

EXMOOR NATIONAL PARK NATIONAL MAPPING PROGRAMME



Management and Summary Report



Exmoor National Park NMP
Historic Environment Enabling Programme
Project Number 5107 MAIN

Management and Summary Report

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Abbreviations used in the text

CUCAP	Cambridge University Collection of Air Photos
CRAAGS	The Committee for Rescue Archaeology in Avon, Gloucestershire and Somerset
DCC	Devon County Council
DAP	Devon Air Photograph
DTM	Digital Terrain Model
EH	English Heritage
ENPA	Exmoor National Park Authority
ESA	Environmentally Sensitive Area
FEP	Farm Environment Plan
GIS	Geographical Information System
ENPHER	Exmoor National Park Historic Environment Record
ENPHES	Exmoor National Park Historic Environment Service
HLC	Historic Landscape Character
HLS	Higher Level Stewardship
NMP	National Mapping Programme
NMR	National Monuments Record
NMRC	National Monument Record Centre
OS	Ordnance Survey
RAF	Royal Air Force
RCHME	Royal Commission on the Historical Monuments of England
RCZA	Rapid Coastal Zone Assessment
SCC	Somerset County Council

1 Summary

The Exmoor National Park archaeological aerial survey used National Mapping Programme (NMP) methodology. It was funded by the English Heritage Historic Environment Enabling Programme (EH HEEP) and carried out by the Historic Environment Service (HES) of Exmoor National Park Authority (ENPA). Work began in March 2007 and was completed in July 2009.

The remit of this report is to outline the methods used and to provide highlights from the results of the survey phase. It is a comprehensive account of the survey results.

Dissemination of interim results took place during the project. A fuller dissemination project is currently underway, comprising an accessible, popular publication on aspects of Exmoor's medieval and post-medieval landscape and a series of web-based thematic essays. The web essays will populate a front-end to the new and developing Exmoor National Park Historic Environment Record, providing a route into the primary data.

The landscape of Exmoor National Park includes woodland, moorland and agricultural land, plus 55 kilometres (34 miles) of coastline, all contributing to its varied character. The project area comprised the National Park and a small contextual area, but excludes the area of previous surveys (see section 4.1 below), and therefore covered , 809 square kilometres of land.

The aim of the survey was 'to enhance our understanding about past human settlement, by providing information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century' (Bewley, 2001, 78). Relevant information identified on aerial photographs was interpreted and mapped to a consistent standard, and recorded in a digital geographical information system (GIS) and the English Heritage National Monument Record database. This data has now also been transferred to the Exmoor National Park HER.

The project results will provide ENPA HES staff with data for use in agri-environment scheme consultations. The survey data is already informing strategy and facilitating decisions regarding the management, preservation and research of archaeological sites and the historic landscape.

Over 2200 previously unrecorded archaeological features were transcribed and recorded during the project and a further 580 records were enhanced or amended. Of particular significance is the identification of a previously unrecognised coastal hill-top site of possible late Neolithic or early Bronze Age date. The survey has also enhanced perceptions of later prehistoric unenclosed settlement on Exmoor. A key outcome is the development of our understanding of the archaeology of Exmoor's medieval and post-medieval landscape, most notably of post-medieval enclosure, agricultural improvement and reclamation. A further key outcome is the improved definition of the extent of Second World War military activity on Exmoor.

2 Introduction

2.1 BACKGROUND TO THE PROJECT

The Exmoor NMP project is part of the English Heritage (EH) funded National Mapping Programme (NMP). The NMP was initiated by the Royal Commission on the Historical Monuments of England (RCHME) in 1992. Since the merger of RCHME and EH in 1999, the programme has been carried out or administered by EH.

The aim of the NMP is ‘to enhance our understanding about past human settlement, by providing information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century’ (Bewley, 2001, 78).

Exmoor was designated a National park in 1954. The National Park falls within the historic counties of Devon (29%) and Somerset (71%). Until 1997 National Park objectives for the area were met by the county councils, and since then by a free-standing local government body, the Exmoor National Park Authority (ENPA). ENPA has the usual range of statutory duties including responsibility for the historic environment, the conservation of which forms one of the National Park’s purposes, formalised under the Environment Act 1995 (Exmoor National Park Authority, 2007; Section 8.9).

The Exmoor NMP project was proposed to foster a structured programme of research, to increase our knowledge and improve the management of Exmoor’s historic environment (ENPA Draft Management Plan 2007-2012).

The primary aim of this report is to review the management of the project, document the sources consulted and highlight the themes emerging from the survey. It is hoped that this will be of some use in informing future NMP projects.

2.2 POLICY CONTEXT AND REASONS FOR THE PROJECT

The subtle archaeological remains and historic landscape of Exmoor have tended to be overlooked in favour of other, more obvious monuments on neighbouring upland landscapes in the south-west of England, most notably Dartmoor and Bodmin Moor (Riley and Wilson-North, 2001). On Exmoor focus on the historic environment was boosted the appointment of the first archaeologist to ENPA staff in 1991. Despite increasing interest in Exmoor’s archaeology and cultural heritage significant gaps still remain in our understanding of the National Park’s historic environment (see Hegarty 2006, section 5 for a summary of relevant previous and noteworthy recent work). This perhaps accounts, to some extent, for the relatively low numbers of Scheduled Monuments and Listed Buildings in Exmoor compared with surrounding districts and some other National Parks, for example Dartmoor.

Only a fraction of the known individual sites and structures within Exmoor's historic landscape have any form of statutory protection. At present this includes 204 Scheduled Monuments, compared to over 1200 on Dartmoor. The potential extent and importance of this unprotected resource was highlighted by the English Heritage Monuments Protection Programme survey of Exmoor. Suspended in 2004, this project unfortunately remains incomplete.

Two ENPA initiatives are beginning to address this data deficit. The National Park's five-yearly Scheduled Ancient Monuments at Risk survey (SAMS at Risk) is assessing the condition of the National Park's currently scheduled monuments. The creation of a separate list of sites and monuments of local significance, is addressing the need to conserve those monuments with no such statutory protection (Exmoor National Park Authority, 2007. Section C 2.3).

NMP data will form an important element in the development of Exmoor's HER, improving the quality of the data available to the HES for day-to-day management. As outlined in the project design (Hegarty 2006), agri-environment schemes, and in particular the Higher Level Environmental Stewardship Schemes, have great potential for the conservation of Exmoor's historic landscape. The Exmoor NMP project was therefore proposed and designed with the primary intention of improving the baseline data available to the ENPA HES, thereby improving the effectiveness of archaeological advice given in response to such agricultural land-management proposals.

To date, only interim NMP survey data has been available to the ENPA HES, and it has therefore had little direct assessment as part of consultations for Higher Level Scheme Farm Environment Plans (FEPs). However, based on an assessment of the data available to the ENPA HES from the previous NMP survey of the Brendon Hills, the Exmoor NMP data should greatly enhance the range of information available, providing valuable data on the extent and condition of surviving earthworks and a closer estimate than currently available of date of loss for levelled features.

2.3 PRODUCTS AND ARCHIVE DEPOSITION

Items relating to the project are deposited in the archive at the National Monuments Record (NMR), Kemble Drive, Swindon SN2 2GZ and at the office of the Historic Environment Service, Exmoor House, Dulverton, Somerset, TA22 9HL. A full account of the project archive is presented in section 9 of this report.

2.4 DATA EXCHANGE

Current HER data was kindly supplied to the survey by the Devon and Somerset County Council Historic Environment Services.

Supply of completed survey data to ENPHES was carried out on a limited and informal basis during the course of the project. This consisted of the *ad hoc* transfer of completed AutoCAD drawings to the HER GIS, usually on a project block basis, to facilitate the interim use of NMP data by ENPA HES.

At the project design stage, the full transfer of database records from the NMR to the ENPA HER was envisaged as occurring on the completion of the project under the *aegis* of the NMR. However, a suitable NMR export module was not operational and an alternative method for importing the data from the NMR into the ENPA HER was developed as part of the development of NMP data flowlines by Aerial Survey and Investigation, English Heritage (H. Winton, personal communication; see below). This method may not be appropriate to the Devon and Somerset HERs without further resources becoming available. Also see section 7.1.4.

Mapping from the Exmoor National Park NMP was combined with mapping from all previous RCHME/EH air photo projects on Exmoor to create a single Exmoor NMP map in AutoCAD. These projects included Parracombe and Challacombe RCHME Exmoor Survey projects (Winton 1999, Riley and Wilson-North 2001), Brendon Hills NMP (Dyer 1998), Severn Estuary RCZAS NMP (Crowther and Dickson 2008) and the bulk of the data came from the Exmoor NMP project discussed in this report. The data (mapping and monument polygons) was exported from AutoCAD as ESRI shape files and supplied to ExeGeIS for import to the ENPA GIS.

The monument records for all the air photo projects were exported from the NMR database (AMIE) using the Aerial Survey Business Area of the Oracle Discoverer facility. The combined dataset for the projects was exported as a series of excel spreadsheets. The spreadsheets contained sub-sets of the monument fields for each monument record created or amended during each project. These were supplied to ExeGeIS who concatenated the spread sheets to create a dataset of complete monument records for import to the ENP HBSMR HER.

3 Scope of the Survey

3.1 GEOGRAPHICAL SCOPE

Exmoor National Park covers almost 70 000 hectares, split between the counties of Devon and Somerset. The area of the NMP survey comprises twenty five full Ordnance Survey quarter map sheets and eleven partial map sheets (equating in area to 7.4 quarter map sheets), or a total area of 809 square kilometres. Excluding areas of previous RCHME/EH aerial survey this equates to approximately 75% of the total area of the National Park. By following map sheets the project area in places extends beyond the National Park boundary, taking in a contextual area which falls under the aegis of Devon and Somerset County Councils. The project area is illustrated in figure 1, areas of previous RCHME/EH aerial survey in figure 2.

3.2 TOPOGRAPHICAL SCOPE

Exmoor is essentially an upland landscape and over half is above 300 metres above OD, dominated by three ridges running roughly east to west across the project area (figure 3). The southern escarpment includes Molland and Anstey commons. The central ridge incorporates the Chains and Dunkery Hill, upon which stands Exmoor's highest point at Dunkery Beacon (519 m or 1, 704 ft AOD). The northern ridge takes in the coastal zone, overlooking the Bristol Channel, including some of the most remote coastline in England; the height of the cliffs from Combe Martin to Heddon's Mouth and Countisbury to Glenthorne ensure there is very limited access to the shoreline. The east of the National Park is dominated by the Brendon Hills, the subject of previous aerial survey. To the north-east the Vale of Porlock forms an isolated, relatively low-lying, well settled agriculturally productive zone. (Riley and Wilson-North, 2001; Findlay, 1984)

Numerous watercourses incise the upland landscape forming narrow and steep combes, most flowing from the central ridge which forms a 'drainage divide'; those to the north flow to the Bristol Channel, those to the south flow mostly (via the River Exe) to the English Channel (Edmonds 2000, 26-7). The West and East Lyn are the main north flowing rivers, the Rivers Exe and Barle flowing generally east and then to the south (Riley and Wilson-North, 2001).

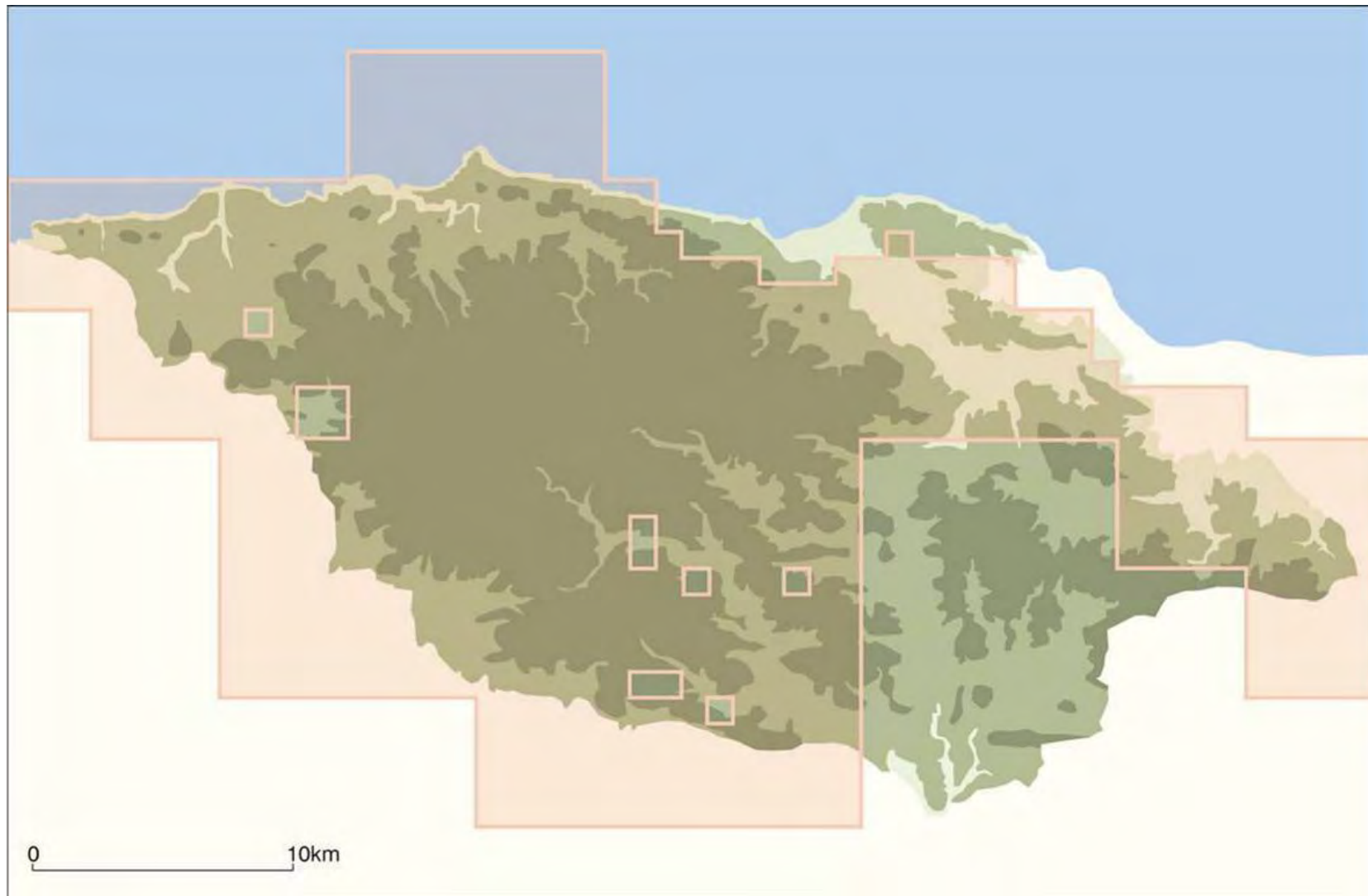


Figure 1: The Exmoor NMP survey area (shaded in pink) excluding areas of previous RCHME/EH archaeological aerial surveys (unshaded) on Exmoor. (Based on an Ordnance Survey Map, with permission. © Crown Copyright. All rights reserved)

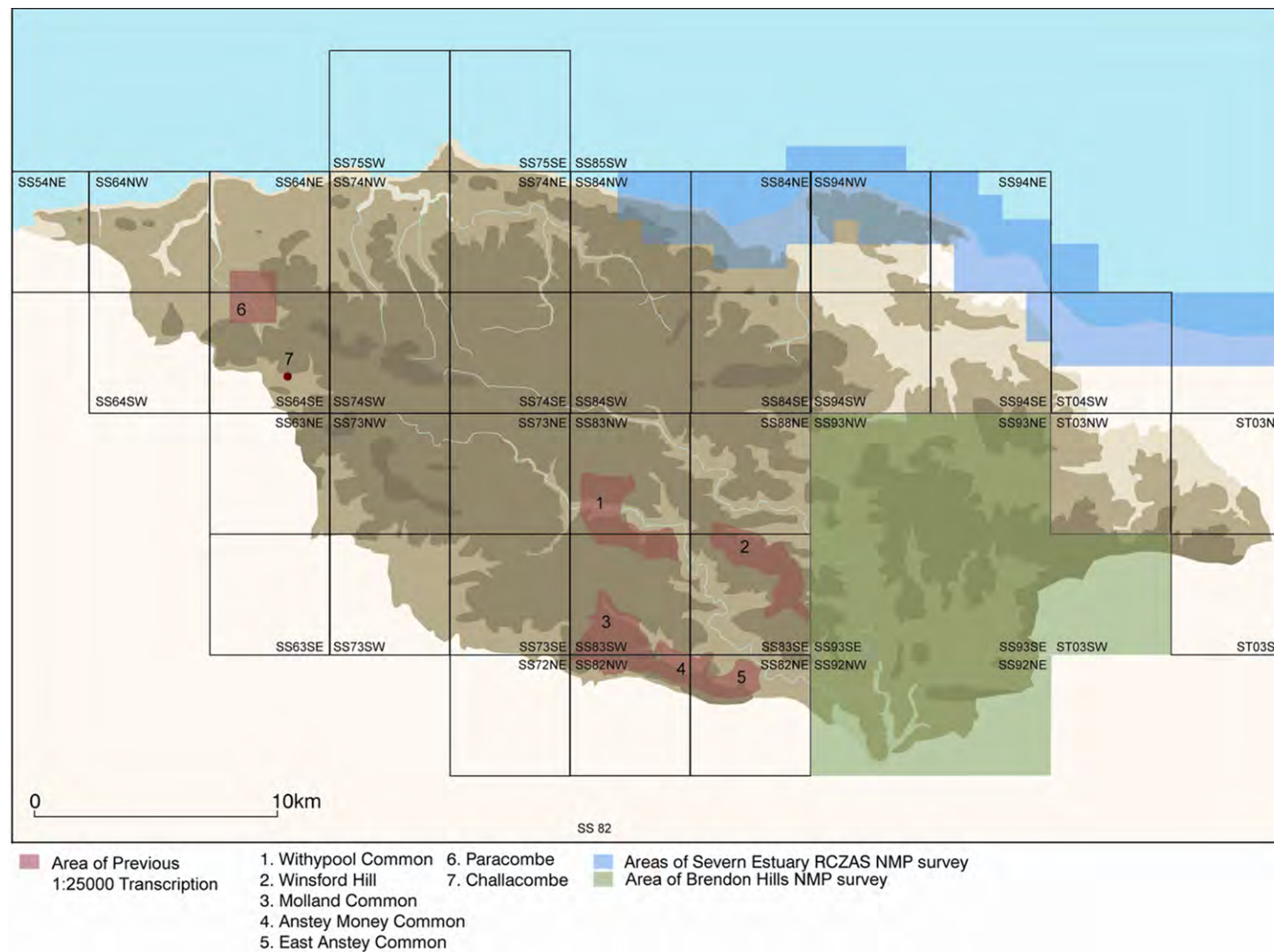


Figure 2: Areas of previous RCHME/EH archaeological aerial survey on Exmoor. (Based on an Ordnance Survey Map, with permission. © Crown Copyright. All rights reserved)

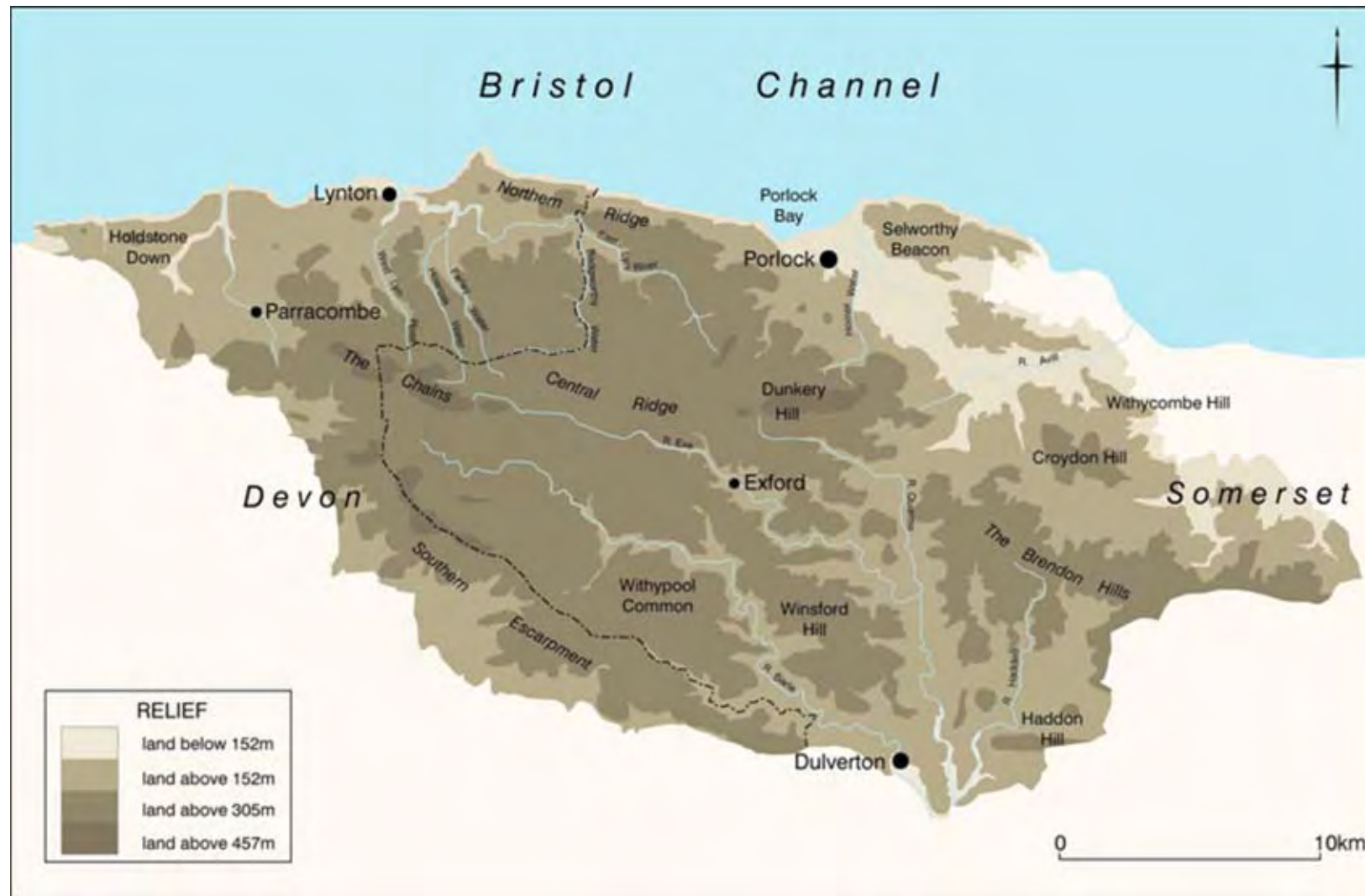


Figure 3: The main topographical features on Exmoor. (Based on an Ordnance Survey Map, with permission. © Crown Copyright. All rights reserved)

3.3 GEOLOGICAL SCOPE

The moors of Devon and Cornwall are largely formed from granite, but Exmoor is unusual in that its solid geology is dominated by sedimentary rocks from the three main divisions of the Devonian period (figure 4). The oldest, from the Lower Devonian, are the Lynton Beds, grey slates and sandstones deposited 350 million years ago. The extremely hard sandstone of the Middle Devonian Hangman Grits form the highest parts of Exmoor and the characteristic coastal formations of the northern escarpment. The centre of Exmoor is defined by belts of the Middle and Upper Devonian Ilfracombe Beds, Upper Devonian Morte Slates and the Pickwell Down Beds. Small pockets of Limestone known as the Leigh Barton, Rodhuish and Roadwater limestones occur within the Ilfracombe Beds. Much younger deposits of the Jurassic, Triassic and Permian are found in areas to the north-eastern corner of Exmoor, such as the Vale of Porlock (Riley and Wilson-North, 2001).

Drift deposits consist of peat on the high plateau and alluvial material in the river valleys. The foreshore is composed of scree and shingle derived from periglacial conditions during the Pleistocene (Edmonds *et al*, 1975).

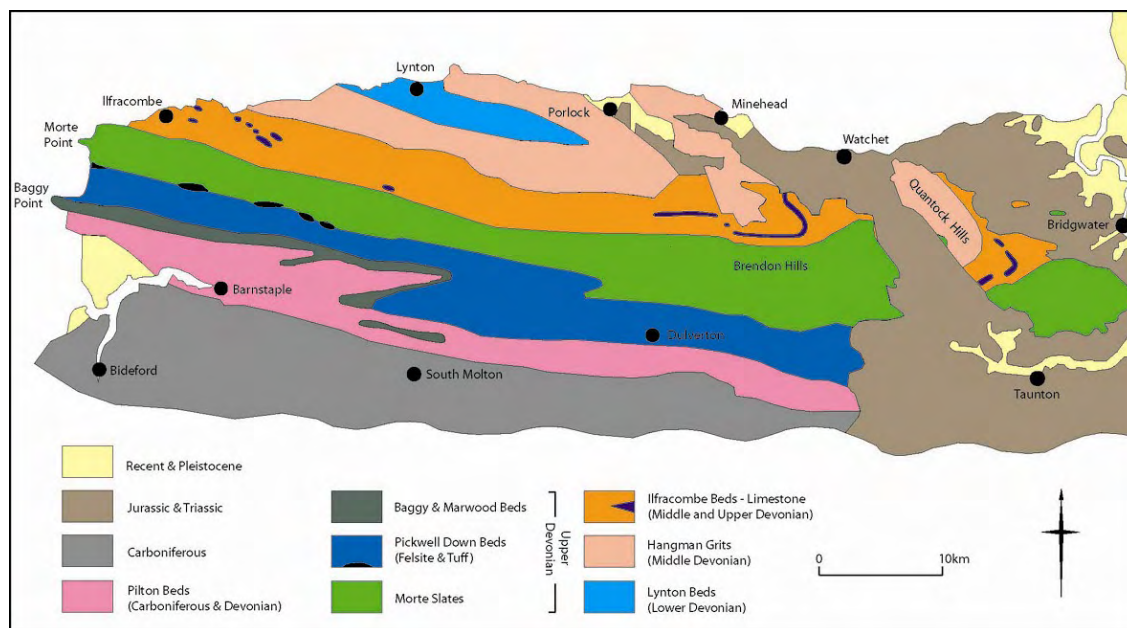


Figure 4: The geology of north the Exmoor area. (Reproduced by permission of the British Geological Survey. © NERC. All rights reserved. IPR/118-01CT British Geological Survey.)

3.4 SOILS

Exmoor's varied geology, land-form and land-use have resulted in a diverse landscape of soil types (Findlay, 1984). This is characterised by the contrast visible over a distance of just twenty kilometres between the productive agricultural soils of the Vale of Porlock and the intact Blanket Bogs of the Chains, with peat deposits up to at least 2.8 metres in depth.

However, the soils of the South-West of England are generally poorly suited to arable farming and much of Exmoor is no exception (Findlay, 1984). The parent rocks are mostly covered by locally derived Head, a mixture of soil and scree, with only the superficial levels degrading to form soils. Such soils formed in post-glacial times from material deposited in periglacial conditions around 10000 BP. The area would have been dominated by mixed deciduous forest and a brown topsoil, associated with well drained brown-earth profiles or gleyed brown-earth in less well drained pockets. The cause of deforestation, waterlogging and peat bog formation is still debated but the creation of much of the character of the uplands and valley slopes, dominated by peat deposits of varying depths, probably originated in the Bronze Age (Maltby 1995, 34).

The central plateau is covered with deep peat deposits, with thinner blanket peat occurring on other upland areas above 400 metres AOD. The soils of the highest points on Exmoor are dominated by the Winter Hill Association, British Soil Survey (BSS) 1011b, and the Crowdy 2 Association (BSS 1013b).

Downslope the peat becomes thinner and often merges with soils of peaty surface horizons, very acid permeable podzols, stagnohumic gleys and thin iron-pan stagnopodzols, known locally as 'black ram' on upper valley slopes (Edmonds et al 1975, 104). The soils of this progression are composed of the Wilcocks 2 Association, (BSS 721d), the Lydcott Association (BSS 654b), the Larkbarrow Association (BSS 633) and the Hafren Association (BSS 654a), incorporating un-reclaimed areas of the central Exmoor plateau and steep valley sides. On Exmoor these soils occur in Exmoor Forest, Dunkery and Winsford Hills, Molland and Withypool Common. Peat accumulations or gleyed brown earths can often be found on valley bottoms, separated from the upper slopes by the better drained brown earth soils of the Manod Association (BSS 611c) (Findlay, 1984). It is probable that changes in vegetation composition following the cessation of intensive sheep grazing after 19th century enclosure was a significant factor in increased peat formation in the area of the former Royal Forest (Maltby 1995, 35).

The agriculturally productive areas of the geologically permo-triassic Vale of Porlock are dominated by the soils of the Newnham Association, 'versatile loamy soils' (Findlay, et al 1984, 249) composed of reddish coarse and fine loamy typical brown earths.

3.5 LAND-USE

Of Exmoor's 69280 hectares, 19000 ha (c. 27%) are moorland, 38000 ha (55%) farmland and the remaining 17% is largely composed of woodland, a third of which is ancient (<http://www.exmoor-nationalpark.gov.uk>; figure 5). The remaining open moorland cuts a swathe from west to east across the National Park, from Challacombe Common and the Chains to Dunkery Hill. This area includes much of the former Royal Forest of Exmoor, a hunting reserve originating in pre-conquest times, and some of the neighbouring commons (Riley and Wilson-North, 2001;5).

The surrounding enclosed farmland is largely a post-medieval creation, originating in 19th century 'improvement', but converted to pastoral sheep farming after the failure of attempts at arable cultivation (Orwin and Sellick, 1970). Much of Exmoor remains predominantly a hill farming region, although a few dairy farms are located in the milder, more sheltered fringes of the National Park. This has preserved a landscape of moorland and improved pasture with good potential for earthwork survival. The exception to this is in the arable land of the Vale of Porlock. This is limited in area but is of very good quality, capable of producing high yields of cereals, vining peas, linseed, swedes, potatoes and grapes (<http://www.exmoor-nationalpark.gov.uk>).

The settlement pattern is one of small dispersed farmsteads and villages concentrated on the river valleys, with the only settlements of any size concentrated on the coast at Dunster, Lynton and Porlock.

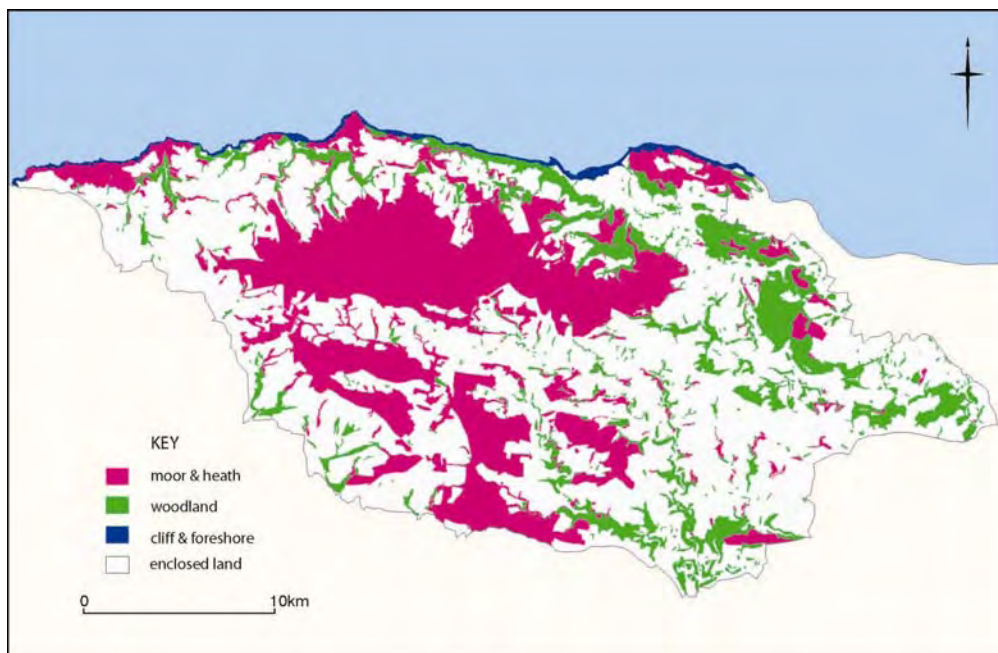


Figure 5: Land-use on Exmoor. (Based on an Ordnance Survey Map, with permission. © Crown Copyright. All rights reserved)

3.6 ARCHAEOLOGICAL SCOPE

The NMP applies a systematic methodology to the interpretation and mapping of all archaeological features visible on aerial photographs, dating from the Neolithic to the twentieth century. This methodology includes recording sites visible as cropmarks and earthworks but also structures, in particular those relating to twentieth century military activities. The archaeological scope of the Exmoor NMP as outlined in the Project Design is based upon that set out in the documents 'The National Mapping Programme Manual' (EH, draft 2006) and NMP: Sphere of Interest (AER/4/2004). The elements relevant to the landscape of Exmoor are detailed in Appendices 1 and 2, which summarise their application in this survey and how they have been depicted and recorded.

During the course of the survey a number of minor, project-specific refinements to the archaeological scope were made. With the exception of condition recording (3.7.2), these relate either to the level of detail appropriate in recording large area or numerous features of post-medieval or twentieth-century date, or reflect variations from the anticipated results. These are summarised below.

3.7 PROJECT-SPECIFIC ISSUES

3.7.1 Factors Affecting the Survey

The topographical character of Exmoor and patterns of past and current land use have, to some extent, influenced the nature of the archaeology recorded during the Exmoor National Park NMP survey.

Topography

Within the Exmoor NMP project area the coastline is largely defined by high coastal cliffs, with very few small and largely inaccessible beaches at their base. The exceptions to this are the areas of the coastal towns of Lynmouth and Porlock. A number of spectacular archaeological sites follow this dramatic coastline, such as the Iron Age promontory fort of Wind Hill, the probably prehistoric enclosure at Hollerday Hill, the Roman camps at Martinhoe and Old Burrow and the previously unrecognised and potentially Neolithic or Bronze Age cliff enclosure at Little Hangman Hill. However, this extreme topography has also historically limited access to the shoreline, and with the exception of previously known fishtraps or weirs at Countisbury (NMR UID 766343, SS 762505) and Lynmouth (NMR UID 926186 and NMR UID 926193, circa SS 7249), very few inter-tidal features were recorded as part of the Exmoor NMP survey. This is in contrast to the plethora of inter-tidal and twentieth coastal anti-invasion century military activity recorded in the lower lying areas to the north-east of the survey area, examined during the Severn Estuary RCZAS NMP survey (Crowther and Dickson, 2008).

The steep angle of the north-facing coastal cliffs also caused sharp shadows to be cast over much of their seaward side, causing some difficulty in viewing this area. It is therefore possible that those features identified and recorded within this area are only partially recorded.

Land use

The narrow but often sharply incised combs of Exmoor that radiate from the moorland also presented some obstacles to the survey. Although these relatively sheltered areas have historically been the focus of Exmoor's dispersed pattern of settlement, of farmsteads, hamlets and villages, they also contain the bulk of Exmoor's ancient and semi-natural broadleaf woodlands. These have proved an effective barrier to aerial survey. Recent fieldwork as part of the Exmoor Iron project has revealed extensive evidence for iron smelting within many of these woodland areas, such as at Horner Wood and Cloutsham Ball, and the remains of charcoal burning platforms indicate that they have probably been exploited and managed to supply fuel for metal-production and metal-working industries since the Iron Age (<http://www.exmoor-nationalpark.gov.uk>; see figure 5 above; for a summary of Gale, R. in Juleff and Bray, 2007;152-162). These areas should be considered a priority for any future LiDAR survey of Exmoor.

From the mid-19th century onwards many of the upper combe slopes and hillsides above the ancient and semi-natural woodlands were also planted with coniferous plantations, particularly on the eastern hills and valleys. Including plantations on ancient woodland sites, these plantations now cover an area of over 5000 hectares, although fortunately much of Exmoor escaped the 20th century drive towards afforestation (Riley and Wilson-North, 2001;5). Unsurprisingly these woodlands have also proved a barrier to the NMP survey. The recent discovery and clearance of an iron Age hillslope enclosure within Timberscombe Wood would indicate that further sites remain to be discovered in these areas (Sainsbury, I. 1995).

As described above in section 3.5, approximately 55% of the National Park comprises enclosed farmland which, with the exception of the vale of Porlock, is predominantly under regularly improved grassland. The NMP data-set within the National Park is dominated by earthwork or levelled earthwork remains with very few sites recorded as cropmarks. This pattern changes once the survey passes beyond the eastern boundary of the National Park, into the topographically similar, but predominantly arable area between Brompton Ralph and Stogumber, where a significantly higher proportion of visible monuments have been recorded as cropmarks. This indicates that the picture painted by the NMP survey is almost certainly partial and incomplete. The pattern of cropmark features visible in the Brompton Ralph to Stogumber area probably reflects a density of monuments present within the National Park, but not visible to the NMP methodology due to the very low level of arable cultivation.

A corollary of this is probable good sub-surface feature survival within the National Park and comparatively poor earthwork preservation in the project area outside the National Park.

3.7.2 Condition recording

In defining the recording practice for the survey, the project design originally set out the intention to record information additional to standard NMP practice. Where appropriate, information assessing the condition of the monument was to be recorded, with particular reference to those ‘detrimental indicators’ required for the effective compilation of FEPs by ENPA HES Officers (Hegarty 2006, 20).

However, the inherently non-standard nature of the available resource (i.e. aerial photographs of an inconsistent most-recent date), made systematic and standardised database recording of monument condition unviable. Nonetheless, comment on condition was felt to be valuable information. The aerial photographs allowed an unprecedented overview of the recent condition of often very remote earthwork monuments, and in the final event the best compromise was to maintain the best-practice of noting the latest visible condition on the most recent aerial photographs in long text field.

In exceptional cases, on-line resources such as Google Earth (<http://earth.google.co.uk>) were consulted to assess monument condition. These resources use images of very recent date, often more recent than those available as prints to the Exmoor NMP survey, and often of reasonably high quality and resolution, allowing the survey to assess to the survival and condition of earthworks sites in comparison to the latest available print. This provides valuable contextual information for agri-environment scheme consultations.

There are inherent limitations to such sources, however. For instance, the images cannot be viewed stereoscopically and, despite their high resolution, are taken at a small scale and therefore can only be used to confidently identify large scale threats or damage, such as plough or vehicle damage. Smaller scale damage, such as animal burrows, can only realistically be recorded and monitored by specialist reconnaissance and field visits.

3.7.3 Peat cutting

Defining the extent of the cutting of peat for fuel, most particularly in the area of the former Royal Forest, was a particular aim of the survey, although due to uncertainty over the nature and scale of the evidence a recording strategy remained unspecified at the project design stage (Hegarty 2006, 10).

Typically the evidence for peat extraction on Exmoor is extensive but, with the exception of a few larger pits, an accurate limit proved difficult to define from aerial photographs. The definition of even the largest peat cuttings proved problematic as the visibility of the edges of these shallow and irregularly shaped features on aerial photographs depends on good lighting conditions, low vegetation and the local water table, all of which varied dramatically with the seasons.

Experience has taught that the most effective strategy seemed to be to use multiple sorties to overcome the seasonal variables and confidently transcribe the area and form of most clearly visible large pits, in this instance defined as those 5 metres or greater in width or length, and to define the wider area of

extraction, often visible as little more than a disturbed ground surface or a change in vegetation, using an extent of area boundary. It was felt that accurate transcription of the form of the larger pits was important as this may provide some indication of distinct styles or zones of extraction. This could therefore provide some sense of the extent of this widespread but economically small-scale industry, in which individual turbaries may have remained under family control. However, at the time of writing there has been no critical field-evaluation of the accuracy of the 'extent of areas' defined, and the practical value of this data in this context. However, it is hoped this may occur under the auspices of the MIRE project, a programme to rewet areas of moorland blanket peat. (see section 8.3.4, p.68). Any future LiDAR survey would provide valuable baseline data and should also target these areas.

3.7.4 Water Meadows

Post-medieval water-meadows, of a type known variously as catchwork, catch-water or field-gutter systems, are the single most numerous class of feature recorded during the survey. Individual gutter earthworks were transcribed as single line objects (as opposed to polygons) unless the earthwork appeared to be 2 metres or more in width. This methodology was also used where a functional differentiation between different elements was required, such as between water-meadows gutters and other superficially similar features, such as head-mains, carriage gutters or post-medieval drains.

3.7.5 Quarries

In Blocks 1,3 and 4, all visible quarries were transcribed and recorded, regardless of size, and whether or not depicted and annotated on the First Edition Ordnance Survey map, to allow consistency of comparative data.

However this proved very time consuming and was not felt to be of sufficient value for the whole project. Therefore in Blocks 5 and 2, quarries were transcribed and recorded only when not already depicted and annotated on the First Edition Ordnance Survey maps. Post medieval quarries were not recorded when adjacent to, and therefore likely to be source of building material of, post-medieval field boundary walls.

3.7.6 Twentieth century military archaeology

In line with standard NMP practice, the Exmoor NMP survey transcribed and recorded military sites of Second World War date. Cold War sites identified during the survey were also recorded.

The project design (Hegarty, 2006) surmised that the low lying coastal setting of the towns of Ilfracombe and Minehead, to the west and east of the National Park respectively, may have warranted the construction of Second World War anti-invasion defences which extended into the area of the National Park. It was suggested that historic photographs might reveal evidence of such defences, particularly on the stretches of lower lying shoreline. Completed during the life of the Exmoor NMP survey, the Severn Estuary Rapid Coastal Zone Assessment Survey (SERCZAS) did indeed record

evidence for substantial coastal anti-invasion defences in the environs of Minehead and Dunster (Crowther and Dickson, 2008), but these did not extend westwards into the Exmoor NMP project area, the coastal cliffs apparently providing defence enough.

The most extensive military 'site' recorded was the Exmoor Firing Range, an extensive Second World War artillery training area. It was felt that the NMP survey could make a valuable contribution to the understanding of this activity by defining the extent of the danger area, which was unknown prior to the survey. This was defined solely from the spread of shell craters, visible on aerial photographs taken in the 1940s.

It would have been impractical and time-consuming to map every individual crater. Therefore only craters over 2 metres in diameter were depicted, with certain level of schematic standardisation (copy and paste of a circular drawing objects), and within this range only a representative sample depicted to indicate the firing area and any concentrations of craters.

3.7.7 Buildings

The transcription and recording of buildings was limited to structures of Second World War date and evidence of ruined medieval or post-medieval settlements and agricultural buildings.

4 Previous Aerial Survey

Prior to the project a limited amount of transcription had been carried out in the project area.

The Committee for Rescue Archaeology in Avon, Gloucestershire and Somerset (CRAAGS) examined a limited range of aerial photographs, largely 1940s RAF and possibly 1970s Ordnance Survey vertical images, and carried out a manual transcription of all visible archaeological features (McDonnell 1980; 1980a; 1985). At the time this information greatly enhanced the state of knowledge for Exmoor. This mapping was available to the NMP survey as geo-referenced digital overlays, viewable in AutoCAD Map. Although not to NMP standards, this information proved to be a valuable resource to the NMP survey, particularly for familiarisation with the existing data, and regular reference was made to the CRAAGs sketch transcriptions for comparison throughout the survey.

Several 1:2500 scale aerial surveys were carried out of discrete areas in advance of RCHME and EH field surveys. These focused on eight areas, including extensive field systems of the southern commons; Molland Common, West and East Anstey, Challacombe, Parracombe, Winsford Hill, Withypool Common, the Woodadvent Lane Enclosure and Colton Pits.

In response to a request by the RCHME Exeter field office the Brendon Hills were also incorporated into the NMP for the Exmoor area (Dyer 1998). Seven complete 1:10,000 map quarter sheets to the south-east of the National Park were surveyed, comprising SS 93 NW, NE, SW, SE, SS 92 NW, SS 92 NE and ST 03 SW. The project area lies mostly within West Somerset but the far south-eastern extent is in Mid Devon. Prior to the survey the NMR listed 187 monuments for the survey area, which included archaeological sites, buildings and find spots. Of these, sixty-nine were 'skeleton' records; fifty-nine signposting the Somerset SMR and eight signposting the National Buildings Record. During the Brendon Hills survey 387 new NMR records were created and 148 existing records amended. The vast majority of monuments were interpreted as being of medieval or post-medieval date, with very few features ascribed a prehistoric date. The majority of sites were interpreted as being related to agriculture and subsistence although a significant number of features relating to post-medieval iron mining were also recorded. A nationally significant discovery was the identification of the earthwork remains of a Roman fort at Rainsbury (Dyer 1998; 11-13; 22).

The application and integration of this data into the NMP survey is discussed in more detail in section 5.3.

5 Sources

5.1 AERIAL PHOTOGRAPHS

More than 10000 aerial photographs were consulted during NMP mapping of Exmoor National Park. The majority of photographs consulted are dispersed between three main collections, the NMR, ENPA, and the Cambridge University Collection of Air Photographs (CUCAP).

Devon County Council Historic Environment Services hold a number of high quality specialist oblique photographs, but many of these images for Exmoor are also held by the NMR. The small number not held by the NMR was identified during the course of the survey. These were consulted at County Hall in Exeter and are detailed below (table 1).

Name and address of repository	Type of photography consulted	Number of photos consulted
NMR collection National Monuments Record Centre English Heritage Kemble Drive Swindon SN2 2GZ	Vertical & oblique	11372
ENPA collection Exmoor House Exmoor National Park Authority Exmoor House Dulverton Somerset TA22 9HL	Vertical	280
Devon Air Photographs The Historic Environment Service Devon County Council County Hall Exeter Devon EX2 4QW	Oblique	243
CUCAP Air Photo Library Cambridge University Unit for Landscape Modelling Sir William Hardy Building Tennis Court Road Cambridge CB2 1QB	Oblique	359

Table 1. The main aerial photographic collections consulted.

5.1.1 The National Monuments Record collection

The single largest and most important collection consulted during the project was that held at the National Monuments Record Centre in Swindon. The NMR photographs were loaned to the survey on a block basis. The loans consisted of 7407 vertical and 3965 oblique prints.

Vertical photography

The vertical photography contained in the NMR collection was taken at range of scales and for a variety of non-archaeological purposes, such as military and cartographic reconnaissance or civil engineering projects. The sources of the NMR vertical photography consulted for the Exmoor NMP survey are listed in table 2.

Increased enclosure of former common land and modern agricultural improvement methods in the decades following the Second World War have greatly changed some areas of Exmoor's upland landscape. For this reason, the RAF vertical coverage from the 1940s provided a valuable record for earthwork monuments which no longer survive above ground.

Source	No. of prints consulted	Date range of photos
RAF	4021	1945-1971
Ordnance Survey	2131	1967-1999
Meridian Airmaps Ltd	885	1966-1979

Table 2. The principal sources of vertical photography in the NMR collection

A full list of NMR verticals consulted during the project is contained in the cover search listings accompanying each loan. These listings are contained in the project archive and are summarised in Appendix 3 of this report.

Oblique photography

The NMR collection for Exmoor contains oblique photography from a range of sources, which are listed in table 3 below. There was a degree of overlap between the NMR, CUCAP and Devon Air Photo collections, which was taken into account when consulting the external sources and compiling loan requests.

Military obliques taken in 1952 were also loaned to the survey. Although potentially useful for illustrative material, particularly of the coast, due to the limited area covered they proved to be of limited archaeological value.

During the project, specialist reconnaissance was carried out by Damian Grady of the EH Aerial Survey team. This new NMR specialist photography proved to be of very high quality, allowing valuable new

detail to be added to several previously known sites, such as the Bronze Age field system at the Valley of Rocks.

Source	No. of prints held	Date range of photos
NMR	3099	1977-2008
CUCAP	58	1948-1953
Devon HES (Devon Air Photos)	201	1984-1992
Somerset HES (Devon Air Photos)	14	1989
WestAir	17	1974
RAF Military Obliques	943	1952

Table 3. The sources of oblique photography in the NMR collection

5.1.2 The Exmoor National Park Authority Collection

Verticals

ENPA holds a collection of vertical aerial photographs in both digital and print form, dating from 1946 onwards. Aerial surveys were flown for monitoring purposes at intervals of between 3 to 5 years from 1977. A number of the sorties included false colour infra-red coverage.

The print collection was kept at Exmoor House in Dulverton but was found to be poorly catalogued and organised. The catalogue was examined to identify potentially useful sorties, but unfortunately the collection proved to be incomplete, with many of the catalogued prints missing. The available prints were pulled from the collection and transferred to the EH Exeter office for the duration of the NMP.

The archive also contains a number of high quality CUCAP vertical infra-red transparencies, which were not available for loan from CUCAP. Initially these were examined alongside the available prints using a light box, but this was found to be a very time consuming task, as well as difficult to obtain an effective stereo view and to acquire a high quality scan. After block 3 their use was discontinued.

A full quantification and cataloguing of the ENPA aerial photograph archive is planned as part of future HER development.

From the year 2000, ENPA vertical surveys were photographed only in digital format and are accessible only as a layer on the National Park's in-house GIS. This limited accessibility made frequent examination of the resource problematical and the absence of vertical prints prevented stereo viewing. As a compromise the digital vertical coverage was examined on the completion of each block, but this

resource was informative mainly for clarification or checking of site survival and condition, rather than identification.

Obliques

A small collection of unsorted and largely unsited oblique photographs was also made available to the survey. The collection comprised 188 WestAir photographs and 19 unattributed images, possibly CUCAP photographs. As these were unknown to the survey prior to its commencement, they had not been quantified and no time provision made for their siting. As such, they were rapidly assessed at the end of the survey once the survey team had greater familiarity with the landscape of Exmoor.

The photographs were of variable but generally fairly high quality. Little new archaeological information was gained from this source but a number of images may be useful for illustration purposes.

Source	No. of prints held (Catalogued)	Date range of photos
Verticals		
RAF	n/a	1946-1953
ENPA	79	1977
ADAS	82	1986-1990
GEONEX	12	1993
AEROFILMS	107	1994
Geoperspectives	n/a	2000
Cartographic Engineering	n/a	2006
Obliques		
WestAir	188	1981-1983
CUCAP	19	1987
n/a = digital resource only.		

Table 4. Sources of aerial photography in the ENPA collection

5.1.3 The Cambridge University Collection of Air Photographs

The CUCAP collection was quantified on a project block basis by the survey team using the online CUCAP catalogue. The filtered selection was submitted to Fiona Small who liaised between the project and ULM. ULM then kindly loaned the relevant photographs to the project. 456 vertical images and 359 oblique images were held for the Exmoor area.

The vertical coverage returned for the survey area consisted largely of false-colour infra-red surveys held by the collection only as transparencies and therefore not available for loan. A number of these transparencies are held by ENPA and were examined as part of that collection (see 5.1.2).

A small proportion of CUCAP oblique images are also held by the NMR and these were supplied as part of the NMR loan (see table 3). This reduced the number of images to be requested from the CUCAP by 50, approximately 14 %.

Unfortunately the CUCAP oblique coverage consisted largely of landscape panoramas of little archaeological use.

5.1.4 The Devon Air Photo Collection

The Devon Air Photos (DAPs) examined by the survey ranged in date from 1984 to 1997. Searches of DCC HER returned 243 DAPs for the Exmoor NMP survey area. 119 of these were supplied as part of the NMR oblique photography loans and therefore not examined at the HER. The NMR loans also included 5 Somerset Aerial Photographs, DAPs which had previously been accessioned into the Somerset HER and were subsequently accessioned into the NMR, and an additional 82 DAPs not returned by HER searches. The remaining 124 DAPs were examined at the DCC HER.

The DAP coverage was not evenly distributed across the survey area. 100 prints were examined for Blocks 1, 3, 4 and 5, an area of 33 full and partial quartersheets. The remaining 143 were concentrated in Block 2, an area of 3 quartersheets (75 square kilometres). This discrepancy may be explained by the higher proportion of land under arable cultivation in this area to the east of the Brendon Hills, and the concomitant increase in visibility of sites as cropmarks in the area.

It is also worth noting that Block 2 was the only area within the survey area for which DAPS provided the sole evidence for a significant number of archaeological features visible as cropmarks. Within Blocks 1, 3, 4 and 5, the DAPs provided a high quality source of complimentary information for many earthwork monuments on Exmoor.

5.2 MONUMENT DATA SOURCES

Due to the former tripartite division of curatorial responsibility on Exmoor and the devolution of responsibility for the National Park's Historic Environment Record during the life of the NMP survey, several sources of data were consulted and concorded. These are outlined below.

5.2.1 National Monuments Record

The NMR archaeological database, AMIE was the primary data source for the survey. The information comprised site location and monument details and event records. The EH web-based GIS system provided further valuable information, most particularly graphic representation of the existing records and digital versions of historic Ordnance Survey maps, including the first and second editions of 1889-91 and 1902-04.

5.2.2 County Historic Environment Records

Due to the geographical division of Exmoor between Devon and Somerset, reference to and concordance with the county HERs was integral to the project methodology. The number of sites contained within these databases was often significantly greater than in the NMR and ENPA HER, and the information contained within the records often more detailed.

Following some initial delays at the start of the survey (outlined in section 7.2.2) Chris Webster of SCC HES and Graham Tait of DCC HES kindly supplied the survey with digital monument data for the project area which fell within their respective counties. The existing AMIE records and survey data were concorded with this HER data.

5.3 ADDITIONAL SOURCES

Between 1993 and 1999 the English Heritage field survey team carried out systematic higher level analytical earthwork surveys of many of Exmoor's known field monuments and identified many more previously unknown remains (RCHME: Exmoor, Event UID 917219; RCHME: East Exmoor Project, event UID 1049365). As described above (see section 4) several 1:2500 scale aerial surveys, and the NMP survey of the Brendon Hills, were carried out in advance of the field surveys. The results of the integrated surveys were published in 2001 as *The Field Archaeology of Exmoor* (Riley and Wilson-North 2001).

It was specified in the project design that all previous aerial surveys would be collated in advance of the Exmoor NMP getting underway, to allow an assessment of the previous transcription and plan its incorporation into the survey (Hegarty 2006, 18). In practice this did not occur as planned. Although the survey team were aware of the majority of the previous aerial surveys, from English Heritage Aerial Survey colleagues and published material (e.g. Riley and Wilson-North 2001), geographical queries in AMIE during the initial set-up of the project did not return the survey's event record UID numbers, limiting the Exmoor NMP team's awareness of the full range of aerial survey transcriptions potentially

available for consultation; the reason for this omission remains unclear but may in part be due to the survey team's unfamiliarity with AMIE and the vagaries of the database. Nonetheless, the majority of these surveys were picked up during the course of the survey through discussion with EH field survey colleagues and most of the aerial survey data acquired from colleagues in Aerial Survey in Swindon and the NMR. It must be stressed, however, that following the eventual unearthing of the original Exmoor field survey event records, it became clear that the available aerial survey data for some sites was incomplete.

Where the existing aerial survey data was to NMP standards, as with the aerial survey of the Brendon Hills, (event UID 1109083), this was assessed and integrated into the wider Exmoor NMP survey alongside any newly visible details.

If the existing aerial survey predated digital transcription, or no digital archive could be located, the manual transcriptions were acquired from the NMR as digital raster images, rectified in Aerial 5.30, and used to inform a new enhanced transcription.

Where the existing survey predated the use of standard NMP conventions, but consisted of digital mapping of potentially higher accuracy than NMP standard (as with the stereophotogrammetric digicart transcriptions for Challacombe, Withypool Common and Winsford Hill), the transcriptions were referred to, to enable the confident identification of any previously unrecorded features, but not incorporated into the Exmoor NMP. The conversion of such data to NMP standards was identified as a task for the EH Aerial Survey and Investigation team at the project design stage (Hegarty, 2006: 21). This also allowed valuable time savings to be made, particularly towards the end of the survey.

In addition, a number of the subsequent earthwork survey reports became available to the survey and, where practical and time allowed, could be used as the basis of transcription or to inform NMP interpretations. Again, the failure of AMIE to return the field survey event UIDs limited NMP team's awareness of the full range of site plans potentially available for consultation. However, discussion with EH field survey colleagues ensured the most significant sites were picked up as the survey progressed. Nonetheless, only features visible on the aerial photographs were transcribed.

6 Methodology

6.1 MAPPING METHODS

All the available aerial photographs from the sources outlined above were examined under magnification, stereoscopically or in the case of transparencies, via a light-box. Photographs selected for rectification were scanned at a resolution of no less than 600dpi.

Scanned images were rectified using AERIAL 5.30 software. At the beginning of the survey control information was derived from OS 1:2500 scale Landline digital mapping. Landline data was withdrawn from use in March 2008 and replaced with OS Mastermap data. Although some data, such as place and road names were not visible on the new data as supplied to the survey, this information was available from the EH webGIS system. In addition, Mastermap data is of equivalent accuracy to Landline data (nominally within 2.5 metres in rural areas, at a scale of 1:2500; OS Mastermap Technical Specification, Chapter 6). The change of base map therefore had no discernable effect on the accuracy of the resultant NMP transcription.

Exmoor's upland topography necessitated the creation of Digital Terrain Models (DTMs) in Aerial to allow accurate rectification. Initially the OS Land-form Profile™ contour data (5m vertical interval, 1:10,000 scale) was used to create the DTMs, but following a change in our data supply, this data was replaced by Next Perspectives™ data of equivalent accuracy (5m interval, derived from aerial survey). The DTMs allowed rectifications to be carried out in Aerial to the NMP standard, with average errors at control points below 2 metres.

6.2 RECORDING STRATEGY

6.2.1 Manual record

A manual record of each map surveyed was produced using an aerial survey Map Note Sheet (see Appendix 4). The Map Note Sheet is a standardised form containing a checklist of sources, indicating the dates that the sources were consulted and summarising the length of time taken to complete transcription and data recording for each map sheet.

6.2.2 AMIE Database record

The primary record for the project was created in AMIE, the NMR's archaeological database.

New AMIE records were created for previously unrecorded sites or certain sites previously recorded only as part of a monument group. For instance, new records were created for individual barrows visible as earthworks which had previously been recorded only within a single AMIE record for the wider cemetery group.

For previously recorded sites transcribed during the survey, the existing AMIE record was updated.

For each NMP-generated monument record or monument record enhancement, a standard range of data was recorded (see Appendix 5).

Very occasionally the nature of the evidence justified the creation of a new record without the creation of an accompanying graphic object, for instance where the recorded feature was a twentieth century structure depicted on the Ordnance Survey base map. In such an occurrence a text record was completed or updated.

It was judged not to be a valuable or viable use of project time to habitually record the absence of evidence, i.e. to state that previously recorded sites or features were not visible on the available aerial photographs.

6.2.3 AutoCAD attached data tables

Using standardised object-data tables, a selection of summary data was also attached to each AutoCAD drawing object to allow simple interrogation of the graphical data and to facilitate data export. (Appendix 6).

6.3 DISSEMINATION

Detailed analysis and publication of project results will form the main dissemination phase of the project. This is currently at the proposal stage. However, during the survey, interim project results and emerging themes have been disseminated in a variety of ways.

Annual NMP Meeting

New results and emerging themes were presented to NMP colleagues via short presentations at two annual NMP meetings.

Historic Environment Review

The ENPA Historic Environment Review is an annual publication summarising the work of the HES over the previous 12 months, with a print run of 2000 and a distribution well beyond the boundary of Exmoor, including to other National Parks. The NMP survey has featured in three editions of the Review, including as a 'centre-fold' feature in the review of 2008.

Exmoor Archaeology Forum

The Exmoor NMP survey was the focus of the 2008 Exmoor Archaeology Forum, a well received annual public event with over 65 attendees.

Liaison Group

A liaison group met twice during the project. The group was chaired by ENPA HES and comprised members from Devon and Somerset's HES, English Heritage, the National Trust, and local archaeological and amenity groups such as the North Devon Archaeology Society and the Exmoor Society and the Exmoor Trust. The actual membership was fluid but the bodies represented remained consistent, and are detailed in appendix 7. The 2008 Exmoor Archaeology forum took place in lieu of a third liaison meeting.

Local Society Meetings

The interim results of the survey have been presented by project staff to a variety of local society and amenity group meetings, including the 2009 Devon Archaeology Society *Archaeology in Devon Day*, as well as more informal meetings such as the East Devon Metal Detectorist club. The survey results have also fed into a number of local talks given to a range of audiences by other ENPA staff.

Websites

Regular updates of the projects findings have been made on the EH Aerial survey webpages, with links from the ENPA HES homepages.

Other publicity

The survey was the subject of a number of local news stories based on press releases issued by ENPA. One story in particular was widely featured in the regional press and television coverage.

7 Strategy and Project Management

7.1 THE SURVEY TEAM AND MANAGEMENT STRUCTURE

The survey team comprised two aerial investigators, forming part ENPA's Conservation and Land Management section, but based in the English Heritage Exeter Office. Cain Hegarty was the Aerial Survey officer, Katherine Toms the Assistant Aerial Survey Officer. Helen Winton was the EH Project Assurance Officer, based in the Aerial Survey and Investigation team in the Research department in Swindon. Rob Wilson-North was the ENPA Line-manager and advice and liaison on agri-environment scheme matters was provided by Jessica Turner and Lee Bray. Faye Glover was appointed the ENPA HER Officer in May 2008 and has liaised closely with the project team over issues of data transfer.

7.2 THE WORKING BLOCKS

The project area was divided into five blocks to facilitate training, aerial photograph loan management and to allow coherence in assessing the main topographical features on Exmoor, which, by and large are orientated roughly east-west (figure. 6).

Block one encompasses the coast and the northern ridge. Block two comprises three quarter sheets to the east of the Brendon Hills and completed the recording of the eastern side of the National Park. Block Three and Four covered the central ridge and Block Five the southern escarpment.

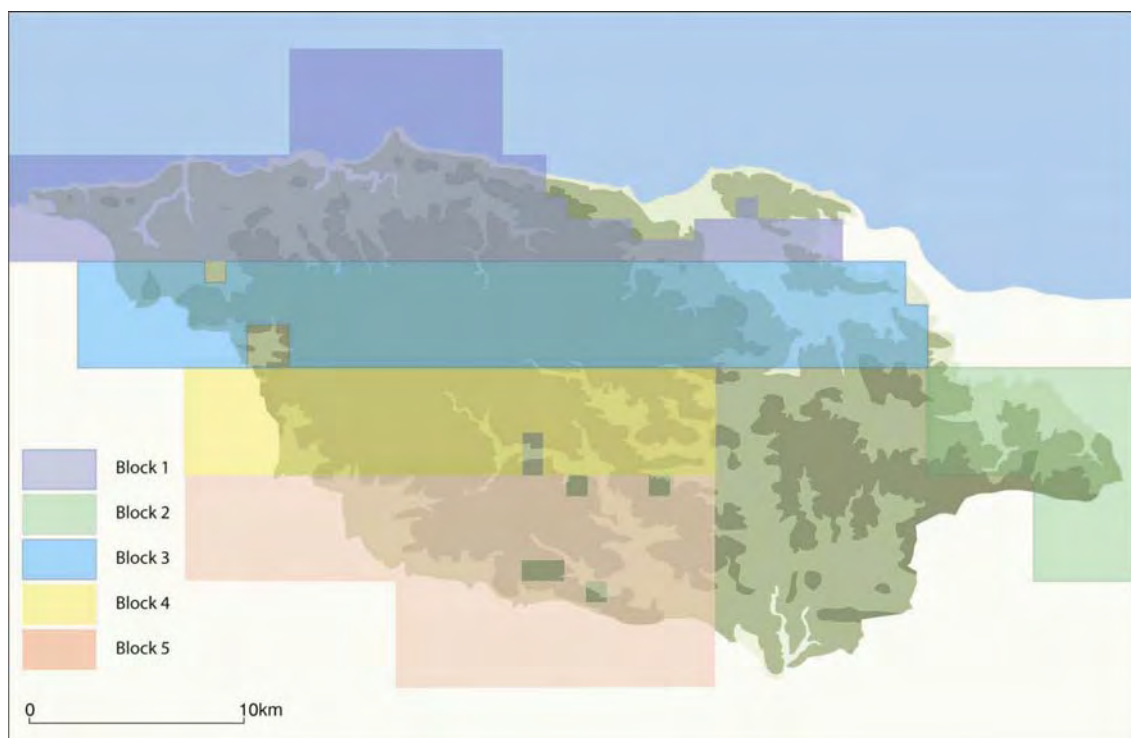


Figure 6: The survey working blocks. (Based on an Ordnance Survey Map, with permission. © Crown Copyright. All rights reserved)

7.3 PROJECT DELAYS

Several unanticipated issues caused delays to the survey. These are summarised below.

7.3.1 NMR Loan Policy

The sequence of working block transcription as agreed in the project design (Hegarty 2006) specified a small number of blocks to be surveyed concurrently. In the early stages of the survey, the Exmoor NMP survey was advised that the NMR would not loan more than one block concurrently to any NMP survey. Consequently, the order of transcription was amended and the blocks were transcribed out of numerical sequence. Due to this reorganisation, the timetable and task-list as set out in the PD was not viable and the timetable reassessed and reorganised. Due to this unforeseen change, the survey incurred a slight delay and in addition it was not possible to assess progress or training against the previously agreed indicators.

7.3.2 HER data supply

Upon the commencement of the NMP survey in March 2007, issues arose with the provision of Devon and Somerset HER data. This was due to county HER concerns over assurances that the end product would be supplied to the HERs in an appropriate format and timely manner. The effect upon the survey was the restriction of access to HER data by the NMP team until a data-sharing agreement could be reached between the county HERs and EH.

DCC HER began providing the NMP survey with HER data, on a map-sheet basis, in December 2007, with an informal agreement in place from August 2008.

An informal agreement was also reached with Somerset HER and data was supplied in May 2008. In the meantime, an interim method of accessing Somerset HER data was possible via Somerset's online HER. Although an adequate stop-gap, this was a time-consuming method of data-checking.

Once the agreements were in place the survey proceeded well, excepting a small delay incurred whilst all map sheets completed prior to the agreements were revisited to concord the county HER data with that held by the NMR and any newly identified sites.

7.3.3 Staff Illness and Injury

Unanticipated levels of staff absence due to illness and injury also contributed to delays. In total 90 working days were lost through illness or injury, equal to 4.5 months of staff time. See table 5 for more detail.

Year	Days Lost
2007-2008	24
2008-2009	49.5
2009-2010	16.5
Total days lost	90

Table 5: Staff time lost to illness or injury.

Finally, the Aerial Survey Officer suffered an injury in January 2009. Although no working days were lost following the initial visit to A&E, the injury impaired his ability to carry out essential tasks and the progress of the survey was therefore slowed for six weeks while the injury healed.

Although individually these issues are relatively minor, cumulatively they had a tangible effect on the survey timetable and inflicted an estimated 3 month rolling delay on the project. Due to the adoption of a number of time-saving efficiencies (detailed in section 3.7), the fortunate occurrence of a number of ‘quiet’ maps towards the end of the survey and more than a few long days in the office, these issues ultimately did not impact on the completion of the survey within the original timetable.

8 Results

8.1 AMIE RECORDS

The Exmoor NMP survey has made a significant contribution to the understanding of Exmoor's historic environment. This can be quantified as the creation of 2220 new monument records and the enhancement or amendment of 580 existing records, totalling 2800 records created or amended. This figure is broken down by period in chart 1.

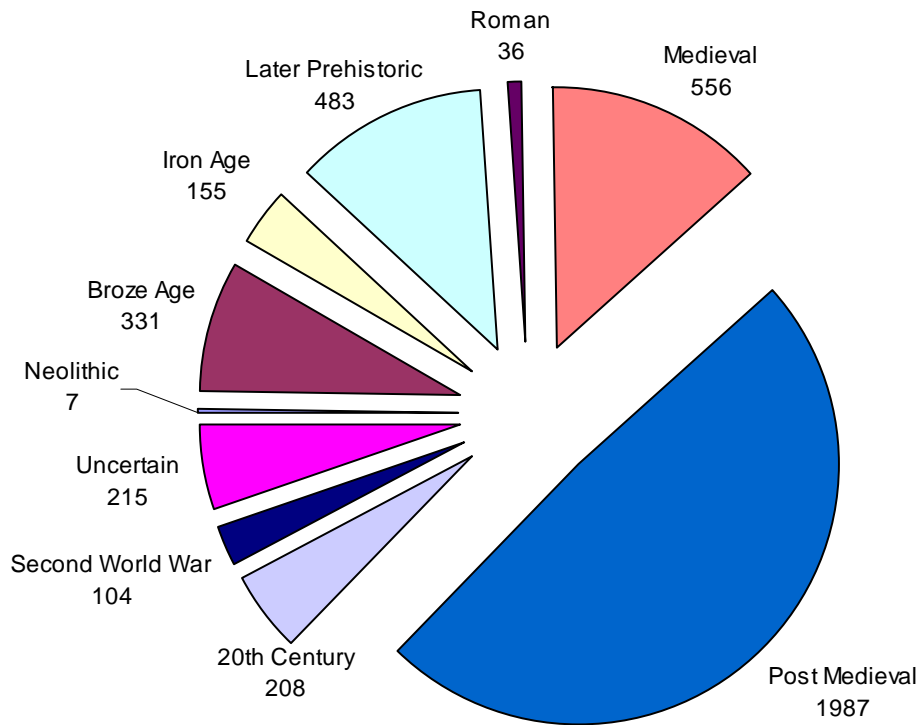


Chart 1. Total number of monument records by period

8.1.1 NMR New Records

A breakdown of the new sites by period is shown in chart 2. In a limited and currently unquantified number of occurrences, some new records have been interpreted as possibly dating to more than one period and therefore will be represented in the chart as two records. This double-indexing is most common for sites dated to the medieval or post-medieval periods, with a lesser number for the Later Prehistoric, Iron Age or Roman periods. Nonetheless, it is felt that the figures accurately represent the dominance of the post-medieval period during the survey; over half of all newly recorded sites are post-medieval in date, the majority relating to water management or enclosure. Selected highlights from the survey are illustrated in Section 8.3.

At the start of the survey there were 3014 AMIE monument records within the project area. The 2220 records arising from the NMP survey therefore equates to an increase of circa 73%.

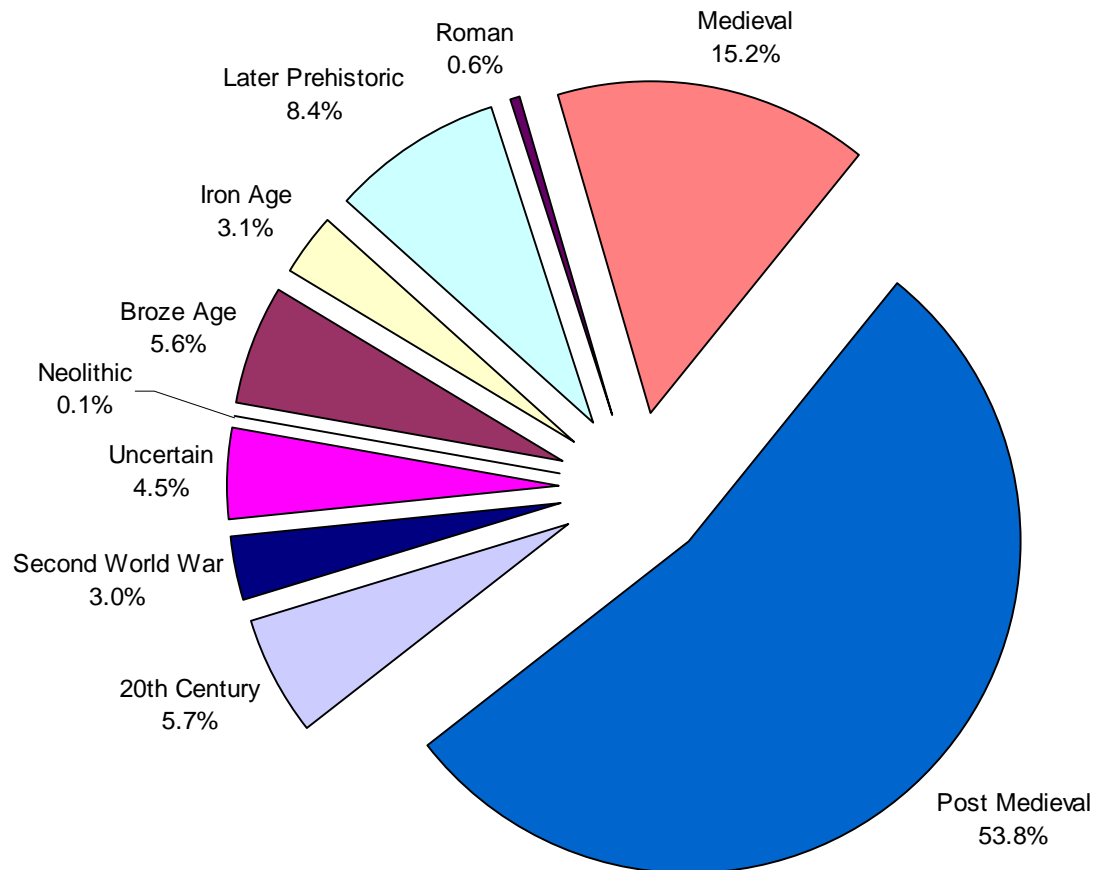


Chart 2. New NMR records by period

8.1.2 NMR Amended Records

The number of enhanced or updated monument records equates to just over 19% of the previously known NMR record for Exmoor. See chart 3 for a period breakdown of amended records.

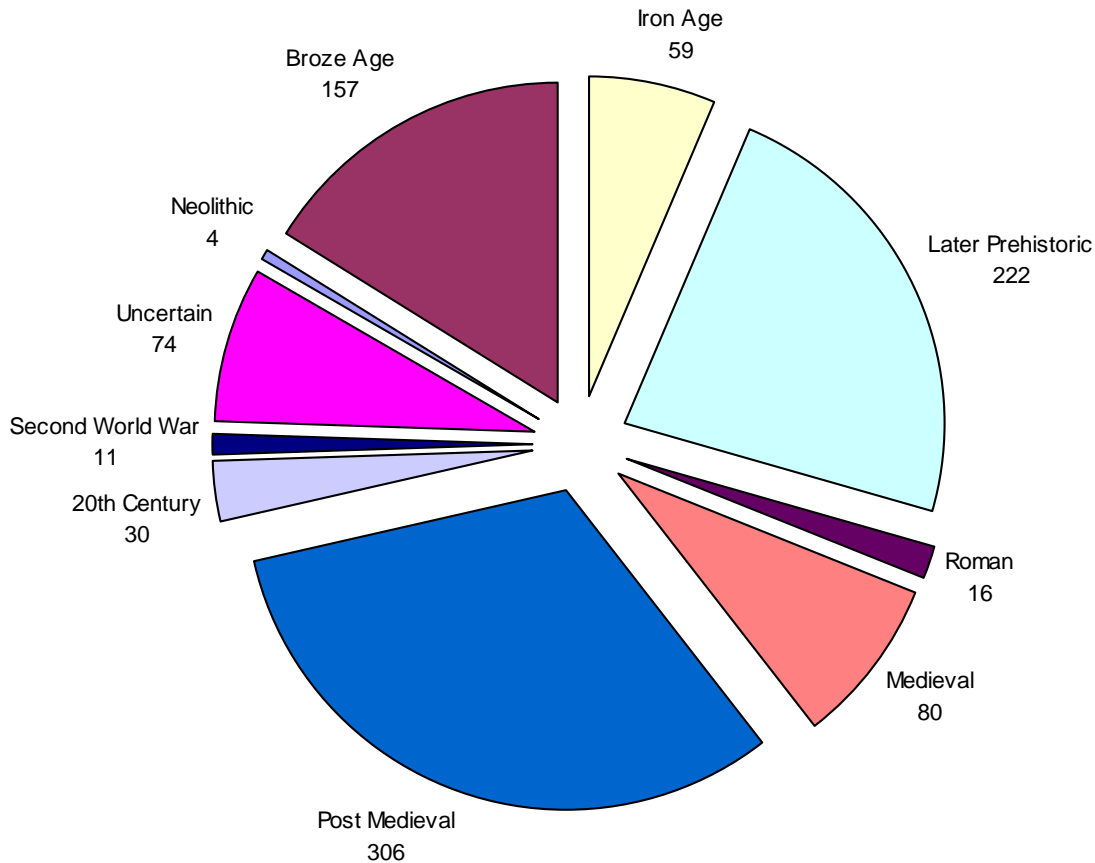


Chart 3. Amended NMR records by period

8.1.3 ENPA HER Enhancement

At the time of writing the ENPA HER currently contains 3860 records, although it is anticipated that this figure will increase dramatically following the migration of data from the Devon and Somerset HERs (F. Glover, personal communication).

As the NMP survey area extends beyond the administrative boundary of ENPA, as the data currently stands it is not possible to be sure of the precise number of new records which relate only to the ENPA area. However, a rapid visual assessment of the data suggests that approximately 605 new and amended records fall outside the National Park area (see section 8.1.4). Of the remaining circa 2195 monument records, 425 are also represented on the ENPA HER, equating to circa 11 % of the known record.

8.1.4 Devon and Somerset HERs

The visual assessment of the NMP date indicates that the project created or updated 605 new or amended monuments records outside the park boundary, 439 in Devon and 166 in Somerset.

8.2 THE FORM OF THE EVIDENCE

The majority of features transcribed during the survey were visible as earthworks or levelled earthworks. Very few cropmarks of any period were recorded and evidence of structures was largely confined to the ruins of post-medieval deserted settlements or military structures of 20th century date. The dominance of earthwork evidence is illustrated in Chart 4.

A large percentage of the earthwork remains have been interpreted as being of post-medieval date, but the survival of a high proportion of prehistoric sites as earthworks, at least until the 1940s, reflects the absence of intensive arable cultivation over much of Exmoor.

An exception to this pattern can be seen in the Iron Age and Roman periods, where record numbers are relatively low but sites visible as cropmarks are in the majority. This pattern has a geographical bias towards the fringes of Exmoor, particularly the area to the east of the Brendon Hills, an area of more intensively exploited arable land outside of the National Park.

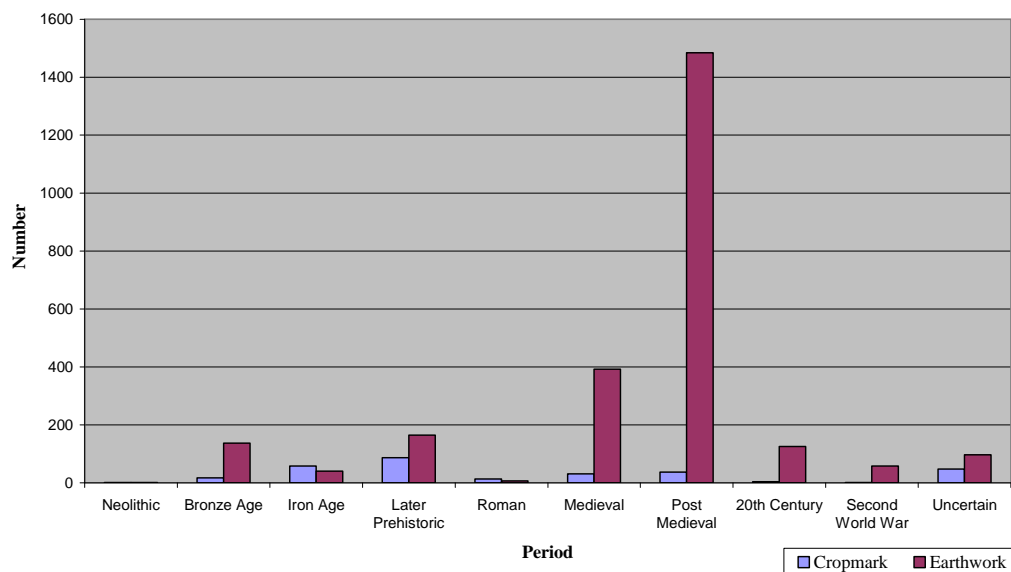


Chart 4. Number of sites, by period, visible as earthworks and cropmarks.

8.3 SURVEY HIGHLIGHTS

The project highlights and themes emerging from the survey are briefly summarised below on a period basis, illustrated with representative examples. The definition of date ranges stated for each period are those used by the EH database AMIE. Conventions used in the illustrations are detailed in appendix 1.

8.3.1 Neolithic (4000-2200 BC)

In total, the survey created or amended seven records for sites dating to the Neolithic period. Three of these sites are previously unidentified or new sites, including a possible hengiform monument, a possible mortuary enclosure and an unusual hill-top enclosure.

Evidence for early prehistoric monuments on Exmoor is rare. Chance finds of Neolithic artefacts, including flint arrowheads, knives and axes have been made, but prior to the survey the known monuments consisted of ‘micro-lithic’ monuments such as stone settings, stone rows and stone circles. These are generally placed in the late Neolithic-Early Bronze Age, although no firm radiocarbon chronology yet exists for these monuments (Riley & Wilson-North, 2001; 20-21). These sites do not lend themselves particularly well to aerial survey; the stone monuments on Exmoor are almost always less than 0.5m high and are therefore frequently obscured by vegetation and peat. However, the location of the monuments can occasionally be identified on aerial photographs from the modern paths and tracks which have eroded around the monuments, such as at the stone circle on Withycombe Hill.

The absence of early Neolithic monuments, such as the characteristic communal monuments known as Tor Enclosures seen on Dartmoor and Bodmin Moor, has led to suggestions that Exmoor was not intensively occupied in the early Neolithic but continued as a wooded upland, used occasionally as a hunting ground (Siraut, 2009;18). Neolithic funerary monuments such as long barrows, cairns and chambered tombs are also currently unknown. However, the Exmoor NMP project has identified two possible Neolithic monuments; an enclosure at Little Hangman Hill, Combe Martin, which may be similar to the Tor Enclosures on Dartmoor and Bodmin Moor, and a possible mortuary enclosure at Kentisbury. It is possible that with further survey utilising geophysical methods and remote sensing techniques such as LiDAR, additional Neolithic monuments will be identified on Exmoor.

The enclosure at Little Hangman (NMR UID 1460177; SS 585 480) was identified early in the project. Despite its prominent location and proximity to the South-West coast path it was previously unknown (figure 7, 8).

The site, which lies some 210 metres above sea level on the summit of precipitous sea cliffs, consists of a ditch or terrace measuring between 5 and 7 metres wide, surrounding the summit of Little Hangman hill, which rises above and to the east of Combe Martin, Devon. The bank is not visible on the northern (seaward) side, where a natural geological shelf may have completed the circuit. A site visit in 2007 identified edge set stone slabs facing the earthwork boundary, as well as evidence that the summit of Little Hangman might have been quarried to provide this material. Recent scrub clearance in advance of field survey has revealed further slabs (R. Pullen personal communication).

The date and function of this enclosure are unknown. Potential parallels to this site do exist, such as the possibly Iron Age settlement at Hollerday Hill, also in a dramatic coastal hilltop location (NMR UID 926335). However, the construction and extremely inhospitable location of the Little Hangman Hill enclosure are unprecedented on Exmoor, and could suggest a ceremonial or ritual function in the landscape rather than a settlement or defensive function.

The enclosure could be similar to the tor enclosures of Dartmoor and Bodmin Moor, such as Carn Brae and Helman Tor, both in Cornwall, and Whittor, Devon. Tor enclosures are defined as “hilltop or hillslope enclosures located near natural rock outcrops and surrounded by one or more circuits of stone built walls.” (EH monument thesaurus; also see Barber, forthcoming; Oswald, A., Dyer, C and Barber, M. 2001;85).

While the topographic setting at Little Hangman Hill certainly fits this description, it is not directly comparable with the known tor enclosures for several reasons. The known tor enclosures are generally located inland and the example closest to the coast is the possible Neolithic tor enclosure at Carn Galver near Zennor, which is circa 1.3 kilometres from the sea. The enclosure at Little Hangman is also defined by a cut feature, resembling a terrace or scarp, rather than a bank and is therefore different to tor enclosures in its construction. Little Hangman Hill also appears isolated in contrast to other tor enclosures which are often associated with settlement evidence, such as at Helman Tor, where internal subdivisions and additional enclosures can be seen (Riley 1995;3). However recent field survey at Little Hangman Hill has revealed evidence, not visible on aerial photographs, for complex activity within the enclosed area including a number of possible platforms (R. Pullen and H. Riley, personal communication). Unfortunately the survey plan is incomplete at the time of writing and was not available for inclusion in this report.

There are some similarities between tor enclosures and causewayed enclosures in terms of dating evidence and form. This has led to suggestions that tor enclosures may be comparable sites built in igneous geological conditions as opposed to areas with mainly sedimentary geology (Oswald et al 2001). If this is the case, the possible parallels between the Little Hangman enclosure and tor enclosures may indicate a new form of Neolithic land use, since causewayed enclosures and tor enclosures are currently unknown on Exmoor.

Little Hangman also has features in common with the ‘cliff castles’ of the Cornish coast. These sites have previously been interpreted as Iron Age defensible refuges during times of unrest, or as trading centres, with the rampart intended to protect wealthy merchants and high value items (Sharpe 1992). However, more recently these castles have been linked to Tor enclosures, with the only difference being the coastal setting. In each case, a prominent natural feature has been enhanced by the addition of a

constructed ring-work. This suggests the possibility of an earlier origin for cliff castles, perhaps Neolithic or Early Bronze Age, with re-use in the Iron Age (Sharpe 1992; 67).

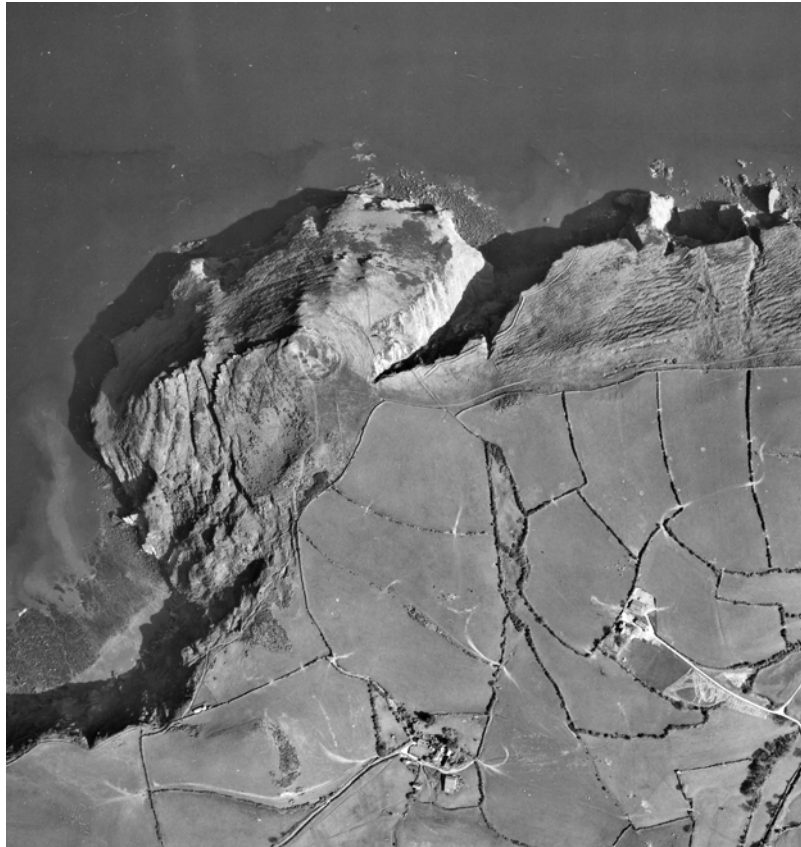
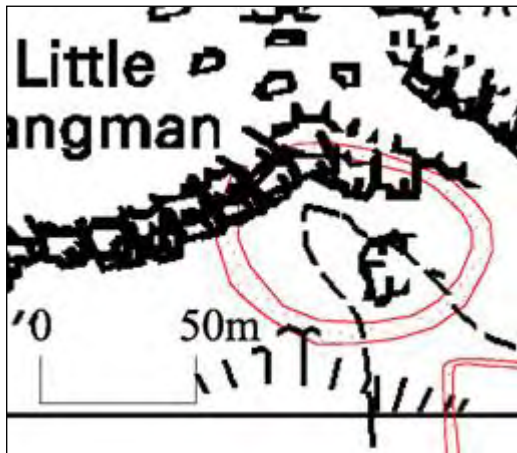


Figure 7: Little Hangman Hill in its coastal setting (SS 585 480). © Crown Copyright. Ordnance Survey. NMR OS/89114 653 04-MAY-1989



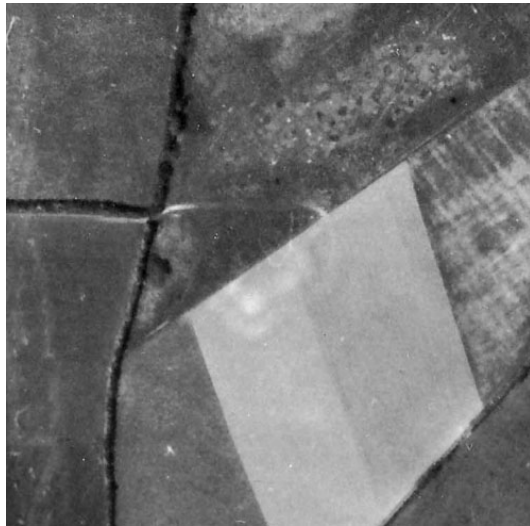
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Figure 8: Detail of the Little Hangman hill-top enclosure. The encircling earthwork is depicted in red, following the NMP 'Bank' convention. In actuality it more resembles a terrace or enclosing platform.

An elongated enclosure (NMR UID 1465302) was identified as a series of levelled earthworks in Kentisbury, Devon (SS 6274 4363). The site lies close to Kentisbury Down, where a substantial flint scatter has been recovered, comprising material dating to the Mesolithic, Neolithic and Bronze Ages, indicating long-term prehistoric activity in the area. The enclosure strongly resembles mortuary enclosures found in Lincolnshire, in particular those identified as an oblong class of monuments (Jones 1998, 87). Mortuary enclosures are rare in Devon, but not unknown, for example at Tiverton (Smith 1990).

It comprises a central platform, measuring 32 metres by 16 metres, surrounded by a ditch approximately 2 metres wide. A second bank then surrounds this ditch, making the total visible area of the monument 48 metres by 23 metres. Although the enclosure is clearly visible on an aerial photograph taken in the 1940s, some sections are visible on more recent photographs on Google Earth and a recent site visit confirmed the presence of earthworks (H. Riley, personal communication). The site appears to have been truncated by a late post medieval or twentieth century field boundary on its eastern side and there is no visible evidence of it beyond this boundary.

This site may be similar in character to a number of 'cigar-shaped' possible mortuary enclosures identified from DAP sorties in the Exe Valley and at North Tawton (Horner, B. personal communication, 14th January 2010).



English Heritage (NMR) RAF Photography.
RAF 106G/UK/1501 4297 13-MAY-1946



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Figure 9: A possible Neolithic mortuary enclosure at Kentisbury Down. (SS 6274 4363)

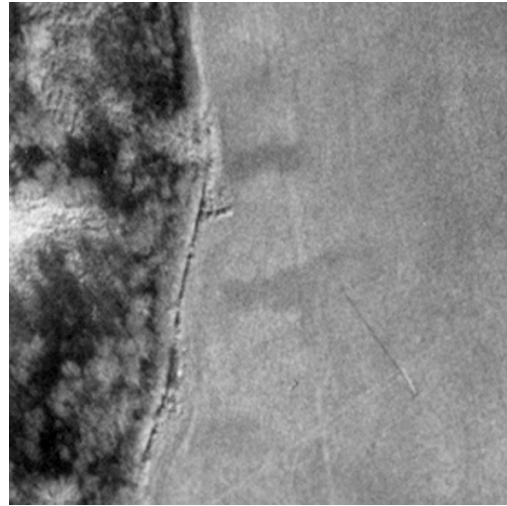
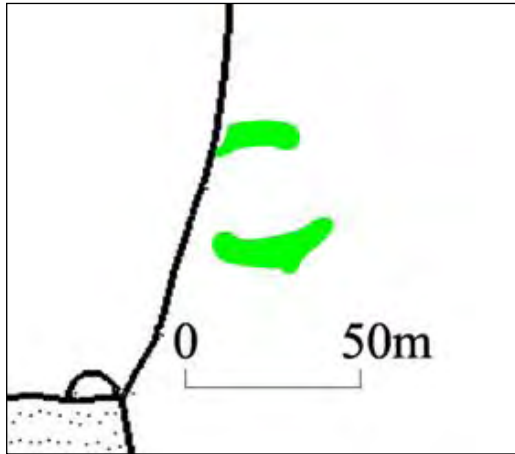
Cropmarks of a possible hengiform enclosure of late Neolithic or Early Bronze Age date (NMR UID 1493466) were identified in pasture in East Anstey, North Devon (figure 10). The cropmarks were poorly defined, and are visible on only two aerial photographs from the 1960s. The cropmarks appear to form over curvilinear ditches, approximately 7 metres wide and up to 35 metres long, enclosing a roughly circular or elliptical area approximately 26 metres across. Breaks in the ditches on the east and west sides may form broad opposing entranceways.

The function of hengiform enclosures is unclear, although given their morphological similarities to larger henges, it is reasonable to assume that they performed similar ritual or ceremonial functions (Roberts 2005, 201). Few have been excavated, but those that have show a wide variability in size and orientation, and in the presence or absence of burials perhaps indicating a variation in function.

Henges and hengiform enclosures are rare, if not completely unknown on Exmoor. A circular earthwork on Parracombe Common, North Devon had been previously identified as a henge, but too much of the monument has been obscured or destroyed to allow a confident identification. Other possible interpretations of this site also include a saucer or disc barrow dating to the Bronze Age or tree ring of post-medieval date.

Henges and hengiform monuments are notoriously difficult to identify confidently, with cropmark identification in particular relying heavily on comparisons between a small number of well known sites. Barber refers to the term hengiform being “highly unsatisfactory,” suggesting that most circular or sub circular enclosures of this date are labelled hengiform simply because they fall outside the accepted classification of a henge (Barber, forthcoming pp 87-88).

Further investigation of this site should include a closer comparison with known Devon examples, including Bow Henge and a possible Henge monument identified from a DAP sortie at Hockworthy, north Mid-Devon (Horner, B. personal communication, 14th January 2010).



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NMR MAL/67006 060 08-FEB-1967

Figure 10: A possible Hengiform monument visible as a cropmark in East Anstey parish (SS 8653 2558).

8.3.2 Bronze Age (2600-700 BC)

Ritual Monuments

On Exmoor some of the best known landmarks include large and impressive Bronze Age monuments such as the Chapman Barrows and Robin and Joaney How (Riley and Wilson-North, 2001, 32-40). The known monuments vary in size dramatically from around 35 metres down to 2 metres in diameter. Although detailed gazetteers have been compiled, (Grinsell 1969;1970), they remain somewhat enigmatic features and there is little firm dating evidence, with the exception of the monument at Bratton Fleming, just outside the National Park, which provided late 2nd to early 1st millennium radio-carbon dates (Quinnell 1997).

There are therefore problems of interpretation associated with Bronze Age monuments typically seen as ritual or funerary in nature. Identification is mainly based on assessment of their construction and morphology, of which only the latter can be considered by archaeological aerial survey. As such, any further classification of sites, such as cairns or barrows, must rely on fieldwork.

Therefore, during the NMP survey, the records of 173 barrows were amended, often to simply include a photographic reference, but also frequently to provide more accurate location data and, where possible, a basic record of condition. For ease of retrieval and analysis an individual record may have been created for a monument where it had previously been recorded only as part of a group.

A total of 73 previously unrecorded possible barrows or cairns were transcribed during the survey. Although a relatively low number, it includes possible additions to well known barrow cemeteries, such as the Five Barrows group.

This scarcity of newly identified sites reflects the often very limited visibility of such earthworks on the moorland areas of Exmoor, due to seasonal vegetation cover and the irregular nature of the topography, where natural geological outcroppings and gorse can mimic the appearance of earthen mounds. Very often even well known and substantial mounds were not identifiable on any photograph available to the survey. The limited area of Exmoor under arable cultivation also limited the potential for sites to be identified as cropmarks.

Agriculture and Unenclosed Settlement

Possible evidence for the Bronze Age settlement and cultivation of Exmoor has emerged from the NMP survey. Unlike Dartmoor and Bodmin Moor, Exmoor has little evidence for intensive settlement in the Bronze Age and prior to the survey only 10 prehistoric field systems, 20 fragmentary field boundary banks and 45 unenclosed hut circles were known to survive as earthworks (Riley and Wilson-North 2001, 40-43).

There is no fixed chronology for the known prehistoric field systems and associated unenclosed settlements on Exmoor, and their interpretation as Bronze Age in date is based on field observation and analogy with other areas in the south-west, such as Dartmoor (Riley and Wilson-North 2001, 40). A small scale excavation was opened on the junction of coaxial and transverse field boundary on Codsand moor. Radiocarbon dating indicated that the field system post-dated a buried soil dated AD 340-620, covered by peat AD 1250-1440. Current opinion is that these problematical dates are erroneous and that the field system remains viewed as probably Bronze Age until further dating evidence proves otherwise (Riley 2009, 26;33)

Unenclosed hut circles on Exmoor are thought to date from the later Bronze Age (1500-1000 BC) although there are no recorded excavations with absolute dates from any Exmoor examples (Riley 2009,18). Nonetheless, they are seen to be part of a movement from open to enclosed settlement typified by hillslope enclosures (Riley and Wilson-North 2001, 43). At Codsand Moor, a landscape of prehistoric settlement and field systems similar to Almsworthy, discussed below, the field system associated with unenclosed hut circles is overlain by two small hillslope enclosures, though it is possible the field system remained in use (Riley 2009, 12).

The NMP survey has identified 31 possible previously unrecorded Bronze Age hut circles, 4 of which are associated with fragmentary field boundary banks. An example on Woolhanger Common, illustrated in figure 11, is similar in character to the rectilinear field system known on Great Hill (Riley and Wilson-North 2001m 45, figure. 2.36).

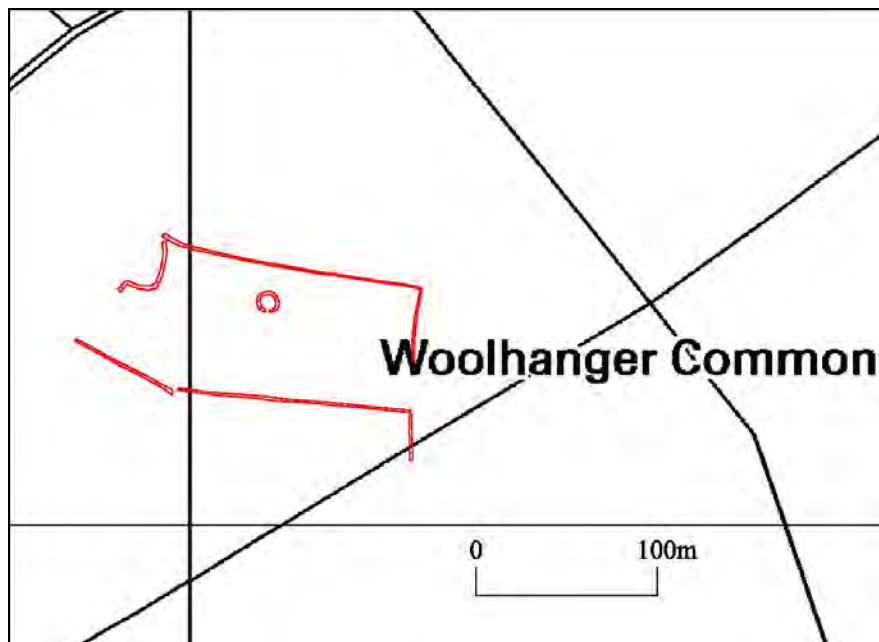


Figure 11: Field boundary banks associated with a previously unrecorded hut circle on Woolhanger Common (SS 6904 4612). This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

Most of the known unenclosed hut circles on Exmoor are closely associated with prehistoric field systems, with a small proportion recorded as isolated monuments. Prior to the survey this included one of the largest hut circles known on Exmoor, on Almsworthy Common (figure 12, NMR UID 36310). The discovery of at least two additional hut circles approximately 200 metres to the south, apparently integrated into a possibly associated coaxial field system may change the perception of this formerly isolated monument, perhaps recasting it as part of a wider unenclosed settlement (figure 13). These features were only revealed as soil marks following the ploughing of the field in which they were located.

The NMP survey did not identify any previously unknown prehistoric field systems, but made noteworthy additions to our understanding of several examples, including those on Codsend and Hoar Moors, the Valley of Rocks and Great Hill, all of which have previously been the subjects of field surveys. This data contributed to a recent reappraisal of the prehistoric settlement of Exmoor by Hazel Riley (Riley 2009). Significant new details for the Valley of Rocks field systems and the settlement on Martinhoe Common were acquired from a single sortie flown by Damian Grady in January 2008, emphasising the importance of ongoing reconnaissance.

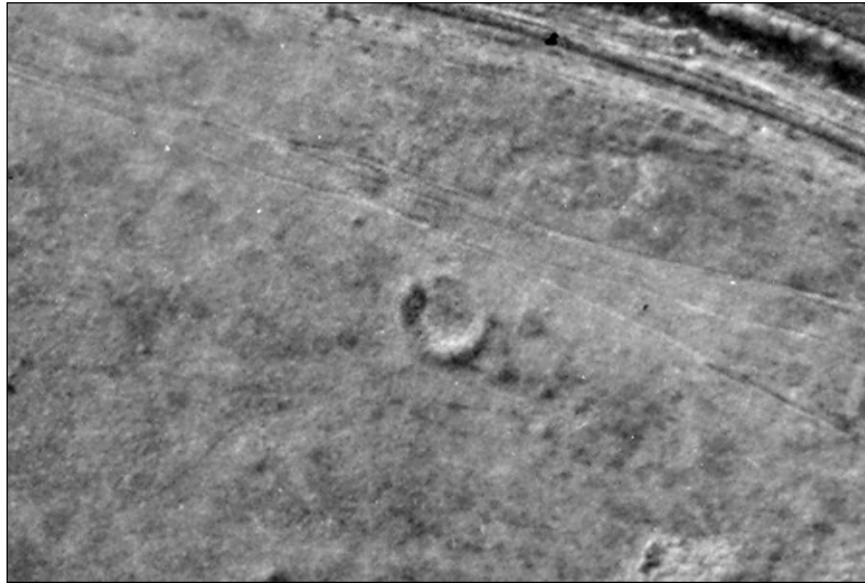
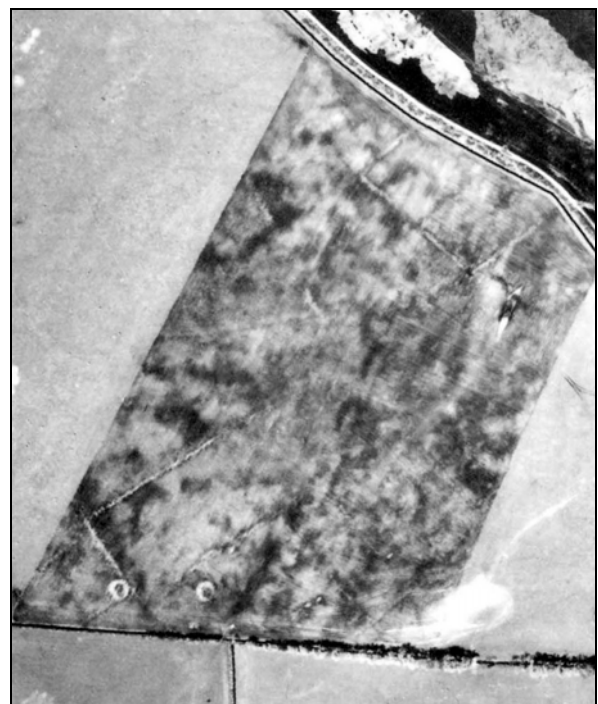
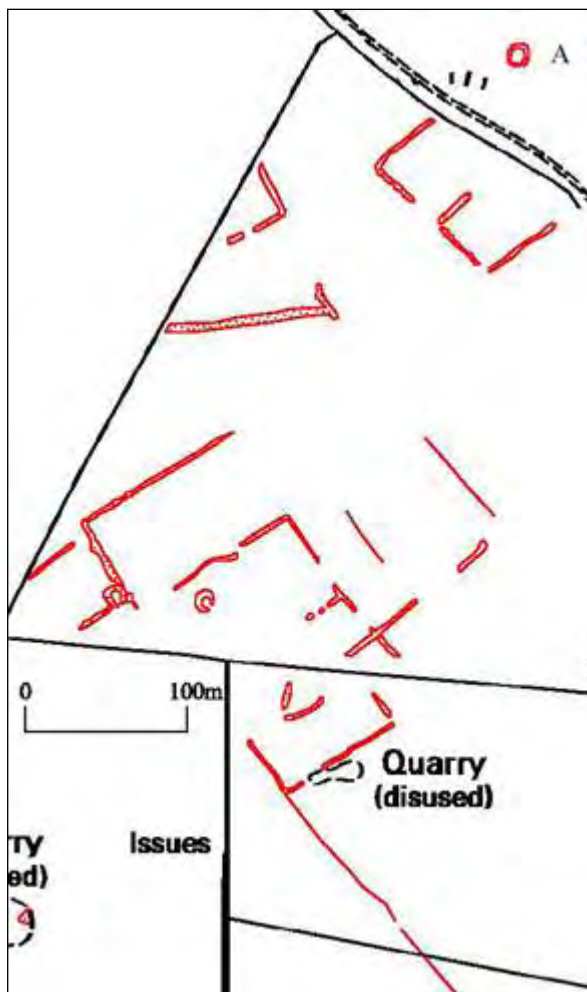


Figure 12: Almsworthy Common hut circle (NMR UID 36310; SS 8395 4182). North is to the bottom of the image. English Heritage (NMR) RAF Photography. NMR RAF 540/931 (F20) 3098 08-NOV-1952



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Figure 13: Previously unrecorded hut circles associated with a field of probable prehistoric date, on Almsworthy Common (SS 8380 4154). The previously recorded hut circle is annotated 'A'. This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

8.3.3 Iron Age to Roman (800 BC - 43 AD / 43-410 AD)

The evidence for Iron Age activity on Exmoor prior to the NMP survey comprised the earthwork remains of seven hillforts and numerous small enclosed sites known as hill-slope enclosures. Hill-slope enclosures have been seen as “originating in the gradual shift from unenclosed to enclosed settlements at the end of the Bronze Age” (Riley and Wilson-North 2001, 70) but their interpretation is problematical. Other than univallate enclosure, there is very little morphological homogeneity within the known group, with sites ranging in size from 25-80 metres in diameter and located in a variety of situations. Most appear isolated and it is possible further settlements are located underneath more enduring, extant settlements in more favourable locations (Riley and Wilson-North 2001, 65; 70)

At present only a single hill-slope enclosure, at Holworthy Farm, Parracombe, has been excavated and the limited dating evidence appears to support a Bronze Age date for the monument, although the absence of an enclosure ditch may mark this site as atypical (Green 2009, 4). Recent post-graduate research on Somerset has added to the body of data on this class of monument, suggesting a pattern of isolated enclosures in upland areas and a tendency for ‘clustering’ or pairing of sites at lower elevations (Norman 2006). New evidence from the NMP survey supports this although, as the focus of Norman’s research was on Somerset only, the analysis of hill-slope enclosures is incomplete for Exmoor.

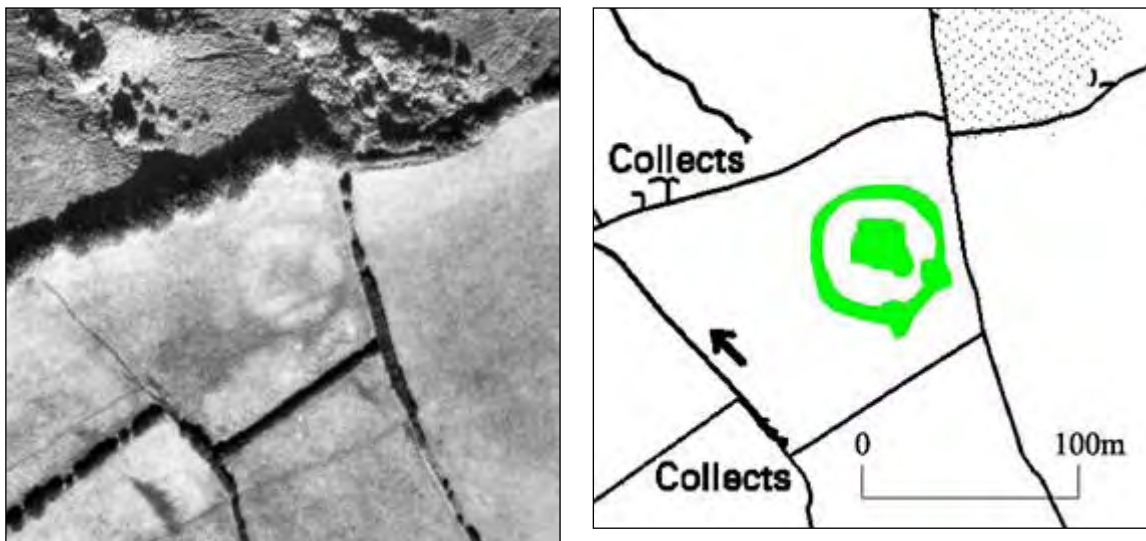
Evidence for Roman activity on Exmoor prior to the NMP survey was confined to the military sites of Old Burrow, Martinhoe and the recently confirmed fort at Rainsbury, and a rapidly growing body of evidence for Romano-British iron extraction and processing (Riley and Wilson North 2001, 56; 76-81). It is generally acknowledged that it is difficult to identify any material evidence of the transition from the Iron Age into the Romano-British period on Exmoor and the occupation of hill-slope enclosures are likely to have continued into the Romano-British period (Riley and Wilson North 2001, 56). Other than two possible sites to the east of the National Park boundary, the NMP survey has not identified any characteristically Roman monuments during the survey and the Iron Age and Roman periods are therefore summarised together.

Hill-slope Enclosures

The evidence for Iron Age activity on Exmoor is largely in the form of hillforts and hillslope enclosures. The NMP survey has identified over 80 enclosures. These could be Iron Age and, taking into account the imprecise nature of the monument type and the possible variation in size and morphology of such features, 26 have been identified as possible hill-slope enclosures. Of this number, 15 have been recorded from cropmark evidence and 11 as earthworks.

Some of the possible enclosures are visible as very subtle earthwork remains, often little more than areas of terracing. The absence of extant ramparts and ditches at such sites makes interpretation difficult but it is possible these remains include a number of levelled hill-slope enclosures.

Much of the National Park is in permanent pasture. Cropmark formation in grass is usually rarer and can be less well defined than in cereal crops. Nonetheless some tentative identifications of hill-slope enclosures have been made (figure 14) although further work is required to assess such sites, perhaps by geophysical survey, or targeted excavation.



NPA JAS-85042 036 29-AUG-1985

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Figure 14: A possible hill-slope enclosure visible as a cropmark on Lyncombe Hill (UID 1485236) located on the north-facing slopes above the River Exe at circa SS 8714 3727, roughly equidistant between Road Hill hill-slope enclosure (UID 35715) and Staddon Hill Camp (UID 35712)

It was not uncommon to identify previously unrecorded enclosures as a combination of both earthwork and cropmark evidence (figure 15).



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Figure 15: A hill-slope enclosure east of Wistford Cross visible as low earthworks and cropmarks at circa SS 6688 3314. This enclosure is new to the NMR but was recorded on the Devon HER (NMR UID 1495208).

The impact of these Iron Age earthworks is often apparent in their influence on the surrounding field patterns. For example, a possible medieval field boundary originally followed the inner rampart of the Wistford Cross enclosure before it was realigned in 1976. Similarly, grown out hedgerow trees can still be seen on aerial photographs of 1985 atop the relict banks of a previously unrecorded hill-slope enclosure at North Hawkwell (figure 16).



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Figure 16: a previously unrecorded hill-slope enclosure surviving as an earthwork at North Hawkwell (SS 9250 4021).

Cropmark enclosures

Away from the upland areas, cropmark evidence for enclosures becomes more numerous and they display a greater variation in morphology and size. A concentration of possible curvilinear or oval hill-slope enclosures can be seen as cropmarks to the east of the Brendon Hills, ranging in size from 35 to 65 metres in diameter. In this area the enclosures appear to cluster into small groups or pairs. However, this does not necessarily mean that the enclosures were contemporary and some clusters of sites have evidence of overlapping cropmarks, probably indicating different phases of settlement (as seen in figure 17). Rectilinear enclosures range from 30 to 60 metres in size. The enclosures usually appear to be defined by a single ditch but there are examples of multiple ditched curvilinear and rectilinear enclosures. A double ditched enclosure at Vellow (NMR UID 1500338) has been interpreted in the past as a possible Roman signal station, comparable to those identified from the air elsewhere in Devon (Griffith 1984) but surface pottery finds suggest it may have been in use in the second to fourth centuries AD and be civil in nature (Norman 2006). It is possible that a newly recorded triple ditched enclosure near Brompton Ralph, of similar size and shape, visible to the east of Old School House in figure 17, could also be of similar date and Romano-British origin.

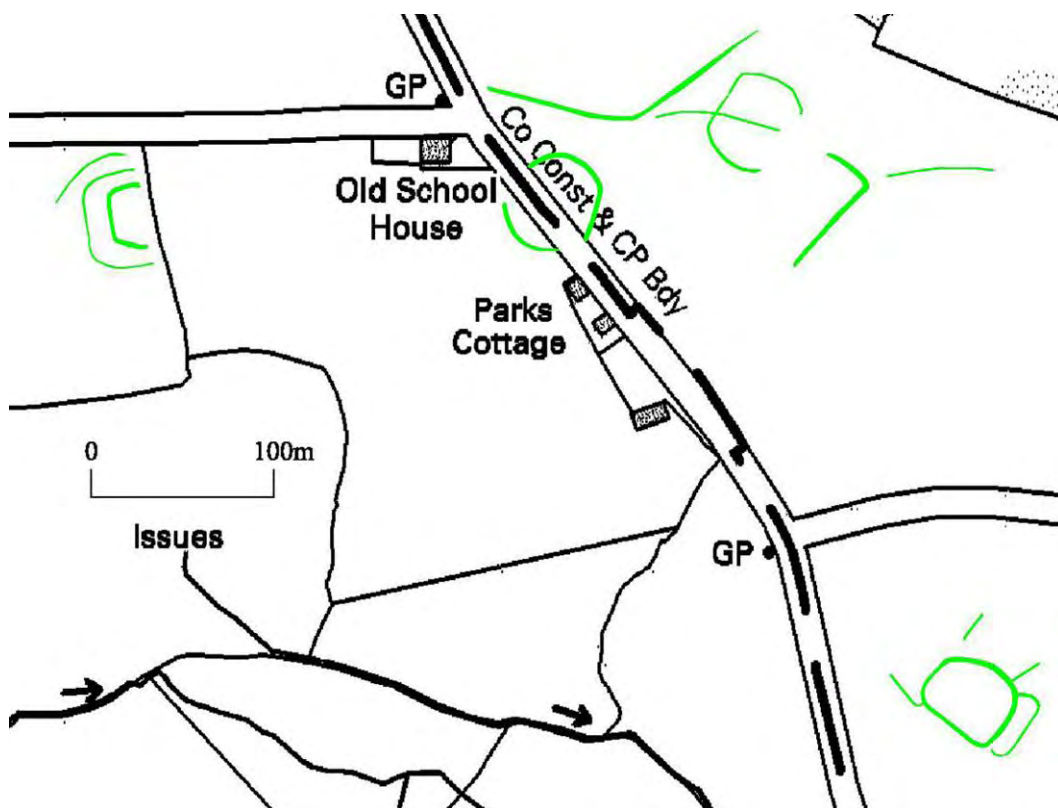
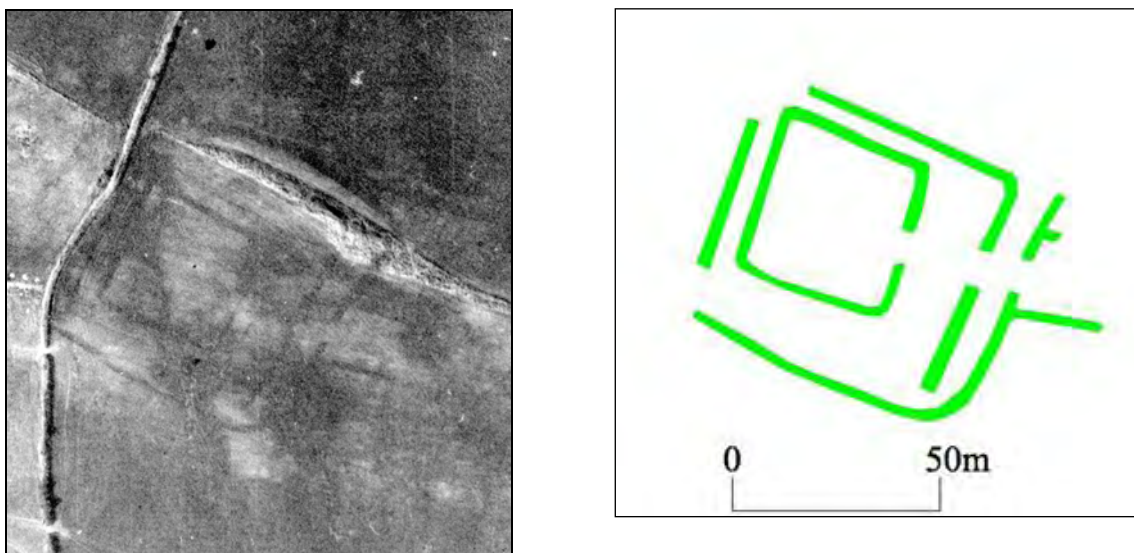


Figure 17: Clustered enclosures to the east of Brompton Ralph at circa ST 094 323, including a triple ditched enclosure similar in form to the putative Roman signal station at Vellow.

A rectilinear double or triple-ditched enclosure identified as a cropmark on Stoneditch Hill to the west of the National Park, near Combe Martin, appears unusual (NMR UID 1459874; figure 18). The site is not remarkable in form or size; it is typical of small enclosed lowland settlements commonly interpreted as being of Iron Age or Romano-British date, in Devon and throughout England. In Devon, small square or rectilinear ditched enclosures make up a high proportion of the sites visible as cropmarks, a pattern different to the earthwork sites, where oval or curvilinear forms are more common (Griffith 1994, 93; Riley and Wilson-North 2001, 70). The Stoneditch Hill enclosure is similar to cropmarks sites recorded in Devon at Pitt Farm, Mamhead, Ashburton and Kenton (Griffith 1983, 63-4; 1988, 60; Wilson 2000, 119), and is not dissimilar to a rare example of a surviving earthwork site at Stoke Gabriel (Griffith 1983, 57).

However, the situation of this site is noteworthy as it is not a lowland site, but is close to the summit of Stoneditch Hill at an elevation of over 240 metres AOD. Excavations at the morphologically similar site at Stoke Gabriel, amongst others, have provided dates of the 1st to the 4th century AD, perhaps supporting the interpretation that the Stoneditch Hill site may represent evidence of a Romano-British upland settlement tradition that existed in parallel with Exmoor's hill-slope enclosures. A similar site in North Devon at Webbery Cross, Alverdiscott, is also situated not far from an ovoid enclosure and Roman marching camp at Higher Kingdon. The phasing of these enclosures is unknown, but they provide corroborative evidence for different enclosure styles in the same geographical area. (Horner, B. personal communication; 14th January 2010).

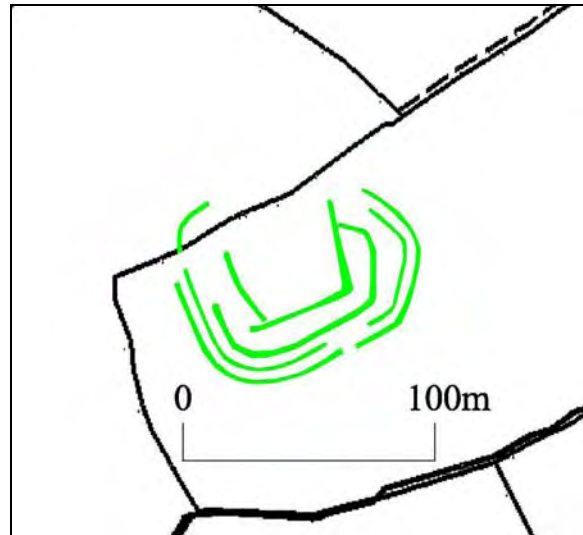


English Heritage (NMR) RAF Photography.
NMR RAF 82/1281 0054 29-AUG-1954

Figure 18: Romano-British hill-farming on Stoneditch Hill (SS 5863 4507). (NMR UID 1459874).



NMR RAF 106G/UK/1655 4426 11-JUL-1946



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Figure 19: A potentially Roman multiple ditched enclosure to the south of Stogumber at circa ST 093 361. (NMR UID 1497739).

Another significant enclosure (Figure 19) is situated on a north-east facing slope, at 155m above OD, about 1km south of Stogumber and 2.5km south-west of the suggested possible Roman signal station at Vellow. The outer two narrow enclosure ditches are spaced 5 metres apart and are almost perfectly parallel for much of the visible circuit. These define an outer enclosure almost 95 metres long. To the north-eastern end of the enclosure the innermost two ditches are less regular, but at the south-west the outer three ditches can be seen to define a very regular curved corner and partly visible north-western corner. Despite the relatively small scale of this site, aspects of its construction are very reminiscent of typically much larger Roman military installations, such as the possible fort at Killerton (Griffith 1984, 25-26). It has also been suggested that a corner of a possibly larger enclosure is visible as a faint and narrow cropmark immediately to the south-east of the triple-ditched enclosure, which could be interpreted as evidence of a marching camp, similar to examples known from North Tawton, Devon and Restormel in Cornwall (C. Smart, personal communication). However, the Stogumber enclosure is also not dissimilar from a clearly 'native' or Romano-British multivallate enclosure identified at Horwood, North Devon (Griffith 1994, 96). It must be borne in mind that the Stogumber enclosure was recognised and transcribed from only one run of aerial photographs and detail therefore is limited. Nonetheless, it warrant further investigation and it would be useful to search for further parallels beyond the study area.

Roman Road

A possible Roman road was recorded from cropmarks near Brompton Ralph (Figure 20). It is visible in two sections each over 300 metres in length and in the 700 metre space between the cropmarks the line of the route seems to be perpetuated by extant field boundaries. The cropmarks appear to be forming over buried cut features, possibly roadside ditches. A degree of parching may indicate a buried metalled surface, but this evidence was difficult to differentiate from the natural 'background' cropmarks and has not been depicted. Nonetheless, the evidence indicates a road with a possible metalled or compacted surface of approximately 7.5-8 metres width, well within the range for Roman roads known from elsewhere (Davies 2002, 73-77).

Local place name evidence is also suggestive of a Roman road. Stane or Stone placename elements are frequently applied to Roman roads and it may be significant that the names of the farms located between the two sections of cropmark all currently or formerly contain the Stone element; Middle Stone Farm, Lower Stone Farm and Manor Farm, previously Higher Stone Farm (Davies 2002, 23; 2008, 44-5).

Further circumstantial relative dating evidence may be visible in that the possible route appears to be aligned upon, and perhaps cut, a small D-shaped enclosure of probable Iron Age date (figure 20B; cf. figure 21). It is also worth noting that the possible road is aligned almost exactly upon the triple ditched enclosure near Stogumber, described above (figure 19), over 4 kilometres to the north.



A.



B.

Figure 20: A possible Roman road near Brompton Ralph (ST 091 313).

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Figure 21: A case of life imitating (cartoon) art? (Reproduced with the kind permission of Rupert Belsey)

8.3.4 Medieval to Post-medieval (1066 – 1540 AD to 1540-1901 AD)

Beyond place-name evidence and three inscribed stones very little is known of early medieval Exmoor, the period AD 410 - 1066 (Riley and Wilson-North 2001, 85-90) and the NMP survey did not identify any features which could be ascribed an early medieval date.

With the exception of the former Royal Forest of Exmoor, now the parish of Exmoor, the modern settlement pattern on Exmoor can be seen to reflect that of the later medieval period in many ways. Many of the farms, hamlets and settlements listed in Domesday exist in some form today; the single farm was, and remains the predominant unit of settlement, although the situation is undoubtedly more complex than a simple unbroken line of descent (Riley and Wilson-North 2001, 90). Due to this continuity, little direct settlement evidence was recorded during the NMP survey. Nonetheless, the transition from the medieval to the post-medieval period - the sale of the Royal Forest and the creation of new estates, settlement shrinkage and abandonment, the rise of industry and improved communications - shaped much of the landscape of Exmoor into what is visible today. However, it is difficult to ascribe many of the landscape features recorded during the survey to a particular period with any confidence, and for this reason the evidence for the medieval and post-medieval periods is summarised together.

Water meadows

As stated in section 3.7.3 above, water meadows of a type known variously as catchwork, catchwater and field gutter systems were the single most numerous class of feature recorded during the survey. Over 650 systems were recorded, equating to almost a third of the total new record count. In practical terms, catchworks were almost ubiquitous within the survey area, with some form of water meadow recorded associated with almost every farm.

Roughly defined, a water meadow is an area of grassland where the quality and quantity of the crop is artificially increased by various irrigation methods, both to produce hay and to provide an early crop of pasture for grazing young stock (Cook and Williamson 2007). On low lying or flat ground, such as typically found in the valleys of Wessex, these may take the form of complex earthwork systems known as bedworks, while on steep valley sides the simpler catchwork systems were widely used.

At their most simple, catchworks comprise a single carriage-gutter or headmain running along a valley side, which were dammed to cause the water to over-top the gutter and flow down the valley slope (Cook and Williamson 2007). A number of very extensive headmains have been identified during the survey, exceeding 2 kilometres in length (figure 22). Often previously recorded simply as leats, the full extent or significance of these headmain gutters was often unrecognised prior to the survey. For

instance on Cheriton Ridge, three separate records existed for leats which the survey identified as being part of a single long earthwork.

More often, however, a series of parallel gutters or ditches were constructed below the headmain to more evenly distribute the water. The majority of individual farm catchworks recorded are relatively modest in scale, comprising between 1-5 gutters which when flooded would have irrigated 5 to 10 hectares of slope. However, large and complex systems have been identified ranging in area between 15-25 hectares, with the largest exceeding 50 hectares (see below). It is not unknown for such large individual systems to contain in excess of 30 separate gutters, often tapping multiple water sources.

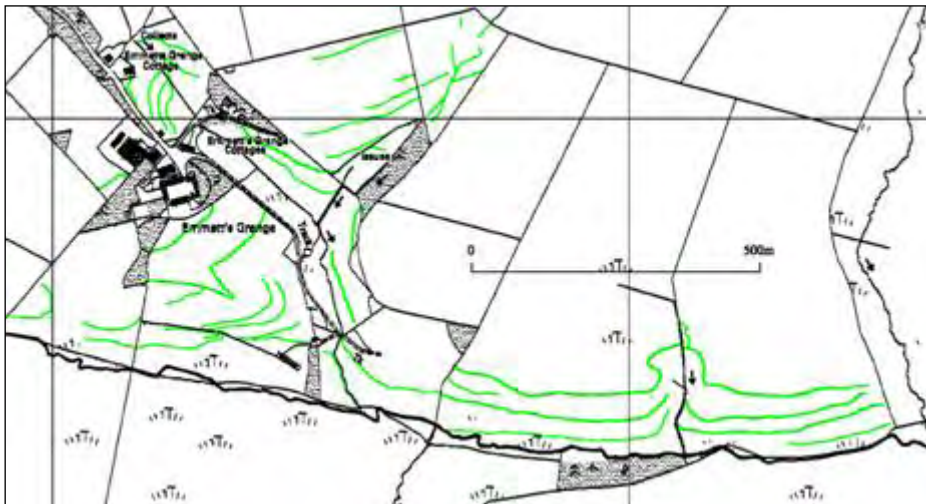
The parallel gutter systems are usually carefully constructed, with various feeder gutters supplying water to the system. Some of the systems, termed 'integrated systems' by Cook and Williamson (2007), have been constructed to pass the water through farmyards or collect in special ponds, to allow stored manure to be collected or added and washed down onto the meadow as liquid fertiliser. Other systems, termed 'detached' lie separate from their farmstead and therefore had no access to liquid manure except what was carried out to it (Cook and Williamson 2007).

Catchworks pre-date valley-bottom bedwork systems and were probably in use throughout Devon and Somerset by the 16th century (Taylor, Smith and Brown 2006). However, following the acquisition of the former Royal Forest of Exmoor by John Knight in 1818, the Knight family hired Robert Smith as land agent, who was considered an expert in water meadows and irrigation, and extensive catchwork systems were constructed at each of the Knight's tenant farms (Orwin 1929, 77-79). These farms were all carefully planned and designed to be at the cutting edge of agricultural technology, and the inclusion of water meadows, sometimes extensive and complex, was a vital part of their designs.

One of the largest of the Exmoor catchworks, if perhaps not the most complex, is based at Emmett's Grange (NMR UID 1099668; figure 23) where Robert Smith lived from 1848 (Burton 1989; 86). Emmett's Grange was one of the Knight's newly established planned farms within the former Royal Forest and the accompanying water meadow was possibly constructed as an 'advertisement' for the agricultural improvements favoured by the Knights, a 'flagship' farm from which to attract more tenants into Exmoor. The gutters and leats, which vary in length from 37 to 920 metres, stretch across the contours of the slopes above Kinsford Water and cover an area of more than 53 hectares. The system uses various springs, water courses and boggy ground to supply flowing water to the gutters and the remains of culverts and sluices can also be seen in the fields.



English Heritage (NMR) RAF Photography. NMR RAF CPE/UK/1980 4448 11-APR-1947



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Figure 23: An extensive catch-work or field-gutter water meadow at Emmet's Grange Farm (SS 7520 3680).

A recent review of the archaeological evidence for water meadows suggested that catchworks, in comparison to bedworks, are “usually small, poorly integrated systems (which) often served only individual farms or small estates.” (Taylor *et al* 2006, 49). For Exmoor, the second part of this summary appears to be largely correct; it is clear that many water meadows were constructed to serve small individual farms and remained within their holdings (figure 24). Indeed, many of the systems transcribed by the NMP survey are small, consisting of as few as one, two or three gutters. However, a brief assessment of the NMP data demonstrates that even relatively small systems can be not only individually complex, but form an inter-linked network of farm-scale irrigation systems.



Figure 24: Small catchworks recorded at South Stock, South Sparhanger and Radsbury Farms (centred on circa SS 718 458). Note the system in operation on this 1972 aerial photograph. (NMR UUIDs 1464948, 1464993 and 1464988). © Crown Copyright. Ordnance Survey. NMR OS72065 191 15-APR-1972.

The catchwork system is almost ubiquitous on Exmoor, with undoubtedly significant implications for the availability of water resources. At Parracombe for example, at least three farms, one of which was abandoned in the 19th century, appear to have shared water sources to supply extensive water meadow systems (figure 25). The gutters surrounding Rowley Barton, Lower Rowley and Hollacombe Farms, cover an area of more than 20 hectares. Although each farm utilised springs and streams local to each farmstead, diverting water from these sources would have affected the amount of water feeding downstream and therefore available to other holdings.

This example also highlights the difficulties in identifying the full extent of some systems and confidently attributing them to a particular holding on the basis of the aerial photographic evidence alone.

It appears that these water meadows also operated as ‘integrated systems’. Interestingly, the gutters are overlain in places by post medieval field boundaries, suggesting that this system may belong to the earlier part of the post-medieval period, possibly even predating the Knight family’s improvements.

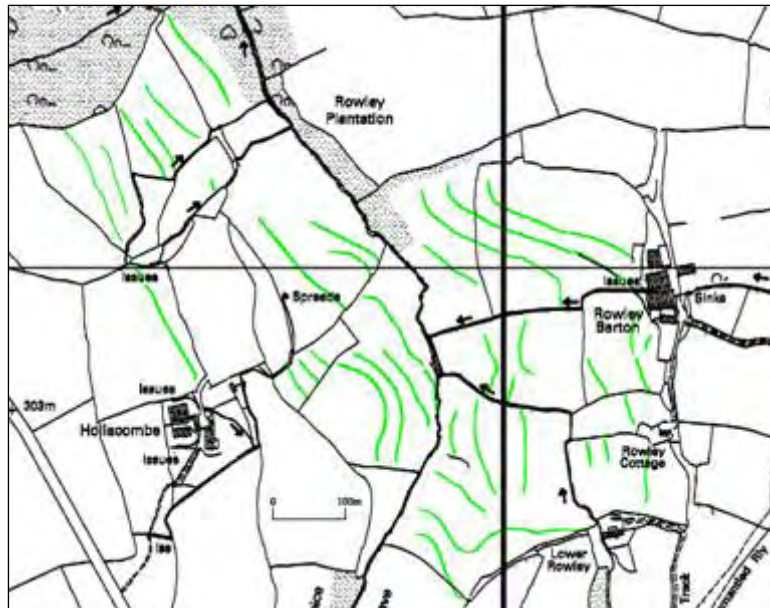


Figure 25: Integrated water meadows at Rowley Barton, Lower Rowley and Hollacombe Farms (SS 649 439). Base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

In some instances, where sources of water additional to the main feeder stream were not present, such as springs, the operation of a farm's catchworks could utilise the entire flow of the stream (S. Dymond, personal communication). This would have an obvious and direct impact on its neighbours downstream, effectively starving any lower systems of water while in use. This inter-dependant relationship is most evident for the smaller farms strung along Exmoor's narrow and sharply incised combs (figure 26), and a degree of cooperation would have been required between farmers and tenants, the abstraction of water carefully timetabled and agreed between holdings. This need for cooperation is equally, if not more applicable to larger holdings with more extensive catchworks (figure 27). Recent work by East Devon AONB has revealed that neighbouring farms at Branscombe alternated the flooding of their catchwork systems on a weekly basis hoping to avoid such problems, but that conflicts did arise, not least with water powered industries such as Branscombe Mill (S. Dymond, personal communication). Such work adds an interesting social dimension to the uptake and use of catchworks on Exmoor and is worthy of further work.



Figure 26: A direct relationship between Shercott and Coombe Farms (Mon UID 1485085 & 974641), circa SS 854 393. This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

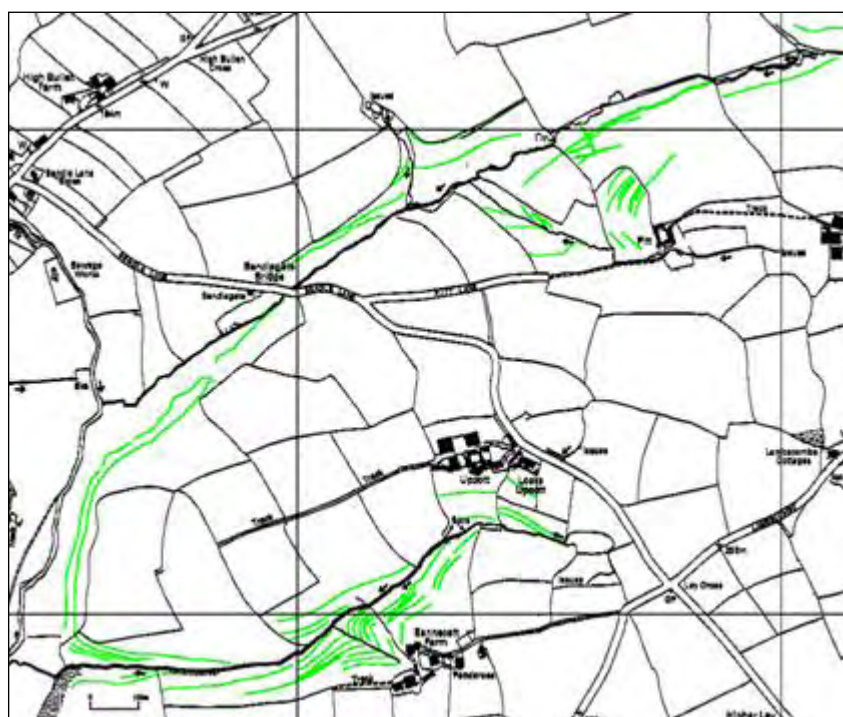


Figure 27: Inter-related extensive catchworks at Pitt Farm, Upcott Farm, Sannacott Farm and the former outfarm of Bendle Down (circa SS 752 293). This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

Peat cutting

Peat would have been the main source of fuel on Exmoor during the post-medieval period, and a vital resource for constructing and turfing enclosure walls. Indeed the practice continued on the moor well into the 20th century. Several extensive areas of cuttings were identified by the survey, with most located close to the Parish of Exmoor, the former Royal Forest.

Burton records peat cutting continuing on Exmoor up until the late 1980s, and indicates that the owners and tenants of cottages and farms on Exmoor would have cut between 8000 and 20,000 turves each year for fuel (Burton 1989, 232-33). This amount was probably much higher in the 19th century, when peat was used for enclosure walls as well as fuel.

Several particularly large areas of cutting can be seen on Brendon Common, covering at least 124 hectares (figures 28, 29). The individual cuttings show a wide variety of shapes and sizes, from straight-edged or square pits measuring 10-12 metres across to irregularly-shaped and curved pits up to 100 metres long and 30 metres across. Several of the pits show signs of having been re-worked, or cut in stages, producing a “stepped” effect to the edges of the pit. Brendon Common was purchased by John Knight in the 19th century, and according to Burton (1989, 78), the tenant farmers on Brendon were so concerned that he intended to enclose the common that they destroyed field boundaries and walls under cover of darkness. Brendon Common was probably exploited for peat right up until the Second World War, when it was requisitioned by the army and used as a training ground and firing range.

Peat comes in two forms: spine turf, consisting of shallow deposits, is cut on the slant, while pit turf is much deeper and is cut straight down. The variations in the cutting methods and patterns seen during the survey are most likely a reflection of the varying depth and quality of peat at various areas. They may also be a result of unique cutting patterns, possibly relating to individual families or farms working the same area over a period of time. The importance of this resource, particularly to those moorland edge farms with peat cutting rights, such as Cloggs Farm, is reflected in the construction or integration of permanent farm buildings as peat or ‘turf’ stores (Jones 2000, 3).

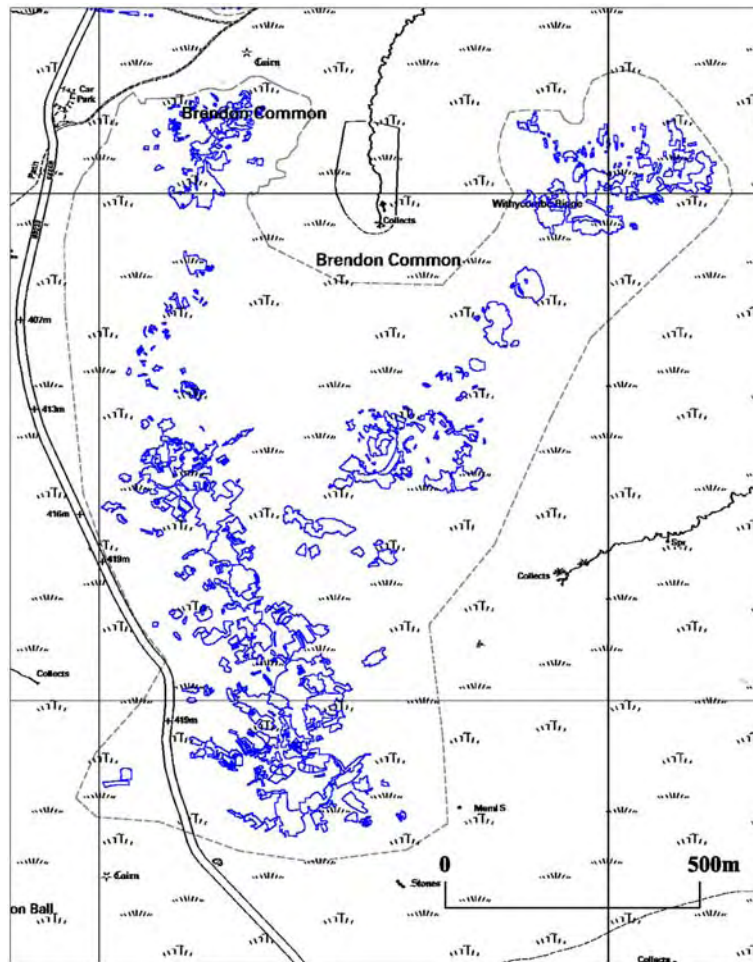


Figure 28: Schematized transcription of extensive post-medieval peat-cutting on Brendon Common (SS 764 444). This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.



Figure 29: A detail of Brendon Common Peat Cutting. © Crown Copyright. Ordnance Survey. NMR OS/73087 676 17-APR-1973.

Drainage

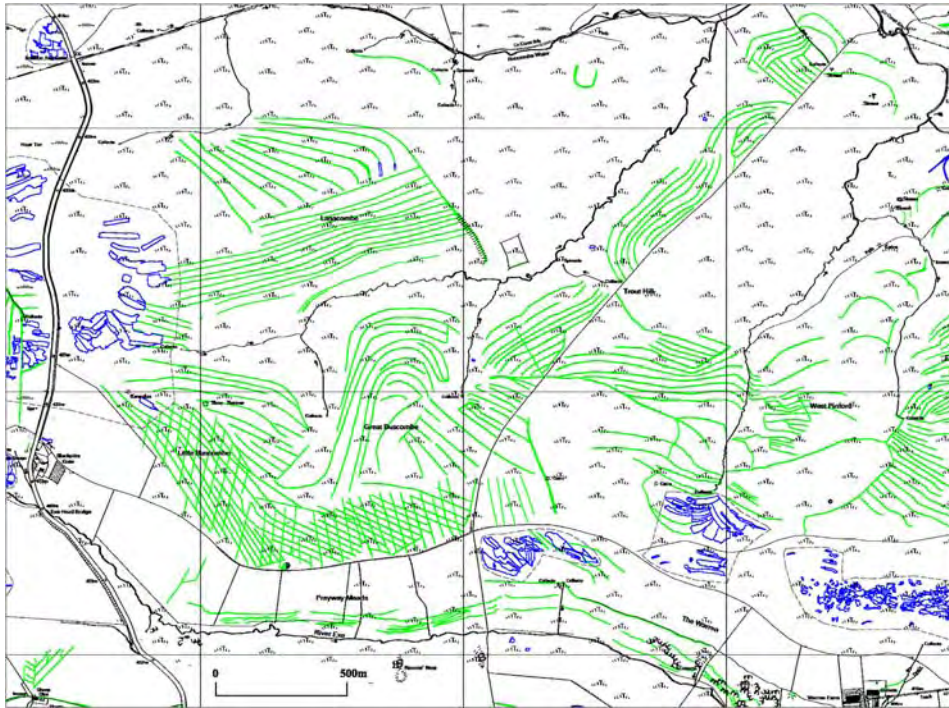
As part of their plans for the Former Royal Forest of Exmoor, from the 1830s the Knight family instituted drainage works of an enormous scale across the moor. Their aim was to improve the quality of the land prior to enclosing it and converting to arable use. Their early efforts comprised cutting massive surface drains that are clearly visible on numerous air photographs examined as part of the survey. Both John Knight and his son, Frederic, had many miles of these surface drains cut across areas such as The Chains, East and West Pinford, Trout Hill and Lanacombe; some of the boggiest areas of Exmoor. Accounts for the year 1836 show a payment for 8 and a half miles of surface drains cut on The Chains (Burton 1989, 72), indicating what an enormous and expensive undertaking these works were, perhaps the single greatest example of such an undertaking. However, they appear to have achieved limited success, although they remain visible and continue to function today (Orwin 1929, 56).

Partly due to their continuing function, the drains have recently come to attention once more as the subject of the Exmoor Mire Restoration Project (Exmoor National Park Authority, 2008). This project has far-reaching environmental and ecological objectives and aims to rewet Exmoor's central moorland blanket peat by damming many of the 19th century drainage ditches.

An representative example of these drainage ditches can be seen on Lanacombe and Great Buscombe (figure 30A; NMR UID 1041443/1475743), where they extend for more than 240 hectares. The ditches run in various directions but are nearly always parallel. Their size is variable but some measure up to 1.5 metres wide and nearly a metre deep. In several areas they are overlain by straight, regular mid-19th century boundaries later constructed by the Knight family. At the southern edge of Great Buscombe, several of the drains criss-cross each other and interconnect, suggesting they were recut on at least one occasion. Several large leats known as "canals" can also be seen in the vicinity, such as Pinkery Canal. The function of the canals remains unclear but it is possible that the drains were intended to carry water to these structures.

The drains are also often closely associated with areas of peat cutting, and it is possible that local tenants were encouraged to cut their peat here in an attempt to improve the drainage. It is also possible that once it became apparent that the drainage attempt had failed, the drains were simply exploited as "ready made" cuttings into the peat.

Most of the areas where this drainage technique was attempted remain boggy marshland, particularly The Chains, Lanacombe and East and West Pinford. Orwin suggests that John Knight was not fully aware, or did not take account of the effects of the high elevation on the climate of Exmoor. However, in later years, other areas were successfully drained by subsoil ploughing, breaking up the iron pan deposits which prevented drainage, and it is likely simple surface drainage would never have succeeded (Orwin 1929, 33).



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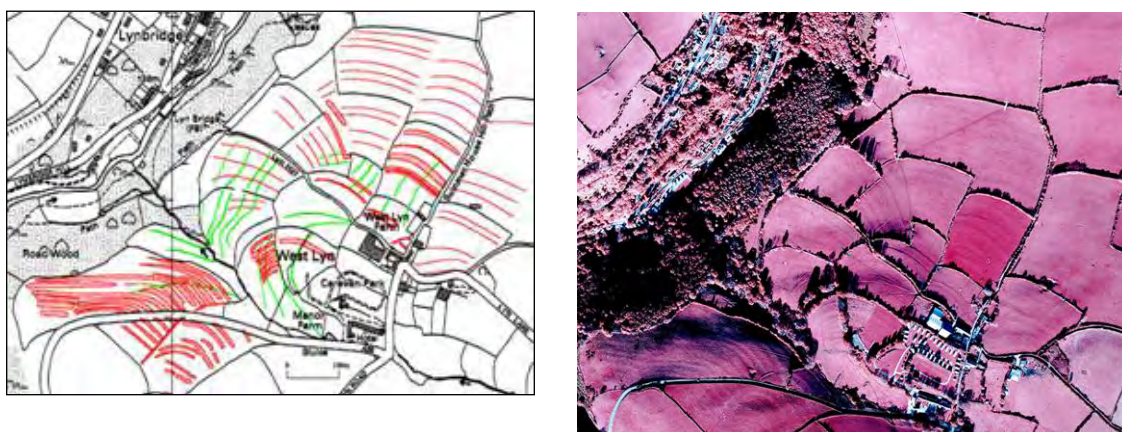
B. © Crown Copyright. Ordnance Survey. NMR OS73109 869 29-APR-1973

Figure 30: Money down the drain? A: The NMP survey transcription of 19th century drainage at Lanacombe (circa SS 775 424). B: A detail of the drainage illustrated in A.

Agriculture

Little direct settlement evidence was recorded during the survey. However, a number of relict medieval or post-medieval field systems associated with both extant and deserted settlements have been transcribed, visible as low ridge and furrow or strip-lynchet earthworks. Such earthworks are assumed to be indicative of open fields and their survival within enclosed land is therefore often partial.

A medieval field system at West Lyn is visible on aerial photographs as relict sinuous strip-field boundaries located between extant field boundaries which fossilise and perpetuate the medieval field pattern. The earthworks have recently been surveyed for the National Trust (Berry 2003) but had been not recorded on the NMR. The NMP survey has transcribed this field system and added important new detail to this significant survival of a medieval agricultural landscape (NMR UID 1465970; figure 31). It is probable that the earthworks are the remains of an open field system operated from the former hamlet of West Lyn, the infrastructure of which remained virtually unchanged even as the individual farms amalgamated into a single settlement (cf. Riley and Wilson-North 2001, 116-119).



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Figure 31: West Lyn fossilised strip fields. Note the later, possibly 19th century water meadow cutting the earlier field boundaries (SS 723 483).

A similar but more extensive strip field system extends for 36 hectares around the deserted 14th century settlement at North Thorne (NMR UID 34807; figure 32). Unlike at West Lyn, however, the settlement associated with the North Thorne field system was abandoned. Many of the North Thorne strip field banks have been levelled by recent intensive agricultural improvements, but it is probable that some earthworks survive under the waters of Wistlandpound Water reservoir.



A.

English Heritage (NMR) RAF Photography. NMR RAF
CPE/UK/2082 3096 19-MAY-1947



B.

© Crown Copyright. Ordnance Survey. NMR OS/73109 911
29-APR-1973

Figure 32: Strip fields surrounding the deserted settlement of North Thorne (SS 6473 4120). A: Visible as upstanding earthworks in 1947 and B, levelled in 1973.

These newly identified fieldscapes are similar to previously known rare survivals on Exmoor, such as at Challacombe and Parracombe, and similarly seem to be concentrated on individual hamlets, perhaps indicating each settlement operated its own communal field system (Winton 1999; Riley and Wilson-North 2001, 99;117).

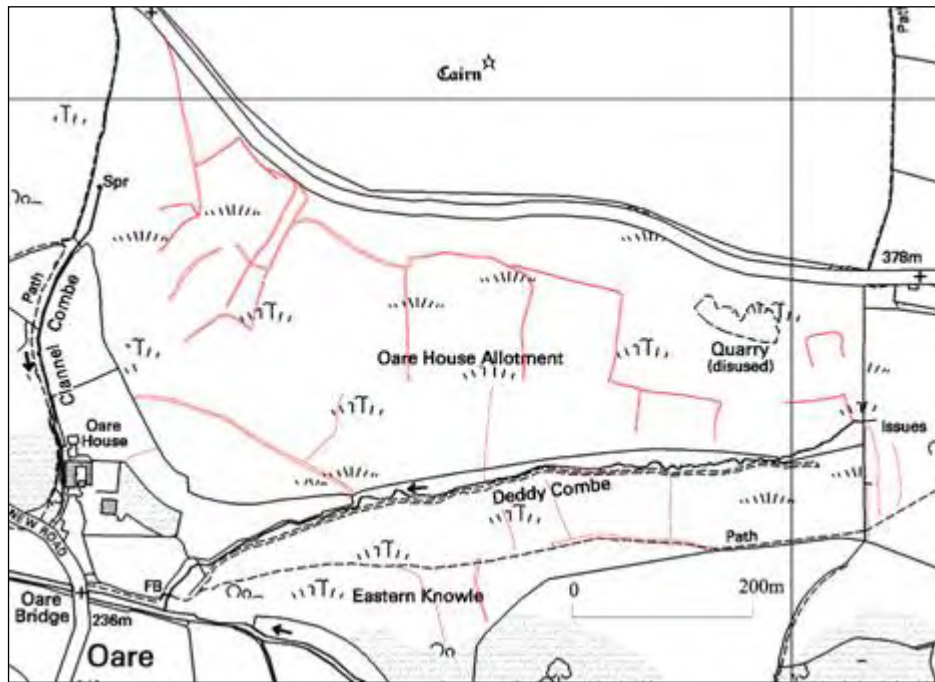


Figure 33: Previously unrecorded post-medieval enclosure on Oare House Allotment (SS 8060 4775). This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

Evidence for the large scale medieval or post-medieval enclosure, cultivation and then abandonment of more marginal land has only relatively recently been recognised. Several extensive examples were transcribed from aerial photographs on the southern commons surrounding the former Royal Forest, prior to field survey (Riley and Wilson-North 2001, 126: see section 4).

With the exception of a small field system on Oare House Allotment (NMR UID 1460591; figure 33), the Exmoor NMP survey has identified few areas of previously unknown post-medieval enclosure. However, the survey has enhanced our knowledge of several field systems to the north of the former Royal Forest, notably towards the coast at Countisbury parish (figure 34).

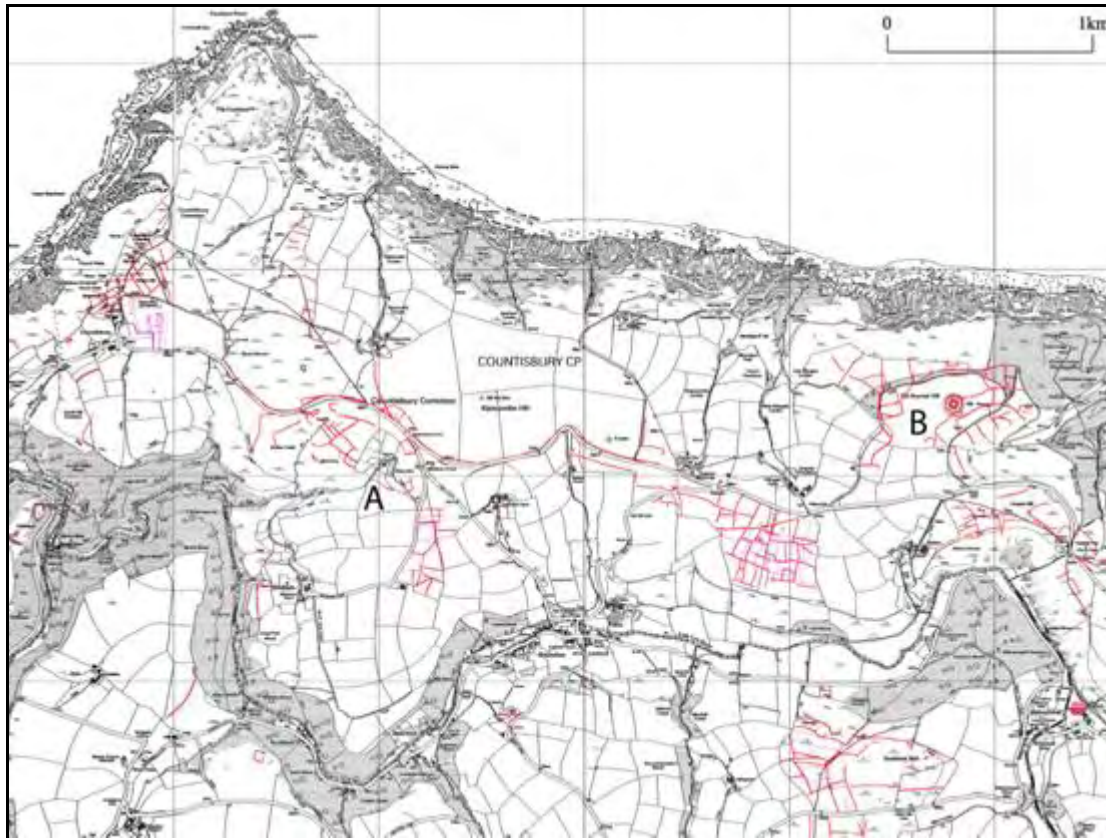
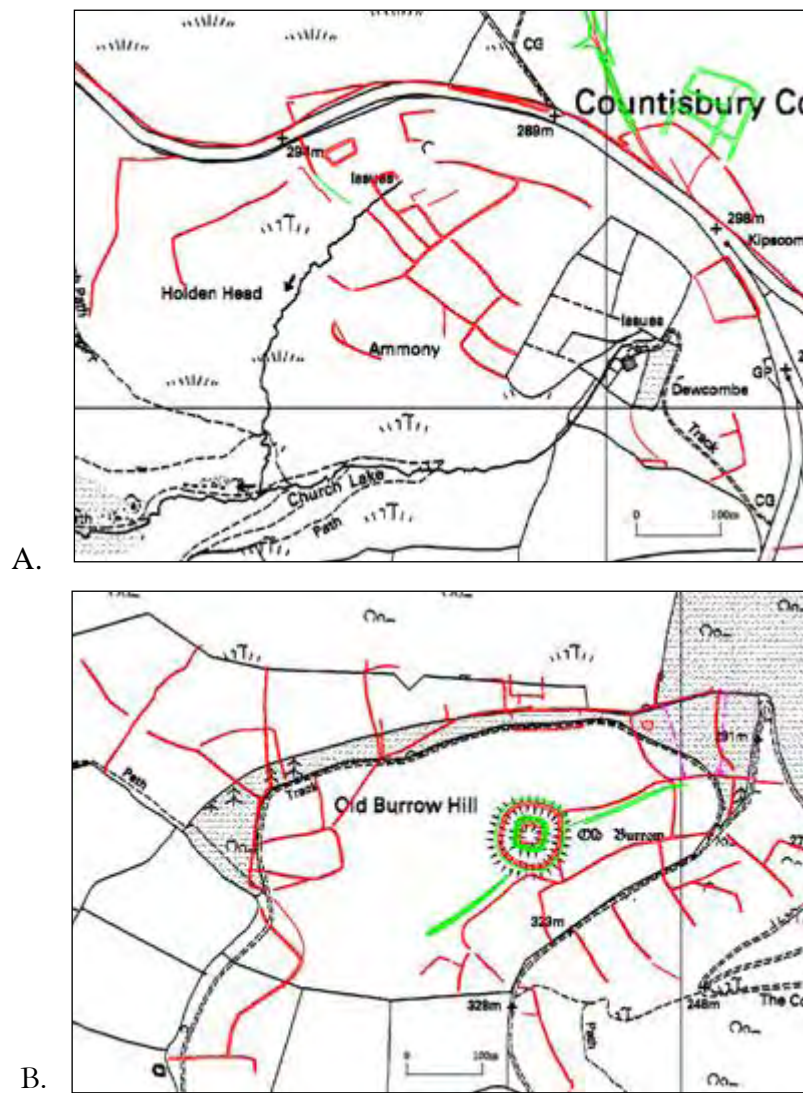


Figure 34: Extensive failed or abandoned post-medieval enclosure around Countisbury. See figure 35 for details of sites annotated A and B. This base map ©Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100019088.

Significant new details have been recorded in the former field systems at Ammony (NMR UID 1033005; figure 35A) and Old Burrow Hill (NMR UID 1357343; fig 35B). The relationship between the relict and the extant field systems at Ammony is clear, supporting an interpretation of agricultural expansion onto the commons and subsequent shrinkage. The earthwork evidence for the post-medieval enclosure of Old Burrow Hill and its environs has been all but levelled by 20th century ploughing. Nonetheless, the NMP survey has revealed the previously unknown extent of the former field system and unexpected details, such evidence for the incorporation of the Roman signal station ramparts into the field pattern.



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Figure 35: Details of relict and abandoned field systems, transcribed at Ammony (A; SS 7575 4918) and Old Burrow Hill (B; SS 7741 4831).

8.3.5 Twentieth Century Military sites

No evidence for First World War activity was identified but over 100 records relating to the Second World War and a single Cold War site were created or amended. The NMP survey has recorded evidence for varied Second World War military activity on Exmoor and this is expressed in chart 5.

Prior to the survey it was anticipated that historic vertical aerial photography might reveal extensive Second World War anti-invasion defences along the low lying stretches of shoreline close to the coastal towns of Ilfracombe and Minehead (Hegarty 2006, 14). This section of the coastal zone was surveyed as part of the NMP phase of the Severn Estuary Rapid Coastal Zone Assessment Survey (RCZAS). The RCZAS results confirmed the anticipated pattern and recorded dense areas of anti-invasion ‘coastal crust’ defences as well as evidence of varied military training activities, such as the AFV firing ranges on North Hill (Crowther and Dickson 2008, 253-255; 259-261). During the survey it became apparent that Exmoor’s high coastal cliffs were deemed to be sufficient defences in themselves and no further anti-invasion defences were noted.

Few military buildings or structures were noted but the NMP survey recorded numerous earthwork features related to military activity. Many of these earthworks were levelled in the post-war decade. The record count does not necessarily reflect the number of individual earthwork features transcribed or the scale of activity represented, a point which should become apparent in the discussion of the Exmoor Firing Ranges below.

The NMP survey has greatly improved our understanding of Second World War military activity on Exmoor, and three features are worthy of illustration.

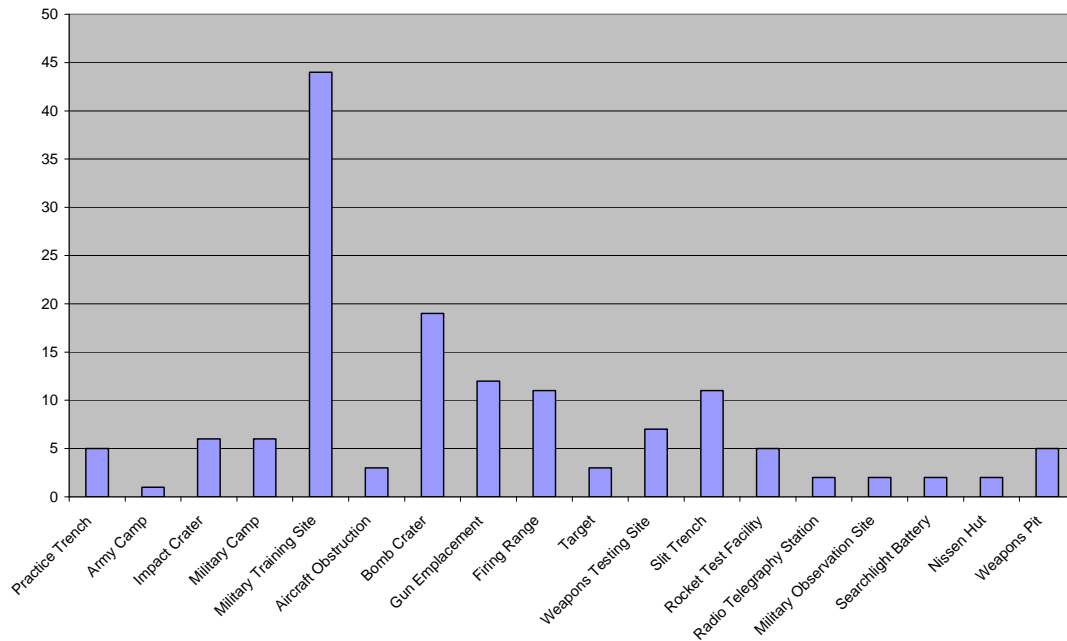
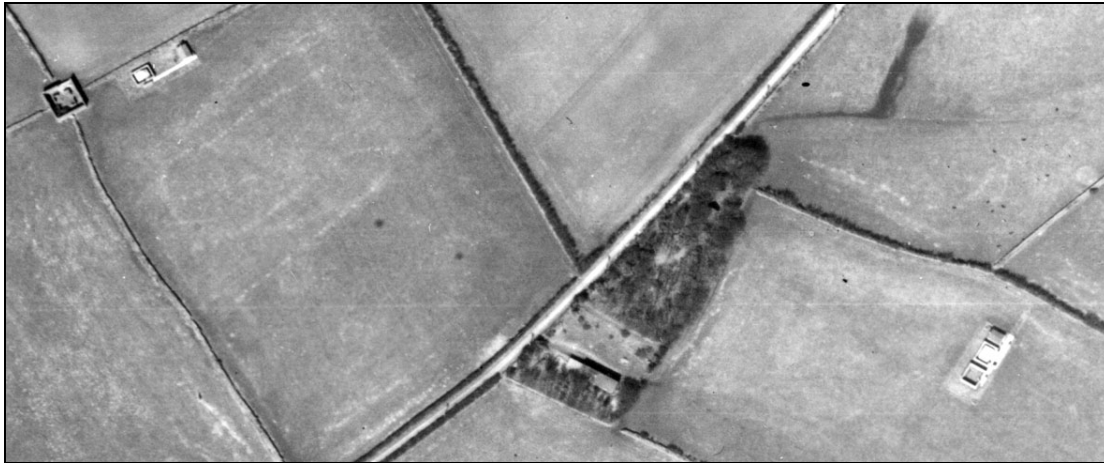


Chart 5: The range and incidence of Second World War military features recorded during the Exmoor NMP survey.

Lynton Wireless Stations

Two rectangular concrete structures are visible on aerial photographs taken from 1946 onwards. These are situated to the north-west and south-east of Lydiate Lane, near the coast at Lynton (figure 36: NMR UID 1466290 and NMR UID 1466282). Both structures are depicted but are not annotated on the current Ordnance Survey maps, and prior to the survey their function was unknown. Although now in a somewhat ruinous condition, these structures represent a rare survival of Second World War buildings on Exmoor (fig 37). Blast walls enclosed both building complexes indicating they are likely to be associated with munitions stores or wireless stations (Roger J.C. Thomas, personal communication). As no artillery emplacements are known from this area and the remains of mast footings are visible at the south-western end of both structures, the latter function would seem most probable. The structures have been identified as the transmitter and receiver stations for either a wireless telegraphy W/T station (morse) or a radio telephony R/T station (speech), although further comparison with known site layouts is desirable to tighten the interpretation (Roger J.C. Thomas, personal communication).



English Heritage (NMR) RAF Photography. NMR RAF CPE/UK/1980 (F20) 4052 11-APR-1947

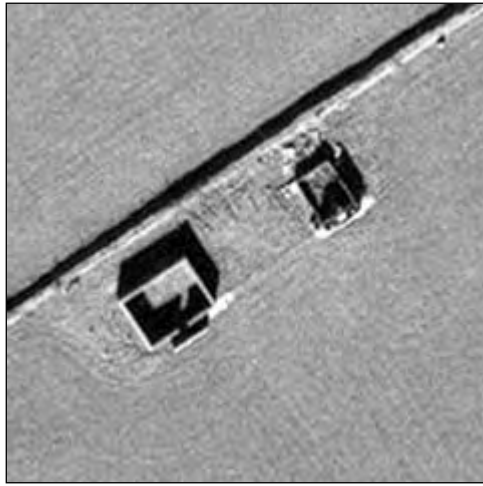
A.



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B.

Figure 36: Lynton Wireless transmitter (top left) and receiver sites (bottom right) as visible in 1947 (A) and 1995 (B). See figure 37 for more detail.



A.



B

Figure 37: Details of the receiver site (A; SS 7071 4868) and transmitter site (B; SS 7110 4858) as visible in 1995 (not to uniform scale). Note the blast wall surviving at the probable transmitter site. The structures remain visible on Google Earth, but in a more ruinous condition. (© Crown Copyright. Ordnance Survey. NMR OS/95026 015-6 12-MAR-1995)

Holcombe Water Searchlight Battery

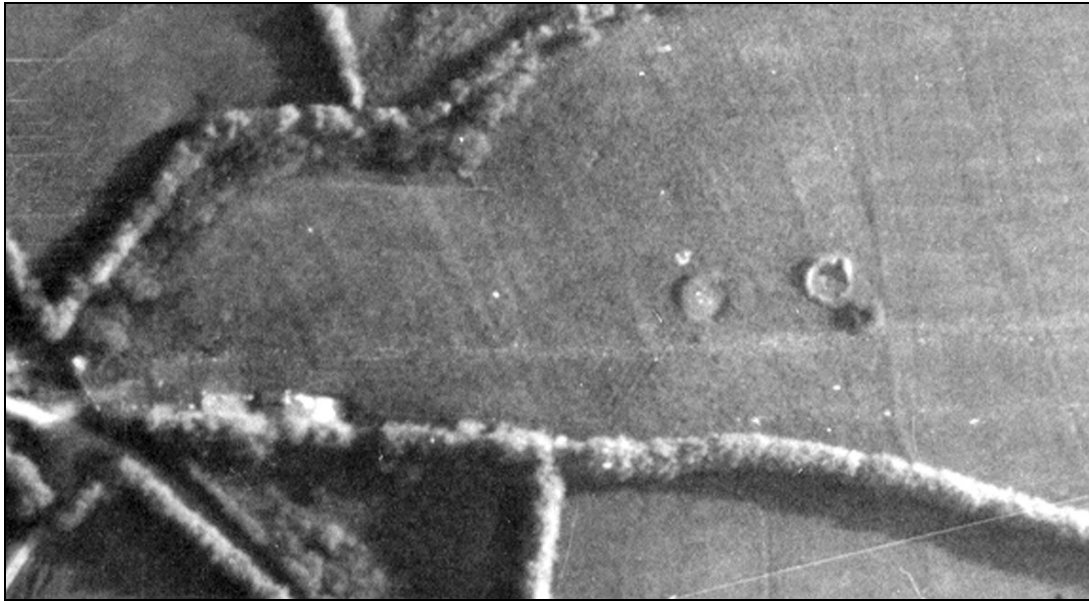
During the Second World War, the entire country was covered with a network of searchlight emplacements forming part of the Air Defence of Great Britain (Riley 2006, 155). The standard layout and construction of such sites was set out in pre-war documents, although a degree of local adaptation in their construction was to be expected (Dobinson 2001, 184: figures 15-16).

Three circular earthworks at Holcombe Water, visible on aerial photographs taken in 1946 and 1947, have been interpreted as a previously unrecorded Second World War anti-aircraft searchlight battery, probably a local variation on the standard emplacements designs (figure 38). It is likely that the 9 metre penannular bank-defined emplacement housed a 90 centimetre searchlight and the smaller earthwork immediately to the south-east a Light Anti-aircraft Artillery machine gun emplacement, such as a Lewis gun. The second large circular platform is unusual for a small site such as this, but might have housed a sound-locator emplacement (Roger J.C. Thomas, personal communication: Lowry 1996, 63).

Two rectangular concrete footings visible against the hedgeline to the south-west of the searchlight mark the location of Nissen Hut type buildings. These are possibly the Command Post associated with the searchlight, and a third, smaller square base may be the location of the searchlight generator. It is probable that further footings some 450 metres to the north-east (figure. 39) provided the battery's main accommodation, stores and ablutions, in a pattern similar to that outlined by Dobinson for larger, clustered batteries (Dobinson 2001, figure. 24).

Riley (2006, 155: Figure 6.6) illustrates the earthwork remains of a similar site at Crowcombe Court on the Quantock Hills and suggests the site was part of the West Somerset searchlight grid. It is probable that this searchlight and a previously known example on Exmoor at Blackpitts (NMR UID 1039140) also operated as part of that same network.

All earthwork and structural evidence for this site now appears to have been levelled.



English Heritage (NMR) RAF Photography. NMR RAF CPE/UK/2082 4016 19-MAY-1947

Figure 38: Searchlight battery emplacements and hut bases at Old Holcombe Water Farm (ST 058 337).



English Heritage (NMR) RAF Photography. NMR RAF 106G/UK/1655 4292 11-jul-1946.

Figure 39: Accommodation and ablutions; evidence for the temporary hutted camp associated with the searchlight battery at Old Holcombe Water Farm (SS 061 340).

Military Training Sites

A large area of Exmoor was requisitioned for military training during the Second World War (Riley and Wilson-North 2001, 167-9). Training activities occurred across the former Royal Forest and the survey has transcribed a wide range of evidence visible as earthworks, cropmarks or structures. These include several temporary tented camps, numerous fieldworks such as slit trenches and weapons pits, ephemeral evidence such as tracks inferring motorised training and transport, and several additional types of earthwork of unknown function. These activities all produced distinctive, if occasionally poorly understood earthworks and where possible the evidence for these sites or activities has been recorded separately. The activities represented by many of these sites are not spatially discrete or clearly defined and it is probable that many training activities overlapped, both geographically and temporally, and that some earthworks – and therefore activities - have been partially or incorrectly conflated. Nonetheless, a highlight for this period is the identification, possibly for the first time since the end of the conflict, of the extent of the Exmoor Firing Ranges.

The Exmoor Firing Ranges

The requisition of a large area of north-west of Exmoor for artillery practice had a dramatic impact on the landscape, not least by using sites such as the 19th century planned farms of Larkbarrow and Tom's Hill as targets (figure 40; Riley and Wilson-North 2001, 168-169).

No official records have yet been uncovered defining the extent of the firing range and a variety of evidence for other training activities has been recorded within the same area, confusing the picture somewhat. Nevertheless, we can be confident that the NMP survey has now accurately defined the outer limit of the firing range impact areas. The earthwork evidence, i.e. artillery shell craters, is numerous and widespread. By transcribing a sample of the many thousands of visible craters, the extent of firing ranges has been established at over 22 square kilometres or 2278 hectares (figure 41), undoubtedly the single most extensive “monument” defined during the survey.

The distribution of craters within this area is not uniform and several foci of intensive activity have been identified. Particularly dense concentrations of craters can be seen at Larkbarrow Farm and Tom's Hill, on Brendon Common, Badgworthy Hill and Manor Allotment on South Common. These concentrations suggest target areas and three small concrete squares identified within or close to some of these concentrations, such as at Stowey Allotment and at Outer Alscott, may be the remains of firing range markers or targets (figure 42: NMR UID 1478586, 1461089 and 1478588). Linear spreads of craters aligned upon a large V-shaped embanked ditch on Porlock Common (figure 43; NMR UID 1478252) might indicate a specialised site perhaps employing moving targets on narrow-gauge railway

tracks similar to AFV firing ranges, on North Hill and elsewhere throughout the UK (Crowther and Dickson 2008, 259-261; Hegarty and Newsome, 2007; 68; Riley, 2006; 153, figure. 6.3).

Several bomb craters have also been recorded during the survey, including a number of isolated examples noted on moorland areas. These can usually be differentiated from the artillery range craters by a halo of upcast or spoil, thrown up by the bomb's high explosives, absent from the artillery range dummy shells. German bombers 'load-shedding' their excess bombs following raids on strategic targets such as Bristol could account for many of these over Exmoor, and it has been suggested that certain areas such as Dunkery Hill, Landacre Gate, Winsford Hill and Blackpitts acted as collecting points, although little evidence for this has been noted from aerial photographs (Hurley 1978, 75-77).



© Crown Copyright. NMR. NMR SS 8242-10 (15608-19) 14-JAN-1997

Figure 40: The ruins of Larkbarrow Farm surrounded by impact craters.

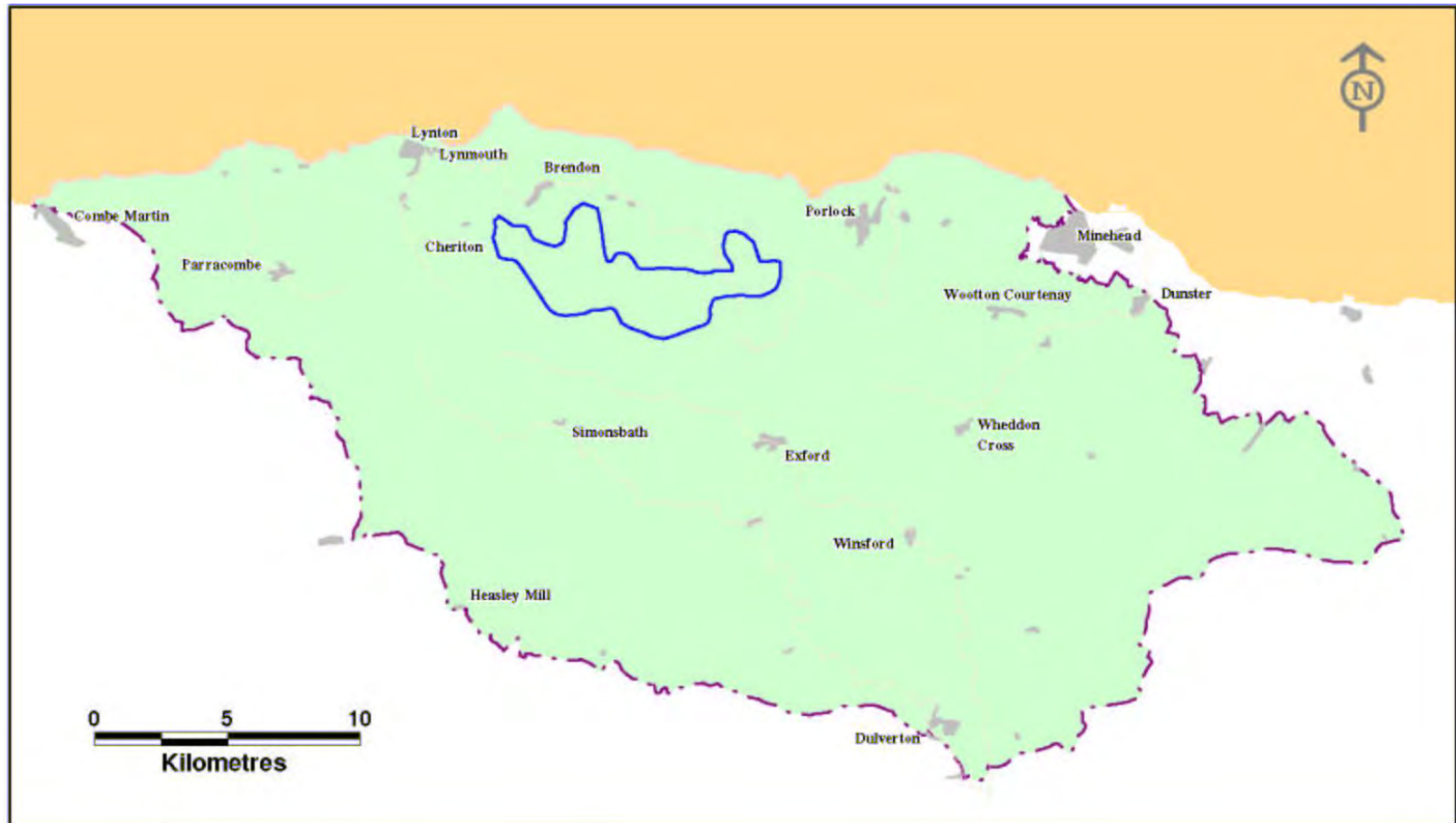
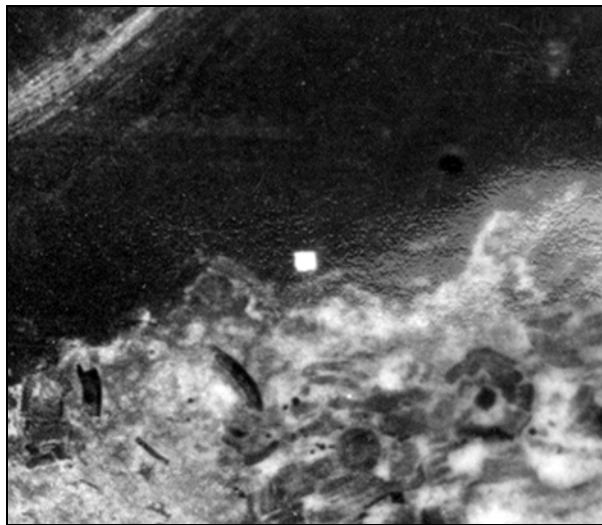
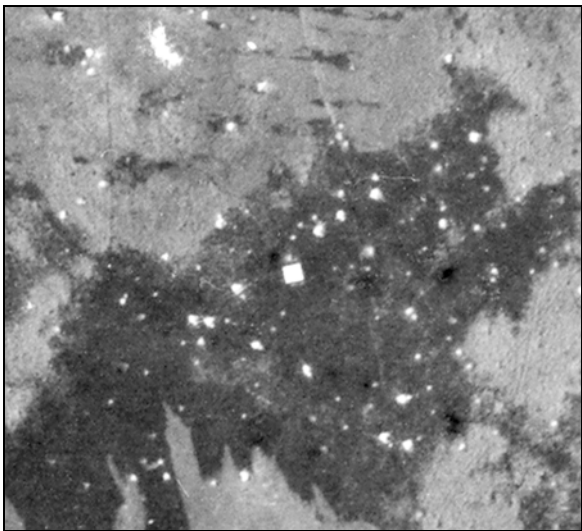


Figure 41: The extent of the Exmoor Firing Ranges identified from the spread of craters, outlined in blue (Mon UID 870601, centred on circa SS 81095 44135).



A.

English Heritage (NMR) RAF Photography RAF CPE/UK/1980 (F20) 4074-5 11-APR-1947



B.

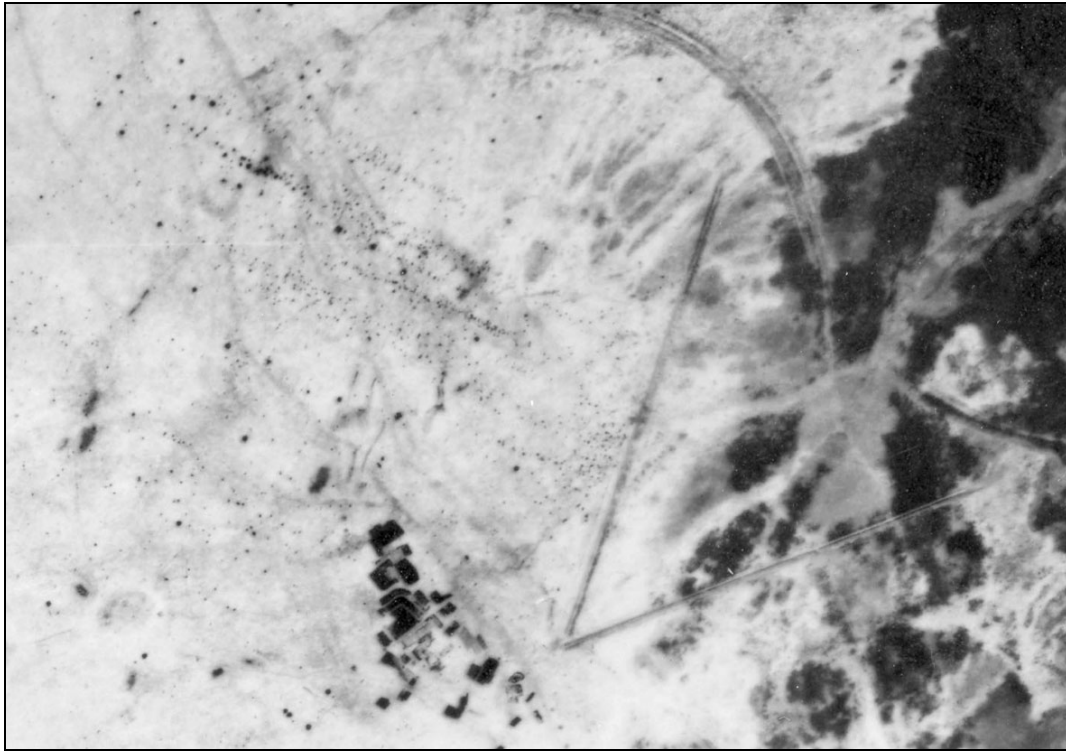
English Heritage (NMR) RAF Photography. RAF 106G/UK/1655 (F20) 4083-4 11-JUL-1946



C.

Photograph, Rob Wilson-North

Figure 42: Possible Second World War firing range markers: A. on Brendon Common (SS 80794464) and B. at Outer Alscott (SS 7623 4522). C: The authors at the Brendon Common concrete square today; note the firing range antiquity star on the Bronze Age cairn in the background.



English Heritage (NMR) RAF Photography. NMR RAF CPE/UK/1980 3166 11-APR-1947

Figure 43: Concentrated artillery firing range activity on Porlock Common (SS 8377 4320).

9 Summary and Conclusions

The Exmoor NMP survey has made a significant contribution to the understanding of Exmoor's historic environment. This can be quantitatively summarised as 2220 AMIE records created and 580 existing records enhanced or amended, totalling 2800 records created or amended. Described as a percentage, approximately 73% of the records generated through NMP were for sites that had not previously been recorded in the NMR and 46% had not been recorded in the ENPA HER. These statistics disguise the very broad variety of monument types seen by the survey, ranging in date from the Neolithic to the Cold War. The range of monument types recorded or amended by the survey is expressed in tabular form in Appendix 8.

The majority of records created date to the post-medieval period and it is in advancing our understanding of the archaeology of improvement on Exmoor that the survey has had its greatest impact. This will be captured fully in the forthcoming dissemination phase.

The project has fulfilled its primary objective, as stated in the project design (Hegarty 2006), to provide ENPA HES staff with key base-line data for use in agri-environment scheme consultations. NMP derived cropmark data has already provided a number of FEPs with a previously unavailable landscape context. However, the full value of the survey data to this process must await extended practical application for a full assessment. Nevertheless, based on the experience of applying the Brendon Hills NMP survey data to this process, the full Exmoor NMP data will greatly enhance the range of information available and will provide valuable data on the extent and condition of surviving earthworks, and in the case of levelled features, a closer estimate than currently available of date of levelling.

The survey has also highlighted several avenues for further survey. Firstly, on a landscape scale a National Park wide LiDAR survey would greatly enhance several strands of our understanding of some of the more subtle and difficult to transcribe features identified, from the potentially Neolithic enclosure on Little Hangman Hill to the amorphous 19th century peat cuttings on Brendon Common.

LiDAR modelling could also potentially penetrate and illuminate some of the areas where NMP is less effective, such as the sheltered combs which house Exmoor's ancient and semi-natural woodland. Increasing evidence for ancient industry is being identified within these difficult to survey areas, including charcoal burning platforms and metalworking sites dating from the Iron Age to the post-medieval period, and LiDAR data would provide a significant addition to the existing data-set.

Secondly, on a smaller scale the arable landscape to the east of Brompton Ralph, near Stogumber, is suited to additional study. This area contains a cropmark landscape tentatively ascribed a Romano-British date, and given the appropriate conditions, undoubtedly has potential for further cropmark

discoveries. A programme of coordinated investigation could incorporate ongoing aerial reconnaissance and targeted geophysical survey and excavation, not least to investigate the relationship of the enclosures with the feature interpreted as a possible Roman Road.

Thirdly, the survey has also highlighted several individual sites or features that warrant further research. A field investigation and higher level field survey of the North Hawkwell hillslope enclosure (NMR UID 1479610) is recommended, as is a programme of ground truthing site visits to assess newly identified and often somewhat ambiguous potentially prehistoric sites, such as the possible Kingsland Pits enclosures (NMR UID 1488522; SS806357).

Fourthly, the survey has returned high quality information pertaining to the medieval and post-medieval settlement, enclosure and improvement of Exmoor, particularly within the area of the former Royal Forest. This currently comprises a vast resource, providing a previously unseen perspective on this relatively recent, but archaeologically poorly understood period of enormous change on Exmoor. For instance, catchwork watermeadows are an almost ubiquitous physical expression of improvement, and although their individual operation can be assessed on a site by site basis, the complexities of farm-scale water management and the wider inter-relationships between neighbouring farmsteads vying with each other and potentially industry, to use a finite water supply, remain poorly understood.

Fifthly, the survey has also raised a number of questions about Second World War activity on Exmoor. What were the functions of the newly identified and enigmatic concrete and earthwork sites and features associated with the Exmoor Firing Ranges and associated training areas? What role did the structures at Lynton play? Further research is required to answer these questions and condition surveys are recommended for the newly recognized structures.

It is hoped that a publication and a series of thematic essays based upon the findings of the Exmoor NMP survey, scheduled for 2010, will shed light on some of these questions. However many are beyond the scope of this planned research, and should inform future strategies for archaeological research in Exmoor National Park.

In conclusion, the Exmoor National Park NMP survey not only demonstrates the significance, variety and richness of Exmoor's historic environment, but also provides a consistency of data which allows the proper assimilation and consideration of elements of the historic landscape, like field gutters, into the record.

The survey data also throws into relief certain unavoidable biases; the nature of land management within Exmoor has led, understandably, to a focus by archaeologists on upstanding monuments. The almost complete absence of cropmark sites within Exmoor National Park means that more emphasis must be placed on other survey or prospection techniques and methodologies, such as LiDAR,

geophysical survey or where appropriate geochemical survey and fieldwalking, to address those areas and sites which do not include upstanding earthworks.

10 Project Archives and Copyright

Items relating to the project are deposited in the archive at the National Monuments Record Centre (NMR), Kemble Drive, Swindon SN2 2GZ, and at the Exmoor National Park HER, Exmoor House, Dulverton, Somerset, TA22.

The various items making up the project Archive are summarised in table 8 below

Archive	Swindon	Dulverton
AutoCAD plots	35 digital maps	35 digital maps
Map Note Sheets	35 paper sheets	35 paper sheets
Project design	Hard copy/ Digital version	Hard copy/ Digital version
Management Report	Digital version (Word)	Digital version (Word)
Quarterly Reports	11 digital reports (Word)	11 digital reports (Word)
NMR Photograph loan lists	6 digital lists (Excel)	6 digital lists (Excel)

Table 6. Summary of the project archive

The copyright of the graphical data and associated database records produced by this survey remains with English Heritage. Licence to use this data has been extended to the Exmoor National Park HER.

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Digital Resources: Ordnance Survey Mastermap User's Guide:

<http://www.ordnancesurvey.co.uk/oswebsite/products/osmastermap/userguides/docs/OSMMTopoLayerUserGuide.pdf>

Appendices

APPENDIX 1: ARCHAEOLOGICAL SCOPE OF NATIONAL MAPPING PROGRAMME PROJECTS

Feature	Do we map it?	How do we depict it?	How do we record it?
Earthwork archaeology	Yes. All extant and vestigial features visible on aerial photographs, irrespective of whether they have previously been recorded by the Ordnance Survey or English Heritage Field Investigation, the latter will be used to aid interpretation and mapping.	Features will be depicted according to the form and extent of the remains and at an appropriate level of detail for the 1:10,000 scale product.	Text will identify the date, type, form, extent and location and morphology of the features. It may be appropriate to comment on the condition and survival of the earthworks.
Levelled archaeology	Yes. All cropmark, soilmark and parchmark features visible on aerial photographs.	Features will be depicted according to the form and extent of the remains and at an appropriate level of detail for the 1:10,000 scale product.	Text will identify the date, type, form, morphology, extent and location of the site.
Buildings and structures (originally designed without a roof)	Yes, but generally not upstanding roofed or unroofed buildings. Buildings and structures will not be mapped, if first edition or later Ordnance Survey maps depicts them. In specific contexts (eg industrial and military complexes, or country houses) and when in association with other features, they may be mapped.	Features observed as earthworks, ruined stonework, cropmarks, soilmarks and parchmarks will be depicted. The plan outline of upstanding buildings and structures may be depicted.	As above. Additional detail of the form of the buildings will be noted either as, extant, ruined or demolished. If the Ordnance Survey depicts buildings and structures, the map may be referenced.

Feature	Do we map it?	How do we depict it?	How do we record it?
Ridge and furrow (medieval and post medieval) Cord rig (prehistoric)	Yes. All earthwork and levelled features.	<p>The extent of the area of ridge and furrow will be outlined and the direction of the furrows broadly shown.</p> <p>Cord rig will be depicted as above, but will be distinguished from medieval and post medieval ridge and furrow.</p>	Text will identify the date, type, form, morphology, extent, preservation and location of the site. The record may relate to a block of ridge and furrow, either in the context of a parish, or township, or a discrete area.
Post medieval field boundaries	No, except where large field systems are not depicted by the Ordnance Survey or where they are considered to be, regionally or nationally, archaeologically significant.	Features will be depicted according to the form and extent of the remains.	<p>For mapped features, text will identify the date, type, form, morphology, extent and location of the site.</p> <p>For non-mapped field boundaries, where they may be misinterpreted within areas of archaeology, they should be mentioned in the text.</p>
Parkland, landscaped parks, gardens and Country houses	Only vestigial features, not botanical features, will be mapped. In urban areas only significant parks and gardens will be recorded. 20th century features will not normally be mapped.	Features will be depicted according to the form and extent of the remains. An extent of area may be used.	The complex of features, house, garden and landscaped park will be recorded in a single record. If the Ordnance Survey depicts country houses, the map may be referenced.

Feature	Do we map it?	How do we depict it?	How do we record it?
Industrial features including extraction	Yes, irrespective of whether they have previously been recorded by the Ordnance Survey. Urban industrial sites will not normally be mapped. Widespread and local extraction will not be mapped, except when associated with other industrial features. Modern twentieth century quarries will not normally be mapped.	Individual features will be transcribed, However, for large industrial complexes, an extent of area will be used and only the main features mapped.	Text will identify the date, type, form, morphology, extent and location of the features. It may be appropriate to comment on the condition and survival of the features.
Transport	Major transport features (eg canals and railways) will not be mapped except where they are considered to archaeologically significant. Smaller networks (eg local tramways) will be mapped, especially in the context of associated features.	Features will be depicted according to the form and extent of the remains.	Text will identify the date, type, form, morphology, extent and location of the site.
20th century military features	Yes. Features from World War I and II and the Cold War.	Features will be depicted according to the form and extent of the remains.	As above. It may be appropriate to comment on the condition and survival of the features.
Coastal archaeology	Yes, features within inshore waters, inter-tidal zone, seashore and river estuaries .	Features will be depicted according to the form and extent of the remains. Wrecks will have a simple plan outline depicted.	As above.

Feature	Do we map it?	How do we depict it?	How do we record it?
Urban areas	Yes, features of the pre-urban landscape, except large conurbations.	Features will be depicted according to the form and extent of the remains	As above .
Natural features (geological and geomorphological)	No, except in unusual circumstances which have been agreed in advance (eg Fenland areas).	An extent of area, distinguished from archaeological layers in AutoCAD.	If features occur in the context of archaeology, they may be mentioned in the text.

APPENDIX 2: STANDARDISED AUTOCAD MAPPING CONVENTIONS

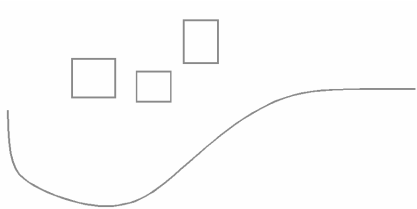
All cut features e.g. Ditches, hollow ways pits etc.
(Using Ditch layer in AutoCAD)



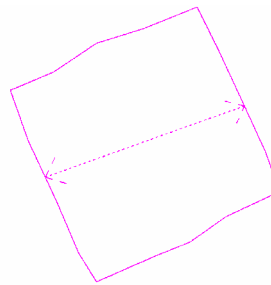
Earthwork or Cropmark Banks (using Bank and Bankout layers in AutoCAD)



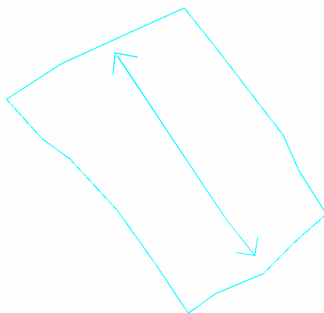
Buildings, walls etc. (Using Structure layer in AutoCAD)



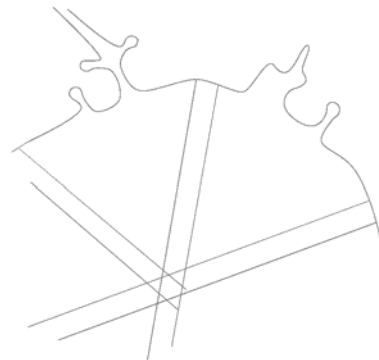
Ridge and furrow seen as cropmarks, or seen as earthworks and known to be ploughed level (Using the Rigdotslevel and Rigarrlevel layers in AutoCAD)



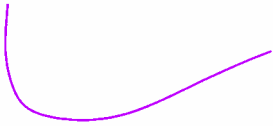
Ridge and furrow seen as earthworks on the latest available aerial photographs (Using the Rigdotsewk and Rigarreww layers in AutoCAD)



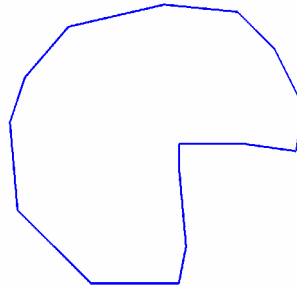
Large area features, such as airfields, depicting the extent of the feature (using the Extent of area layer in AutoCAD), and the main features (using the Structure or Stonework layers in AutoCAD). Or use peat cutting as an example, with pits depicted in Large Cut Feature layer.



Railways and tramways (using the Tramway layer in AutoCAD)



Large cut features, such as quarries, ponds (using the Large cut feature layer in AutoCAD)



APPENDIX 3: SUMMARISED NMR PHOTOGRAPH LOANS

Aerial photographic loans from the National Monuments Record Centre

Update with Stats from coversearches/Luke

Mapping Block	Loan Reference no.	No. of Vertical Photographs	No. of Oblique Photographs	No. of Military Oblique Photographs
Block 1	6543A	1833	1241	
Block 2	14794	768	253	
Block 3a	14795	863	655	
Block 3b	14795A	945	854	
Block 4	14796	939	632	103
Block 5	14797	1692	330	168
Sub-total of photographs loaned		7040	3965	271
Total number of photographs loaned		11276		

APPENDIX 4: EXAMPLE PROJECT MAP NOTE SHEET

ENGLISH HERITAGE – AERIAL SURVEY

NATIONAL MAPPING PROJECT - MAP NOTE SHEET

Exmoor NMP

Block No:	Map sheet:	Author:
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Sources Check List - enter dates main consultation completed

Archival Source	Date		Photo Source	Date
AMIE MONUMENTS			NMR Air Photos obliques	
AMIE events			NMR Air Photos verticals	
ENPA HER data			ENPA photos	
Devon HER data			Devon air photos	
Somerset HER data			Somerset air photos	
OS 1st Edition map			CUCAP	
OS 1:10560 map				
Richard MacDonnel Trscript				
Other (please state)				

Progress	Date	Days
Transcription commenced		
Transcription completed		
Database input commenced		
Database recording		
AutoCAD object data		
Map prepared for GIS/archive		
Data transfer to ENPA		
Total Days		

Project Database	Number	of
Updated records		
New records		

Illustrative Photographs:

i.e. only those that will be of use in talks/reports

References:

i.e. only those that won't be apparent from looking at the monuments records, say a very general source

Comments

APPENDIX 5: AMIE MONUMENT RECORD DATA

Indexing

Monument Type, Monument Date, Evidence. Monument indexing reflects every interpretation mentioned in the text, however uncertain. Evidence reflected the latest visible evidence for the monument i.e. cropmark, earthwork or levelled earthwork etc

Location data

6-8 figure grid reference plus County/District/Parish. The NMR database requires a single grid reference for the centre of the site. A polygon depicting the extent of the site was also created in AutoCAD.

Text/description

The summary text field comprises a brief description summarising the period, type, form and source of the feature recorded.

The long text comprises an incremental record of each addition to the record. The NMP survey element includes a description of the main elements of the site including period, type, form of remains, and main source (i.e. aerial photographs, maps, documentary evidence, excavation etc), as well as any interpreters comments. The text is linked to the sources using a link number(s), e.g. 1-3 in brackets at the end of the text.

Sources/references

Sources list the photographs that best illustrate the site. This does not necessarily include the photographs used to transcribe the site. Any other sources mentioned in the text are also listed e.g. map sources, including date and scale (if known), bibliographic sources, other unpublished surveys, excavations etc.

Other identifiers

When a HER number has been identified for an existing it has been recorded. Other identifiers such as Scheduled number have also be added when known.

Links

Where relevant to the interpretation of a site or feature, a General Association (GAS) has been made digitally between records in the NMR database. This does not include geographical proximity.

Compiler details

These comprise the role (Air Photo interpreter), the date of the creation of the record and the location (Exeter Office).

Event

The Exmoor NMP NMR event record (UID 1457937) is linked to each monument record created during the survey.

Collection

A parent collection record is created for the whole project in the collections module of the NMR database. Child records are then created for each quarter sheet. The appropriate quarter sheet collection record is linked to each monument record.

APPENDIX 6: AUTOCAD ATTACHED DATA TABLES

MONARCH:

Field	enter
MONARCH	NMR AMIE Hob UID

MONUMENT DATA:

Field	enter
MONARCH	NMR AMIE Hob UID
PERIOD	enter date e.g. BRONZE AGE
TYPE	enter monument type e.g. ENCLOSURE
EVIDENCE	enter form e.g. CROPMARK
PHOTO REF	enter photo reference which feature was plotted from

HER NUMBER:

Field	enter
DEVON	enter HER Hob UID
SOMERSET	enter HER Hob UID
ENPA	enter HER Hob UID

APPENDIX 7: LIAISON GROUP MEMBERSHIP

Exmoor National Park Authority	English Heritage
National Trust	Natural England
North Devon Archaeology Society	Freelance Archaeologist Richard McDonnell
Bristol University	Devon County Council
Exmoor Society	Somerset County Council

APPENDIX 8: EH THESAURUS TERMS INDEXED BY SURVEY

- A** Adit
Agricultural building
Aircraft obstruction
Amalgamation plant
Army camp
Artificial mound
- B** Bank (earthwork)
Barn
Barrow
Barrow cemetery
Beacon
Bell barrow
Blacksmith's workshop
Bloomery
Bob setting
Boiler house
Bomb crater
Bothy
Boundary bank
Boundary ditch
Boundary wall
Bowl barrow
Bowling green
Building
Building platform
Burial cairn
Butts
- C** Cairn
Cairn cemetery
Cairnfield
Canal
- Castle
Causeway
Cemetery
Chapel
Charcoal burning platform
Chimney
Circular enclosure
Cist
Clearance cairn
Coastal battery
Coastal fish weir
Commemorative monument
Copper mine
Cremation
Cross dyke
Crushing mill
Culvert
Cultivation marks
Cultivation terrace
Curvilinear enclosure
- D** D-shaped enclosure
Dam
Deer park
Defended enclosure
Deserted settlement
Disc barrow
Ditch
Ditched enclosure
Double ditched enclosure
Drain
Drainage ditch
Drainage system

	Dressing floor		Hermitage
	Drove road		Hillfort
			Hilltop enclosure
E	Enclosed cremation cemetery		Hollow
	Enclosed settlement		Hollow way
	Enclosure		Horizontal steam engine
	Engine house		Horse engine house
	Extractive pit		House
			House platform
F	Farm		Hut circle
	Farm building		Hut platform
	Farm labourer's cottage		
	Farmstead	I	Impact crater
	Field		Inclined plane
	Field barn		Ironstone mine
	Field boundary		Ironstone pit
	Field system		Ironstone workings
	Firing range		
	Fishpond	L	Leat
	Fish trap		Limekiln
	Flood defences		Limestone quarry
	Flood relief canal		Linear earthwork
	Fortlet		Linear feature
	Furnace		Linear system
G	Garden terrace		Linhay
	Golf course		Longhouse
	Gravel pit		Lynchet
	Gully	M	Macula
	Gun emplacement		Manganese mine
H	Hard standing		Military building
	Head race		Military camp
	Henge		Military installation
	Hengiform monument		Military observation site
			Military training site

	Mill		Pond
	Mill pond		Pool
	Mill race		Pound
	Mineral railway		Powder magazine
	Mine pumping shaft		Practice trench
	Mine shaft		Promontory fort
	Moat		Prospecting pit
	Mortuary enclosure		
	Mound	Q	Quarry
	Multivallate hillfort		
N	Narrow ridge and furrow	R	Rabbit warren
	Natural feature		Race track
	Nissen hut		Radio telegraphy station
	Non antiquity		Railway
			Railway carriage shed
			Railway station
O	Observation post		Rectangular enclosure
	Orchard		Rectilinear enclosure
	Orchard bank		Reservoir
	Orlit post		Ridge and furrow
	Outbuilding		Rifle butts
	Outfarm		Ring bank
	Oval enclosure		Ring barrow
			Ring cairn
P	Packhorse road		Ring ditch
	Paddock		Road
	Parish boundary		Road block
	Peat cutting		Rocket test facility
	Peat stand		Round barrow
	Pillbox		Round cairn
	Pillow mound		Royal observer corps site
	Pit		
	Plantation	S	Sand pit
	Plantation bank		Saucer barrow
	Platform		Scarp

	Searchlight battery		Terraced ground
	Settlement		Threshing barn
	Shaft		Tree enclosure ring
	Sheepfold		Tree mound
	Shepherd's hut		Tree ring
	Shrunken village		Trackway
	Signal station		Tramway
	Slag heap		Transmission rods
	Slit trench		Trench
	Sluice		Tor enclosure
	Spoil heap		
	Square enclosure	U	Unenclosed hut circle settlement
	Standing stone		Unenclosed settlement
	Steam ploughed rig		Univallate hillfort
	Stream		
	Strip field	V	Ventilation shaft
	Strip lynchet		
	Stock enclosure	W	Water channel
	Stone circle		Water meadow
	Stone quarry		Weapons pit
	Structure		Weapons testing site
	Sub circular enclosure		Wheel pit
	Subrectangular enclosure		Worker's cottage
T	Tail race	Y	Yard
	Target		
	Terrace		

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