of Sheldon Manor (993161) may also be related.

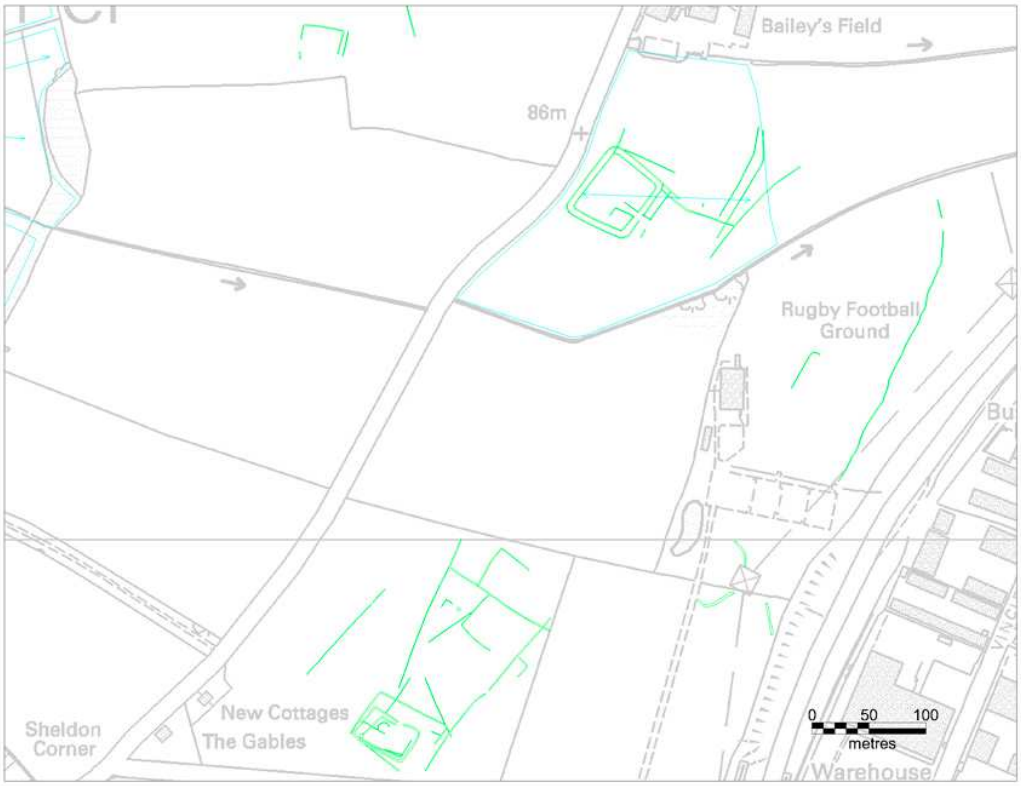

Fig 21: Iron Age or Roman enclosures west of Chippenham (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 22: Iron Age or Roman enclosures near Chiverling's Farm (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

A further group of rectilinear enclosures and fragmentary field systems lies on an east-north-east to west-south-west alignment close to the northern boundary of the project area. An enclosure north of Allington, which was seen as an earthwork in the 1950s but is apparently now levelled, could be an Iron Age/Roman feature or a later stock enclosure (1580790; not previously recorded). Other mostly undivided rectilinear enclosures of similar size (40–50m across) are evident in Kington St Michael (1579191; not previously recorded) and Kington Langley (1579180, 1579181, 1579182, 1579186; Fig 23), the latter area also including a curvilinear enclosure (1579185) and a series of other ditches. There are also two D-shaped enclosures (887766 and 1581065), the first of which lies within another area of fragmentary settlement or field boundaries; Fig 24). Excavations along a pipeline easement which intersected these cropmarks suggested this enclosure could be Middle Iron Age in date, while the ditches to the north-west were Roman (Bateman 2000).

Another group of enclosures lies between Thingley and Notton, near Corsham, close to the four ring-ditches mentioned above. As well as a rectangular enclosure with an internal subdivision (1580041) there is a D-shaped feature (1580117) and the remains of two other possible enclosures associated with field boundaries (1001561).

Fig 23: Cropmarks of settlement and field systems at Kington Langley (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 24: Cropmarks of settlement and field systems at Kington St. Michael (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

A small rectilinear earthwork enclosure on Bowden Hill (1578886), measuring *c* 40 x 30m, may also be Roman in date, based largely on its proximity to the Roman road.

In the east of the project area two double-ditched cropmark enclosures near *Verlucio* may be Romano-Celtic temple sites. The more convincing of the two, though rather large for a temple (over 150m across), is a square enclosure to the north-west of the Roman settlement (1578150; Figs 25–26). If this interpretation could be proven, it would be a monument of at least regional significance, especially as it has a degree of earthwork survival where a belt of woodland runs diagonally across it. The other site lies to the east of *Verlucio* next to an area of ancient woodland in Deepet's Wood Copse; it is smaller (*c* 70m across) and sub-rectangular in form (1578221; Fig 27). Its striking resemblance in both form and orientation to the enclosure at Allington Bar might suggest it is more likely to be a settlement. Midway between these sites a rectilinear earthwork enclosure of uncertain date was mapped from lidar imagery within another area of ancient woodland, St Edith's Leigh Wood (1580916).

A number of Roman sites have also been located during development-led fieldwork. At Marsh Farm near Trowbridge, geophysical survey and evaluation identified the remains of an early Roman agricultural settlement comprising a

series of rectilinear enclosures (James 2014; Sausins 2014). These may correspond with a group of undated cropmarks recorded on the HER, which have a similar orientation to the geophysical features though they are plotted about 100m to the west. The current project only recorded a single cropmark ditch in the area, which seems to form part of the same complex and is recorded as Iron Age/Roman (NRHE 1578925). To the south-east of Trowbridge at Ashton Park, two areas of early Roman ditched enclosures, associated trackways and pits/postholes were identified by geophysical survey and investigated by trial-trench evaluation; there was no sign of an Iron Age origin to this activity (Barber 2014a).

East of Spa Road, Melksham, geophysical survey and trial-trench evaluation located a rectilinear ditched enclosure measuring *c* 70 x 120m, with associated small paddocks or fields; the pottery indicated occupation during the 2nd and 3rd centuries AD (Clarke 2015, 217). Slightly further east, at Melksham Football Club, an evaluation recorded another possible small Roman farmstead, which could not be more precisely dated (Wessex Archaeology 2014). At Norrington Common, to the west of Melksham, geophysical survey located a probable Roman building (with pottery, pennant stone tile fragments and possible building stone visible on the surface of the field) as well as two small sub-circular enclosures and a rather irregular series of ditches (Sabin and Donaldson 2012). The recent discovery of Roman settlement remains close to the Roman road near Catridge (Wessex Archaeology 2015) also demonstrates that, despite the volume of information generated for this landscape, aerial photography provides an incomplete record; it is unclear whether this is the site of a number of Roman coin finds from Lacock reported by Moorhead (2001).

In the north of the project area two truncated ditches containing Roman pottery were excavated on the line of the Chippenham Western Bypass (Bateman and Enright 2000) and a number of subdivided enclosures with settlement evidence, as well as field systems of this period, were found during evaluation of land east of Chippenham (Joyce 2010). To the west, potentially abundant evidence for Roman settlement, possibly including sub-rectangular enclosures, was disturbed by wartime MOD labs at Corsham (Wessex Archaeology 2000).

Later Iron Age stray finds are barely more common than earlier material, comprising a number of coins and other metal objects with a mainly riverine distribution. However, the existence of further Roman sites that are not visible on available aerial photographs is hinted at by clusters of metal-detecting finds, including a small group at Lacock and two rather dense clusters, mainly of coins, south-east of Broughton Gifford and west of Holt. Compared with the chalk downland, Roman settlement remains are still under-represented in the project area, as shown by the results of the Roman rural settlement project (Allen *et al* 2015); undoubtedly there are more sites to be discovered.

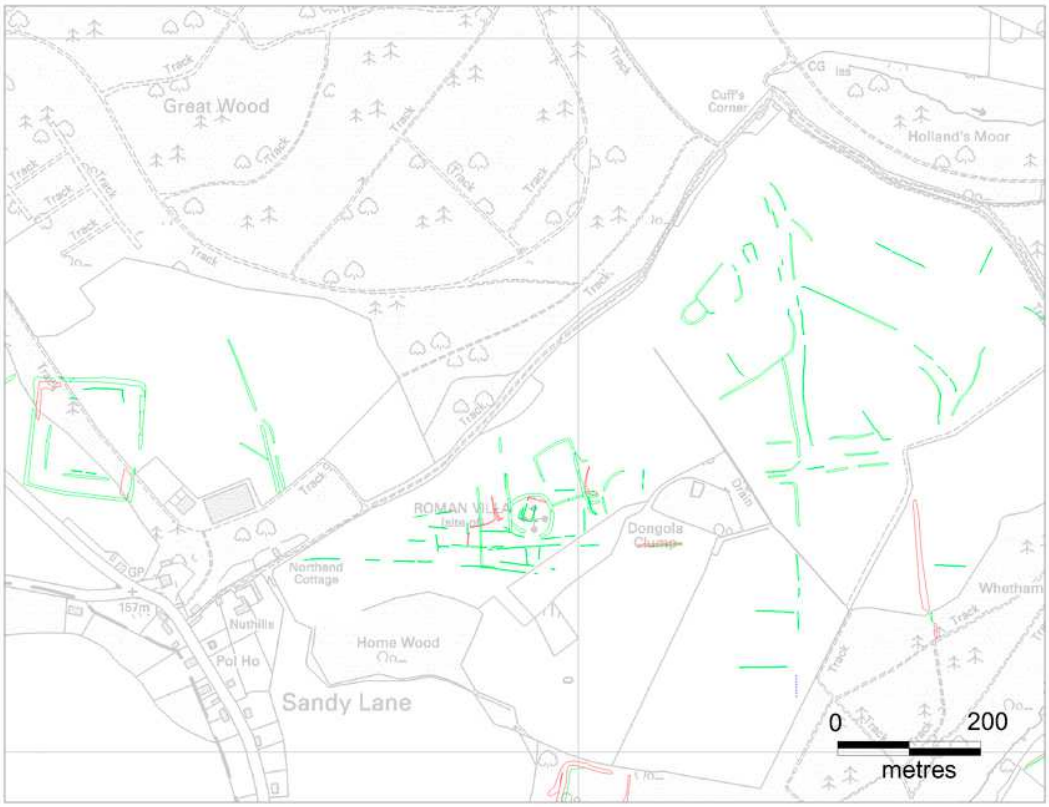

Fig 25: Iron Age/Roman landscape at Sandy Lane with possible Roman temple (left), Nuthills villa and field system (centre), field system, droveway and enclosure (right) (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 26: Cropmark of double-ditched enclosure, possibly a temple, visible on a photograph from 1983 (2118-83 09-JUN-1982 © Historic England)

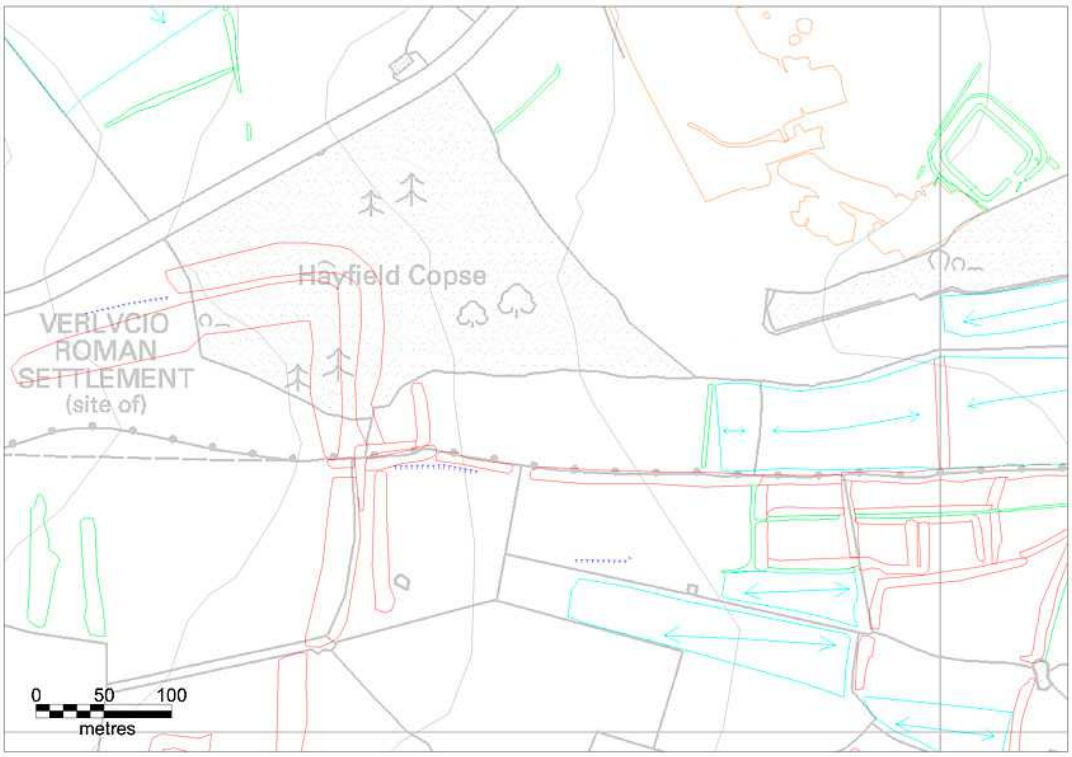

Fig 27: Verlucio (left) and double-ditched enclosure (top right) (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Paxcroft (North)

Excavation was undertaken to investigate a rectilinear enclosure 250m to the north of the Iron Age enclosure at Paxcroft (1578781; D on Fig 18). Along with the site at Kellaways discussed below, this was selected as a typical representative of the type of cropmark enclosure found widely across the project area. As mapped from the air, the enclosure measured approximately 70m across and appeared to contain a smaller enclosure or possibly a building, about 25 x 22m in size, against its northern side. Ditches on the same alignment were visible to the north and south of the enclosure, while to the south-east was a linear pattern of further enclosures on a slightly different alignment. Although these features bore some resemblance to a ladder settlement they were highlighted as probably geological, especially given the presence of polygonal patterning, which is often characteristic of limestone, on the same alignment in the wider area (D. Knight, pers comm; Fig 28).

Because of the cropping schedule it was not possible to undertake geophysical survey in this field until after the excavation had taken place (see below). Accordingly the aerial mapping was used to position the excavation trenches. Three trenches were excavated (Fig 29), one of which (Trench 4) focussed on the main enclosure and its accompanying field system, aiming to understand its date and the nature of activity at the site. The other two trenches (3 and 5) were

small interventions aimed at clarifying whether the features mapped to the south-east were geological or archaeological, and in the latter case how they might relate to the main enclosure and its associated ditches. In the event Trench 3 (5 x 5m) found just a single linear feature which was confirmed as geological.

In Trench 5 (10 x 4m) two parallel shallow linear features were cut into fractured yellow limestone with clay bands, while another linear terminated in the northern part of the trench, cutting one of the former. Both of these were recut and seem to have formed the corner of a field; the fills of each phase contained pottery dated to the 2nd century AD.

The largest intervention, Trench 4 (20 x 20m), investigated the northern side of the enclosure (Fig 30). Immediately overlying the natural limestone in the south-western corner of the trench was a layer of hard yellowish-brown clay loam containing cultural material including Early Iron Age ceramics. The extent of this layer is unknown as the overlying deposit (context 95019) was not removed in this area. However, where layer 95019 was sampled elsewhere an analogous deposit to the Early Iron Age layer was not present, which suggests that it is part of a discrete feature or limited spread. It indicates some activity in this area that was broadly contemporary with the southern enclosure at Paxcroft discussed above (1578812).

Fig 28: Cropmarks of the northern enclosure at Paxcroft and geological features to the south-east (lower right) (27729_022 12-JUL-2013 © Historic England)

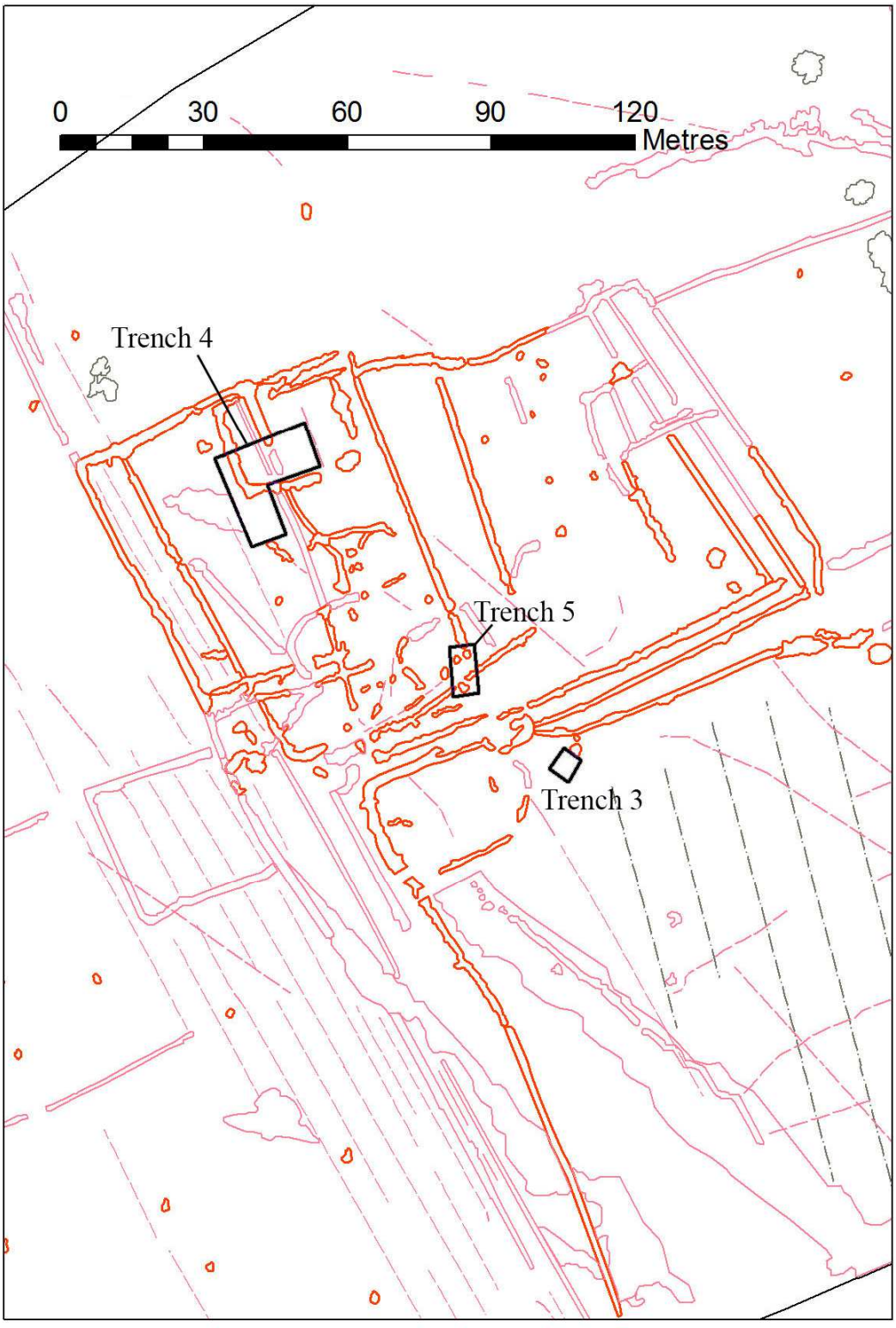

Fig 29: Location of excavation trenches at the northern enclosure at Paxcroft in relation to geophysical anomalies (© Historic England)

Various linear features were encountered within the trench, including the main Roman enclosure ditch (context 95026), which was a substantial feature 0.8m

deep and 1.3m wide, containing a large pottery assemblage dated to the early 2nd century AD.

Overlying the natural limestone in the north-central part of the trench was a limestone-pebble surface which was cut by this ditch and other features; ditch 95026 is therefore interpreted as a later remodelling of the enclosure. The earlier enclosure ditch produced only Iron Age pottery from its basal fill and predominantly early Roman wares, no later in date than the mid-2nd century AD, from its uppermost fill. This context also produced a large fragment of daub with wattle impressions, which may have derived from a structure in this area.

West of ditch 95026 was occupation layer 95019, a 0.2m-thick deposit which was sampled through four 1-x-1m sondages and excavated more extensively in the east and north-east. It produced a 2nd century AD ceramic assemblage and a wide range of other material. The layer was cut by a pit (context 95029) in the south-western corner of the trench which contained a large assemblage of 2nd-century pottery and other finds suggestive of a rubbish pit.

Overlying these deposits was a surprisingly deep subsoil, 0.3m thick, containing residual Roman pottery. No reasonable explanation could be found for the accumulation of such a substantial deposit on the crest of a slight rise. It is notable that none of the residual material dates to later than the 2nd century AD, suggesting the site may have been unoccupied after that period.

Fig 30: Excavating Roman ditches at the northern enclosure at Paxcroft (© Historic England)

The Roman pottery assemblage of over 500 sherds largely appears to date to the later 1st and 2nd centuries AD. Over 80% of the sherds from Trench 4 came from enclosure ditch 95026, pit 95029 and occupation layer 95019. The assemblage is overwhelmingly dominated by a diverse range of 'local' coarse wares, most or all of which are likely to have come from the poorly documented Wiltshire pottery industry. Imported wares are limited to a few sherds of samian and Dorset black burnished ware. The local wares are quite diverse but there are also just a few sherds of Savernake ware, which is known in particular for its large handmade storage jars. One of the more common wares, accounting for almost 30% of the Roman assemblage by sherd count, is a wheel-made black sandy ware, well documented from Cirencester (Rigby 1982, fabric 5) and probably from a Wiltshire source. This ware probably dates from the Neronian period to the mid-2nd century and was used to make jars, bowls, beakers and lids, often with a burnished finish. The other two main categories of Wiltshire products are reduced (grey) and oxidised sandy wares which account for 33% and 10% of the assemblage respectively. Most of the rims are quite small and largely from jar forms with a few dishes or bowls.

A total of 18 flotation samples were taken from Trenches 4 and 5. All of the samples from Trench 5 derive from ditch fills while in Trench 4 a variety of features were sampled, including four different areas of occupation layer 95019 in order to investigate potential variation across this context. Charred remains were limited, however, and it is interesting that layer 95019 did not produce plant remains in any quantity. Occasional cereal grain was present in seven samples, including hulled barley (*Hordeum vulgare*), spelt wheat (*Triticum spelta*) and indeterminate spelt/emmer type (*Triticum spelta/dicoccum*), with occasional grains of oats (*Avena* sp.), which may be a cultivated crop or an arable weed. A pulse of indeterminate type (bean or pea, *Vicia/Pisum* sp.) was noted in one sample. Small numbers of weed seeds were present in six samples while charcoal, which was also rare, consisted of oak and Pomoideae or *Prunus* type. The small faunal assemblage primarily comprised sheep/goat with cattle also present.

The enclosure therefore appears to have been constructed in the Late Iron Age with a wattle-and-daub structure present in the excavated area. Following the removal of the structure, probably in the early 2nd century AD, a new enclosure ditch was dug and an occupation layer accumulated before the site was abandoned in the mid- to late 2nd century. Structures associated with this phase of occupation must have lain beyond the excavated area. The pottery assemblage from both phases suggests a low-status settlement with access only to local trade networks.

The magnetometer survey (Linford *et al* 2015a) added considerable detail to the aerial mapping, showing that the main enclosure extended further east, and helped clarify the excavation findings (Figs 18 and 29). A series of conjoined

sub-rectangular enclosures in three main blocks is defined by multiple and single ditches, and the whole complex, which measures approximately 200 x 70m, is apparently aligned with a trackway that forms the western boundary of the settlement. It is possible that this trackway extends south towards the southern enclosure, although the evidence is not particularly clear.

The western part of the enclosure complex, where Trench 4 was located, exhibits the greatest complexity of internal subdivisions including the small rectangular enclosure seen on aerial photographs, which is perhaps indicative of occupation activity. There are some similarities between the system of bounded rectilinear enclosures mapped here and other Late Iron Age and Roman settlement sites covered recently by geophysical survey in the Vale of Pewsey (Linford *et al* 2013a; 2013b) as well as within the wider aerial record in the NAIS project area (see above).

Fortunately, the background geological variation in this area has a weaker magnitude of response to the more strongly magnetised archaeological anomalies, allowing the two sources to be more readily distinguished by geophysical survey than from aerial photographs. However, some confusion between the geological and archaeological responses does occur in places, for example along the western edge of the rectilinear enclosure system. Though mapped as Cornbrash, it appears that the enclosure complex is situated in an area of quite complex local geological variability, with deeper soils or superficial drift deposits capping the ridge of higher ground.

Paxcroft (North) is a relatively typical example of a small enclosed farmstead, originating in the Late Iron Age and continuing until the later 2nd century AD, at which point the enclosure ditch was filled in and the site apparently abandoned. There are two main phases of activity with evidence for reorganisation of the settlement in the early 2nd century.

The restructuring of the central enclosure in Trench 4 appears to be part of a wider remodelling of the surrounding field system, which was demonstrated in Trench 5. When reviewed against the geophysical survey, it becomes clear that the excavation evidence reflects the replacement of a large enclosure and field system with a more rectilinear enclosure system. The earlier field system appears to extend further to the west than the remodelled area, and it is possible, although unproven, that this part remained in use throughout the life of the settlement.

The economy of the site was based on mixed farming, with sheep/goat dominating the faunal assemblage, and spelt wheat and hulled barley comprising the main crop species, although there is insufficient evidence to judge the relative importance of cereal and pastoral agriculture. There is limited

evidence for material wealth; most notable are three iron brooches, which are probably early Roman in date.

The site is at least partly well-preserved, being sealed from modern ploughing by a substantial and apparently pre-modern subsoil layer across Trench 4. Deposits further south in Trench 5 were heavily truncated, however, and only the deeper cut features are at all well-preserved.

Kellaways

Near Kellaways Farm there are at least two phases of boundaries (1579096, 159098) and settlement enclosures (1579091, 1579092) visible on aerial photographs beneath the current pattern of fields, which incorporate parts of medieval land division and are classified in the HLC as amalgamated fields (Figs 31–32). Long ditched cropmark boundaries appear to form large fields, measuring up to 180 x 135m (Fig 31, upper centre). Other more fragmentary boundaries appear to be on a similar alignment but it is unclear if these represent a different or contiguous phase of fields (Fig 31, lower left). Some of the boundaries seem to incorporate or align with smaller enclosures, for example that bisected by the line of the medieval trackway, Maud Heath's Causeway (Fig 31, top). The enclosures probably indicate settlements but it is also possible that there is unenclosed settlement associated with the fields.

This relatively small area contains a variety of enclosures and boundaries suggesting a long period of changing land use. The earliest features seen on aerial photographs are likely to be the ring-ditches (1579099 and 1579101, Fig 31, top right), which are presumably Bronze Age, while the boundaries and possible settlement enclosures appear to be Iron Age or Roman, though possibly with earlier origins. The range of enclosure forms recalls some of those seen elsewhere in the project area (see above), especially two enclosures which include a subdivision at one end (Fig 31, centre and lower left). Other enclosures and boundaries apparently defined by very irregular ditches (Fig 31, middle left, south of Kellaways Farm) could be a result of localised soil conditions or indicate a different date, construction method or function. While one enclosure (1579092) sits on a different alignment to the field system, the others are more clearly incorporated into the field pattern.

The northern enclosure (1579092; Fig 32, top right) was selected for excavation as it was easier to access. The aerial photographs clearly indicated a rectilinear ditched enclosure (approximately 45 x 60m in area) with a subdivided compartment to the south and apparent recut entrance gap facing south-east. There was also possible evidence for a linear group of quarry-type features along the inner edge of the ditch on the eastern side of the enclosure.

Fig 31: Cropmarks of later prehistoric or Roman settlement and fields underneath medieval or later ridge and furrow and boundaries at Kellaways (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Fig 32: Aerial photograph of the cropmark enclosures at Kellaways, looking north-east (27734_037 16-JUL-2013 © Historic England)

Caesium magnetometer and earth resistance surveys were undertaken over an area of approximately 0.7ha covering the enclosure and external areas to the south-east and north-west (Linford *et al* 2015b; Figs 33–34). Due to the presence of a standing crop in the field it was not possible to extend the survey in order to explore the wider relationship between the enclosure and adjacent field systems (see below).

Although only a limited area of the site was available for survey, the background magnetic response appeared to be extremely weak except where there was likely anthropogenic enhancement due to burning. The magnetometer data replicated the ditches and south-east entrance gap of the enclosure shown by the aerial photography and suggests an eastward extension of the northern enclosure ditch. The magnitude of response was higher in the east where the ditches may be associated with localised burning or industrial activity. Some additional internal details, including a series of large pits, a central curvilinear anomaly and an apparent small partition in the north-east, are also visible. A series of more amorphous anomalies to the west may be indicative of in-filled quarry pits or natural geological variation, although there is little correlation with the earth resistance results. To the west of the enclosure a linear feature replicates part of the wider field system visible on aerial photographs.

Fig 33: Graphical summary of significant caesium magnetometer anomalies at Kellaways and location of excavation trench (© Historic England)

In the earth resistance survey the main ditched enclosure correlates with a low resistance response, more consistent than that demonstrated by the corresponding magnetic anomaly. Groups of more amorphous anomalies and

pit-type responses are found to both the east and west of the enclosure, although these are difficult to interpret given the limited correlation with the magnetic data and the aerial photographic record. A pattern of ridge and furrow was also found overlying the enclosure on the orientation suggested by aerial photography (see Fig 34).

A wider area survey than was possible in 2014 would perhaps resolve some of the anomalies which do not correlate between the two geophysical techniques or with the aerial photographic record, and allow a more detailed investigation of the enclosure within its immediate archaeological context.

Aerial photography and geophysical survey suggested that the enclosure was well-preserved and complex with two main internal subdivisions. The amorphous features outside the enclosure were interpreted as possible clay or gravel extraction pits, and the highly magnetic anomalies may therefore have been kilns for ceramic production. The excavated trench (767 sq. m) aimed to characterise the enclosure ditches, the interior and exterior of the north-eastern subdivision, the large and very highly magnetised anomalies within the enclosure and a range of other smaller features (Fig 33). It revealed that the stratigraphic sequence was not particularly complex and that there had been heavy truncation of almost all features, mainly by medieval or post-medieval ridge-and-furrow agriculture but also in places by modern ploughing. The 'natural' was a loose, heterogeneous mix of Pleistocene sands and gravels.

The earliest activity revealed in the trench comprised a hearth and associated features in the centre of the enclosure, although there was little evidence of other structural remains. This could indicate an open-air site or the presence of ephemeral structures. The first phase was dated to the early 2nd century AD on the basis of potsherds from the primary fill of the north-eastern enclosure ditch (context 96006) and the secondary fill of the eastern ditch (context 96105), which was subsequently recut. The hearth (context 96083) measured 2.4 x 2.0m in area and 0.1m deep; it contained a limestone lining that appeared to have been heavily disturbed by ploughing and the surrounding natural soil was scorched. The hearth lay close to a burnt area (context 96075), approximately 1.4 x 1.2m in area, that was cut by a number of other shallow, amorphous features which may represent occupation spreads. A shallow curvilinear ditch may be structural but did not fully extend around the hearth area.

Fig 34: Graphical summary of significant earth resistance anomalies at Kellaways (© Historic England)

The first phase of the main enclosure boundary on its eastern side (Fig 35) includes ditch 96105 to the north, which was 0.5m wide and 0.4m deep, and a separate ditch to the south, which was 1.5m wide and 0.8m deep; the former contained a single sandy loam fill while the latter had a primary gravel fill beneath a sandy clay deposit. These features were subsequently recut as a continuous ditch 2.5m wide and 0.4m deep. In the north-east, ditch 96006, which was not recut, was 2.4m wide and 0.7m deep; it contained a primary gravelly fill overlain by occupation material apparently dumped from within the enclosure. A lower density of finds came from the upper fills of the ditch. Also assigned to Phase 1 was a ditch (context 96119) which subdivided the enclosure in its north-eastern corner; this measured 1.8m wide and 0.6m deep.

Phase 2, which was dated to the 2nd century AD, was marked by substantial reworking of the eastern part of the main enclosure ditch and the north-east subdivision, as well as a sequence of possibly structural features in the vicinity of the Phase 1 hearth. At this time the south-eastern enclosure ditch was again recut, this time as a narrower feature (context 96010), 1.2m wide and 0.5m deep, which contained a number of clearly defined dump deposits, each with a significant quantity of charcoal and material culture. In the north-eastern part of the enclosure, subdivision ditch 96119 was recut by a new ditch (context 96004), which ran for about 10m from the eastern enclosure ditch (96006) before turning at right angles to run for another 5m towards the northern enclosure boundary. Any junction with the latter had been lost to truncation

although there are magnetic anomalies on a similar alignment to where ditch 96004 might have continued.

Fig 35: The main eastern ditch of the enclosure at Kellaways prior to excavation (© Historic England)

A group of features in the south-west of the trench included a ditch and a rectilinear pit with a complex series of fills. A number of isolated pits and other features of probable Roman date, some with evidence of burning, could not confidently be assigned to either Phase 1 or 2. However, some of these hint at occupation within the north-eastern subdivision of the enclosure.

Phase 3 comprises a distinct single layer (context 96047) overlying the occupation areas and possible structural features in the centre of the enclosure. It was cut by a medieval or post-medieval plough furrow and may indicate the remains of an ephemeral structure. It contained a large quantity of material culture, including 284 sherds of pottery.

The total pottery assemblage from the site comprises some 1520 sherds with a low average sherd weight of just 4.8g and poor surface preservation, with slips, colour-coats or burnishing apparently lost in many cases. Overall there is a very limited range of vessels present and the assemblage largely appears to date to a single episode of use spanning the 2nd century AD, making the site contemporary with some phases of the occupation at Paxcroft (North). The assemblage is dominated by a diverse range of 'local' coarse wares, most or all of which are likely to have come from the poorly documented Wiltshire pottery industry. Most abundant is the wheel-made black sandy ware (Rigby 1982, fabric 5) which accounted for about 30% of the Roman assemblage from Paxcroft but here comprises 57%. One base from ditch 96004 has been modified with a hole through the centre and the broken edges ground smooth. There are 78 sherds of Savernake ware, which suggest these large handmade storage jars were rare, as at Paxcroft. A small number of sherds of South-West oxidised and white slipped/oxidised wares, conventionally dated to the 2nd and 3rd centuries AD, include a mortarium from one of the dumps within ditch 96010. The other two main categories of Wiltshire products are reduced (grey) or oxidised sandy wares; this industry was probably established in North Wiltshire from the Flavian period and continued into the 2nd century (Anderson 1979). Samian makes up just 1.4% of the assemblage by count and suggests a rural settlement of moderately low status. The samian is dominated by material from the 2nd-century Lezoux kilns of Central Gaul.

Building material was limited to just 13 pieces of brick associated with hearth 96083, a possible sandstone roof tile and three other pieces of worked stone. The finds assemblage also included a single iron bow brooch, two possible gaming pieces, a few scraps of structural ironwork and three fragments of possible Roman glass.

Charred cereal grain and/or chaff were present in numerous flots, and abundant (>100 items) in four contexts: subsoil 96047, burnt area 96075 and two of the discrete dumps within ditch 96010. Occasional pulses were found in one sample from the ditch. Cultivated species were dominated by cereal grains, mostly spelt wheat, with barley and oats also present. A small number of emmer-like grains (*Triticum dicoccum*) suggests this second hulled wheat was present as a minor crop or contaminant. The short-lived nature of the site might make detailed analysis of the cereals useful as it is possible the deposits are closely related both functionally and temporally, and there was very little evidence for contamination by more recent agricultural activity. Charcoal fragments greater than 2mm were surprisingly rare in the samples, despite the presence of charcoal-rich deposits noted by the excavators, suggesting that the charcoal was very fragmentary.

The animal bone assemblage is small but generally in good condition, indicating that the paucity of bone recovered is not due to adverse preservation. Those

fragments identifiable to taxon comprise predominantly sheep/goat and cattle but there is also a single equid specimen. Although the excavation was fairly small-scale the size of the assemblage is less than might be expected from domestic occupation, and there is no evidence for substantial dumping of butchery, kitchen or industrial waste.

The Kellaways enclosure could be interpreted as a rather short-lived, occasional or seasonal outdoor occupation site, given the lack of convincing evidence for buildings from either survey or excavation, although the site has been truncated heavily by both (post-)medieval ridge and furrow and modern ploughing. It is plausible that the wider system of fields, enclosures and trackways is later in date than the enclosure, continuing the intensification of activity in this landscape demonstrated by the later phase of the excavated site.

Chalfield

A significant area of later prehistoric and/or Roman fields, tracks and possible settlements extends between South Wraxall and Great Chalfield, over an area measuring 2km long and up to 1.2km across, largely in Atworth parish (992877, most of this not previously recorded on the HER; Fig 36). The boundaries appear roughly parallel to an eastward-flowing stream that forms the southern edge of the field system. The field system includes routes defined by parallel ditches, up to 15m apart in places, which may have functioned as major droveways. These suggest east-west travel parallel with the stream and the modern road, while there is a northern branch which extends up to the enclosure discussed below (Fig 36, lower centre, and Figs 37–38). The southern part of the system has evidence of more than one phase, indicated by many of the ditches cutting across each other. The eastern boundary of the field system may have been laid out with reference to earlier round barrows, as mentioned above.

The later pattern of land division has a similar alignment to the earlier fields and it is possible that some of the ditches seen as cropmarks relate to post-medieval enclosure but it is difficult to confidently distinguish these. This area has high potential for targeted work to better understand the phasing and function of these field systems and the settlements and droveways which they incorporate, along with their possible influence on later land use.

Fig 36: Iron Age/Roman field system at Little Chalfield with the enclosures labelled (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The largest of the settlement enclosures, and the one most clearly associated with these fields and droveways, is rectangular and measures 94 x 54m (Figs 36 (A) and 37–38). At this location there is also evidence of a number of intercutting ditches representing the remains of smaller and less regular enclosures from different phases of occupation. The large enclosure is connected to the main droveway by a straight 'avenue' approximately 13m wide, though it widens to 15m just before meeting the enclosure on its southern side; however, the centrally placed entrance is only *c* 4m wide. Despite the regularity of the enclosure and its 'avenue', it has a slightly different alignment to the wider field system and may therefore have been inserted into the system.

Caesium magnetometer survey was undertaken over an area of 17.7ha on the Cornbrash in a large modern prairie field (Fig 38). The general response at the site is relatively weak (<2nT) and has suffered some interference from a water main along the southern field edge and a domestic supply that runs diagonally across the survey area. A distinct soil change is visible to the north of the field, where the geophysical response is subdued, suggesting either a reduced level of archaeological activity or the masking effect of a different soil type.

A series of linear and curvilinear anomalies correspond with the cropmark evidence over the main rectangular enclosure and provide some additional

detail, particularly within the large enclosure, which contains evidence for internal occupation activity, including the ring-gully of a probable circular dwelling, with associated localised responses, perhaps indicative of hearths, ovens or pits. The varying orientation of the ditches suggests an original smaller enclosure may have been replaced or enlarged by the main enclosure. A complex of curvilinear ditch-type anomalies together with a D-shaped arrangement extend beyond the main enclosure, suggesting the settlement developed in several phases.

Fig 37: Cropmarks of Iron Age/Roman enclosure at Little Chalfield (27728_008 12-JUL-2013 © Historic England)

The main enclosure also has a northward extension, defined by a series of ditches and subdivisions of generally rectilinear form which appear to respect a linear anomaly to the north that partly corresponds to a former field boundary recorded on historic mapping. Whilst this may form the northern limit of the enclosed settlement, partially fossilised in later field boundaries, the aerial survey record suggests the related field systems are more extensive. The eastern ditch of the 'avenue' is flanked by a slightly narrower linear anomaly which apparently joins the main avenue ditch to the south. A further linear anomaly on a slightly different orientation, which runs right across the field, corresponds with a field boundary evident on the first edition OS mapping.

Fig 38: Graphical summary of significant magnetic anomalies with the aerial mapping evidence (green) for the enclosure and droveway at Little Chalfield (adapted from Linford *et al* 2014. Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The 'avenue' ditches form a T-junction to the south with an apparently persistent sinuous trackway which has evidence for some realignment over time. This runs parallel to and approximately 70m north of the current by-way between Little and Great Chalfield, and the cropmarks suggest it continues west on a similar alignment beyond the survey area. The field boundary mentioned above cuts across the trackway along with a parallel ditch-type anomaly further east. A series of narrow linear anomalies which respect the boundary are indicative of a field system to the west, while to the east a number of weak ditch responses on varied alignments do not form a coherent system, although one could be associated with a track from Little Chalfield shown on historic mapping. An unusual pattern of weak linear anomalies to the north-east may also relate to some form of agricultural activity, perhaps lazy-bed cultivation.

While geophysical survey added detail to the aerial mapping, excavation would be required to clarify the chronology and phasing of the enclosure and its relationship to the field system. However, a few potsherds collected during the

survey from the field surface in the vicinity of the enclosure can be broadly dated to the Late Iron Age and Roman periods.

About 500m to the north-west lies another enclosure which sits within the field system (1076256; Figs 36 (B) and 39). In contrast to the surveyed site this is curvilinear and at least partially double-ditched. It includes the incomplete cropmark of a ring-ditch with an internal diameter of 14m, which would put it at the upper end of the size range for roundhouses. By analogy with the curvilinear enclosures discussed above this site may be earlier in date than the rectilinear enclosure and could therefore indicate a pre-Roman origin to the wider system, or that an earlier enclosure was incorporated into the system. An early date is supported by the 'four sherds of late prehistoric, most probably Middle Iron Age, pottery' recovered from the tertiary fill of the ditch when the northern edge of this enclosure was evaluated in 2014 (Barber 2014b). Another possible rectilinear enclosure 300m further north (1578523) also produced a few sherds of late prehistoric pottery.

A smaller, double-ditched rectilinear enclosure (992877) lies on the south-western edge of the field system, partly overlain by the modern road from Little Chalfield to Lower Wraxall (Fig 36 (C)). It is associated with a curving trackway that runs northwards for at least 300m and appears to cut many of the field boundaries at the western end of the group.

Villas, towns and roads

The key Roman site in the project area is the roadside settlement of *Verlucio* near Sandy Lane, located roughly halfway between the walled towns at Bath (*Aquae Sulis*) and Mildenhall (*Cunetio*); for the identification see Colt Hoare (1975) and Rivet and Smith (1979, 494). A number of villas or similarly substantial buildings cluster around the site (Corney 2001, fig 2.1) while coin finds in the wider area appear to be correlated with the road network (Moorhead 2001), even though Roman sites and finds in general are, as discussed above, widely distributed well beyond the major road.

Two Roman villas (Atworth and Nuthills or Sandy Lane) were recorded during the project, though Atworth (207925; Erskine and Ellis 2008) was only visible on aerial photographs taken when the site was being excavated in the late 1930s. Two other villas that have previously been investigated lie just outside the project area at Bromham (Olivier 1881) and St Laurence School, Bradford-on-Avon (Corney 2003); the latter was first identified from parchmarks on aerial photographs taken in 1999 (Edwards 1999).

Fig 39: Double-ditched enclosure with incomplete or penannular ring-ditch at Little Chalfield (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

At Nuthills (212025; Appendix 2; Lansdowne 1927) the cropmarks on photographs taken in 2013 show the scheduled villa within what is thought to be an Iron Age circular enclosure (1578124), though its exact relationship to this feature is uncertain (Fig 40). Immediately to the east a rectilinear enclosure and the fragmentary remains of what may have been a second circular enclosure can be seen (1578116). These are closely associated with a field system but the exact relationships between villa, circular enclosures and field system are not yet clear (Fig 40 and see Fig 25). To the east and north-east there are further elements of the field system (1578127) and another enclosure (1578136), neither of which were previously recorded on the HER.

At *Verlucio* itself (212022), according to the local farmer, parchmarks of buildings do show in the right conditions. However, the evidence from aerial photographs seen during this project is limited to fragments of the ditches and banks which enclosed the settlement, an area of approximately 3 ha. These largely survive as very slight earthworks in an area of piecemeal enclosure, though the rounded corner of a double-ditched and banked enclosure marking the north-east corner of the town sits within Hayfield Copse where preservation is better (Fig 27); the copse is not marked as ancient woodland in the Natural England inventory but may be an old coppice. An unpublished report in Wiltshire HER on fieldwork undertaken by Chippenham College in the 1980s, including the cutting of a section across the earthworks in Hayfield Copse,

suggests these are the remains of a Claudian fort, with a military presence continuing into the 2nd century before the town developed in the 3rd century (Wilcox 1986). However, it seems more likely that the defences are part of a Late Roman fortification (B. Walters, pers comm).

Some detail of the interior of the settlement (which covers *c* 4ha) has been revealed by an unpublished magnetometer survey undertaken by Alister Bartlett, which demonstrates the presence of masonry buildings and areas of occupation within the town (P. Linford, pers comm). Wilcox (1986) also notes that iron slag and kiln debris were common in the surrounding fields, as were structural remains (nails, pennant stone, brick and tile) indicative of substantial extra-mural occupation.

Although previous work at *Verlucio* has generally been of poor quality (the magnetometer survey and the unpublished coin catalogue compiled by Moorhead are exceptions), it nevertheless demonstrates the richness of the artefactual record (Corney 2001), while the results of the present project emphasise the complexity of activity in the vicinity of *Verlucio* and the need for further work on the settlement and its hinterland. The Nuthills villa could also be reanalysed in this wider context, given the evidence outlined above of additional components at that site, while the large square enclosures in the vicinity have potential to add a great deal to understanding of the Roman period in this region. Some clarification of the relationship between the settlement and the Roman road is also required, since *Verlucio* sits at a change in its course. Additionally, the possible Early Iron Age enclosure to the south and the influence of the Roman landscape on patterns of medieval settlement and agriculture to the west of the town, where there appears to be a notable continuity of fieldscapes, suggests there is potential for investigating some 2000 years of settlement and landscape change in this area.

Understanding the road itself and its subsequent history is a key part of this. Although the villas of Wiltshire may not have functioned after the 4th century AD, the Roman road clearly retained some significance in the succeeding period, its line linking the two sections of linear earthwork known as East and West Wansdyke, and today it still denotes the parish boundaries between Lacock and Corsham in the north and Atworth and Melksham Without to the south.

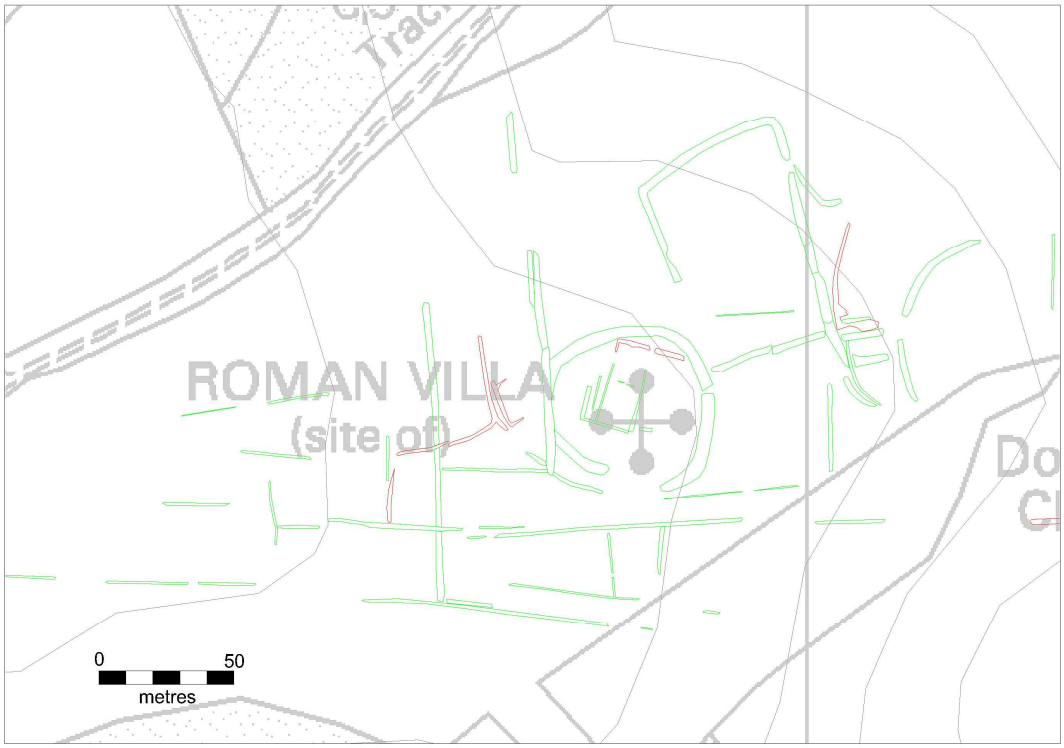

Fig 40: Nuthills villa, possible Iron Age enclosures and associated field system (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Wansdyke is usually considered to have formed a barrier between British and Anglo-Saxon areas in the 6th and 7th centuries, though Reynolds and Langlands (2006) have argued for it being a later boundary between the Middle Saxon kingdoms of Mercia and Wessex. To what extent the stretch of Roman road within the project area was reconfigured to serve as a defensive earthwork remains unclear, however. Early antiquarians were misled by Stukeley's claim that the Wansdyke was Belgic in origin and therefore preceded the Roman road. Nevertheless, from Colt Hoare (1975) we have a detailed, field-by-field report by Skinner and Crocker on the course and condition of the road as it was in October 1819. At this time the earthwork reportedly reached a height of around 6 feet in both Neston Park and Spye Park, where 'the grand agger' had a ditch on its northern side and a smaller bank outside that. Clark's (1958) review of the manuscripts, as well as the sections he cut in Spye Park, suggested it had rather more modest proportions but that the road was nevertheless 'very massive in its final form' (Clark 1958, 95). He argued there was no sign of the Wansdyke as a defensive alteration to the Roman road. During the current project the road was observed on the ground only during fieldwork south of Chapel Knapp; Roman pottery was visible in the agger bank where it is cut by a pond. However, at Wick Farm to the east of *Verlucio*, where the course of the Roman road appeared to survive as a spread bank, *c* 10m wide and 0.5m high, with a re-cut ditch on its northern side (Fig 27), recent geophysical survey has suggested the extant bank is the later Wansdyke, with the line of the Roman road running 10m to the

south of this (Donaldson and Sabin 2015). Significant roadside activity was also evident while late or post-Roman enclosures appear to overlie the course of the road. Further investigations in this area could be very informative.

The royal forests

The debate about the Wansdyke shows the low level of understanding of the early medieval landscape. However, much of the project area was once part of the extensive Saxon forest of *Sealwudu* (Selwood), out of which the royal forests in Wiltshire were subsequently carved. While *Sealwudu* formed a boundary between Wiltshire and Somerset in the 8th and 9th centuries AD, reaching as far north as Chippenham (Stenton 1971), the precise extent and nature of the forest at this time remains uncertain (Hill 1981, 16–17). The boundaries of the later royal forests are better defined, while the chronology of disafforestation is clearly relevant to the medieval and post-medieval settlement pattern discussed below. To summarise the discussion by Grant (1959), in the 13th century the royal forests of Chippenham (or Pewsham) and Melksham (or Blackmore), which were administered jointly, lay on the claylands east of the Avon, bounded to the south by Semington Brook and to the north by the River Marden, which joins the Avon east of Chippenham. Meanwhile the forest of Selwood, a remnant of the former *Sealwudu*, lay south of the Avon and Semington Brook, which meet at Whaddon. Within the project area, therefore, there was a continuous expanse of forest on the left (east) bank of the Avon, downstream from Chippenham. However, this does not imply uninterrupted tree cover: although established in regions where clearing and cultivation had made comparatively slow progress and population was relatively sparse, the forests included arable, pasture and villages as well as woodland.

The system of forest law established by the Norman kings was languishing by the 13th century, by which time assarting of waste land within the forests had begun. Between that time and the early 17th century extensive areas were disafforested: Chippenham and Melksham forests were reduced after 1300 from a single area of some 85 sq km to two detached portions measuring respectively 20 and 36 sq km. It is notable that the Roman road/Wansdyke had no relationship to the boundary of the forest until this time, after which it formed the northern boundary of the detached Melksham forest. The leasing and enclosure of forest wastes brought about hardships by depriving the poor of their common rights, as recorded in rhyme by John Aubrey: 'When Chipnam stood in Pewsham's wood, Before it was destroy'd, A cow might have gone for a groat a year, But now it is denyed'. Selwood Forest disappeared far more rapidly: the total area in Wiltshire before 1322 was about 425 sq miles, covering the south-western corner of the county, but during the reign of Edward III it was reduced to a small area along the Wiltshire-Somerset border, less than one tenth of its former extent (Grant 1959).

The medieval and post-medieval fieldscape

Historic Landscape Characterisation

The results of the Wiltshire HLC project (Sunley 2016)[1] show that, compared with other parts of the county, the fieldscape in the north-west has a high proportion of irregular enclosure but fewer reorganised fields and relatively little Parliamentary enclosure. Most of the project area is characterised by medium-sized irregular fields, with moderate numbers of semi-irregular fields. These are evenly distributed between the narrow types 'amalgamated fields', 'piecemeal enclosure' and 'reorganised fields'. There is also a small scatter of regular fields (planned enclosure), mostly around Lacock, and some assarts (defined as 'land enclosed from woodland') on the Corallian limestone between Lacock and Sandy Lane. A few areas of Parliamentary enclosure are found around Trowbridge, while large modern 'prairie fields' are sparsely but evenly distributed across the project area. Areas of field boundary loss since the first edition 6 inch OS mapping of 1886 are patchily but evenly distributed across the project area, interspersed with some areas of boundary gain. Boundary loss has generally been greater in north-west Wiltshire than in areas to the south and east.

Farming practices

Rippon (2012, table 11.5) has summarised historic land-use data for a broad area of the south-west, which he divides into a number of '*pays*'. Two of these (the Jurassic clay vales and Jurassic limestone hills) broadly correspond with the two NCAs in the project area. At Domesday the clay vales had an average population density with small amounts of pasture, average amounts of meadow and, as discussed above, some extensive areas of woodland; in comparison the limestone hills had a higher population and relatively little woodland, while pasture and meadow areas were similar. In the period 1250–1349 population was high in both areas; the limestone hills had proportionately more arable in relation to pasture and sheep were the main livestock, whereas cattle were dominant in the clay vales. This conforms with Roberts and Wrathmell's (2002, 62) statement that, perhaps because it did not entirely conform to the pattern of nucleated villages and common fields that was typical of their central province, the south-western part of the province saw more varied types of post-medieval farming than the corn and stock combinations found elsewhere: 'stock fattening, horse breeding, pig keeping and dairying amid the extremely diverse terrains of Somerset and north-west Wiltshire'.

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[1]see also http://www.wshc.eu/our-services/archaeology/24-our-services/archaeology/113-historical-landscape-characterisation-project.html

By the 16th century the famous if simplistic division of Wiltshire into areas of 'chalk' and 'cheese' could be applied: the chalk downland, which was part of the south-eastern province (but see Roberts and Wrathmell 2002, 8), forming the centre of a wider region of sheep-corn husbandry, while the claylands were devoted to dairy farming and grazing. Although the Cotswolds was another sheep-corn district there was less sheep-walk than on the chalk downs and dairying became more important here too (Kerridge 1959). This conforms with Rippon's tabulation which suggests that in Wiltshire both the limestone hills and clay vales were characterised by dairying and pig-keeping in the 16th and earlier 17th centuries, and by corn and cattle with substantial dairying in the later 17th and earlier 18th centuries (Rippon 2012, table 11.5). In contrast to the chalklands, the clay vale was substantially enclosed by the 17th century, with former open fields largely enclosed by agreement and piecemeal enclosure of common, woodland and rough grazing, while in the Cotswolds extensive enclosure took place in the later 17th and early 18th centuries (Kerridge 1959). However, land use diverged again during the 19th century and by 1840 the limestone had roughly equal arable land and pasture while the claylands were predominantly pasture, a pattern that still pertains today (see above).

The 'chalk and cheese' division of Wiltshire not only simplifies the farming diversity seen in the county but also reflects farming regimes that did not come into being until the post-medieval period (Kerridge 1959). The distribution of ridge and furrow, seen on aerial photographs and lidar, provides evidence that arable farming was once extensive across a region that was subsequently devoted to dairying. It is largely medieval in origin but also contains fields that may have remained in use or been created in the post-medieval period. A total of 2024 fields of ridge and furrow have been recorded by the project, 1116 of which (55%) still survive as earthworks (Fig 41).

However, the ridge and furrow is not continuous across the project area. It is most extensive along the lower-lying land either side of the Avon from the north of Trowbridge up to the Roman road which crosses the project area in an east-west direction to the north of Whitley and Beanacre. On the north side of the Roman road, where the vale is at its narrowest, there is very little ridge and furrow in the area between Corsham and Chippenham but extensive evidence of former, probably medieval, field boundaries. The pattern of more-or-less continuous ridge and furrow then recurs to the north and east of Chippenham, extending beyond the project area. Very little ridge and furrow was identified along the western edge of the project area (i.e. the eastern edge of the Cotswolds) while more dispersed remains, detached from the main blocks, were seen in the east of the project area, around Sandy Lane.

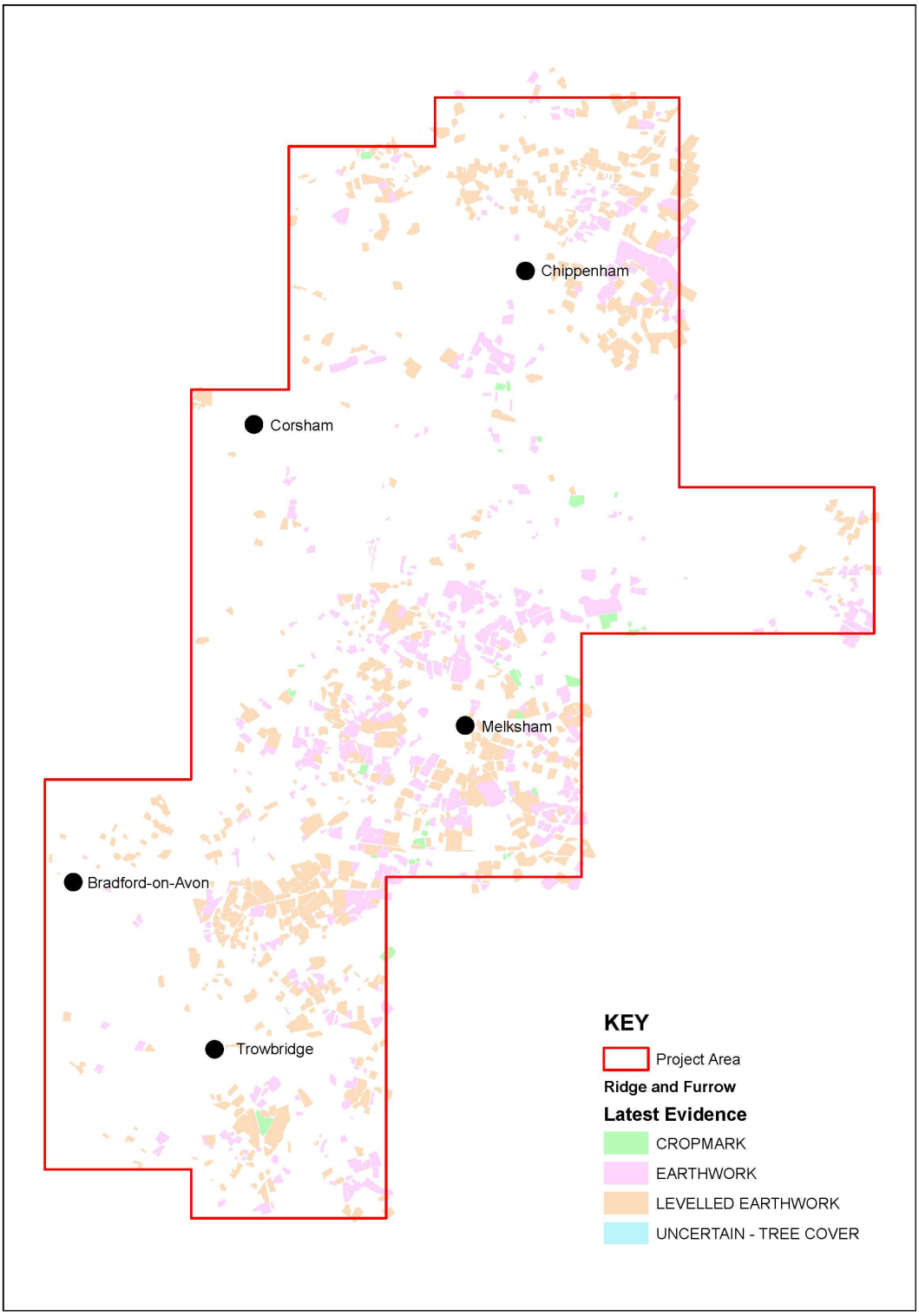

Fig 41: Distribution of ridge and furrow in the project area (© Historic England)

To some extent the distribution appears to reflect local geology. While there is little correlation with individual local character areas, there is a relative lack of ridge and furrow on the Great Oolite and Lower Greensand; there are numerous exceptions but they tend to be isolated fields. In contrast, some areas of

Kellaways and Oxford Clay Formation and river terrace deposits have extensive blocks of ridge and furrow. Gaps in the distribution of ridge and furrow on the clay may reflect past land use, for example the area between Lower Lodge Farm and Great Lodge Farm, south of Chippenham. The names indicate it was formerly part of the royal forest, though it is notable that the area east of Chippenham, which also lay within the forest boundary, has a significant block of ridge and furrow. The same goes for most of the area within Melksham forest, which has as much ridge and furrow as the opposite area west of the Avon.

This suggests some chronological patterning to the distribution. Ridge and furrow classified as medieval is largely concentrated around Melksham, between the Roman road and the ridge of Cornbrash around Trowbridge. Interestingly it includes significant areas within the former Melksham forest so much of this is presumably late medieval; at Little Snarlton Farm, ridge-and-furrow cultivation was laid out over an industrial site that came to an end by the later 14th century, and may therefore be post-medieval in date (Hardy and Dungworth 2014, 142). Fields which continued to be cultivated into the post-medieval period are generally more dispersed and less constrained to the claylands, while those labelled more generally as medieval/post-medieval are largely found in the north-east of the project area, upstream from Chippenham and east of Sandy Lane.

Further research, including documentary work, would be required to better understand the spatial and chronological patterning of arable farming in this part of Wiltshire during the medieval and early post-medieval periods. In particular, does the present distribution of ridge and furrow, which shows a broad correlation with the claylands, reflect a genuine pattern or variable survival? And what is the relationship between ridge and furrow, former open fields and settlement patterns? Several parishes, particularly those between Trowbridge and Melksham, have evidence of relatively extensive areas of ridge and furrow, but while survival is fragmentary in some, such as Hilperton, in others, such as Broughton Gifford, there is good coverage across much of the parish (1579386, 1579402, 1579407, 1579423, 1579424, 1579426). Some blocks of ridge and furrow are closely associated with settlements, as at Whitley (1579923 and 1580313) and Beanacre (1579925 and 1579926), both in Melksham Without parish, or with single farms, such as Queenfield in the same parish (1579228). Where there is extensive ridge and furrow there is usually a pattern of interlocking strips, indicating many phases of development. In places these still survive as earthworks and a good example is found at the northern end of Beanacre (1579925; Fig 42).

Fig 42: Well-preserved ridge and furrow near Beanacre, north of Melksham Without parish (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Evidence of the post-medieval amalgamation of fields is fragmentary but is generally found in areas where ridge and furrow was not identified. It is not clear, therefore, if the absence of ridge and furrow is genuine or the result of subsequent ploughing when fields were amalgamated. However, narrow ridge and furrow is also widespread in some places, demonstrating later cultivation (possibly as late as the early 19th century). At Great Chalfield narrow ridge and furrow overlies a disused field boundary and later pillow mound, while large areas have also been recorded at Catridge (see below).

As discussed above, many areas were converted to permanent pasture from the 16th century onwards and a landscape of small enclosed fields was created as dairy farming was established. By the 17th century three-quarters of what had become the 'cheese' country of Wiltshire had been enclosed (Kerridge 1959, 44). Although still a landscape of small fields, there are traces of numerous field boundaries (some surviving as slight earthworks) which were removed during a process of field amalgamation that must have taken place prior to 1886, the date of the first edition Ordnance Survey maps. Abandoned field boundaries are seen, for example, as low, spread earthworks within the eastern side of Corsham Park (1581142) and presumably reflect the field pattern at the time when the park was extended (possibly in the third quarter of the 18th century; see Fig 62). This suggests further work on open fields in the area should include study of the

parklands, a distinctive feature of this part of West Wiltshire where there is potential for earthwork survival of earlier field systems.

Boundary removal continued throughout the later 19th and 20th centuries; although these were not mapped, since they are depicted by the OS, they have been recorded for the Wiltshire HLC (see above). Areas of pasture were also brought back into cultivation after the Second World War, resulting in the gradual levelling of ridge and furrow that survived as earthworks in the 1940s (see below). Some of this ploughing-up of pasture was encouraged by incentives offered by the government to bring more land into cultivation in the 1950s but some reflects more recent agricultural trends, as described above. Residents of Staverton recalled the levelling of ridge and furrow earthworks in the early 1970s (Barber *et al* 2013, 18).

The fields discussed in this section had generally not been recorded on the HER, and although ridge and furrow has been encountered in a number of development-led projects it has rarely been studied in detail. At Showell Farm, Chippenham, remains of ridge and furrow appeared to be wholly contained within the topsoil (Cotswold Archaeology 1999), while at Rew Farm, Melksham, ridge and furrow was visible as variations in the depth of subsoil in the evaluation trenches (Moore 2014). On the Holt to Semington Water Main furrows were recorded as 0.1-0.4m deep and separated by ridges spaced *c* 6m apart (Evans 2011). During the current project medieval ridge and furrow with traces of field boundaries and plough headlands were visible on lidar images on the northern edge of Lacock village and examined during fieldwork in August 2014. The field boundaries survive as spread banks, *c* 5m wide and 0.2m high. Remains of levelled ridge and furrow were encountered during the excavations at Kellaways (see above), overlain by criss-cross ploughmarks from more recent cultivation episodes.

Gastard 'long lands'

What may be evidence of early land division surviving in the modern field pattern can be seen in the south-east corner of Corsham parish (1580332; Fig 43), on the northern edge of the main concentration of mapped ridge and furrow. In an area classified in the HLC as piecemeal enclosure and reorganised fields, the alignments of the current field boundaries describe reverse-S patterns that extend for 800m north from the Roman road which marks the southern edge of the parish. Slight earthworks of former field banks run parallel to these boundaries (Fig 44) and some slight ridge and furrow, which when combined with the surviving field boundaries extend the total length by 100m. Elements of some of the other illustrated field boundaries, including part of Goodes Hill road (on the left hand side of Fig 43) and to a lesser extent the southern end of the eastern parish boundary (on the right), echo the same long reverse-S line.

Fig 43: Possible ‘long lands’ seen in the layout of current and former boundaries near Gastard, Corsham parish. The Roman road (and parish boundary) extends across the bottom of the frame. (Detail of LIDAR ST8867 Environment Agency DSM 02-16-APR-2005 © Historic England; source Environment Agency)

Field examination and small-scale survey of the earthworks south of Chapel Knapp Farm revealed more of this highly distinctive field layout characterised by sinuous strips running north-south with lateral subdivisions. The strip pattern is reflected in the modern landholdings which are each two fields wide. This layout extends from the parish boundary in the east to the Roman road in the south. Its northern and western limits are the settlements at Chapel Knapp and Gastard and the road from Whitley to Gastard, although relics of a similar field pattern are visible further west, beyond a quarried area which may have removed traces of earlier fields.

The field boundaries at Gastard have previously been interpreted as the remains of a Roman field system, their 'wavy brickwork' plan perhaps the legacy of a coaxial landscape (Draper 2006, 93) while the survey of Bradford-on-Avon Hundred mentioned above revealed not dissimilar fields preserved as earthworks in Inwood. These were assigned a broad Iron Age/Roman date range (Canham 2014, 8–9).

Fig 44: Earthwork field banks within the 'long lands' near Gastard (© Historic England, J Last)

Alternatively the Roman road, which was later utilised as a parish and hundred boundary, may have served as a baseline for early medieval rearrangement and these features may be evidence of 'long lands', individual strips seen in Yorkshire and the Midlands which in some cases run for up to 2000m (Stamper 1999, 258). They are thought to represent the earliest stage in the rearrangement of the countryside into open fields that took place around the end of the 10th century AD. The possible examples in West Wiltshire occupy a relatively small area which contrasts with other examples, such as Doddington in Northamptonshire, where the long lands were 1.6km long and crossed the entire township (Hall 1995, 133; Stamper 1999, 258 and fig 14.6).

Further work could help answer questions about the development of the early medieval landscape and rural settlement in this part of Wiltshire. However, the survey suggests that although the present reverse-S field boundaries reach the line of the Roman road, the earthworks seen on lidar do not stretch this far south. The relationships between the linear boundaries and the Roman road have been obscured by centuries of field boundary refurbishment, making the relative chronology impossible to determine from earthwork evidence. South of Chapel Knapp, for example, a field boundary straddles the agger of the Roman road, which is *c* 10m wide, but soil creep from (probably) medieval ploughing masks its edges.

Establishing a link between the 'long lands' and the Roman road would help provide a chronology for the development of medieval agriculture, and might also shed some light on the question of the Wansdyke (see above). The old

road's structuring role in the medieval landscape might explain the scarcity of ridge-and-furrow earthworks to the north, compared to their prevalence south of the road (Fig 41), though other factors may also be involved: the claylands narrow just to the north of the road, around Lacock, with ridge and furrow becoming more frequent where the clay area widens again to the north and east of Chippenham.

Rippon *et al* (2015) have recently considered the extent to which the Roman fieldscape influenced or survived into the medieval period in different regions of Britain, and emphasise the value of comparing cropmark evidence with historic mapping. In the project area the main field systems visible as cropmarks are, on the whole, not aligned with the fields depicted on the first edition OS mapping: this goes for the cropmarks at Kellaways, west of Chippenham, Showell Nurseries, and north and south of *Verlucio*. The major exception is the field system around Little Chalfield where, as discussed above, the later pattern of land division has a similar alignment to the earlier fields. Further work is required to understand why this should be the case here but not elsewhere. Some development-led fieldwork has also hinted at continuity: the medieval field system at Staverton was on broadly the same alignment as the Roman ditches excavated there (Barber *et al* 2013) while the enclosures at Marsh Farm were aligned with the field boundaries on the first edition OS map (James 2014).

Great Chalfield

A survey of earthworks to the north-east of Great Chalfield Manor shows the potential for identifying and understanding agricultural palimpsests that are not represented on aerial photographs. The work was centred on a field called 'Watgrove', part of an area of piecemeal enclosure, while further earthworks are found in 'Crooked Wood Leaze', immediately to the north, which is classified in the HLC as planned enclosure (Fig 45). Both fields are owned by the National Trust and managed as permanent pasture grazed by sheep. The area, which spans the valley of the Lenton Brook, lies at the confluence of several small tributaries which flow south and east to join the Avon.

The underlying geological composition may have been a determining factor in the location of historic settlements in the vicinity. The fields surveyed overlie sandstones, siltstones and mudstones of the Kellaways Formation, which give rise to seasonally wet loam and clay soils while immediately to the south the manorial centre is situated on the Cornbrash and its lime-rich alluvial soil.

Fig 45: Earthworks at Great Chalfield (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The manorial complex at Great Chalfield is of classic layout, with the manor house adjacent to the parish church. It was once defended by a moat and a high outer wall with semi-circular bastions, the remains of which still survive north and south of the house. However, the buildings have undergone various phases of rebuilding and alteration. The earliest fabric survives in the parish church and the gate house, which both date from at least the 14th century. The earliest parts of the manor house, which has been extensively rebuilt, date from the 15th century, as does the Old Brew House which overlies the course of the moat, indicating that this was a time of extensive remodelling (Floyd 2013).

The earthworks at Great Chalfield had not been recorded previously and were encountered by chance during the investigation of field boundaries discovered by aerial survey to the south of the manor. They include features of a variety of types and periods, varying in their state of preservation from prominent and well-defined features to spread earthworks and amorphous disturbance. A possible prehistoric mound (feature A on Fig 45) has been described above.

Among the features broadly contemporary with the manorial complex is another mound in Crooked Wood Leaze (1593888; feature B on Fig 45). It is subrectangular in plan, measuring *c* 30m x 8m and standing approximately 0.3m high. A narrow surrounding ditch is evident on all but its southern end, where it is truncated by the current field boundary. The mound has been constructed on top of a lynchet (feature C), which is a prominent feature bisecting the field. While the mound's existence was known it had not previously been surveyed. In fact its subrectangular plan and general form are highly characteristic of a pillow mound, part of a rabbit warren of medieval or post-medieval date. Construction of pillow mounds on top of former field boundaries appears to have been common practice and is seen elsewhere, for example on Minchinhampton Common and Barrington, Gloucestershire (Smith 2002, 28). The relationship clearly demonstrates the antiquity of the field lynchet, which must have been disused by the time the warren was created. The former existence of a rabbit warren in the vicinity is confirmed by the presence to the west of field names containing the name 'Conygree' on an estate map of 1794.

A further phase of agricultural activity in Crooked Wood Leaze is demonstrated by narrow ridge and furrow which overlies and cuts both the pillow mound and lynchet (1578500). Across the western half of the field this is aligned at an approximate right angle to drains depicted in 1834, indicating that it may have been the result of post-drainage cultivation using steam ploughing.

At the eastern tip of Watgrove an elongated sub-rectangular mound, potentially another pillow mound, partially overlies the lynchet that bounds the settlement earthworks discussed below (area D).

Water management

Water management has been important at Great Chalfield for many centuries – a moat surrounded the medieval manor house, filled from a leat. These features still survive in part, although fish ponds and a watermill which once existed have gone. The most prominent, and probably latest, earthworks at Watgrove are those of a water management system and field drainage (1593702), concentrated along the former course of the Lenton Brook, which runs through the centre of the field as a sinuous earthwork (feature E on Fig 45). Some time before the earliest detailed map of the area in 1794 the Brook was diverted from this original course into an artificial channel skirting the southern boundary of the field. A further shallow channel (feature F), now dry, runs inside the north-western boundary of the field before joining a further channel at right angles. It may represent a further part of the original course of the stream through Watgrove and continues south-east to a point (G) where it meets four other radiating channels, one of which (feature H) flows through a sheep dip, the remains of which are evident as a sub-square depression with two of its sides revetted by dry-stone walling. Stone bridges of uncertain date provide access across the water channels while vestiges of smaller channels over much of the field may be later under-drainage.

The field continued to be the subject of intensive water management schemes into at least the 19th century, although the purpose of the multiplicity of channels and drains is not obvious today. The alignment of channel F suggests that it brought water from the Lenton Brook onto the field and, via a complex of further channels, ultimately supplied the sheep dip. This complex of features may pre-date the diversion of the Brook or may have functioned as a crude form of water meadow, with the re-aligned section of the Brook serving as a main drain. The earthworks bear no resemblance to the bedworks found in chalk valleys, but are similar to examples of water meadows recently discovered in Devon (Hegarty *et al* 2015, 53–5). Great Chalfield has a potentially significant connection in its association with the Duke of Kingston, who held the manor for much of the 18th century and whose agent is known to have constructed water meadows on the Duke's main estate in Nottinghamshire (Lowe 1798, 102).

More widely, water meadows are a significant landscape feature in the south of the project area around Trowbridge but rare to the north of the Kennet and Avon canal. They represent a priority feature for improved protection (Smith 2013, 8). A sample of those recorded from aerial photographs was examined in the field. Some had been ploughed since the most recent aerial photographs were taken and few traces remained. Others were inaccessible and might not survive due to on-going building development around Trowbridge.

It is notable that the extensive and well-preserved bedwork water meadow systems seen in other parts of Wiltshire appear to be absent. Potential systems

examined around Trowbridge remain as faint linear scarps, with no accompanying structural evidence for water control features. The most extensive water meadows lie along Biss Brook, Bitham Brook and the River Biss in the parishes of Heywood and North Bradley (1577325, 1577327 and 1577335; Fig 46). The remains of the system at North Bradley are more coherent, with the main drain, supplementary channels and beds still visible. Many of the ditches still contain water and a small stone slab bridge crosses one of the channels immediately south of the Biss Brook. The remains are under permanent pasture and many of the ditches still contain water. However, not all the water meadows seen as earthworks on air photographs have survived. Downstream on the east bank of the River Biss, earthworks did not appear to be extant on the latest 2009 vertical photography, and a field visit showed the area to be under improved pasture, with only faint traces of linear scarps visible.

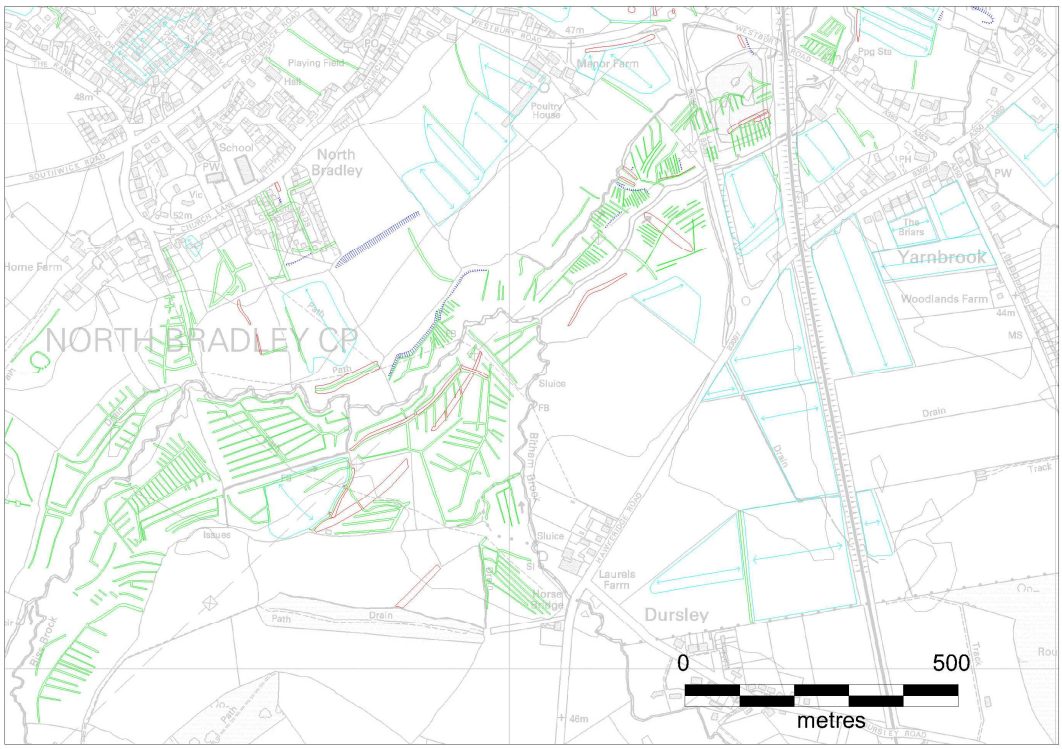

Fig 46: Water meadows south of Trowbridge (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The carefully controlled flooding of these meadows provided new grass for flocks of sheep early in the year when winter fodder supplies were running low. The sheep were in turn kept primarily to manure the arable fields, and it is this link which may explain the distribution of water-meadow earthworks in an area close to the sheep-corn farming area. Water meadows seen to the north-west of Trowbridge may have served the same area or were perhaps associated with a similar farming regime on the Cotswolds.

Increased grazing for sheep in this part of the project area might also have been related to the cloth trade. The 'wool towns' of the Avon vale, especially Bradford-on-Avon and Trowbridge, prospered from the late 15th century, interrupted only by a brief decline in the early 17th century, before gradually losing out to northern manufacturers from around 1820 (Mann 1959). However, the woollen industry was 'dependent more on organization and capital than on purely geographical advantages for cloth-making': while Bradford had better water for fulling and greater power for milling, Trowbridge had better road connections to the London market (Beckinsale 1951, viii). These considerations, along with the availability of fuller's earth and the ability to support an industrial population, were more important than the proximity of the wool, much of which came from the Cotswolds, Wales and the Midlands rather than the immediate hinterlands of the towns (Ramsay 1965). Although wool and cloth were primarily an urban industry in post-medieval times, medieval fulling mills are recorded at several other locations within the project area, including Peckingell and Rowden, both near Chippenham, as well as Whaddon (Carus-Wilson 1959).

Water meadows occur less frequently in the northern half of the project area, but north of Rhotteridge Farm, to the north-east of Melksham, slight earthwork remains visible on lidar were interpreted as a possible post-medieval catchwork water meadow (1577421). At the northern extent of the earthworks is a flood dyke, from which water could have overflowed downslope to the north-west and drained into additional parallel channels before returning back into the stream it had come from. However, when this area was examined during fieldwork the gradient of the slope appeared too slight for a catchwork system, so it is unclear exactly what the earthworks represent. Vestiges of a channel are still visible, but much of the area is under recently improved (ploughed) pasture.

The most complete water meadow seen during fieldwork is found north-east of Lacock Abbey, where low but well-defined earthworks of a bedwork system lie within a bend in the River Avon (1578841). The head main leads from the river at the north of the system, where a weir lies at a bend in the river. There are three other mains and drains, ridged beds and numerous parallel channels (subsidiary floats and drains). Water drained back into the river at the southern end via a main drain. No remains of hatches, sluices, bridges or other such structural features were seen. The date of the system is not known, but its main channels appear on Andrews and Dury's survey of Wiltshire (1773). It shares a common water source with the ornamental gardens (619015) which border its western edge (see below), so may be contemporary with the water garden layout.

Development-led work within the project area has yet to investigate any water meadows. Although levelled water-meadow earthworks are located within the evaluation area at Ashton Park (1578831), there is no reference to them in the report, though one evaluation trench in the area of the former earthworks found

a north-east/south-west-aligned feature, described as 'possibly a former furrow', which contained a single sherd of late 18th to 19th-century pottery (Barber 2014a).

Medieval and post-medieval settlement

Settlement patterns

Fieldscapes cannot be studied in isolation from contemporary settlements, where those who created and worked the fields lived. While elements of the settlement pattern may have pre-medieval origins (see above) it primarily reflects developments during and since the late Saxon period. In Roberts and Wrathmell's (2002) characterisation of medieval settlement across England the project area lies in a region of medium settlement density towards the south-western end of their central province (within the Cotswold Scarp and Vale sub-province). While the central province can generally be characterised as an area of open fields and nucleated settlement, there is significant local variability which bears out Williamson's (2013, 140) caution that any system of broad regional classification for medieval England usually dissolves on closer inspection into 'a multiplicity of more local landscape types'. In particular, the south-western part of the central province had considerably more woodland at the time of Domesday than many areas to the north (see below).

Following Andrews and Dury's 18th-century map, Lewis (1994) suggests that, while lacking the extensive row settlements of the chalkland valleys, the clay vale had a slightly more coherent settlement pattern than the adjacent Corallian-Gault-Greensand belt, with a number of regular rows alongside small nucleated settlements; the Cotswolds area was also characterised by a nucleated pattern of settlement. The *Farmsteads and Landscapes Statement* for the Avon Vales NCA notes that the area had mixed settlement patterns with nucleated villages intermixed with hamlets and dispersed farmsteads, often associated with areas of common. In comparison with the chalklands, this area generally had weaker manorial control resulting in the selling of manorial land and the creation of small family farms from the 16th century (Edwards and Lake 2014). Such differences in landholding could have had social consequences, reflected in e.g. Civil War allegiances or religious non-conformity, though historians are rightly wary of oversimplifying these patterns (Smith 1988).

Settlement earthworks

Since the present project has not investigated the modern settlement pattern in any detail, and few current villages have seen development-led fieldwork, this section focusses on the evidence of former medieval and post-medieval settlement identified as both earthworks and cropmarks at a number of sites

across the project area. These remains consist of hollow-ways, croft boundaries and building platforms, though no details of individual buildings were seen during the aerial mapping stage. Fieldwork took place at two sites, Lower Paxcroft and Catridge (see below), shedding further light on settlement in these periods.

Settlement earthworks of definite or probable medieval date are relatively common on the HER and include the SMs at Whaddon and Sheldon Manor (Brown 2001a). Many of these sites tend to be clusters of farmsteads rather than nucleated villages, though linear, single-row settlements are also seen. At Whaddon, where a settlement is documented from the Domesday Book onwards, the church, scheduled house platforms, hollow-ways and field boundaries lie on an arterial road, while at Sheldon, well-preserved building platforms and tofts survive, many of which line the northern side of a prominent hollow-way. Although moats are generally rare in this part of Wiltshire, some small moated medieval manors are known, such as Great Chalfield (208088; see above), where part of the moat has been filled in and the remainder forms part of a landscaped garden, and Rowden (212499), where a scheduled complex of earthworks including a moat, ponds and other earthworks lies concealed in vegetation, which precluded ground-based survey during the current project. Rowden Manor was a stronghold during the Civil War before it was dismantled and destroyed in 1645. Some of the earthworks to the north were marked as 'Intrenchments' on 19th and early 20th-century Ordnance Survey maps and were thought to be Civil War defences, but a 1966 field survey challenged this interpretation and highlighted the non-defensive appearance of the earthworks (212499, source 5; Fig 47). Bromham Manor (212031) in the far east of the project area was also destroyed in 1645; some garden earthworks are still visible at the site.

Sites with settlement earthworks are evenly spaced across the project area, except to the south and west of Trowbridge, in Wingfield, Southwick and North Bradley parishes, where earlier settlement remains are scarce, and on the Great Oolite in the west, where only two sites are known, at Easton Court Farm (208453) and Thingley Farm (1580181). Two sites lie on the Corallian Limestone: at Chittoe (1578358), close to the modern hamlet, and at West Ashton (207706), to the east of the modern roadside settlement. There is also one site on Lower Greensand, at Heddington Wick (1578264). The remaining settlement earthworks are on the claylands, including the scheduled monuments at Sheldon Manor, Rowden and Whaddon. Many earthworks may represent shrunken villages or hamlets, where they are adjacent to extant settlements, as at Kington Langley, Kington St Michael, Langley Burrell, Tytherton Lucas, Lacock, Whitley, Beanacre, Broughton Gifford and Holt. Of these only the site at The Common near Broughton Gifford (1579367) was not already on the HER, though all the features mapped there are interpreted as field boundaries, so it is not clear how much settlement is represented. Other

settlement remains now lie within the suburbs of major towns, including dispersed boundary features at Hardenhuish in north-west Chippenham (1578982) and now-levelled earthworks at Hilperton, north of Trowbridge (1578825).

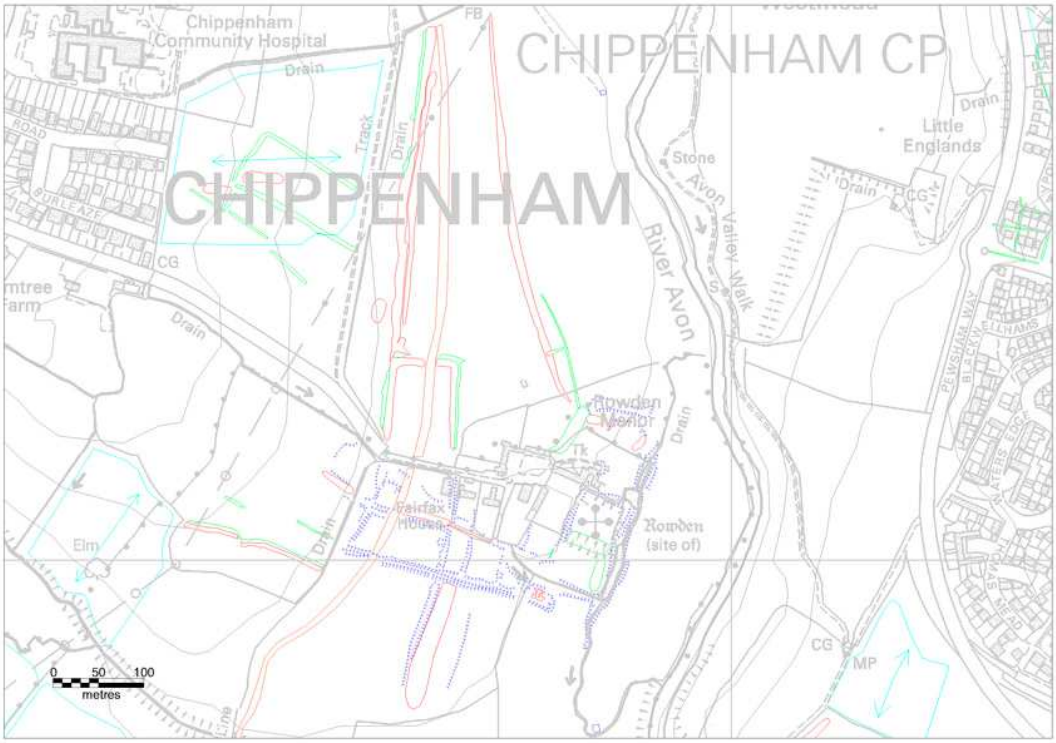

Fig 47: Rowden Manor and associated earthworks (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Other sites, like those discussed below at Catridge and Lower Paxcroft, lie away from modern settlements. These include Kellaways Mill Farm (1579088), Rawlings Farm (1578998) and Hither Farm (1580056) near Chippenham; Lackham Park (1578850), Bewley Crescent (212142) and Queenfield (1579233) near Lacock; Woodrow House Farm (867420 and 1579904), Snarlton Farm (867423), Redstocks (867427), Monkton Farm (866602) and Melksham Park Farm (1579825), all near Melksham. The high number of sites around Melksham, including the excavated example at Little Snarlton Farm (see below), might suggest a greater degree of post-medieval settlement reorganisation here, perhaps associated with disafforestation. The loss of common rights due to enclosure resulted in many poor families leaving villages and settling on unused land (Taylor 1975, 128). In the 17th century John Aubrey commented on the hardships endured by the poor after the disafforestation of Chippenham and Melksham forests, which led to a situation where 'the highwayes are encombred with cottages, and the travellers with the beggars that dwell in them'.

Evidence of this kind of post-medieval roadside settlement can still be seen to the east of Melksham and aerial photographs provide evidence of the

subsequent abandonment of some of these homesteads. At Redstocks, east of Melksham, the earthworks of perhaps a single property and associated field boundaries can be seen within an area of dispersed settlement (867427). Closer to Melksham (and often now subsumed into the town), roadside properties were more closely spaced, creating linear settlement such as Snarlton Row. Earthworks to the east of this indicate the abandonment of a more dispersed settlement along the same lane, once collectively known as Moor Lane (867423; Fig 48).

Fig 48: Remains of former roadside settlement at Snarlton (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

While historical records of settlement along Snarlton Lane do not predate the 17th-century deforestation, recent excavations directly to the west of Snarlton Farm have revealed evidence of earlier activity, comprising a small settlement and iron production site of the 12th to 14th centuries (Hardy and Dungworth 2014). The availability of timber from Melksham forest and iron ore from nearby Seend no doubt explains the location of the site, though the reason for its demise is less clear.

Secondary settlements which have suffered shrinkage and now comprise farms or small hamlets can be seen in other areas, including the parishes of Heddington, Lacock and Chippenham Without. Earthworks to the west of Sheldon Manor (867333; Appendix 2) have previously been surveyed by the RCHME (Brown 2001a). They consist of a hollow-way and associated building platforms which are slightly detached from the manor site, similar to the pattern

at Wick and Catridge Farms in the south-west of Lacock parish (see below). Sheldon's heyday appears to have been during the 12th and 13th centuries when sheep farming was important (200 sheep were recorded there in 1195, as well as two ploughs and 24 oxen). As in so many cases, the reasons for the abandonment of the site are unclear but may have been linked to the growing importance of nearby Chippenham drawing inhabitants away, perhaps accelerated by the plague of the 14th century. In any case abandonment of the hamlet probably occurred in the late 14th or early 15th century (Brown 2001a); the settlement had definitely declined by 1582, when the manor was split into the two farms shown on 18th-century and later maps.

At Heddington Wick a surviving area of common forms a green that is surrounded by a dispersed group of settlement remains. Earthworks indicate that settlement along the southern side of this common was once more extensive and encroached upon the green where building platforms and sub-square enclosures are still visible. Nowadays the lane through the green ends to the west at Wick Farm, but a second group of earthworks to the south of this farm includes a hollow-way, suggesting that this was once a through road (1578262, 1578264, 1578267). The earthworks were examined during fieldwork in April 2014. Those on the common comprise building platforms and low banks, approximately 0.3m high and 1m wide, defining small sub-square enclosures; they may represent pre-common settlement or later encroachments. Hollow-ways and a large depression, possibly an old quarry, were evident in the field to the west of the common, but any more subtle features were obscured by long grass.

Nearby at Chittoe, earthwork remains of a number of building platforms, field boundaries and hollow-ways were identified around the core of the surviving settlement and mapped from lidar images. The earthworks were examined during fieldwork in April 2014. They represent the remains of an irregular, dispersed, settlement which covers a large area surrounding the present settlement and extending to the north and west. Some of the outlying settlement is associated with relatively recent quarries, e.g. the foundations of Grove Cottages, which are depicted on late 19th-century OS maps. Further building platforms are terraced into the valley side.

Lidar acquired in 2005 shows the slight earthworks of medieval settlement shrinkage and abandoned field boundaries at Easton, east of Corsham, with a possible settlement site to the east of Easton Farm (208453; not previously recorded). This is connected to a series of former field boundaries that extend to the north and east and pre-date the arrangement of fields depicted on the first edition OS map of 1886. Other earthworks can be seen both sides of the road to the west of Easton. The earthworks were examined where they were accessible or visible from public roads and footpaths in August 2014. They comprise extensive and well-preserved hollow-ways, rectangular enclosures and building

platforms representing settlement shrinkage. A small complex of building platforms amid field boundaries, possibly a small farmstead, lies opposite Easton Court Farm. The date of the earthworks is probably medieval, since the earliest extant building in the village dates from at least the 13th century; the date of the shrinkage is unknown but the village would be an ideal candidate for an integrated landscape study of the earthworks and historic buildings.

At Tytherton Lucas a variety of settlement earthworks were identified on aerial photographs taken in the late 1940s, though many of these have since been levelled (887782, 1043942, 1579071). They include three concentric curving banks and ditches defining an area to the west of the church (1579071, not previously recorded). While this suggests an association with a manor house there are no comparable enclosures within the project area. Field examination of earthworks visible from public rights of way was undertaken in August 2014; although many of the fields were under long grass, well-defined shrunken settlement earthworks were clearly visible in sheep pasture south-east of the church.

Further south at Whaddon (208100; Appendix 2), the scheduled medieval settlement is visible as earthworks on 2005 lidar. Hollow-ways, building platforms and enclosure banks represent the remains of linear roadside settlement extending eastwards from the church, with further earthwork elements visible immediately south of Whaddon Farm. The Domesday Book records a settlement here, held by a Saxon thegn called Alvric prior to 1066. It still existed in 1334, but is not mentioned in the Poll Tax return of 1377, suggesting that the plague of 1349 may have played a part in its demise. The remains of the settlement were examined during fieldwork in March and April 2014. The majority of the earthworks fall within the scheduled area, but slight earthworks were also visible in the arable field to the south of the road which runs through the settlement.

Extensive medieval settlement earthworks on the other side of the Avon at Monkton (866602) were visible on air photographs and lidar. The settlement comprises a network of hollow-ways with associated field boundaries and ridge and furrow, though the area has been damaged by post-medieval extraction. An arterial hollow-way extends north-east, parallel to the River Avon, for at least 500m towards Monkton House. This formed the focus for numerous linear field boundaries and probable building platforms. It is possible that river migration may have removed settlement evidence along this stretch though most of the earthworks are extant on the latest 2005 lidar and 2008 vertical photography. The remains were examined on the ground during fieldwork in April 2014. At the time of the visit some of the earthworks were in the process of being ploughed, with only those closest to the river remaining under pasture. No finds indicative of settlement were visible in the ploughed soil but croft and toft boundaries were still evident in the unploughed part.

At Great Chalfield, in the far eastern tip of Watgrove (see above), a small complex of previously unrecorded earthworks (1593859; area D on Fig 45) was found close to the Lenton Brook. This comprises two well-defined subrectangular platforms and the remains of three larger platforms with short lengths of hollowed access-ways running between them, all set into the natural west-facing slope. The complex is bounded on its northern side by a 0.7m high scarp and to the west by an equally substantial lynchet.

While there have been substantial excavations in an urban context at Trowbridge Castle, where Anglo-Saxon sunken-featured and post-built structures were succeeded by a medieval manorial enclosure, church and cemetery as well as the castle (Graham and Davies 1993), and investigations of medieval industry, including ironstone mining, metalworking, pottery and tile kilns, at Nash Hill (McCarthy 1974), little development-led excavation of medieval rural settlements has taken place within the project area. As well as the above-mentioned work at Little Snarlton Farm, tenements of a former ribbon settlement of the 11th to 13th centuries, associated with surviving linear earthworks, were investigated opposite Manor Farm, West Ashton (Hart 2004). At Melksham campus, on the western edge of the medieval town, a recent evaluation revealed possible domestic and agricultural activity dated to the 12th to 14th centuries (Wessex Archaeology 2013). Less well-defined activity revealed during an evaluation at Bowerhill, Melksham, included a medieval pit of 12th to 15th-century date and linear features that could represent settlement or fields/paddocks (Howard 2014). Rather later in date are the remains of a small number of probably timber-framed houses on stone foundations identified during evaluation of land by the Black Ball brook to the east of Trowbridge (Wessex Archaeology 2005). This settlement was occupied during the 17th and 18th centuries before being abandoned, possibly because the site was too wet, after which the site appears to have quickly reverted back to farmland. No evidence for a medieval precursor was recovered.

Recording of standing buildings was outside the scope of the project and only took place at Catridge Farm (see below) with the assistance of the Wiltshire Buildings Record. However, it is worth noting that about 70% of listed historic farm buildings in the Avon Vales NCA remain unconverted. 'Most are intact structurally and may still see conversion to other purposes, although this late 20th-century trend may now have declined' (Natural England 2014, 27). The Wiltshire Farmsteads Project (Edwards and Lake 2014) has mapped more than 4000 traditional farmsteads present on the OS second edition 25 inch map of *c* 1900, recorded the dates of the surviving buildings, and identified the extent of change through comparison with modern mapping; this work was drawn on for the case study at Catridge. The largest surviving group of medieval buildings is at Lacock, which accounts for over a quarter of the medieval entries on NRHE within the project area.

Lower Paxcroft

Evidence of settlement shrinkage was studied in an area of amalgamated fields at Lower Paxcroft Farm, near Hilperton on the north-eastern edge of Trowbridge. A series of earthworks on low-lying Oxford Clay to the east of the present farm indicate a more extensive former settlement bounded by a tributary of Paxcroft Brook, itself a minor tributary of the River Biss, on its southern side (1578806, not on the HER). In 2014 an analytical survey of these earthworks was undertaken along with further desk-based research (Caswell 2015; Fig 49).

The name Paxcroft is said to originate from the personal name Pæcci (Mawer *et al* 1930, 310); it is first recorded in 1249 in the Assize Rolls for Wiltshire as Packlescrofte (Gover *et al* 1939, 127) while the form in use today is first recorded in 1574 (ibid). On Andrews and Dury's county map of 1773 at least seven structures are shown at Paxcroft, but the first detailed representation is the Enclosure Award map for Semington, dated around 1818. This shows two groups of buildings in the area of the surviving earthworks, all of which had disappeared by the time of the first edition OS map of 1886. Between these dates the 1841 census records four families living at Paxcroft.

The earthworks identified from aerial photography primarily consist of several ditches aligned north-east to south-west and associated with other bank and ditch features, appearing to represent rectangular units backed onto a possible hollow-way. Evidence of ridge and furrow was recorded to the north of the earthworks.

The southern boundary of the survey area comprised a deep, irregular ditch, up to 12m wide and partly flooded, which contained a fenced and hedged boundary (X on Fig 49). A pond inserted into the ditch is first recorded on the first edition OS map. This ditch, which may have originally formed a hollow-way, marked the transition between land used for cultivation and common land prior to its enclosure, and also formed the border between Semington and Steeple Ashton parishes, prior to more recent boundary changes.

The main group of earthworks is bounded to the west by another ditch (Y on Fig 49), between 8m and 15m wide, that is also broken by a pond. On the 1818 enclosure award this formed a field boundary but it may also have been an earlier hollow-way, running past Lower Paxcroft Farm, subsequently turned into a boundary by planting a hedge in its ditch. A third hollow-way, comprising a 4m-wide ditch, bounded the settlement earthworks to the north, running north-west to south-east (V). This survives partly as a hedged and fenced boundary and partly as parallel earthwork banks.

Fig 49: Earthworks at Lower Paxcroft (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

Within the area defined by these boundaries and trackways are the remains of at least eight croft and toft farmsteads on a north-east to south-west alignment. Each croft is defined by parallel banks spaced about 50m apart and running for approximately 100m. Within several of them are the earthwork remains of ridge-and-furrow ploughing which runs parallel to the croft boundaries. At the south-western end of each croft, adjacent to the main hollow-way, are smaller ditched enclosures. The size and form of these vary, which implies more than a single phase of construction, but five of them contain evidence for buildings while the others may represent enclosures added to adjacent farmsteads.

The best preserved toft earthworks are found at the south-east end of the settlement. Here a very clear sub-square platform measuring 20 x 26m (area A on Fig 49) abuts the hollow-way. It is surrounded on three sides by a ditch which is up to 6m wide and 0.3m deep. Within the platform a small scarp might indicate a subdivision. A second, rectangular platform runs parallel with the northern boundary of the larger enclosure and may indicate the location of another building. The earthworks do not correlate to any of the buildings seen on the enclosure or tithe maps so the farmstead must have been abandoned and destroyed before 1818, although its northern and eastern ditches follow the boundary of a later 'homestead and orchard' shown on these maps.

The next enclosure to the west (area B) may represent a second toft but the lack of a clearly defined croft might indicate that it was an addition to the first farmstead. It would have contained at least one building. Further west again, the third enclosure (area C) corresponds with farm buildings shown on the 1818 enclosure map, though the plan does not fit the earthworks very well. The next area (D) might be classed as an extension to a farmstead, as its northern edge is delimited by a slope rather than a ditch. The next (E) comprises a croft defined by a wide ditch which is cut by a modern pond; a further rectangular enclosure at its eastern edge might be a secondary yard or orchard, if not associated with area D. Directly adjoining the western edge of area E is a further platform likely to represent a second farmstead (area F). This is cut by an extant field boundary which may have been moved since the farmsteads went out of use. West of area F are far more diffuse and irregular earthworks (area I), which have suffered visible damage since 1946, though in older aerial photographs these appear as a well-defined enclosure which may represent an addition to the farmstead in area F, similar to the situation with area B.

Only one other area, in the north-west of the settlement (area H), corresponds to buildings recorded on the early 19th-century maps; this farmstead was attached to the western hollow-way rather than that to the south. Another farmstead (area G), comprising earthwork remains of a rectangular platform, sits in the corner formed by the two hollow-ways. Finally, the area between the western hollow-way and the present Lower Paxcroft Farm (area J) displays scant remains, despite a building being recorded on the 1818 enclosure map.

This probably reflects more intensive improvement of the western field but it seems likely that the settlement continued beyond the western hollow-way.

The settlement therefore took the form of an interrupted-row hamlet fronting onto a hollow-way which marked the divide between arable and common land. The placement of settlements along trackways which border common land is frequently seen in the area. The surviving earthwork platforms with mounds that are consistent with the dimensions of medieval buildings were almost exclusively recorded in areas showing no occupation on the 1818 enclosure map or subsequent records. Each of the fields has been subject to ploughing in the 20th century, as shown on early aerial photographs, and the presence of the crofts would suggest this has been the case since the medieval period. However, this does not seem to be the main explanation of the variable earthwork preservation which perhaps results from structures that were abandoned earlier being left to decay, leaving large earthworks, while a more concerted effort was applied to flatten more recently abandoned buildings that were recorded on 19th-century maps.

It is hard to date the settlement's origin or duration, although it is likely to post-date the Norman Conquest, given the relatively ordered nature of the settlement, and to have been occupied for several centuries. This site probably equates with the settlement recorded in the 13th century. The favoured interpretation is that the settlement comprised at least four farmsteads (areas A, C, E and H, and probably also F and G), with enclosures added to at least three of these (B, D, and I). Modification of the settlement might be evidenced by area H which appears to have been constructed in what was initially a croft associated with area G. The features therefore clearly represent a palimpsest of remains.

The size of the settlement and lack of evidence for a church suggests that the Paxcroft earthworks were a secondary hamlet. According to Roberts (1987, 46) this would fit neatly into Van Bath's 'category d' of row plans, i.e. a settlement made of strips with scattered dwellings which has more recent origins than other field systems. A similar layout is evident at Thorndon, Withington, Gloucestershire (Dyer 2002, 18).

Though the tofts at Paxcroft are varied, the crofts associated with them are very uniform, which might indicate that the land was already ploughed before the hamlet's construction, and was allotted within the existing ridge and furrow. A similar situation is noted at Toft in Cambridgeshire (Oosthuizen 1997, 45) where a seemingly planned settlement may have been defined by a pre-existing series of regularly spaced furlongs. Further archaeological investigation would be required to resolve whether the farmsteads were constructed at the same time or over a longer period.

The hamlet seems to have suffered a staged decline which started before 1800 and continued until the end of the 19th century. The ponds cut into hollow-ways show that the latter were no longer used as trackways and may indicate a changing mode of subsistence for the settlement, possibly a shift to dairy farming. If the farmsteads at Paxcroft were placed to exploit the interface between arable and common land then this advantage disappeared after enclosure of the land immediately south of the hamlet, though the census records show that the later occupants of the settlement were not agricultural workers so the loss of the common may not have been disadvantageous to all. Moreover the irregular character of much of West Wiltshire's fieldscape indicates that pressure to enclose land had existed in this area for a long period; indeed earthworks have also been recognised to the south of the hollow-way. Factors leading to the abandonment or survival of settlements were not straightforward.

Catridge

Further information about the character and chronology of the occupation at Lower Paxcroft will only be obtained by geophysical prospection and excavation along the lines of the work undertaken at Catridge Farm, south-west of Lacock. This site was identified as a shrunken settlement (which is not recorded on the HER) and mapped from lidar images (1580890; Fig 50). The present farm is located within the settlement earthworks and partly overlies a hollow-way which links Catridge to the manorial site at Wick Farm, around 400m to the north-east, where earthworks of a dam and causeway suggest a series of ponds once existed (212139). The HLC classifies the land at Catridge as reorganised fields.

The settlement is located on a level terrace at the foot of a south-east-facing escarpment between 55m and 60m OD, on the boundary between the Cornbrash and the sandstones, siltstones and mudstones of the Kellaways Formation. At the foot of the limestone, springs feed a series of small ponds and streams, the latter winding their way south-eastwards towards the River Avon. Most of the earthwork remains lie in two paddocks to the north and north-west of the present farm buildings, within an alignment of north-west to south-east-oriented field boundaries which have been subject to both subdivision and enlargement but like the possible 'long land' boundaries to the west (see above) extend as far as the Roman road/Wansdyke to the south (Fig 51).

No reference to Catridge dating from the medieval period has yet been discovered although Wick is first documented in the later 13th century when a tenement comprising buildings, meadows and lands was surrendered to the abbess of Lacock (Rogers 1979, 33). Wick Farm was leased, with some interruptions, from the Lacock estate between the 15th and 19th centuries.

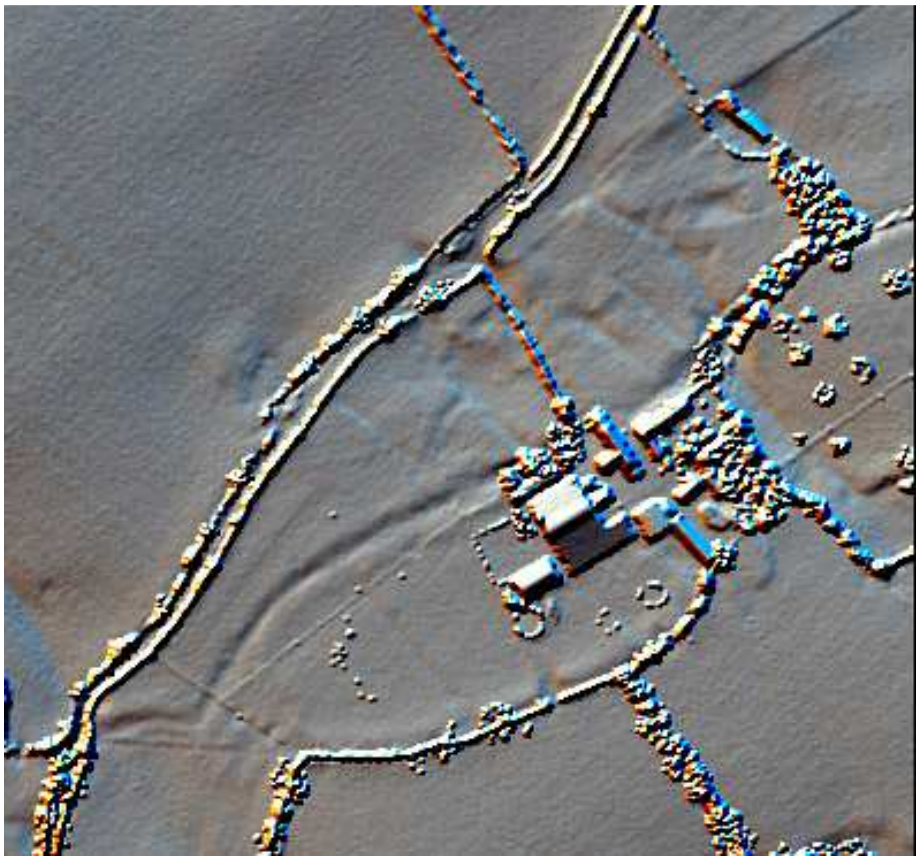

Fig 50: Hollow-way and settlement earthworks at Catridge Farm (Detail of lidar ST8967 Environment Agency DSM 02-16-APR-2005 © Historic England; source Environment Agency.)

The Wiltshire Buildings Record found that a 'tenement called Catteridge' had been sold in 1579 by Edward Sharington to Edward Baynard, whose family owned Lackham manor between about 1350 and 1646, when it passed to the Montague family, along with the tithes belonging to Lackham parsonage (owned until the Dissolution by Lacock Abbey) and five closes at Bowden Hill. An inventory of 1628, when it appears to have been sublet to the Pountney family, mentions a 'halle', 'a chamber within the halle' and a 'kitchine'. There are some records of 18th-century tenants in registers of licensed victuallers compiled in 1745, which suggests the possibility that the house – sited next to a crossroads – was used as an inn for at least part of the 18th century.

The earliest depiction of Catridge or 'Catheridge' Farm is on an estate survey of 1755, with the estate map showing the farmhouse and its surrounding fields (Fig 52). A second farmstead depicted to the north-east of Catridge is named 'Wick' on the estate map. This is the earliest evidence linking the name Wick and the settlement at Catridge, and raises the possibility that the wider settlement was known as Wick from the medieval period. The map also shows a further holding to the south-west of Catridge Farm which remained separate into the 19th century. A second survey undertaken in 1764 records the amalgamation of Wick and Catridge, which is henceforth documented as a freehold farm subject to tithes. By the time of the tithe apportionment of 1838 the farmstead comprised a farmhouse and six farm buildings set around two or

more yards, as well as a further detached complex to the north-east, the holding consisting of 144 acres of pasture, arable and meadow.

The remains of the shrunken settlement in the two paddocks at Catridge are represented above ground by slight, smoothed grass-covered earthworks. The main area of settlement covers around 1.7ha and is surrounded by relict field boundaries, ridge-and-furrow ploughing and trackways (Fig 51). The core of the settlement lies along a well-marked hollow-way aligned north-east to south-west, which continues eastwards, beyond the survey area, to Wick Farm. Towards its junction with Wick Lane in the south-west, a sub-rectangular building platform was identified, representing the remains of a farmstead or cottage abutting or perhaps encroaching on the hollow-way (A on Fig 51).

There is clear evidence for infilling of the main hollow-way around Catridge Farm, soon after its stone barn was extended and remodelled (see below). This indicates the hollow-way had gone out of use as a through road, or had been diverted, by the time the building was constructed (it is first depicted on the estate map of 1764), and may represent a deliberate attempt to prevent access through the farmyard. The modern access to the farm runs south from Wick Lane and carves through the settlement earthworks. This appears to have been created some time after 1764, with a boundary and possibly a track depicted in this location on a plan accompanying sales particulars of 1826 (Wiltshire and Swindon Archives: 1769/3).

A number of tracks strike off at right angles from the main hollow-way, with a convergence of routes *c* 45m north-east of Catridge farmhouse (B on Fig 51). These would have given access from the hollow-way to the settlement plots and surrounding fields, but may also reflect earlier land divisions. On the north-western side of the main hollow-way a further three tracks have been recorded running north-westwards. These survive as very shallow earthworks, no more than 0.3m deep, and would appear to have given access from the main street to a series of crofts and tofts. The earthwork remains of a number of possible building platforms are associated with these plots, the platforms measuring 9.3m to 11.4m in length and 5.9m to 7.3m in width.

More clearly defined remains of farmstead complexes were identified set back from the main hollow-way. One is depicted on the estate map of 1755 (Fig 52), approximately 100m to the north-east of Catridge farmhouse, and was accessed from the main settlement street by a sunken track. This farm track is now defined by modern field boundaries and has been blocked by the insertion of a pond which was in existence by 1764 and appears to have been cut into the track when the farmstead it served was abandoned. One of the farm buildings was reused as an out-barn and survives as an unroofed structure, with the location of the farmhouse now defined by a slight, sub-rectangular terraced platform (C on Fig 51).

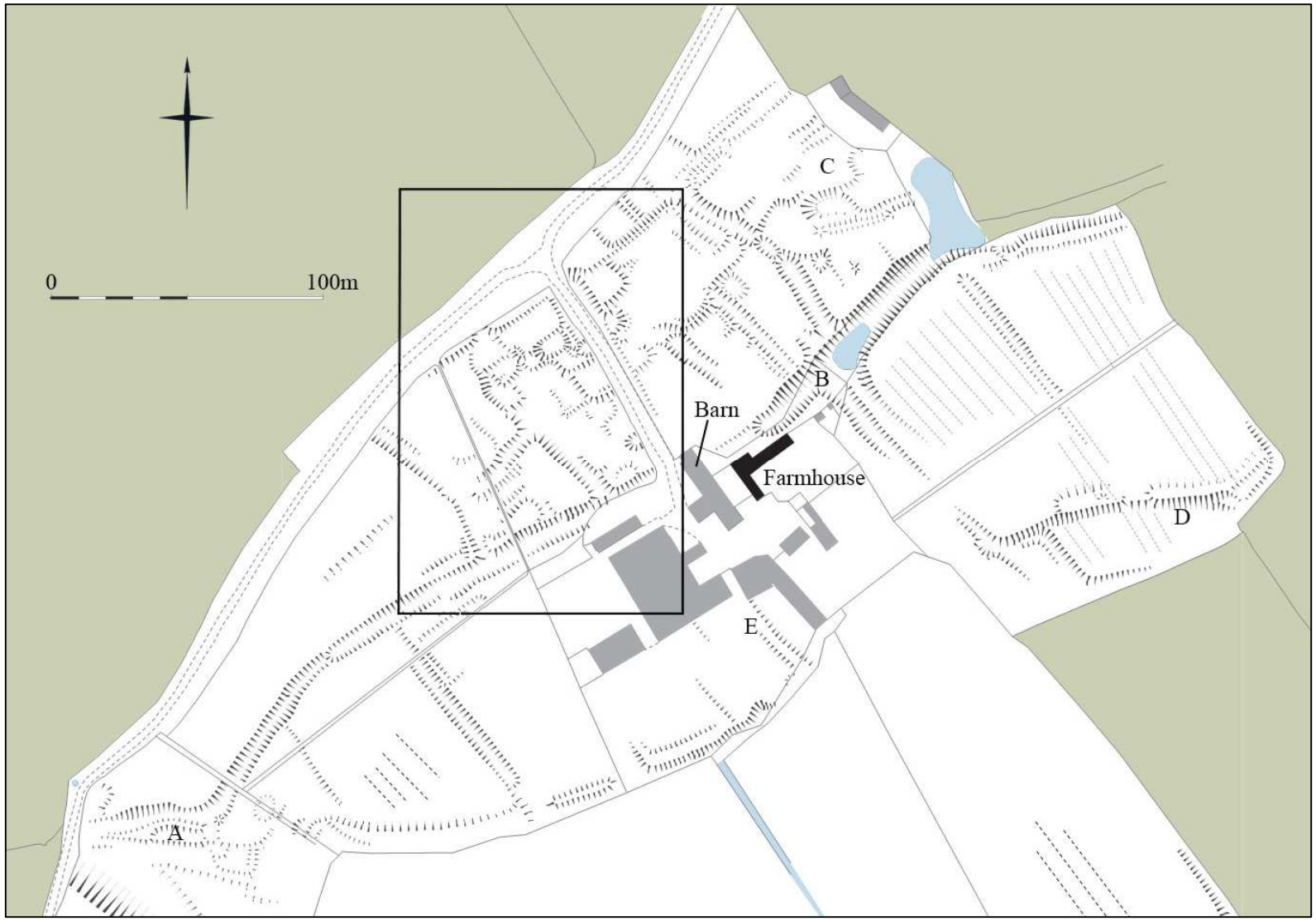

Fig 51: Earthworks at Catridge (box shows area of Fig 53) (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

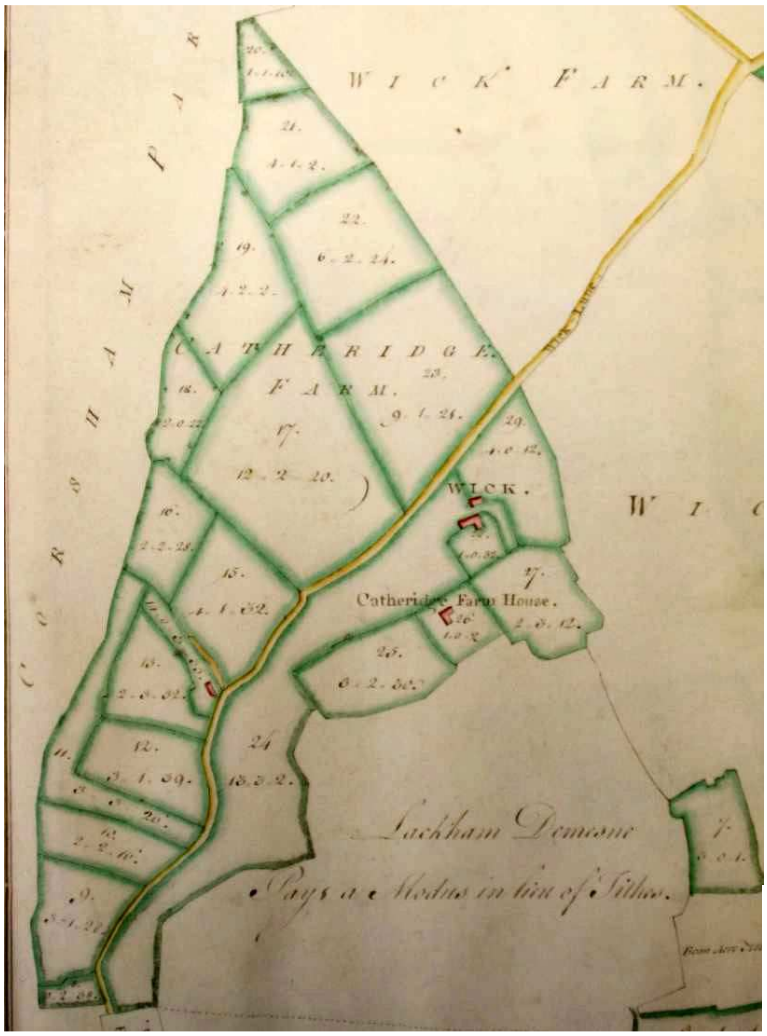

Fig 52: Detail of estate map of 1755 (Wiltshire and Swindon Archives: 2664/1/2D/21)

To the north-west of the farmhouse a second, relatively well-defined complex has been identified set back from the main street. The remains of this farmstead have been sliced through by the later access route to the farm, making interpretation more problematic. The earthwork remains suggest a complex of buildings, yards and closes accessed from the main hollow-way by one or more tracks. This complex had been abandoned before the earliest estate map was produced in 1755, its land amalgamated with the holding to its north-east.

A number of ponds were cut into the main hollow-way, including one which still holds water today some 55m north-east of the farmhouse. Another was depicted on the first edition OS map of 1886 in the north-western corner of the modern farmyard, but has now been infilled. Creating these ponds in the hollow-way may in part be attributed to ease of construction, but also emphasises the change in patterns of movement through the landscape.

The remaining earthworks recorded during survey work largely relate to relic field boundaries and evidence for past agriculture. In the field immediately to the east of Catridge Farm (depicted as an orchard on the first edition OS map) is

a substantial lynchet running east to west (D on Fig 51). The lynchet is topped with a low, spread bank and has narrow ridge and furrow running over it. This boundary had gone out of use by 1755. A similar broad, spread bank follows the curving boundary south and west of the farm complex; these banks possibly represent the fragmentary remains of medieval headlands. The fields on the south side of the main hollow-way also display evidence for subdivision, defined by linear ditched boundaries. The western boundary of the close surrounding Catridge Farm, shown on both the 18th-century estate maps, was identified as a short section of bank surviving in the paddock to the south of the modern farmyard (E on Fig 51).

The communication pattern demonstrates a direct link between the holdings at Catridge and the manorial centre at Wick Farm, with the main hollow-way continuing towards the latter site. By the 18th century the fields immediately surrounding Wick Farm were known as 'Wick Home Grounds' (Wiltshire and Swindon Archives: 2664 Box 6 15 1/2/4/1015), and reflect the extent of the demesne land. The small dependent settlement at Catridge would therefore appear to have developed on the western boundary of the demesne land, at the western extremity of Lacock parish. Wick Farm itself could not be inspected on the ground, but was mapped from aerial photographs; it retains a 17th-century or earlier dovecote, the dam and causeway remaining from a set of ponds and the form of a dispersed multi-yard farmstead plan – all indicative of a long evolution from a high-status medieval site or curia.

Recent activity at Catridge has made evidence for the earliest phases of occupation difficult to detect though the boundary features and tracks provide an indication of the medieval settlement pattern. Slight evidence for possible buildings in the closes adjoining the main hollow-way may represent some of the earliest structures on the site. The settlement pattern was not static, however, with changes clearly visible, such as the blocking of one of the tracks through the settlement by a later building. The small farmstead or cottages at the south-western end of the main hollow-way also reflects a period of settlement expansion. Another holding in a similar location on the opposite side of Wick Lane survived into the 18th century, settlement possibly attracted to this location as it was close to a natural spring. Other changes are visible through the scale, location and complexity of some of the earthwork remains.

Some of the best preserved earthworks were identified set back from the main hollow-way and one platform here was evaluated by excavation (Figs 51 and 53–4). The excavation covered about 70 sq m and was focused on a building platform and areas on additional platforms upslope and downslope from it in order to characterise three apparent platforms with a single trench. Two cores were also taken from different points along the main hollow-way where waterlogged deposits were suspected but assessment of diatoms found they were poorly preserved and no further work was recommended.

The 'natural' subsoil in the excavation trench was Cornbrash, overlain by a silty clay substrate. In the northern end of the trench this was overlain in turn by a loose silty loam layer which contained frequent limestone pebbles and a concentration of finds (medieval pottery and animal bone) at its southern end, and a sandy silt/loam layer (context 97010) containing both medieval and post-medieval pottery. Truncating the two layers was a revetting wall (context 97009; Fig 55), which was 0.5m wide and 0.4m high, and extended across the width of the trench. The wall was made of roughly squared and randomly coursed limestone blocks, bonded with sandy clay. It had been robbed at the western end, from where late 16th to early 17th-century pottery and animal bone were retrieved.

Opposite wall 97009 to the south was another wall (context 97029), which was not as well preserved but had a substantial amount of collapsed stone and a pitched limestone foundation in a cut 1.4m wide. The wall continued into the western section but appeared to end just before the eastern baulk. It was made of irregular limestone blocks bonded with clay. Animal bone, medieval and post-medieval pottery, glass fragments and window lead were retrieved from the collapsed wall and its foundations.

South of wall 97029 was a possible third wall. Unlike the other walls, it was oriented north-south and all that remained were foundations of roughly squared chalk rubble. This wall was also significantly smaller, measuring 1.2m long and 0.25m wide.

These structural remains were overlain by demolition and dumping. Over the collapsed southern wall was a substantial rubble layer with few finds, and overlying this deposit in turn, between walls 97009 and 97029, was a dump layer (contexts 97004/97008). Finds from these deposits include medieval and post-medieval pottery, animal bone, vessel and window glass, copper alloy, lead and iron objects; of particular note is a jetton dated to 1586–1635. The robber trench that targeted wall 97009 was cut through this layer. To the north of that wall a similar dump layer overlay deposit 97010.

The excavation showed that the structural remains in this part of the site are post-medieval in date, probably associated with the agricultural activities carried out by the household at Catridge Farm. Apart from the residual finds in later deposits, the evidence for medieval activity is limited to a group of small and abraded sherds from buried soils, which may be the result of manuring, suggesting this area was agricultural land until the 15th century.

The structural remains are not particularly substantial and suggest a non-domestic building. It has been suggested that the pit and posthole in the central area were part of a cheese or cider press but neither interpretation can be substantiated without further evidence.

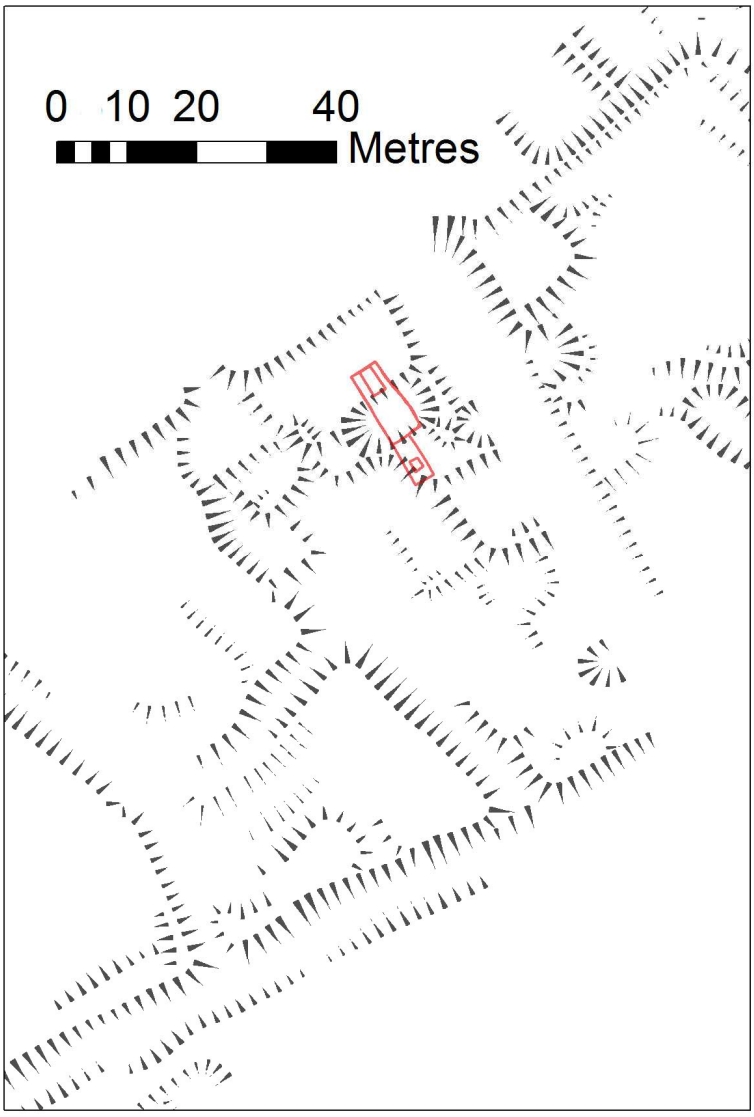

Fig 53: Location of excavation trench at Catridge (© Historic England)

The finds assemblage from Catridge, although small, represents a high density of material considering the size of the trench. Individually recorded small finds, most from dump deposits 97004 and 97008, include a number of iron and copper-alloy objects identified as dress fittings. A near-complete clay pipe bowl is likely to be a Bristol product dating from 1630–1660 (Peacey 1979, 46–7). Other household objects include a decorated bone knife handle made from a sheep/goat metatarsal, with a parallel from Norwich (Goodall 1993, 122–3), a large number of iron nails, door fittings and some window lead, among other items; an iron horseshoe was also recovered. The material has probably been redeposited in a single dumping episode from a nearby area used for long-term deposition of household rubbish.

Fig 54: View of the excavation at Catridge with the historic farmhouse in the background (© Historic England)

Fig 55: Revetting wall on the northern side of the possible structure at Catridge (© Historic England)

The pottery (785 sherds) is mostly post-medieval in date, indicating that the majority of the excavated features can be dated to the 17th century. However, the largely residual medieval sherds form an interesting group including Box,

Ham Green and Bath fabrics. There were also fragments of a decorated floor tile, which has parallels with late 13th to early 14th-century examples from Lacock (McCarthy 1974, 142 and 144) and Cirencester (Vince 1998, 145 and 152), and a late-medieval green-glazed roof tile, both indicative of a relatively wealthy household in the vicinity.

The latest vessel represented in deposit 97008 is a Westerwald jug, dating from the late 17th or 18th century. A Frechen jar with decorative medallion is comparable to late 17th-century examples from Exeter (Allan 1984) and Norwich (Jennings 1981), while a sgraffito-decorated dish, likely to be from south Somerset, dates to the 16th or 17th century. The assemblages from deposits 97004 and 97008 contain a mix of tablewares and more functional vessels such as pancheons (shallow dishes used to stand milk). While the material in 97008 is less fragmented than that in 97004 the similar range of fabrics and the presence of sherds from the same vessel in both contexts suggest the material was deposited in one episode in the late 17th century. A small assemblage of window and vessel glass mostly dates to the 17th century. Rural post-medieval assemblages are rare from Wiltshire and the Catridge finds are typical of assemblages from the West Country, containing a number of pancheons indicative of dairying. The range of local wares is similar to other sites in the region though some of the tablewares are more comparable to urban assemblages.

Environmental remains include a small assemblage of marine shells, mainly oyster. Their presence at an inland site not of very high status indicates that high-speed transport links were available to the gentry in the early modern period. Very small numbers of fish scales were also recovered from two samples. Animal bone was fragmented but generally in good condition; it comprises predominantly domestic species (cattle, sheep/goat and pig) in roughly equal proportions. Ten flots were assessed from 17th-century contexts with small quantities of charred cereal grain present in all but one, including free-threshing bread or rivet wheat, hulled barley and oats. Pulses were noted in small numbers in most samples, including peas (*Pisum sativum*) and broad/field bean (*Vicia faba*), which may have been cultivated for human consumption or as fodder. The occasional weed seeds are all species which could have occurred within arable fields, on field margins or around the settlement, though the absence of some common cornfield weeds is notable. Charcoal was present in all flots and was dominated by *Quercus* sp. (oak), *Fraxinus* sp. (ash) and *Ulmus* sp. (elm), which may reflect the types of timber used for construction.

Because the excavation revealed the presence of stone wall footings, geophysical survey was undertaken across the main area of earthworks to see if more such features could be identified (Linford *et al* 2016). Magnetometry proved variable, but served to detect roadways, enclosure ditches, linear boundaries and areas with probable building remains (Fig 56). Ground penetrating radar (GPR)

survey was more successful in resolving the building remains, suggesting the presence of further structures with similar dimensions within the central enclosed settlement, and corroborating the earthwork evidence, including a rectilinear walled enclosure (Fig 57). A series of probable stone buildings run off the enclosure to the west, curtailed by the modern access road but continuing into the adjacent field. The settlement appears to terminate to the west against a linear boundary recorded by the earthwork survey. A more recent pattern of land drains was also revealed, demonstrating the ongoing importance of water management at the site, which may perhaps help interpret other ditch-type topographic and geophysical anomalies apparently draining off the escarpment.

In general, the magnitude of magnetic response at the site was relatively good in the areas of the site associated with former occupation, although this became much weaker at the limits of the survey. The magnetic results were also affected by the presence of buried services and other ferrous disturbance, including the former farmstead shown on the historic mapping. Two roadways are replicated as linear anomalies (A and B on Fig 56) where the magnetic response coincides with a broad sunken earthwork, with further evidence of enclosure ditches and other linear boundaries within the settlement complex. Areas of magnetic disturbance in the vicinity of the excavation trench are likely to correspond with buried building remains, one of which has a clear surface expression as an earthwork platform. Similar magnetic responses have been recorded over building platforms at other post-medieval sites.

For the GPR, significant reflections are separable from background noise to approximately 25ns (1.2m), beyond which the signal is attenuated, possibly due to water-saturated soils. A complex area of response adjacent to the abandoned byre to the east of the site contains some internal detail, including a rectilinear anomaly that correlates with the small enclosure shown on historic mapping. A network of land drains was found in the paddock to the west though the survival of a broad linear earthwork suggests they have not been too destructive.

From approximately 5ns (0.24m) a series of high amplitude anomalies (A and B on Fig 57) correlate with the earthwork survey and perhaps suggest the remains of a walled enclosure or farmyard, with weaker linear reflectors associated with the sunken tracks or ditches draining off the escarpment and the hollow-way heading to the west. In general, the GPR anomalies agree well with the layout recorded by the earthwork survey. The settlement contains a number of discrete rectilinear anomalies (C to H on Fig 57) which generally correlate with building platforms identified during the earthwork survey. Anomaly E may be partially due to the excavation trench (Fig 53) but high amplitude GPR anomalies elsewhere indicate the wider distribution of similar stone building remains across the central area of the site. A broad, more diffuse anomaly coincides with an earthwork bank that may define the western extent of the settlement, while a low-amplitude linear response follows the hollow-way.

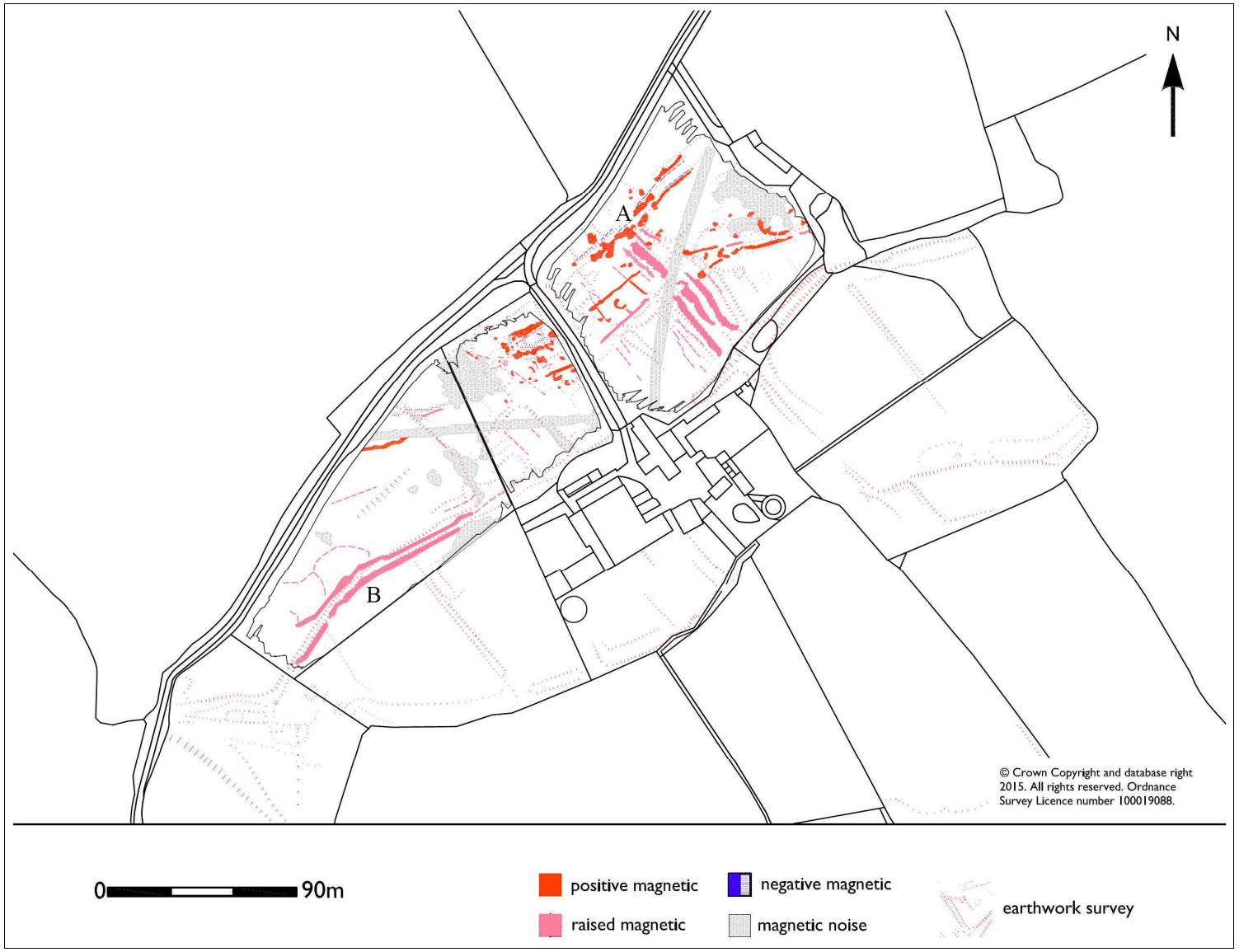

Fig 56: Graphical summary of significant magnetic anomalies at Catridge (adapted from Linford *et al* 2016)

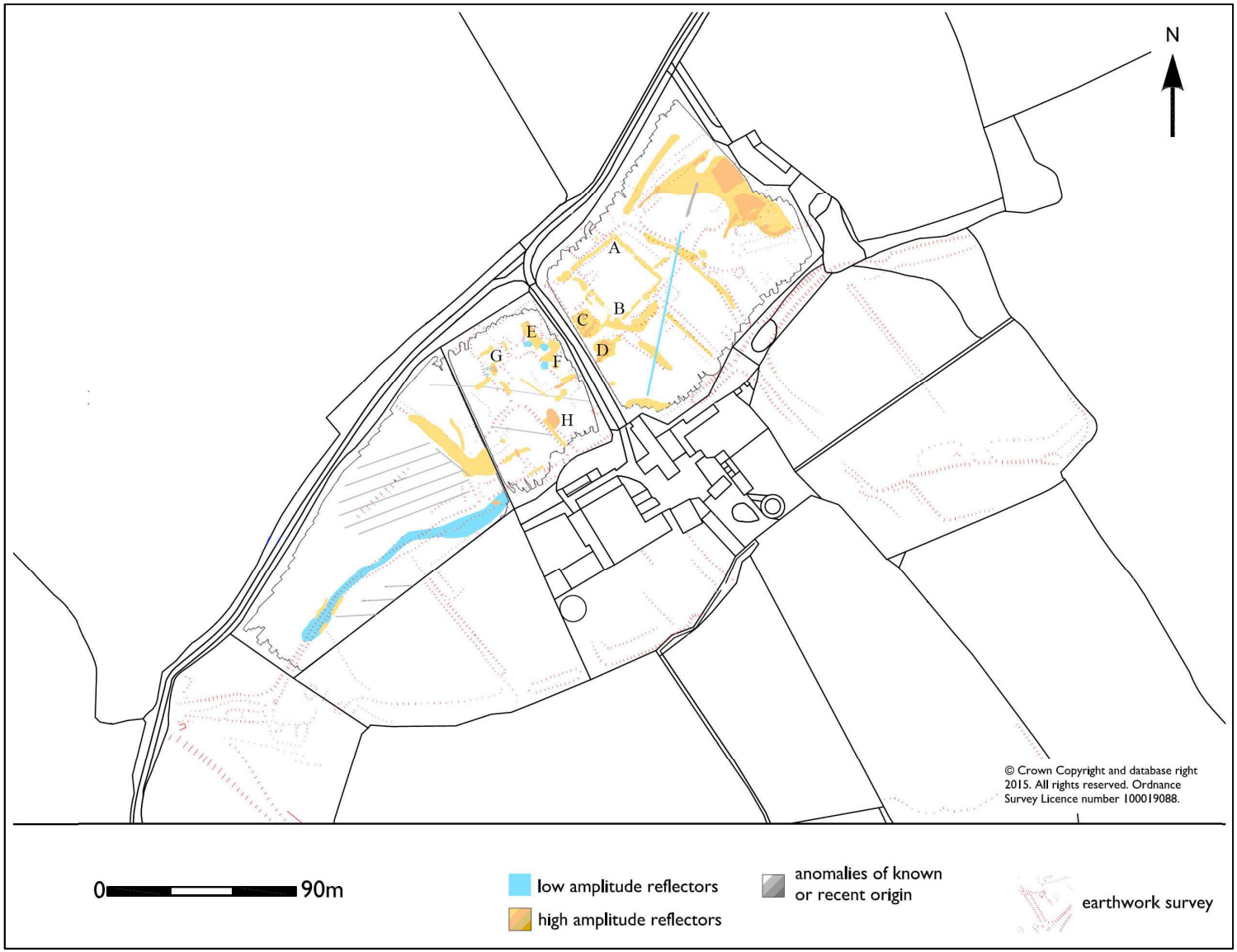

Fig 57: Graphical summary of significant GPR anomalies at Catridge (adapted from Linford *et al* 2016)

A number of other high amplitude reflectors appear too small to represent individual structures (less than 2 x 2m). These may have a more specific domestic or agricultural explanation, perhaps as sluices for the control of surface drainage.

The evidence for post-medieval occupation from the excavation suggested that the extant farmhouse could be broadly contemporary. Accordingly, the Wiltshire Buildings Record (WBR) conducted surveys of the house and farm buildings in late 2014 (WBR 2014). The recording of buildings has deepened the evidence provided by the archaeological fieldwork and the documents referred to above.

The *Farmsteads and Landscapes Statement* for the Avon Vales NCA (Edwards and Lake 2014) notes the following key characteristics of relevance to Catridge:

- Most farmsteads have two or more regularly laid-out yards which appear to date from the expansion and reorganisation of farmyards in the 19th century. Loose courtyard plans with detached buildings set around a single yard are also common. There is some survival of dispersed and linear plans around areas of historic common land and heathland.

- The range of farm building types includes threshing barns, evidencing the need to process corn crops, and also early cattle housing (some integrated into barns), dairies, pigsties and cowhouses, evidencing the importance in this part of Wiltshire of dairying from the 16th century onwards. This represents a shift from the predominance of arable agriculture across much of the area up to the 14th century or later, the widespread survival of ridge and furrow being highest in those areas where grazing became more important than growing corn.

- Stone was widely used for walling with stone slates for roofing, particularly in the west. There is some limited timber-framing, concentrated away from the Jurassic limestone; most framing was replaced or intermixed with stone construction by the 17th century. Straw thatch was once widely used but remains an important characteristic.

The farmhouse at Catridge dates from the late 16th century. Its plan form follows a familiar tripartite subdivision into a central hall, with the cross-passage adjoining an unheated service room to the west and a parlour to the east. In the early 17th century the west service end was rebuilt in stone as a kitchen, and after the inventory of 1628 a substantial semi-sunken dairy with an upper cheese loft was added to the east (Fig 58); within the passage leading to it, which was taken from the hall, are wooden shelves for large skimming and other

dishes for dairying. The west end was further transformed in the later 18th century with the addition of a dairy built of stone, which had its own external door to the south and was then linked to the house by an outshut, built by 1826. A projecting wash-house range was built to the south-west between 1851 and 1866, making an overall L-plan, and the south porch was also added in this period. The dating of the southern elevation of the hall and parlour range is uncertain.

Fig 58: North-west elevation of the farmhouse at Catridge with the dairy on the left, looking from the hollow-way (© Historic England, J Last)

A highly distinctive feature of the late 16th and 17th century phase is the mix of stone and a prestigious close-studded timber frame, which is characteristic of those areas where timber and stone building traditions converge – including much of the Avon Vales beneath the western scarp of the Cotswolds; this is highly visible in Lacock. The size of the farmhouse at Catridge and the expense accorded to its cross-gabled upper end and the close studding facing the hollow-way, as well as the settlement that was recently deserted or in the process of desertion, all suggest that the farm had been amalgamated from several smaller holdings by the late 16th century. The relationship between commercial dairying, expanding farm size and the rebuilding of farmhouses has been noted in Cheshire, north Shropshire and Suffolk but has not been subject to any study, least of all in the landscape context of enclosures from amalgamated strip fields, pastures and commons.

By around 1900 the farmstead at Catridge had developed into a regular multi-yard plan of a type common in this area: of the 34 farmstead sites in the project area with pre-1700 listed buildings (overwhelmingly houses), 20 are regular multi-yard groups, of which 15 are church/manor court sites. Analysis of the maps presented in the WBR report, in combination with the phasing suggested there for the house and working buildings, suggests that as with many farmsteads the plan form of Catridge is substantially the result of development in the late 18th and 19th centuries, particularly for housing increasing numbers of yard-based cattle. Some buildings have since been demolished, and modern sheds and stables for the present racehorse stud farm have been built with easy access to the main driveway (Fig 59).

The 1755 map (Fig 52) shows the whole of 'Catheridge Farm House' as an L-shaped range within a rectangular enclosure: this may of course indicate that the house was L-shaped with an agricultural or domestic range attached to the west, but it is also possible that this simply represents the overall form of the house and the barn to its west, rather than an accurate portrayal of the two as separate buildings. The 1764 map shows the house and to its west an L-shaped barn, all set within a rectangular enclosure, while the tithe map of 1840 shows the house with its northern outshut and the barn in its present form, with the western bays projecting into a close, almost certainly a rickyard. The farmhouse is shown without any form of garden area, its southern side facing into the farmyard with cattle buildings further to the south. The routeway is blocked by two buildings and a yard to the north-east, and there are three other buildings relating to two large yards to the south.

Sales particulars of 1851 show the new driveway built along the former hedge line extending in a straight line to Wick Lane, and the buildings relating to four yards. The driveway is shown as passing between the farmhouse and the barn before it enters the main farmyard areas. The rickyard to the west of the barn is again clearly indicated. There is a narrow area extending along the southern side of the farmhouse, with part of the surviving pigsties shown immediately to its south. By 1886 the farmstead had been reconfigured again, with the farmyard and buildings to the north-east swept away and a new garden area created to the south of the house, with the present porch shown. The impression is of a private space for the enjoyment of the farming family and their guests, ornamented by fruit trees and shrubs and overlooked by the newly-reworked south-east elevation with its new porch. The dairy to the west was separately accessed, still convenient for taking whey to the pigsties. However access to the former hollow-way was by now far more restricted. A farm pond for the increased number of yard-based cattle and horses had been dug out of the area to the west of the barn, probably making use of the rickyard difficult or impossible: by then it is possible that hand threshing was supplemented by portable steam power.

Fig 59: Aerial view of the yard at Catridge with the T-shaped barn in the centre, to the left of the farmhouse (29095_056 01-JUL-2014 © Historic England)

Nineteenth-century leases describe a substantial mixed farm with arable but mostly pasture and meadow land. Land drainage is recorded in 1821 and in 1851, when many local farms were converting to arable production – it was described as 'a valuable Dairy and Grazing Farm' and in 1868 as having '152 acres of good Dairy Pasture and rich Arable Land'. There was a small labour force recorded in the 1851 and 1861 census returns which appears to have further reduced over the remainder of the century as the size of the working family increased. There were no labourers and only three horses recorded in the National Farm Survey of 1941, when it was described as a 'Mixed and dairy farm. Production: Hay & Milk (Good), Corn (Fair)'. Such a small labour force – in contrast to that identified in the WBR report for Wick Farm – is also strongly suggestive of a largely pastoral farming economy. Between 1792 and 1941 (when 128 of the 144 acres were permanent grass), the farm remained at a constant 140–160 acres. It expanded in size in the post-war period, with a milking parlour built in one of the yards and modern sheds to the west.

Investigation of the barn to the west of the house indicates that it originated as a modest (probably 3-bay) threshing barn, prior to its progressive development by 1826 into a T-shaped plan by an extension to the west, as well as additional single bays to the north and south. This represents not simply a fundamental remodelling of the barn but also a revision of the way that the farmstead, and in particular the area around the farmhouse, functioned.

The added northern bay is a lofted cowhouse, with a main entrance to the west and a low pedestrian entrance accessible from the east below a loft door. It is probable that this was intended for milking cows, the low doorway allowing access to the dairy attached to the farmhouse. The added southern bay was altered in the early 19th century. The eastern elevation has been infilled in coursed stone rubble, and it is probable that it was originally open-fronted with a carthouse below a possible loft (perhaps a granary). The disturbed masonry around the wide doorway for cattle in the west elevation suggests that it has been inserted. The evidence from both of these bays indicates that the western elevation was occasionally used for carts, but the reconfiguration of the barn – with the threshing floor (still surviving as a boarded floor raised on stone piers) sited in the western extension – indicates a strong desire to move the dust of threshing away from the farmhouse dairy.

The added northern bay encroached upon but probably did not totally block the hollow-way: the cartshed added between 1850 and 1886 to its north did this. Nevertheless, the alterations to the barn, when seen in the context of the whole farmstead, suggest there was a clear desire to begin to separate some of the messier farm operations away from the farmhouse. The workshop attached to the south of the barn, with a wide entry to the east, was added in the same period. Other buildings including pigsties, a cowhouse, a poultry house and stables were constructed at different times during the 19th century.

The archaeological and cartographic evidence suggests that settlement shrinkage at Catridge was a gradual process. Some tenements were probably lost in the 14th or 15th centuries, the casualties of social, economic and environmental change, with others holding on and perhaps accumulating land as their neighbours left. The excavation has not shed much light on the medieval settlement, except to suggest that it did not extend far from the main hollow-way. The architectural evidence of the farmhouse shows that its occupant had emerged as a prosperous local farmer, prepared to invest not only in a fine close-studded façade but also in an ornate dairy sited prominently in the landscape, facing into the hollow-way to be seen by travellers walking or riding from Lacock and Wick Farm, and also onto the crossroads where it is intersected by the routeway which extends into the former settlement to the north. It appears this siting presented a serious inconvenience, with the dairy only accessible via a passage in the upper end of the hall. The 17th-century shelving in this passage was intended to display ceramic dishes, and it is significant in this context to note that wide pancheons used for holding and settling milk were recovered from the excavation. Such early and elaborate dairies are extremely rare but seldom recognised or studied in their landscape context. In this case the elaboration of the farmhouse seems to have been broadly contemporary with the disappearance of the surrounding settlement.

Documentary records show that the remaining tenements were finally amalgamated around the middle of the 18th century, reflecting a drive towards the adoption of improved farming techniques. The importance of arable farming is witnessed in the many threshing and combination barns seen in and around Gastard and extending towards Lacock where arable farming was considerably easier. Intensification is also reflected at Catridge in the extension and reorientation of the barn to face away from the farmhouse and the dairy built at its western end in the late 18th century. It is also reflected in the farmstead's other surviving buildings, from the cowhouse to the north of the barn, and accessible from the farmhouse dairy, to the evidence for continual rebuilding of cattle housing into the final decades of the 19th century, and the substantial pigsties (pigs being fed on the whey produced as a by-product of dairying). Meanwhile the former settlement was simply grassed over and used as pasture, the alignment of these fields contrasting with the predominant alignment of fields noted above.

The different strands of evidence gathered during the fieldwork at Catridge highlight the potential for integrated approaches to surface earthworks, buried archaeology and standing buildings to enhance understanding of the development of the medieval and post-medieval rural landscape in Wiltshire's cheese country.

Parkland

While the rural gentry were redeveloping medieval farmsteads like Catridge, some of the aristocracy transformed the landscape in other ways. There are a number of 18th- and 19th-century gardens and designed landscapes at various locations across the project area and parkland is a distinctive feature of this part of Wiltshire. In particular the central part of the project area includes the registered parks of Corsham Court in the west (619003), Spye Park (1360712) and the southern part of Bowood Park (212082) in the east, and Lacock Abbey between these (619015), all in different geological and topographical settings. The origins of these designed landscapes are similarly varied: at Corsham there were already two parks in the middle ages (Brakspear 1927, 513–14) while Spye Park was created out of Pewsham Forest in the early 17th century (Aston and Bettey 1998, 122). Meanwhile at Lacock, part of the medieval nunnery was retained and converted to a house after the Dissolution, while the part of Bowood Park within the project area, known as Abbot's Waste, was purchased from Lacock manor in 1769 and its closes replaced by woodland (Crowley and Freeman 2002).

In the south of the project area near Trowbridge the largest park was at Rood Ashton (157728 and 1577731), though this, unlike the sites mentioned above, is no longer extant and does not appear on the Register of Parks and Gardens. The

original house had been surrounded by formal gardens and lakes in the 1770s and the landscape was remodelled in the 1840s; however, the estate was broken up by sale in the 1920s and after its use by the military during the Second World War the park was turned over to agriculture. Hence while aerial photos taken in the 1940s and 1950s show good earthwork preservation both around the village of West Ashton and within Rood Ashton Park, today the park does not appear to have noticeably improved earthwork preservation compared with the surrounding area; indeed survival appears poorer. The features identified at Rood Ashton largely relate to medieval or post-medieval field boundaries and ridge and furrow, while elements of the post-medieval road network may also be represented. Other features are associated with the former Rood Ashton House, such as the earthworks of the carriageway, and it is possible that there are also traces of landscaping, though little if anything of the line of ponds depicted on 18th and 19th-century maps can be seen on aerial photographs.

Also not included on the Register are the remains of Bowden Park (1123393), which may have once been part of Spye Park. The variation in the origin and subsequent development of these parks may explain the variety of features identified within them, which reflect both the designed and earlier farming landscapes. The degree of preservation of earthworks of earlier landscapes within areas of existing or former parkland is variable in this part of Wiltshire. Corsham Park has a concentration of features which points to a slightly better degree of preservation than the surrounding area (see below). Although larger than Corsham, Spye Park has fewer remains visible from the air, though this is probably due to the extensive tree cover. Features seen include slight earthworks of undated field systems and an enclosure, as well as the scheduled remains of a stretch of the Roman road (Appendix 1) – all of which may owe their survival to their location in the park (Fig 60). In contrast that part of the road in Neston Park, which was well preserved in the early 19th century (Colt Hoare 1975), now lacks a substantial earthwork presence.

The southernmost tip of the extensive parkland at Bowood falls within the project area and here tree planting on the edge of Abbot's Waste has preserved the opposite corners of a large square Iron Age or Roman enclosure, possibly a temple enclosure, which has otherwise been virtually levelled (see above). Good earthwork survival within woodland is also seen in St. Edith’s Wood near Sandy Lane where the rectilinear enclosure discussed above was identified by aerial survey in an area that has been woodland since at least the 1840s.

Corsham House was purchased in 1745 by Paul Methuen, a descendant of wealthy Wiltshire clothiers, and he brought in Capability Brown to enlarge the old deer park (Harcourt 1976; Fig 61). Aerial survey of Corsham Park (619003) identified a range of earthworks within the current boundary of the park that were laid out during the late 18th or early 19th century (Fig 62). Traces survive of an earlier course of the Bath Road, which once formed the northern boundary

of the park, along with a copse boundary bank which is thought to have marked the eastern extent of the grounds in the later 1700s. Other earthworks include the remains of a lane that ran from Easton to Corsham, as well as post-medieval field boundaries and ridge and furrow, which subsequent fieldwork identified as forming two phases of fields. Although the lidar indicates that there are fewer earthworks within the older, western part of the park, they include the slight earthwork remains of an ornamental lake depicted on a 1773 map. Within the south-western part of the park is a flat-topped earthwork bank which crosses a shallow valley and may have been used as a causeway but could have also functioned as a dam for creating a pond. Presumably these features predate the 18th-century redesigning of the landscape.

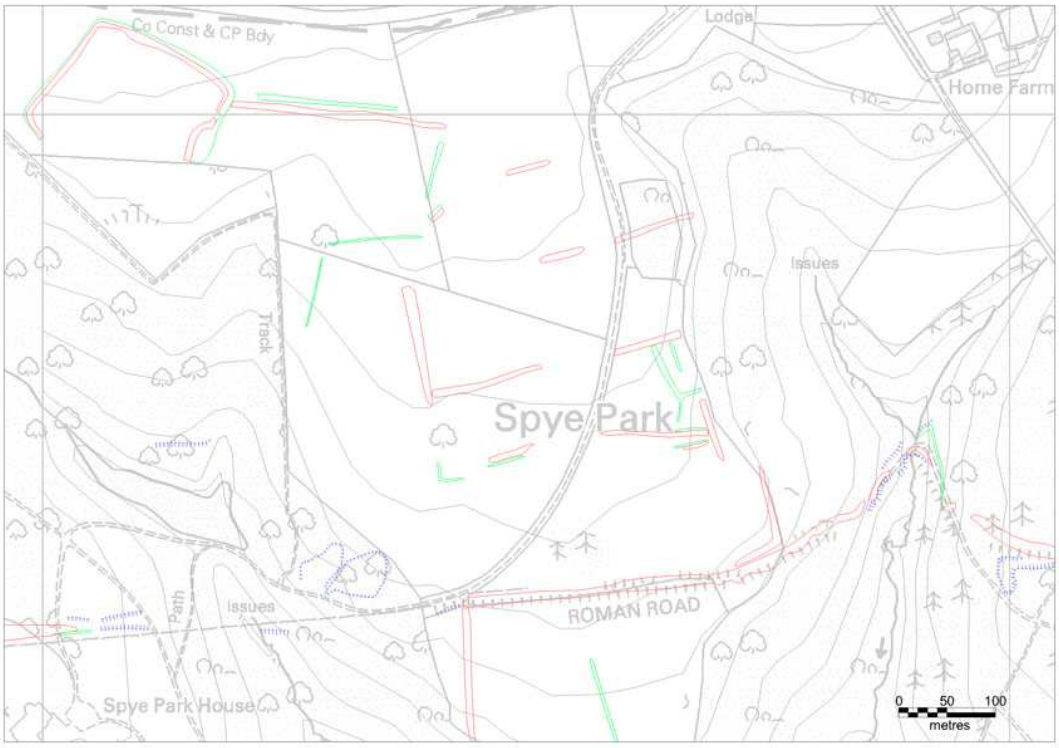

Fig 60: Spye Park, showing remains of Roman road, undated field system and enclosure (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The examples of Corsham and Rood Ashton may suggest that post-medieval fields are only preserved in areas of relatively late imparking. At Corsham fewer earthworks can be seen on aerial photographs within the older, western part of the park which may form the original grounds to the house. Although some earthworks remain, suggesting that the area once contained fields, it is not clear if their scarcity is the result of landscaping.

Other examples of garden earthworks have been seen at Lacock Abbey and Bowden Park. At Bowden the remains of a terraced garden with commanding views across the Avon Valley survive to the north of the present house (the third

to be built within the park) and were surveyed by the RCHME in 1996 (see Brown 2001b). At Lacock (Fig 63), which also includes work by Capability Brown (Gregory *et al* 2013), there are earthworks on both the northern and southern side of the house; those to the north were surveyed by the RCHME in 1995 (619015). A field visit in 2014 found well-defined earthworks of garden features and an underlying pattern of former field boundaries. A circular feature visible on aerial photographs with an outer diameter of 30m consists of a low, ditched mound, approximately 0.3m high. It may be the site of a fountain or basin, particularly given its proximity to the canal or pond, which survives as a prominent earthwork. A further sub-circular ditched mound, lying just to the east, partially overlies a former field boundary. The underlying phase of field boundaries consists of spread banks approximately 8m wide, which share a common alignment with the wider fieldscape surrounding the Abbey.

Fig 61: View of the parkland at Corsham (© Historic England, J Last)

To the east are earthworks of a hollow-way and raised causeway which lead to a mound that once occupied a now-bypassed and dry loop in the river. The hollow-way, which appears to have been truncated by a post-medieval ha-ha, led to the site of a former bridge over the Avon that is depicted on an estate map of 1714. From this point a causeway leads to the footings of a second small bridge that would have provided access to the mound. These earthworks are not depicted on any historic maps and may be medieval in origin. Excavation of a pipe trench in 1996 provided an oblique section across the 18th-century mill leat that is still visible as an earthwork to the east of the house, but no evidence for the date of the channel was recorded (Hawkes and Cotton 1996).

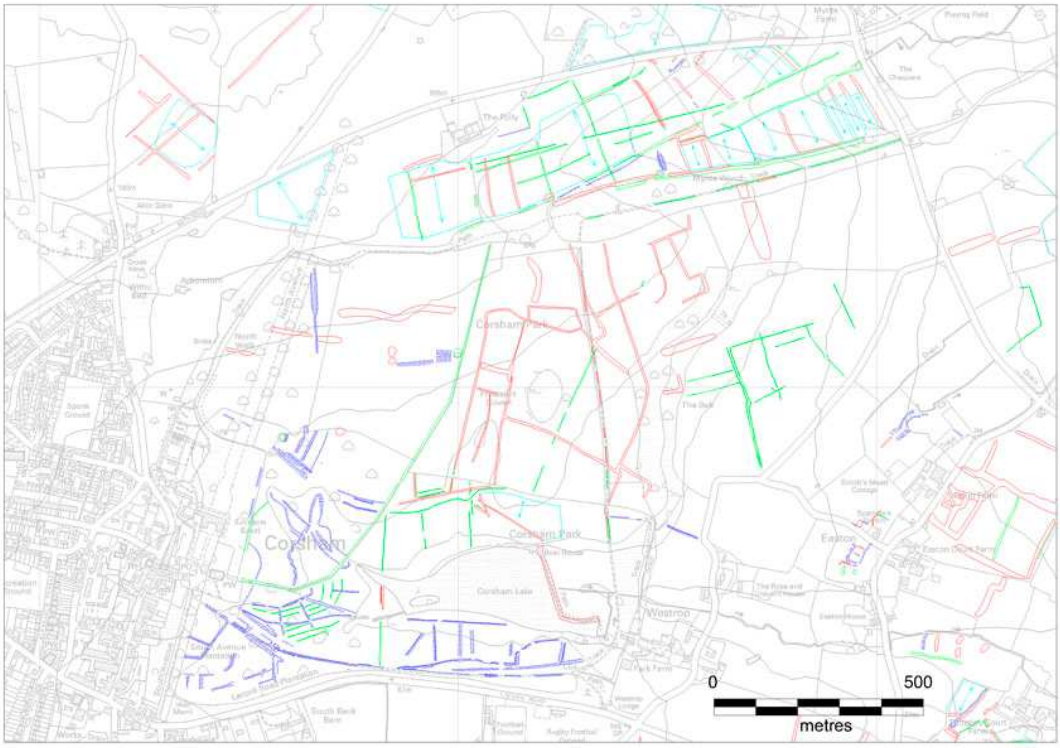

Fig 62: Corsham Park: the older part of the park is the relatively empty area on the left, either side of the avenue of trees depicted on the base map (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

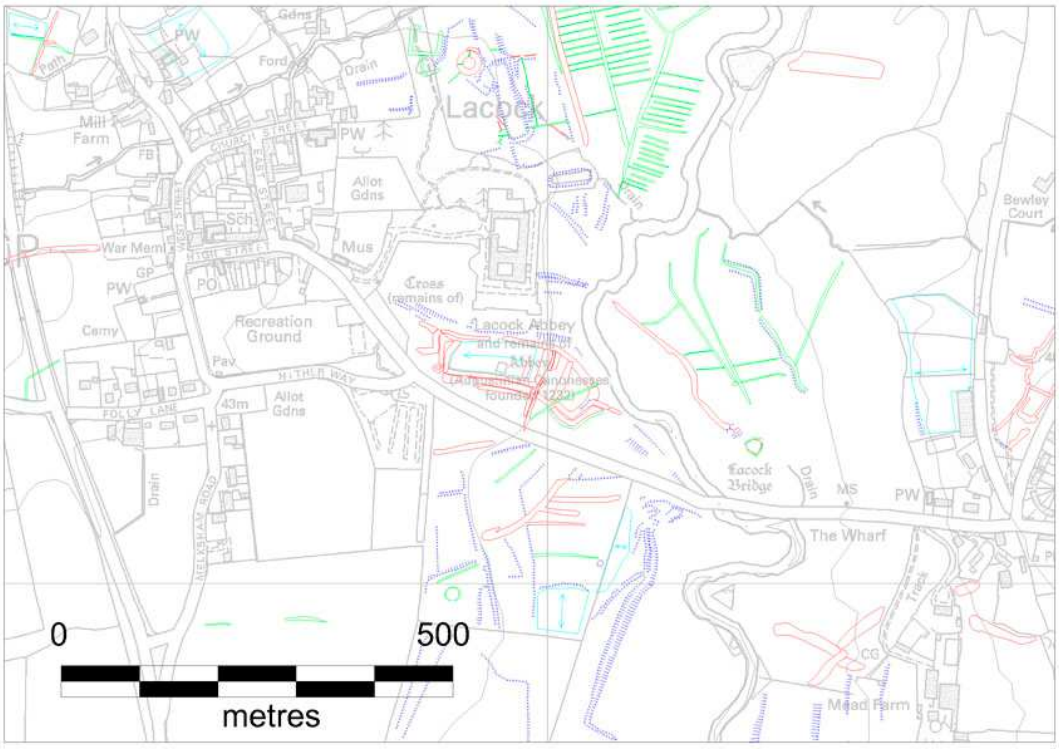

Fig 63: Lacock Abbey, with formal garden earthworks to the north and those of an uncertain origin to the south (Base map Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900.)

The earthworks south of the house do not appear to be garden features but their survival, at least to the north of the road, may be due to their inclusion within the park; all may warrant further investigation. Field examination in 2014 found these earthworks to be fairly well-preserved and under improved pasture grazed by sheep. Additional detail of individual building platforms was visible.

Hidden from view? Railway lines, quarries and ammunition

The sense of enclosure within the Avon vale, created by the small fields and hedgerows (Fig 5), gives way to the west to the more open aspect of the Cotswolds. Even here, particularly around Corsham, there is still a hidden aspect to the landscape which is due to the various subterranean constructions that exist, particularly under Box Hill. Clues to the earliest of these can be seen on the surface of Box Hill in the form of large and now overgrown spoil heaps, each with an associated air shaft, that are arranged at intervals along the line of Box Tunnel below. This tunnel, which is almost 3km in length, was built between 1838 and 1841 by the Great Western Railway for the main London-to-Bristol railway line.

The construction of the tunnel revealed a source of good-quality Bath Stone and led to the establishment of a number of underground quarries. Despite the extensive nature of some of these quarries, when the earliest aerial photographs were taken in the 1940s, their impact on the surface appears minimal. Many were entered via slope shafts and their entrances, perhaps along with a building or two, are all that are visible at many sites. Very little spoil appears to have been brought to the surface. The 19th-century Ordnance Survey maps also show a network of tramways linking many of these sites to the main railway line but little of this remained by the 1940s, an indication of the decline that this industry suffered in the early 20th century.

Some of the redundant quarries were adapted for the storage of ammunition in the 20th century. This was first done on a small scale during the First World War when Ridge Quarry (1580819) was taken over by the Admiralty for a short period from 1915 (McCamley 1998, 11). Large-scale conversion of quarries for ammunition storage got underway in the late 1930s and continued through the Second World War (see 1466496, 1536692, 1539496, 1580813, 1580819, 1580824). There are also a number of camps and hostels (1539374, 1579797, 1579801, 1579811, 1579814, 1579817, 1579888, 1579900, 1580759, 1580962, 1580971).

The choice of subterranean storage reflects the pre-WW2 concern with air attack and the peacetime contingencies to prepare for it and Corsham was one of a number of installations across the country which reflect these concerns. In

addition to offering protection from air raids, the choice of underground storage might be interpreted as an attempt to hide from view but this does not seem to have been the case. The adaptation of existing quarries involved the clearing out of backfilled galleries which produced huge amounts of spoil in the early years of the war. This can be seen in the area around Westwells, Corsham, by comparison of a photo from 1940 (Fig 64) with one taken at the end of the war (see spoil heaps between the woods in the bottom left of Fig 65; 1539496). Military activity was also clearly apparent from the extensive surface structures that were constructed both for tasks that could not be carried out underground and to accommodate the large number of troops stationed there.

Fig 64: Military development at Corsham in 1940 (top right) (Detail of RAF 225A/UK842/ 19826 6-JUL-1940 Historic England RAF Photography)

The largest quarries at Corsham which became the focus for military use, during WW2 and the Cold War, were the subject of a detailed above- and below-ground Characterisation Study commissioned by English Heritage and undertaken by Oxford Archaeology (Phimester and Tait 2014). The present survey overlapped with the OA project area but also extended further to the south and east. This has illustrated further buildings presumably associated with the main quarries as well as a dispersed band of additional surface works associated with smaller quarries that were requisitioned for use as wartime storage. These buildings and structures were interconnected partly through the existing lanes but also via a network of roads built by the armed forces which in places followed the line of the earlier quarry tramways. Connection with the wider rail network was provided by three sidings at Thingley Junction, Beanacre (both pre-WW2) and

Lacock (completed in 1943) (1580150, 1579929 and 1580159). These were all defended with pillboxes and at Beanacre aerial photographs show traces of barbed wire entanglements as well. Pillboxes and some barbed wire were also seen at Eastleys Quarry south-east of Chapel Knapp. Short-lived works to counter the threat of invasion in 1940 were put in place at Corsham and Chapel Knapp with ditches and mainly small mounds of earth positioned across open areas to prevent them being used by the enemy as landing strips (1580859, 1581039, 1581046).

Little development-led work has investigated these remains. On the western edge of Corsham, the area of military camp 1579900 was evaluated in 2000 but the 20th-century remains were not explored (Wessex Archaeology 2000); the area of camp 1580962 was evaluated in 2007 when evidence of landscaping was observed across the majority of the site (Brett 2007).

Fig 65: Military development at Corsham showing the extent of the camp by 1946. In addition to new buildings the development includes two large spoil heaps showing white at the bottom of the photo. (Detail of RAF CPE/UK/1821 3023 4-NOV-1946 Historic England RAF Photography)

Elsewhere within the project area, Second World War defences were seen to the south-west of Melksham, along the southern bank of the Avon, in Whaddon and at strategic points along the Kennet and Avon canal. These include pillboxes and road blocks, some of which survive. The defences were part of the anti-invasion GHQ Line Green and GHQ Line Blue and formed the Whaddon Defence Area (see Foot 2009).

Two small circular ditched enclosures of uncertain function, not on the HER, were seen on air photographs in a field adjacent to the River Avon north of Lacock and examined during fieldwork in August 2014 (1578949). The more northerly consists of a low, sub-circular mound with a surrounding ditch. It measures *c* 12m in diameter and the mound stands up to *c* 0.3m high. The second enclosure is a ring-ditch overlying an earthwork field boundary. Their exact date is not known but they post-date the underlying medieval or post-medieval field system, and it is possible that they form part of a wartime anti-aircraft decoy or searchlight battery.

DISCUSSION

This section considers the results of the survey in time and space: firstly, what they reveal about the character of the archaeological landscape and to what extent those patterns are related to variation in the modern landscape; and secondly, how this landscape changed and developed over time, especially with reference to the research aims set out in SWARF (see above). Finally, the results are assessed in relation to some of the management and conservation issues highlighted by the project.

The preceding narrative demonstrates that the project has achieved its first aim of improving the recognition and definition of heritage assets in the project area, as well as increasing understanding of the wider historic landscape, with the caveat that the methodological approach adopted for the project suits some periods and types of site better than others. Reflections on the successes and shortcomings of the methods, as touched on above, will help achieve the second major aim of understanding how to maximise the potential of the different techniques for future projects of this kind, given the limited resources that are likely to be available. For example, geophysical survey and excavation are most effectively deployed when there is a good knowledge not only of the aerial record but also of development-led work in the area. There also needs to be a balance between cherry-picking sites of apparently high significance for fieldwork and understanding the range of variation within site types that seem particularly characteristic of the project area.

Although it is hard to quantify the results of the project in a way that can be extrapolated to other under-explored areas it is clear that archaeological mapping derived from analysis of air photographs and lidar can add greatly to understanding in terms of both the recognition of individual sites and their distribution patterns across the landscape. Meanwhile, the ground-based work undertaken for the project, combined with the results of development-led fieldwork, complement the aerial record by demonstrating that not every site will be visible or legible from the air, and that morphologically similar sites may differ greatly in chronology, function and/or condition.

The view from the air

Understanding AIM results

The known distribution of archaeological monuments in West Wiltshire has changed significantly following completion of the aerial investigation and mapping stage. Fig 66 shows the number of 'in-scope' archaeological monuments for each square kilometre of the project area following the aerial mapping. Prior to the commencement of the project, densities of monuments were generally quite low with between 0 and 15 NRHE monuments per sq km and their distribution was fairly uniform across the landscape, with the exception of the area around Whaddon, where a concentration of Second World War and medieval remains was recorded. This contrasts with the monument densities on completion of the aerial mapping. Broadly speaking, the eastern half of the project area now has a higher concentration of archaeological monuments (up to 48 monuments per sq km) than the western half, where monument numbers per sq km have remained fairly low.

Whilst it is clear that aerial investigation and mapping techniques greatly enhance archaeological understanding of an area, they rarely offer a full picture of archaeological distributions. Rather they offer a reflection on the visibility of features in areas conducive to this form of survey. Aerial mapping, like other archaeological investigative techniques, has its limitations and the resulting record will inevitably be biased by a number of factors (Carter 1998, 96). The following analyses elucidate some of the biases inherent in this form of survey and indicate areas in which future photography could be targeted.

Earthworks and cropmarks

The lowest densities of archaeological monuments recorded by the project are found in the Cotswolds NCA, whilst higher densities are present within the Avon Vales NCA. The two NCAs have a reasonably similar mix of arable and pastoral land use, so it seems likely that the difference between the two zones reflects either genuine archaeological distributions or better earthwork survival in the wetter, clay areas of the Avon Vales. It is notable that if ridge and furrow is removed from the equation, the patterning of archaeological earthwork remains across the character areas is more even. This reflects an association of ridge and furrow with the Kellaways and Oxford Clay Formation, which is almost entirely confined to the Avon Vales NCA. Gaps in the distribution of ridge and furrow on the clay may also reflect past land use, as discussed above.

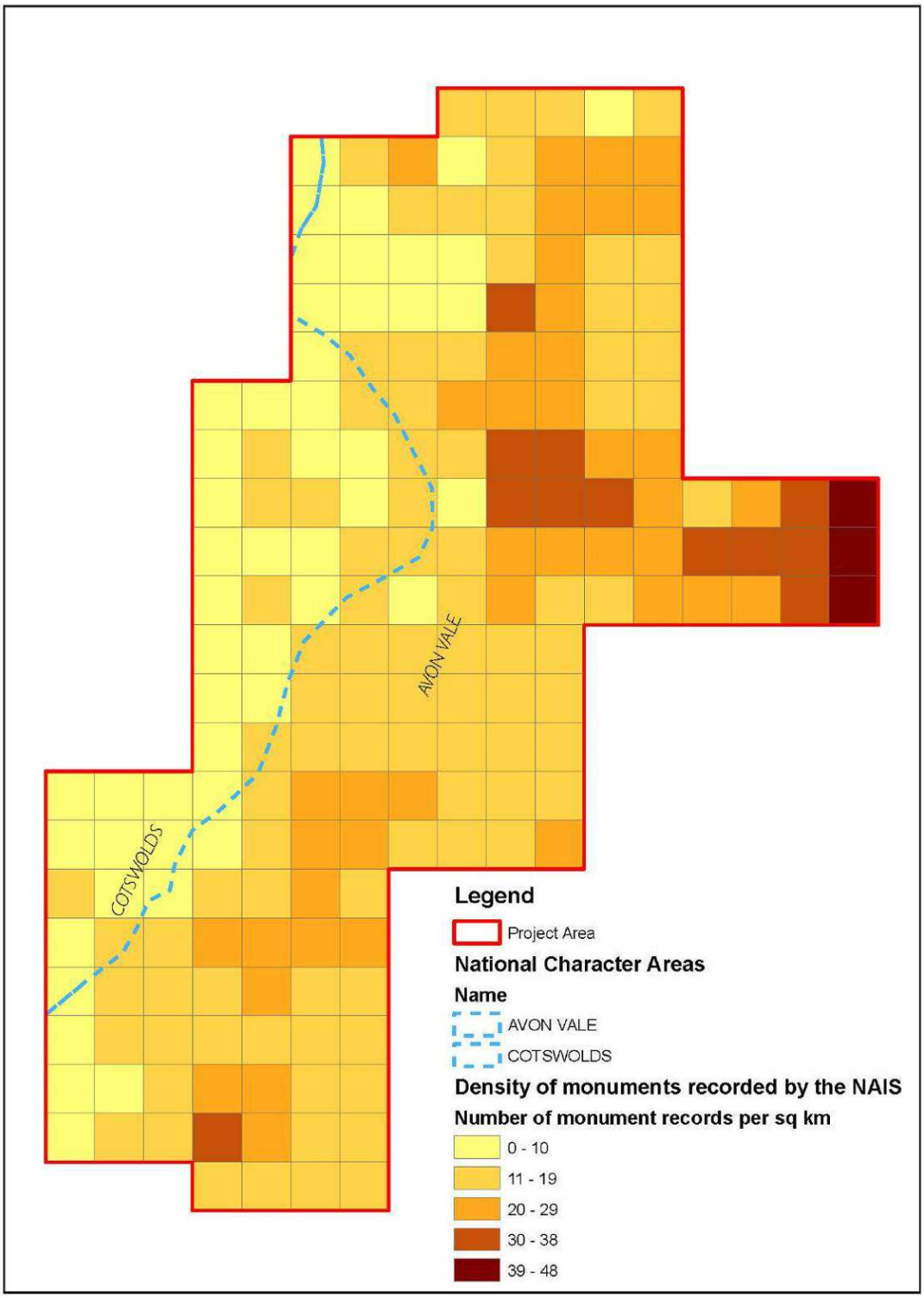

Fig 66: Density of 'in-scope' NRHE monument records per square km recorded by aerial mapping in relation to the National Character Areas (© Historic England)

However, since arable agriculture has increased recently in the clay areas as a result of modern farming methods, they therefore contain not only the highest densities of surviving archaeological earthworks but also most of the earthworks

levelled during the later 20th century (see below). These areas continue to be most at risk in terms of their earthworks but they also have the highest potential to reveal underlying pre-medieval features as cropmarks if they revert to arable. Even then, however, clay soils and geologies release water more gradually, meaning moisture differentials are lower and archaeological cropmarks appear more slowly (Carter 1998, 96).

The distribution of cropmarks would therefore be expected to have a relationship both to the underlying soils and geology, and to the survival of overlying earthworks. In particular, the apparent pattern of pre-medieval sites is more likely to reflect their susceptibility to cropmark formation rather than a true bias in settlement location. Free-draining areas are ideally suited to the formation of cropmarks, which are most commonly caused by moisture differentials between the archaeological deposit and the surrounding area. It is notable that the more freely draining greensand coincides with the Sandy Lane area, where one of the densest cropmark landscapes is recorded (Fig 67). The mapped enclosures at Kellaways, field system at Showell Farm and barrow cemetery at Boundary Farm coincide with areas of river terrace deposits (sand and gravel). To the west, the extensive Iron Age/Roman settlement and field system in Atworth and South Wraxall parishes (see above) lies on an area of Cornbrash, with overlying thin lime-rich soils. And further south, the cropmarks at Paxcroft are associated with the ridge of Cornbrash on which Trowbridge and Hilperton are situated. However, there are also large areas of limestone geology that lack significant cropmarks, especially, as mentioned, to the west of the project area in the Cotswolds NCA; more detailed geological mapping suggests this blank zone coincides with the mudstones of the Forest Marble Formation.

Land use

In relation to the GlobCover land use categories mentioned above, most of the cropmark sites recorded correspond with Rainfed Croplands, which broadly reflect the distribution of underlying oolitic limestone. Although there are some cropmarks on the clay lowlands where Closed to Open Grassland is the main land use category, they are fewer in number. Whether the cropmarks are showing as a result of parching in grassland or whether they are in arable fields within an area dominated by grassland is unclear. Most earthwork sites recorded by the project are located on this grassland.

Another approach is to use Agricultural Land Classification (ALC), which provides a method for assessing the quality of farmland and was largely developed to protect high-quality agricultural land from inappropriate development (Natural England 2009). The ALC system was based on reconnaissance field surveys mapped onto Ordnance Survey base mapping, at a scale of one inch to one mile, from 1967 to 1974. The data have been digitised and are available as a download (.shp) at a scale of 1:250,000 from the Magic

website (http://magic.defra.gov.uk/); all assessments were made using this information.

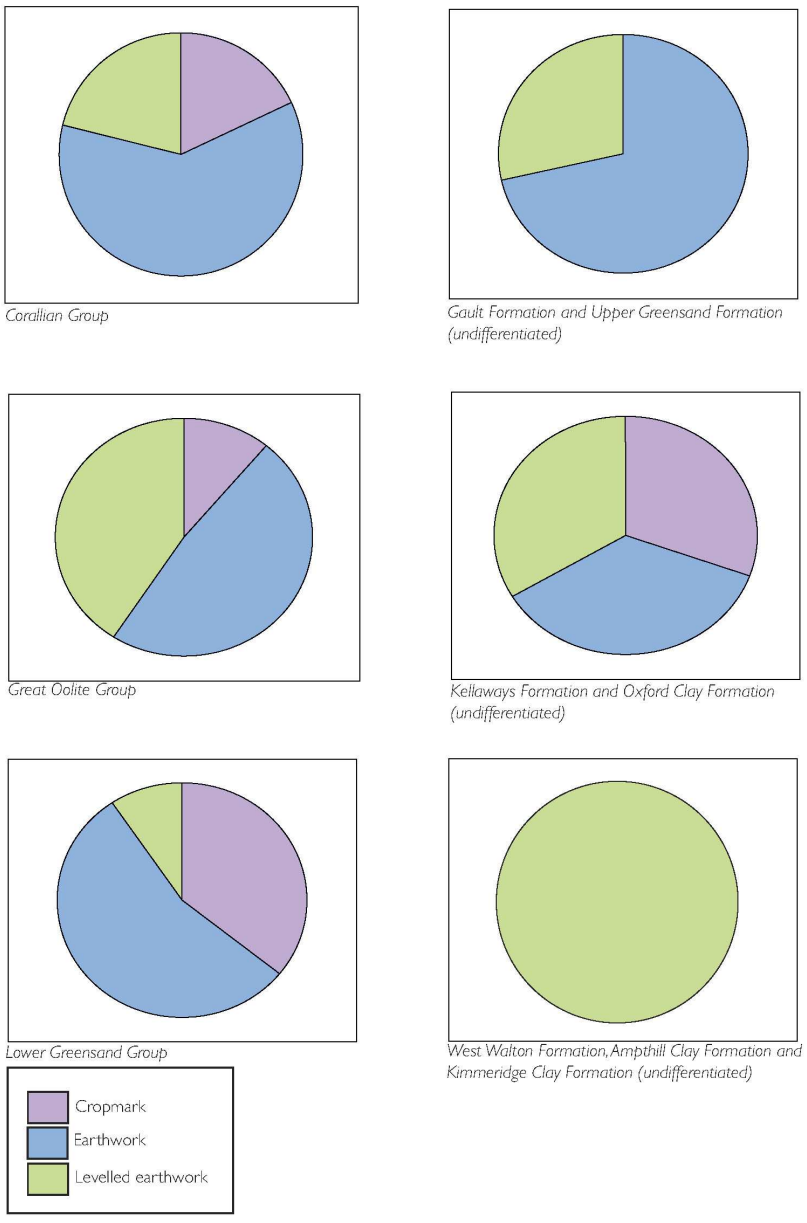

Fig 67: The relative condition of archaeological monuments on each of the bedrock geologies within West Wiltshire (© Historic England)

A significant issue when using this data for assessing archaeological potential is that the classification is concerned with the inherent potential of land; the current use does not affect ALC grade. However, broad trends are apparent, with higher ALC grades dominated by arable agriculture and lower grades dominated by pastoral regimes. It has advantages over the GlobCover land use data in the fact that the dataset can be fully interrogated in ArcMap GIS.

Land quality varies across the region but ALC classifies farming land from Grade 1 (excellent) to Grade 5 (very poor), and also distinguishes Urban and

Non-agricultural land. The best agricultural land falls into Grades 1–3, being flexible, efficient and productive. Within the project area only ALC Grades 1–4 and Urban classifications are represented (Fig 68), with nearly 70% of the land recorded as Grade 3, good or moderate, and only 2% as Grade 1.

ALC was used in the Chalk Lowland and Hull Valley NMP project to assess on which grade of land the aerial photograph mapping recorded the highest densities of archaeological monuments. In the Hull Valley the highest densities were on Grade 4 land and it was felt that this pattern might be repeated elsewhere in England (Evans *et al* 2012, 57–60). Analysis of the results from West Wiltshire has indeed replicated these findings. Fig 69 shows that Grade 4 land has the highest number of archaeological features at just over 17 NRHE archaeological monuments per square kilometre. Grade 1 and 2 land also have relatively high numbers of sites with between 8 and 11 monuments per sq km, though this is less significant given that Grade 1 land covers just 4.4 sq km and Grade 2 land 19 sq km. Less archaeologically productive areas are Grade 3 land and Urban areas, with just over 4 monuments per sq km for the former and just under 6 monuments per sq km for the latter areas.

The reasons for this pattern are not entirely clear, especially considering the extensive nature of Grade 3 land in this area, though comparing the relative proportions of evidence type (earthwork, cropmark, etc.) provides some elucidation (Fig 70). There is a strong correlation between cropmark sites and ALC grade, with the highest proportion of cropmarks seen on Grade 1 land and the lowest on Grade 4 land. This is unsurprising given that higher quality land is more likely to be used for arable agriculture and therefore to produce cropmarks. However, the proportions of extant and levelled earthworks are not so closely correlated with land grade as the greatest amount of levelling is seen on Grade 3 land. This suggests that Grade 3 land was more likely to be taken into cultivation during the 20th century, which may explain the trend, if not the scale of the difference compared to Grade 4. Meanwhile, the highest densities of standing and demolished structures coincide with the urban areas and are readily explained by the presence of 20th-century military remains.

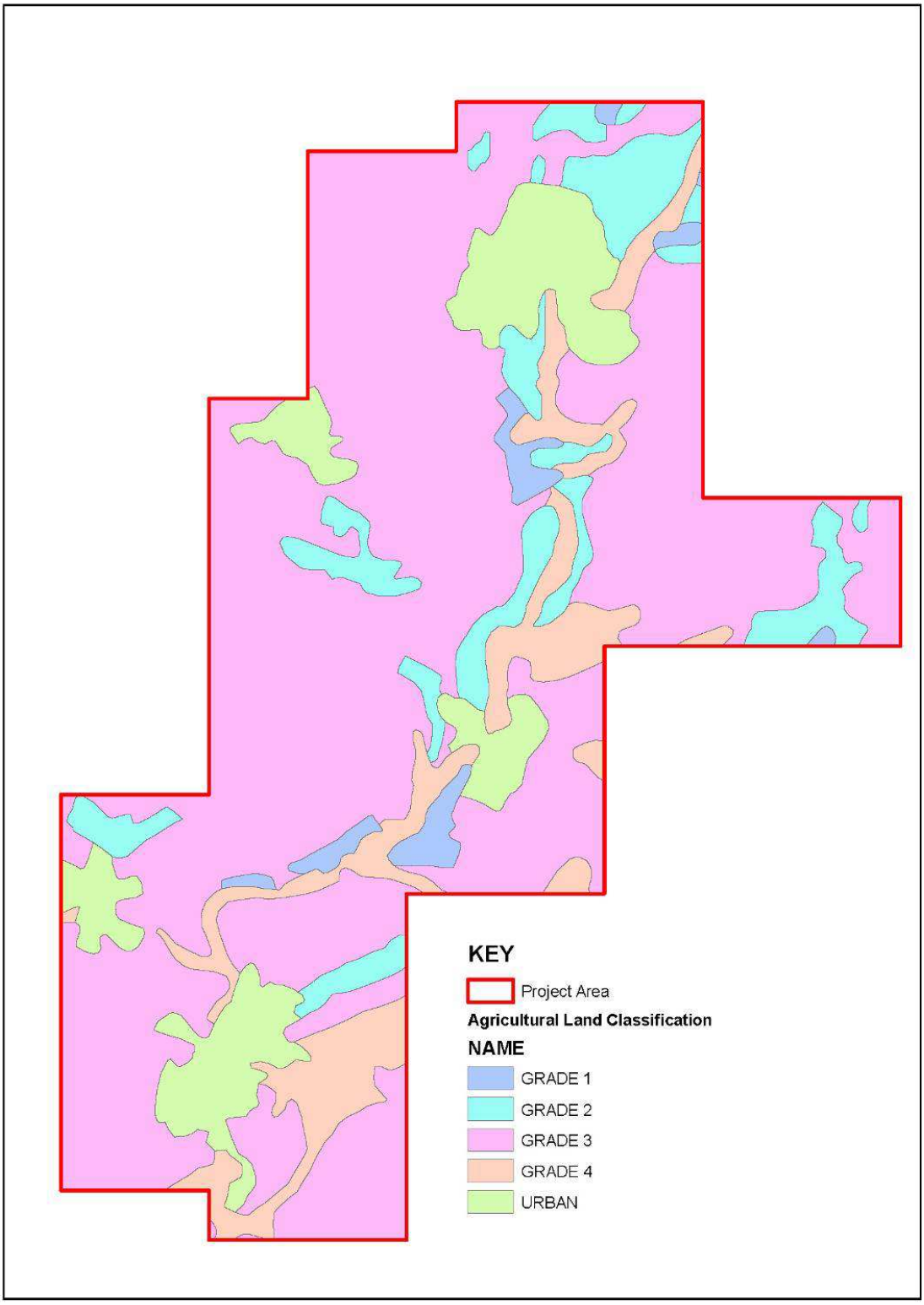

Fig 68: Agricultural Land Classification in the project area (Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2014.)

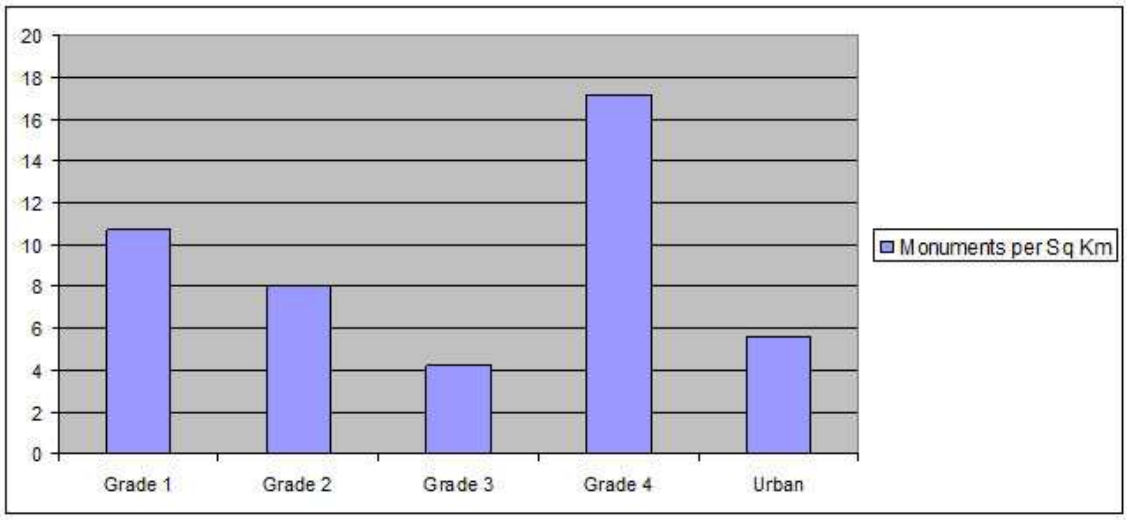

Fig 69: Number of archaeological monuments per square km on each ALC Grade (© Historic England)

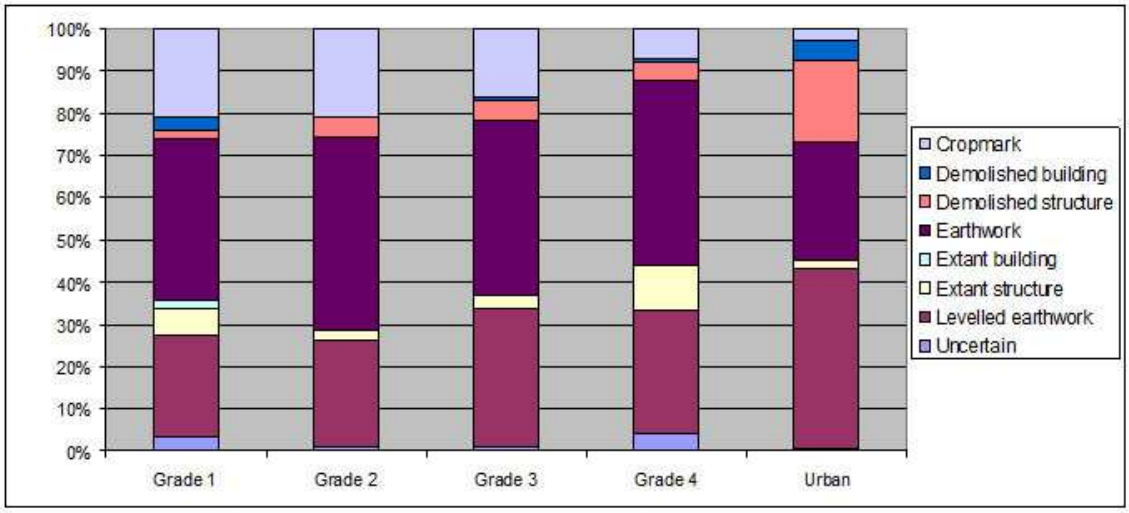

Fig 70: Relative proportions of latest evidence for each ALC Grade (© Historic England)

Rates of levelling in a lowland setting

The archaeological landscape is a fragile resource vulnerable to a wide range of human activities and natural processes, some of which can be assessed from the results of this project. At the outset of the project it was felt that rates of post-war plough levelling would be relatively high given the lowland setting of the project area. Such areas tend to be predominantly used for arable agriculture and as such attrition rates affecting earthwork monuments can be high, especially as a consequence of the intensification and increased depth of ploughing during the 20th century. On the other hand, in certain circumstances arable agriculture can aid the identification of below-ground archaeology by revealing monuments as cropmarks and making them easier to detect in magnetometer surveys (mixing the topsoil leads to a more uniform, less noisy magnetic contribution that interferes less with the detection of buried features).

The consequence is that the survival or otherwise of earthwork features can impact on the visibility of cropmark sites and also in some cases earlier phases of archaeological activity in magnetic surveys (as possibly seen at Catridge). For example, in areas where medieval and post-medieval ridge-and-furrow earthworks survive within present-day pasture landscapes, very few sub-surface sites are likely to be visible through parching in all but the driest years. Thus the survival of a fossilised medieval or post-medieval landscape reduces the chance of discovering from the air buried sites of later prehistoric or Roman date. It is only after conversion to arable and the ploughing out of the medieval and post-medieval earthworks that earlier features may be revealed as cropmarks. However, this does not necessarily mean that the sites will be well-preserved since medieval cultivation furrows can have a significant impact on earlier remains, as noted at Kellaways (see above). On the other hand, where cropmarks are visible despite the presence of overlying ridge and furrow, as at the Boundary Farm barrow cemetery (see above), it may be a sign that those overlying deposits are being levelled by modern agriculture, raising concerns for the future management of the site.

The degree of levelling of archaeological features between the earliest and latest imagery therefore shows both the attrition of these earthworks and where cropmarks might be expected to appear in the future. This was assessed by examining the attribute data attached to the digital mapping (see Appendix 2): 'Evidence 1' records how the monument was initially seen whilst 'Evidence 2' records the condition of the monument as it appears on the latest available imagery. Within the project area, the latest available imagery was generally PGA orthophotography, lidar or occasionally oblique photographs. Where an archaeological site (or element of a site) appears to have been totally levelled then this will be labelled as such. Likewise, if an archaeological site appears to the aerial photograph interpreter to still have height it is recorded as an earthwork, though this cannot be used as a reliable indicator that no damage has occurred to the monument. This type of analysis relies on both the historic and recent imagery being of reasonable quality. If the historic photography is poor, then archaeological sites may not be identified at all. Conversely, if the latest imagery is poor or taken during sub-optimal conditions, then an archaeological site which may survive as a slight earthwork could be recorded as levelled. Lidar can be used to give more definitive statements on the latest condition unless archaeological features are very slight, in which case lidar resolution can become problematic.

Nearly half of the archaeological monuments recorded by the project as earthworks survive in this condition to the present day. Most of these are medieval or post-medieval agricultural features, such as ridge and furrow, field boundaries and water meadows. The handful of Roman and pre-Roman sites surviving as earthworks are, due to their relative scarcity, potential targets for further study. By comparison, most of the sites recorded as cropmarks tend to

relate to the pre-medieval period, with numerous round barrows, possible settlements and field systems worthy of future study. The survival of nearly 50% of the earthworks suggests that rates of ploughing in the project area may be lower than in some other lowland areas. The Chalk Lowland and Hull Valley NMP project for example, recorded levelling rates of nearly 70% for archaeological monuments originally seen as earthworks (Evans *et al* 2012, 52).

The pattern of archaeological monument survival varies across the project areas (Fig 71). Although buried features showing as cropmarks (pink on Fig 71) are located throughout the project area, these are more extensive and contiguous in the east-central and west-central parts of the project area. Archaeological monuments surviving as earthworks (blue) are distributed across the entire project area, with the exception of the westernmost edge, where monument densities as a whole are low. Recent levelling of archaeological monuments (green) appears to be widespread, with the exception of a band across the central part of the project area – though this is also the area where ridge and furrow, which forms a large proportion of the earthworks, is scarce.

The rates of survival and levelling and their potential impact on our understanding of the landscape can therefore be summarised as:

- Earthwork survival is higher in the east of the project area.
- Levelling of earthwork monuments during the 20th century was most prevalent in the north and south-central parts of the project area.
- Sub-surface deposits can survive when an archaeological earthwork has been levelled, so a site may not be totally destroyed.
- Cropmark sites are intermittently visible over the whole project area, but extensive cropmark landscapes are limited to the east-central and west-central zones.
- Pre-medieval features are less likely to be discovered in areas dominated by extant earthworks.
- Medieval or post-medieval remains may have been destroyed in areas where pre-medieval cropmarks dominate (Kellaways is an example of an area of post-war loss of ridge and furrow where cropmarks are now visible).
- There is an increased risk to cropmark sites through continued ploughing in the areas where levelling of ridge and furrow has revealed rich cropmarks.
- Pre-medieval earthwork sites are relatively rare and therefore of particular importance.

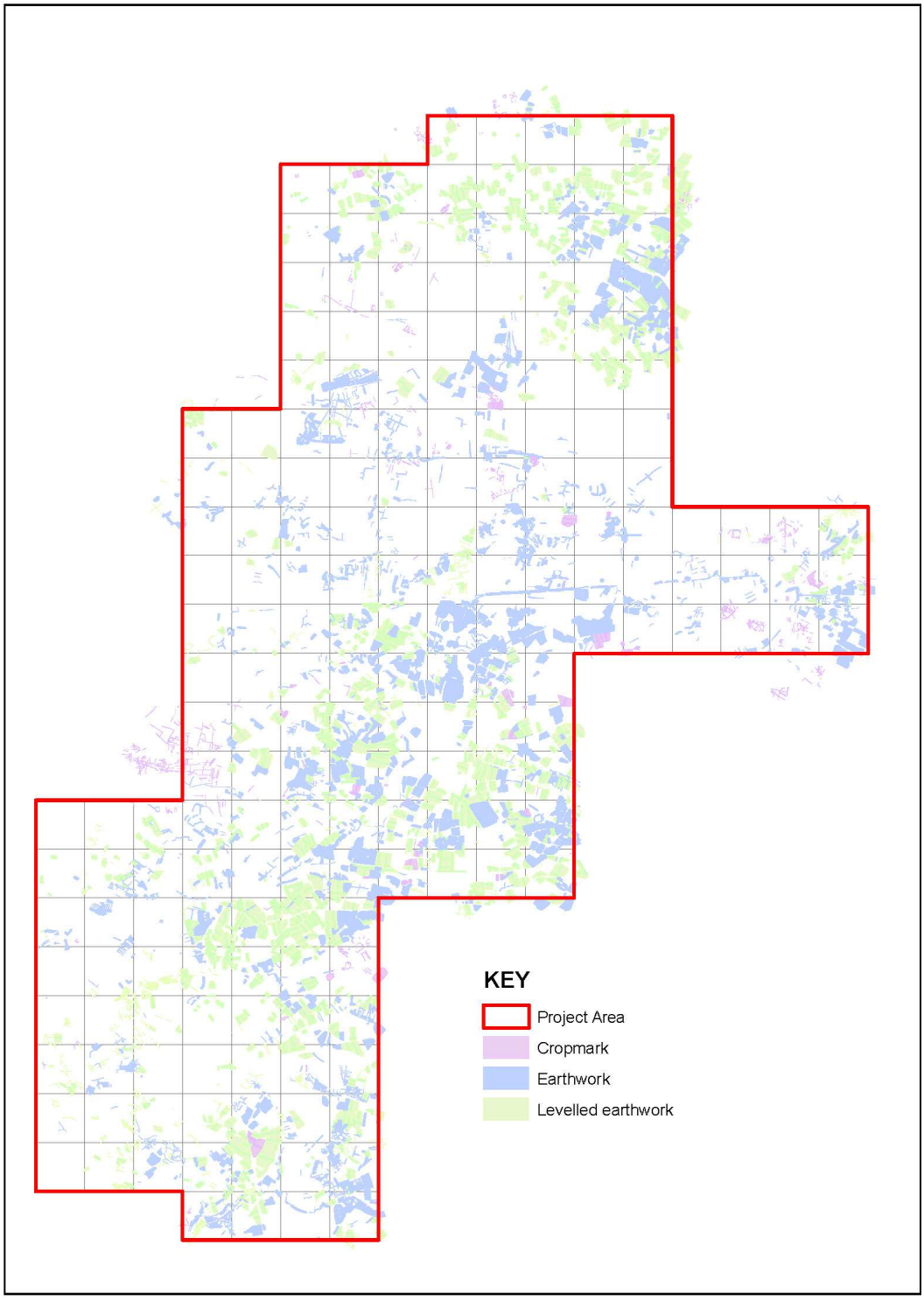

Fig 71: The relative survival of archaeological monuments as cropmarks, earthworks or levelled earthworks on the latest imagery (© Historic England)

The view from the ground

Notwithstanding the factors outlined above, aerial photographic interpretation and mapping has been very successful in providing a framework for analysis of the archaeological landscape of West Wiltshire (SWARF Aims 1, 3). Significant areas of later prehistoric, Roman, medieval and post-medieval settlement and agricultural activity that were previously unknown or poorly recorded have been added to the record, as well as a number of barrows and ring-ditches. Large-scale patterns in some of this data can be analysed in relation to geology, later land-use and the persistence of some historic features into later periods, especially the major Roman road.

However, a number of caveats are also required because other evidence shows that the aerial record is not comprehensive. Although the mapping undertaken for this project is undoubtedly a higher-quality record than the HER, it does not include all features mapped there as cropmarks. While many of these can be rejected a few appear to be genuine. A possible case at Marsh Farm, Hilperton, was mentioned above but the clearest example is at Kingston Farm, Bradford-on-Avon, where features interpreted in the HER as 'fragments of an undated field system ... visible on an aerial photograph, mostly as shadow sites' were subsequently shown to be a rectilinear Iron Age enclosure (Sabin and Donaldson 2011; Sausins 2012). The finds from Kingston Farm are also important as they show the potential for significant archaeological remains on the western side of the project area, where aerial survey found lower monument densities (see above). Elsewhere, development-led work has encountered a number of sites that were not visible on aerial photographs; while many of these may have been hidden beneath later ridge and furrow, that is not always the case, as at Ashton Park, Trowbridge. Such discoveries emphasise that cropmark formation is patchy and depends on all the factors discussed above.

Another caveat, as mentioned above, is that some periods and types of site which lack large cut features such as ditches are very hard to detect from the air. For the Mesolithic and Neolithic periods other approaches to the aerial record, such as mapping palaeochannels, could indicate areas where activity might be focussed, but this does not form part of the NMP methodology. Fieldwalking could be a useful technique to investigate the distribution of lithic sites but did not prove possible within the constraints of the project.

Nevertheless, the aerial photographic mapping was the main basis for targeting ground-based work which verified the basic accuracy of the aerial record while also demonstrating how much detail could be added by geophysical survey, earthwork survey and excavation (SWARF Aim 1). The main limiting factor for fieldwork was the small proportion of the project area that could be covered in comparison to the aerial mapping: about 50ha of geophysical survey (0.25% of

the project area) and less than 0.2ha of excavation (under 0.001%). Hence the value of the nearly 1000ha of development-led fieldwork (largely comprising magnetometer survey and trial-trench evaluations) which offers a sample of sufficient size to assess what and how much may be missing from the aerial record, and provides dating evidence to add to the few sites sampled during the current project.

The fieldwork sample was chosen through discussion within the project team, which identified the widespread presence across the project area of later prehistoric/Roman enclosures, often of rather particular form (see above), as key to understanding the character of the cropmark landscape, while it was also thought important to assess undesignated earthwork sites. Selection within these categories then boiled down to more pragmatic issues of resources and access (often related to crop regimes). The former consideration meant, for instance, that ground-based investigation of the densely cropmarked *Verlucio* area has been deferred to a separate project (subject to approval), while the latter meant that it was only possible to investigate the enclosure at Great Chalfield through geophysical survey, not excavation. Fieldwork is also dependent on obtaining the landowner's permission, a time-consuming process when landholdings are small (and permission was not always forthcoming from the larger estates). Landscape understanding is therefore influenced by survey choices based on incomplete information and pragmatic decisions; consequently, future work will no doubt refine or overturn the interpretations presented here.

Rapid field assessment enhanced aerial mapping results by providing current information on the condition of upstanding features, identifying additional earthworks and providing detailed information to assist with interpretation. Large-scale analytical earthwork survey combined with brief documentary study provided the basis for case studies illustrating the development of medieval and later rural settlement. However, the scarcity of prehistoric earthworks in West Wiltshire meant that opportunities to apply ground survey techniques to pre-medieval features were extremely limited.

Geophysical survey added considerable detail to the aerial record at all four locations. Its value was made particularly clear at Paxcroft (North) where for logistical reasons excavation had to precede the magnetometer survey, which subsequently greatly aided comprehension of the excavated features. The detection of buried remains by magnetometer survey depends on the magnetic mineralogy of the soil, which is heavily influenced by the parent geology. Past experience suggested magnetic prospecting was likely to produce the clearest results over the oolitic limestone to the west of the project area and possibly also over the Lower Greensand to the east. Success over the central band of Oxford Clay, terrace deposits and alluvium was thought likely to be more mixed. In the event geophysical survey was focussed on the limestone at Paxcroft, Chalfield

and Catridge, with only Kellaways on terrace deposits and no sites investigated on the clay proper. However, development-led magnetometer surveys have located possible archaeological features on the Kellaways Formation at Norrington Common (Sabin and Donaldson 2012) while the Roman enclosure on Head deposits over Oxford Clay at Melksham Town FC had been picked up, albeit tentatively, by previous gradiometer survey (Wessex Archaeology 2014).

However good the remote sensing, excavation was essential to confirm the nature and condition of mapped features and to provide definitive evidence of phasing, date and function through systematic recovery of artefacts and palaeoenvironmental data (SWARF Aim 17). In particular the very different results from superficially similar enclosures at Paxcroft (North) and Kellaways show that the Roman landscape cannot be understood on the basis of site morphology alone.

Finally, one of the key outcomes of a large-scale project like this is the opportunity not just to present new data but also to synthesise existing knowledge, much of which resides in grey literature (SWARF Aims 2, 4, 12).

A matter of scale

This kind of project, where relatively small-scale interventions on the ground are contextualised within a framework provided by aerial mapping, inevitably foregrounds scale as a key issue and problem. In particular, how do we connect 'the interpretative scale of landscape and the data-collecting scale of excavation', address 'the cultural meanings of the landscape to its inhabitants' and resolve the tensions 'between phenomenological scale as lived and analytical scale as observed' (Lock and Molyneaux 2006)?

Firstly, it is important not to privilege one scale over another: the patterns emerging from large-scale survey are complemented by the local variability revealed by excavation, and both are essential for understanding the archaeological landscape. Nor should we assume that the scale of particular techniques defines analytical scale. The aerial and geophysical records contain intimate insights, such as how the layout of a field system structured human movements (cf. Giles 2007), while excavations provide information about the wider landscape, for example the Iron Age environment inferred from the charcoal, charred plant and faunal remains at Paxcroft (South), or the trade and exchange networks indicated by the Romano-British ceramic assemblages at Kellaways and Paxcroft (North).

The key issue therefore lies in how we tack between these different scales so that each informs our understanding of the other. One way of doing this may be by considering the landscape in relation to the affordances it offered people dwelling within it, in terms of resources, communications and perceptions. This

approach emphasises that patterns of settlement or burial sites are not imposed on the landscape, but rather that the cultural landscape emerges through situated human practice. The placement of barrows on the edge of landscape zones creates a perception of difference as much as it is influenced by the physical character of the land. A 'natural' feature like the river can serve as barrier or communication route, depending on people's choices and perceptions, just as a 'cultural' feature like the Roman road can be transformed from routeway to boundary, influencing the character of the landscape for another 1500 years. Our narratives need to interweave process and pattern.

Change in the landscape

While little has been added to understanding of the early prehistoric landscape, largely owing to the nature of the techniques employed during the project, it was already known that Mesolithic, and to a lesser extent, Neolithic activity was mainly concentrated in the north and east of the project area. The lack of confirmed Neolithic monuments, with the exception of the Lanhill long barrow, emphasises the need for a larger scale of analysis to make sense of activity in a landscape that appears to be a liminal area between the Cotswolds and the chalklands. To some extent the same goes for the Early Bronze Age, given the low density of barrows compared to the number known, for example, on Salisbury Plain, but sufficient ring-ditches were mapped during the project to discern an emerging pattern of small sites, often in pairs, dispersed along the edge of the limestone above the Avon vale, with a significant cluster on the terrace gravels around Melksham and a smaller group further east around Sandy Lane (SWARF Aim 54).

The later Bronze Age also remains poorly defined. The small enclosure at Great Bradford Wood remains an enigmatic feature, with no obvious parallels, while poorly defined occupation of this period was found at Paxcroft Mead and Blacklands, Staverton. For the Early Iron Age, however, there is more of a sense of an organised and occupied landscape, especially in the central part of the project area, with a series of relatively large (1–2 ha) curvilinear enclosures around and between the small promontory forts at Budbury and Nash Hill. The excavation at Paxcroft recovered sufficient pottery and other material to suggest an Early Iron Age date for the non-hillfort enclosures and shed light on their economic basis (SWARF Aims 14, 40). This dating for the curvilinear enclosures is tentatively supported by the evaluation at Kingston Farm (Sausins 2012), which also revealed a square enclosure, apparently of the same period (Reynish 2013). With the upland and lowland sites not vastly different in scale, there is little sense of the hierarchical settlement pattern seen in some other hillfort landscapes.

The project area lies on the periphery of two recent regional syntheses of the Iron Age evidence, for the Wessex region (Sharples 2010) and the Cotswolds (Moore 2006). Brief comparisons suggest the project area could be seen as transitional between these two regions: while the absence of developed hillforts in the Avon vale suggests parallels with the Cotswolds, the presence of enclosed Early Iron Age occupation points to connections with Wessex, though it is relatively rare in other non-chalk landscapes in that region, where a richer record only emerges in the 2nd century BC (Sharples 2010, 88). More research is needed, however, especially given the limited Middle Iron Age evidence from the project area. For example, the date of the field systems mapped in the project area remains uncertain; while excavated field boundaries appear to be Late Iron Age or Roman, as discussed above, the larger system between South Wraxall and Great Chalfield could have an earlier origin. The absence of specialised enclosure types such as banjo enclosures is also notable.

The Late Iron Age and Roman periods are marked by the emergence of a new settlement pattern based on rectilinear enclosures of around 0.5ha in size, often subdivided, and associated with semi-regular field systems and trackways (SWARF Aims 21a, 29, 40, 41). There is a sense of order in the arrangements of enclosures in some areas. Some of them clearly have Late Iron Age origins, as at Paxcroft (North), while others originate in the early Roman period, as at Kellaways. In this respect the project area may have more in common with Wessex, where similar enclosures become common in the Late Iron Age (Sharples 2010, 57), than with the Cotswolds, where rectilinear enclosures (without subdivisions) emerge in the 4th century BC (Moore 2006, 24) – though the early date of the Kingston Farm enclosure also needs to be taken into account.

Many of these sites, including those excavated for the current project, do not appear to continue in use into the late Roman period, though some saw reorganisation, such as Staverton. It may be that a landscape of numerous small settlements was rationalised so that the late Roman rural economy was controlled by a smaller number of high-status villa sites, such as Atworth (Erskine and Ellis 2008). However, some farmsteads endured rather longer; for example, the main phase of activity at Manor Farm, Allington, spans the 2nd to 4th centuries AD (Field and Glover 2015). The material culture from the excavated sites generally suggests a lack of wealth or widespread connections, though we might suspect that would not be true of *Verlucio* and its immediate hinterland, where further work is particularly recommended. The structure of the Roman landscape appears to be varied and complex; there is an obvious contrast, for example, between the clustered pattern of enclosures around *Verlucio* and the regularly spaced linear arrangement of sites west of Chippenham.

The Anglo-Saxon period continues the theme of oscillation between visibility and invisibility in the (aerial) archaeological record. Evidence is largely restricted to excavations in the towns, with the Saxon settlement at Trowbridge probably originating in the 7th century. Wright (2015) suggests the urban focus hints at the targeting of these locations for development by the kings of Wessex, though it may also reflect a lack of fieldwork within the villages in the project area. However, it seems unlikely that a busy Roman landscape was depopulated within a couple of centuries, despite the documentary references to the barrier formed by the forest of *Sealwudu*. By and large the Iron Age and Roman cropmarks do not overlap with the later royal forests, suggesting these may have ancient origins, though the southern part of Chippenham Forest overlies a substantial cropmark landscape north of Sandy Lane, perhaps implying some post-Roman woodland regeneration (though, as outlined above, forest land was not necessarily wooded). Further exploration in the Sandy Lane area of the relationship between the Roman road, with its associated roadside activity, and (if it is present) the Wansdyke is most likely to shed light on post-Roman developments and how the road to *Aquae Sulis* became a medieval frontier respected by parish boundaries and field systems.

Two areas of possible continuity between Roman and medieval fieldscapes were noted during the project (SWARF Aim 31): the 'long lands' adjacent to the Roman road near Gastard and the cropmark field systems mapped around Little Chalfield, both of which are located in areas where later ridge and furrow is absent. In contrast there are fewer signs of continuity around Sandy Lane where, for example, the cropmark field system mapped on Chittoe Heath (1578271) has a different orientation to the modern landscape, as do the field ditches mapped around the excavated enclosure at Kellaways.

Later landscape change generally appears slow rather than sudden. At Lower Paxcroft, extensive yet slight earthworks of tofts, crofts and a few possible building platforms represent the remains of an irregular row settlement along an ancient hollow-way which marked a parish boundary. The settlement appears to have declined over a long period, with some parts shown on maps as late as the 19th century (Caswell 2015). This reflects the gradual abandonment seen at other settlements in the project area, such as Catridge, where a well-marked hollow-way was the focus for multiple farmsteads situated on minor lanes. Change here also appears to have been gradual, with some tenements probably lost in the medieval period while others continued into the 18th century (Jamieson 2015). By definition, work based on earthwork surveys often records settlement decline, since successful hamlets and villages are likely still to be extant. However, many of the villages with earthwork remains are ongoing in some form so the abandoned earthworks may represent a shift in the settlement's focus as a result of changing road patterns, for example.

Detailed study of the landscape context for the known medieval settlements will require documentary research which, except for Lower Paxcroft and Catridge, is beyond the scope of this report. However, aerial survey has shed light on the extent of arable agriculture (ridge and furrow) in the project area before the post-medieval shift towards dairying and enclosure, reflected in the developments at the two sites (SWARF Aim 21b). In particular, the combination of techniques applied at Catridge has demonstrated how social and economic change were interwoven in the early modern period (SWARF Aim 43), with the post-medieval development of dairying initially a cause for ostentatious display, shown by the cheese loft facing the hollow-way, before the farm became a more private space from the 18th century. Investment in livestock is also demonstrated by the extensive water meadows around Trowbridge. Parallel to these developments was the creation of the great landscape parks which have protected some features of the earlier landscape from the plough. The subsequent tale of industry and transport, which led ultimately to the area's key 20th-century wartime role, is also illustrated by the archaeological remains (SWARF Aims 48, 64). Evidence for recent changes to the fieldscape, mapped on a larger scale by the Wiltshire HLC, is highlighted by the recording of now-lost field boundaries and former sub-divisions of larger fields by the geophysical surveys at Chalfield and Paxcroft.

The reconstruction of past landscapes, the remains of which are not always visible or require expertise to interpret, is essentially complementary to the process of HLC, which is concerned instead with an archaeological perspective on the present-day landscape. Both inform the management of change by elucidating the character and distinctiveness of the landscape as a whole, not just places considered to be especially significant. However, that significance also requires attention and is recognised through the process of designation.

Heritage protection and management

Designated heritage assets

In principle nationally important archaeological sites and monuments should be protected through designation (scheduling) but it is accepted that many such sites are not scheduled and that new discoveries of national importance are likely to be made. The project area contains 27 scheduled monuments of which seven are Old County Number schedulings (Appendix 1). Following discussions with Listing Group, recommendations for amendments to scheduled monuments have been made in some cases (Appendix 4) while a number of monuments were identified in the aerial investigation and mapping phase with potential for designation assessment, some of which have been subject to further investigation, as outlined above.

Designation, and indeed any other management or conservation response, is dependent on an assessment of significance, which can only be made if the ordinary, baseline character of the archaeological landscape in a particular area is understood. The scheduling criteria include the principle that 'a selection must be made of those monuments which best portray the typical and commonplace as well as the rare; this process should take account of all aspects of the distribution of particular classes of monument, both in a national and a regional context'. Apart from exceptional cases, therefore, a holistic understanding of a landscape is a necessary precondition for a designation programme.

In relation to possible new designations, key locations include the site of *Verlucio* and other monuments in its vicinity. However, the level of further work required in this area was thought to be beyond the scope of the present project without compromising the wider landscape approach. *Verlucio* and its environs will therefore be the subject of a future project which is currently in development.

Elsewhere, some of the earthwork sites identified during the project have the potential to be of equal interest to the designated examples, subject to further study to confirm their date, form, function and archaeological potential. Aside from the sites that were surveyed in detail, these include Easton, where earthworks probably represent a cluster of small medieval farmsteads, and Chittoe, where outlying building platforms and enclosures are probably traces of occupation associated with post-medieval and 19th-century quarries.

Heritage at Risk

The important process of checking the condition of our heritage goes back more than two decades to the first Buildings at Risk survey. The method has since been widened to include other types of historic places from scheduled archaeological sites to conservation areas, registered parks and gardens, registered battlefields and protected shipwrecks. The Heritage at Risk (HAR) programme was launched in 2008 as a way of understanding the overall state of England’s designated historic sites. In particular, the programme identifies those sites that are most at risk of being lost as a result of neglect, decay or inappropriate development (English Heritage 2014). Survey projects like this one are a key monitoring tool, especially as Historic England's HAR team is no longer able to systematically cover all designated sites.

This project was the first time aerial mapping methodologies were applied to inform the Heritage at Risk programme. The latest aerial photographs were systematically studied to gain an understanding of the current condition of all scheduled monuments in the project area (see Appendix 2), except those falling outside the scope of NMP mapping, such as village crosses or standing

buildings. This left a total of nine scheduled monuments where HAR condition statements were attempted. Of these a further three were excluded as the last HAR site visit post-dated the available photography. Additionally, the condition of the earthwork enclosure in Great Bradford Wood is unknown due to a lack of visibility through the tree canopy.

Two monuments, the medieval settlement of Sheldon and the Lanhill long barrow were assessed as being in 'optimal' condition, meaning there is very little intrusive vegetation, erosion or other damage. However, whilst the long barrow is managed under long grass, the settlement at Sheldon is under rough pasture with some tree cover, and is listed on the HAR register as vulnerable to tree growth. Another medieval settlement, at Whaddon, was assessed as being 'generally satisfactory but with minor localised problems', meaning there may be some intrusive vegetation, minor erosion scars caused by stock trampling or natural erosion but this is limited, affecting no more than 15% of the monument.

One site, Nuthills Roman villa, was felt to have 'extensive significant problems', meaning there is widespread damage affecting over 50% of the monument. In this instance the villa site remains in arable cultivation and is therefore subject to repeated ploughing. However, an assessment for the Conservation of Scheduled Monuments in Cultivation (COSMIC) project, which looks at ways in which further damage to an archaeological monument can be avoided whilst enabling cultivation to continue, considered the site to be vulnerable rather than at high risk, and it has accordingly been removed from the HAR register.

From these analyses it is clear that aerial mapping methodology can reasonably be applied to assess the condition of scheduled earthwork and cropmark sites. However this is dependent on having good quality aerial photographs, taken relatively recently. In order to maximise results additional reconnaissance targeting those scheduled monuments not recently photographed should occur at the outset of any future projects. And in order to ensure the register is updated, a system for formally reporting back to the HAR teams also needs to be considered.

Countryside Stewardship

Designation does not necessarily provide a means to change the way a site is managed because of the class consent which allows the continuation of agricultural and forestry works of the same kind as those previously carried out. Improving the management regime is therefore often better pursued through Countryside Stewardship.

The number of new and amended NRHE records were analysed in relation to areas under the former Environmental Stewardship scheme in 2014 (Fig 72).

Approximately 42% were within an Environmental Stewardship agreement, 15% of which were in areas covered by Higher Level Stewardship (HLS), and 85% in areas covered by Entry Level Stewardship (ELS). However, archaeological features will only be actively managed under an agreement if they were recognised when it was put in place. Of the monuments located within areas of ELS agreements 91% were new to the NRHE and a comparable 87% of monuments within HLS were new, although some of these monuments have previously been recorded by Wiltshire and Swindon HER and may therefore have been recognised when the agreements were implemented.

The remaining 58% of archaeological monuments recorded by the project are currently not in areas covered by stewardship agreements. Subject to the terms of future schemes, the recognition of these monuments could enable more farmland to be accepted onto such schemes under the next Regional Development Plan. The incorporation of the records from this project into the HER will enable the information to feed into the Selected Inventory for Natural England (SHINE) database and improve management of rural archaeological assets in the future.

Informing the planning process

The intention behind locating this project in an area likely to be subject to ongoing development in the future was to provide information that will allow more informed decisions to be made by planning archaeologists, i.e. adding new sites to the Historic Environment Record, enhancing existing records, and improving understanding of the landscape as a whole. The project has helped refine understanding of where sites of particular type are more likely to occur, what condition they are likely to be in, how they can best be characterised, and what research questions they may be able to address. This in turn should influence planning policies and allocations, as Local Plans and Strategies are reviewed and revised, and inform the development control process by allowing more nuanced briefs and Written Schemes of Investigation to be prepared for commercial archaeological investigations of particular types of site.

There is also a deeper relationship between research and heritage protection that goes beyond local authority plans and statutory processes. Ultimately protection depends on people and communities caring about their archaeological heritage, and that interest will only be fired if engaging stories about that heritage can be told to both local residents and leisure visitors. A series of dots on a map is not a compelling reason for people to care about the historic environment but the story of long-term human activity and endeavour, which emerges from archaeological analysis of the landscape, can be.

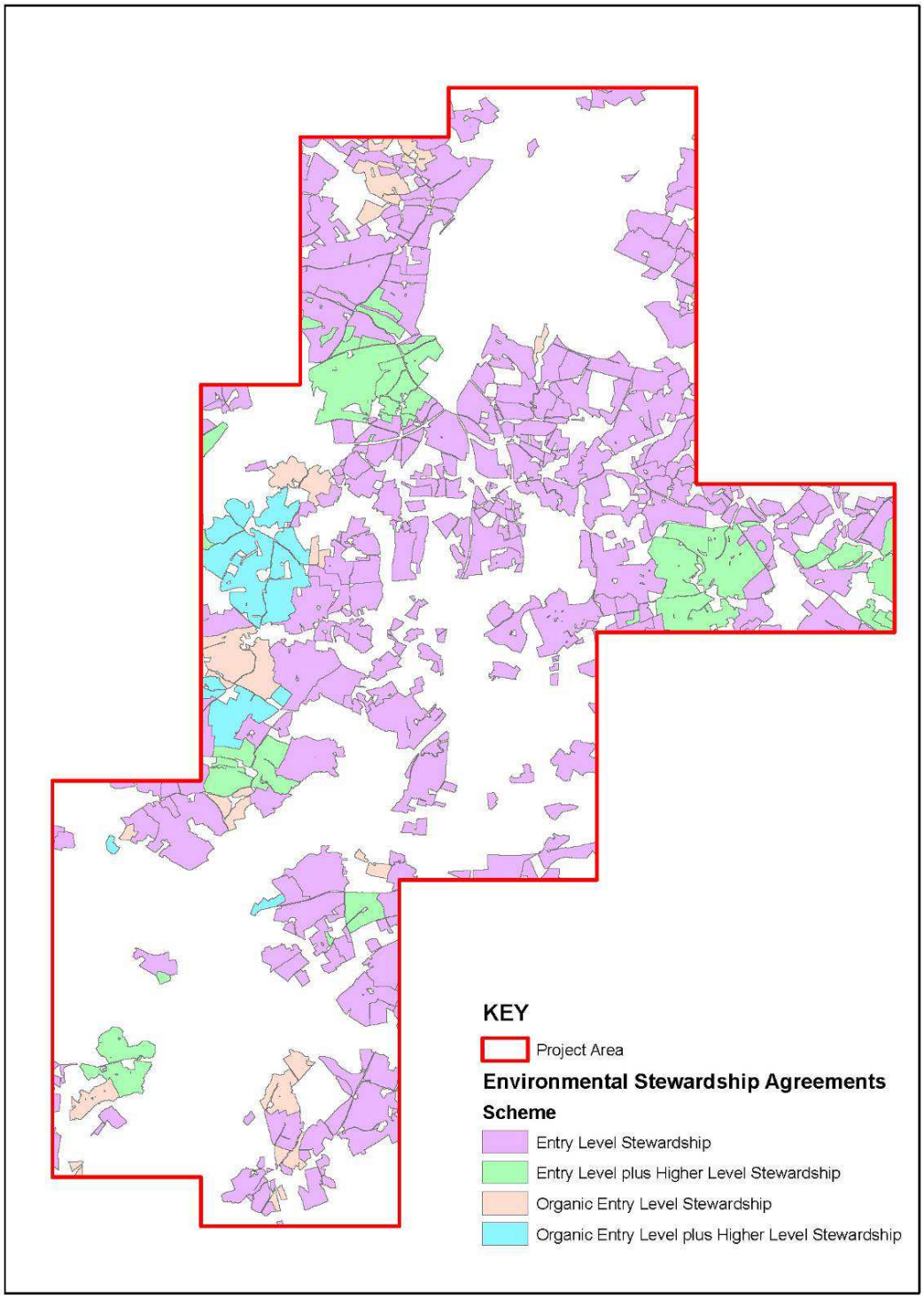

Fig 72: Environmental Stewardship Agreement areas (Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2014.)

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APPENDIX 1 Local Character Areas

A number of landscape character areas (LCAs) have been defined for Wiltshire (Land Use Consultants 2005) and the project area includes five of these (Fig 4). Bradford-on-Avon, Corsham and the western part of Chippenham lie in the Malmesbury-Corsham Limestone Lowland (LCA 16a), which extends further east than the Cotswolds NCA. This comprises gently undulating farmland with a mix of permanent pasture and arable, a strong network of hedgerows but also some dry-stone field boundaries, occasional woodland and numerous rivers in shallow valleys. Large geometric fields typical of 18th and 19th-century enclosure are common, with smaller irregular fields close to settlements. Traditional buildings are often of local limestone while historic parkland and estates are also found.

The Avon Open Clay Vale (LCA 12b) runs from the eastern side of Chippenham through Melksham to the northern side of Trowbridge. This comprises the level land of the Avon floodplain and is generally pastoral with some arable in large geometric fields bounded by hedgerows or drainage channels. Buildings are in varied materials of brick, render and stone, while the historic use of the area for transport is evident in its canals.

The southern part of the project area, south of Bradford-on-Avon and Trowbridge, lies within the Trowbridge Rolling Clay Lowland (LCA 11c). It comprises gently rolling lowland with mixed arable and pastoral land use, medium to large rectangular fields with a network of hedgerows, woodland blocks including some ancient woodland, and a small number of meadows. The portion of this LCA within the project area contains the A350 and a concentration of railway lines, and is described as 'considerably less rural and tranquil than the east of the area'.

The other two LCAs cover the area around Sandy Lane: the Swindon-Calne Rolling Clay Lowland (LCA 11a) has similar characteristics to LCA 11c, while the Bowood Greensand Hills (LCA 7c) is an area of rolling hills which supports a large proportion of woodland, some of which may be a remnant of the former Chippenham Forest (see below). It is the most northerly part of a discontinuous zone of greensand hills that contains country houses and estates set within landscaped parkland and has a distinctive pattern of settlement, with villages of stone dwellings hidden in the deep valleys, ancient sunken lanes and Iron Age fortifications on hill tops. The hill slopes are pastoral with an intact hedgerow network, while the more level high ground has large-scale arable fields.

More detailed local landscape character assessments are available for the northern (White Consultants 2004), southern (Chris Blandford Associates 2007) and eastern (Kennet District Council 2005) parts of the project area. These broadly subdivide the county LCAs as follows:

Limestone Lowland

- Hullavington Rolling Lowland

  A rural area of gently rolling hills and shallow valleys north and west of Chippenham. Medium to large fields with irregular medieval shapes and more regular shapes from later enclosures. A number of villages but few other settlements and a dispersed pattern of farms. Cropmarks and earthwork remains are well-distributed across the character area.

- Corsham Rolling Lowland

  An urban fringe and mixed agricultural landscape around and south of Corsham with a strong rural character in the quieter areas, enhanced by an intact pattern of hedges. Earthwork remains of field boundaries dominate the aerial record in this area, with the exception of the eastern fringe which includes the investigated site at Catridge.

- South Wraxall Limestone Lowland

  A rural area with a mix of pasture and arable, in a patchwork of medium-sized irregular fields bounded by mostly intact hedgerows. Cropmarks dominate the aerial record, including the surveyed enclosure at Little Chalfield

- Broughton Gifford Limestone Lowland

  A rural area with a mix of pasture and arable farmland west of Melksham. Small irregular fields enclosed by generally intact hedgerows. A few woodland blocks include the ancient Great Bradford Wood in a coil of the River Avon. Linear villages and scattered farms. Earthwork remains, including those surveyed at Great Chalfield, and a few cropmarks are well-distributed across the area, with ridge and furrow common in the east.

Open Clay Vale

- Avon Valley Lowland

  A mixed agricultural landscape on the east side of Chippenham, with arable on the freer draining land and wet grassland adjacent to the watercourses. Hedges are mostly intact. Scattered settlements and dwellings. Cropmarks and earthwork remains are well-distributed across the area (including the excavated enclosure at Kellaways), apart from a gap to the south-east of Chippenham; ridge and furrow is more common to the north.

- Avon Clay River Floodplain

  A patchwork of rough grassland and arable fields on the floodplain between Bradford-on-Avon and Lacock, with few hedgerows visible but some dry stone

walls. Settlement is generally sparse with occasional scattered farmsteads. Staverton cereals factory is a dominant landmark. A patchy distribution of cropmarks, earthworks and ridge and furrow includes the barrow cemetery at Boundary Farm.

- Melksham Open Clay Vale

  A predominantly flat area east of Melksham, dominated by arable and pasture farmland, with a medium-sized regular field pattern and mature hedgerows. The landscape has an urbanised feel in proximity to Melksham and Bowerhill with scattered farmsteads elsewhere. Earthwork remains and to a lesser extent ridge and furrow are mainly restricted to the southern part of the character area.

- Semington Open Clay Vale

  A predominantly flat area between Melksham and Trowbridge with an urban fringe character around the Semington Brook and the Kennet and Avon Canal, which provides a distinctive corridor. A mixture of arable fields and pasture with fragmented field boundaries. Cropmarks are relatively common (including the excavated sites at Paxcroft); ridge and furrow is mainly found in the northern part of the area.

Rolling Clay Lowland

- Wingfield Rolling Clay Lowland

  A generally rural area west of Trowbridge with a mixture of pasture and arable farmland and a scattering of farmsteads and manors. Medium to large irregular fields bounded by hedgerows. Earthworks of water meadows dominate the aerial record.

- North Bradley Rolling Clay Lowland

  An area south of Trowbridge with a mixture of pasture and arable farmland. Generally small irregular fields bounded by mainly intact hedgerows. Farms tend to be clustered around the villages. Earthworks of water meadows dominate the aerial record, with some ridge and furrow.

- Green Lane Rolling Clay Lowland

  An area east of Trowbridge with a relatively regular patchwork of arable and pasture fields, bounded by generally intact mature hedgerows, to the north, and predominantly arable farmland with low, trimmed hedgerows to the south, along with two large areas of woodland. Away from the town settlement is restricted to scattered farmsteads. Water meadow and settlement earthworks (including those surveyed at Lower Paxcroft) dominate the aerial record, with ridge and furrow mainly in the northern part of the character area.

- West Ashton Rolling Clay Lowland

  An area of strongly rolling topography with predominantly arable fields of varying size delineated by mature hedgerows. Small areas of woodland throughout the area and the parkland of Rood Ashton Hall, alongside isolated farmsteads. Earthworks dominate the aerial record, with patchy ridge and furrow.

- Biss Clay River Floodplain

  A combination of rough grassland and meadow/pasture line the channel either side of Trowbridge, with arable farmland at greater distance from the river. Field boundaries are low to medium-height hedgerows. Farmsteads are scattered throughout the area. Earthworks of water meadows dominate the aerial record, with some ridge and furrow.

- Hilmarton Rolling Lowland

  A low-lying area of mixed agriculture (mainly pasture but with arable on lighter soils) with small settlements and a patchwork of small to medium-sized fields with hedged boundaries. The small part of this character area within the project area includes the dense concentration of cropmarks and earthworks around Verlucio.

<u>Greensand Hills</u>

- Bowood and Bowden Parkland

  A rolling hill landscape of parkland, woodland and enclosed pasture with a largely intact hedgerow system on the lower slopes, giving way to fences and woodland surrounding arable fields on the higher ground. Cropmarks and earthwork remains are well-distributed across the character area.

- Bowden Hill

  The western slopes of Bowden Hill, covered by a mixture of farmland and rough grassland, with small irregular fields bounded by hedgerows. Patches of the slopes and their tops are dominated by woodland. Sparse settlement pattern. A small area with mainly earthwork remains.

- Spye Parklands

  The area is dominated by the woodland of Spye Park and the surrounding estate farmland, with small areas of heathland on the sand and damp woodland on the heavier clays. Cropmarks and earthwork remains are well-distributed across the character area.

APPENDIX 2 List of Scheduled Monuments

Monument Number (*=Old County No)	Name	NGR	Period	At Risk?	Principal Vulnerability	Condition from APs	AP date	Comments
EARTHWORKS AND BURIED SITES								
1010908	Lanhill barrow	ST 8774 7472	Neolithic	N	No known threat	Optimal	Sep 2012	Under long grass
1019731	Earthwork enclosure in Great Bradford Wood	ST 8457 6052	Prehistoric	N	No known threat	Unknown	Apr 2005	Under dense woodland and not visible on recent APs though lidar shows earthworks. Vehicular track across site appears in heavy use on 2008 APs
1003010*	Roman road in Spye Park	ST 9599 6755	Roman	Y	Arable clipping	No data		No APs since last HAR visit (May 2006)
1004723*	Nuthills Roman villa	ST 9696 6833	Roman	Y	Arable ploughing	Extensive significant problems	Jul 2013	Both land parcels under cereal crop
1003785*	Wansdyke: 420m SE of Broads Green to 240m NE of Paddock Farm	ST 9929 6719 to 9988 6717	Early Medieval	N	Animal burrowing (localised/limited)	No data		No APs since last HAR visit (Jul 2008)
1013876	Moated site and fishponds SE of Rowden Farm	ST 9186 7201	Medieval	Y	Plant growth	No data		No APs since last HAR visit (May 2004)
1014813	Monastic grange at Barton Farm	ST 8232 6047	Medieval	N	Vandalism	No data		No APs since last HAR visit (May 2006)
1018428	Medieval settlement of Sheldon	ST 8838 7410	Medieval	N	Plant Growth	Optimal	Sep 2012	In rough pasture with part of site under tree cover
1020232	Medieval settlement of Whaddon	ST 8818 6144	Medieval	N	No known threat	Generally satisfactory but with minor localised problems	Apr 2008	On common ground under mixed scrub. NE part appears to have been truncated by extension of property boundaries between 1976 and 2002.

STANDING BUILDINGS AND MONUMENTS								
1004724*	Village cross, Lacock	ST 9158 6844	Medieval?					
1018429	Chapel at Sheldon Manor	ST 8868 7414	Medieval					
1018383	Lacock Bridge	ST 9222 6810	Medieval					
1018382	Bridge 170m west of Lacock Methodist Chapel	ST 9231 6809	Medieval					
1005663*	Barton Bridge, Bradford-on-Avon	ST 8227 6055	Medieval?					
1005659*	Bradford-on-Avon Bridge	ST 8262 6091	Medieval?					
1018384	Tithe barn and lock up in East Street, Lacock	ST 9166 6845	Medieval & Post-medieval					
1018386	Dovecote at Corsham Court	ST 8731 7076	Post-medieval					
1005662*	Dovecote at Wick Farm	ST 9025 6792	Post-medieval?					
1019734	Lock up NE of Church Farm	ST 8723 5927	Post-medieval					
1018387	Dovecote at Easton House	ST 8896 7043	Post-medieval					
1019838	Conduit house 50m north of St Anne's Church	ST 9377 6798	Post-medieval					

APPENDIX 3 Aerial Investigation & Mapping Methodology, Scope and Sources

Introduction

The distribution and type of archaeology recorded are defined by the nature of the evidence visible on aerial photographs. This usually includes surface features defined by ditches, banks or stonework and sub-surface remains visible as cropmarks, soilmarks or parchmarks. Features defined as structures in a military or industrial context are also routinely recorded. The project scope included those features that were extant on historic aerial photographs but have since been plough-levelled or removed.

Oblique and vertical photographs were scanned and then rectified using the specialist AERIAL 5.29 software. Control was derived from either the 25cm resolution PGA orthophotography or Ordnance Survey 1:2500 scale MasterMap® vector data. Rectified images, georeferenced orthophotography and lidar were inserted directly into AutoCAD Map 3D where archaeological features were mapped.

The accuracy of rectified images is normally to within ±2m of the source used for control but this error may be larger in areas with large topographic variation. The accuracy of the PGA orthophotography and Environment Agency lidar is within 10–15cm. Consequently the accuracy of mapped features, relative to their true ground position, will depend on the source used for mapping. This may be in the range of ±5–15m for images rectified using an OS base map but will be sub-metre accurate for those features mapped from orthophotography and lidar.

Archaeological scope

Cropmarks, parchmarks, soilmarks

All sub-surface archaeological remains visible as cropmarks, parchmarks or soilmarks were mapped and recorded.

Earthworks

All archaeological earthworks visible on aerial photographs were mapped and recorded. This included features visible as earthworks on early photographs, which have since been levelled and archaeological features depicted on OS maps that are within the NMP sphere of interest.

Buildings and structures

The foundations of ruined buildings visible as cropmarks, soilmarks, parchmarks, earthworks or stonework were mapped and recorded. Standing roofed or unroofed buildings were not normally mapped. The exceptions were in specific archaeological contexts such as industrial and military complexes (see below), or when associated with other cropmark and earthwork features.

Ridge and furrow

Medieval and post-medieval ridge and furrow were mapped and recorded, regardless of preservation. The extent of a contiguous block of ridge and furrow (including plough headlands) was defined by a closed polygon.

Post-medieval field boundaries

Post-medieval field boundaries (upstanding or levelled) that were depicted on OS first edition or later mapping were not generally mapped. The exception to this was where they formed part of an earlier field system that was not depicted by the OS.

Parkland, landscape parks, gardens and country houses

Artificial elements of parkland, landscape parks and gardens were mapped and recorded. Modern or 20th-century parks and gardens were not mapped.

Industrial features and extraction

Widespread and common small-scale extraction for local use, such as chalk pits, was not mapped. Extraction measuring over 1ha in area was defined as an extent-of-feature. Any extraction that directly impinged on an archaeological monument was mapped.

Industrial complexes were mapped as an extent-of-feature and the main elements of the process depicted. This includes any roofed or unroofed structures that are still upstanding.

Limekilns and their associated quarries (regardless of size) were mapped and recorded in the same record.

Transport

Major transport features (canals and main railway lines) were not mapped. Smaller features such as tramways were mapped and recorded, especially in the context of associated features.

20th-century military features

Military features up to and including the Cold War were mapped and recorded. This includes any roofed or unroofed structures that are still upstanding.

Natural features

Natural features which are geological or geomorphological in origin were not mapped. If there was risk of confusion in contexts with other archaeological features, then the natural features were mentioned in the text record.

Sources

During the aerial investigation phase of the project the following sources were consulted:

Images

- Historic England Archive Vertical photographs
- Historic England Archive Oblique photographs (prints and digital)
- West Wiltshire and Swindon HER aerial photographs
- The Cambridge University Collection of Aerial Photography (CUCAP)
- 25cm orthophotography supplied through the Pan Government Agreement (PGA)
- Google Earth
- Environment Agency lidar (1m and 2m resolution)

Monument datasets

- West Wiltshire and Swindon HER
- National Record of the Historic Environment (NRHE) database

Other sources

- Ordnance Survey modern and historical mapping
- Existing NMP data
- National Soil Resources Institute (NSRI) soilscapes
- Administrative boundaries
- Scheduled Monument data
- Heritage at Risk data
- Existing field surveys
- Published and internal reports

Photographic sources

All available vertical and oblique aerial photographs held by the Historic England Archive in Swindon were consulted; the coversearch was carried out on 25 Jun 2013 (loan refs 76385 and 76386). A total of 3839 vertical and 1572 specialist oblique prints were examined. The vertical photography ranged in date from 1940 to 2001 and the obliques from 1924 to 2012. In addition, further digital oblique photographs, taken in 2013, were made available locally as they were not accessioned into the Historic England Archive at the start of the project.

Prints were loaned to the project by the Cambridge University Collection of Aerial Photography (CUCAP) which is administered by the Department of Geography.

The photographic collection of Wiltshire and Swindon HER was accessed at the county offices in Chippenham in October 2013. Where additional details were visible photographs were scanned for rectification and mapping.

Orthorectified vertical photographs were supplied to Historic England by Next Perspectives™ through the Pan-Government Agreement (PGA) as 1 sq km tiles in TIFF format, covering the entire project area. Additional vertical photography hosted on Google Earth was also routinely consulted.

Reconnaissance and oblique photographs

Archaeological aerial reconnaissance in the project area has been carried out by Historic England's reconnaissance team (and its predecessors), but also by CUCAP, Roy Canham (formerly of Wiltshire County Council), and other regional flyers. Historic England aerial reconnaissance covers a range of topics including archaeological earthworks or buried features seen as cropmarks, scheduled monuments (to inform condition assessments), parks and gardens, and targets linked to thematic work such as Ministry of Defence sites, mills or farms. Aerofilms oblique photographs tended to focus on commercial targets, including dairies and factories in the area. Therefore, the aerial photographs consulted for the project covered a range of subjects but due to the archaeological focus of the project and the land use in the area most of the monuments recorded and mapped from oblique photographs were buried later prehistoric or Roman sites revealed as cropmarks.

The two largest archives, the Historic England Archive and CUCAP, hold their photograph catalogues digitally and analysis of their coverage and scope is straightforward. However, the oblique photographs held by Wiltshire and Swindon HER are not catalogued and are therefore not included in this analysis (though their photographs were consulted as part of the mapping stage of the project). Oblique photographs held by the Historic England Archive ranged in date from 1924 to 2012 and were of varying quality and usefulness while CUCAP photography was limited, with only 59 frames, dating from 1948 to 1966. The densest concentrations of photographs are of Bradford on Avon, Trowbridge and Lacock where 76 to 159 frames exist per sq km. However, over the whole project area the number of oblique photographs is relatively low and 47% of the 1km squares within the project area have no oblique photographic cover (Fig A1).

These relatively low oblique photograph densities are surprising given the short transit time from Oxford airfield where Historic England's southern reconnaissance team is based. However this area has been relatively difficult to access given the proximity of three military airfields (RAF Brize Norton, RAF Fairford and RAF Lyneham) and their associated Military Aerodrome Traffic Zones (MATZ) and Control Zones (CTR). Although it is not impossible to enter these controlled zones, attempts to do so can be difficult and may need to be pre-arranged (Carter 1998, 96). It is therefore unsurprising that the area is largely bypassed, with north–south transits occurring either to the east of Swindon or over the Bristol channel (D. Grady, pers comm).

The MATZ and CTR surrounding RAF Lyneham (Fig A2) affected approximately 650 sq km of airspace (including *c* 115 sq km or almost 60% of the project area) with access limited to above 3500ft. This makes the area largely unsuitable for archaeological aerial

reconnaissance, for which altitudes of between 1500 and 2500ft are preferred. Analysis of oblique photographs held by the Historic England Archive (excluding CUCAP) showed that the part of the project area covered by the restricted airspace has an average of 5.9 photographs per sq km, compared with 8.5 per sq km in the rest of the area.

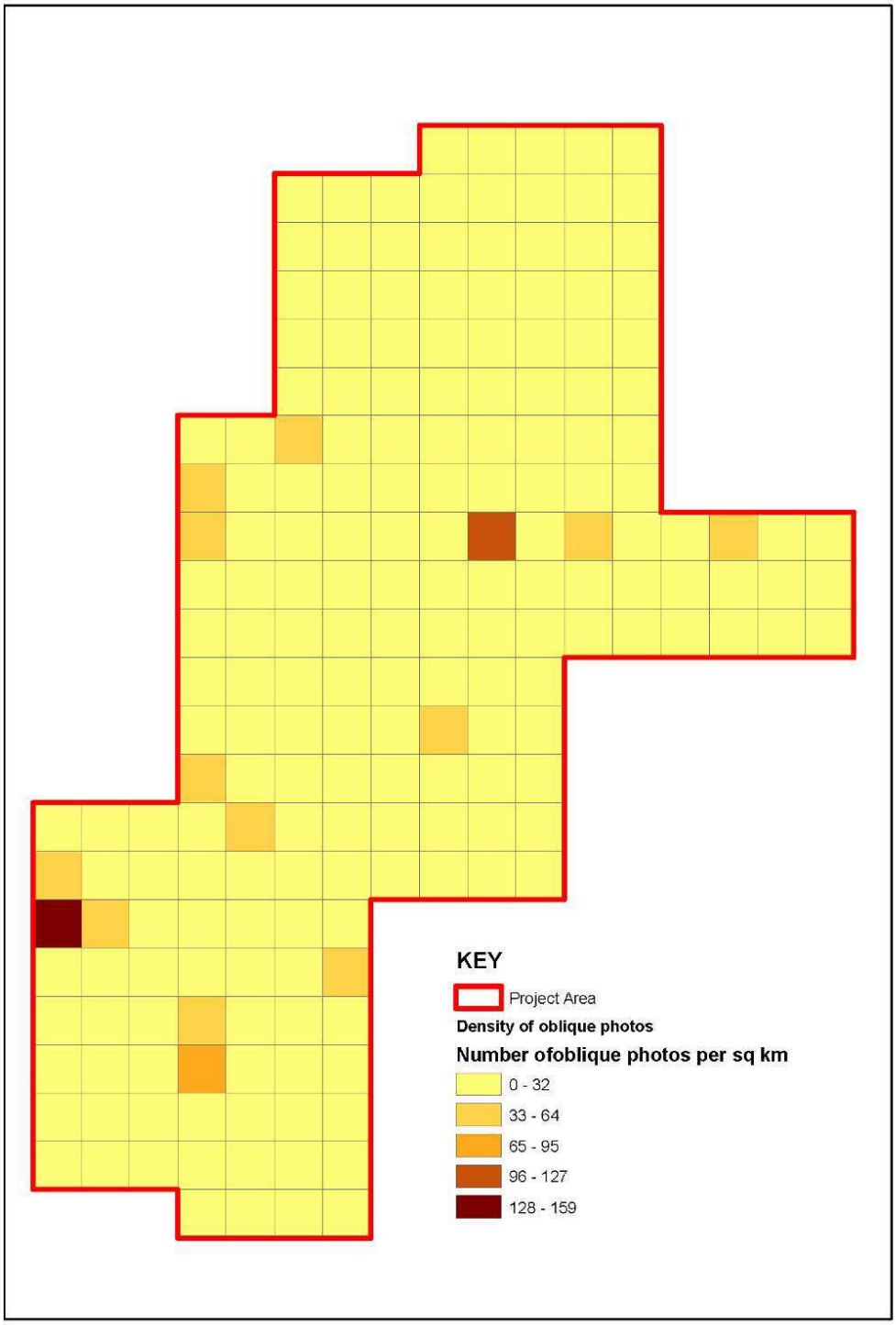

Fig A1: Number of oblique photographs per square km held by the Historic England Archive and CUCAP (© Historic England)

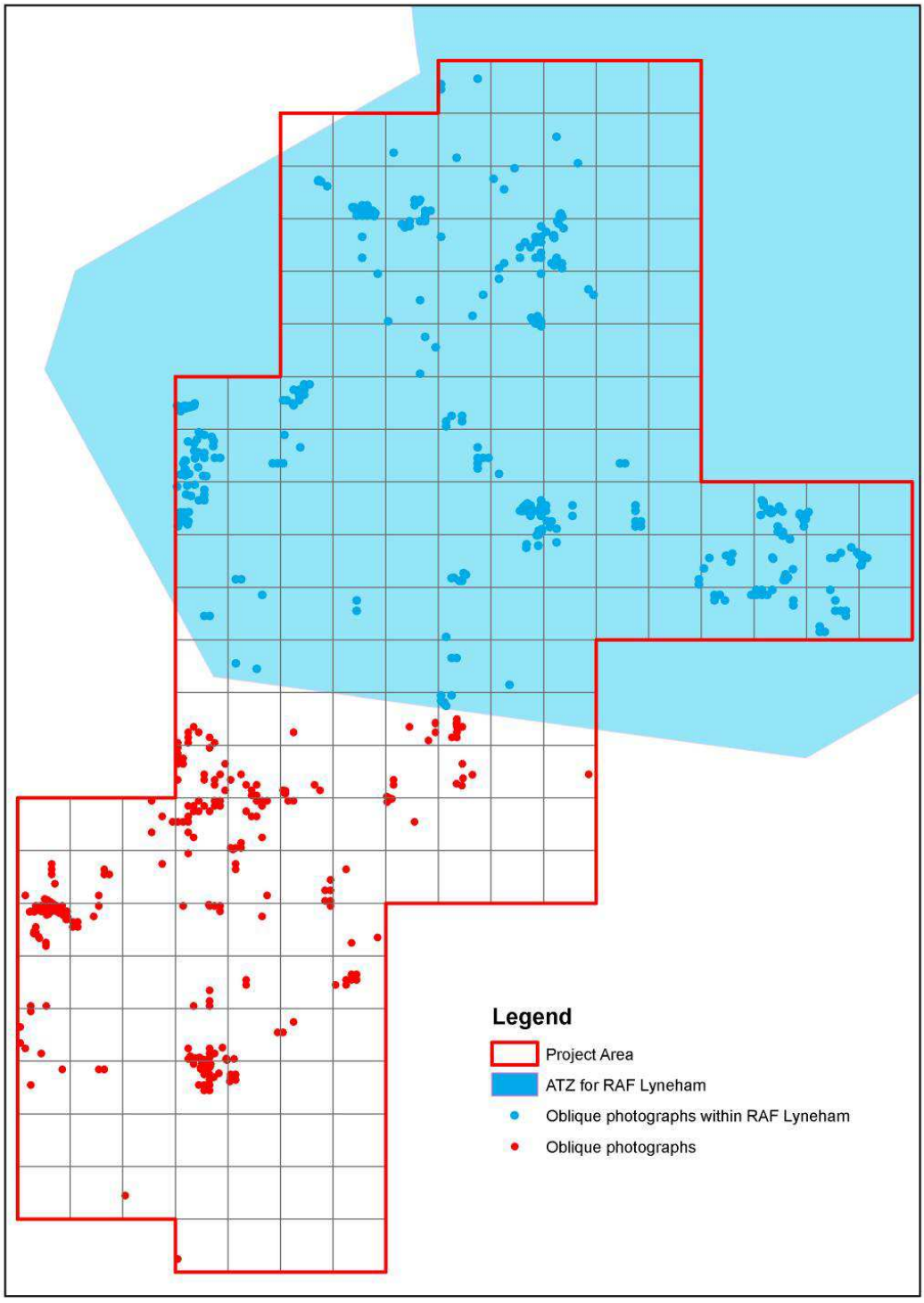

Fig A2: Centre point of the oblique photographs held by the Historic England Archive. Former areas of restricted access for civil aircraft around RAF Lyneham are shown in blue. (© Historic England)

Fortunately for this project, RAF Lyneham was officially disestablished on 30th September 2011 and the closure of the airfield coincidentally combined with good weather and ground conditions for archaeological prospection. Reconnaissance flights

in June and July 2013 therefore provided excellent archaeological returns. These photographs allowed the identification of numerous new cropmarks and helped record additional detail at known sites. A total of 48 monuments, all seen as cropmarks, were recorded or partially recorded as a result of these photographs. These discoveries, combined with the low densities of photographs described above, make this area a prime candidate for future systematic archaeological reconnaissance.

Vertical photographs

Vertical coverage provided by the Historic England Archive ranged in date from 1940 to 2001, with Pan-Government Agreement (PGA) imagery taken as late as 2010; these photographs are non-targeted and provide landscape-scale coverage. They were supplemented by Google Earth imagery ranging in date from 1999 to 2009. Although CUCAP have vertical photographs in their collection, only 15 frames were located within the project area, of which nine were available for loan.

Vertical photographs are acknowledged as a key resource for offsetting the possible bias from the study of targeted oblique photographs alone (Cowley 2002, 264). However, it should be remembered that vertical photographs are largely taken for non-archaeological purposes, often at inappropriate times of year. Factors influencing the visibility of archaeological features include the quality of the negative/print, the scale of the image, vegetation cover, state of the crop or pasture and for earthwork remains, the angle and direction of the sun. Stereoscopic pairs of vertical photographs are especially useful for the recording of archaeological earthworks as they can be viewed in 3D. The comprehensive cover and date range of the verticals, especially in the Historic England archive, also provide a historic overview of land use from the 1940s, particularly before arable intensification had levelled many earthworks (see below).

Fig A3 shows the density and distribution of vertical frames per sq km based on the centre point of each frame. This is only indicative of coverage, as most vertical frames will cover more than 1 sq km, but it reveals broad trends in their distribution. The highest densities of photographs coincide with the urban areas of Chippenham, Trowbridge, Melksham and Bradford-on-Avon. The course of the modern road corridors, the A350 and A4, as well as the route of the Kennet and Avon canal, have also seen multiple sorties. In these areas vertical coverage is between 29 and 35 frames per sq km. This contrasts with the central zone of the project area, where on average there are between 2 and 19 frames per sq km.

Vertical photographs were used extensively for the AIM element of the project. Medieval and post-medieval earthworks were largely recorded from historic vertical photographs. Most of these features relate to farming and include extensive ridge and furrow, field boundaries and water meadows. Settlement remains were also largely recorded from vertical prints. This contrasts with the Upland NAIS project where these types of remains were largely recorded from lidar (Oakey *et al* 2015). However, in lowland areas like West Wiltshire many features were levelled by arable intensification before the date of the lidar survey.

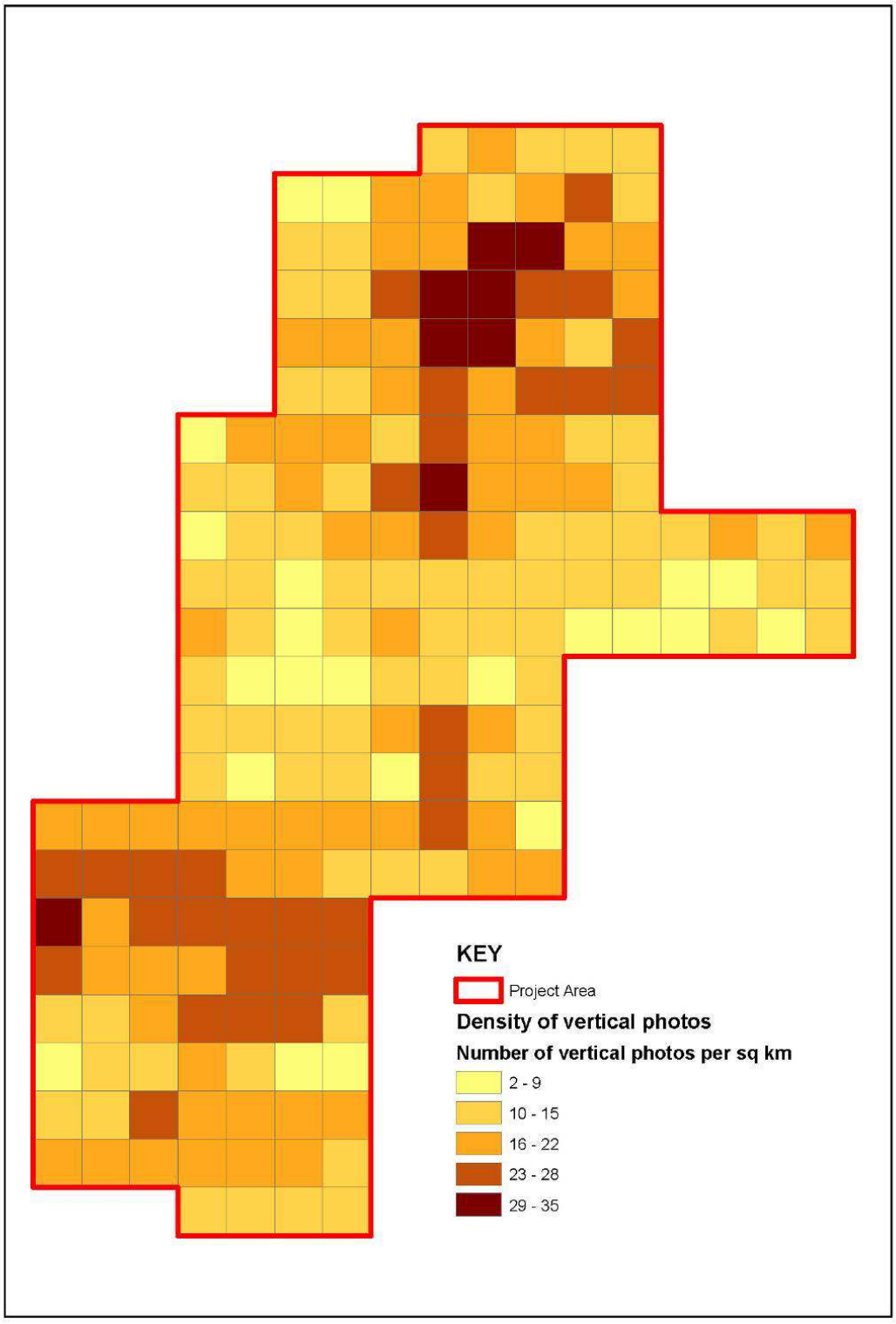

Fig A3: Number of vertical photographs per square km held by the Historic England Archive (© Historic England)

Some of the most significant gaps in the AIM results coincide with the towns, where vertical coverage is highest. Historically, NMP projects have avoided urban areas, largely because the main elements of the historic environment are either still standing

or in use, or are buried and invisible on aerial photographs (Horne 2009, 25). However, the 1940s vertical photographs recorded numerous military structures in urban areas that were rapidly demolished after the war and would otherwise have gone unrecorded.

Lidar

Single-direction hillshade lidar tiles are supplied to Historic England by the Environment Agency as 2D JPEG images. These tiles were assessed alongside the photographic sources where appropriate.

Lidar data were supplied to the project by the Environment Agency as 1m-resolution gridded ASCII data. These were processed in-house by Simon Crutchley using 16-direction hillshade and Principal Components Analysis (PCA) to produce 2D GeoTIFF images which were used in AutoCAD Map. The Environment Agency coverage encompassed a north-east to south-west swathe covering approximately 165 sq km (83% of the project area; Fig A4). The lidar tiles were processed using 16 direction hillshade which creates a composite image, lit from 16 different angles. This method allows a landscape to be viewed under numerous different lighting conditions, including directions from which it might ordinarily never be lit.

Lidar is a useful tool for the identification and mapping of archaeological earthworks, especially when combined with photographic resources to provide additional clarity. As lidar is a georeferenced dataset it does not have to undergo the process of rectification necessary for oblique or vertical photographs. It is often used to determine the most recent condition of a monument as it post-dates most vertical coverage, with the exception of PGA orthophotography which cannot be viewed in 3D.

Approximately 40% of archaeological features recorded during the project were mapped from lidar. This number is low when compared to upland areas, where lidar mapping rates reach 80% (Oakey *et al* 2015), but surprisingly high for a lowland area where earthworks are often levelled. Ninety-one per cent of the features recorded from lidar are medieval or post-medieval remains, principally ridge and furrow, field boundaries and water meadows. The lowest archaeological monument densities were recorded in the west of the project area, where lidar coverage was lacking. This may reflect a true archaeological distribution or result from the lack of imagery in the area.

Methodology

Evaluation

Where appropriate, aerial photographs were examined under magnification and stereoscopically. Digital images where no print was provided and lidar data were viewed on a computer screen.

Rectification

Scanned or digital images were rectified using AERIAL 5.29. Control was derived from either the Ordnance Survey 1:2500 MasterMap® vector data or PGA orthophotography.

Digital terrain models derived from 5m-interval contour data supplied by Next Perspectives were used to improve the accuracy of the rectification.

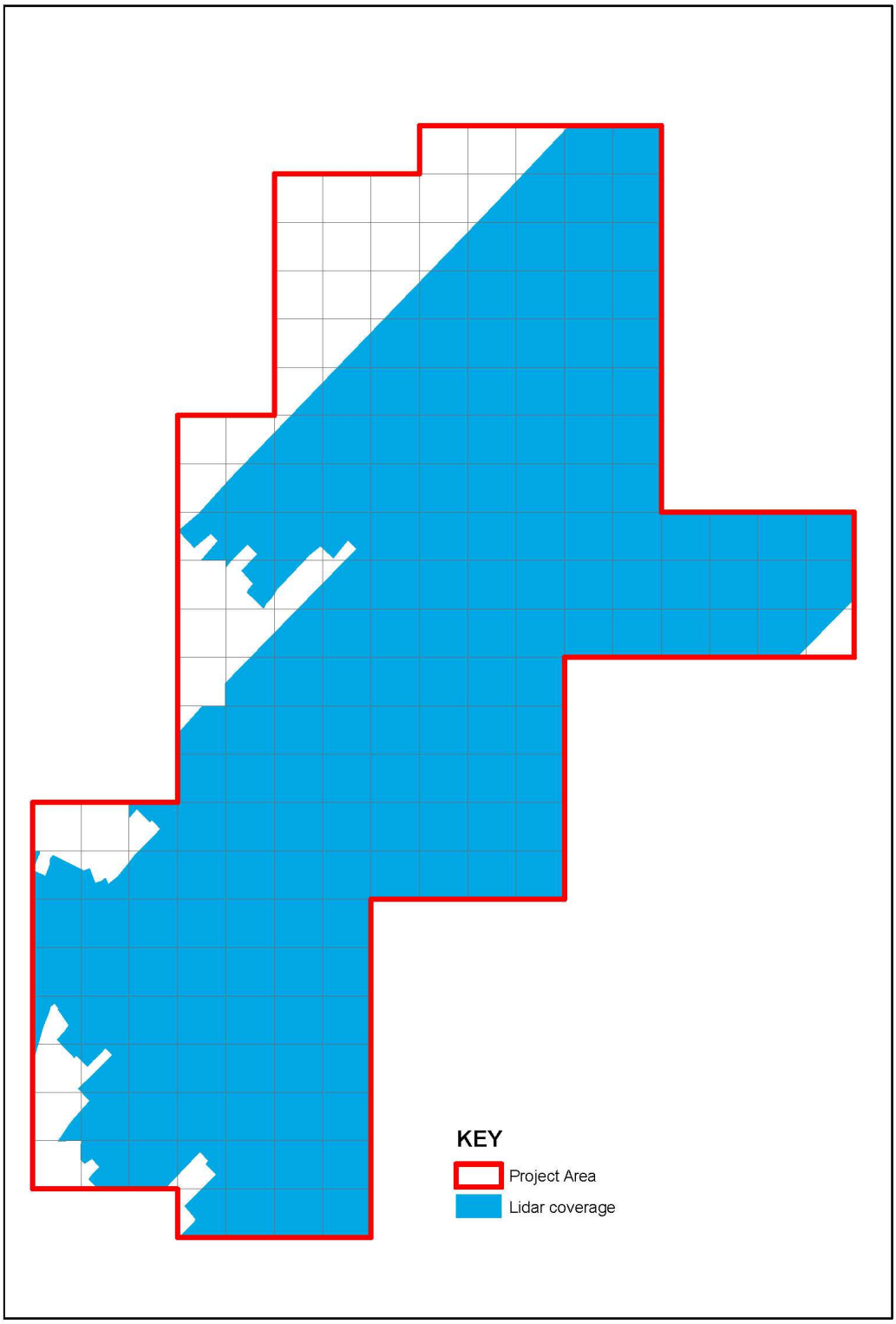

Fig A4: Coverage of 1m-resolution Environment Agency lidar

Mapping

Rectified and georeferenced imagery (lidar and PGA orthophotography) were loaded into AutoCAD using a world (TFW) file. If required for mapping, Google Earth images were aligned to the 1:2500 Ordnance Survey map base.

All archaeological features were mapped as closed polygons in AutoCAD. Features such as scarps or large platforms were mapped using a schematic T-hachure convention. The extent of a contiguous block of ridge and furrow was mapped as a closed polygon and a single polyline, in the form of an arrow, which indicated the form and direction of ploughing.

An object data table was attached to all features which includes the following information:

Attribute	**Description**	**Sample data**
MONARCH*	NRHE Unique Identifier (UID)	44125
PERIOD	Date of feature (HE Thesaurus). Single or dual indexed terms	IRON AGE/ROMAN
NARROW_TYPE	Monument Type (HE Thesaurus). Specific monument type for individual features	HUT CIRCLE
BROAD_TYPE	Monument Type (HE Thesaurus). Broader monument type to enable grouping of individual features	SETTLEMENT
EVIDENCE_1	Form of remains (HE Thesaurus) as seen on PHOTO_1	EARTHWORK
PHOTO_1	Source feature was mapped from (aerial photograph or lidar)	LIDAR SD6383 DSM 12-20-MAY-2009
EVIDENCE_2	Form of remains (HE Thesaurus) as seen on PHOTO_2	EARTHWORK
PHOTO_2	Latest available source (aerial photograph or lidar) to give indication of current state of preservation. Not applicable for cropmark sites	NMR 28365_015 11-DEC-2012

*MONARCH is a former name of the National Monuments database now known by the umbrella term NRHE. The table retains the former name to facilitate download into the Historic England GIS and for delivery and use by the relevant HER.

Recording

New records were created and existing records enhanced in the NRHE database to Historic England Data Standards. Where possible, records were concorded with the relevant HER data.

Additional sources

Datasets held on the Historic England GIS (e.g. historic maps) as well as HER data were used to inform interpretation, mapping and recording. Where higher level surveys existed, these were used to aid interpretation.

Quality Assurance

Quality assurance was undertaken by AIM team members on a representative sample of mapping and NRHE records. This was undertaken both within and between the York and Swindon offices to ensure consistency.

Data archive and dissemination

The aerial mapping stage of the project remained open until all project stages were complete to allow the results of the other work to feed back into the mapping. An AutoCAD drawing file of the mapping has been deposited with the Historic England Archive in Swindon (MD003247). Data were also supplied to project stakeholders (Wiltshire and Swindon HER) for incorporation into their GIS systems.

NRHE records created and amended by the project are available via PastScape (http://www.pastscape.org.uk) and signposted via Heritage Gateway (http://www.heritagegateway.org.uk).

APPENDIX 4 Monument Types

AIR RAID SHELTER
AIRCRAFT OBSTRUCTION
ALLOTMENT
AMMUNITION DUMP
ANTI TANK BLOCK
ANTI TANK CUBE
ANTI TANK DITCH
ANTI TANK GUN EMPLACEMENT
ARMAMENT DEPOT
BANK
BANK (EARTHWORK)
BARRAGE BALLOON SITE
BARROW CEMETERY
BLAST WALL
BOUNDARY
BOUNDARY BANK
BOUNDARY DITCH
BRICKWORKS
BRIDGE
BUILDING
BUILDING PLATFORM
CARRIAGEWAY
CAUSEWAY
CROFT
CURVILINEAR ENCLOSURE
D SHAPED ENCLOSURE
DAM
DEPOT
DITCH
DITCHED ENCLOSURE
DOUBLE DITCHED ENCLOSURE
DOVECOTE
DRAIN
DRIVE
EARTHWORK
EMERGENCY WATER SUPPLY
ENCLOSURE
EXTRACTIVE PIT
FIELD BOUNDARY
FIELD SYSTEM
FIELD SYSTEM/SETTLEMENT
FIRING RANGE
FISHPOND
GARDEN
GARDEN FEATURE
GARDEN/HOUSE
GRAVEL PIT
GRENADE RANGE
HILLFORT
HOLLOW
HOLLOW WAY
HOUSE PLATFORM
HUT
LANDSCAPE PARK
LEAT
LIME KILN
LIMESTONE QUARRY
LONG BARROW
LYNCHET
LYNCHET/FIELD BOUNDARY
MANOR HOUSE
MILITARY BASE
MILITARY BUILDING
MILITARY CAMP
MILITARY DEPOT
MILITARY INSTALLATION
MILITARY ROAD
MILL POND
MILL RACE
MINE SHAFT
MOAT
MOUND
NARROW RIDGE AND FURROW
OVAL BARROW
PARK PALE
PATH
PILLBOX
PILLOW MOUND
PIT
PLATFORM
PLAYING FIELD
PLOUGH HEADLAND
POND
QUARRY
RAILWAY SIDING
RAMP
RAMPART
RECTANGULAR ENCLOSURE
RECTILINEAR ENCLOSURE
RIDGE AND FURROW
RING DITCH
ROAD

ROADBLOCK
ROUND BARROW
ROUND HOUSE (DOMESTIC)
SETTLEMENT
SEWAGE WORKS
SIEGEWORK
SPIGOT MORTAR EMPLACEMENT
SPOIL HEAP
SQUARE ENCLOSURE
STACK STAND
STONE QUARRY
TERRACED GARDEN
TOFT
TOWN
TRACKWAY
TREE ENCLOSURE RING
TRENCH
VENTILATION SHAFT
VILLA
WAR PRODUCTION FACTORY
WATER CHANNEL
WATER MEADOW
WORKERS HOSTEL

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