The Aggregate Landscape of Somerset: Predicting the Archaeological Resource

Aggregates Levy Sustainability Fund:
English Heritage Project Number 3994PD

Archaeological Aerial Survey in the Central Mendip Hills

Report Author: Krystyna Truscoe, Somerset County Council

SOMERSET County Council Heritage

ENGLISH HERITAGE

SUMMARY

The Aggregate Landscape of Somerset: Predicting the Archaeological Resource project was commissioned by English Heritage in 2005. It was financed by the Aggregates Levy Sustainability Fund (ALSF), which is managed by the Department of Food and Rural Affairs (Defra). The project as a whole comprised two components: a largely HER based assessment of the archaeological resource within areas of past and present aggregate extraction in the county of Somerset and archaeological aerial surveys and analysis of two aggregate producing areas, which were carried out to the National Mapping Programme (NMP) standards developed by English Heritage.

The initial phase of the aerial survey was targeted at two trial areas chosen from the aggregate character areas identified in the assessment: the eastern Mendip Hills (Carboniferous Limestone) and the Somerset Levels (Burtle Beds). This report covers the continuation of the survey in the central part of the Mendip Hills character area. This phase of the aerial survey concentrated on the part of the character area lying within the Mendip Hills Area of Outstanding Natural Beauty (AONB) and was carried out between April 2006 and January 2008. The full extent of the AONB that lies within the Somerset county boundary was covered. Two strands of funding were available: ten months from the AONB and eleven months funded by the ALSF.

Several main themes were apparent from the results of the aerial survey: a pattern in settlement that possibly follows through from the later prehistoric periods to the medieval period; the significance of the landscape in the Neolithic and Bronze Age, when a concentration of field monuments are constructed; an increase in use of the upland pasture for grazing of sheep in the medieval period; the effects of agricultural intensification in the post medieval period, leading to enclosure of the common land and the advent of permanent settlement on the central plateau; the effects of the post medieval lead mining industry on the landscape; and the growth of aggregate extraction in the modern period, with massive post-Second World War expansion of the limestone quarries in the southern part of the survey area.

There was an increase in sites recorded on the Somerset HER for the east Mendip Hills project area of 52% as compared to an increase of 58% for the central Mendip area. Both figures demonstrate the potential for recording new archaeological sites in the Mendip Hills using the NMP methodology. The aerial survey has resulted in both an increase in knowledge of the central Mendip Hills and a dataset which will be useful for future archaeological work. In particular, mapping the lead mining remains in detail has enabled comparison of areas of areas which followed different patterns of extraction. Information of this kind has already contributed to an English Heritage multi-disciplinary study in the Mendip AONB and should be useful for future analysis of both the lead mining and the archaeology of the Mendip Hills in general.

Cover photograph: NMR ST 5056/64 (24331/27) 07-SEP-2006 © English Heritage (NMR)

ACKNOWLEDGEMENTS

I would like to thank: Richard Brunning, Steven Membery, Chris Webster and all the Historic Environment Service team at Somerset County Council; Hannah Firth for her collaboration on the first phase of this project; the Aerial Survey team of English Heritage, particularly Helen Winton, for her help in preparing this report and continuing advice, and Simon Crutchley for his preparation of the lidar and advice on its use; the staff of the National Monuments Record; and, the Aggregates Levy Sustainability Fund and Mendip Hills Area of Outstanding Natural Beauty authority.

CONTENTS

FIGURES

1 INTRODUCTION

The Aggregate Landscape of Somerset: Predicting the Archaeological Resource project was commissioned by English Heritage in 2005. It was financed by the Aggregates Levy Sustainability Fund (ALSF), which is managed by the Department of Food and Rural Affairs (Defra). The fund was introduced in 2002 to attend to issues arising from the extraction of aggregates (http://www.english-heritage.org.uk/server/show/nav.1315).

The project as a whole comprised two components: a largely HER based assessment of the archaeological resource within areas of past and present aggregate extraction in the county of Somerset and archaeological aerial surveys and analysis of two aggregate producing areas, which were carried out to the National Mapping Programme (NMP) standards developed by English Heritage (Firth 2006;Truscoe 2006).

The first phase of the archaeological assessment was to identify geology within Somerset suitable for aggregate extraction (Firth 2006: 14). This comprised all areas of historic and current quarrying and included places deemed suitable for extraction by the Somerset Minerals Local Plan (SMLP). As result of information provided by Somerset County Council Minerals Planning Officers and historic documentation, seven major aggregate geologies were identified which then formed the basis for six character areas. Once this was achieved all Historic Environment Record (HER) entries that lay entirely or partially on aggregate geology were analysed (ibid).

The aerial survey was then targeted at two trial areas chosen from the aggregate character areas identified in the assessment: the eastern Mendip Hills (Carboniferous Limestone) and the Somerset Levels (Burtle Beds) (Truscoe 2006). The initial phase, carried out from October 2005 to March 2006, was targeted on a trial project area identified in the eastern Mendip Hills: a 10km by 5km block in an area of intensive limestone extraction located between Shepton Malet in the west and Frome in the east (see Chapter 9). The Somerset Levels survey area was then examined: a 5km by 6km block centred around Sowy Island to the north east of Athelney.

This report covers the continuation of the survey in the central part of the Mendip Hills character area. This phase of the aerial survey concentrated on the part of the character area lying within the Mendip Hills Area of Outstanding Natural Beauty (AONB) and was carried out between April 2006 and January 2008. The full extent of the AONB that lies within the Somerset county boundary was covered. Two strands of funding were available: ten months from the AONB and eleven months funded by the ALSF.

A unique feature of the archaeological aerial survey of the Mendip Hills is that it is the first National Mapping Programme (NMP) project to use lidar data during the mapping phase. A lidar (light detection and ranging) survey was commissioned by the Mendip Hills AONB and flown by the Cambridge University Unit for Landscape Modelling in late 2005 to 2006. The Lidar measures height differences on the land surface resulting in a detailed digital terrain model. Slight earthwork sites can

sometimes be identified using this aerial survey method which might not be visible on aerial photographs, or even on the ground, due to their lack of elevation.

A substantial part of the ALSF central Mendip Hills character area is with the area designated as the AONB and, due to the patchwork nature of the funding for this project, it is the AONB area within Somerset that was targeted for this phase of the survey. During the time in which the ALSF survey was being carried out, an English Heritage multi-disciplinary survey of the AONB has begun. The Mendip Hills landscape research project is being carried out by various teams from within English Heritage, including Archaeological Survey and Investigation and Architectural Investigation. The results of the aerial survey have therefore been available for use by this complementary project and findings from the landscape project have been incorporated into the aerial survey.

Figure 1: Location of the survey area

1.1 Enhancement of the Somerset Historic Environment Record

The archaeological aerial survey in the ALSF central Mendip Hills project area resulted in an increase in sites recorded on the Somerset HER of 58%. The nature of aerial survey means that, in general, it is relatively large earthworks, cropmarks and structures which are recorded. No new information was added to monument records which describe buildings, finds, or other archaeological structures no visible from the air.

New records	253
Amended records	303
No new information	130

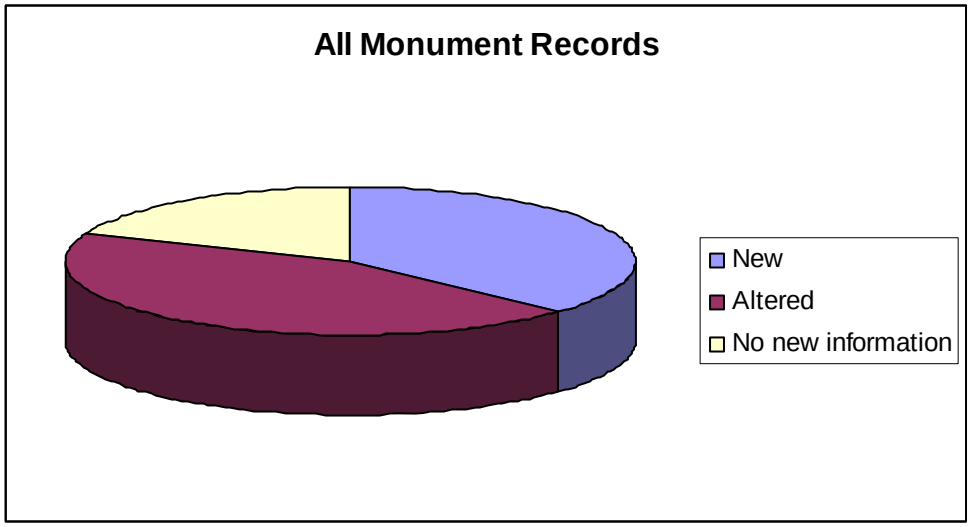


Figure 2: Pie chart of Somerset HER monuments records relating to the project

2 METHODOLOGY

The overall aim of the project, *The Aggregate Landscape of Somerset: Predicting the Archaeological Resource*, is to enhance the archaeological record of the aggregate mineral producing areas of Somerset by collecting and integrating information from the following sources:

- Relevant geological information.
- The Somerset County Historic Environment Record.
- The National Monuments Record.
- Published and unpublished text and map information relevant to the geology, archaeology and history of the area.
- Aerial photography and lidar data.

The main aim of the archaeological aerial survey is to incorporate analysis and mapping from aerial photographs for the aggregate producing areas into the County HER. A secondary aim is to trial the effectiveness of lidar data in identifying sites of archaeological potential (Somerset ALSF Archaeological Survey Project Design Objective 6.5).

2.1 Specific aims of the aerial survey

1. To use National Mapping Programme (NMP) methodology in appropriate areas to produce digital mapping and textual descriptions of all archaeological sites using the Somerset HER GIS and database and to assess non-NMP methodologies for different landscapes and levels of survey.
A decision was taken to record all three areas (East Mendip, the Somerset Levels and Central Mendip) to NMP standard.

2. To assess the usefulness of digital vertical aerial photographs in the Somerset HER GIS for archaeological survey.
While these photographic layers of 1946 and 2001 were useful as reference tools, they could not be used directly for mapping of archaeological sites. The NMP mapping process requires very accurate rectification of photographs over specific areas. A wide range of photographs were consulted and the optimum example from which to map an archaeological site, even if from the same date as the HER GIS layer, was not always from the same sortie. Therefore, the site may not be shown as favourably, for example, shadows may fall differently. The vertical photographs are intended to be viewed as stereo pairs, using a stereoscope, which enables further information to be gained from them. Viewing a flat image is therefore not always as useful.

3. To assess the usefulness of lidar data, in conjunction with conventional aerial photography, for archaeological survey.
Lidar data was consulted alongside the aerial photographs throughout the survey. The results over woodland areas were not as positive as initially hoped. While some archaeological features could be identified, further information could not be added in many of the wooded areas due either to the nature of the woodland. The woodland in the central and east Mendip areas consists predominantly of dense coniferous plantations which the light pulse used for lidar survey cannot always penetrate. The eastern half of the lidar survey, which covered most of the central Mendip area and

the east Mendip area, was flown in springtime (in April 2006) and increased height of low-lying vegetation could cause problems of visibility, for example, on Black Down.

4. To produce a short report summarising the methodology and results of the project.
This report will answer the objectives outlined above and will be disseminated via the Somerset County Council website and the National Monuments Record. Updates on the progress of this project have also been disseminated via the English Heritage website.

2.2 NMP Methodology

The NMP methodology entails the interpretation, mapping and recording of all archaeological sites from the Neolithic to the twentieth century from aerial photographs (see Appendix 2 for more information).

Good vertical coverage was available of the survey area from the 1940s to 1990s, from RAF, Ordnance Survey and Meridian photography. Specialist archaeological oblique photography tended to be limited to certain sites, due to the restrictions in the Bristol airport area. All available aerial photographs from the National Monuments Record, Somerset HER and Cambridge University Collections were consulted. A lidar survey flown by the Cambridge University Unit for Landscape Modelling was available covering all but the extreme southern edge of the survey area.

Photographs and lidar tiles (provided as hill shaded, greyscale TIFs) were rectified using Aerial and archaeological features were mapped on to the Somerset HER GIS in MapInfo. NMP drawing conventions were used throughout. Newly discovered sites and additions to known sites were recorded on to the Somerset HER database.

In addition to aerial photographs, books, journal articles and map sources were consulted. The map sources included: the first edition and current Ordnance Survey; geological information produced by the British Geological Survey of Great Britain; and the Soil Survey of England and Wales.

2.3 Lidar

A lidar survey was commissioned by the Mendip Hills AONB and flown by the Cambridge University Unit for Landscape Modelling in late 2005 and spring 2006. The lidar survey was carried out primarily over the Mendip AONB in order to feed in to the English Heritage interdisciplinary study of this area. The western half of the AONB, between Bleadon in the west and Blagdon in the east, was flown between September and December 2005. The survey of the eastern half of the AONB and the east Mendip Hills, between Blagdon in the west and Frome in the east, was flown in April 2006.

While the initial phase of the aerial survey was completed in March 2006, the lidar data was not available at that time. However, there was an opportunity for later

comparison of the results of the aerial photographic survey of the eastern Mendip Hills trial area with the lidar data (Firth & Truscoe forthcoming).

Lidar survey is based on the principle of measuring distance through the time taken for a pulse of light to reach a target and return. Airborne lidar uses a pulsed laser beam which is scanned from side to side as the aircraft flies over the survey area measuring between 20 and 1000 ground elevation points per second. Even small variations in height can be interpolated to produce a model of the land surface at metre and sub-metre resolution (Bewley et al 2005, 637). Airborne lidar also has the capacity to penetrate many types of woodland canopy (Devereaux et al 2005, 651) meaning that archaeological sites can potentially be identified under tree cover.

The Mendip survey was flown with a 1m ground resolution, which provides a ground model of sufficient resolution to pick up subtle archaeological earthworks. This was demonstrated in past work in the Stonehenge World Heritage Site to be capable of picking up new sites and also adding extensions to previously known sites (Bewley et al 2005, 640).

Lidar can produce good results for archaeological prospection in deciduous woodland, particularly when taken in winter when trees are bare of foliage. The first pulse will record the height at the top of the trees, while the second pulse will penetrate through to the ground surface. In this way archaeological sites under tree cover can sometimes be identified. In areas covered by coniferous woodland, the laser pulse is unable penetrate the dense canopy in order to take a reading on the woodland floor, so only the height at the top of the trees can be recorded (Devereaux et al 2005, 658). This, unfortunately, is the case with much of the woodland in the project area, a large proportion consisting of coniferous plantations.

On Mendip, another factor influencing the visibility of archaeological sites in woodland particularly in the eastern half of the area was the time when the lidar survey was flown. The data for the western half of the lidar survey was captured in autumn and winter when deciduous trees will have lost their leaves, while the eastern half was flown in spring, when they might be expected to have more foliage.

2.4 Changing priorities for future work

Although the majority of the project was defined by ALSF priorities, it was possible to order the way in which the work was approached so that it fed into the work of the complementary English Heritage multi-disciplinary project in the Mendip Hills AONB. The Priddy area was the first to be chosen it is an area known for its Neolithic and Bronze Age field monuments, but is also the centre of a concentration of lead mining remains. Lead mining was carried out on a large scale in the Mendip Hills in the Post Medieval period and the remains of this industry can still be seen in the landscape in the form of linear groups of pits, or, as the lines of pits are known collectively, rakes. A decision was made to map the mining rakes in detail from aerial photographs and lidar, rather than surveying them on the ground. Small areas might be targeted by the Archaeological Survey and Investigation team, but the full extent would be covered by aerial survey only. NMP provides large scale mapping of sufficient quality to help target and contextualise smaller scale ground based survey.

NMP methodology developed in Cornwall in the 1990s showed the necessity of mapping mining areas in detail. During the Cornwall and Isles of Scilly NMP mapping project, mapping of extensive tin and copper mining remains was originally carried out using the standard NMP method. This method was then changed when it became apparent that information produced was not sufficiently detailed either, to produce an accurate record of the industrial remains, or, to be most helpful to end users, for example, those planning the World Heritage Site bid for the mining landscapes of Cornwall. The mining remains were then mapped as seen, or as accurately as possible (Young 2007: 27-8). The same reasoning was followed when considering how best to map the Mendip Hills lead mining remains. The detailed approach, of mapping the pits as seen rather than just indicating their extent, provides a clear picture of the pattern of the lead mining in different areas was also produced, providing a useful dataset for future analysis. It was also found to be most useful to the Archaeological Survey and Investigation team.

2.4.1 Contribution to other projects

The aerial survey of the Mendip Hills was initially carried out as part of the ALSF project, *The Aggregate Landscape of Somerset: Predicting the Archaeological Resource*. As such, identification of the original area to be mapped was dependent on the scale of aggregate extraction being carried out there. The second phase of mapping was carried out with funding from the Mendip AONB during the period April 2006 to January 2007. Mapping was still carried out within the ALSF project character area, while also inside the boundaries of the AONB, but the setting of priorities for future work was governed by different factors. This situation continued with the third phase of mapping which was funded through the ALSF. Mapping was carried out between April 2007 and January 2008 within the character area, but, with a priority placed on completing that portion which lies within the AONB.

In addition to influencing priorities for future mapping, co-operation with other survey teams during this project meant there was scope for exchange of information. Field visits were a useful source of new information about sites previously only seen on aerial photographs or lidar aiding my understanding of earthwork sites, such as the deserted settlement at Hope or the Charterhouse Roman mining settlement.

The contribution of the ALSF survey information into the Mendip Hills AONB multi-disciplinary project provided an opportunity to take part in outreach work. One of the stated objectives of the multi-disciplinary project is "to widen participation in archaeological fieldwork and build capacity in the sector" (Jamieson 2006: 6). This was an area where all three teams involved worked together to some extent. A training week for people from local interested groups on Mendip was run primarily by Archaeological Survey and Investigation and Architectural Survey, with contributions and training from the author (21-25 May 2007). Representatives from a number of the local history and archaeology groups attended the week long session, which included; a session on aerial photographs; earthwork and architectural survey lectures and field exercises; and a day studying landscapes.

The involvement of the ALSF archaeological aerial survey in the English Heritage multi-disciplinary project has, I believe, benefited all the teams involved. The way that the aerial survey has been carried out is influenced by a number of factors. The fact that field survey work is being carried out in the areas simultaneously covered by aerial survey means that site visits become more informative. Visiting sites has helped with the interpretation of earthworks recorded as part of the aerial survey. The aerial survey data can also help to give an overview of a particular site and set it in its wider context. Different survey methods are capable of yielding different types of information and the complementary data sets achieved can help to build up a more complete picture of the archaeology.

2.5 Dissemination of information

Information on aerial survey in the Mendip Hills has been disseminated via a number of routes due to the overlapping nature of the project. The records created throughout the project, either inside or outside the AONB, can be accessed through the Somerset County Council HER website: http://webapp1.somerset.gov.uk/her/sop.asp?flash=true. The NMP mapping is held as a GIS layer which can be accessed through the Somerset HER. Mapping and monument records currently hosted by Somerset County Council will eventually be incorporated into the NMR providing seamless data for the whole Mendip Hills area and environs, which covers three local authorities.

This report will be disseminated via the Somerset County Council website http://www.somerset.gov.uk/somerset/cultureheritage/heritage/projects/aggregaeslevyproject/ (sic). Updates on the progress of this project have also been disseminated via the English Heritage website:
http://www.english-heritage.org.uk/professional/research/landscapes-and-areas/national-mapping-programme/somerset-alsf-nmp/ (Somerset ALSF)
http://www.english-heritage.org.uk/professional/research/landscapes-and-areas/national-mapping-programme/mendip-hills-aonb-nmp/ (Mendip Hills AONB).

Information on this project has also been made available through papers given at conferences both regionally (Mendip Hills AONB Service Heritage Weekend, 2007, 2008; Archaeology of Mendip and its Environs, 11-12 November 2006) and nationally (English Heritage National Mapping Programme day, 2006, 2007).

3 CHARACTER OF THE SURVEY AREA

3.1 Landscape character

The ALSF central Mendip Hills project area extends from Compton Bishop in the west to Frome in the east, encompassing the Mendip plateau. The Mendip Hills are the southernmost outcrop of Carboniferous Limestone in England rising to a height of a little over 300m above OD, forming a dramatic contrast with the low lying Somerset levels. The limestone geology gives rise to a characteristic "karst" landscape of crags and gorges. There are no rivers on the main plateau of the Mendips, but ground water permeating through the rock forms a number of springs at the base of the scarp and these feed into the rivers Yeo, the Lox Yeo, The Cheddar Yeo and the Chew. The outpouring of water from these springs has been a key factor in the development of settlement at the foot of the scarps.

Free draining silty clay loam soils are found on the Limestone on Mendip, which tend to be shallow in depth (Smith 1976: 37). The current appearance of the majority of the survey area is typical of Limestone geology, with large areas under permanent grassland. There are also areas of thinner more alkaline soils derived directly from the limestone extending down the steep slopes. (Soil Survey of England and Wales 1983). Woodland is found on the higher areas.

Figure 3: Looking west along the Mendip Hills

NMR ST 4155/3 (23618/07) 05-JUL-2004 © English Heritage (NMR)

Further east, dropping down off the plateau, the character of the landscape is one of rolling hills and incised valleys. The overall pattern of settlement appears to have been largely dictated by the local topography and geology, with villages located in

valley bottoms, near to areas of free draining soils on the lower slopes. The nature of the landscape means that the villages in the eastern Mendip Hills feel very isolated from each other, despite their relative proximity (Truscoe 2006). This proximity of settlement contrasts with the more widespread distribution seen in the western area of the Limestone plateau, the AONB. Another contrasting factor in the appearances of east and west Mendip are in the field boundaries. The stone walls which are a noted characteristic of the AONB area disappear towards the less exposed eastern end of the plateau, where hedges are predominant. Stone walls were originally erected on the plateau during the post medieval period to provide a temporary shelter and field boundary while hedges were established. However, exposure to the weather meant that hedges did not survive well in western Mendip, meaning that the temporary walls became a permanent feature of the landscape (Williams 1976: 113).

3.2 Archaeological character

The Mendip Hills have a rich archaeological heritage, ranging from Mesolithic cave deposits to Second World War military features. The landscape was exploited throughout the prehistoric with a wide range of site types including settlements and ritual landscapes.

The landscape appears to have had significance in the Neolithic, with such field monuments as mortuary enclosures and the henge-like Priddy Circles constructed during this period. There are approximately 300 barrows across the Mendip plateau, constructed between the Neolithic and the early Bronze Age, highlighting the ritual significance of this landscape. Bronze Age barrows are frequently found in linear cemeteries, such as Ashen Hill barrows and Priddy Nine Barrows. Late Bronze Age/Iron Age settlement sites such as Pitcher's Enclosure, near West Harptree, or Dolebury hill fort, near Shipham, have been found around the edges of the higher ground. There is a concentration of possibly ritual field monuments in the centre of the plateau, but some monument types, such as Bronze Age barrows, occur in most areas.

Medieval and post medieval deserted or shrunken settlements and extensive relict field systems are found along the southern scarp edge of the limestone plateau in the central Mendip area. Relict field systems were also found throughout the trial survey in the eastern Mendip Hills and a deserted element was recorded around nearly all of the settlements.

The mineral wealth of the Mendip Hills led to the development of a major Roman mining settlement at Charterhouse. Mining of lead continued in this area into the Post Medieval period, particularly around Charterhouse, Stockhill, East Harptree and Chancellor's Farm, creating distinctive patterns in the landscape.

The extensive Second World War bombing decoy found on Black Down serves to highlight the wide range of archaeological monuments that are found in this area. The contemporary, or near contemporary, aerial photograph may sometimes be the only record for some other types of site from this period, including Prisoner of War and military bases. Two Prisoner of War camps were recorded to the north of

Wells and the structures associated with an ammunition store and associated base were mapped near to Maesbury Castle.

3.3 Land use

From at least the medieval period, the main land use over the Mendip Hills plateau has been pastoral with large areas given over to grazing for sheep either in semi-improved grassland or natural heath. In more recent times, substantial parts of the main plateau have been turned over to arable farming, but the overall picture is still predominantly pastoral. The main settlements are situated around the edge of the central plateau. Medieval and Post Medieval field systems can been seen along the southern scarp edge with deserted settlements above them on the edge of the plateau. In the eastern Mendip Hills the picture is more mixed, with field systems and deserted elements found around each of the villages, suggesting that arable farming could be carried out in more areas in the eastern hills than in the west.

The Mendip Hills have long been a focus of industrial activity and mining in the area both for stone and various minerals has had a dramatic impact on the landscape. Lead mining has been carried out since at least the Roman period, if not earlier. Exploitation of lead deposits continued into the post medieval period and then experienced a revival in the 19th century. Stone was mined in the past from small pits and quarries often adjacent to the buildings or structures for which the material was being mined, but in more recent times it has been extracted on an industrial scale. Somerset is now the second biggest producer of aggregate in England and the east Mendip Hills in particular have seen a massive expansion in the limestone extraction industry in the post Second World War period. The increase in size, and impact on their surroundings, of sites such as the Torr Works quarry near Downhead and Battscombe quarry near Cheddar can be followed on the sequence of historical aerial photographs.

3.4 Factors affecting the visibility of archaeological sites

The visibility of archaeological sites is affected by the geology, soils and land use. While the free draining soils found on Limestone geology might be expected to show cropmarks on aerial photographs favourably (Wilson 2000: 69), much of the area is under permanent grassland rather than arable. As a result, the archaeology of the area is predominantly recognised through earthwork remains preserved in modern pasture rather than from cropmarks which are usually visible in arable crops and, in severe drought conditions, in grass. The soils can be very thin in the upland areas which may result in earthworks being more ephemeral in nature since they will be greatly affected by any phase of ploughing. Overall, if aerial photographic evidence only was used to find sites, the conditions in this area are likely to affect the survey, resulting in a skewed picture of the archaeology. There will be a bias towards sites surviving as earthworks, rather than those which might show only as cropmarks or soilmarks.

In the medieval or post medieval periods, large areas along the southern scarp edge and around settlements in the east were under arable as is shown by the evidence of

ridge and furrow and strip lynchets. The predominance of evidence from aerial photographs relating to cultivation of the land in the medieval and post medieval periods may explain the lack of visibility of Prehistoric and Roman sites in the east Mendip ALSF survey area, as these sites may potentially have been masked by the later agricultural activity. The picture is different on the top of the limestone plateau in the west, where limited access to water and thin soils have affected land use and resulted in almost permanent pasture in some areas. A greater number of Prehistoric sites survive as earthworks and the Roman settlement at Charterhouse is a particularly striking survival.

A drive for land improvement in the Mendips took place in the post medieval period, primarily between 1770 and 1870. During this time, much of the area was enclosed and various works took place to make the land more productive, such as drainage schemes and liming of the soil (Williams 1976: 105). The results of these improvement works can be seen in a number of ways, including: the layout of the field systems, the numerous small quarries associated with lime kilns and water meadows, particularly in the east Mendip area.

The agricultural depression of the 1880s had a great effect on some areas of the Mendip Hills. It was a time of decline in farming and rural depopulation, as people moved to towns around the Mendip area, such as Frome, in search of work (ibid: 118). The next phase of ploughing up of pasture in areas of the Mendips did not take place until the Second World War (ibid: 121). The post war period saw a phase of agricultural intensification but, in the present day, the area is again predominantly under pasture.

This sequence of alternate ploughing and pasture, in some areas, would affect the survival of earthwork sites. While they might have survived the land improvements of the late eighteenth and nineteenth centuries to a large extent, agriculture in the modern age may have eroded them to the point that they could no longer be recognised.

4 RESULTS OF THE AERIAL SURVEY: PREHISTORIC – NEOLITHIC TO IRON AGE

4.1 Neolithic

One of the most striking features of the landscape to the north east of Priddy is the group of four Neolithic henge-type monuments known as the Priddy Circles. Three are spaced between 40m and 60m apart. The fourth circle appears to be unfinished and is out of alignment with the other three. Two further sections were added from lidar to the known extent of the fourth circle, both in the north western quadrant.

The area around the Priddy Circles is dotted with sinkholes. Sinkholes are a feature of Limestone geology and would have caused subsidence in this area. It could be that the nature of the geology in this area led to the construction of the Circles being halted (Stanton 1986: 356) and the change in alignment and spacing of the fourth circle. It is also possible that the presence of such a large number of sinkholes in this area made it an attractive location for the builders of the Priddy Circles. The natural depressions may have held some significance and influenced the siting of the monuments.

This area appears to have retained a ritual significance through to the Bronze Age, with barrows or burial mounds found inside two of the circles and linear barrow cemeteries located around them. A possible disc barrow was identified from aerial photographs of 1925 within the most northerly of the group of three. The unfinished fourth circle is associated with five possible round barrows (Somerset HER), although only three could be identified in the survey and from lidar data only. I will return to discussion of the barrows below.

Figure 4: A disc barrow is visible in the north west quadrant of the third Priddy Circle

NMR ST 5452/1 (CCC 8713/1902) 25-nov-1925 © Crown copyright. NMR. Crawford Collection

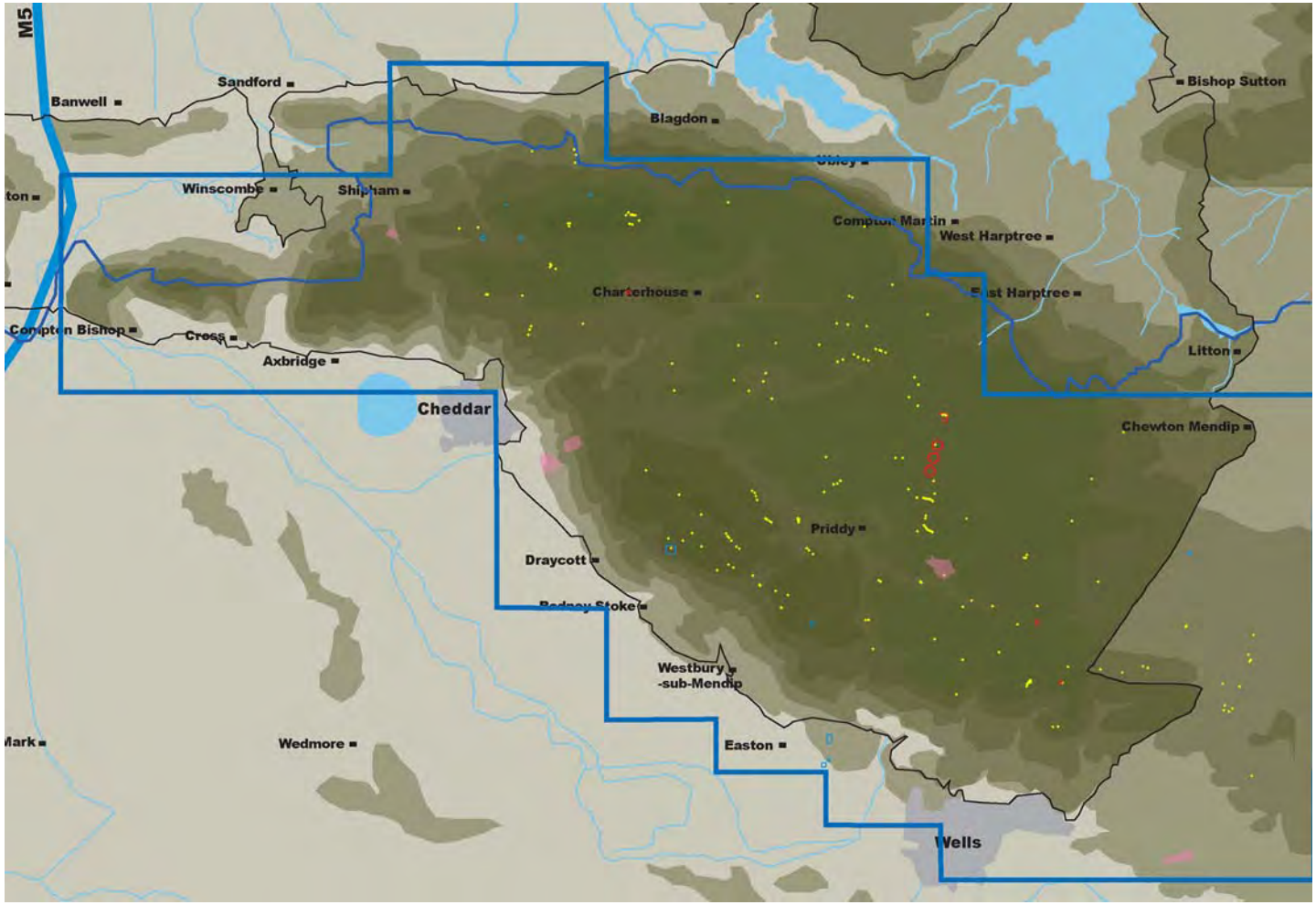


Figure 5: Distribution of results of the Prehistoric

Red circles = Neolithic henges; red lozenges = Neolithic long barrows; yellow diamonds = Bronze Age barrows; Pink shaded areas = Iron Age field systems; Blue rectangles = Iron Age settlements. Map base © Crown copyright. All rights reserved 100023366 (2008)

Two other henge monuments were recorded during the survey, both smaller in size than any of the Priddy Circles. Gorsey Bigbury henge to the west of Charterhouse, has a configuration of bank and ditch and entrances more usual for a henge monument (Whittle 1999: 72) unlike the atypical Priddy Circles. The possible second henge is located within Priddy parish to the south of Hillgrove Road. The sub-circular bank measures 55m in diameter and enclosed a central raised area. As is the case with the Priddy Circles, Bronze Age barrows are located around both of these henges.

The survey did not add to the known record of Neolithic long barrows, a relatively rare site type on Mendip.

4.2 Bronze Age

In contrast to the small number of long barrows found in the Mendip Hills character area, Bronze Age barrows are the most numerous field monument of the prehistoric. Of the 275 known, 166 were recorded. Of the barrows that could not be identified through aerial survey, 54 were recorded in the corresponding HER entry as indistinct or levelled earthworks. Where the barrow was recorded as surviving to a greater extent, but could still not be observed on aerial photographs or lidar, as was the case with 55 sites, the explanation could be that: either the mound had been destroyed in the period between the date of the last HER entry and the date of the lidar survey; that the mound survives but as too slight an earthwork to show up on either aerial photographs or lidar; or that it is masked by tree cover or later agricultural or industrial activity. Two examples of barrows thought to have been levelled are located to the east of Charterhouse (Somerset HER PRNs 24085 and 24086). However, these round barrows were visible as low earthworks on lidar and could therefore be recorded as part of the survey.

A feature particularly of the Priddy area is the arrangement of Bronze Age barrows into linear cemetery groups, of which sixteen were recorded within the survey area. The linear barrow cemeteries are predominantly oriented on a north west-south east alignment. They are generally positioned on areas of higher ground, making it possible for them to be seen on the skyline.

4.3 Iron Age

While the results from the prehistoric periods up to the Bronze Age are dominated by ritual or religious practises, the evidence for the Iron Age is overwhelmingly domestic and agricultural in nature. Enclosed settlements, field systems and agricultural enclosures are found around the edge of the limestone plateau. This might suggest that the favourable settlement sites on Mendip were being reused. Therefore, the Iron Age evidence may be obscuring settlement sites for the Bronze Age and Neolithic periods, leading to the skew in evidence towards ritual or religious sites.

A general pattern can be traced for all the Iron Age settlement sites recorded through the aerial survey: the sites are all located around the edges of the higher ground of the limestone plateau. This puts them in close proximity to the current centres of settlement, although on slightly higher ground. It is possible that we are

only seeing half of the picture; further settlements may have existed on the lower ground which are masked by medieval and post medieval agricultural activity and the modern villages. These upland sites may have been exploiting different resources and my have either been seasonally occupied, for example, just associated with upland grazing of livestock, with different types of settlement elsewhere.

The Iron Age sites are all similar in nature in that they are enclosed, but vary in shape and size. They are predominantly recognised through earthwork remains, due to the fact that much of the survey area is under pasture. However, sites were recorded from cropmarks in three areas where land was being used for arable farming, suggesting that there may potentially be more information to add to our knowledge of this period in the Mendip Hills.

The sites mapped through the survey are located around the central plateau: the enclosure or hillfort of Westbury Camp, a small settlement and two banjo enclosures on Wattles Hill, a banjo enclosure and possible settlement to the north of Ramspits, and a sub-rectangular enclosure to the west of Webbington, all on the southern scarp edge; a partial Iron Age or Roman enclosure to the south of Chewton Mendip in the east; and three enclosures, Longbottom Camp, Rowberrow Camp and West Twin in the north west.

Westbury Camp has recently been confirmed through an earthwork survey as being a univallate hillfort. It is probably early Iron Age, or possibly late Bronze Age, in date and may have been in use for a relatively short period of time (www.english-heritage.org.uk/server/show/nav.9918). The hillfort is pentagonal in shape with an entrance at the northern end of the east side. The site is on the very edge of the Mendip plateau, as it begins to slope down to the south. The exterior bank was easy to identify on aerial photographs over the whole of its extent, but field reports state that it becomes weaker in appearance around the southern end (Somerset HER) and no contemporary internal features were identified inside the hillfort.

Three banked enclosures of a similar size and construction are located to the north west of the central plateau: at West Twin, Rowberrow and Longbottom. They are all sub-rectangular in shape and measure respectively: 55m by 43m; 82m by 74m and 88m by 75m. all three enclosures are of a similar construction: a bank with an exterior ditch enclosing an area of land. The West twin enclosure appears to have two entrances, on the east side and in the north west corner. Rowberrow Camp has been bisected by a forestry track, but appears to have what may be an original entrance in the south west corner. Longbottom Camp has one entrance, in the south east corner. A recent earthwork survey of Longbottom Camp found it to be an Iron Age hill-slope enclosure. An area of earthworks immediately to the north east of the enclosure was also analysed. These earthworks were identified as part of a possible Roman settlement, suggesting that the enclosure may have also been reused in this period (www.english-heritage.org.uk/server/show/nav.9918).

The three sites are also situated on sloping ground, which suggests that they might all be classified in the same way as Longbottom camp. A further site which might be added to this group is a circular banked enclosure in Rowberrow Warren, measuring 25m in diameter, It is cut through by a forestry track, from north to south, so it is difficult to determine the original entrance.

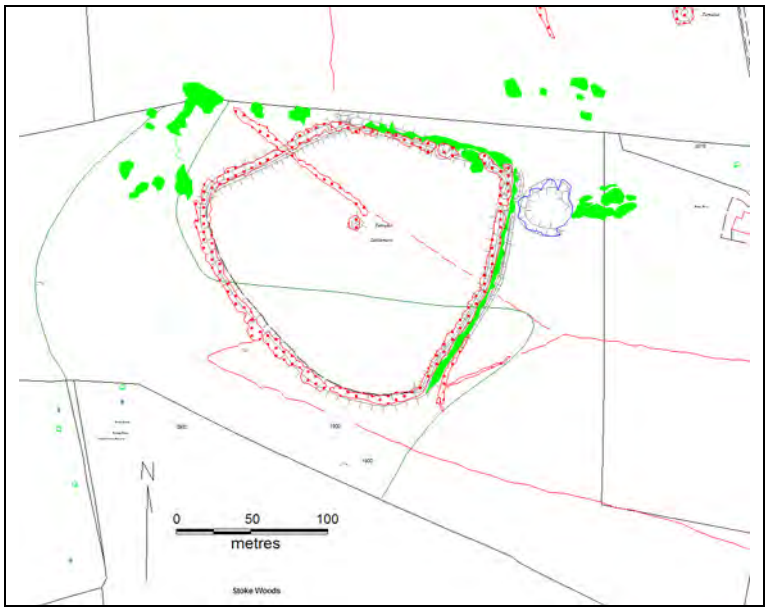


Figure 6: Westbury Camp, Late Bronze Age or Early Iron Age hill fort

As a monument type, hill-slope enclosures can vary greatly. A large number of examples were found on Exmoor, all with the same basic characteristic of a bank enclosing an area of ground. However, the enclosures could be circular, ovoid or rectangular and could measure between 25m and 80m in length. The function of these enclosures is not clear, but they may have been used to corral animals or have contained a farmstead (Riley & Wilson-North 2001: 65). The fact that these enclosures survive as earthworks demonstrates how substantial was their original construction. It has been suggested that substantial ditched and banked enclosures had a social significance in the Iron Age, possibly reflecting the high status of the inhabitants (Hingley 1989: 59). While we are only seeing part of the picture, it is possible that the inhabitants of these enclosures may have had some standing in their communities.

Figure 7: Longbottom Camp

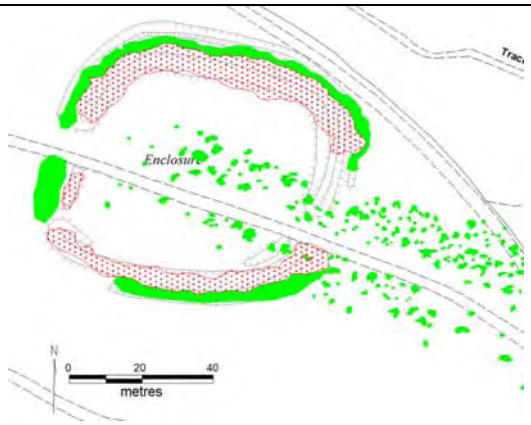


Figure 8: Rowberrow Camp

The small settlement and two banjo enclosures on Wattles Hill were identified from cropmarks over an area measuring 167m by 110m, consisting of three or four enclosed areas which may have served different functions. Two ring ditches, probably round houses, can be identified among the ditched enclosures. These two houses are probably not contemporaneous since one is located fully inside the southern area, while the other seems to have been cut through by a later boundary. Possible storage pits are located in and around the two northern areas. The south eastern area, which is empty of visible features apart from one sub-rectangular ditch, may have been used for corralling stock, rather than for domestic purposes. The site is similar in layout and size to examples from the Lower Thames Valley, such as Watkins Farm and Mingies Ditch, which are suggested by Cunliffe as being the settlements of an extended family (2005: 253). The Watkins Farm site was in use until the Late Iron Age, which may have also been the case with this site (ibid: 254).

Two possible *banjo* enclosures are situated 270m to the south of the Wattles Hill settlement and may have been associated with it. These sites typically have a single entrance with an approach road, or path, flanked by ditches which join up with the ditch surrounding the enclosure. The Wattles Hill enclosures both have funnel-shaped entrances narrowing down to an attached pathway measuring up to 15m in length. This type of enclosure is thought to have been used for the corralling of livestock. They are often found separately, but there are instances when two are found in close proximity (ibid: 246). The morphology of the two Wattles Hill enclosures suggests that they fall into this category of Iron Age monument. They may have been part of an agricultural system associated with the farmstead to the north.

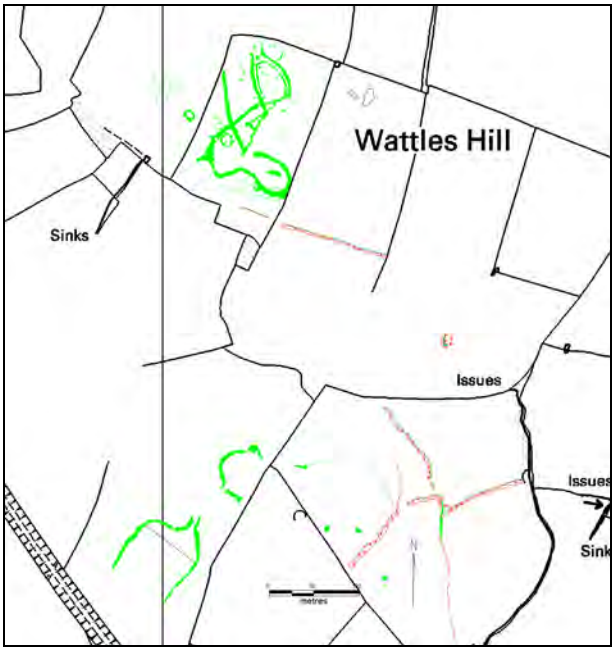


Figure 9: Iron Age settlement on Wattles Hill

A third possible banjo enclosure was also visible as a cropmark to the north of Ramspits. It is similar in size and shape to the Wattles Hill enclosures, although not

as clear in plan. The beginnings of a narrow entrance way can be identified but only measuring 8.5m in length.
Two further examples of possible Iron Age settlement sites were recognised from cropmarks: a sub-rectangular enclosure to the west of Webbington measuring 57m by 24m; and a sub-rectangular enclosure of which the north and west sides only were clearly defined, but which would measure 78m by 34m. Both are located to the south of Chewton Mendip. These two enclosures may both have housed single farmsteads, possibly each for an extended family. The morphology of these sites is similar to examples found throughout Iron Age Britain, often with continuity of use into the Roman period, for example, Woodcuts in Dorset and Catsgore in Somerset. Many examples have also been found through aerial survey in the Cambridgeshire and Lincolnshire Fens (Hingley 1989: 56).

Banjo enclosures are not the only surviving element of Iron Age agricultural practise in the survey area. Several examples of field systems which may date to this period, or possibly earlier, were recorded at: in three areas at Bradley Cross, near Cheddar; to the north of Rodney Stoke airfield; to the south west of Shipham; on Rowberrow Warren; and to the south of North Hill, Priddy (Somerset HER PRNs 11243, 10355, 11458, 11515, 11928 and 25834).

4.3.1 Field systems

The field systems in the Bradley Cross, Shipham and Priddy areas consist of small, sub-rectangular fields defined by banks or lynchets. The pattern of the field boundaries in all three areas is dramatically different to the medieval and post medieval field systems around them. The field systems in the first two areas survive as earthworks while the Priddy fields were recorded from cropmarks. Prehistoric field systems have been recognised from field work over an extensive area around Bradley Cross, but were only visible in three discrete areas on aerial photographs. In one area field boundaries appear to be associated with two enclosures, a possible farmstead. However, in other areas, unless the areas mapped are part of one cohesive system, the fields are not associated with any visible domestic site. A system of medieval or post medieval strip fields is particularly well preserved along the scarp edge between Draycott and Rodney Stoke, enabling a direct comparison. While it is hard to judge the age of field systems from aerial photographic evidence alone, their morphology, small roughly rectangular fields, is suggestive of an Iron Age origin (Muir 2000: 202).

Another field system to the south of North Hill, to the east of Priddy, has been suggested as Roman in date, due to nearby surface finds (Somerset HER). The morphology of the fields is very similar to the those seen at Bradley Cross and it is possible that there was continuity in use of the North Hill field system from the Iron Age through to the Roman period.

The field system recorded to the north of Rodney Stoke airfield consists of five parallel field boundaries defined by narrow banks are spaced over a fairly flat area of land, measuring 950m by 340m. The boundaries are on a different orientation to the medieval and post medieval field boundaries to the south and west and presumably predate them. The dates of use of the field system are hard to determine, but their

form may be a response to the local topography which made larger fields easier to lay out, rather than the sloping ground of the other areas.

Figure 10: Iron Age Field system, Bradley Cross

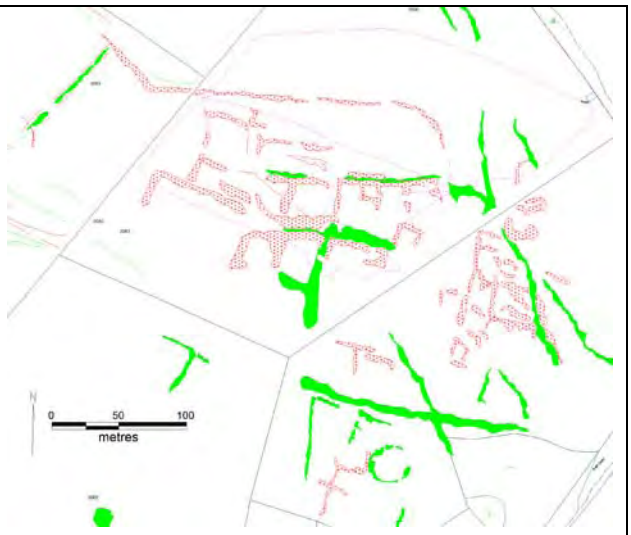


Figure 11: Iron Age/Roman Field system, North Hill

4.3.2 Conclusions

The evidence for the prehistoric is skewed towards ritual and religion for the earlier periods and towards settlement and agriculture for the later periods. This may indicate reuse of locations for settlement around the edges of the central limestone plateau, where access to water was easier and better faming land was available. There may have been more than practical reasons for leaving the central plateau comparatively free of settlement traces. The large number of field monuments from the Neolithic and Bronze Age suggest that this area was regarded as special, possibly partly because of it was inaccessible and inhospitable. It has been suggested that the central Quantock Hills were set aside as a ritual landscape (Riley 2006: 50) and this may have also been the case on the limestone plateau of the Mendip Hills.

Case Study: Bronze Age Barrows

Bronze Age barrows are the most numerous prehistoric field monument in the Mendip Hills. Their presence has affected both the periods preceding them and succeeding them. The relationship of the barrows to the Neolithic monuments in the landscape is particularly interesting.

The concentration of individual barrows and linear barrow cemeteries around the Priddy Circles reinforces the importance of these monuments as a focus for ritual. While the linear cemeteries are found at a distance from the Circles, individual barrows or small groups of barrows are directly associated with the monuments. A possible disc barrow appears to be located within the third most northerly of the Circles and three round barrows were recorded within the fourth, unfinished, Circle. Recent discussion on the positioning of Bronze Age barrows around Neolithic monuments has suggested that while they are frequently found in close proximity to henge monuments, it is more usual for them to be placed as a "respectful" distance (Watson 2001: 207). Whether the presence of barrows inside the monuments is indicative of the atypical nature of the Priddy Circles, or is simply a rare occurrence, is difficult to know. Barrows are found close to the two other henges within the survey area, but none within the actual structures of the monuments.

Figure 12: Three of the Priddy Circles with the Ashen Hill barrow cemetery below

RAF 58/6155 (F21) 0083 05-FEB-1964 © Crown copyright. NMR

The ritual importance of the central plateau appears to have been respected throughout the Iron Age, with just one possible example of an interaction between the ritual and the domestic identified through the ALSF survey. A barrow is positioned almost in the

centre of Westbury Camp. This may be co-incidental, or may have influenced the siting of the hillfort. More prosaically, it may have been used as an aid to laying out the plan of the hillfort.

A large number of previously known barrows could not be recorded during the aerial survey, either because they have been ploughed away, or, have been damaged or obscured by other features. Large-scale lead mining in the post medieval period has obscured or obliterated barrows on the central plateau. While the farming regime in this area has been predominantly pastoral, there have still been phases of ploughing in the past that have affected the survival of field monuments. The process of enclosure had a particular effect on the Bronze Age barrows. A number appear to have been used as surveying aids when the new pattern of enclosed fields was being laid out. Barrows are bisected by field walls and are sometimes at the junction of three or four field boundaries, for example, to the southwest of Dale Farm (Somerset HER PRN 23972) or to the southwest of Ubley Warren Farm (Somerset HER PRN 24013), both in Priddy parish.

The barrow cemeteries on Black Down appear to have been less affected by the construction of the extensive Second World War anti-aircraft landing obstructions. While it might be expected that the gridlines marked out by small mounds would incorporate any barrows on the same alignment, this is only the situation in one or two cases. For example, two of the Beacon Batch group of barrows (Somerset HER PRNs 24103 and 24105).

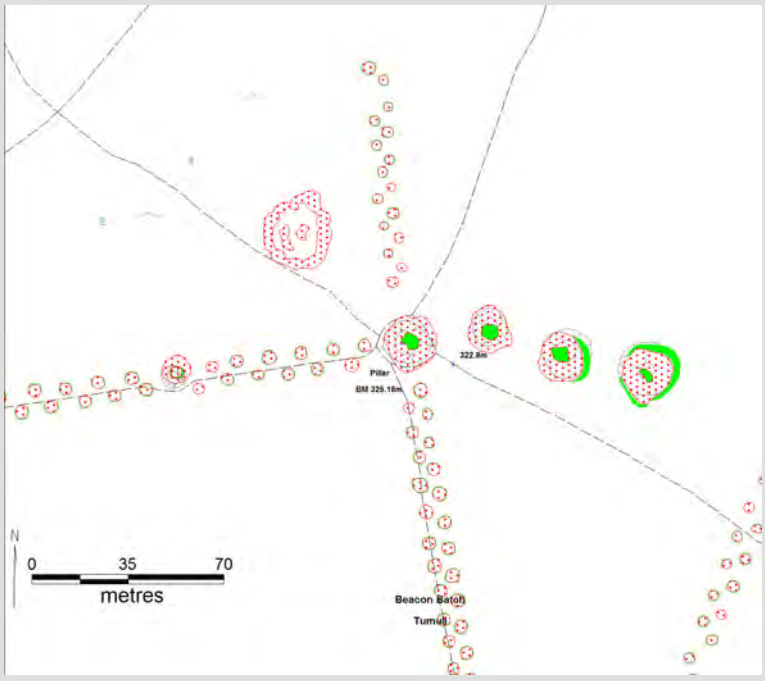


Figure 13: Two of the Beacon Batch tumuli incorporated into the grid of anti-aircraft landing obstacles on Black Down

The Bronze Age barrows of the Mendip Hills, particularly on the central plateau, have continued to interact with the later landscape. The linear barrow cemeteries are an inescapable focus of attention as you move around this area, appearing lined up on hill tops as you approach them from different angles. While they may have been reused or disappeared, they are still a potent feature of the Mendip landscape.

5 RESULTS OF THE AERIAL SURVEY: ROMAN: AD 43 TO AD 410

There appears to have been a Roman presence on Mendip relatively soon after their arrival c. AD 43, probably in order to take advantage of the mineral resources in the area (Fowler 1976: 67). The results from the Roman period in the ALSF central Mendip Hills character area consist of a variety of site types, some as well preserved earthworks. The mining settlement at Charterhouse (see Case Study) is particularly well known and has been the subject of much discussion elsewhere (eg, Todd 2007; Ellis 1992). It has also recently been the subject of an earthwork survey by English Heritage. Other sites include farmstead enclosures, a field system and sections of the road which runs between the Charterhouse mining settlement and Old Sarum.

5.1 Settlements, Agriculture and Transport

As mentioned above, there may have been some continuity of use of both the rectilinear Iron Age enclosures and field systems, such as those found on North Hill, from the Iron Age into the Roman period. Additions appear to have been made to Longbottom Camp. A trackway runs along the eastern side connecting up with a small area of earthworks, consisting of trackways and platforms. This area was interpreted after an earthwork survey in 2006 as being a Roman settlement (www.english-heritage.org.uk/server/show/nav.9918). Longbottom Camp itself was probably reused during this period, although for what purpose, possibly domestic or as a stock enclosure, is unclear.

Enclosures elsewhere on Mendip may have also been reused, or continued in use, for example the rectangular enclosure to the south of Chewton Mendip. Compounds containing farmstead buildings are a common feature of the countryside during the Roman period and this tradition may have originated in the Iron Age (Hingley 1989: 56). Further evidence of life in the Roman countryside, possibly of a higher status, is provided by the remains of a villa at Star, to the north west of Shipham. Fragmentary banks survive as earthworks but the plan of the villa, recovered through excavation in 1959 to 1960, is not obvious from aerial photographs from 1946. At its greatest extent, the villa buildings consisted four or possibly five rooms with an external corridor and yard (Barton 1964: p63-5).

The field system to the south of North Hill is adjacent to the site of a Roman building found through excavation (Somerset HER PRN 23963). Surface finds of building fabric and pottery have also been collected in this area and it is also thought to be a Roman lead mining site. Lead was worked intensively in this area in the post medieval period and in the late 19th century, a fact also true of the mining site at Charterhouse. Further investigation of the area to the east of Priddy would be needed to establish whether it was a mining site of similar significance to Charterhouse. The Roman road between Charterhouse and Old Sarum runs to the northeast of this site. This suggests that it was not as important to the roman administrators if this key route did not run closer to it, but there may have been connecting roads or trackways that are masked by later mining, roads or other landscape features.

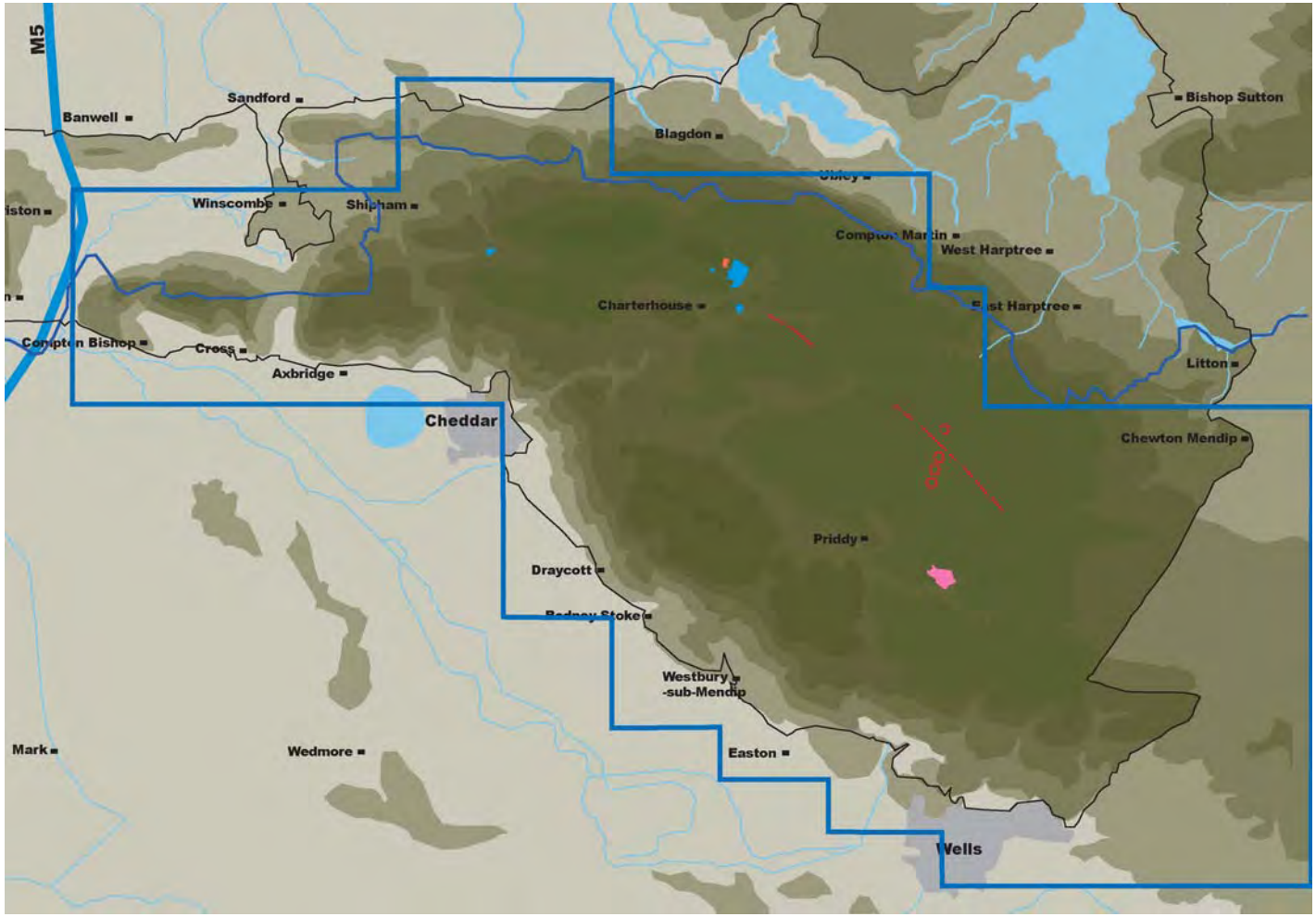


Figure 14: Distribution of results for the Roman period

Red = Roman road; Pink = Field system; Blue rectangles = Settlement; Orange = lead mining. Map base © Crown copyright. All rights reserved 100023366 (2008)

The Roman road was plotted as an intermittent but upstanding earthwork on aerial photographs and lidar from the north side of Stockhill plantation (ST 5527 5204) running north west, between the third and fourth Priddy Circles, to a point 490m east of the Roman fortlet at Charterhouse (ST 5093 5566). Examination of the lidar data revealed the final stretch of the road extending to the north west of Ubley Warren Farm as a slight earthwork. This information added to the previously known length of the road by 133m and helped to clarify the final part of its route towards Charterhouse.

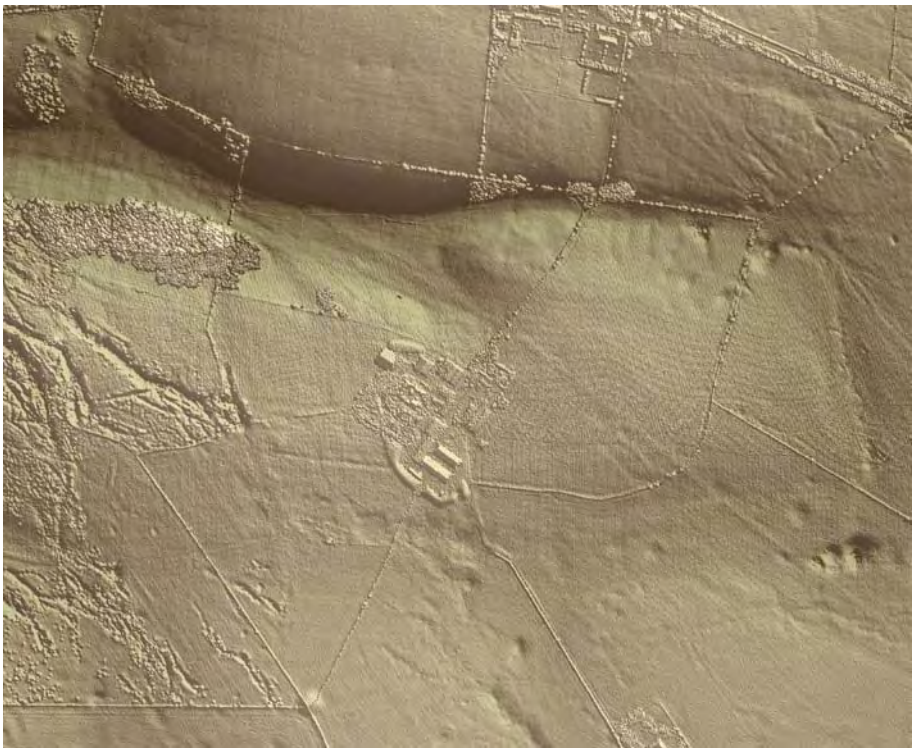


Figure 15: Lidar image showing the route of the Roman road towards Charterhouse

Other information on a Roman presence in the ALSF central Mendip Hills character area comes from cave deposits surface finds and documentary evidence, predominantly along the southern scarp edge and close to the northern edge around Shipham and Rowberrow (Somerset HER). The sites recorded during the aerial survey which can most readily be identified as Roman are either connected with lead mining on the plateau, or, possibly, with earlier settlement sites around the edge. The pattern of land use largely follows that seen with the earlier Iron Age sites: settlement sites are predominantly located around the central plateau. Continuity of use of these areas for settlement is demonstrated by excavations at Star villa, where Iron Age and Mesolithic phases of occupation of the site were found (Barker 1964: 48). The construction of the Roman town at Charterhouse means that settlement is now seen on the higher areas of the plateau, although possibly only for the mine workers, with administrators and supervisors living in more favourable areas on the lower slopes (Ellis 1992: 24).

The central area of the Mendip plateau is again used for a different purpose, but this time with the emphasis on industrial rather than ritual. However, the area around Priddy, with the greatest concentration of prehistoric field monuments, may still have

retained some significance. The suggested mining areas are located to the northwest at Charterhouse and to the southeast below North Hill skirting what may have still been a ritual landscape, although somewhat reduced in size.

Case Study: Charterhouse Roman Mining Settlement

The Charterhouse Roman mining settlement survives as well preserved earthworks visible on aerial photographs over an area measuring c.600m by 300m. The ground here is very stony with thin soil. Some attempt seems to have been made to improve the land, possibly in the post medieval period, but the process appears to have been abandoned. The site has therefore been left as pasture for a considerable amount of time, aiding the preservation of the site. The earthworks consist of: an area of settlement, a small fort, an amphitheatre and a possible temple site. Lead mining remains associated with the Roman settlement have been found through excavation in this area (Gough 1967: 183; Todd 2007: 64), but, due to the extent of the post medieval mining, they are hard to identify from aerial photographs.

Lead was an important resource in the Roman period. Its malleable nature meant that it was ideal for piping and waterproofing and it was also the main component of pewter, which was used for plate (De la Bédoyère 2003: 144). Excavations of rakes in 1993-5 found evidence of an Iron Age phase of mining use and analysis of artefacts found in the Iron Age settlement of Meare demonstrated that they contained metallic elements specific to Mendip (Todd, 2007: 64). The new Roman administrators appear to have taken control of this known resource relatively quickly after their arrival in AD 43/4. Excavations at the fortlet confirmed the earliest assumed date of use of AD 49 (ibid: 65) suggested by the earlier finds of an inscribed panel at Wookey Hole and an inscribed lead ingot at Blagdon (Whittick 1982: 113-118).

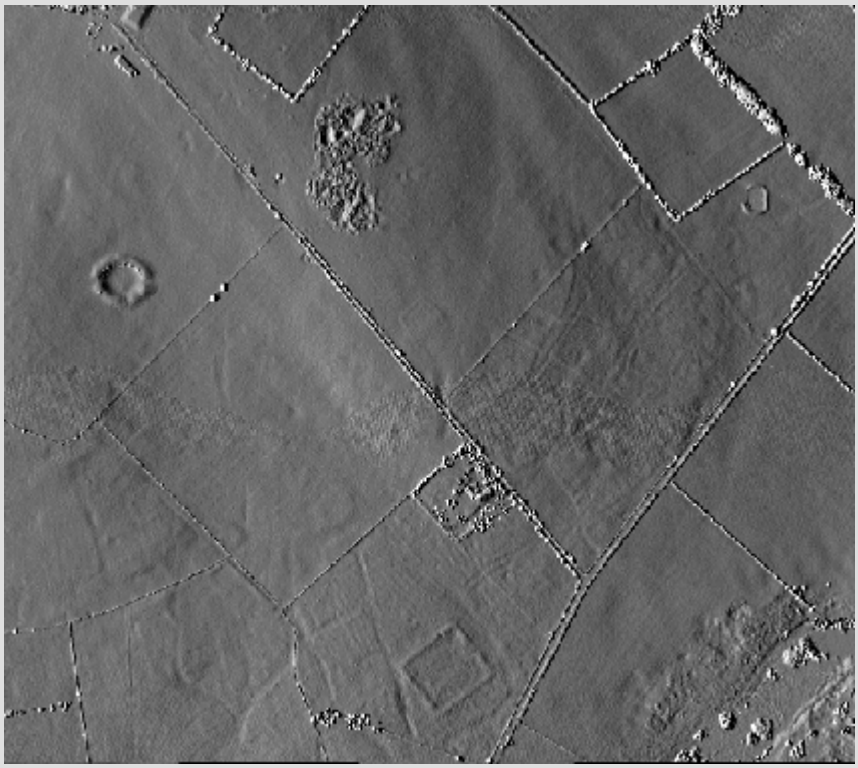


Figure 16: Lidar image of the earthworks at Charterhouse

The fortlet appears on aerial photographic evidence to be a sub-square enclosure with two concentric defensive banks. Excavations demonstrated that the structure in fact consisted of two successive enclosures (Todd 2007: 65), a fact recently confirmed through an English Heritage earthwork survey (Brown 2008: pers comm). The fortlet is sited at the northern edge of the mining area c. 300m to the south of the settlement. It may have been so positioned in order to serve an administrative role, controlling access to the mining area and its products. Todd suggests that the function of the structure could have changed over time, with its initial use being to garrison troops overseeing the lead mine. In its second phase, however, quantities of smelting debris found through excavation suggest that it had become a processing site (Todd 2007: 65).

The settlement earthworks, which were mainly recorded from aerial photographs, but with additions from lidar, consist of building plots defined by an irregular grid pattern of streets visible over an area measuring 650m by 360m. The earthworks are clearest in the field of Lower Rains Batch, but the pattern of streets and building plots continues into Upper Rains Batch field. The continuation of the building plots and streets could only be clearly identified from the lidar data. Some features also continue into Town Field to the south and into the field to the north west and more evidence of settlement was discovered through a recent earthwork survey carried out by English Heritage (Jamieson 2007: pers comm).

A small earthwork is located immediately to the north west of the settlement just outside a perimeter road or town boundary ditch. This earthwork is a sub-square banked enclosure measuring 47m by 45m, with an inner and outer ditch and a slightly raised central area. It appears to be only slight in elevation, but survives to a similar extent to the settlement earthworks. The morphology of the site is reminiscent of a Romano-British temple, which generally consisted of two concentric foundations of circular, rectangular or polygonal shape (Wilson 2000: 151). This is one interpretation which has been given for the site (Faulkner 1998 in Somerset HER), but excavators in 1967, finding few indications of structures and only a few sherds of, possibly, Roman pottery, suggested that it may have been a post Roman stock enclosure (Budge, Russell & Boon 1974: 336).

The amphitheatre has similarly been a focus of discussion as to its origins and use. It is positioned c.310m to the north west of the mining settlement and is fairly small in size. It is oval in shape, measuring 65m by 58m and encloses a central space measuring 37m by 26m. It is comparable in size to Gorsey Bigbury henge which measures 45m in diameter. The adaptation of a Neolithic henge into a theatre or amphitheatre is not unknown in Roman Britain, for example at Dorchester, and this may be the origin of the monument at Charterhouse (De la Bédoyère 2003: 63). St George Gray's excavations in 1909 found no artefacts postdating the period of Roman occupation and concluded that it was a wholly Roman construction (Gray, St George 1909: 134). Flint scrapers also found on the site were considered not to affect the date of construction by the excavators (ibid: 134), but their presence suggests prehistoric occupation of this area and may be indicative of an earlier origin for the amphitheatre.

The mining settlement may not have developed in the same way as a Roman small town, having a particular purpose in its origin, but probably had some of the same amenities. The amphitheatre has been interpreted as being a cock, or bear, pit (ibid: 135) because of its size, but it may have also been associated with a temple and used for religions festivals (De la Bédoyère 2003: 145). This might support the interpretation of the rains Batch earthwork as a temple. An amphitheatre and theatre site are found in close proximity in Frilford (Oxfordshire) and the suggestion has been made that this might indicate a religious use for the amphitheatre. Temples associated with theatres are common in Gaul, but fairly rare in Britain (Hingley 1982: 309). In a remote area of Mendip, on a settlement solely created to carry out mining, it may have been deemed practical to double up the uses of structures in this way. This would also provide an additional phase of use as a religious or ritual centre if the amphitheatre is an adapted henge.

A further adaptation in use for the Roman amphitheatre is suggested by two possible medieval or post medieval sheep enclosures located to the east. These enclosures were identified as low earthworks on lidar, from which it is then possible to survey them on the ground. The amphitheatre may have been used together with the sheep enclosures for the corralling of stock taken up on to Mendip for summer grazing.

The full picture of what was happening at the Charterhouse Roman mining settlement may never be known without extensive excavation. The aerial photographs and lidar provide a plan view of this complex area of earthworks. The data provided by the ALSF archaeological aerial survey also puts this site into the context of the post medieval mining remains around it. The survey data can be used in combination with other forms of survey to aid analysis of the site and provide context for targeted earthwork surveys and excavation. The information given by aerial survey may not provide all the answers about the Charterhouse site, puts us in a stronger position to know what the future questions we ask of this site should be.

6 RESULTS OF THE AERIAL SURVEY: MEDIEVAL: UP TO 1540

6.1 Patterns of settlement

Evidence of the early Medieval period, prior to the Norman conquest, can be difficult to ascertain from aerial photography. A pre-Conquest presence on Mendip is evinced by place-name and documentary evidence and the few surviving Anglo-Saxon charters for the Mendip Hills provide a picture of a settled farming landscape (Neale 1976: 81). Many of the main settlements in the Mendip Hills character area may have their origins in the early medieval period, but the few signs of deserted elements around them suggests that they have often remained in use in the same location and have been redeveloped over time. Definitive signs of Anglo-Saxon archaeological sites are therefore frequently obscured by later development. A possible example of the re-planning of an earlier settlement in the medieval period is Axbridge, where the market place and church are thought to be sited to the north of the Saxon burh (Aston 1982: 127). Investigations in Rodney Stoke, where the church is isolated from the modern village, found evidence of a farmstead to the south of the church, suggesting that it may have been the basis of an earlier core, perhaps for a settlement from the early medieval period (Broomhead 1990: 224).

A general pattern of settlement, possibly established in the later prehistoric or Roman periods, may then persist from the early medieval through to the medieval period. Continuity of occupation cannot be assumed without definite evidence, but it would be logical to suggest that the best locations for settlement would continue to be exploited. The main villages are predominantly found around the edges of the central plateau. On the southern scarp edge, villages are located near the bottom of the slopes along the springline. The parishes in the Mendip Hills may have their origin in the pre-Conquest period, either centred around parish churches or part of early secular estates (Neale 1976: 79). Parishes in the central Mendip Hills are frequently narrow and angular, encompassing land of different types, extending from the hilltop down to the valley, contrasting with the eastern part of the hills, where parishes tend to be more rounded in shape, utilising the valleys (ibid).

The layout of the central Mendip parishes demonstrates the importance of access to different types of land. The hilltop was no longer an area set aside, or one being exploited only for its mineral resources, but was valuable grazing land during the medieval period and probably also the pre-Conquest period. During the 14th century, the rise in the woollen industry (Athill 1976: 162) meant that the larger ecclesiastical estates, such as Glastonbury Abbey, were controlling large flocks of sheep in addition to carefully planned use of arable land (Neale 1976: 95).

Changes can be seen in the distribution of farmsteads during the medieval period, probably as a result of the rising emphasis on sheep farming. A number of deserted farmsteads and shrunken sites were recorded from earthworks along the edge of the southern scarp between Webbington in the west and West Horrington in the east, which may have been seasonally occupied sites connected with sheep farming. Further examples are known from the area around Cheddar, but which could not be mapped from aerial photographs due to factors affecting their visibility, such as tree cover.

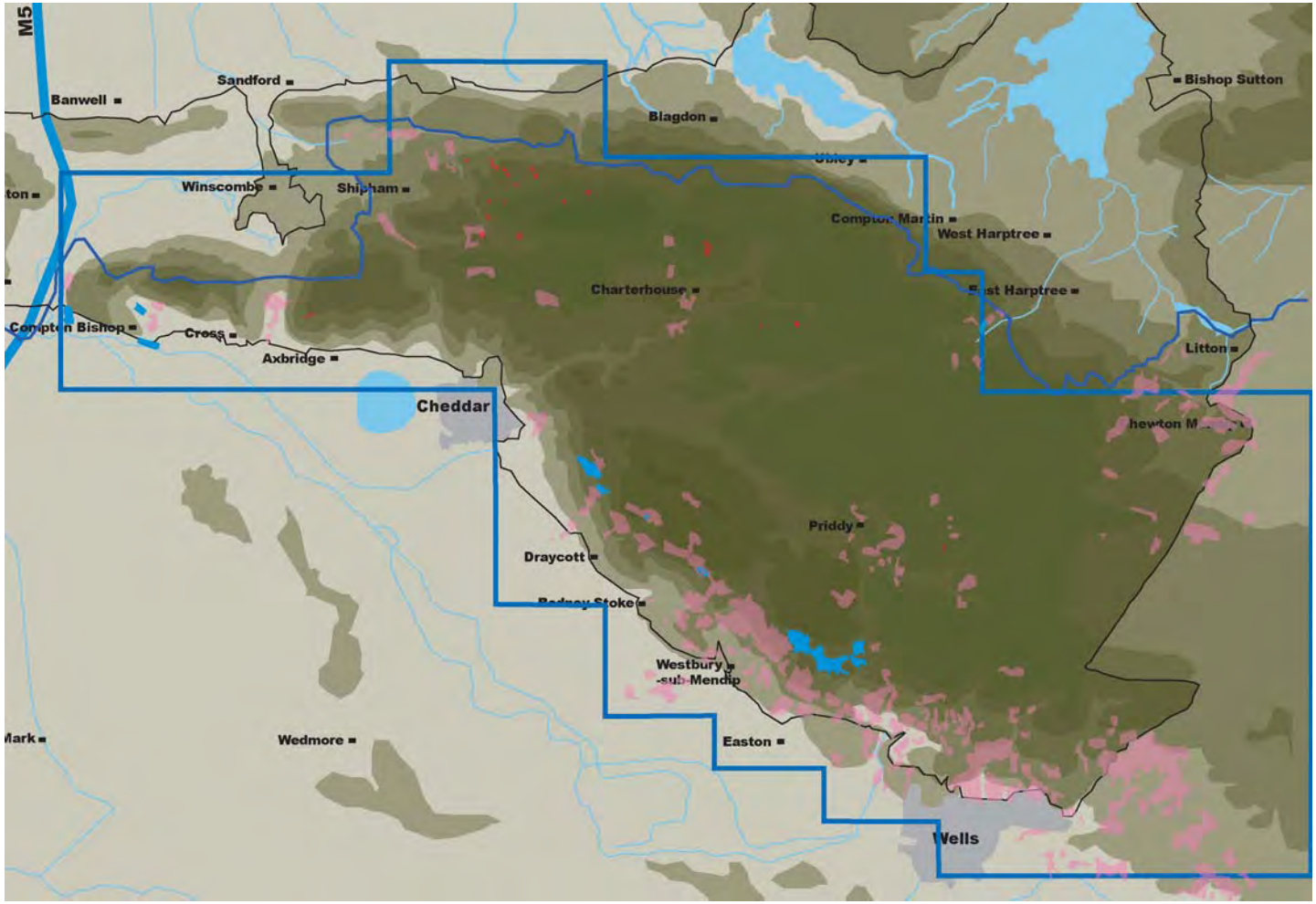


Figure 17: Distribution of the results for the medieval period

Pink areas = field systems; blue areas = deserted settlement; red lozenges = pillow mounds; red rectangles = sheep enclosures. Map base © Crown copyright. All rights reserved 100023366 (2008)

Deserted farmstead sites occur throughout the survey area, but particularly at the edge of the higher ground. Deserted sites are found in other areas away from the marginal land at the edge of the plateau, for example, a small farmstead was recorded from earthworks within Stoberry Park, Wells (Somerset HER PRN 25996). Larger deserted settlements are less common, although there are examples: elements of a deserted village were recorded to the south of Rowberrow; and a deserted town and port at Rackley, a site formerly owned by the Bishop of Bath and Wells. Many of these sites may have continued into use in to the post medieval period and may have gradually been deserted.

The deserted farmsteads found above the line of these field systems range in size and complexity and were probably serving different functions. Smaller sites may have been shielings, seasonally occupied buildings used when the sheep were grazing the upland. Other, larger, farmsteads, such as the well defined site with an associated field system on and around the airfield at Rodney Stoke (Somerset HER PRN 24268) may have been mixed holdings, with some arable close to the farmstead and sheep grazing in the land around. This site is surrounded by a curving, sinuous boundary, which may denote periodic intakes of the common land above the farm. This type of boundary is frequently seen around farm holdings on Exmoor (Riley & Wilson-North 2001: 98).

A concentration of farmsteads of medieval and post medieval date are located to the northeast of Westbury-sub-Mendip, on the hilltop above Ebbor Gorge. These sites, Hope, Lower Hope, Dursden and Ramspits, have recently been the subject of an earthwork survey by English Heritage. The main elements of the farmsteads could be identified as earthworks on aerial photographs, but the greater part of the detail was only clear from the earthwork survey. A 12th or 13th century date is suggested for at least one of the Hope farmsteads and the Dursden site from pottery evidence collected in the vicinity. However, it may be safer to say that these farmsteads date to at least the medieval period since the pottery was found in a scrape (Brown forthcoming).

Aston suggests that these type of hilltop sites may have originated as seasonally occupied settlements in the early medieval period, later developing into permanent farmsteads (Aston 1994: 228-9), possibly as the ecclesiastical estates of which they were a part were developed. Religious houses had large interests on Mendip and in Somerset as a whole, in the medieval period, with more than a third of the county encompassed in ecclesiastical estates (Bettey 1988: 55). The position of the farmsteads above the level of arable cultivation, but below the higher pasture suggests that they were in a position to exploit resources in both directions. Both the Dursden and Hope settlements have trackways leading out to the higher ground, suggesting that their primary function was to exploit land on the higher plateau (Brown forthcoming).

A number of the medieval farmsteads along the southern edge of the Mendip Hills may have continued to be occupied into the post medieval period, but it is probable that many were abandoned during the 14th or 15th centuries. This period marks the end of the 13th century expansion of farmland and a gradual retreat from the marginal lands (Dyer 1994: 13-26). The sites that were abandoned during this time

were on marginal land and may have been dependent on other settlements for their survival (Aston 1985: 53).

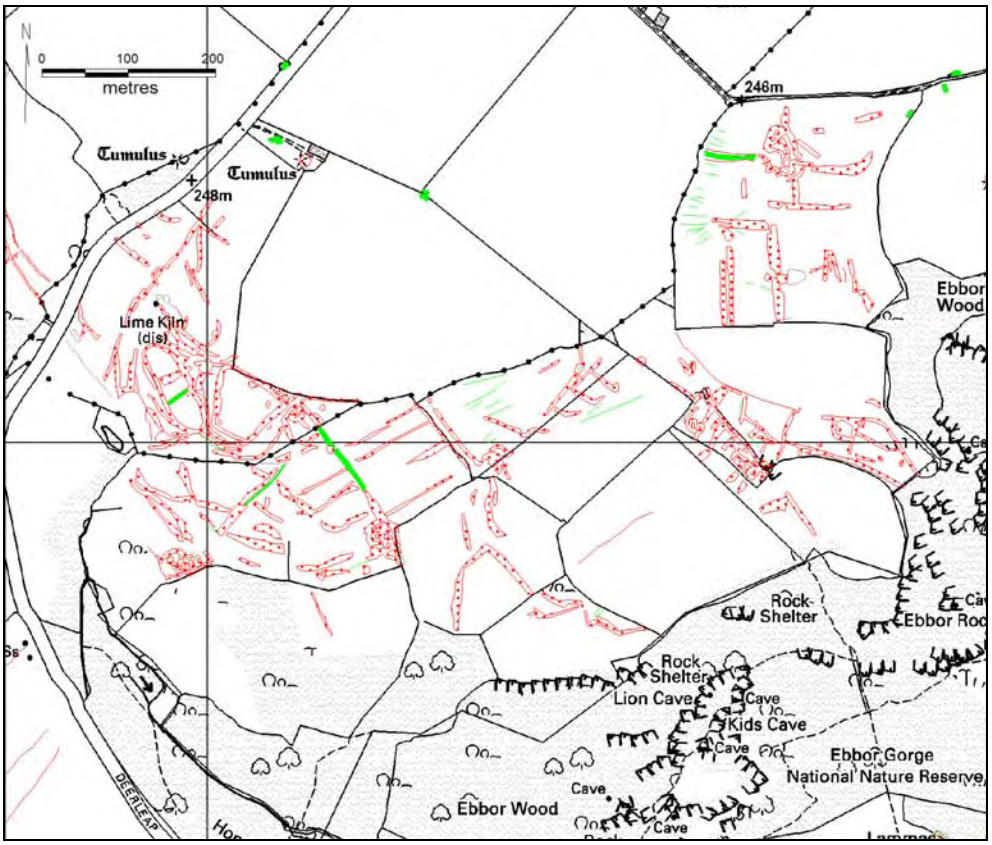


Figure 18: Deserted farmsteads above Ebbor Wood

There are many social and economic reasons that may explain why settlements fall out of use, one being changes in settlement patterns. The religious houses in Somerset were involved in many works on their estates which were intended to make them more profitable, including the planning and re-organisation of towns. People living on the estate may have been moved to a new or enlarged village, resulting in the desertion of dispersed farmsteads or hamlets. A large town or village, especially with a market, would be an increased source of revenue for the landowner. Draycott, to the south east of Cheddar, is thought to be a planned nuclear settlement, thought to date to the late 13th century, when St Augustine's Abbey in Bristol acquired land in the area. Owever, the *cott* element of the village name suggests an earlier origin (Aston 1994: 226) and it may be an example of an expanded, rather than a completely new, settlement. Draycott also has a very well preserved strip field system around it, adding to its appearance of an efficiently designed, new, village. Two deserted settlements, at Carscliff (Somerset HER PRN 11586) and at Batcombe Farm (Somerset HER PRN 12804) are located to the north of Draycott. These sites may be the remains of an earlier, more dispersed, form of settlement around Draycott.

A band of contour ploughing lies below the line of deserted settlements on the steeper slopes. As the slopes become more gradual, nearer to the villages below,

the system changes to a pattern of strip field boundaries, which are still particularly well preserved today around Draycott. This form of farming forms part of the open field system around the villages, with the pattern of fields adapted to the local topography. The system of utilising the steeper slopes in this manner probably continued into the post medieval period, prior to enclosure of the Mendip Hills in the 18th and 19th centuries.

This pattern of field systems can be seen between Rodney Stoke in the west and Croscombe in the east, with a particular concentration around Westbury-sub-Mendip. The same pattern of strip fields on the lower slopes near to a settlement and contour ploughing, or strip lynchets, on the steeper slopes is also seen in the north east of the plateau around Chewton Mendip. The intensity of use of the hill slopes may be due to a period of "land hunger" in the 12th and 13th centuries that required people to exploit all available areas for arable cultivation (Aston 1988: 87). There may have been other limitations on land use in this area. Aston suggests that the concentration of strip lynchets seen in Westbury-sub-Mendip in particular may be due to the fact that a large area of the lower, flatter ground in the parish was taken up by a deer park belonging to the Bishop of Bath and Wells (ibid). Similar concentrations of strip lynchets can be seen on Exmoor, for example around Challacombe (Riley & Wilson-North 2001: 99), whose creation may have been also been as a response to a lack of available farmland.

Figure 19: Systems of strip lynchets to the north east of Westbury-sub-Mendip

RAF TUD/UK/15/19 PART III 5157 13-JAN-1946 English Heritage (NMR) RAF Photography

6.2 Common land

Common land and upland pasture was a shared resource during the medieval period, with Dartmoor, Exmoor and Mendip all used for summer grazing by the settlements located around the hilltops (Aston 1985: 112). Relatively distant parishes had grazing rights on the central plateau, for example, Bleadon, at the extreme western end of Mendip, had common rights over land around Priddy and Harptree (Neale 1976: 94). The rise of the wool and cloth industry meant that keeping sheep was an increasingly

profitable venture in the medieval and early post medieval periods (Smith 2005: 192) and for the great ecclesiastical landowners sheep farming was the most profitable use of their hilltop land (Neale 1976: 94).

The seasonal movement of animals onto Mendip from relatively distant villages onto the grazing land on the plateau is associated with the construction of sheep folds or pens in which they could be temporarily corralled. Twelve earthwork enclosures, which may be sheepfolds were mapped in the survey area. The majority of these enclosures are found in the north of the area on the high ground, extending from Rowberrow, through Black Down, across to Charterhouse. Another example is found to the east of Priddy, constructed across the parish boundary between Priddy and Chewton Mendip. It is possible that earlier structures in this same area may have been reused as stock enclosures: Iron Age enclosures such as Longbottom Camp, Rowberrow Camp, the West Twin enclosure; and the Roman amphitheatre at Charterhouse. Other possible sheep enclosures are situated just below Cheddar Gorge and to the north of Pen Hill, although they may also be associated with ornamental tree planting.

The enclosures are rectangular or trapezoidal in shape and measure between 23m by 30m and 46m by 58m. They are predominantly defined by a single bank, sometimes with an external ditch, and an entrance is not always apparent. These enclosures may have had associated buildings and were often found in groups of three, in order to keep different types of sheep apart. There would be one for ewes, one for castrated males and one for yearlings (Smith 2005: 194). It is possible that a rectangular enclosure and a partial enclosure recorded from lidar to the north west of the Charterhouse Roman mining settlement may have worked together with the nearby amphitheatre to form this kind of group.

Sheep enclosures were found on the Marlborough Downs in similar locations to those seen on Mendip. Typically, they were found in sheltered locations in dry valley bottoms, or in combes between hills (ibid). Three of the Mendip enclosures are located along the combe on Rowberrow, suggesting the funnelling of sheep down the hillside. The prehistoric structures of Rowberrow Camp, Longbottom Camp and a small circular enclosure are also found in this area and may have formed part of the same system controlling the movement of sheep through the Mendip Hills. Sheep were an important part of the Mendip economy into the post medieval period and it is likely that these enclosures continued to be in use until enclosure of the common land made them obsolete.

Another type of field monument constructed on the upland common land in the medieval period is the pillow mound, or artificial rabbit warren. Rabbits were bred for their meat and fur in the Medieval and Post Medieval periods. Groups of pillow mounds are found either associated with a settlement, or spread across upland areas on Dartmoor (Aston 1985: 115). The examples from the central Mendip Hills generally fall into the latter category. Rabbit warrens were generally situated on high ground around the edge of the hills (Neale 1976: 92) with particularly clear examples seen on Rowberrow Warren and Shute Shelve Hill. Pillow mounds are also found in a group on Pen Hill and isolated examples were recorded in the Charterhouse lead mining area and at Ubley Warren Farm. The name *warren* is preserved in many place names on Mendip, although earthwork remains of pillow mounds cannot

always be found in the same locations, another example, in addition to those already mentioned, being Warren Lodge, to the north of Fernhill Farm, Priddy. The dates of use of the warrens is unclear and the Mendip examples may be medieval or post medieval in date. Rabbit warrens have been assigned to either period, although, for example, the morphology of pillow mounds found in the Quantock Hills, for example, suggested to surveyors that they were medieval rather than post medieval in date (Riley 2006: 99).

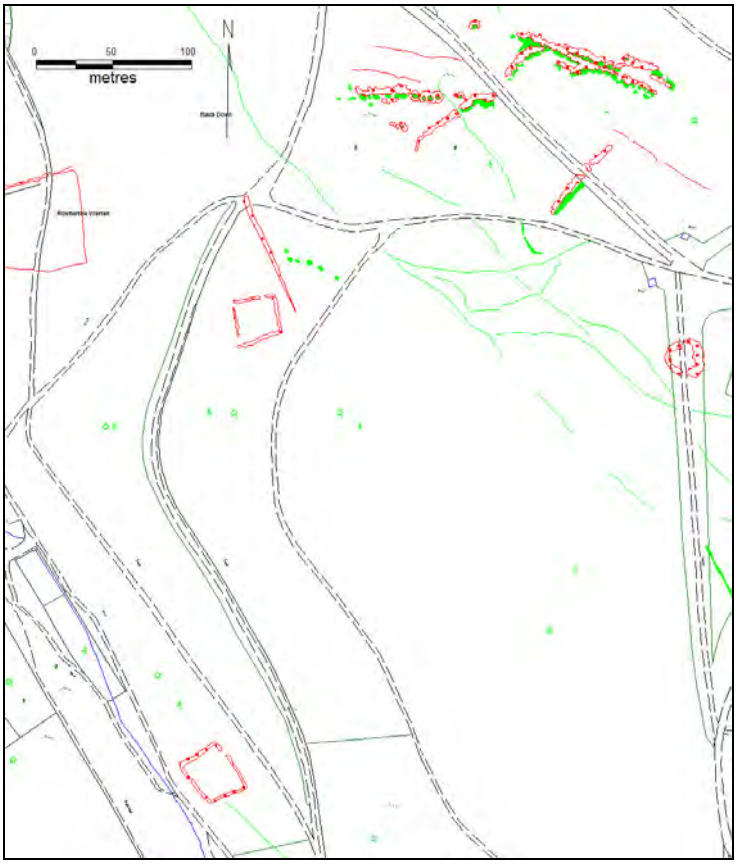


Figure 20: Sheep enclosure on Rowberrow. A circular, possibly Iron Age enclosure is visible to the east of the enclosures and may have been reused at this time.

6.3 The Extractive Industries: Mining and Quarrying

In addition to providing useful grazing lands, hunting grounds and woodland for their various landowners (Aston 1988: 83), the Mendip Hills were also a source of minerals and building stone (Bettey 1988: 64). The Bishops of Bath and Wells were granted the right to mine lead in any of their lands in Somerset by Richard I. In connection with their mining activities, a town and port were developed at Radeclive or Rackley, to the south of Compton Bishop (Gough 1967: 49). Few earthworks of the port survive: hollow ways which may denote the former settlement and possible port and wharf earthworks were recorded through the aerial survey (Somerset HER PRN 10458). By 1235, a further charter gave the Bishops the right to mine lead in many other areas of Mendip if they had permission from other landowners, including *Hidun*, a district in the neighbourhood of Charterhouse and Priddy (Gough 1967: 50). By 1283, other religious houses were also involved in lead mining and in that year, the prior and convent of Witham were given rights to extract lead from any of their lands on Mendip. This included the area around Charterhouse, by which it seems that the claim of the Bishop of Bath and Wells had lapsed (ibid: 53).

While there is documentary evidence showing that mining of lead continued on Mendip during the Medieval period, there is little evidence that can be identified on aerial photographs and lidar. The expansion of the industry in the post medieval period meant that all possible mining areas were worked or reworked, thus obscuring traces of the earlier industry.

The archaeological evidence would suggest that the appearance of the Mendip Hills did not change significantly in the early post medieval period. The change in land ownership brought about by the dissolution of the religious houses does not seem to have had any immediate effect on the method of farming or the pattern of settlement in this area. The agricultural system of open fields and common land probably continued and the occupation pattern may have been largely unchanged. Rights of stone and mineral extraction on the common land probably also remained much as they were, aside from the change in some of the larger landowners from religious to secular. The first major changes to the appearance of this landscape occur in the 17th century, with the peak of lead mining production and in the 18th century with the wide reaching effects of enclosure of the common land and drive towards agricultural improvement.

7.1 Agriculture and Settlement

The 18th century saw increasing interest in agricultural improvement, which was prompted in part by a rise in population in Britain from the mid-1730s and enclosure of land was seen as a necessary part of the drive for increased productivity of farmland (Briggs 1994: 187-8). The break up of open fields and enclosure of common land transformed the countryside. The Mendip Hills were just one area targeted in an effort to transform former common grazing land into productive farming land. The Levels had also been the subject of this drive, together with the western hills near Exmoor (Williams 1976: 105). The process in the Mendip Hills began in 1770, when an Act of Enclosure was acquired for East and West Cranmore (part of the East Mendip ALSF survey area) and by 1811 all the parishes within the central Mendip area had followed suit (ibid). Enclosure could occur over a large area regularised by an Act of Parliament, or could happen in a piecemeal fashion, with as small an area as a couple of strips in an open field being joined together. Where the latter situation happens, the arable, open field system can become fossilised in the enclosure landscape (Aston 1985: 131). This appears to have been the case around the village of Draycott, where a pattern of strip fields is still preserved in the present day field system.

The improvement of the soil on Mendip was one of the key areas addressed in the drive towards increased productivity, both by liming, to counteract acidity and by clearing rocks and repeatedly ploughing in order to prepare the land for arable cultivation (Williams 1976: 107). These improvement methods have left their marks on the Mendip landscape. The heavy ploughing can result in what appears to be ridge and furrow. It is generally in straight lines rather than the curved ridge and furrow associated with medieval ploughing (Aston 1988: 84). Isolated blocks of ridge and furrow which may be the results of 18th and 19th century land improvements are found throughout the ALSF survey area, for example, around East End Farm, to the south of Chewton Mendip and in Town Field, charterhouse. The process of liming has resulted in a large number of lime kiln sites, with associated quarries, located across the survey area.

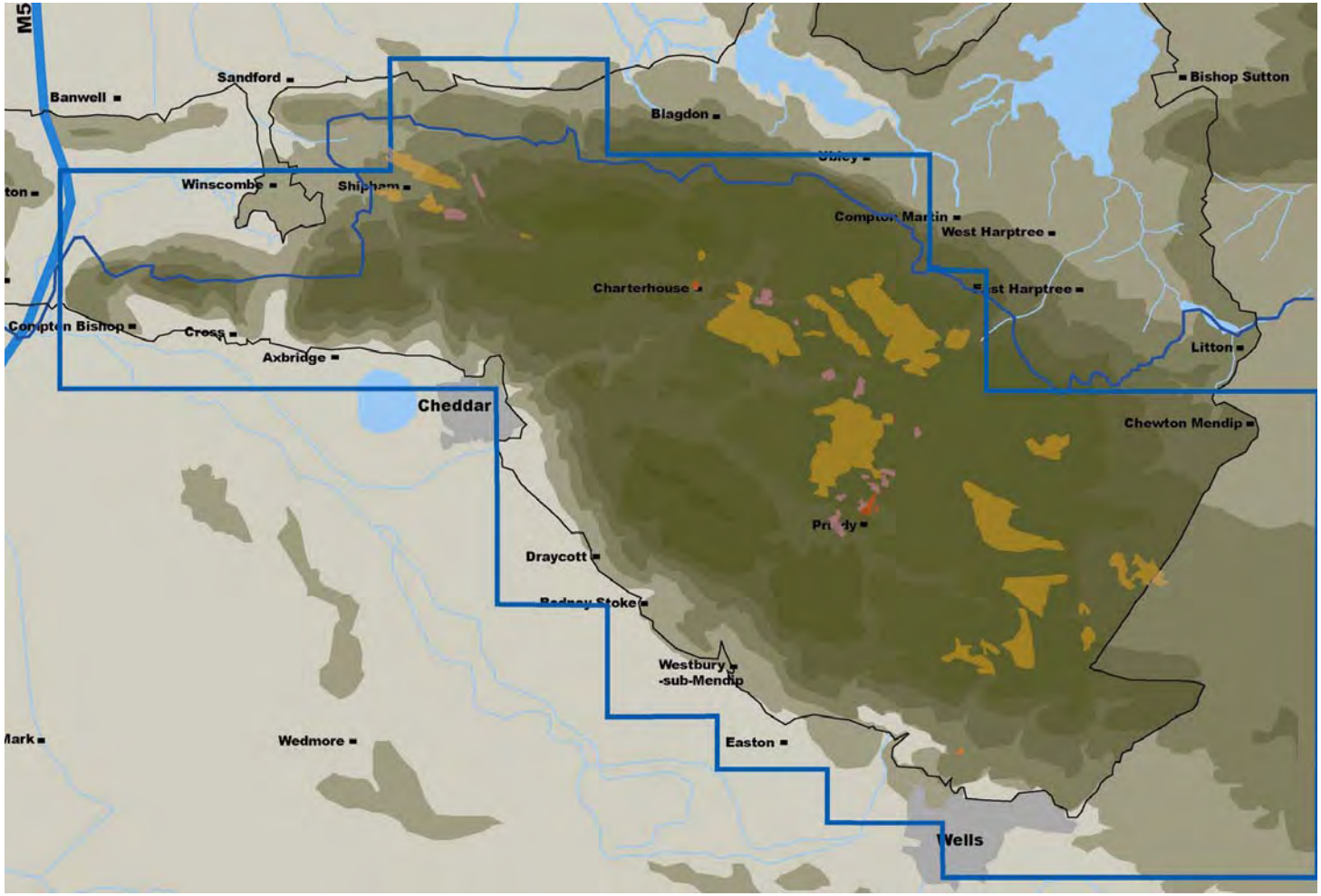


Figure 21: Main results for the post medieval period

Orange = lead mining; pink = field systems; red = water meadows NB: The numerous small stone quarries and dewponds found throughout the central area are not shown on this map so not to obscure the lead mining results Map base

Numerous small quarries were also dug for the purpose of excavating stone to construct dry stone field walls, a key feature of the Mendip plateau today. Hawthorn quickset hedges were the initially preferred type of field boundary by the enclosers, but the exposed nature of the central plateau meant that shelter was needed in order for the hedge to thrive. The stone walls were intended to be a cheap, temporary measure, utilising the readily available Carboniferous Limestone, which either outcrops in this area or is found near the ground surface (Williams 1976: 113).

As noted previously (see Case Study: Bronze Age Barrows) earlier features of the landscape were frequently utilised by the surveyors laying out the new fields. Bronze Age barrows in particular are frequently found at the conjunction of two or more fields.

A feature built into the new field system in the central Mendip Hills was the dewpond or stock pond. These circular or rectangular, often stone-lined, ponds are situated across the boundary between two fields, or at the conjunction of three or four fields. Placing dewponds across the field boundaries meant that they could serve animals in all the adjoining fields. Field walls can sometimes be identified dividing up the ponds in order to prevent movement of stock from one field to another. The construction of dewponds changed the way in which stock were kept. The availability of water meant that a herdsman would no longer need to move animals to a river each day (Smith 2005: 194).

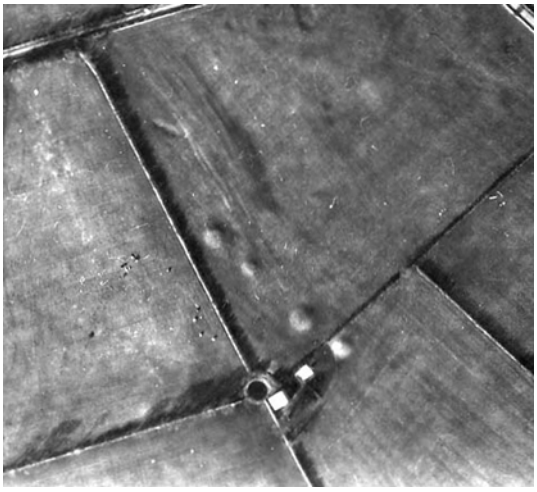


Figure 22: Dewpond at the conjunction of four field boundaries

RAF 3G/TUD/UK/24 5008 14-JAN-1946 English Heritage (NMR) RAF Photography

One method of land improvement which is not commonly seen in the central Mendip area is the floated meadow, or water meadow, due to the scarcity of water in many areas of the plateau. Water meadows worked by covering an area of land with a film of water, fed through artificially constructed channels, in order to increase the yield of grass or hay (Aston 1985: 117). One example, of the bedwork type, found in low-lying areas (Brown 2005: 84), was recorded in the ALSF survey area to the north of Priddy (Somerset HER PRN 19088). This is one of the few areas of the high plateau with access to water, which led to it also being a location for lead processing (see below). Another water meadow of the same type was

recorded on the lower slopes to the north of Wells, adjacent to Milton Manor Farm (Somerset HER PRN 21460).

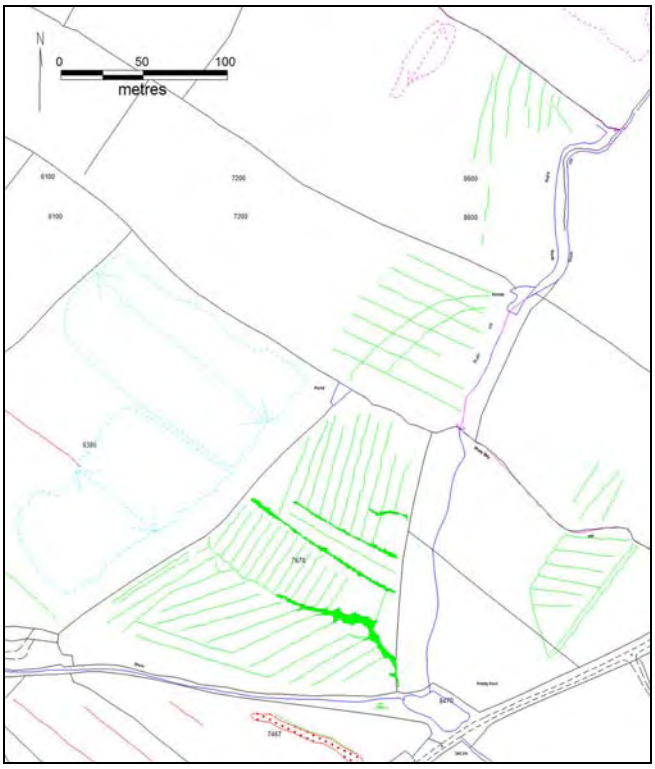


Figure 23: Water meadow to the north of Priddy

A change in settlement pattern on the Mendip upland accompanies the dramatic changes to the landscape in the 18th and 19th centuries, but the concentration of larger villages around the plateau and on the southern slopes remains unchanged. New farmsteads were created on the enclosed land, meaning that permanent settlements are found across the central plateau in the post medieval period, possibly for the first time. The majority of the new farms are not in place until after the 1820s and the names adopted for them are often indicative of their age. They refer to events or people related to the time they were constructed, for example, Victoria and Wellington Farms, or, to previous conditions on the plateau, such as the *warren* names, including Hazel Warren Farm and Ubley Warren Farm (Williams 1976: 115).

The southern scarp edge, which had seen desertions in the medieval period, was also re-settled throughout this period of intensification of agriculture, for examples, the farmsteads above Ebbor Gorge to the north east of Westbury-sub-Mendip (Brown forthcoming).

This period of agricultural improvement, or High Farming, came to an end after 1870. From the 1850s on Britain had become increasingly dependent on imported raw materials and foodstuffs, available at prices which undercut domestic producers. An agricultural depression threatened the livelihoods of British farmers, who had to become increasingly innovative in order to stay in business (Barnwell & Giles 1997: 6-7). It was probably during this period that desertions on the southern scarp edge were seen. The ruined farmstead in Andrews Green Field (Somerset HER PRN

24393) to the north of Ebbor Gorge, appears from cartographic evidence to have only been in existence for one generation. It does not appear on the tithe map, but is shown as two roofless buildings on the 1st edition OS map fifty years later (Brown forthcoming).

The decline in farming on the plateau contrasts with the situation on the hillslopes. The southern slopes were still able to support farmers producing peas, potatoes and early crops, such as strawberries (Williams 1976: 119). The difference in the picture on the plateau and the slopes around it emphasizes what has been seen in the prehistoric to medieval periods. While the appearance of the landscape and settlement patterns had changed dramatically, the central plateau was still an area of marginal land, quickly affected by social and economic changes.

7.2 Ornamental Planting on the Hilltop

Landscape parks, a feature of the post medieval period are not known within the survey area, but there are examples of ornamental planting features. Three plantation circles are located around The Round Clump, probably a larger ornamental plantation, at Rookham to the west of Pen Hill. It is unclear whether these plantation circles or tree rings are associated with a larger planting scheme associated with a landscape park, or what function they serve. Two other possible ornamental plantings are found on the southern side of Cheddar Gorge, above Mascall's Wood.

Similar examples of tree plantation rings are found on the Quantock Hills, either associated with landscape parks, or on common or open ground, but little is known about these structures (Riley 2006: 126). These examples and those on Mendip may have been an attempt by a landowner to make the natural landscape more decorative.

7.3 The Extractive Industries: Mining and Quarrying

By the end of the medieval period, the mining area of Mendip had been organised into four Liberties, administered by the four Lords Royal of Mendip who issued licences to mine (Gough 1967: 68). Large supplies of water, needed for processing the ore, are fairly rare on Mendip and it is those locations with access to a water supply that also became the administrative centres of the industry (ibid): at Charterhouse, Smitham Hill and to the east of Priddy. While there were large concerns on Mendip, smaller scale operators and some free miners were also mining lead here (Athill 1976: 146). Lead mining reached a peak of production in the period between 1600 and 1670, after which there was a decline in the industry. Problems with flooding in the deeper mine workings and a lack of technological skill to enable deep mining meant that all the accessible seams were worked out by around 1670 (ibid: 147).

The extent of the mine workings before the post medieval period is not fully understood as there is less documentation available and they may have been obscured by the later operations. This leads to a picture of a vast increase in mining in the 17th century which may not be entirely accurate (Gough 1967: 112). However, the patterns of mining seen in the landscape do suggest a period of

frenzied activity consisting of organised, large-scale mining and intensive working of smaller areas.

Four main areas of mining rakes were recorded in the ALSF character area. They are: Chewton and Priddy mineries, around Stockhill plantation; Chancellor's Farm, Charterhouse; and Fernhill. Mining rakes are formed of rows of pits, which often join together, demonstrating where a seam of lead was being followed. These four areas appear to have been mined in a systematic manner and each cover a large area. A smaller area of rakes, although just as organised in appearance, was recorded to the north and west of Shipham. Numerous smaller areas were also recorded, ranging from a few pits, where prospection for new sources of lead was probably taking place, to an intense concentration of pits, which don't appear to be specifically following seams, over areas measuring up to 368m by 473m, such as at Lamb Leer. This would fit with the picture of peak production in the industry, where all areas where lead was suspected or discovered were intensively worked, sometimes to the extent that miners broke into each others workings (Athill 1976: 147).

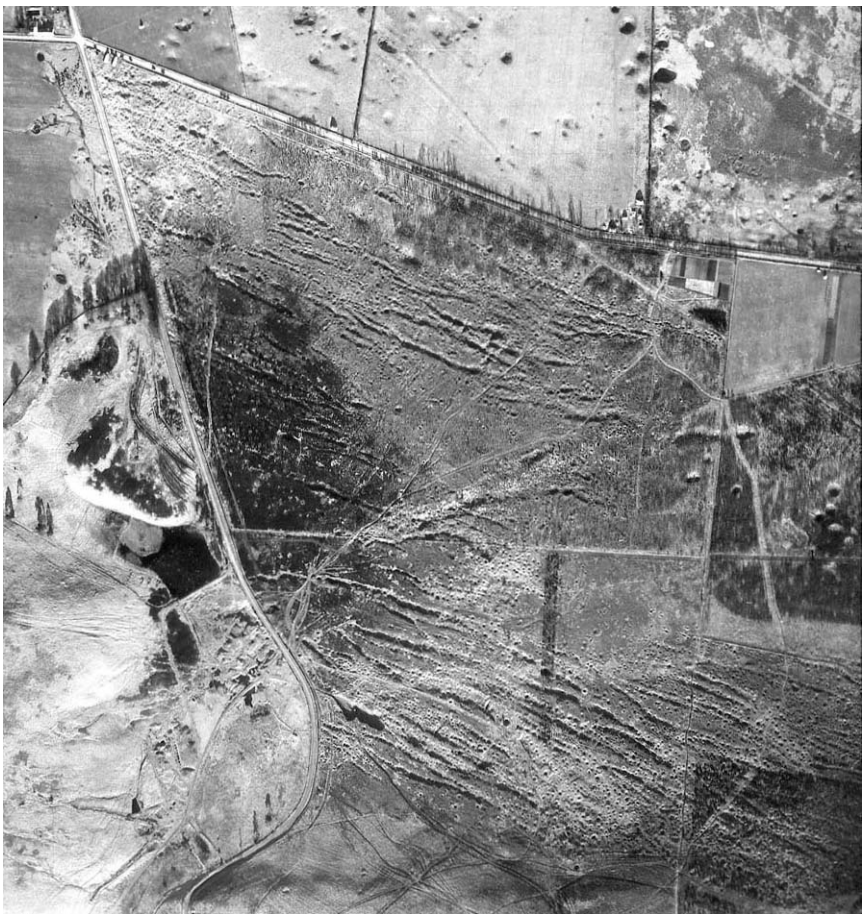


Figure 24: Lead mining in Stockhill Plantation

RAF 3G/TUD/UK/24 5013 14-JAN-1946 English Heritage (NMR) RAF Photography

Figure 25: Densely spaced lead mining pits at Lamb Leer

The decline in the lead mining industry is demonstrated by an area of deserted settlement to the north east of Priddy (Somerset HER PRN 19091). A hollow way known as Gwilmots Lane (Thompson 2006: pers comm), with house plots either side of it extends to the east from the main road through Priddy. Priddy had been described by Skinner in 1815 as having been "a far more considerable place…during the time the Lead Mines were worked" (Skinner in Gough 1967: 169) and it is possible that he could have been commenting on upstanding ruins remaining from the abandoned houses on Gwilmots Lane.

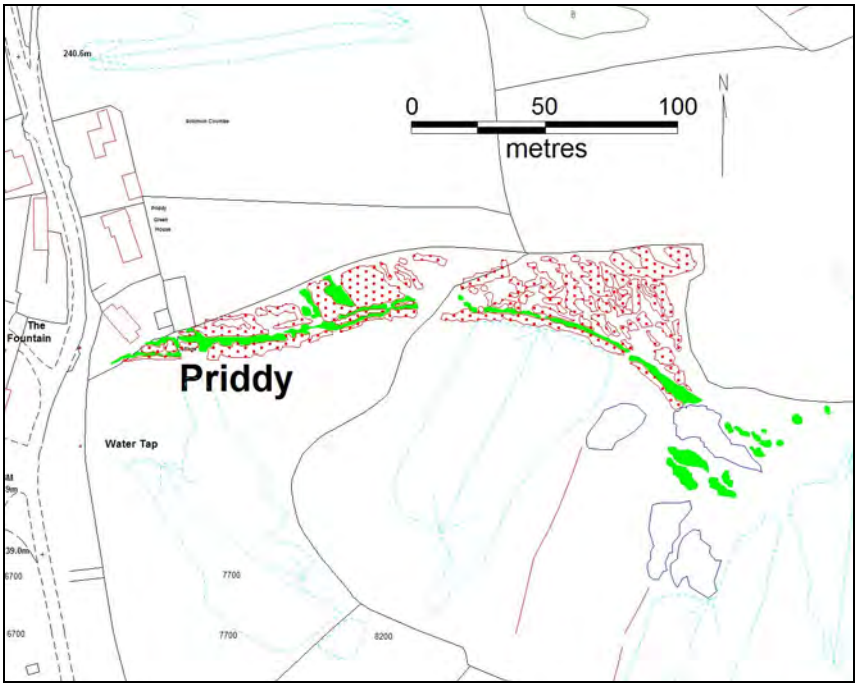


Figure 26: Abandoned house plots on Gwilmots Lane, Priddy

Earthwork remains of house platforms and a probable ore processing area were also recorded at Charterhouse (Somerset HER PRN 23038) and may have also been abandoned at the end of the post medieval period. A leat runs through an area of platforms, which may be the remains of industrial buildings associated with an ore processing site. One of these platforms was excavated in 2007 and was found from dating of excavated finds to be a building extant in the period 1680-1720 (Somerset HER PRN 26990). This would suggest that both the industrial site and the associated housing were abandoned at the end of the most prosperous period of lead mining.

The final phase of the lead industry on Mendip took place in the 19th century and consisted, not of new mining, but of reworking of the considerable amounts of lead bearing slags left behind by the earlier phases (Gough 1967: 181). Smelting was carried out on a small scale at Charterhouse from 1824 on land owned by Dr Benjamin Somers, at the same time that the Reverend Skinner was involved in excavations of the Roman settlement. Skinner's use of Somers' workmen led to the excavation of Roman slags in Rains Batch, which were found to be of a superior quality to the later examples when re-smelted (ibid: 183). This was probably in the isolated area of mining recorded to the north west of the Roman settlement (Somerset HER PRN 21525).
After 1850, smelting was carried out on a larger scale in all four mineries, with the additional assistance of Cornish mining engineers (Athill 1976: 148). Features of the Cornish smelting process survive at Charterhouse in the form of circular buddle pits. These were stone-line pits used to prepare refuse for re-smelting and were generally found in groups of around six (Gough 1967: 185). Two groups of buddle pits were recorded in Velvet Bottom to the south of Charterhouse, one consisting of nine pits and other, six. Two other possible buddle pits were identified from circular cropmarks in the Priddy area, one previously known site and one newly identified through the aerial survey (Somerset HER PRNs 23241 and 19130). Long horizontal flues were also constructed in the hillsides, in which smoke from furnaces deposited lead content before escaping through tall chimneys (Athill 1976: 148). An example of these flues survives above the Charterhouse mining area and a chimney remains at East Harptree. Unsuccessful attempts were also made by Cornish engineers to carry out deep mining at Charterhouse (Stanton & Clarke 1984: 31), but it is very difficult to identify the remains of these shafts through aerial survey.

Other minerals were also exploited on Mendip, most notably calamine, which became an important industry during the 18th century (Gough 1967: 206). Calamine is found in several areas on Mendip, but the main location within the ALSF character area is to the south of Shipham. The earthworks form quite a distinctive pattern in comparison with the lead mining rakes to the north of the village. The calamine workings are defined by shafts surrounded by a collar of spoil, or a long wide groove with spoil either side. The mining appears unsystematic because of the nature of the ore, which runs in many different directions through the bedrock. The ore mainly lay near to the ground surface and mines were generally dug no deeper than between 37 to 55 metres (Gough 1967: 226).

Calamine was used in the Bristol brass industry and later a method of extracting zinc from the ore was developed (ibid: 220). The fact that it was such an important industry up until the early to mid-19th century is demonstrated by the number of people involved in it. An extensive area of shanty town plots is located on the

outskirts of Shipham, which would have formerly housed the miners. However, by 1853, the industry had proved uneconomical and operations in this area ceased. The combination of exhaustion of the ores near the ground surface and competition from cheap imports from abroad meant that the Mendip calamine industry can to an end (ibid: 226; 232).

Stone was quarried in the ALSF Mendip Hills character area for a variety of reasons during the post medieval period. As mentioned above, the construction of field walls entailed many small quarries being opened up, usually in the same location. Limestone was also used for farm buildings and for production into lime for land improvement (Athill 1976: 156).

This industry starts to the seen on a wider scale in the 19th century. Mendip limestone was used for road building, building stone, gravel, asphalt and lime (ibid: 156-7). Quarrying probably began in the Cheddar and Wells areas during the 19th century, before the expansion of the rock quarries in the 20th century.

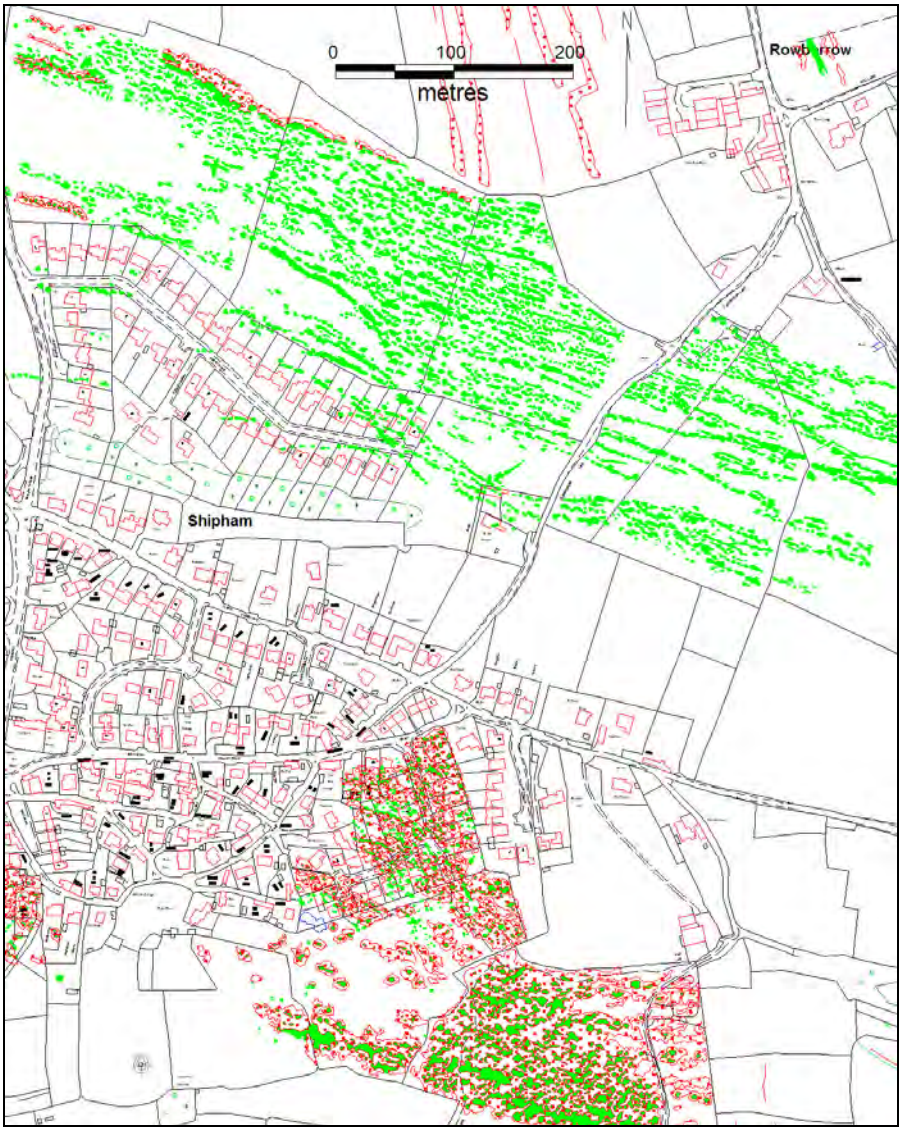


Figure 27: Calamine mining to the south and lead mining to the north of Shipham

Case Study: Recording the Lead Mining

A decision was made early in the ALSF project to map the post medieval lead mining remains from aerial photographs and lidar in detail, rather than just indicating their extent. The information from the survey could then provide the quality of data required for meaningful archaeological analysis of this extensive landscape feature on Mendip. It could also feed into the English Heritage multi-disciplinary survey being carried out in the Mendip AONB. Small areas of mining could be targeted by the Archaeological Survey and Investigation team for ground survey, but due to the large area covered by the four main mining areas, the full extent would be covered by aerial survey only.

The full picture of the mining remains in the four main areas (Chewton and Priddy mineries, Chancellor's Farm, Charterhouse and Fernhill) was achieved through mapping from a combination of aerial photographs and lidar data. The visibility of the mining rakes differed in each of the areas. The Stockhill area, which contains the Chewton and Priddy mineries, is a large coniferous plantation. As mentioned above, this type of dense foliage cannot be penetrated by the light pulse during a lidar survey, so the picture given is of the tops of the trees only. In this area therefore, the best source of information were the earliest aerial photographs where the trees were not yet fully established. Around Chancellor's Farm, the bulk of the mining detail could be mapped from photographs taken in 1946 and 1964, but no detail could be added in a small woodland plantation in the north east of the area, due to the density of the tree cover. Examination of the lidar data revealed that the mining rakes continued in this area and also extended out to the north and south of the main area as shallow linear depressions. This example demonstrates how the change in type of woodland can affect the efficacy of the lidar survey.

Figure 28: Mining rakes seen in a plantation north east of Chancellor's Farm

Mapping the mining areas in detail has created results which can be both analysed easily and which yield more information for the end user. Mapping the individual pits means that the patterns taken in different areas of mining can be easily compared. This provides a data set which has been used in the analysis of the aerial survey results (see above) and will be available for future study of the lead mining on Mendip.

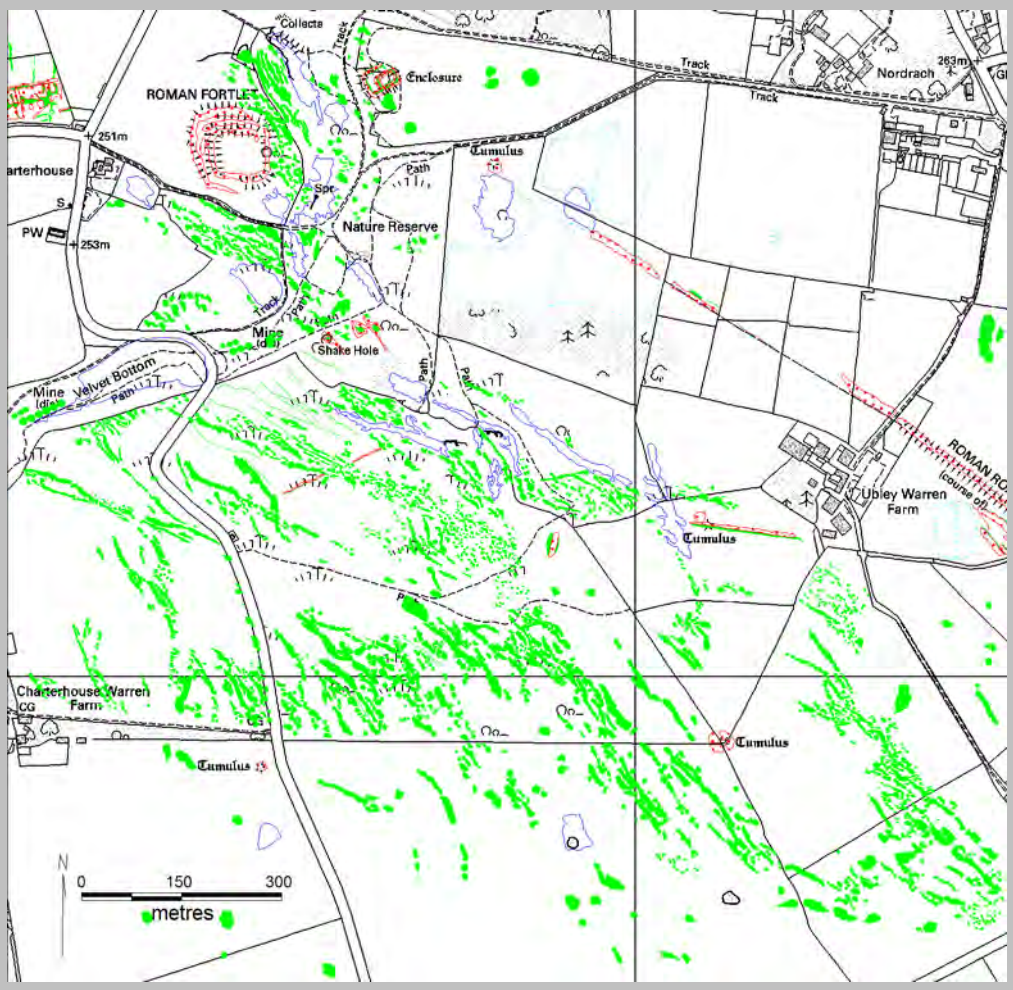


Figure 29: Post medieval mining rakes at Charterhouse

8 RESULTS OF THE AERIAL SURVEY: MODERN: 1900 TO 1945

The results of the aerial survey for the modern period fall into two main categories: the expansion of limestone quarrying; and sites associated with the Second World War. The settlement patterns in the ALSF character area remain relatively unchanged. Additional housing is built on to the main settlements around the plateau, for example, Cheddar and Shipham from the post war period on, but there do not appear to be any more desertions of settlement. Some field boundaries are removed, but the overall pattern laid out during the post medieval enclosure period is unchanged. The 'temporary' dry stone walls have now become a fixed characteristic of the central plateau.

8.1 Stone quarrying

Exploitation of the Carboniferous Limestone from the Mendip Hills had started to grow in scale during the 19th century, principally for extraction of aggregates and lime. This industry saw a rapid expansion in the interwar years due to an increased demand for roadstone. While many, smaller quarries were closed, others were expanded and new sites opened, particularly in East Mendip, but also at Dulcote near Wells, which was started in 1922 (Athill 1976: 157).

The continuing expansion of the main quarry sites within the ALSF survey area in the post Second World War period can be followed on the historic aerial photographs. These quarries include: Batscombe and Callow Hill near Cheddar, Milton Hill and Dulcote Hill near Wells and Broadmead Quarry near Westbury Beacon. All of these quarries supply roadstone and other aggregates as well as concrete products (ibid: 158). Somerset as a whole is now the second largest supplier of roadstone in England (Williams & Williams 1996: 126).

One of the ancillary products of limestone, Calcite, the mineral often referred to as *lime* continues to be extracted commercially for agriculture in the Mendip Hills, particularly in the quarries around Cheddar (Hardy 2002: 48).

8.2 Second World War

Sites constructed in the Mendip Hills ALSF character area during the Second World War can often only be recorded from aerial photographs of the 1940s. Wartime defences and other military sites were often removed very quickly in the post war period so the photograph may sometimes be the only record. However, there are survivals, including most notably, the extensive anti-landing obstructions on Black Down (see Case Study: Black Down in the Second World War).

The sites which no longer survive, or are no longer visible on aerial photographs, fall into three categories: defensive structures, Prisoner of War camps and military bases. The defensive structures comprise: anti-tank cubes and an anti-tank ditch, sections of which were recorded from aerial photographs between Wells and Maesbury Camp; anti-aircraft landing obstacles on Fry's Hill; Starfish lighting decoys, which were intended to represent bombing targets such as railway marshalling yards, and ancillary structures on Black Down. The Fry's Hill anti-aircraft landing obstacles

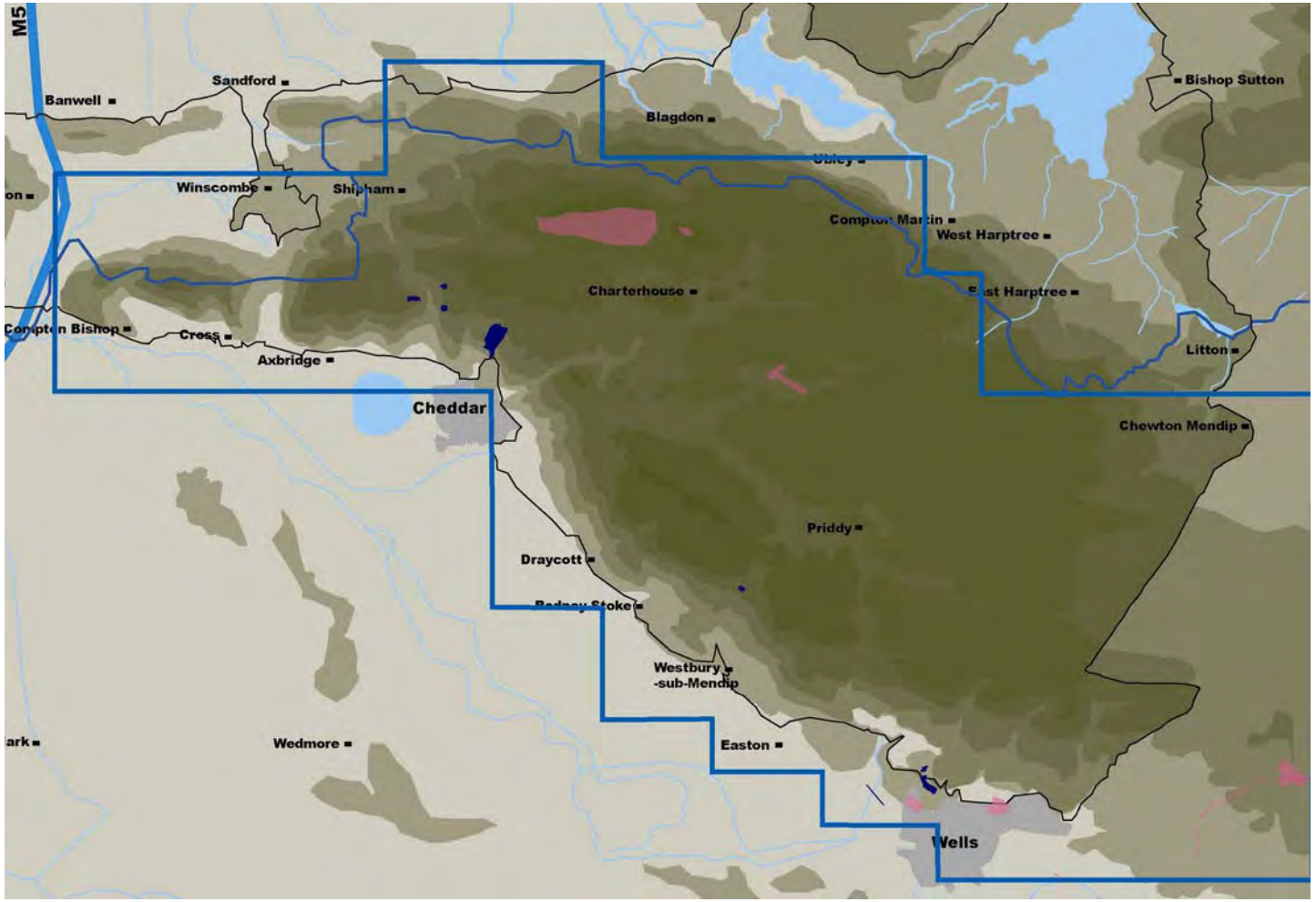


Figure 30: Results for the modern period

Pink = Second World War sites; Blue = Limestone quarries Map base © Crown copyright. All rights reserved 100023366 (2008)

appear to be like a miniature version of the extensive site on Black Down. Two parallel lines of hummocks and one line perpendicular to them are visible on aerial photographs of the 1940s, breaking up the flat area of ground.

The two Prisoner of War camps were recorded to the northwest of Wells and inside Stoberry Park. The site of the first camp, Penleigh, number 107, on Wookey Road, Wells (Brown 1999: 204), has now been built over and the second site, camp number 666 on College Road, Wells (ibid) has also been removed and partially built over.

Military camps in this area were: the firing range at Yoxter and a large ammunition dump and associated camp to the west of Maesbury Castle. The Yoxter firing range is still in use today and is the oldest active military base on Mendip. A permanent camp was first built here in 1933 (ibid: 189-90). The site was expanded during the Second World War and these changes were recorded from aerial photographs of the 1940s. An additional shooting butt and two areas of buildings including air raid shelters were mapped to the east and west of the northern end of the butts. The depot near to Maesbury Castle was controlled by the US Army with a special railway siding approaching it from the north. This was only one of a number of ammunition stores on Mendip, although others could not be identified on aerial photographs. As a result of these storage depots, by early 1943, the Mendip Hills area had been declared a military exclusion zone (ibid: 196).

Case Study: Black Down in the Second World War

The extensive area of anti-aircraft landing obstacles Black Down decoy site largely survives as an earthwork, formed of a grid made up of lines of hummocks. The main features of this site could be seen clearly on aerial photographs of the 1940s and the 1970s. The grid is visible over an area measuring 2,150m by 680m, consisting of 12 rows oriented north-south, crossed by 3 rows oriented east-west. Each row consists of double rows of sub-circular mounds measuring 4m in diameter. The main grid, although it stands out fairly clearly on aerial photographs including photographs taken as recently as 2006, could not be identified clearly on lidar. The lidar data shows the Bronze Age barrow groups on Black down, but the smaller hummocks making up the grid are obscured by low vegetation, which the lidar does not appear to be able to penetrate. Starfish bombing decoys are situated around the anti-aircraft landing obstacles (PRNs 25863, 25793, 25794 and 25792) to the north and east of the main grid. Two control bunkers and a control site for the decoys are situated to the south of the grid area.

Starfish were lighting or fire decoys designed to give the appearance of bombing targets such as railway marshalling yards in order to confuse enemy bombers. The large group of decoys on Black Down were intended to simulate the entire city of Bristol with displaced lighting, including the variety of railway facilities such as Canons Marsh marshalling yard and the Bristol West railway depot (Dobinson 2000: 146). One of decoys on Black Down is designated as a *Q Fire* or *QF* sites, while the majority are *QL* sites, indicating that they were simulating urban lights (ibid: 57; 62). These lighting decoys are fairly ephemeral structures and could only be identified on photographs from 1946. They consist of a firebreak trench enclosing a number of structures on which fires were lit. Only two of the sites could be recorded during the survey, probably due to their ephemeral nature, but the decoys were intended to simulate the following sites in the city of Bristol:

- Burrington "A" - the Canons Marsh marshalling yard and dock.
- Burrington B - the railway West Depot.
- Burrington D - Temple Mills Station and Pyle Hill Goods Depot.
- Burrington E - the Kingsland Road sidings.
- Burrington F was a combined QL and QF decoy designed to represent the East Depot marshalling yard.

Figure 31: Control bunker for decoy

NMR 24330/29 07-SEP-2006 © English Heritage (NMR)

Figure 32: Starfish decoy and anti-aircraft landing obstacles on Black Down

RAF 3G/TUD/UK/15/21 PART IV 5356 13-JAN-1946 English Heritage (NMR) RAF Photography

9 THE EAST MENDIP ALSF SURVEY AREA: A COMPARISON

The East Mendip project area is located at the eastern edge of the Mendip plateau, between Shepton Mallet and Frome. The area is a 10km by 5km block, in an area of extensive Limestone extraction, extending from Chesterblade in the south west to Marston Park in the north east. The landscape is one of rolling hills and incised valleys, with the majority of the area currently under permanent grassland in the west and mixed pasture and arable in the east. Woodland is found on the higher areas, such as to the north of Cranmore.

The overall pattern of settlement appears to have been largely dictated by the local topography and geology, with villages located in valley bottoms, near to areas of free draining soils on the lower slopes. The main settlements, including Nunney, Wanstrow and Cranmore, are located along the spring line. Although this area of the Mendip Hills appears to have been settled fairly densely, the nature of the landscape means that the villages feel very isolated from each other, despite their relative proximity. This proximity of settlement contrast with the more widespread distribution seen in the central Limestone plateau. Another contrasting factor in the appearances of east and west Mendip are in the field boundaries. The stone walls which are a noted characteristic of the AONB area disappear towards the less exposed eastern end of the plateau, where hedges are predominant. A key influence on the appearance of the eastern Mendip Hills in the Post Medieval and Modern periods is the growth of the aggregates extraction industry. Limestone is quarried here for roadstone and lime production and Andesitic Lava is extracted for aggregate. The Limestone quarries in particular have had a dramatic effect on the landscape and probably represent the most significant effect on its appearance since the enclosure of the open fields.

Figure 33: Location of the east Mendip Hills survey area

9.1 Results of the aerial survey

The East Mendip Hills also differ greatly from the AONB in terms of what was previously known of the archaeology of this area, in terms of intensity of study and in

what has subsequently been identified through the aerial survey. Particular locations in East Mendip have been the subject of intensive study, such as the work carried out by the Downhead Historic Landscape Survey (Stokes 2000). However, a wide scale aerial archaeological survey has never been conducted over the whole area, as has been the case in the AONB area (eg Ellis 1992). A systematic study of aerial photographs would redress the imbalance in knowledge across the region, although it does, as with any single survey technique, have certain limitations (see above p?).

The particular conditions of the central Mendip plateau mean that it has been treated differently to the areas around it. The absence of permanent settlement on the plateau until the post medieval period has also positively affected the survival or prehistoric field monuments. Throughout the landscape of the East Mendip survey area, there is greater access to water and therefore, an increased density of settlement. These locations of occupation do not appear to have altered considerably over time and were probably reused. Deserted elements and evidence of medieval and post medieval agricultural practises are preserved as earthworks in pasture around nearly all of the settlements in the survey area into at least the 1940s. As such, they may be masking earlier activity in the landscape. Overall, the survey results are mainly medieval or post medieval and there is very little evidence from the Roman, Iron Age or earlier periods.

9.1.1 Prehistoric and Roman

The earthwork remains in the East Mendip project area from the Prehistoric period recorded on aerial photographs comprise: Bronze Age burial mounds, two possibly Iron Age earthworks and two field systems. The burial mounds, or barrows (Somerset HER PRNs 12046, 12162 and 12163), are generally found singly, although one linear barrow cemetery is located in the extreme west of the area (Somerset HER PRN 23323). The predominantly isolated nature of the barrows differs to the situation in the centre of the Limestone plateau where linear barrow cemeteries are common. This difference could relate to the landscape transition as the Mendip Hills slope down towards Frome, or could be explained by the problems of visibility discussed above.

The two Iron Age earthworks are: Dinies Camp, which has been interpreted as a defended enclosure (Somerset HER PRN 23428); and a possible promontory fort located to the north of Stubbs Wood (Somerset HER PRN 24775). Dinies Camp appears to fit into the category of Iron Age hill-slope enclosures, similar in morphology to the examples from central Mendip, such as West Twin or Rowberrow Camp. Dinies Camp provides an example of how information can be built up about a site from different sources. The banks of the camp were visible on aerial photographs, but clearer on lidar; the banks or field boundaries to the east could be identified from lidar only; and ridge and furrow inside and to the north of the camp was only visible on aerial photographs.

Figure 34: Dinies Camp

RAF 3G/TUD/UK/24 PART III 5271 14-JAN-1946 English Heritage (NMR) RAF Photography

The earthwork to the north of Stubbs Wood occupies a promontory of land. The precise shape of the earthwork is difficult to define due to tree cover, but it is similar in shape to hillforts situated on promontories above the River Barle on Exmoor (Riley & Wilson-North 2001: 63-4). The similar location and morphology of the earthwork to the north of Stubbs Wood suggest that it may also be a hillfort of Iron Age date. Two rectilinear enclosures, thought to be Iron Age or Roman in date, have also been found through fieldwork in Asham Wood (Stokes 2000: 8). These sites are similar in morphology to the possible Iron Age or Roman enclosed farmsteads found in the central Mendip area. The location of these sites suggests a more open farming landscape in the current area of woodland. Their discovery, through fieldwork in a tree covered area, makes that point that the aerial survey results should be considered along with complementary forms of survey. Fieldwork or targeted excavation may also be needed in order to get a complete picture of the area from the Prehistoric to Roman periods.

A field system is located to the northeast of Nunney, around Sharpshaw Farm (Somerset HER PRNs 23915 and 19011). It is formed of small sub-square and sub-rectangular fields, suggesting a later Prehistoric origin (Muir 2000: 202). The field system is similar in morphology to that seen at Bradley Cross, near Cheddar. A second possible field system which may also originate in the later Prehistoric period is located to the north west of Cloford. This area of field boundaries was identified through cropmarks, which suggests that they may be early in date because no surface remains of the field system survive. Other features are visible as cropmarks near Cloford, including quarry pits and field boundaries on different alignments. This area has been heavily ploughed and Medieval sites visible as earthworks on photographs taken in the 1940s, such as shrunken settlement remains around Cloford (Somerset HER PRN 24785), are no longer visible on later photographs. Therefore, it is difficult to assign a date to the field boundaries on aerial photographic evidence alone, but the cropmark features may represent several phases of a field system of Medieval or earlier origin.

9.1.2 Agriculture settlement in the Medieval period

As seen in the central Mendip survey area, the eastern Mendip Hills were also affected by two periods of intensification of agriculture. The first took place in the Medieval period, possibly as a response to a period of land hunger in the 12th and 13th centuries, a time of population rise (Aston 1988: 87). The second took place in the late 18th and 19th centuries, the time of agricultural experimentation, when the Mendip Hills became the target of a drive for land improvement (Williams 1976: 105).

Evidence for Medieval open field systems, which probably continued to be in use into the Post Medieval period, can be seen on aerial photographs throughout the East Mendip survey area. They are generally located around the extant villages, often adjacent to areas of shrunken settlement. They are preserved in relict ridge and furrow and in boundaries marking out narrow, rectangular strip fields. Strip lynchets, or cultivation terraces used to exploit land on hill slopes, are found in the northeast of the survey area to the east of Nunney and in the south west around Chesterblade and East Cranmore. Further details were added to the field system around Nunney from lidar, revealing new areas of strip lynchets and field boundaries. The presence of the systems of strip lynchets in the south of the East Mendip survey area may mean that a pattern of contour ploughing could potentially be followed along the southern scarp edge of the Mendip Hills from Draycott to Wanstrow.

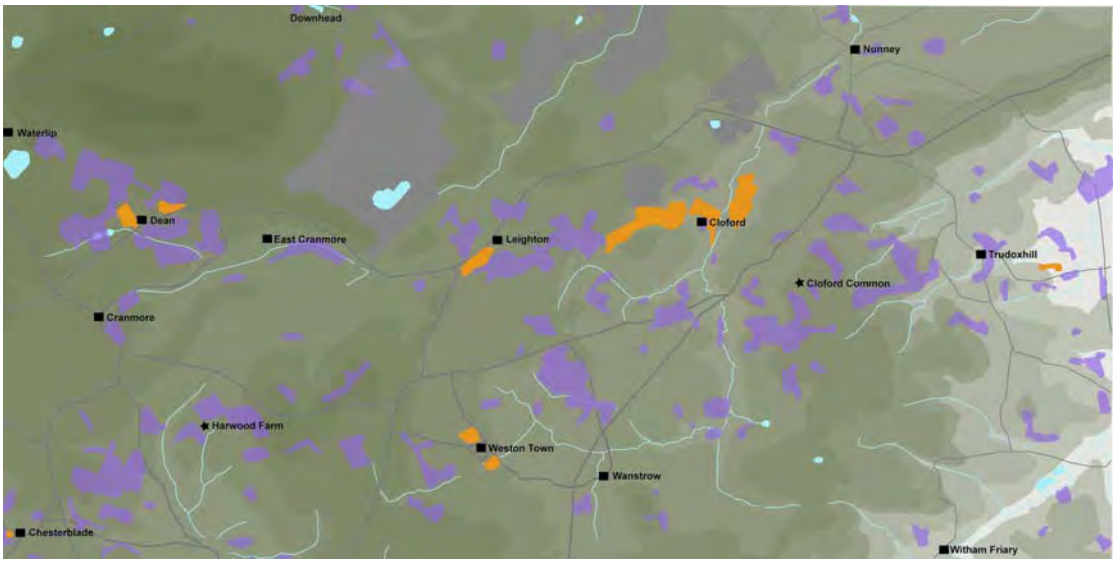


Figure 35: Areas of open fields and strip lynchets (purple) and shrunken or deserted settlements (orange)

If areas of ridge and furrow can be seen as an indicator of Medieval population centres, then two further settlements might possibly be defined. Two large areas of ridge and furrow are not situated close to extant villages: around Harwood Farm and on Cloford Common. Indistinct, but possible, settlement earthworks were recorded from aerial photographs in both areas. The fact that the other extensive areas of ridge and furrow are located around existing villages may support this interpretation of the earthworks. This suggests that the survey area was more populous at one point than even the definite signs of shrunken settlement suggest.

More clearly defined shrunken settlement earthworks were recorded around the majority of the villages in the west of the survey area. Villages shift and change in size for a variety of economic and social reasons (Aston 1985: 53) but the apparently larger number of settlements in this area, and the larger size of extant villages, in the Medieval period may be due to the population rise and accompanying land hunger at this time. This need for greater productivity may have also caused Mendip landowners to reorganise their workers into nucleated settlements surrounded by open field systems. There are possible planned additions to villages in the survey area, including Cloford and Leighton, where regular sized plots of land with associated house platforms were recorded. Earthworks were mapped at Chesterblade, Dean, Downhead, Leighton, Wanstrow and Cloford. Areas of

shrunken settlement newly identified through the aerial survey areas were recorded at Weston Town and Trudoxhill.

Figure 36: Shrunken settlement of Cloford

RAF CPE/UK/1944 2259 23-JAN-1947 English Heritage (NMR) RAF Photography

9.1.3 Other results from the Medieval period

The woods and hills of Mendip were a useful source of fuel, timber and grazing land for sheep for their royal and religious landowners and further evidence of the presence of these landowners is demonstrated by the examples of rabbit warrens found across Mendip. Pillow mounds, the remains of artificial rabbit warrens, are mainly found at the edges of the Mendip Hills (Neale 1976: 92). One example of a warren was identified within the survey area. A group of seven pillow mounds is located to the east of the site of the Medieval grange belonging to the hospital of St John in Bath, at Higher Alham (Somerset HER PRN 15533).

Fish were widely eaten in the Medieval period and fishponds were constructed for the breeding of fish or storing of fish caught elsewhere (Aston 1985: 105). Fish were also an important part of the monastic diet, as, for example, there was a Benedictine prohibition on eating the flesh of four-footed beasts (Bond 2004: 183). Therefore, fishponds, as well as being associated with high status secular residences, are frequently found both within monastic precincts and on demesne estates and granges (ibid: 197). Four examples of fishponds are located across the survey area which reflects this distribution between religious and secular sites. A group of two ponds are associated with the Carthusian priory at Witham Friary (Somerset HER PRN). Other examples are found, to the north west of Wanstrow (Somerset HER PRN 24786), at Dean (Somerset HER PRN 23340) and a further site is suspected at The Goole, east of Chesterblade (Somerset HER PRN 23339). An extensive system of leats are attached to the Wanstrow fishponds which are located to the north of Manor Farm in Wanstrow, which may suggest that the fishponds were associated with an earlier manor house. The presence of fishponds in the East Mendip ALSF survey area highlights the difference between this landscape and the central plateau where water was scarce.

Overall, the aerial survey results show that this area was being intensively exploited in the Medieval period. Arable cultivation is widespread, even extending onto hillsides, and land is being exploited on a scale not seen again until the late 18th century.

Figure 37: Fishponds to the north of Wanstrow

9.1.4 Land improvement in the Post Medieval period

The post medieval period, particularly from the 18th century on, saw dramatic changes to the appearance of the landscape of the Mendip Hills as a whole. Enclosure of land was seen as a necessary part of the drive for increased productivity of farmland. This process starts within the east Mendip project area, and in Mendip as a whole, when in 1770 East and West Cranmore became the first area of Mendip to acquire an Act of enclosure (Williams 1976: 105). Enclosure could happen over a large area, or in a piecemeal fashion, where local agreements could lead to areas as small as a couple of strips in an open field being joined together. Examples of the fossilisation of strip fields, where piecemeal enclosure has occurred, within the later landscape, can be seen in the east Mendip project area around Cranmore and Dean. Fossilised strip fields exist as modern boundaries and intervening boundaries can be identified as linear banks within them.

The settlement patterns in the east Mendip project area become more dispersed in the Post Medieval period, a result of the enclosure process. New farmsteads are constructed which date from the 17th and 18th centuries, for example Honeycliff Farmhouse (Somerset HER PRN 538139) and Batcombe Lodge (Somerset HER PRN 536544). It is probable that the depopulation of settlements, resulting in the deserted areas around many of the villages, may have partly occurred in this period, as former small owner-occupiers became rural labourers or paupers (Briggs 1994: 191). Another option was to seek work elsewhere possibly in cloth production in Frome, whose mills were flourishing in the 18th century (Atthill 1976: 164).

Another clear indication of the changes to land ownership in East Mendip are the landscaped parks, associated with large country houses, that are a distinctive feature of the 18th century. Some of these new landowners had made their fortunes as

clothiers, including the Strodes of Cranmore (ibid: 163). Garden features are visible on aerial photographs in the parkland surrounding Southill House, Cranmore Hall and Marston House (Somerset HER PRNs 23337, 23338 and 24750). The earthworks recorded for each site may reflect several phases of landscaping, as styles changed during the 18th century from formal to the English landscape style. At Southill House, a tree enclosure ring was identified outside the previously recognised extent of the park but connected to it by a pathway suggesting that the park may have been larger when it was first laid out. Areas of probable formal gardens and paths were identified within Marston Park and in the park around Cranmore Hall. Field systems were also recorded to the west of Cranmore Hall, which appear to overlie an area of medieval ridge and furrow, probably the site of a model farm, Home Farm, which was constructed the Pagets on their estate (de Viggiani 1988: 62).

The drive for agricultural improvement by landowners in the east Mendip project area is reflected in the eight examples of the upland version the water meadow, the catchwork water meadow (Brown 2005: 84), which were recorded around Chesterblade, Cranmore, Coldharbour and Nunney. Water meadows were used in order to irrigate and improve areas of grassland and are common in south and west England, particularly on the chalkland areas of Wiltshire, Hampshire and Dorset. Catchwork meadows are widespread in south west England and are also found on Exmoor, the Brendon Hills and the Quantock Hills (ibid: 85). They are generally constructed on hill slopes and consisted of a series of gutters cut along the contours of the hill (ibid: 84). In the east Mendip project area they survive as earthworks in a variety of forms: from a complex of field gutters with connecting drains, to a system of radiating ridges. Other possible surface drainage features, probably also land improvement works, can also be seen throughout the East Mendip survey area.

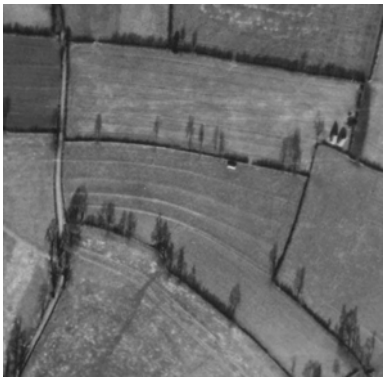


Figure 38: Water meadow, north of Chesterblade

RAF CPE/UK/1924 4276 16-JAN-1947 English Heritage (NMR) RAF Photography

Figure 39: Water meadow, Coldharbour

9.1.5 Landscape change in the 19th and 20th centuries

The decline in agriculture in Britain at the end of the 19th century may account for some of the desertions from the villages in the East Mendip survey area. This period does however see the rise of another industry, large scale stone extraction, which continues to have a dramatic effect on the appearance of the east Mendip Hills. Many of the larger Limestone quarries in the east Mendip project area have their origins in the 19th century, but remained relatively small in size up to the 1940s. However, they saw massive expansion in the post-Second World War period (see figure?). A comparison of historical aerial photographs dating from the 1940s on, clearly demonstrates the changes to the landscape of the survey area, for example,

the gradual disappearance of Asham Wood, into which the Asham Limestone quarry has gradually expanded.

The expansion of the quarries has also affected the archaeology of the area. Fragments of ridge and furrow, field boundaries and earthworks associated with the shrunken Medieval settlement of Downhead are visible on 1940s photographs within the area now covered by the Torr Works quarry. Various features associated with the Post Medieval landscape park around Cranmore Hall are likewise now inside the quarry area. Immediately to the south of Torr Works quarry, the associated effects of the aggregate extraction industry can be seen. The possible Iron Age promontory fort to the north of Stubbs Wood has become the quarry maintenance depot by the 1970s.

Another factor that has affected the modern appearance of the landscape of the survey area is agriculture, particularly in the east where there are larger areas of arable. No trace of the settlement earthworks recorded at Cloford Common and Trudoxhill from 1940s RAF aerial photographs could be identified either on photographs from 2005, or lidar. The fact that none of the features of the settlement could be identified from the idar results demonstrates the extent to which this site has been levelled, since it is capable of picking up very small changes in elevation.

The effects of the Second World War on the landscape which are quite dramatic in other areas of the Mendip Hills, for example the large bombing decoy on Black Down, are relatively limited in the East Mendip survey area. Marston House and its grounds were used during the Second World War by the US Army and an area of numerous, closely based tent bases, administrative and ancillary buildings can be identified on aerial photographs from 1946. A number of bomb craters are also visible on aerial photographs of the 1940s in the survey area, probably the result of enemy bombers emptying their payloads after a raid over Bristol.

9.1.6 Conclusions of the East Mendip Hills aerial survey

The aerial survey highlighted the type and range of archaeological sites and the research potential of this comparatively understudied area of, particularly for the Medieval and Post Medieval periods. There was an increase in sites recorded on the Somerset HER for the east Mendip Hills project area of 52%. However, the problem of visibility of the archaeology because of the predominantly pastoral land use, means that there may be a lot more to learn from this area through complementary forms of survey. The lack of oblique photography in East Mendip, due in part to the restriction zone around Bristol airport, adds a further restriction to what can be found through aerial survey. Oblique photography is carried out at times which are most suitable for the observation of archaeological sites, either as cropmarks or earthworks. While a great deal of information has been gained from the predominantly vertical photography, there may be much more to add from a future programme of specialist archaeological oblique photography in this area.

A key theme that came through the aerial survey results was that of agricultural development and settlement shift, particularly in the Medieval and Post Medieval periods. The results suggest that, at times, this was a busy and populous area where people had to be innovative to make the land productive, and not the area of isolated villages and pastoral land as it appears today.

Another main theme that has come across in the aerial survey results is the effect of large scale quarrying on the surrounding landscape. The erosion of monuments and disappearance of field systems emphasises how large a part of our information for this area may be missing. The historic aerial photographs can, by presenting a frozen moment in time, fill in some of the gaps in our knowledge of this area. The photographs, and lidar, can also be used to monitor the condition of monuments and landscapes.

The difficulties of finding sites in a predominantly pastoral and intermittently wooded landscape are shown by the survey results and emphasise a need for their use together with complementary forms of survey, such as field survey. The lidar survey results demonstrate that this technique has much to add, particularly through identifying very slight archaeological remains on the ground surface. However, the fact that type of woodland in the project area is too dense for lidar to penetrate again adds emphasis to the need for a programme of ground survey. The aerial survey alone has contributed greatly to our understanding of this area of the East Mendip Hills and shows the potential of this area for a multi-disciplinary study of the type carried out in the Mendip AONB.

9.2 Comparison with the central Mendip survey area

The results from the two survey areas within the ALSF Mendip Hills character area emphasize the differences in landscape and resources across the Mendip Hills. There are themes in common across both of the survey areas, particularly as regards developments in agriculture.

The exposed nature of the central plateau, with its scarcity of access to water, has affected the settlement patterns in that area. A point of similarity between the two areas is that the main centres of occupation may have remained the same possibly since the later prehistoric periods. Village locations appear to be governed by the particular topography in both survey areas. The eastern survey area is positioned at the end of the Mendip plateau and the differences between upland and lowland are less extreme. Sources of water are also more plentiful leading to a greater density of occupation.

While it would appear that the eastern area is located on less marginal land, its villages appear to have been more greatly affected by outside events than the villages and towns on the southern slopes of the central area. Each village has an area of deserted settlement associated with it, either suggesting that they had expanded in profitable times, or that they had become depopulated during periods of depression. In the central Mendip area, the villages managed to remain profitable even during the period of agricultural depression at the end of the 19th century. However, desertions of farmsteads were taking place during this period on the southern scarp edge. The effects on the east Mendip villages could be more noticeable because there is less of a distinction between upland, marginal, areas of land and land around a settlement, than in the more fractured landscape of the central Mendip area.

A key theme that comes out of the east Mendip results is the number of archaeological sites associated with water. There are examples of medieval fish ponds and innovative post medieval catchwork water meadows. These results emphasize the differences between the resources of the central and eastern areas of the Mendip Hills. However, the relatively waterless nature of the central plateau has

meant that prehistoric field monuments are preserved here to an extent not seen elsewhere in the Mendip Hills.

The effects of stone quarrying are seen in both of the survey areas. However, the extent to which large-scale limestone extraction has affected the eastern area is probably more comparable to the dramatic effects that post medieval lead mining had on the central area, than to the current quarrying. The enormous Torr Works and Asham Wood quarries have had a huge impact on their surroundings. Although seen to a lesser extent in the central area, the expansion of some of the quarries, such as Battscombe and Dulcote, causes the same concerns for the landscape and for archaeological sites.

There was an increase in sites recorded on the Somerset HER for the east Mendip Hills project area of 52% as compared to an increase of 58% for the central Mendip area. Both figures demonstrate the potential for recording new archaeological sites in the Mendip Hills using the NMP methodology.

10 CONCLUSIONS

The results of the aerial survey in the ALSF central Mendip Hills character area have revealed a pattern in settlement that possibly follows through from the later prehistoric periods to the medieval period. Settlements and field systems tend to be situated around the edge of the hills, while the use of the land on the central limestone plateau appears to different. In the Neolithic and Bronze Age, and possibly also the Iron Age, a concentration of field monuments are constructed, suggesting that this area had some significance to the people of the time. Sources of water are in scarce supply on the central limestone plateau so, while it is probably true that there is a degree of practicality in the choice of settlement site, the central area may have been regarded as special because of its inaccessibility. The medieval period sees in an increase in the use of the upland pasture for grazing of sheep, probably with associated seasonal settlements. The plateau finally see permanent settlement in the post medieval period, in the form of dispersed farmsteads, located in the newly enclosed landscape. The post medieval period also sees a huge increase in another key industry in this area: lead mining. Extensive areas of mining remains were mapped and recorded in detail across the central plateau. The modern period sees the growth of aggregate extraction in this area, with massive post-Second World War expansion of the limestone quarries in the southern part of the survey area.

Comparison with the east Mendip survey area demonstrates the effects of the changes to the landscape at the eastern end of the plateau. Supplies of water are more plentiful on the hilltop in this area and settlements are dispersed throughout the area in the valley bottoms. One similarity is the pattern of strip lynchets along the southern scarp. Strip lynchets or contour ploughing can be identified in the east Mendip area and may indicate a continuous line joining up with the central area, running from Draycott to Wanstrow. Another similar feature of the two areas is the growth in the aggregates extraction industry. The quarries in the east Mendip survey area have expanded more dramatically in the post Second World War period, but huge additions to the quarries around Cheddar and Wells can also be identified from the sequence of aerial photographs.

The results from the east Mendip aerial survey help to put the central Mendip plateau into its wider context. Examination of the remaining part of the ALSF Mendip Hills character, between the eastern edge of the AONB and Shepton Malet, would enable further contextualisation of the plateau and would be recommended for future work. The increase of 52% in sites recorded on the Somerset HER for the east Mendip survey area is a substantial addition to the knowledge of that area's archaeology. However, the increase of 58% for the central Mendip Hills area demonstrates the potential for new discoveries, even in the area within the AONB which is comparatively well studied.

The aerial survey has resulted in both an increase in knowledge of the central Mendip Hills and a dataset which will be useful for future archaeological work. In particular, mapping the lead mining remains in detail has enabled comparison of areas of areas which followed different patterns of extraction. Information of this kind has already contributed to an English Heritage multi-disciplinary study in the Mendip AONB and should be useful for future analysis of both the lead mining and the archaeology of the Mendip Hills in general.

11 BIBLIOGRAPHY

Aston, Michael 1985. Interpreting the Landscape: Landscape archaeology and local history. London: Routledge

Aston, Michael 1988. Land Use and Field Systems, in Aston, Michael (ed), Aspects of the Medieval Landscape of Somerset. Bridgwater: Somerset County Council

Atthill, Robin 1976. Industry. In, Atthill, Robin (ed), Mendip: A New Study. Newton Abbot: David & Charles

Barnwell P S & Giles C 1997. *English Farmsteads, 1750-1914*. Swindon: RCHME

Bettey, Joseph 1988. The Church in the Landscape: From the Norman Conquest to the Reformation, in Aston, Michael (ed), Aspects of the Medieval Landscape of Somerset. Bridgwater: Somerset County Council

Bewley, Robert et al 2005. New light on an ancient landscape: Lidar survey in the Stonehenge World Heritage Site. In, Antiquity, 79:636-647

Bond, James 2004. Monastic Landscapes. Stroud: Tempus

Briggs, Asa 1994. A Social History of England: From the Ice Age to the Channel Tunnel. London: BCA

Brown, Graham 2005. Irrigation of Water Meadows in England, in Památky Archeologické Supplementum 17

Devereux, B J et al 2005. The potential of airborne lidar for detection of archaeological features under woodland canopies. In, Antiquity, 79:648-660

Dobinson C 2000. *Fields of Deception: Britain's bombing decoys of World War II*. London: Methuen

Dyer C 1994. *Everyday life in Medieval England*. London: Hambledon Press

Ellis, Peter 1992. Mendip Hills: An archaeological survey of the Area of Outstanding Natural Beauty. http://www.somerset.gov.uk/media/896B4/MendipAONB.pdf National Monuments Record

Gough J W 1967. *The Mines of Mendip*. Newton Abbot: David & Charles

Hardy P 2002. *The Geology of Somerset*. Bradford-on-Avon: Ex Libris Press

Muir, Richard 2000. The New Reading the Landscape: Fieldwork in landscape history. Exeter: University of Exeter Press

Neale, Frances 1976. Saxon and Medieval Landscapes. In, Atthill, Robin (ed), Mendip: A New Study. Newton Abbot: David & Charles

Riley Hazel 2006. *The Historic Landscape of the Quantock Hills*. Swindon: English Heritage

Riley, Hazel & Wilson-North, Robert 2001. The Field Archaeology of Exmoor. Swindon: English Heritage

Smith, D I 1976. The Physical Environment of Mendip, in Atthill, Robin (ed), Mendip: A New Study. Newton Abbot: David & Charles

Soil Survey of England and Wales 1983. Soil Map of England and Wales. Harpenden: Soil Survey of England and Wales

Stanton W I 1986. Archaeological Notes: Natural sinkholes affecting the Priddy Circles, Mendip, in, *Proceedings of the University of Bristol Spelaeological Society*. 17(3): 355-358

Stanton W I & Clarke A G 1984. Cornish miners at Charterhouse-on-Mendip. In *Proceedings of the University of Bristol Spelaeological Society*. 17(1):29-54

Stokes, Penny (ed) 2000. Downhead: Landscape of Distinction. Shepton Mallet: Mendip District Council

Truscoe, Krystyna 2006. Interim Report for Aerial Survey Component Eastern Mendip Block 1: ST 66 41 to ST 71 46. http://www.somerset.gov.uk/somerset/cultureheritage/heritage/projects/aggregaeslevyproject/

Truscoe, Krystyna 2006. Interim Report for Aerial Survey Component Eastern Somerset Levels Block 2: ST 34 30 to ST 39 36. http://www.somerset.gov.uk/somerset/cultureheritage/heritage/projects/aggregaeslevyproject/

Viggiani, Mary de 1985. A Cranmore Chronicle. Wells: St Andrew's Press

Viggiani, Mary de 1988. Two Estates: The Story of an East Mendip Village. Wells: St Andrew's Press

Whittle A 1999. The Neolithic Period c. 4000-2500/2200 BC: changing the world, in, Hunter J & ralston I (eds) *The Archaeology of Britain: An introduction from the Upper Palaeolithic to the Industrial Revolution*. London: Routledge

Williams, Michael 1976. Mendip Farming: the last three centuries, in Atthill, Robin (ed), Mendip: A New Study. Newton Abbot: David & Charles

Williams R & Williams R 1996. *The Mendips*. Bradford-on-Avon: Ex Libris Press

Wilson D R 2000. Air Photo Interpretation for Archaeologists. Stroud: Tempus

Young A 2007. *Cornwall and Isles of Scilly Mapping Project EH HEEP Project 2170: A report for the National Mapping Programme*. Truro: Cornwall County Council

Unpublished Sources

Crutchley S 2005. *National Mapping Programme Mendip Hills AONB Project Design*

Jamieson E 2006. *Project Proposal: The historic environment of the Mendip Hills Area of Outstanding Natural Beauty*

National Monuments Record

Newsome S 2005. *The Aggregate Landscape of Somerset Predicting the Archaeological Resource: Project Design for Aerial Survey Component*

Somerset County Council Historic Environment Record

12 APPENDIX : NATIONAL MAPPING PROGRAMME STANDARDS

Introduction

The aim of NMP is to enhance the understanding of past human settlement, by providing primary information and synthesis for all archaeological sites and landscapes from the Neolithic period to the twentieth century.

NMP aims to do this to a consistent standard by interpretation, mapping, classification and description of all archaeological sites and landscapes in England which are visible on aerial photographs. This comprehensive synthesis of the information available on aerial photographs is intended to assist planning, protection and research of the historic environment.

The specific aims of NMP are:

- To produce a georeferenced digital transcription of the form and extent of all archaeological features visible on aerial photographs for the whole of England.
- To record the location, indexed classification, archaeological description and analysis, and main sources of all archaeological sites visible on aerial photographs. Additional morphological recording for those sites for which meaningful morphological comparisons can be made.
- To provide a synthesis of the archaeology in each project area in the form of a report on the character, diversity, association and distribution of archaeological sites and landscapes.

Sources

Aerial Photographs

1. National Monuments Record
Enquiry & Research Services
National Monuments Record
English Heritage
Kemble Drive
Swindon SN2 2GZ
Tel: 01793 414 600

2. Cambridge University Unit for Landscape Modelling (formerly CUCAP)
University of Cambridge
Unit for Landscape Modelling
Sir William Hardy Building
Tennis Court Road
Cambridge CB2 1QB
Tel: 01223 764377

3. Somerset County Council HER
Historic Environment Service
County Hall
Taunton TA1 4DY
Tel: 01823 355426

Documentary Sources
Local Historic Environment Record monument records: The relevant Monument and Event records from the HER have been used as an aid to interpretation.

National Monuments Record (NMR): The relevant Monument and Event (including Excavation Index) records from AMIE have been used as an aid to interpretation.

Historic maps: These included Ordnance Survey first and second edition 25" maps from the late 19th and early 20th centuries. The 1955/6 edition Ordnance Survey Archaeology Division 1:10,560 field sheets (the precursors to the current NMR record maps) have also been consulted and have proved valuable in identifying removed field boundaries and structures.

Digital Transcription/mapping
Archaeological maps are produced by tracing archaeological information from georeferenced aerial photographs onto a suitable digital map base.

Rectification of aerial photographs
Rectified and georeferenced digital images are produced by transforming oblique and vertical photographs using AERIAL529. Where no digital image is available the relevant photograph(s) is/are scanned of each archaeological site to be mapped.

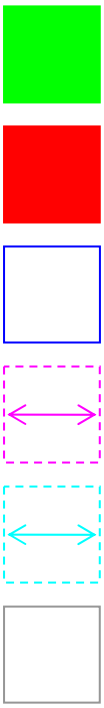
Control information is taken from digital copies of OS 1:10,000 scale maps and the relevant scanned photograph(s) are normally be rectified to an average level of accuracy of + <2m to the map. This gives an overall accuracy of plotted features, to true ground position, within +5-15m.

A digital terrain model function is used to compensate for steep or undulating terrain.

Mapping of archaeological features
Archaeology is traced off the georeferenced and rectified photographs using MapInfo. Archaeological features are depicted on different layers mainly on the basis of form (e.g. bank, ditch etc) irrespective of preservation as this is recorded in the database.

Although NMP has a standard set of colours for different layers they have been set up, on the basis of form (e.g. bank, ditch) so that they can be viewed in any colour or in a GIS environment where colours and symbols may relate to interpretation e.g. period, type etc. Symbols and fancy line types are avoided to facilitate transfer between GISD packages. Exceptions to this are ridge and furrow which is drawn in a semi-conventional manner because it would be too time consuming to map every rig and furrow. Therefore blocks are outlined and the direction of groups of rigs are shown with an arrow.

MAPPING CONVENTIONS



Ditch	Used for drawing all negative features seen as cropmarks and earthworks, eg, ditches, hollow ways and pits
Bank	Used when drawing upstanding earthworks or levelled features
Pits & Quarries	Used for extraction pits, bomb craters and other cut features
Ridge & Furrow	Used for ridge and furrow which has been levelled by the last available photograph
Ridge & Furrow	Used for ridge and furrow which is still extant
Structure	Used for structures, eg, a concrete pillbox or wooden posts

If you would like this document in a different format, please contact our Customer Services department:
Telephone: 0870 333 1181
Fax: 01793 414926
Textphone: 01793 414878
E-mail: customers@english-heritage.org.uk