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North Devon Mapping Project

ENGLISH HERITAGE HEEP PROJECT 3899

A Report for
The National Mapping Programme

Historic Environment Service (Projects)

Cornwall County Council

North Devon Mapping Project

EH 3899

A Report for the National Mapping Programme

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Cover illustration

The Devon landscape at Raddon Hill. Photo Peter Horne

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Abbreviations

ACP	Archaeology Commissions Programme
ADAS	Agricultural Development and Advisory Service
AGLV	Area of Great Landscape Value
AMIE	Archives and Monuments In England
AONB	Area of Outstanding Natural Beauty
AS	Archaeological Aerial Survey Section (English Heritage)
BECGS	Bio Energy Capital Grant Scheme
CCC	Cornwall County Council
CUCAP	Cambridge University Committee for Aerial Photography
DCC	Devon County Council
DEFRA	Department for Environment Food and Rural Affairs
DTI	Department for Trade and Industry
DTM	Digital Terrain Model
ECS	Energy Crops Scheme
EH	English Heritage
EIA	Environmental Impact Assessment
GIS	Geographical Information Systems
HER	Historic Environment Record
HES	Historic Environment Service
HLC	Historic Landscape Character
NGR	National Grid Reference
NMP	National Mapping Programme
NMR	National Monuments Record
NSA	National Scenic Area
PPL	Peninsular Power Ltd
PRN	Primary Record Number
RCHME	Royal Commission on the Historical Monuments of England
SRC	Short Rotation Coppice
OS	Ordnance Survey

1 Summary

This project was carried out between January and November 2005 as part of English Heritage's National Mapping Programme (NMP) and was funded through the English Heritage Historic Environment Enabling Programme (HEEP). The principal aim of the project was to provide a fuller awareness of the range and extent of archaeological remains in central and north Devon through archaeological aerial survey and enhancement of the Devon Historic Environment Record (HER).

The landscape in much of this area is predominantly pastoral in nature, with a history of only limited improvement. The area was badly affected by the Foot and Mouth epidemic of 2001 and is under significant pressure for change in landscape management in response to changing agricultural priorities. Due to a combination of factors the archaeological resource in much of the area is not fully understood. For these reasons there is a pressing need to improve our understanding of the nature of the archaeology here in order to facilitate more effective engagement with the inevitable process of change. NMP mapping was seen as a rapid and effective means of redressing the limited nature of current archaeological knowledge of an area where there is great pressure for diversification.

The area under question is very extensive, covering roughly 4,000 square kilometres. Rather than surveying the whole of this area the current project focussed on four transects which together constitute an approximate 10% sample of the wider area. In order for the survey results to be extrapolated beyond the immediate project area the transects were positioned to test various soils, geologies, landscape zones and Historic Landscape Character types within the wider area. This part of Devon is characterised chiefly by poorly draining soils overlying Carboniferous Culm Measures, but there is an area of sandstone below well-drained gravely soils in the east. The historic character of the landscape is principally one of fields first enclosed in the medieval period, but extensive areas of rough ground, fields enclosed in the post medieval period, and woodland also occur.

During the project 1,678 individual archaeological sites were identified from aerial photographs and mapped. Almost 80% of these sites are new records and the updated Devon HER for the project area will contain almost twice as many records as it did prior to the project. The value of consulting all available aerial photographs was illustrated by the fact that many new sites were identified from photographs taken for non-archaeological reasons, especially RAF vertical photography from the 1940s and 50s.

The archaeological resource of the area is rich and diverse. Features characterising the medieval and post medieval agricultural economy are especially abundant but a range of sites from the Neolithic period to the twentieth century were recorded, including a number of nationally important monuments. Of particular significance are 149 new prehistoric or Romano-British enclosures and 18 possible new Bronze Age barrows. These sites are important both in their own right and as indicators of more extensive prehistoric activity, as there will be many other types of site, such as unenclosed settlements, which are not easily identified from the air.

The sites are not distributed evenly throughout the project area. Concentrations of cropmark features comprising a diverse range of prehistoric sites were recorded from the Mid Devon Farming Belt in parts of the East and Middle transects. These areas are under arable and their historic character has been altered by field hedge removal. In other parts of the project area the historic character of the landscape is largely intact and here the recorded archaeology is dominated by medieval and post medieval field systems and other features of the farming landscape. However a number of prehistoric features were recorded from these areas, mainly those characterised by medieval-

derived fields. In particular the known number of prehistoric/Romano-British enclosures from the Culm Measures in the western and northern transects was significantly increased by NMP mapping. This suggests that here a more extensive prehistoric landscape survives than was formerly recognised; few prehistoric sites are visible here as cropmarks because of the largely intact medieval-derived field patterns and extensive areas of pasture.

The archaeological resource in areas of post medieval-derived fields is less rich, as is that of low-lying rough ground. A number of features of archaeological significance were, however, recorded from upland rough ground, including a high proportion of the round barrows and several prehistoric enclosures. Unsurprisingly, few sites were recorded from woodland areas.

2 Background to the project

2.1 Circumstances of and reasons for the project

The principal aim of the project was to provide a fuller awareness of the range and extent of archaeological remains in central and north Devon through archaeological aerial survey and enhancement of the Devon Historic Environment Record (HER).

The landscape in much of this area is predominantly pastoral in nature, with a history of only limited improvement. The area was badly affected by the Foot and Mouth epidemic of 2001 and is under significant pressure for change in landscape management in response to changing agricultural priorities. Energy crop cultivation, diversification into non-agricultural activities, expansion of the area of managed woodland, and investigation of the regional potential for biofuels are all listed as objectives in a recent document published by the South West Rural Development Agency (RDA 2006). Some of these potential forces of change could put pressure on the conservation and management of the historic environment.

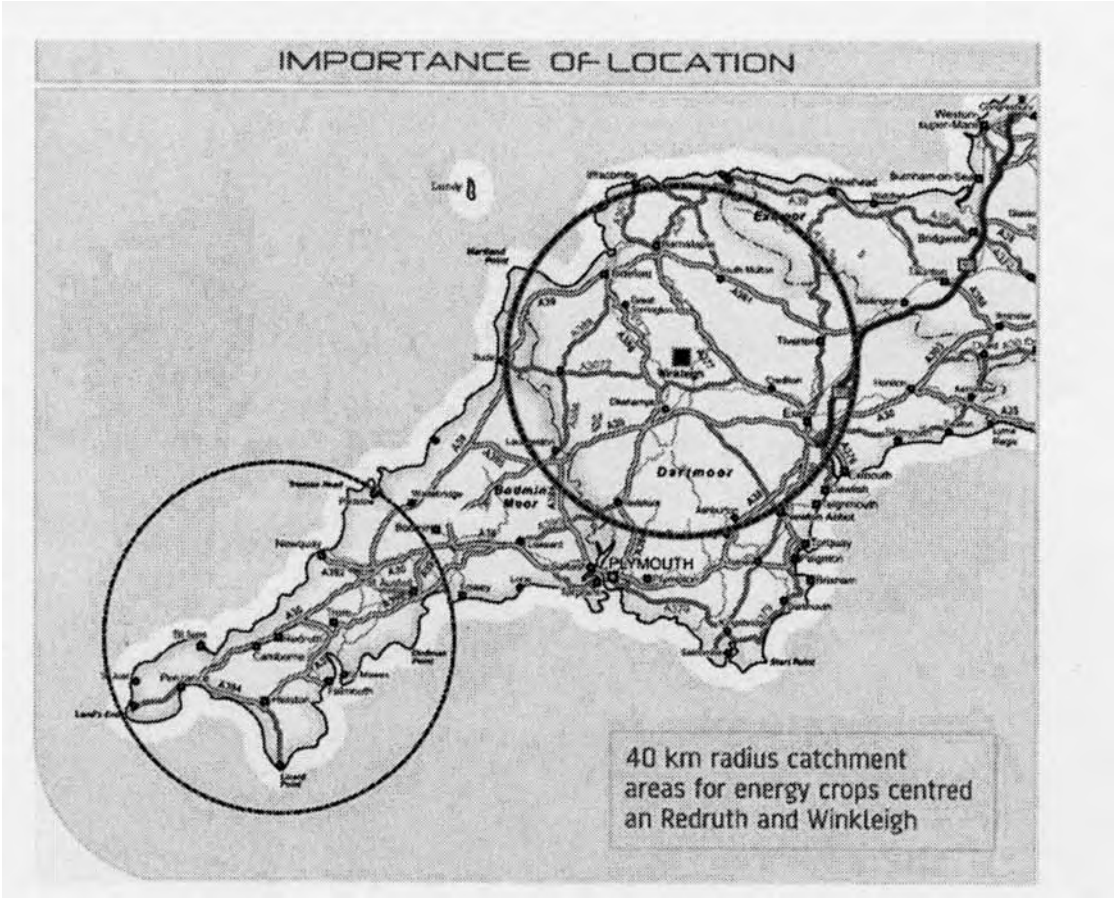
In some parts of the project area relatively little information is contained within the Devon Historic Environment Record (HER). There has been little archaeological investigation or survey, and consequently the extent and nature of the buried archaeological resource is not fully understood. As a result the formulation of strategic and local management policies and decisions on the protection of the archaeological resource and the historic environment of this area are likely to be made on the basis of incomplete information.

For these reasons there is a need to improve our understanding of the nature of the archaeology here in order to facilitate more effective engagement with the inevitable process of change. NMP mapping was seen as a rapid and effective means of redressing the limited nature of current archaeological knowledge of the area.

This need was brought into sharp relief by an application, submitted in 2004 by Peninsula Power Ltd (PPL), of Crediton, Devon, to construct a biomass electricity generator at Winkleigh airfield in central Devon. The main energy crop needed to fuel the proposed generator is Miscanthus, a fast-growing grass from Southeast Asia. At the time of the application there was some concern that energy crop cultivation might disturb below ground archaeological remains (Dyer, 2004).

DEFRA guidelines required that sources of energy crops be sited within a 40km radius of the generator site. The planting catchment area for Winkleigh therefore included much of central, north and west Devon (Fig 1). The proposed scheme precipitated the timing of the project in that it signalled a move from the concept of change to the implementation of change.

Fig. 1 *The planting catchment area of the Winkleigh biomass plant, delineated by the circle on the right (from Peninsula Power Ltd, May, 2004)*



2.2 The National Mapping Programme

In Cornwall systematic archaeological aerial survey in the form of the National Mapping Programme (NMP) has proved an effective method of rapid, non-invasive archaeological assessment. It has significantly enhanced the HER, increasing the number of sites recorded by a quarter, and by mapping sites from all periods across whole landscapes has provided the opportunity to fully characterise the archaeological data on aerial photographs.

The NMP is a project devised by the Royal Commission on the Historic Monuments of England (RCHME) now part of English Heritage (EH), and funded by EH. The aims of NMP are 'to enhance our understanding of the past, to help conserve, promote, and broaden access to the historic environment by providing primary information and synthesis for all archaeological sites and landscapes visible on aerial photographs from the Neolithic to the twentieth century' (Bewley, 2001, 78). Some NMP projects are carried out by EH Aerial Survey teams in Swindon and York whilst others are funded by the Historic Environment Enabling Programme (HEEP) and are contracted out to county units or other organisations. The mapping of Cornwall is one of these external projects and was carried out by the Historic Environment Service (HES) of Cornwall County Council (CCC).

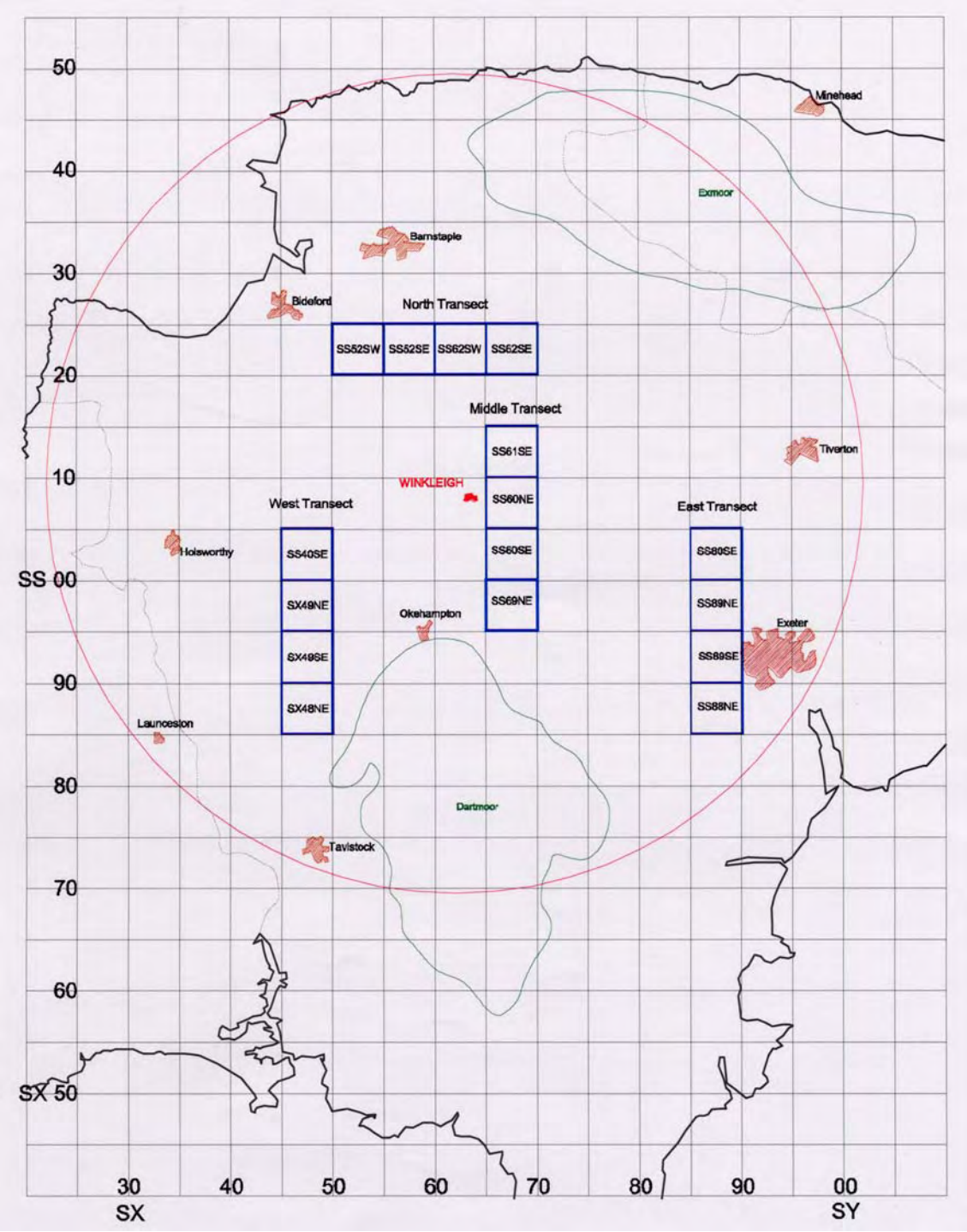
The NMP team in Cornwall has developed an expertise in air photo mapping over the last ten years and, after consultation with Frances Griffith, the Devon County Archaeologist, and Ian Morrison then South West Region Inspector of Ancient Monuments, CCC submitted a Project Outline and Project Design for an NMP project

in the catchment area. The project was approved by EH as part of the Archaeology Commissions Programme (ACP, now HEEP) and was carried out between January and November 2005. This report outlines the scope, methodology and outcome of the survey.

3 The project area

The project area includes a large part of central, west and north Devon. It extends from Exeter in the east to Launceston in the west, from Ivybridge in the south to Lynton in the north, and covers approximately 180 1:10,000 Ordnance Survey (OS) quarter map sheets. It includes parts of both Dartmoor and Exmoor National Parks.

Fig. 2 *The project area and the four transects*



Given the size of this area and the need for a rapid appraisal of its archaeological resource mapping focussed on four transects selected to provide an indication of the likely archaeological potential in the wider project area (Fig 2). The transects, each comprising four OS 1:10,000 quarter sheets, were targeted to sample the landscape zones, soils and geologies, current and historic land use and Historic Landscape Character (HLC) types within the project area as a whole.

Exmoor and Dartmoor were not included in the proposed sample areas as they have already been the subject of archaeological survey (RCHME 1986; Riley and Wilson-North 2001). In addition their National Park status is likely to constrain any significant change in land use.

3.1 Geology of the project area

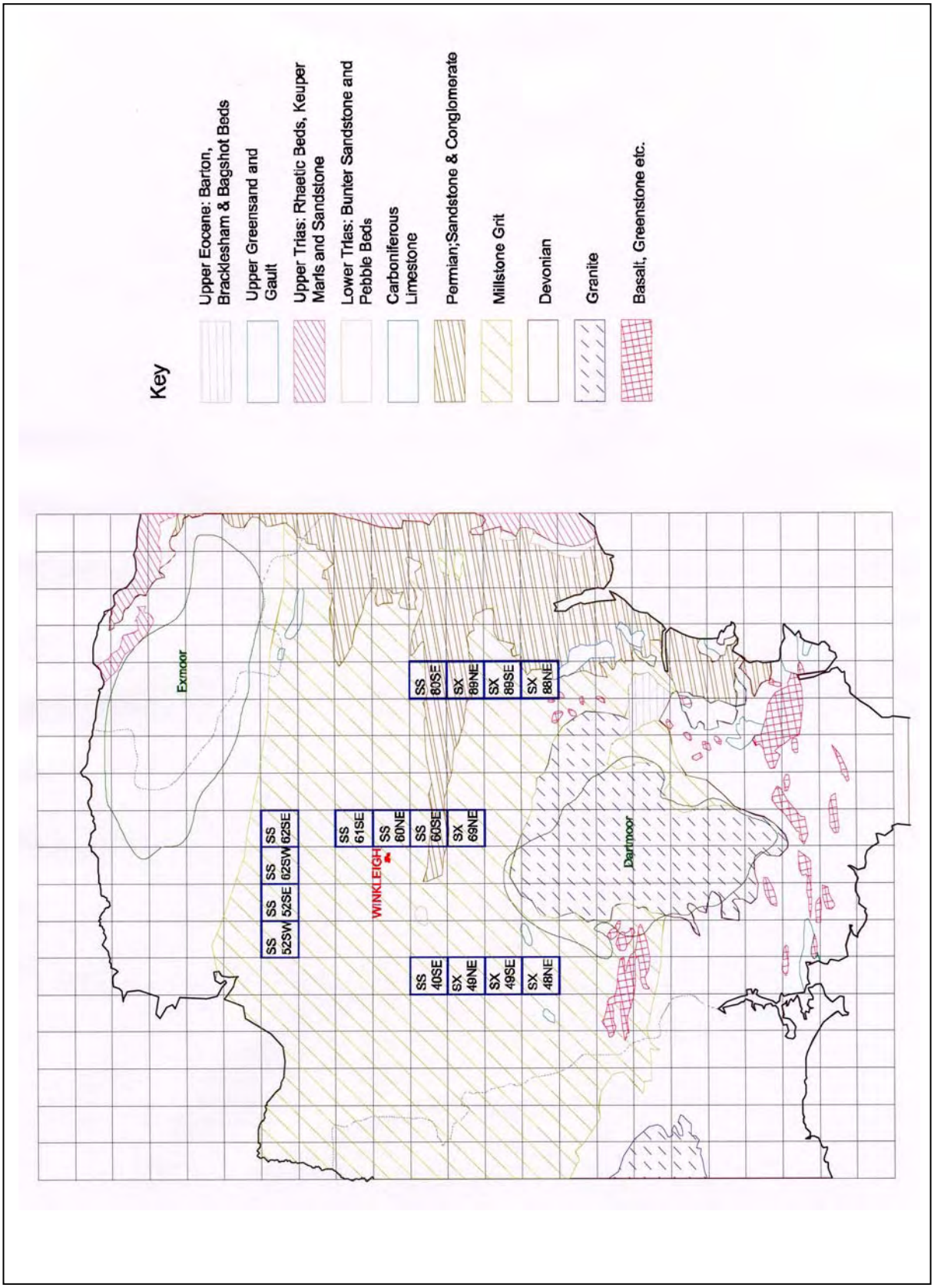
The underlying geology of much of Devon comprises the Carboniferous Culm Measures dating from 360 to 290 million years ago (mya), (Fig 3). These include Lower Carboniferous shales, slates, cherts, limestones and volcanic rocks as well as Upper Carboniferous mudstones and sandstones. These rocks are the same age as the Coal Measures elsewhere in Britain but contain only scarce and thin beds of coal (known locally as 'Culm'). These rocks became folded and faulted during complex earth movements at the end of the Carboniferous period known as the Variscan Orogeny around 290 mya. All of the North and West transects, and parts of the East and Middle, are sited in the Culm Measures.

To the south of the Culm Measures lies the granite boss of Dartmoor which was emplaced as fluid magma during the Variscan Orogeny, forming the roots of a mountain range which has subsequently been eroded. None of the proposed transects cross this area.

To the east of the Culm Measures are Permian Red Sandstones, (290 to 250 mya). These comprise breccias, sandstones and mudstones and run in a north south band from Paynton to Wivelscombe, the band narrowing as it runs northward. A long finger of sandstone runs westwards from just north of Exeter, past Crediton and on to Hatherleigh. These sandstones cross one quarter sheet of the Middle transect and two of the East transect and coincide with the Argillic brown earths of the Mid Devon Farming Belt (Sections 3.2 and 3.3).

The geology in the northern part of the project area consists of Devonian Old Red Sandstone (410 to 360 mya). This comprises sandstones, slates and shales with minor amounts of limestone. As with the Culm Measures, these beds were extensively folded during the Variscan Orogeny around 290 mya. These Devonian rocks underlie the National Park of Exmoor; none of the proposed transects encroach on this area.

Fig. 3 *Map showing the simplified geology of the project area. (Information based on British Geological Survey mapping of 1957).*

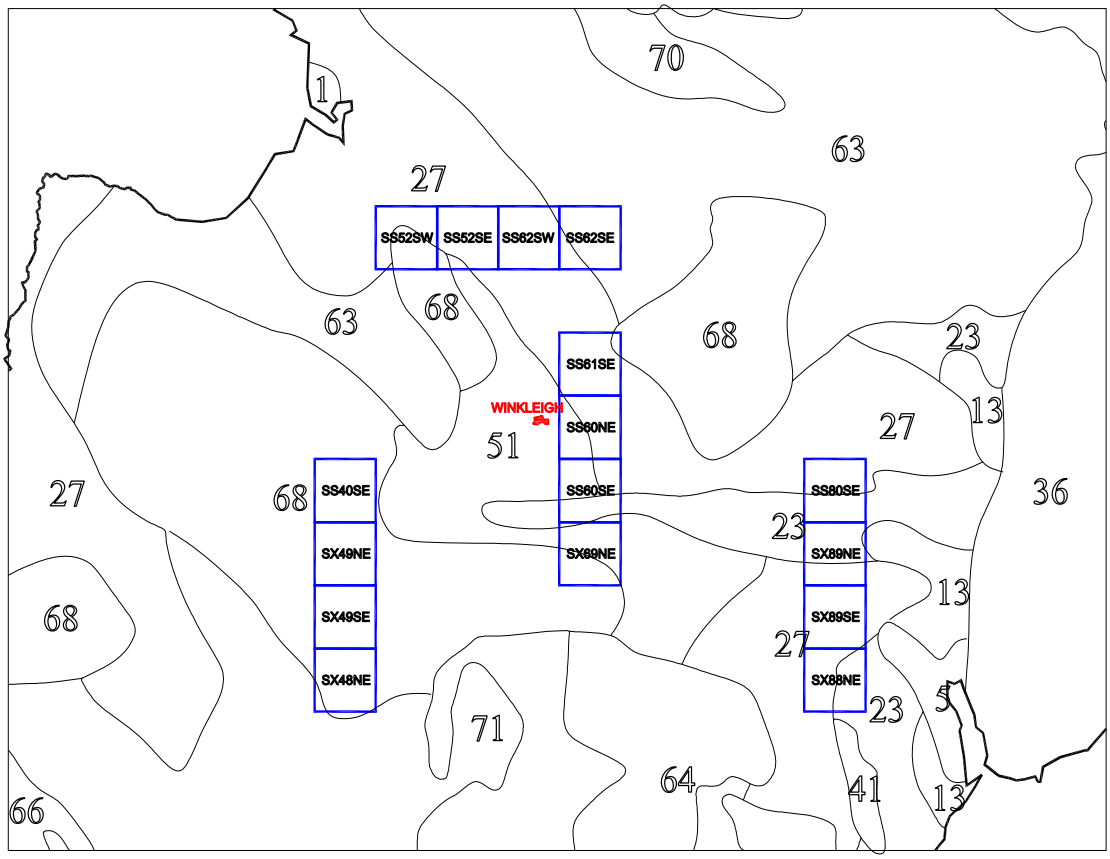


3.2 Soils and land use

A number of soil types occur within the project area. These are recorded by the Soil Survey of England and Wales, 1974 as mainly brown earths, stagnogley soils and rankers (Figure 4).

Upland gley soils cover most of the West transect and parts of the North and Middle transects. The key feature of a gley soil is the grey or grey brown subsurface horizon caused by a chemical reduction of the original matter due to water saturation. In the case of the stagnogley soils and brown earths of the West transect [type 68], this saturation is generally seasonal. The soils tend to be loamy or clayey and locally stony with impeded drainage and are associated with better drained, mainly loamy, soils locally shallow over rock.

Fig. 4 *Soils in the project area (description of numbered soil types is contained in the text below)*.



The soils of the south western extremity of the West transect and the north eastern fifth of the North transect are upland brown earths, being stagnogleys with brown podzolic soils [type 63]. These are moderately deep to deep and are well drained stony loamy soils, associated with poorly drained and usually finer textured soils and shallow soils over rock.

Drier lowland brown earths [types 27 and 23] cover well over 50% of the North and Middle transects and all of the East transect. Type 27, stagnogley soils and rankers, are well drained loamy and often silty soils. They are usually stony and are associated locally with deeper, more clayey soils with impeded drainage.

The argillic brown earths of type 23 coincide with the underlying east-west finger of Permian Red Sandstone described in 2.2 above. They are deep, or moderately deep, well drained loamy soils usually stony or locally very stony (gravely) and are locally associated with loamy or clayey soils with impeded drainage.

Lowland stagnogley brown earths [type 51] are found in the Middle transect. These deep clayey or loamy-over-clayey soils have impeded drainage and are associated with better drained loamy soils, locally stony or shallow over rock.

To summarise, the soils of the proposed project area tend to be fairly poor and often with impeded drainage. This is reflected in the land use of the area which is mainly one of pastoral farming with some mixed farms, local horticulture, and forestry. The exception is the small area of arable land coinciding with the richer argillic brown earths of the Mid Devon Farming Belt.

3.3 Landscape zones and land use

A number of landscape zones which vary considerably in character occur in the project area. With the exception of the West transect, dominated by the high undulating ridges and steep valleys of the Broadbury and Western Devon Ridges zone, the four transects cross a number of different landscape zones.

The North transect is characterised in the west by the High Culm zone; an open landscape of broad ridges with few trees: by contrast the eastern half of the transect, in the Taw and Torridge River Systems zone, is dominated by the steep wooded valleys of these rivers and their tributaries. The Taw and Torridge valleys also characterise the northernmost part of the Middle transect. In the southernmost part the landscape comprises elevated pasture, frequent pockets of woodland and narrow river valleys typical of the Tedburn St Mary zone. The central part of the Middle transect is made up of rolling farmland with few trees: the Mid Devon Farming Belt. This farming landscape also dominates the northern half of the East transect. Further south the transect crosses a swathe of the Tedburn St Mary zone, and the southernmost part of this transect is characterised by the Haldon ridge, a landscape of extensive woodland interspersed with open glades and pasture.

Each of the landscape zones are marked in Figure 5 and described more fully below. (Information from *The Devon Landscape*, Devon County Council 2002).

Fig. 5 *Landscape character zones in the project area (numbered zones are described in the text below)*

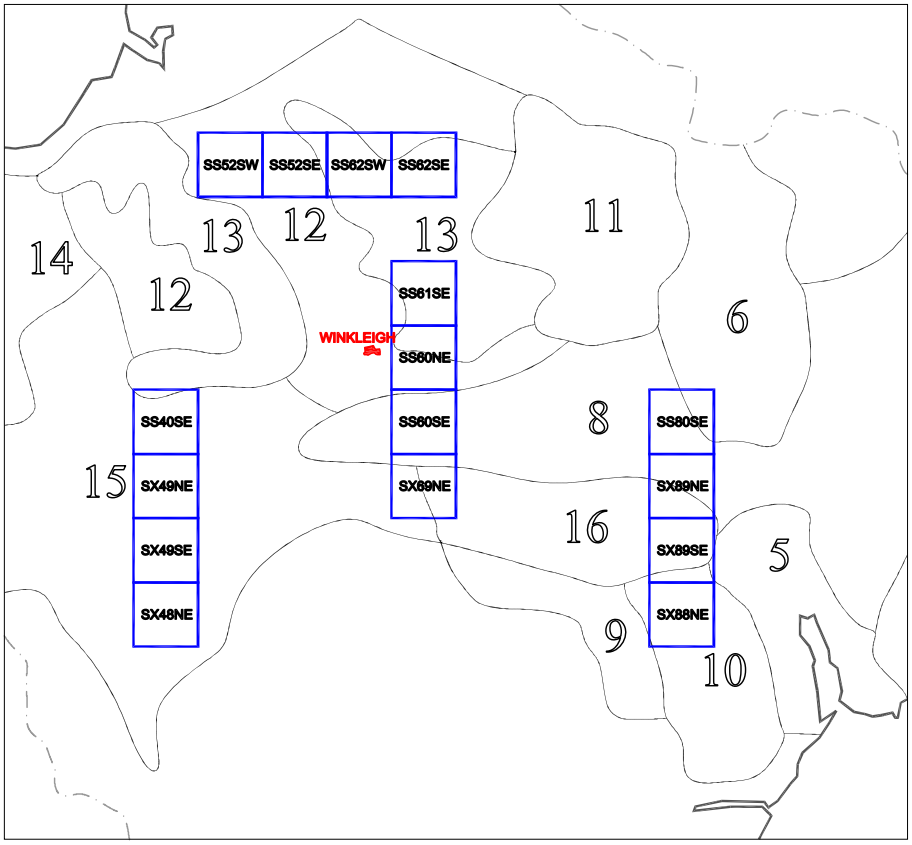


Fig 5, Zone 6. Exe Valley and Environs. This zone covers a small area in the northeast corner of the East transect. This zone covers the middle Exe valley and much of it has been designated as an Area of Great Landscape Value (AGLV). The characteristics associated with the broad expanse of the Exe Valley are extensive woodlands, picturesque villages near the tree-lined valleys with small pasture fields on the surrounding hilly terrain. The landscape characteristics of the zone have been well retained.

Fig 5, Zone 8. Mid Devon Farming Belt. The zone crosses two quarter sheets of the East transect and one of the Middle transect and coincides with the archaeologically richest regions within project area (Section 9.1). Covering a large area of fertile lowlands, this zone is characterised by flat or rolling mixed farmland. There are relatively few woodlands and the area is relatively heavily populated by Devon standards with many farms and villages. The area is under considerable pressure from development and agriculture. None of this zone is subject to any landscape designation.

Fig 5, Zone 10. Haldon Ridge. This zone dominates the southern portion of the East transect. The Haldon ridge forms a distinctive feature, running north-south from the west of Exeter to the Teign Estuary. It has large areas of broadleaved woodland and coniferous forest which, in combination with open glades and pasture, provide valuable wildlife habitats. The whole of this zone has been designated an AGLV.

Fig 5, Zone 12. High Culm Ridges. This zone covers over 50% of the North transect. This zone is characterised by a generally open landscape with exposed broad ridges and few trees. It is a mainly pastoral landscape with regular rectangular fields and scattered farmsteads and hamlets. The Culm geology of the area (Section 3.1) has resulted in an area of poor drainage, dominated by grasslands. A lack of development pressure has left the general integrity of the landscape largely intact. Most of the zone is uncovered by any landscape designations.

Fig 5, Zone 13. Taw and Torridge River Systems. This zone covers the northern part of the Middle transect and the eastern half of the North transect. It comprises the middle and lower valleys of the Taw and Torridge rivers and the valleys of their most notable tributaries. It is characterised by steep wooded valley sides with relatively open pasture in the valley bottoms. Settlement is generally found on the valley sides rather than on the floor. The majority of the zone has been designated an AGLV and the general integrity of the landscape character has been well maintained.

Fig 5, Zone 15. Broadbury and Western Devon Ridges. This zone dominates the West transect. It covers an extensive area of west central Devon, from the north western edge of Dartmoor to the Cornwall border. The high flat-topped area of Broadbury forms the centre of the zone. It is flanked by a series of high, undulating ridges and marked valleys which characterise the zone. Poor soils and high rainfall has resulted in an agricultural economy based on sheep farming in areas of unimproved grassland. In many areas, the pasture has been improved. The hedges are characterised by prominent hedgerow trees which create a relatively wooded appearance over much of the zone and to the north are extensive conifer plantations. Settlement is sparse and confined to hamlets and farms. An area to the south of the zone has been designated as an AGLV.

Fig 5, Zone 16. Tedburn St Mary Area. This zone forms the central third of the East transect. As a whole it covers an elongated area which runs westward of Exeter towards North Tawton and Whiddon Down. Most of the zone has been designated an AGLV. The zone is characterised by elevated pasture well dotted with woodlands cut by a series of narrow winding wooded valleys. These two major elements, the pastoral highlands and intimate valleys, complement each other and create the essential

character of the zone. The settlement pattern is one of scattered isolated farmsteads with occasional larger villages. The extensive valley woodlands and woodland blocks in the higher lands give a strong woodland element to the zone and are important in helping to maintain its intimate character.

3.4 Historic Landscape Character

Consideration of Devon's Historic Landscape Character (HLC) has a significant role to play in the process of extrapolating the results from the project area over the wider project area.

HLC is a method for understanding the nature of the landscape with reference to its historical development. It presents interpretations of the historic character of the whole landscape and allows the historic landscape to be given archaeological significance on a wide scale. Linking recorded archaeology to HLC types within the four transects can be developed and extended to cover HLC types across a wider area. In this way HLC might serve as an indicator of the nature of the archaeological resource likely to be encountered within the various HLC types in the project area as a whole.

Devon's Historic Landscape Characterisation (Turner, 2005, 57-60) is presented in two forms: a characterisation of the modern landscape and a characterisation of the post medieval landscape based on the 1880 1st Edition OS maps. The North Devon NMP project used the HLC of the post medieval landscape as its primary reference. There are two main reasons for this.

- In some parts of the project area field systems have undergone major developments during the twentieth century which have significantly altered their character in comparison to their earlier form. Within the Farming Belt in the East transect, there has been widespread field boundary removal. In the West transect extensive areas of rough ground have been improved. In those areas the post medieval characterisation provides greater historical detail than the modern version.
- The archaeological scope of the project (Section 5.2) excludes field boundaries that appear on 1st Edition (or later) OS maps. In this way the 1st Edition map effectively serves as the project base map and it follows that the post medieval HLC, based on the 1880 mapping, is the more appropriate form of characterisation.

The majority of Devon's landscape is covered with fields. Most of them have medieval origins, but categorising them into different historical types/periods based on their morphology alone can be difficult. In order to allow a degree of consistency, guidelines were developed for use in the Devon HLC project and the descriptions of different character types offered below are based on them (Turner 2005). These guidelines drew on case-studies based on published research that showed how and when the various character types developed.

The descriptions below relate to the main HLC types found within the project area.

3.4.1 Medieval-derived fields

It seems likely that the greater part of the farmed landscape of Devon and Cornwall was divided into strip fields during the medieval period (Herring, 2006). The enclosure of strips can leave distinctive 'markers' behind in surviving field boundaries and field patterns, such as bundles of narrow strip-enclosures, so-called 'reversed-s' or 'reversed-j' curves, or dog-legs. Documentary evidence makes it clear that strip fields of different sorts underwent enclosure in Devon from the thirteenth century until the nineteenth century, and it seems very likely that in places the process began earlier but has remained unrecorded in the documents. The different boundary morphologies and shapes of the resulting fields can throw some light onto the processes and dates of enclosure. The elements they share – notably their substantial, sinuous boundaries and their generally small size (relative to other parts of England) – create some of the most treasured and distinctive elements of Devon's landscape character.

For the purposes of the Devon HLC, medieval-derived field-types were divided into several categories:

(a) Medieval enclosures based on strip fields (type 26)
(b) Barton fields (type 21)
(c) Medieval enclosures (type 25)
(d) Post medieval enclosures with significantly medieval elements (type 20)
(e) Medieval strip-enclosures (type 27)
(f) Strip fields (type 23)

a. Medieval enclosures based on strip fields (type 26). See Fig. 6

Areas included in this type generally contain fields with clear evidence for their origins as medieval strip fields. This evidence can take the form of so-called 'aratral curves' (alternatively known as 'reversed-s' or 'reversed-j' curves) in their boundaries, and/or 'dog-legs'. They are also commonly found in 'regular' field patterns, so that blocks of fields with similar parallel curving boundaries occur grouped together.

Medieval enclosures based on strip fields seem likely to result from one of two processes. Either a farmer gained ownership/tenancy of a large block of strips and enclosed them all at one time (sometimes as several contiguous fields, forming a regular pattern), or small fields were divided into strips which were enclosed from the outset. Unfortunately, without detailed archaeological evidence these two processes are hard to distinguish (e.g. in parts of Challacombe's fields; Pattison 1999).

Fig. 6 *Leper Fields, Little Torrington: two strip enclosures (type 27) survive towards the right of the photo in a landscape of medieval-derived fields based on strip fields (type 26)) (photo: Sam Turner)*

Based on our present understanding, these processes of enclosure seem likely to have occurred most commonly in the fourteenth to sixteenth centuries, although they may well have continued in places into the early post medieval period. Since these fields form the most frequently occurring character type in Devon, we can say that the

greatest contribution to the county's landscape character derives from the enclosing endeavours of medieval farmers.

b. Barton fields (type 21). See Fig. 7

Fields in this category appear to result from the late medieval or post medieval enclosure and/or rearrangement of medieval field systems. In common with late medieval enclosures described above, they often appear to have come into the possession of a single landowner who re-organised the fields to suit changing agricultural conditions (Turner, forthcoming).

They may be identified by a mixture of sinuous boundaries (particularly in cases where some evidence survives of 'aratral' curves, etc.), almost-straight boundaries with regular curves (which are commonly within the field system and do not necessarily also form its outer boundaries), and some straight boundaries; they also commonly contain relatively large fields. Documentary evidence suggests that they were formed largely between the very late Middle Ages and the end of the seventeenth century (pers. comm. Peter Herring, 2003).

c. Medieval enclosures (type 25)

This type stands for several different types which can be very hard to distinguish and date without detailed archaeological and historical research, e.g.:

i. Large enclosures of demesne fields which were subsequently subdivided in the late medieval and/or early post medieval period
ii. Irregular medieval enclosures
iii. Meadows (other than water meadows)
iv. Miscellaneous paddocks and closes (often around medieval farmsteads; these may be distinguished by their small size)

The main distinguishing characteristics of areas of this type are that they all have fields with generally sinuous boundaries that do not necessarily show signs of division into strips. Despite this, it should be noted that much cultivation took place in strips without leaving much sign of its existence (except in documentary sources or buried archaeology). At Houndtor on Dartmoor, for example, the strip divisions in the fields have been preserved by the site's late medieval abandonment: without this, it would not have been evident from the morphology of the fields that they had previously been cultivated in strips (Brandon 1979).

d. Post medieval enclosures with medieval elements (type 20)

These fields are based largely on (or within) existing medieval enclosures. In these cases the existing fields have commonly been divided or substantially rearranged in the post medieval period. Many parishes in the west and north of the county have extensive areas with this type of historic character, for example in the parishes of Rackenford and Lewtrenchard.

e. Strip enclosures (type 27)

These are long, thin enclosures representing individual strips or pairs of strips which have been enclosed. The fields are generally rectangular in shape (i.e. narrower than they are wide). An example of strip enclosures is shown in Fig. 6 above.

They were a widespread historic character type in Devon, particularly in the north and east. Harold Fox has argued convincingly that they derive from piecemeal enclosure by tenants of former strips or groups of strips in medieval strip fields (Fox 1972). They almost always have medieval origins.

Fig. 7 *Barton fields HLC (type 21) in Devon (with an orchard in the bottom right). Straightgate Farm, Ottery St Mary (This location is outside the project area but illustrates a typical area of Barton fields) (Photo: Sam Turner, November 2005)*

f. Strip fields (type 23)

Medieval and early post medieval strip field systems were often largely unenclosed (or at least not subdivided by field boundaries), particularly if they were held in common. However, it is not clear that all were, and many may have had long outer boundaries from a relatively early date. Though strip fields are a rare character type there are some very important examples in north Devon. Amongst the most important is Braunton Great Field, one of the best preserved surviving medieval open fields in Britain.

g. Medieval-derived water meadow (type 16)

In the Middle Ages, water meadows occurred along valley bottoms in flattish ground that would have been naturally irrigated by floodwater. Water meadows are known to have been very valuable in the medieval period, so it is likely that most ground with this potential was used as meadow. Occasional medieval documentary references and early post medieval maps also allow the identification of likely early water meadows (Turner, forthcoming).

3.4.2 Post medieval-derived fields

a. Post medieval enclosures (types 19 and 50). See Fig. 8

This character type covers a fairly wide range of different kinds of fields, united by the morphology of their boundaries which tend to be dead straight (Herring 1998: 29; Turner 2004). Some significant sub-types can be identified by analysing the size of fields within the polygons, e.g. very small plots associated with industrial workers. Straight sided post medieval enclosures can be associated with the enclosure of areas of rough ground, but often erased traces of earlier arrangements (at least as far as map evidence is concerned), and it is not always possible to suggest what the medieval or earlier historic character types were.

b. Orchards (type 11)

Orchards formed an important part of the post medieval agricultural economy in Devon. They commonly cluster in small enclosures around farmsteads and hamlets, although in some parts of the county (e.g. around Whimple in east Devon) there were extensive areas of orchard planted in large fields. In general there were more historic orchards in the south and east of the county, and in parts of the northwest they were fairly rare.

c. Park/garden

This type includes all types of parks and landscape gardens, both those in private ownership and public/civic parks and gardens. Additional data sources include the EH Register of Parks and Gardens and OS 1st Edition 25 inch map.

d. Post medieval water meadows

Post medieval innovations in irrigation which involved complicated networks of channels allowed more land in the bottom of river valleys to be used as water meadows, giving improved early grazing and yields of hay (Turner, forthcoming). Although rudimentary systems of control are likely to have existed in the medieval period, the main periods of development were probably the seventeenth and eighteenth centuries.

A second type of post medieval water meadow is known as the field-gutter or catch-meadow system. This allowed sloping fields to be irrigated through the provision of leats. These are sometimes recognisable using archaeological evidence (either as earthworks or in air photography: Griffith 1988: 104; Riley & Wilson-North 2001;), and are also commonly recorded on the 1st Edition OS maps. The main period of development and use of these irrigation systems seems to have been the later eighteenth and nineteenth centuries. A few are still very occasionally used, as at Walscott, North Molton.

3.4.3 Rough ground

This category includes all rough pasture, moorland or heathland, including that which has been enclosed but then reverted to rough grazing (see Herring 1998: 25-6)). There are two types of rough ground in the project area, Rough ground (type 13) and Rough ground with signs of earlier use for agricultural land (type 14)

These types can be broken down into 3 sub-categories depending on location.

a. Major Areas of Moorland

Firstly there are major areas of open moorland such as north Dartmoor in the south of the project area. Such areas have been open moorland for many millennia and have never been planted with significant crops.

b. Minor Areas of Rough Ground

Small areas of rough ground were once very common in Devon, particularly in the north and west of the county. Many were enclosed during the eighteenth and nineteenth centuries for agriculture, but many of these had reverted to rough ground by the late nineteenth century. As a result of this history they are commonly associated with post medieval hedge banks or other features such as walls. In some places such as Rackenford Common, extensive areas of rough ground are associated with significant earthworks of medieval field systems.

c. Valley-bottom Rough Ground

The boggy valley-bottoms of north and west Devon were often managed as rough ground in the post medieval period and some have remained in the twentieth century. It is possible that they may have provided meadowland in the Middle Ages when this

resource was thought to be especially valuable. Like other minor areas of rough ground, many were enclosed during the post medieval period for agriculture, but a great deal subsequently reverted to rough ground. During the later twentieth century, much was again reclaimed for farming, and much has been invaded by scrub-type woodland.

Fig. 8 *Post medieval enclosures (type 19) at Broadbury with an area of upland rough ground (type 13) in the bottom left of the photograph. The rectilinear enclosure known as Broadbury Castle is visible as a cropmark ditch in the upper right field at the crossroads. Photo: RAF 3G/TUD/UK/138/5167 (11/04/46). Crown copyright.*

3.4.4 Woodland types

a. Ancient woodland (type 24)

This type comprises broadleaf woodland (mapped using additional data from English Nature's ancient woodland maps). It has generally been stable for at least a few hundred years and would be extremely sensitive to change.

b. Conifer plantation (type 17)

Conifer plantations are a character type with origins in the later post medieval and modern periods. They often form important components of landscapes of post medieval enclosure, particularly on estates where they were planted as cover for game (Finch 2004). In many areas commercial forestry occupies relatively steep-sided valleys that were not uncommonly wooded prior to plantation.

c. Other woodland (type 18)

This type includes all other woodland including broad-leaved plantations, re-planted ancient woodland or secondary woodland that has grown up from scrub.

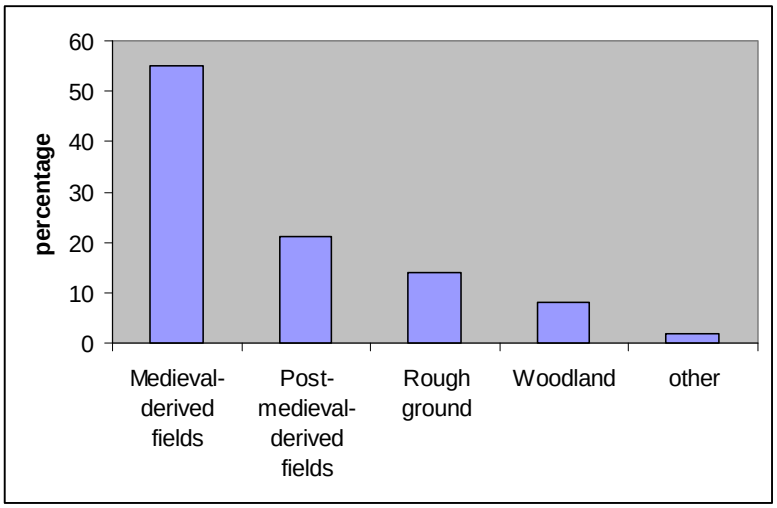
d. Woodland with old field boundaries (type 36)

This type represents woodland that has been planted or grown up over earlier field systems. Sometimes these are medieval, but perhaps more commonly they are abandoned post medieval enclosures on valley sides.

3.4.5 Distribution of HLC types in the project area

More than 70% of the project area landscape comprises fields, the majority derived from the medieval field pattern. Much of the remainder consists of rough ground and woodland. Prevalence of the broad categories of HLC types (3.4.1–3.4.4) in the project area are summarised in Chart 1 below.

Chart 1. *Summary of the categories of HLC types in the project area*



Of the individual types, medieval enclosures based on strip fields (type 26) is the most prevalent in all four transects, followed by post medieval enclosures (type 19) or rough ground (types 13 and 14). Table 1 shows the total hectarage covered by the main HLC types within the project area.

Table 1 *Total hectarage covered by the main HLC types in descending order. 'Other' includes all types which cover less than 1% of the project area.*

Type	Description	Hectares	% of area
26	Medieval enclosures based on strip fields	14,713	37
19	Post medieval enclosures	6,719	17
13	Rough ground	4,955	12
21	Barton fields	3,145	8
18	Other woodland	2,510	6
25	Medieval enclosures	2,279	6
20	Post medieval enclosures with medieval elements	1,532	4
11	Orchard	731	2
10	Parks/gardens	694	1.5
14	Rough ground	643	1.5
24	Ancient woodland	620	1.5
	Others	1,481	3.5

The main HLC types described above occur relatively evenly throughout the project area. There are, however, some variations within each of the four transects.

East transect. This contains most of the Barton fields (21) in the project area, more woodland than the other three transects (including the only significant area of conifer plantation), and twice as many orchards and parks and gardens as elsewhere.

Middle transect. Of all the transects the Middle mirrors most closely the overall pattern of HLC throughout the project area.

North transect. The North transect contains more than twice the average area of medieval enclosures (25) and post medieval enclosures with medieval elements (20). It contains significantly less rough ground than the other transects.

West transect. This transect contains nearly three times as much rough ground (34% of its area) as the average for the project area.

3.5 Previously known archaeology

Across the project area as a whole records for 1,633 sites, 205 (12.5% of the total) of them cropmarks, were contained in the Devon HER prior to the project. The four transects were designed to sample a range of soils and land uses and to provide a sample of the variety and density of archaeological sites previously recorded within the catchment area. This is reflected in the fact that the sites are not evenly distributed throughout the project area. In particular cropmark sites are concentrated on the argillic soils overlying Permian Red Sandstone in the East and Middle transects.

The character of the previously recorded archaeology in the project area is summarised below.

- **North transect.** 269 sites in total. Only eight cropmark sites (3% of the total). Sites of the medieval and post medieval periods are predominant, with a significant number of quarries, buildings and settlement sites as well as larger landscape features such as deer parks. Very few prehistoric sites were known, the most common being barrows which are particularly frequent in SS52SW.
- **West transect.** 258 sites in total. Only 10 cropmark sites (4% of total). Generally few prehistoric sites: a relatively large number of Bronze Age barrows occur in SX49NE, the Iron Age hillfort of Burley Wood lies within SX48NE, and a small number of cropmark enclosures were also known. Medieval and later sites are predominant, buildings and settlement sites being the most frequent although a number of quarries, mill sites and areas of ridge and furrow were known.

A larger number of potentially prehistoric sites were known from the Middle and East transects although medieval or later agricultural, domestic and industrial sites were still the most frequent.

- **Middle transect.** 474 sites in total. 51 cropmark sites (11% of the total). A number of Roman sites were known; in particular the fort, camps and associated features at North Tawton. A significant number of cropmark enclosures, likely to be prehistoric settlements or ceremonial barrows, had also been recorded. This transect contains elements of the major prehistoric ceremonial complex around Bow and North Tawton.
- **East transect**. 632 sites in total. 136 cropmark sites (21.5% of the total). This transect contained the highest density of cropmark sites; for instance over forty-five enclosures were recorded in SX89NE, many of which are likely to be of prehistoric origin. One of the most important archaeological sites in the catchment area - the Neolithic causewayed enclosure on Raddon Hill - lies within SS80SE.

3.6 Previous transcription work

This comprises the Devon Air Photo Project, undertaken by DCC Historic Environment Section, whereby archaeological sites visible on all oblique aerial photographs held in its collection were plotted. The project was restricted to oblique photographs and did not include verticals. It was not carried out to NMP standards nor did it use modern digital transcription techniques.

4 Aims and objectives

4.1 Aims

1. The principal aim of the project is to provide a fuller awareness of the range and extent of archaeological remains in the planting catchment area through NMP mapping of 16 sample sheets.
2. To provide information on the archaeological resource within the project area. This will inform strategic and local management policies, and enable informed decisions to be made on the appropriate protection of the archaeological resource and historic landscape in central, west and north Devon.

4.2 Objectives

1. The primary objective was to produce sixteen AutoCAD drawings, one per OS 1:10,000 quarter sheet, depicting archaeology visible on aerial photographs using the conventions and standards of NMP (RCHME 1994).
2. To provide an interpretation of all sites recorded as part of the survey and enhance the Devon County HER and the NMR Archives and Monuments in England (AMIE) database through the integration into those systems of information generated by the project.
3. To produce a review of the archaeology and conclusions of the archaeological aerial survey in the form of a written report.

5 Method statement

5.1 Sources

Air photograph collections

All readily accessible aerial photographs were consulted during the project. In total this amounted to 3,167 vertical prints and 2,117 obliques held in three collections:

The National Monuments Record (NMR) in Swindon.

Devon County Council (DCC).

Cambridge University Committee for Aerial Photography (CUCAP).

Details of the photographs from these collections are presented in Appendix 1.

Archival sources

Three archival sources were consulted to further understand the archaeology of the project area and to aid interpretation of specific sites.

The Devon HER maps and records and Devon HLC maps.

First and Second Edition Ordnance Survey maps.

The NMR Archives and Monuments in England (AMIE) database (containing monument, event and archive records.

Previous Survey Work and Research

Plots produced during the Devon Air Photo Project (section 3.6) were consulted on an ongoing basis during the project.

5.2 Archaeological scope of the project

All visible archaeological features, dating from the Neolithic to the twentieth century (pre-1946), were recorded. This includes both plough-levelled sites and those with upstanding remains. Sites appearing on OS maps which have not been photographed or which are completely obscured by vegetation were not recorded. Features still in use or fossilized by later structures that are still in use, e.g. buildings, field walls, canals, railways, leats and hedges, were not recorded. Specific components of the project remit are listed in Appendix 2.

5.3 Project methodology

Work on the project was undertaken in accordance with the latest NMP best practice.

The method used to meet project objectives comprised seven elements.

5.3.1 Preparation

This involved three tasks.

- **Sourcing photographs**

The main photographic collection used by the project is housed at the NMRC in Swindon and a loan arrangement was put in place enabling the consultation of these photographs in Truro.

Photographs contained in the collection held at DCC were loaned out at the beginning of the project. Photographs held in the CUCAP collection were loaned out one transect at a time.

- **Sourcing maps and other data**

Prior to and during the transcription of each map sheet the maps and other sources of data listed in section 5.2 were consulted.

- **Preparation and maintenance of the project database**

A repurposed version of the Cornwall HER Access database was used as a stand-alone project database. A few minor changes were made to certain fields to bring it in line with current national standards and background tables were populated with Devon information, such as Parish and District lists. For an example of a database record see Appendix 4.

5.3.2 Transcription

The results of the mapping were produced entirely in digital format using AutoCAD 2002 (Autodesk Map 5). Transcription comprised the following processes.

1. Information was derived from the photographs available in the collections identified in section 5.1 above.
2. Oblique and vertical photographs were scanned.
3. Digital transformations of archaeological features visible on the scanned photographs were produced using AERIAL. Digital copies of current OS 1:10,000 maps were used for control information and as a base for mapping in AutoCAD 2002. Given the hilly character of the project area digital terrain models (DTM) were created as a matter of course using digital contour data prior to rectification of the photographs.
4. The rectified images were imported into the relevant AutoCAD drawings.
5. Archaeological features were digitally transcribed in AutoCAD according to a specified layer structure and using agreed line and colour conventions (see Appendices 5 and 7).
6. Polygons were drawn around each separate monument to define its extent.

5.3.3 Quality Assurance

Quality assurance checks were carried out on selected map sheets to ensure that transcription was carried out to NMP standards.

5.3.4 Data processing

- **Maps Database**

An Access database recording basic information for each map sheet (including progress, sources and transcriber) was maintained in line with other NMP projects.

- **Project database recording**

Monument records with automatically generated unique site record numbers were created in the project database for each site mapped.

Where the site had already been recorded in the Devon HER, the existing HER record number was recorded as was any relevant AMIE Hob UID numbers. In addition the monument record created in the Project Database included contextual information (sources, text etc) so that the record be intelligible in the standalone database and when transferred to the HER or NMR.

- **AutoCAD attached object data**

Three object data tables were incorporated into each AutoCAD drawing to enable concordance with the Devon Geographical Information System (GIS) and to facilitate basic analysis of the drawings. The unique identifier generated by the Project Database, the HER number of any site with an existing Devon HER record and the AMIE Hob UID of each site was recorded in the first table. The second table recorded basic interpretative information and contained four fields; period, type, form, and photo number as well as including a comment field. The third table recorded the date, surveyor, scale

of survey, and copyright information. These tables were attached to all plotted features and the relevant polygon defining the monuments. The content and structure of these tables is described in Appendix 6.

5.3.5 Field Visits

Two field visits, in mid-April and mid-August, allowed the project team to familiarise themselves with the landscape character of each of the four transects and to examine issues relating to site identification. Both trips were arranged to coincide with Monitoring meetings.

5.3.6 Meetings

A number of meetings were arranged and attended

- Regular monthly NMP team meetings
- Four monitoring meetings between the NMP team and the EH Project Officer through the duration of the project.
- One national NMP meeting held in mid-May, at which a progress summary and interim results were presented to the NMP Steering Group and to all the other NMP teams.
- Liaison Group. This group, consisting of representatives from DEFRA, Exeter University, The National Trust, Dartmoor National Park Authority, DCC Landscape Section, English Nature, Exeter Archaeology, Devon Archaeological Society, ACE Archaeology Club (local to Winkleigh), as well as the project team, staff from DCC Archaeology Service, and English Heritage staff, was established and held a meeting in mid-April.

5.3.7 Miscellaneous Tasks

A number of miscellaneous tasks were ongoing during the project.

- **The production of quarterly progress reports.** Brief reports on progress were produced on a quarterly basis.
- **General project management.**
- **Liaison with DCC.** Ongoing liaison with DCC staff was carried out via telephone and email and also at the April Liaison Group meeting.
- **Software training.** Training in the latest versions of Aerial was provided in late February by English Heritage Archaeological aerial survey staff.

6 Resources and programming

The project was carried out by the Cornwall NMP team, which consists of Andrew Young, Senior Archaeologist, Emma Trevarthen, Archaeologist, and Carolyn Dyer, Archaeologist. All three team members are currently employed by CCC but during the mapping phase of the project, Carolyn was employed as an Investigator with EH.

Emma worked full-time for the duration of the project, Andrew was initially returning to work following a period of extended sick leave and worked on a part-time basis until March, Carolyn worked part-time for the duration of the mapping phase, 2.5 days per week until early May and 3.5 days per week after this.

All three team members carried out the mapping, liaison with DCC, liaison for the final report, and participation in all project meetings. Emma carried out mapping of all four transects, Carolyn the East, Middle and North transects, and Andrew the East and West. Project management was shared between Andrew and Carolyn. Carolyn also undertook Quality Assurance of the digital mapping. Andrew was responsible for the production of this report.

Initial preparation of the project database prior to the start of monument recording was undertaken by John Smith of Cornwall HES. John was also responsible for on-site database support during the life-time of the project.

The EH Project Officer, based at NMR in Swindon was Helen Winton. Progress was monitored through regular monitoring meetings with EH staff. Helen also provided comments on this report. A representative of Heritage Data, NMR will participate in liaison for incorporation of the project data into the NMR database. Archaeological aerial survey and Heritage Data staff will be responsible for incorporating the digital data into the NMR GIS and archive.

Frances Griffith, Devon County Archaeologist, and Bill Horner, DCC Archaeological Officer, were involved at all stages of the project. They provided OS mapping, DCC specialist photographs and existing HER data to the project team, liaised with the NMP team and provided comments on the final report. Ann Dick, DCC Archaeological Officer, will be responsible for updating the Devon HER using the records in the project database.

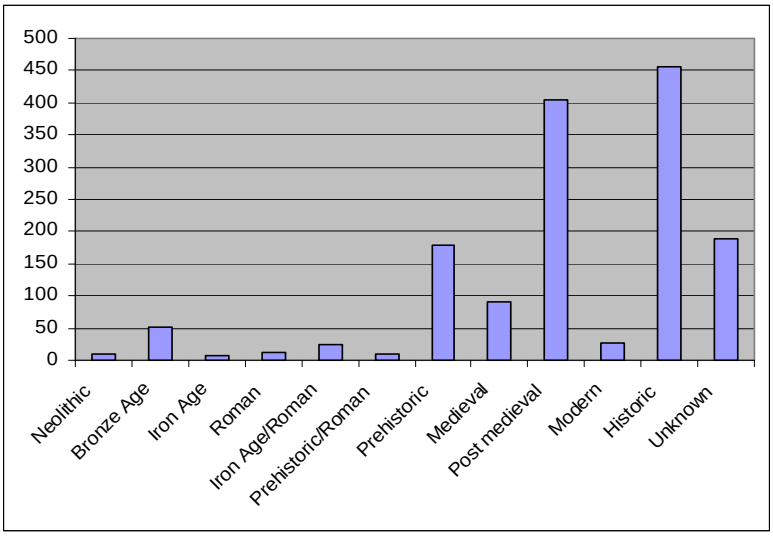
Sam Turner, now a lecturer at Newcastle University but formerly the DCC HLC Officer, produced the section in this report on the sensitivity of the Historic Landscape Character of the project area (section 11.2), supplied various papers on which the section describing the Historic Landscape Character (section 3.4) is based, and provided general comments and advice on other sections of the report.

7 Results

7.1 Summary of results

- Mapping began in January 2005 and was completed in November 2005.
- The project database was populated with 1,536 records detailing 1,678 individual archaeological sites (see Appendix 3).
- The mapping of these sites in their landscape context has provided a fuller awareness of the range, character and extent of the archaeological resource.
- 1,317 sites are new records to the Devon HER. This equates to 78% of all sites identified during the project. When the HER has been updated the new sites will comprise 44% of all records for the 16 map sheets of the project area.
- 1,410 site records (92% of all sites recorded) are new to the NMR.
- Almost 60% of all sites recorded (and the same percentage of the new sites) are plough-levelled and visible only as cropmarks. The project has increased the number of known cropmark sites in the project area by more than 700, and in some areas has recorded almost 20 times as many as were previously recognised.
- 296 prehistoric or Romano-British enclosures (or potentially of this date) have been recorded, including 149 new examples. This is a considerable number and represents the most archaeologically significant result of the survey.
- Almost two thirds of the sites recorded during the project date from the medieval period or later.

Chart 2. *Make-up of the project database showing total numbers of sites by period.*



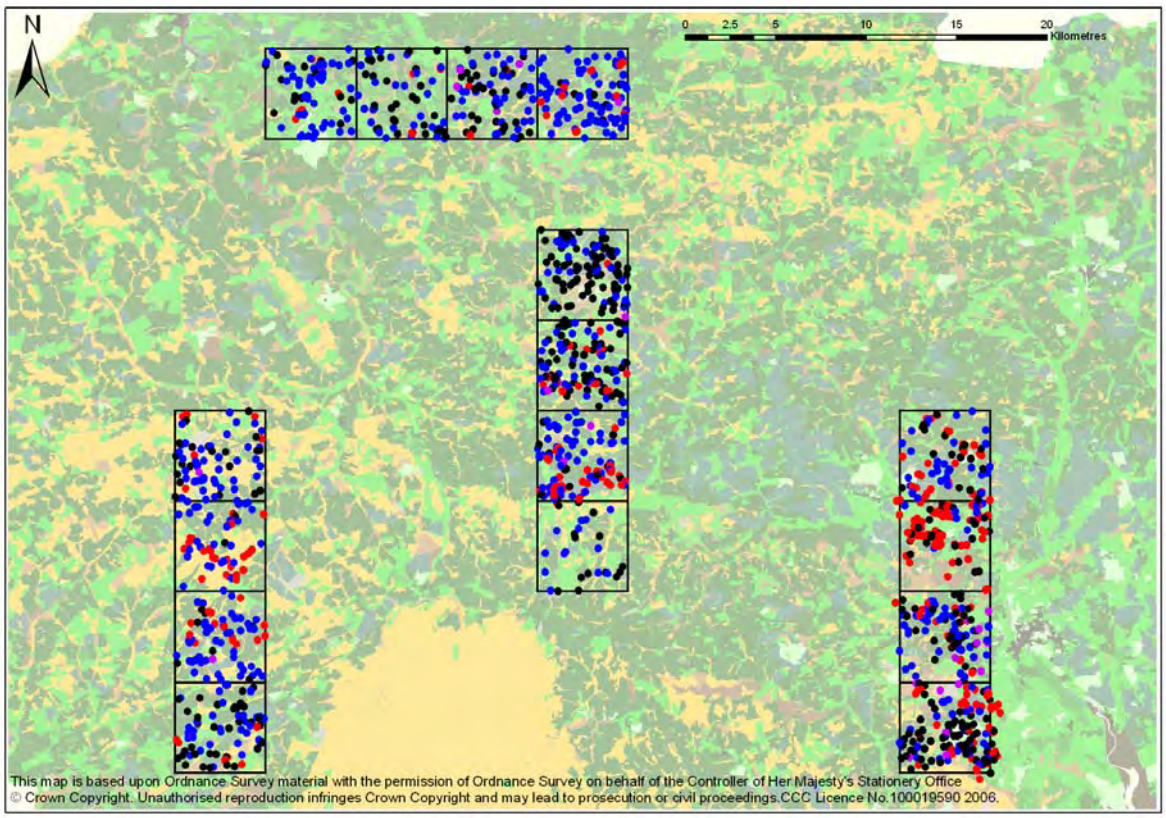
(The generic period 'Prehistoric' includes Romano-British, 'Historic' refers to sites of medieval or post medieval date and 'Unknown' is a catch-all for sites which are potentially prehistoric or possibly historic in origin).

- The archaeology is characterised overwhelmingly by medieval and later agricultural remains, reflecting the lowland rural nature of much of the project area. The predominant site types are field systems and field boundaries. Other abundant features of the farming landscape include relict water meadows, traces of ridge and furrow, orchards, cultivation marks and drainage systems

related to land improvement. Taken as a whole, these components of the late medieval and post medieval agricultural economy constitute roughly half of all the recorded archaeology.

- Visible archaeological remains are not distributed evenly throughout the project area. This is especially true of prehistoric sites: the East and Middle transects produced significantly richer and more diverse results than the North and West.

Fig. 9 *Distribution of all sites recorded during the project. Prehistoric and Roman sites are shown in red, medieval or 'historic' sites in black, post medieval sites in blue, and twentieth century sites in purple.*

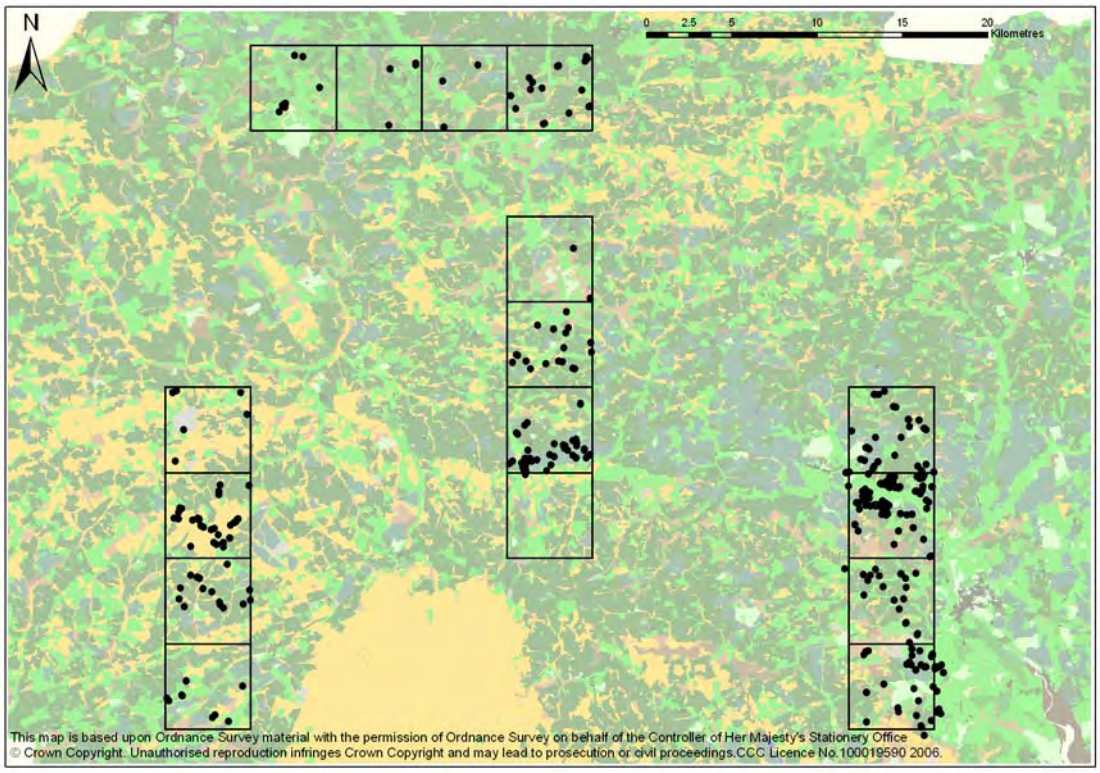


7.2 Character of the archaeology

This section presents an overview of the archaeology within the four transects on a broad period by period basis. The overview takes account of the entire archaeological resource, including those sites already recorded prior to the project. The intention is to provide a context in which the new information can be viewed and to paint an inclusive picture of the likely resource across the project area as a whole.

7.2.1 Prehistory

Fig. 10 *Distribution of prehistoric sites within the project area.*



The Neolithic and Bronze Age

The Neolithic and Bronze Age periods are represented exclusively by ritual or ceremonial features, several of which are monuments of national importance. Notable among these are the Neolithic causewayed enclosure at Raddon Hill (Fig. 11) which was discovered during the Devon Aerial Photo Project, and the Bow-North Tawton ceremonial complex (Griffith 1985).

The richest concentration of features from this period is found in the Middle transect, where two ceremonial landscapes were mapped.

The area centred on North Tawton and Bow (Griffith 1985) comprises two, possibly three, concentric circular cropmark features and a number of barrows and ring ditches interpreted as potential round barrows. Five new ring ditch enclosures, likely to be components of this ceremonial complex, were mapped. This complex is still far from fully understood, and recent geophysical survey has brought to light a number of further ring ditches and other features around the henge at Bow (F Griffith, pers comm.).

Fig. 11 *The Neolithic causewayed enclosure at Raddon Hill (SS 885 031) in the East transect. Photo: DAP RN/06 (07/06/1990)*

Fig. 12 *Prehistoric archaeology in the Middle transect. On the left is a view from the north of the long barrow or mortuary enclosure (PRN 1053) situated on a southeast-facing ridge at Sandford Cross (SS 685 013.) On the right is a view from the north of the possible mortuary enclosure or cursus monument (PRN 55834) at Crooke Burnell (SS 688 010).*

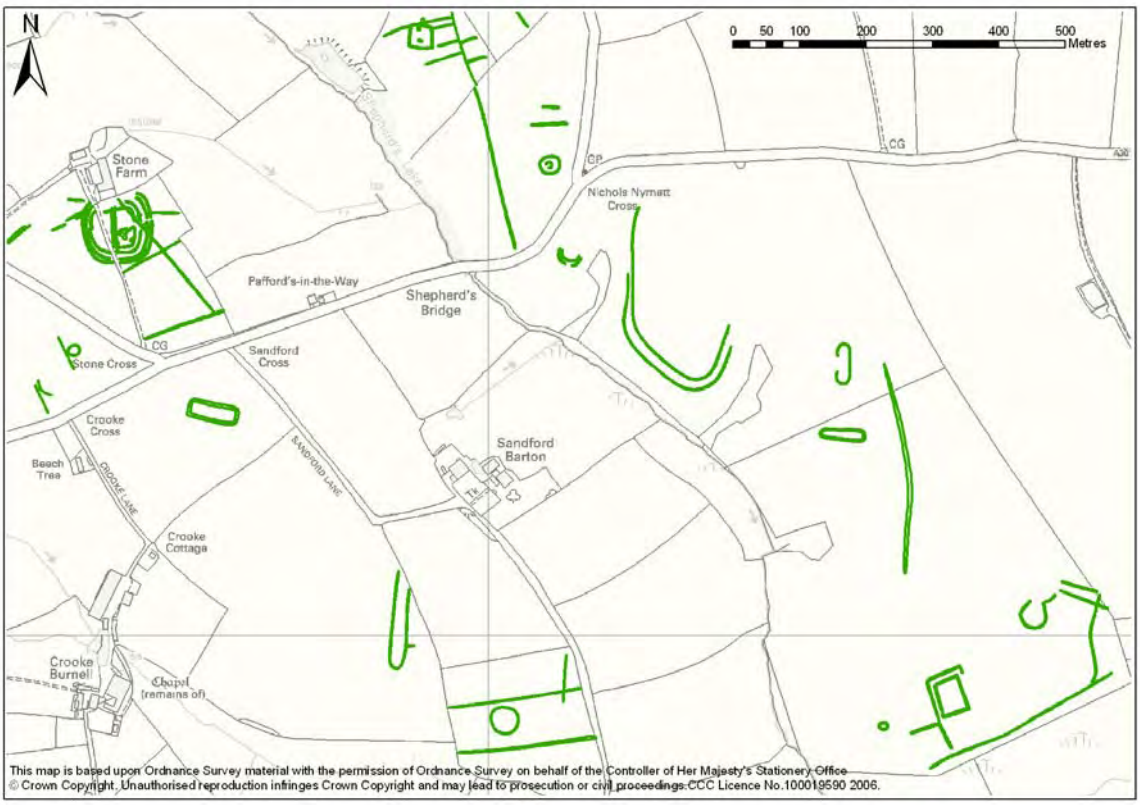
Photo: DAP/ES/03 (19/06/03)

Photo: DAP/AU/04 (03/07/84)

In the vicinity of Sandford (SS 690 010), is a complex of three mortuary enclosures or long barrows (Fig. 13). These appear as elongated sub-rectangular cropmark enclosures ranging from 70m x 20m to 60m x 15m. These are unusual and therefore important monuments; a long mortuary enclosure has been excavated at Castle Hill in east Devon (Fitzpatrick et al, 1999) but few other examples are known in the county (Griffith, 1985 and 1990). A fourth enclosure, that at Crooke Burnell (PRN 55834), is at least 147m long (it is only partially visible) and could be considered a possible cursus monument (Fig. 12).

In addition to these features a number of barrows and ring ditches (one of them, at SS690 019, a new record) of varying size are interpreted as forming part of the complex. Other cropmark features in the area may also be associated (Fig. 13).

Fig. 13 *NMP mapping of the ceremonial complex around Sandford (SS 690 010) including three mortuary enclosures or long barrows, the possible cursus monument illustrated in Fig 12 above, ring ditches and other cropmark features which may be associated.*



Bronze Age round barrows were mapped in far greater numbers. In total 55 have been recorded in the four transects, almost 60% appearing as cropmarks - either ring ditches or plough-levelled mounds. They are most frequent in the West transect, but are also relatively numerous in the East.

Eighteen possible new round barrows have been identified and mapped during the project. Six are visible as cropmark enclosures or ring ditches, the other twelve as mounds and of these, eleven survive only as cropmarks.

In total 37 mounds were recorded. Whilst their interpretation is inevitably tentative – some are interpreted as being spoil resulting from small-scale quarrying – factors such as location within the landscape (on hill tops or ridges) or proximity to previously identified barrows have influenced the interpretation of these twelve as potential barrows.

Fig 14 *Distribution of round barrows in the project area*

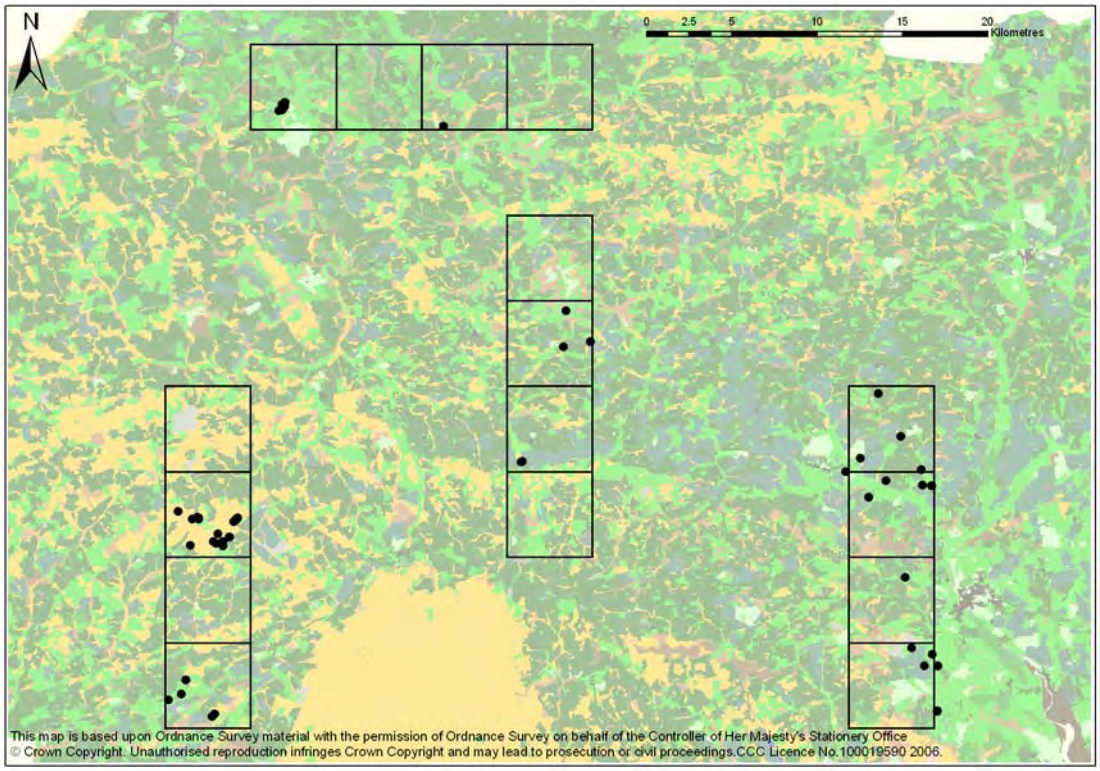


Fig. 15 *A possible new round barrow (PRN 167195) surviving as a cropmark mound at SX 465 972, close to the previously recorded barrow cemetery at Three Barrows in the Broadbury area. Photo RAF 3G/TUD/UK/138/5136 (11/04/46). Crown copyright*

The Iron Age and Romano-British periods

There are three hillforts in the project area, at Raddon, Cotley castle and Burley Down. Another site that could be interpreted as specifically Iron Age is Castle Down. These sites were all recorded prior to the project.

A large number of sites were attributed to the more general Iron Age/Romano-British or Prehistoric/Romano-British periods. These comprise enclosures, field systems, field boundaries, and pits associated with enclosures. Enclosures are the most numerous of these site types and there are, in addition, 72 enclosures recorded as being of 'unknown' date. These could all be interpreted as potentially prehistoric or Romano-British in origin. If these are included then almost 300 enclosures from this period have been identified. Nearly all are visible only as cropmarks and half are new site records.

The distribution of enclosures is not even across the four transects. They have been recorded in parts of the East and Middle transects in far greater numbers than elsewhere: in fact more enclosures were recorded from the East transect than the other three together.

Within each transect the distribution pattern of enclosures is by no means uniform. Because virtually all are only visible as cropmarks their appearance is influenced to a great extent by underlying geology, soil, and current land use. The largest number was recorded in the Mid Devon Farming Belt where the well-drained argillic soils overlying Permian sandstone are under cereal cultivation and readily produce cropmarks (Section 9.1). Thus in the East there are notable concentrations of enclosures in the eastern sector of SX88NE (Shillingford St George, Exminster and Kenn), the northern half of SX89NE (Newton St Cyres), and the southern part of SS80SE (Shobrooke), whilst in the Middle transect there are considerable numbers in the southern half of SS60SE (North Tawton).

The spatial distribution of enclosures on the evidence available is inconsistent, even in the most populous areas: although enclosures often appear in isolation, it is not unusual for several to be recorded in close proximity to one another (e.g. Figs 17, 20, 21).

NMP mapping allows the enclosures to be viewed in their landscape context and provides a snapshot of past landscapes. Fig. 17 shows prehistoric enclosures and other cropmark features mapped around Smallbrook, Newton St Cyres. Whether all these enclosures are contemporary is unclear, even unlikely. But whereas NMP mapping may not show the overall layout of the pre-medieval landscape it does indicate a considerable density of settlement remains.

Fig. 16 *Distribution of prehistoric (and potentially prehistoric) enclosures across the four transects*

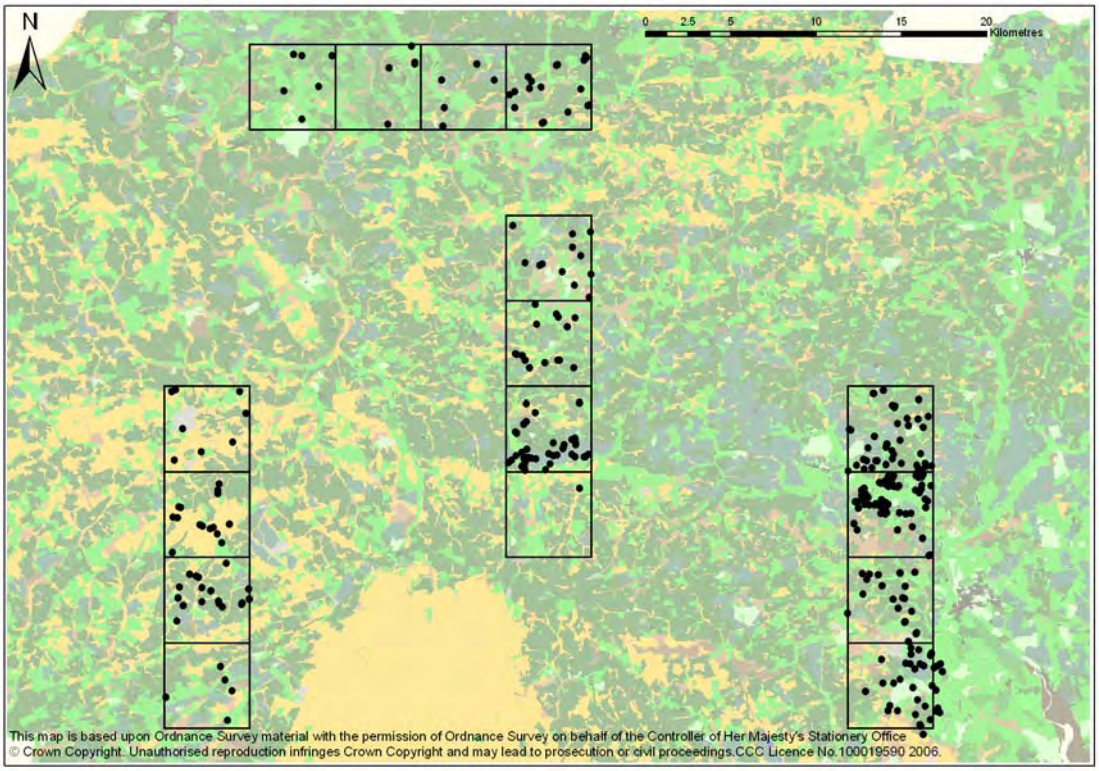


Fig. 17 *NMP mapping of prehistoric enclosures and other features around Smallbrook, Newton St Cyres (Centred on SX877 992). Ditches are shown in green; banks in red.*

A handful of the larger enclosures are multivallate, enclosed by two or more widely-spaced concentric circuits and there are a number of double-ditched examples, but the vast majority have a single ditch or bank (or both ditch and bank).

Fig. 18 *The multivallate enclosure (PRN 54109) at Yendacott, SS 899 999. Photo DAP ZY/09 (17/07/1996).*

Fig. 19 *Both curvilinear and rectilinear forms are evident among the enclosures, illustrated by these two examples at Holloway Barton, Kenn, SX 890 857. Photo: DAP BO/6A (07/07/84)*

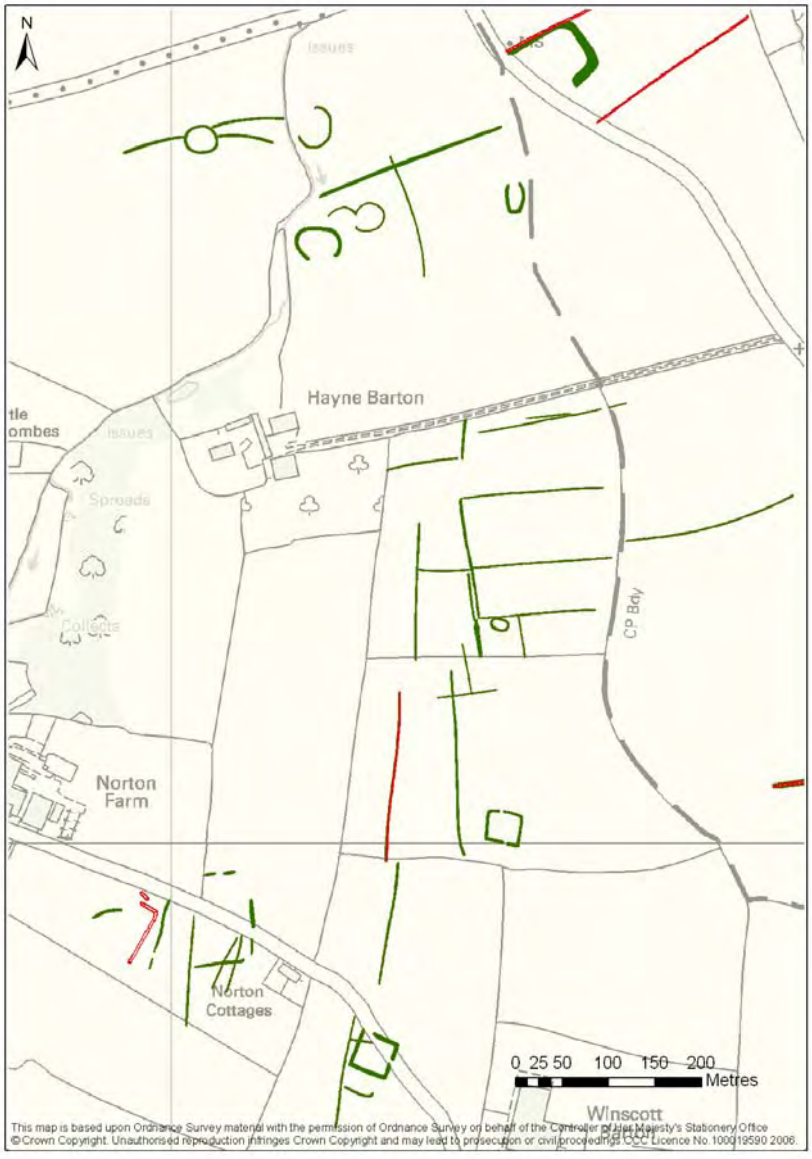
More than half of the enclosures are similar to a type known in Cornwall as a round; they are small (covering less than 1 hectare in area), and have simple entrances which lack elaboration or inturns (Quinnell, 2004, 211). Excavated rounds have proved to be enclosed farmsteads practicing a mixed agricultural economy and are widely accepted as the predominant settlement type of lowland South West England during this period. The dating of lowland enclosures excavated up to 1994 is discussed by Griffith (1997; see also Griffith and Quinnell, 2000).

There is a typically wide range of shapes evident among the enclosures, including rectilinear as well as curvilinear examples. A notable feature of their distribution is that distinctively rectilinear forms are prevalent in the East transect whilst curvilinear forms are the most frequent further west and north.

The interpretation of some of these enclosures as Iron Age or Romano-British farmsteads is based on analogy with similar excavated examples. Whilst this is the most likely interpretation, it ought not to be automatically assumed (Griffith 1994). Two recently excavated enclosures, one of which was discovered during in the Devon Aerial Reconnaissance Project in east Devon (Castle Hill and Hayne Lane), apparently of the 'round' type were shown, in fact, to be Bronze Age in date (Fitzpatrick et al, 1999).

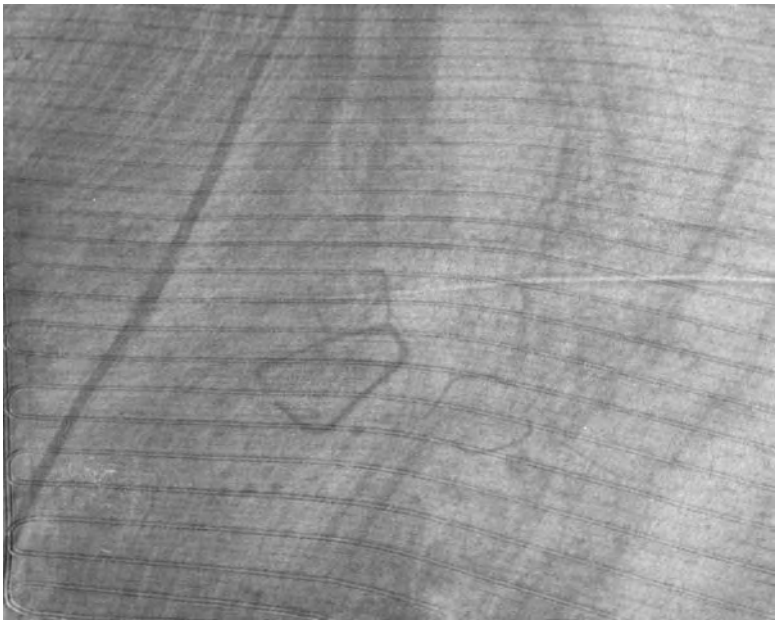
By no means all the enclosures recorded during the project are of this type. Roughly 40% enclose less than a tenth of a hectare. Some may not be settlements whilst others may represent different types of enclosed settlement. One example is the series of small enclosures recorded at Hayne Barton in the East transect. These enclosures appear to be associated with a rectilinear field system (Fig. 20).

Fig. 20 *NMP mapping of small enclosures and associated field system at Hayne Barton, SX 892 995. Ditches are shown in green; banks in red.*



Another example is the group of small enclosures at Shobrooke (Fig. 21). These are associated with a probable open settlement consisting of six round houses, several linear features likely to be the remains of a field system, and a number of pits. A fourth enclosure lies just to the north of these features (Fig. 41).

Fig. 21 *Small enclosures at Shobrooke, SS 861 012. Photo DAP ZY/05 (17/07/1996).*



It is tempting to see the polygonal enclosure at Shobrooke (the central enclosure in Fig. 21) as an enclosed settlement and the two outlying ones (especially that appended to the central enclosure) as serving some ancillary function.

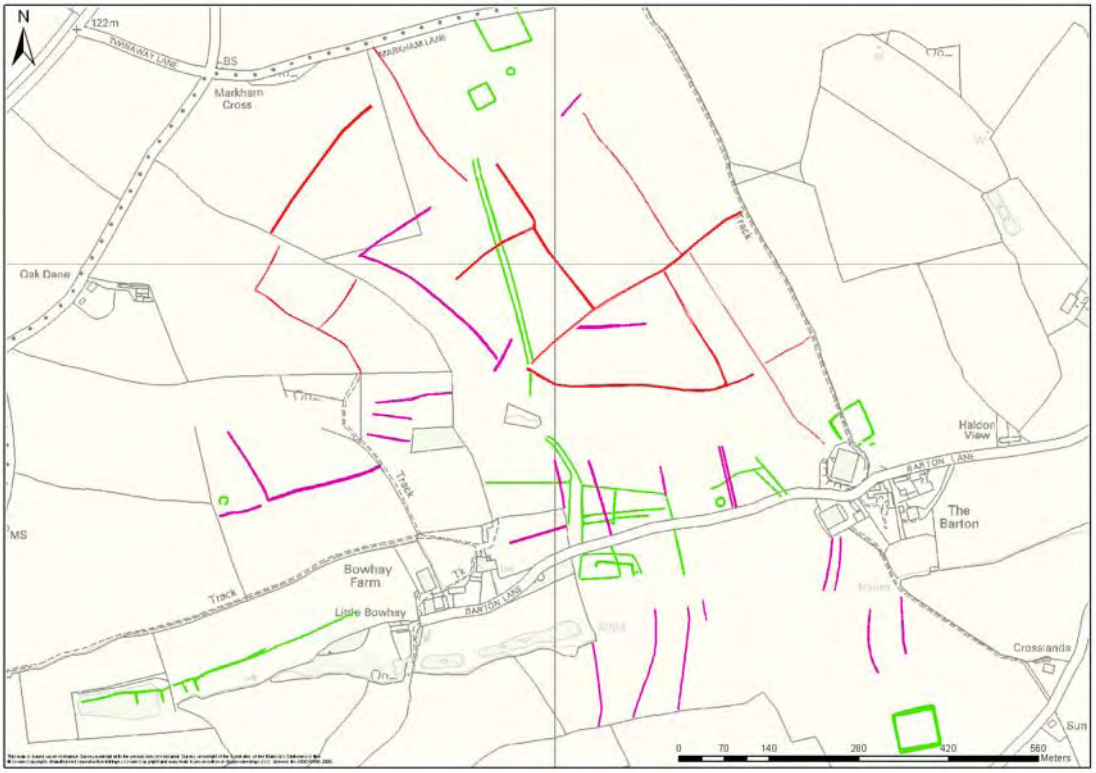
A fair percentage of small enclosures mapped during the project appear to be, or clearly are, associated with 'round' type enclosures and can be interpreted as contemporary ancillary enclosures. A considerable number, however, occur in isolation and their function can only be guessed at. Likewise their interpretation as possibly prehistoric is very much an assumption.

In addition to settlement-related enclosures a handful of possible prehistoric open settlements consisting of groups of round houses were mapped. The best example is that at Shobrooke (Fig. 36) where six possible round houses visible as ring ditches are accompanied by the features mentioned above. Four possible ring ditches (PRN 166584) were recorded from Holcombe Burnell (SX 882 926) and there were two instances of single ring ditches, at Whiddon (SX 887 896) and Bowhay (SX 894 886), which may be round houses. All of these sites are in the East transect.

As many as 40 possible prehistoric or Romano-British field systems or field boundaries have been recorded. However there are few instances where the relationship between an enclosure and associated fields can be clearly demonstrated. At best there are some cases in which an individual field ditch abuts or respects an enclosure, suggesting it is contemporary.

In most cases field systems have been interpreted as dating from this period because they are clearly on different alignments to today's field pattern which is derived largely from the medieval landscape (Section 3.4). An example are the small rectilinear fields towards the bottom left of Fig. 17. In other instances groups of field boundaries display an obvious time-depth. This is the case in the landscape at Shillingford St George (Fig. 22).

Fig. 22 *NMP mapping of the area north of Shillingford St George (SX 899 890) showing prehistoric enclosures and several phases of field system. Prehistoric (or potentially prehistoric) features are shown in green, medieval (or early post medieval) features are shown in red; features of uncertain date are shown in magenta.*



7.2.2 Roman

A small number of Roman sites occur in the project area. The main concentration is the complex of military features at North Tawton in the Middle transect. This consists of a fort (PRN 6841), a two-phased fortlet contained within a possible vexillation fort (29193), a temporary camp (4525), a possible building (55835) and associated road. Two concentric circular features in the vicinity suggested as possible watch towers (Griffith, 1985), have been reinterpreted as barrows incorporated into the later structures in the light of field visits (Griffith, in Passmore 2005).

A villa (PRN 42065) at Downes, near Crediton (Griffith 1988), and a probable signal station (PRN 20078) near Idestone Cross (Griffith 1984) are also in the project area.

Fig. 23 *The multi-phase Roman fortlet (PRN 29193) at North Tawton (SS 660 002). Other features in this cropmark complex include a concentric barrow (PRN 29192) in the centre, and a prehistoric/Roman-British rectilinear enclosure (PRN 55836) (top right). Photo: DAP BE/08 (06/07/84)*

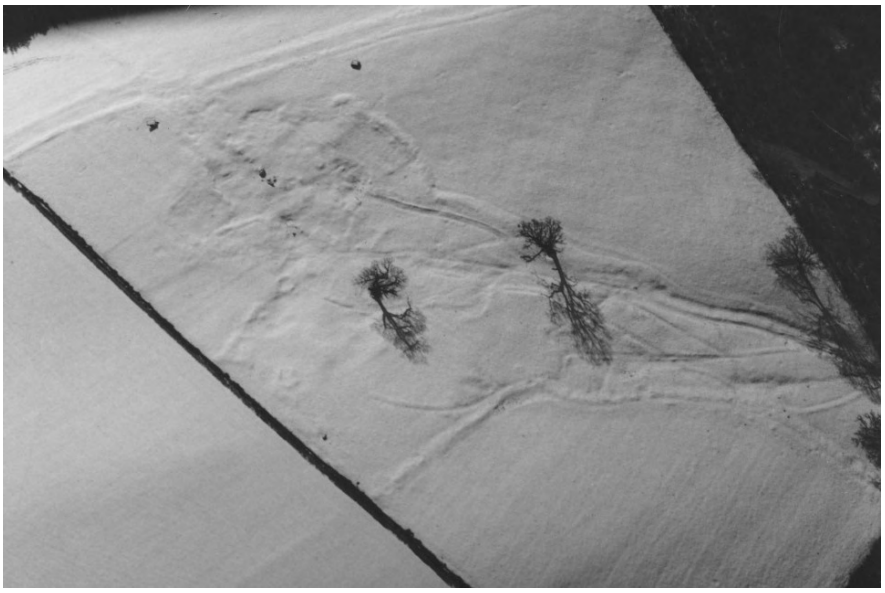
Fig. 24 *The Roman signal station (PRN 20078) near Idestone Cross (SX 885 889) Photo: DAP BO/2 (07/07/84)*

7.2.3 The medieval period and beyond

The medieval period

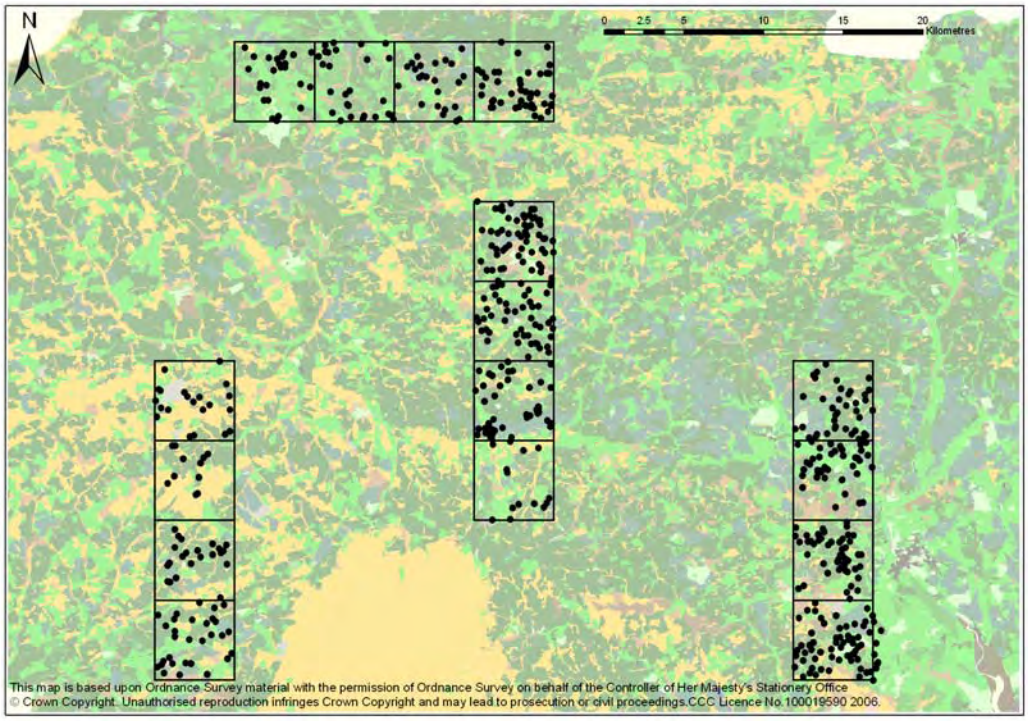
Within the project area there are five motte and bailey castles but otherwise it was not possible to ascribe sites specifically to the medieval period with any certainty. The earthwork remains of deserted settlements (six were recorded in total, all previously known) may date from this period but could equally be post medieval in origin.

Fig. 25 *Earthwork remains of the deserted settlement at Southcott (SS 694 115). Photo: DAP TX/13 (11/02/91)*



Uncertainty over precise dating applies also to field boundaries and field systems. These were mapped in large numbers and form the bulk of the recorded archaeology from the project.

Fig. 26 *Distribution of medieval or later field systems and field boundaries.*



Roughly half the field boundaries survive in the form of banks, half as ditches, and 60% are visible only as cropmarks. Although the number of extensive coherent field systems recorded (such as that at Hannaford, Fig 27) is relatively small, there are very numerous examples of single discreet boundaries or small groups of boundaries. Almost all of these, however, fit into the present day field pattern and should be considered in this context rather than as features in isolation.

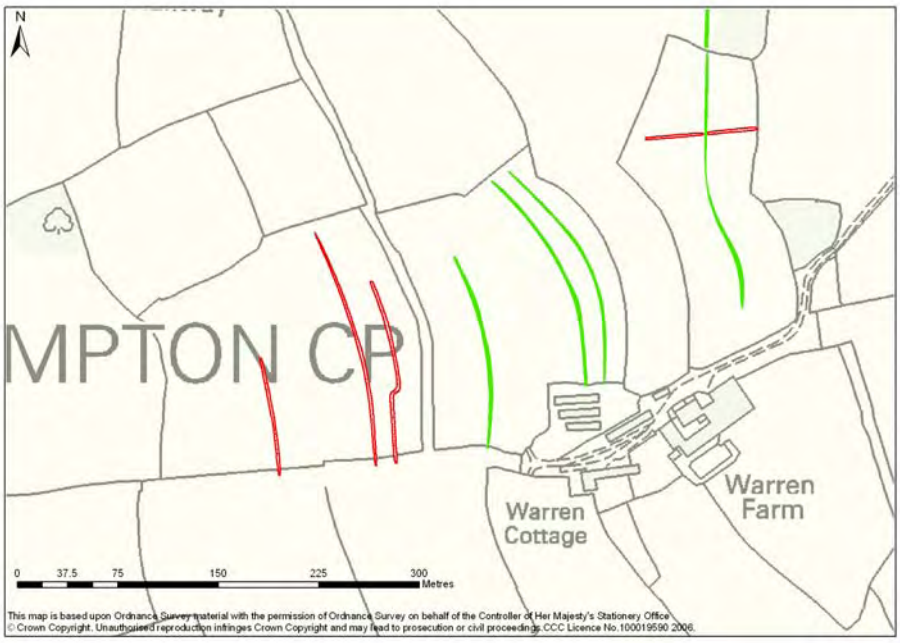
Fig. 27 *The medieval or post medieval field system at Hannaford, Kenn (SX 896 854). Photo: NMR SX 8985/18 (27/06/84). Crown copyright*

With reference to Devon's HLC, the morphology of these fields can shed light on their origins and, by association, on the date of the newly mapped boundaries. More than half are on similar alignments to and fit into present day field systems described in Devon's HLC as medieval enclosures based on strip fields (HLC type 26). They represent the enclosure of strip fields, a process which took place from at least the thirteenth century and was most common during the fourteenth to sixteenth centuries (Turner 2005, 29-40). This might suggest that as many as 70% of the field boundaries recorded during the project are, in fact, medieval in origin. In parts of Devon, however, the process of enclosure continued into the post medieval period (Turner 2005, 39) and in the absence of documentary or other evidence, late medieval/early post medieval seems the most appropriate date attributable to these features.

Almost all the boundaries resulting from the enclosure of strip fields in the project area reflect a block of several strips being enclosed as one. There are, however, a few instances where the mapped boundaries clearly represent the piecemeal enclosure of only one or two strips, such as the boundaries at Upcott in the Middle transect (Fig. 28).

In the northernmost map sheet of the Middle transect there is a rare survival of medieval strip enclosures (HLC type 27) in the vicinity of Chulmleigh. A number of field boundaries and catch meadows were recorded from this area.

Fig. 28 *NMP mapping showing the enclosure of strips (HLC type 26). Newly mapped boundaries at Upcott (SS 494 034). Ditches are shown in green; banks in red.*



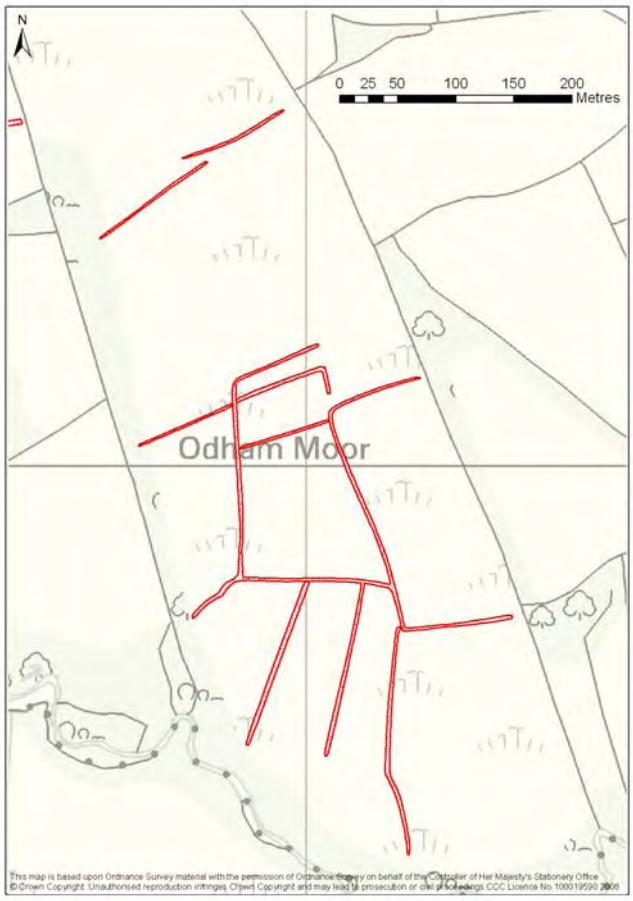
There are also instances where field boundaries fit into present-day field patterns characterised in the HLC as medieval enclosures (Type 25) and Barton fields (Type 21). These reflect fourteenth to seventeenth century enclosure of blocks of fields including the subdivision of large enclosures of demesne fields (Section 3.4). These fields are generally larger and more regular in form than enclosures based on strip fields and within the project area are much less numerous.

Fig. 29 *NMP mapping showing medieval enclosures (HLC type 25). Newly mapped boundaries at Higher Barton, Doddiscombsleigh (SX 860 860)*

The post medieval period

There is a greater degree of certainty over the dating of features from the post medieval landscape. Roughly 20% of the newly recorded field boundaries are very probably post medieval in origin. Typically they are on similar alignments to and fit into present day field systems described in Devon's HLC as post medieval enclosures (HLC type 19). These were laid out during the eighteenth and nineteenth centuries and have very distinctive straight boundaries. Other field boundaries from this period are those located in areas described as rough ground (HLC types 13 and 14) in Devon's HLC and which are interpreted as being late post medieval clearance and enclosure.

Fig. 30 *NMP mapping of remains of a stone and earth field banks at Odham Moor (SS480 020) reflecting post medieval enclosure of rough ground.*



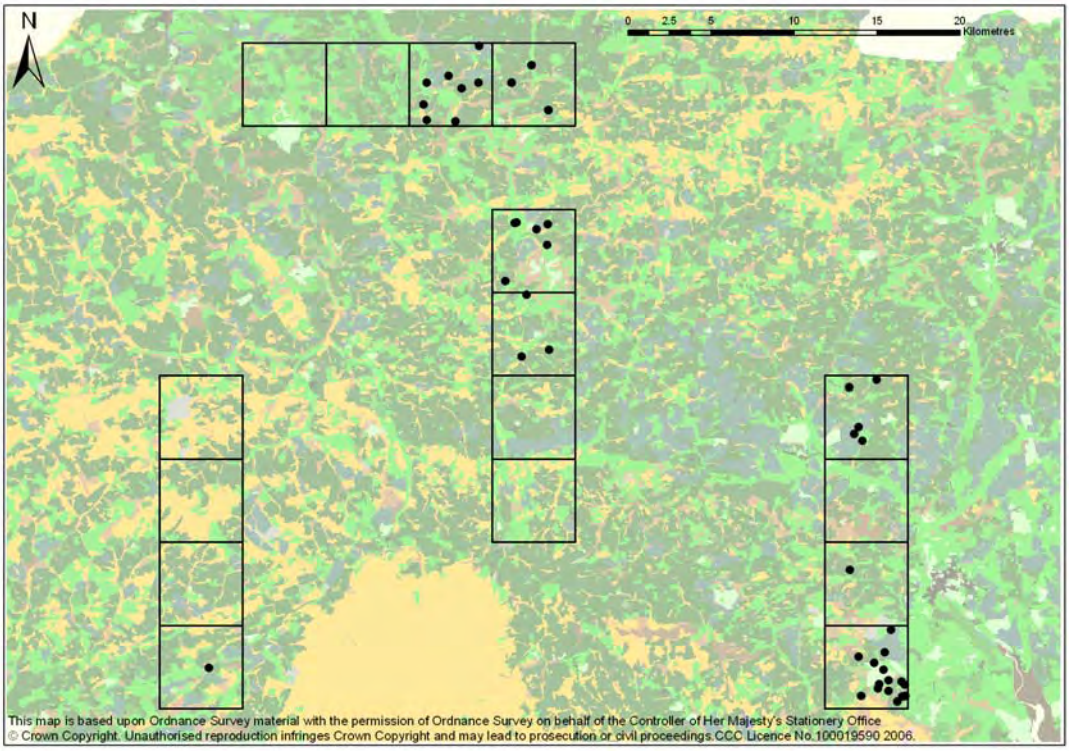
Two noteworthy features of the post medieval agricultural economy in the project area are orchards and water meadows. In most cases the sites of former orchards are indicated by wide parallel ridges; these were designed to enhance drainage for the fruit trees and shrubs planted on them.

Post medieval water meadows are of a very characteristic form known as catch meadow irrigation systems. Catch meadows are found in localised concentrations in different parts of Devon and are typically a nineteenth century and earlier method of land improvement which involved the creation of parallel leats running along the contours of hill-slopes. Water holding tanks controlled the flow of water along the leats which were allowed to periodically overflow and water to spill down slope. This was intended to bring on the early growth of spring grass (Griffith, 1998, 104; Riley and Wilson-North, 2001).

Fig. 31 *The contour-hugging leats of a typical Devonian catch meadow system at Lower Pennicott (SS 872 011). Photo: RAF CPE/UK/1823/3187 (04/11/46). Crown copyright.*

Both orchards and catch meadows are most abundant in the East transect but virtually absent from the West. Catch meadows are also locally abundant in the North transect (especially in map sheet SS62SW) and some of the best-preserved examples are to be found there although the reason for this is unclear.

Fig. 32 *Distribution of catch meadows.*



A predominant feature of the later post medieval landscape in the West transect are extensive areas of cultivation marks, appearing either as cropmarks or low parallel ridges.

Fig. 33 *Distribution of cultivation marks and post medieval ridge and furrow*

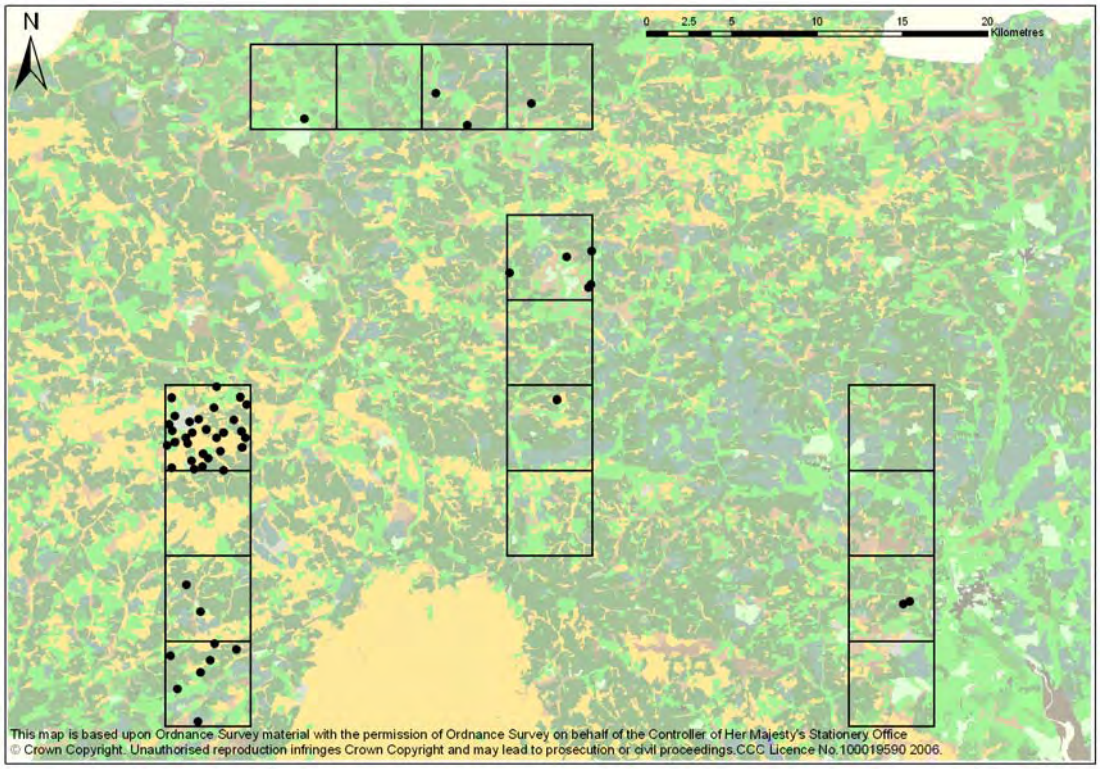


Fig. 34 *Cultivation marks, evidenced by parallel narrow ridging, at Highampton (SS 499 020). Photo: RAF F21/82/1199/0034 (25/05/55). Crown copyright*

The cultivation marks are typically long, straight and narrow and appear to be the result of mechanical ploughing. In many cases these features are interpreted as being nineteenth or early twentieth century improvement of rough ground and are frequently accompanied by drainage features. Similar cultivation marks were recorded in places in the Middle and North transects but there they cover nothing like as extensive an area as in the West.

Cultivation marks of this type closely resemble post medieval ridge and furrow and in some cases, where differentiating between the two was particularly difficult, site records were double-indexed in the database (see Appendix 3).

Quarries are a characteristic and widespread feature of the post medieval landscape. More than 150 quarries were identified, of which almost two thirds had not previously been recorded. Most quarries in the project area are pre-1900 in date but a small number of twentieth century quarries were also recorded.

The twentieth century

The most significant twentieth century remains mapped during the project were Second World War features. These include a heavy anti-aircraft battery at Nadderwater which formed part of the defences of Exeter. There are also two possible military camps from this period and a series of bomb craters to the west of Exeter.

Fig. 35 *A line of bomb craters to the south of Exwick Wood, SX 899 940. The bombs have narrowly missed a small orchard (centre of photograph).* *Photo RAF 106G/UK/1630/5124 (08/07/46). Crown copyright*

8 New information provided by the survey

The NMP survey has proved remarkably successful in identifying new archaeological sites. The anticipated outcome expressed in the Project Design (Dyer 2004, 22) was that 'whilst primary mapping of the oblique aerial photographs held by the Devon HES has taken place…, it might still be expected that 2-300 new sites will be recorded through the proposed NMP mapping project.' In the event, 1,316 of the sites recorded – 78% of the database – are new to the Devon HER and 1,410 (92%) are new to the NMR.

In part this success is due to NMP methodology involving the systematic consultation of all available aerial photographs, and the fact that resources had not previously been available for the systematic transcription from vertical photography in Devon. The various series of vertical photography (Appendix 1) were the source of information for more than 90% of the new sites. Of these series the flights carried out by the RAF during the 1940s and 50s were especially valuable, providing information on 1,184 new sites.

Many new examples of certain site types, including some of the most predominant in the project area, were recorded.

- almost all records for Second World War remains
- ninety percent of records for historic period field systems and boundaries
- almost all records for ridge and furrow
- almost all records for cultivation marks
- almost all records for catch meadows
- almost all records for orchards
- more than half the records for quarries

In part the success of the project in identifying new sites is due to some of these types of sites not being included in the remit of previous mapping work in Devon. In particular there had been no systematic programme of recording individual medieval or post medieval field systems.

On the other hand the NMP survey has also identified a significant number of new sites of the types that were the focus of the Devon Air Photo Project (Section 3.6). It should be pointed out that some of these represent the recording of individual features previously transcribed as complexes in the Devon HER. New examples include:

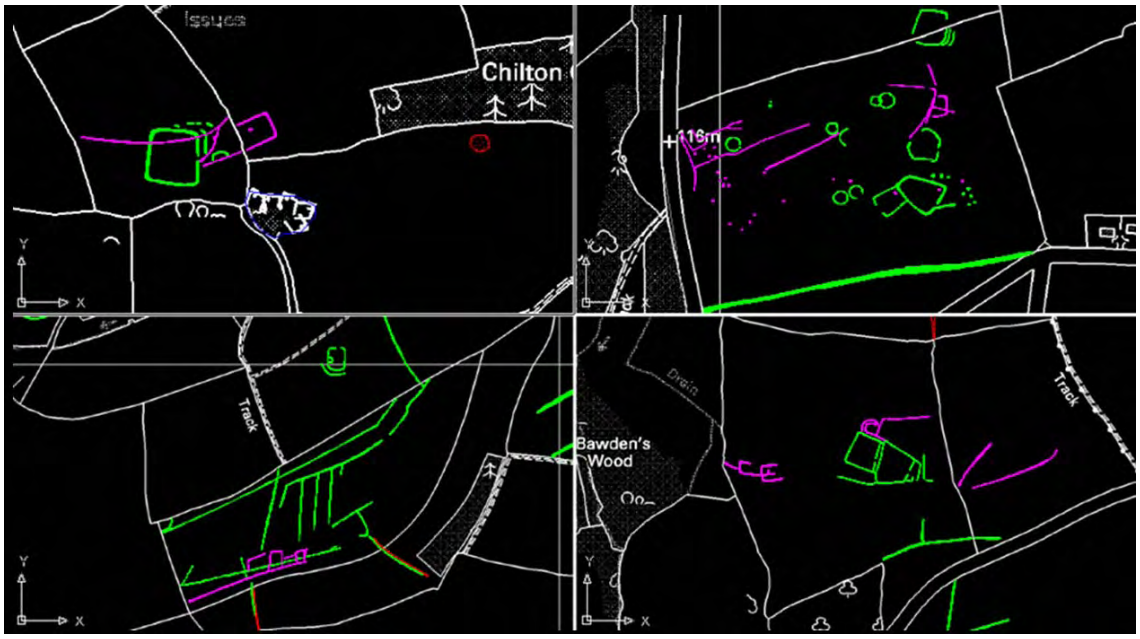
- 149 prehistoric or potential prehistoric enclosures.
- Eighteen possible new round barrows.
- Three possible open settlements consisting of round houses and associated field boundaries.
- Six lynchets of uncertain date, some perhaps prehistoric.
- Two sites of pillow mounds, the only ones recorded in the project area.

The project has enhanced the HER for this part of Devon not only through mapping new sites. A number of sites were mapped which had been previously identified on aerial photographs but not plotted. For example the earthwork remains of deserted settlements from the medieval or post medieval periods (Fig. 25).

For some sites documentary or other evidence was already available and this has been complemented by NMP mapping. One instance of this is the mapping of the remains of Eggesford House which survive as a series of ruined walls.

Additional detail was added to existing plots of many previously identified sites. This is difficult to quantify but was certainly the case in a significant number of cases.

Fig. 36 *NMP mapping from the East transect. Additional information (shown in magenta) added to sites which had previously been plotted (shown in green) as part of the Devon Air Photo Project. Locations: Chilton (SS 865 045) top left; Shobrooke (SS 861 014) top right; Lower Pennicott (SS 876 007) bottom left; West Raddon (SS 894 026) bottom right.*



Finally there were a few instances where sites had been previously identified from aerial photographs and interpreted as archaeological features but were considered by the project team to be natural features or the result of agricultural activity, or which could not be seen at all on the quoted photographs. These observations were added to the existing records for the sites in question.

8.1 Enhancement of the Devon HER

A numerical analysis of sites contained in the Devon HER for the project area prior to the mapping is presented in the Project Design (Dyer, 2004, 21). Many of those records are for sites either beyond the remit of NMP mapping (e.g. churches and other buildings) or which are not visible on aerial photographs (e.g. artefact find spots). Once the data resulting from the project is incorporated into the HER the breakdown will be as outlined in Table 2.

Table 2. *Distribution of records in the updated Devon HER for the project area*

Sheet	Total site entries in database	New sites	Percentage of new sites to total entries (%)	Total of crop mark sites	Percentage of cropmarks to total entries (%)
North transect					
SS52SW	132	65	49	52 (2)*	41
SS52SE	135	60	44	41 (3)	36
SS62SW	154	76	49	26 (0)	17
SS62SE	140	91	65	61 (3)	46
Total	**561**	**292**	**52**	**180 (8)**	**32**
West transect					
SS40SE	135	93	69	51 (0)	38
SX49NE	133	49	37	39 (6)	30
SX49SE	147	61	41	64 (2)	44
SX48NE	157	75	48	27 (2)	17
Total	**572**	**278**	**49**	**181 (10)**	**32**
Middle transect					
SS61SE	254	116	46	33 (3)	18
SS60NE	223	125	56	81 (8)	36
SS60SE	260	105	40	128 (40)	49
SX69NE	115	27	23	10 (0)	1
Total	**852**	**373**	**44**	**252 (51)**	**30**
East transect					
SS80SE	229	83	36	106 (36)	46
SX89NE	229	51	22	119 (80)	52
SX89SE	235	106	45	49 (2)	21
SX88NE	313	134	43	78 (18)	25
Total	**1006**	**374**	**37**	**352 (136)**	**35**
Entire project area					
Total	**2991**	**1317**	**44**	**965 (205)**	**32**

* Bracketed numbers indicate the number of cropmark sites for each map sheet in the Devon HER prior to the mapping project

NMP mapping has increased the number of archaeological sites in Devon's HER by 44% across the project area. Also significant is the percentage of cropmark sites across the project area recorded in the updated HER. This is shown in Table 2 and is remarkably even (between 30 and 35% for each transect), which was certainly not the case prior to the project. NMP mapping has clearly been effective in providing a more balanced view of the cropmark archaeology within the project area than was hitherto possible.

9 Factors influencing site distribution

The distribution of archaeological features recorded during the project is by no means uniform across the four transects. In numerical terms the East transect is the richest of the four. Sites from all periods are well represented and examples of almost all the predominant site types in the project area are most numerous here. More fields than in any other transect, more prehistoric enclosures than from the other three transects put together, half the orchards and catch meadow systems and almost all the Second World War features are in this transect.

To a degree this uneven distribution reflects in part the vagaries of past human settlement and activity, in part the inevitable inconsistencies in the aerial photographic record (some areas, for instance, have been subject to more archaeological aerial reconnaissance than others). To a greater extent, however, there are identifiable patterns to the distribution which can be readily understood when certain factors are considered. Principal among these are the influence of underlying geology, soils, and current land use: these influences are discussed below in section 9.1. Whilst these factors explain some more obvious trends, land use history, as reflected in Devon's HLC, sheds light on the more subtle aspects of site distribution: these aspects are discussed in section 9.2.

9.1 The Mid Devon Farming Belt

The most obvious cause of bias in the perceived distribution of sites is the tongue of Permian red sandstone and associated argillic brown earth (soil type 23) characterising the Mid Devon Farming Belt (Sections 3.1 - 3.3). The visible archaeological resource in the Farming Belt is considerably more populous and diverse than elsewhere.

The contrast between the density of recorded archaeology from the brown earths of the Farming Belt with that from the gley soils is well illustrated in map sheet SS60SE in the Middle transect (Fig 37). The western tip of the sandstone tongue runs through the lower third of this map sheet, whereas lowland stagnogley soils (soil type 51) characterise the upper two thirds. The lower part of the map (the area around North Tawton and Sandford) contains numerous sites, including some of the most important in the project area (e.g. Figs.12, 13, 23). By comparison the northern part of the map is much less densely populated, as is the map sheet to the immediate south (SX69SE).

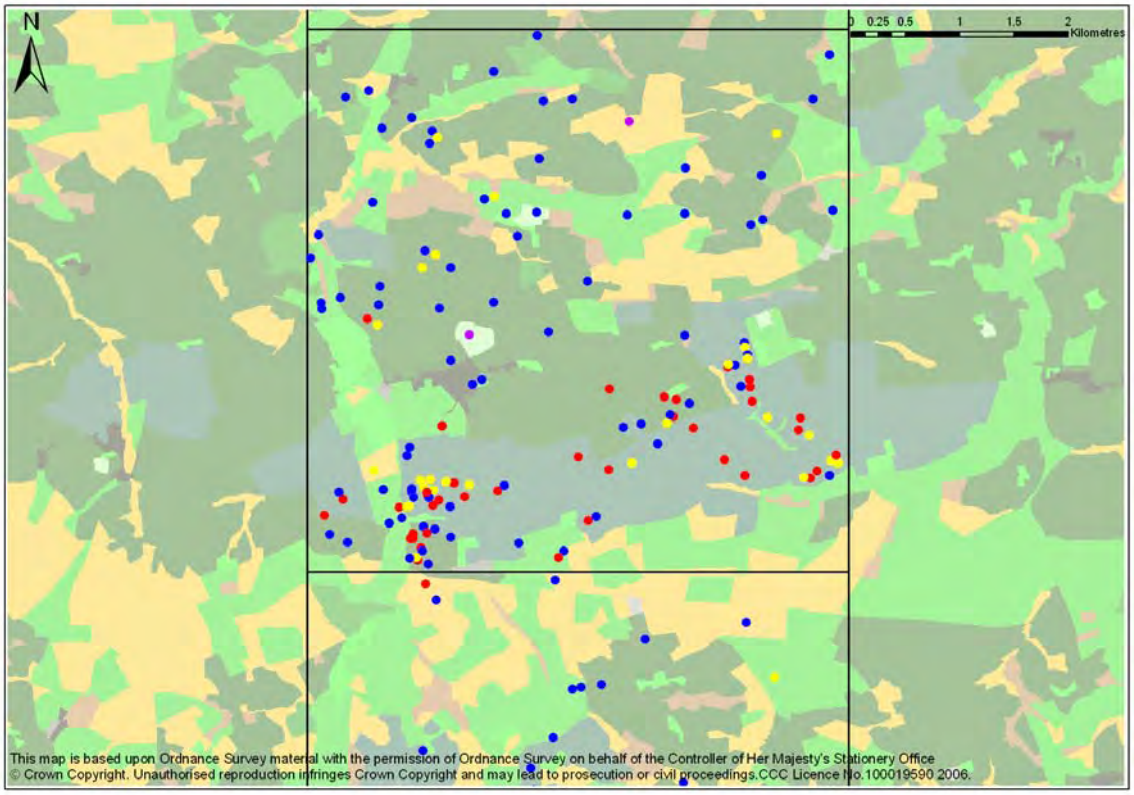
It can be argued that because argillic brown earths are the most fertile soils the Farming Belt will have always housed the most settlements, just as it does today.

There is, doubtless, some truth in this assertion but it is an over-simplification. The key characteristic of the archaeological resource in the Farming Belt is the high proportion of sites visible as cropmarks (e.g. 80% of sites in Fig.37). The soils overlying sandstone are free-draining and locally gravely. This renders them far more conducive to cropmark production than the gley soils of the Culm Measures, which can suffer from impeded drainage and have a locally high clay content.

Fig. 37 *Distribution of sites in SS60SE and the northern part of SX69NE in the Middle transect. The southern half of the SS60SE overlies Permian sandstone: the density of sites is greater here than to the north or in SX69NE to the south.*

Red symbols represent prehistoric or Roman sites, blue symbols medieval or post medieval sites, yellow symbols sites of unknown date.

The background comprises HLC types: green/brown represents medieval enclosures based on strip fields (type 26), grey represents Barton fields (type 21), bright green represents post medieval enclosures (type 19), and yellow represents rough ground (types 13 and 14). A large proportion of the archaeology occurs within the area of Barton fields.



The influence of soils and geology is magnified by land use within the Farming Belt. Parts of the zone support cereal production and are under arable regime. Commercial pressure has resulted in widespread field hedge removal and there has been a history of repeated ploughing. Consequently much of the medieval-derived character of the landscape has been removed or altered. The archaeological record of these areas is one almost exclusively of cropmarks and reflects, for the most part, the pre-medieval landscape (Griffith, 1994; Griffith and Quinnell, 2000).

Fig. 38 *The landscape southwest of Exeter in 1992 (SX 885 895). The fields under arable in the centre and lower right, in Ide and Shillingford St George, have been enlarged by the removal of field hedges. The fields in Alphington, towards the top and left of the photo have retained much of their medieval- and post medieval-derived character. Photo: Geonex 126/92/026 (31/07/92) Copyright: 1993 Geonex UK.*

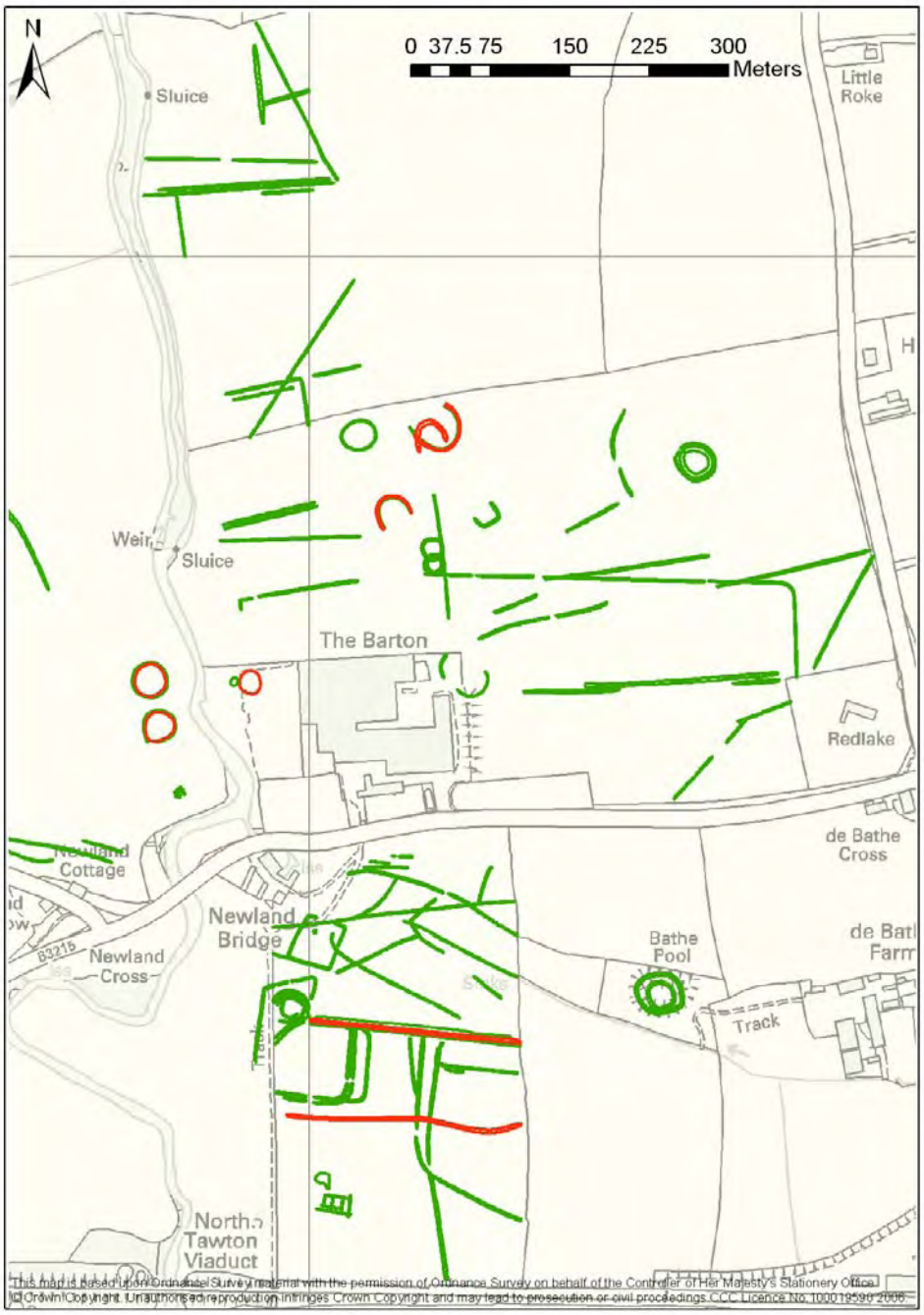
Because of these factors the below-ground archaeology of the Mid Devon Farming Belt is more visible on aerial photographs (albeit in the form of cropmarks) than that of any of the other landscape zones.

This suggests why visible archaeological sites are most numerous in the Farming Belt, and why the visible archaeological resource is characterised by a more diverse range of site types. In these favourable conditions cropmarks showing fine detail or relatively insubstantial features (such as small ring ditches or pits) are readily detectable. The distribution of sites of this type is limited to the Farming Belt. Cropmarks of removed field boundaries or the substantial ditches of enclosures, on the other hand, are found throughout the project area.

The well-drained and fertile nature of the soils in the Farming Belt has also influenced past land use and, consequently, the Historic Landscape Character of the zone. Within the Farming Belt, areas of Barton fields (HLC type 21) are much more extensive than elsewhere. Barton fields characterise the holdings of wealthier landowners (they often represent the enclosure of demesne fields) and, by inference, contain the locally best farming land. They are generally more regular in form and larger than other medieval-derived fields (Section 3.4.1 and Fig. 7), which facilitates ploughing. As a result the

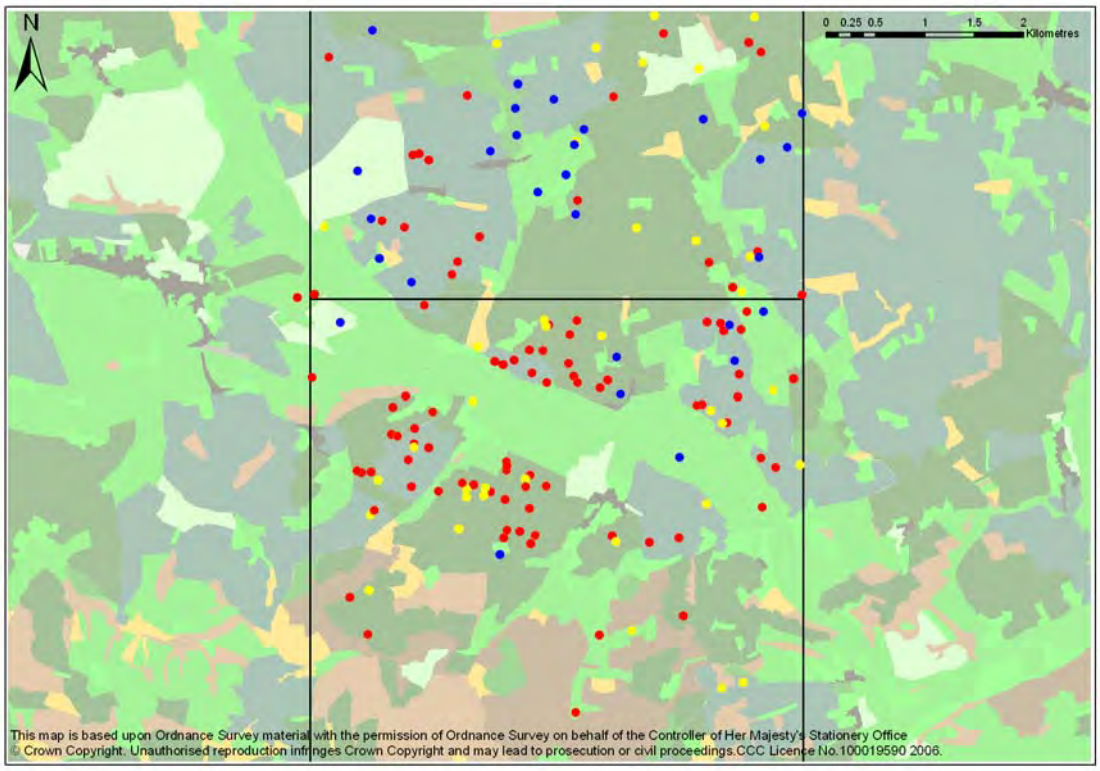
cropmark resource of Barton fields is more apparent than that of any of the other HLC types. In Fig. 37 the dense concentrations of visible archaeological remains are confined to a large extent to the area of Barton fields (shown in blue) which coincides almost exactly with that of the argillic soils.

Fig. 39 *The archaeology of Barton fields in the Middle transect. NMP mapping of cropmark features to the south of North Tawton (SS 660 003). These include a two-phased Roman fortlet, the northeast corner of a temporary camp, a rectilinear prehistoric/Romano-British enclosure; several ring ditches, three plough-levelled barrow mounds, a number of medieval-derived field boundaries, and numerous linear features. The double-ditched linear feature running east-west has been interpreted as the northern side of a vexillation fortress (Griffith, 1985). Ditches are shown in green, banks or mounds in red.*



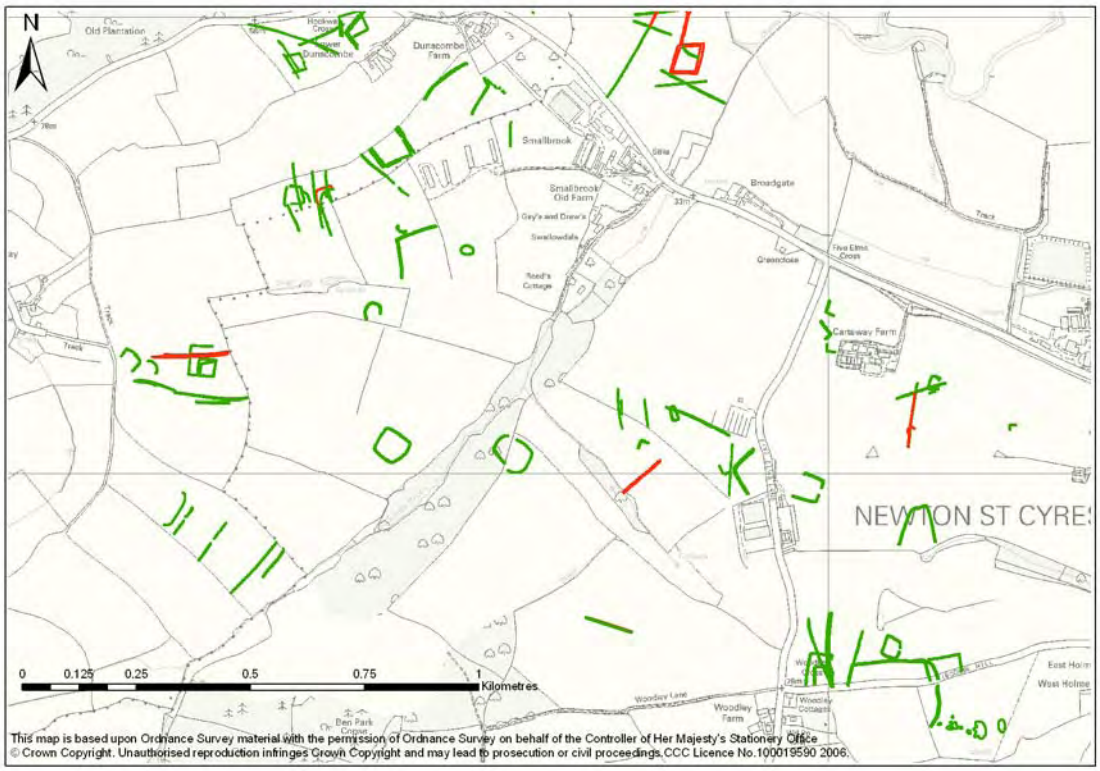
The relationship between argillic soils and Barton fields is apparent in other parts of the Farming Belt. The northern half of map sheet SX89NE and southern half of SS80SE, in the East transect, are host to a rich cropmark landscape overlying sandstone and argillic soils and parts of this area are characterised by Barton fields.

Fig. 40 *Distribution of cropmarks and HLC types in SX89NE and SS80SE in the East transect. Red dots = prehistoric or Romano-British sites, yellow dots = medieval or 'historic' sites, blue dots = post medieval sites. HLC types: Grey = Barton fields (type 21), green/brown = medieval enclosures based on strip fields (type 26), bright green = post medieval enclosures (type 19), yellow = rough ground (types 13 and 14), brown = woodland (types 17 and 18).*



The visible archaeological resource of the area shown in Fig. 40 is concentrated not only in the Barton fields, but in the medieval-derived landscape generally. Indeed, medieval enclosures based on strip fields (type 26) can be seen to contain site densities comparable to that of Barton fields.

Fig. 41 *NMP mapping of archaeological features located in an area of medieval enclosures based on strip fields (type 26) in the Newton St Cyres area of the East transect, centred on SX 863 980. Ditches are shown in green; banks in red.*

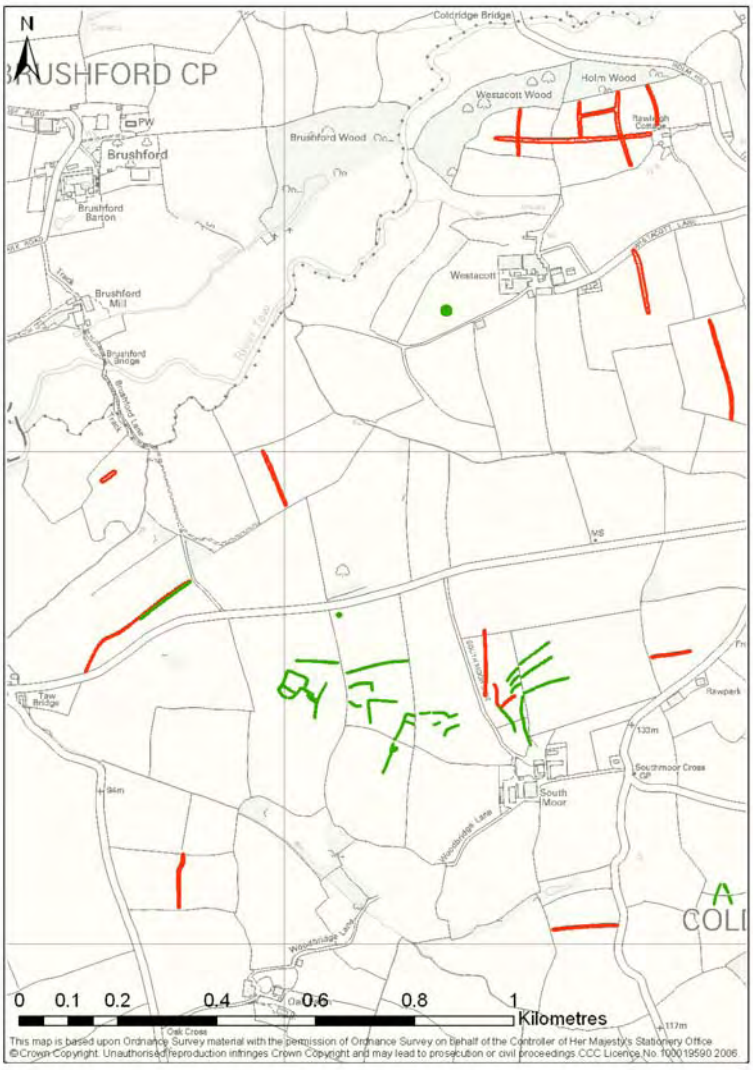


Whilst Barton fields are far less widespread outside the Farming Belt (covering only 4% of the North transect, for instance), medieval enclosures based on strip fields are found extensively throughout the project area. Outside the Farming Belt, however, the visible archaeological resource of type 26 medieval enclosures is comparatively less rich.

Little intensive ploughing has taken place elsewhere in the project area where the agricultural regime is predominantly pastoral. The historic character of the landscape (based on strip fields) has remained largely intact and comprises extensive systems of small irregular fields which, for the most part, fossilise the layout of the medieval field pattern.

Comparison of NMP mapping of the Farming Belt (Figs. 39 and 41) with that of the area between South Moor and Rawleigh (Fig. 42) in the Taw and Torridge River Systems zone illustrates these differences. This sample of mapping can be said to be broadly typical of much of the project area outside the Farming Belt, both in terms of landscape character and the visible archaeological resource.

Fig.42 *NMP mapping of the area between South Moor and Rawleigh (SS 682 065) in map sheet SS60NE in the Middle transect. Most of the area in this illustration is characterised as medieval enclosures based on strip fields (HLC type 26). In general terms the recorded archaeology from this map sheet typifies the overall archaeological resource of the project area as a whole. Ditches are shown in green, banks in red.*



A high proportion of sites recorded from this landscape relate to the late medieval and early post medieval reorganisation of farming land and, although some enclosures have been mapped, the prehistoric landscape is more elusive than in the Farming Belt.

Nevertheless NMP mapping demonstrates that a prehistoric landscape does exist. This is most apparent when considering the overall distribution of prehistoric enclosures. Enclosures were recorded from every map sheet in the project area and can be seen as a key indicator of the prehistoric archaeological resource. Their substantial ditches are more likely to produce cropmarks in the gley soils than some types of site recorded from the Argillic soils (43 new enclosures were recorded from the West transect, for instance). Away from the Farming Belt, enclosures are distributed at an average rate of one per 2.5 kilometres. Their very dense distribution in the Farming Belt does, however, suggest that their actual rate of distribution elsewhere may well be higher than this.

In conclusion, buried archaeological remains in Barton fields and medieval enclosures based on strip fields in the Mid Devon Farming Belt are apparent in large numbers.

Medieval-derived fields elsewhere in the project area, on the other hand, do not necessarily produce similar results. What can be said is that the particularly favourable conditions in the Farming Belt allow the archaeological potential of this landscape to be more fully visualised and it is likely that medieval-derived fields outside the Farming Belt contain a comparable density and range of sites not fully visible on aerial photographs.

9.2 Historic Landscape Characterisation

The previous section explored the link between the nature of the archaeological resource and Barton fields. This theme, linking recorded archaeology to HLC types, can be developed and extended to cover the whole range of HLC types across the project area. HLC is a method for understanding the nature of the landscape with reference to its historical development. It presents interpretations of the historic character of the whole landscape and allows the historic landscape to be given archaeological significance on a wide scale. In this way it can serve as an indicator of the nature of the archaeological resource likely to be encountered within the various landscape types.

For the purpose of assessing the nature of the resource within the various HLC types, it is convenient to group together the principal types into the four broad categories presented in Section 3.4.

9.2.1 Medieval-derived fields

These comprise by far the largest category, covering 21,862ha (55%) of the project area. The individual medieval-derived HLC types are listed below.

- Medieval enclosures based on strip fields (type 26)
- Barton fields (type 21).
- Medieval enclosures (type 25)
- Post medieval enclosures with medieval elements (type 20)
- Medieval strip enclosures (type 27)
- Strip fields (type 23)

All the medieval-derived types contain proportionately large numbers of medieval or early post medieval field boundaries and field systems (Fig. 42), sometimes with associated ridge and furrow. All bar type 23 (which is rare in the project area) contain prehistoric enclosures (Fig. 41). They also contain a fair number of quarries and features representing elements of the post medieval agricultural landscape such as orchards and catch meadows.

For the most part the ratio of cropmark to earthwork survival of features in the medieval-derived types is roughly 50:50. But in types 20 and 21 (post medieval enclosures with medieval elements and Barton fields respectively) three times as many cropmarks were recorded than were earthworks. In places where soil conditions are favourable, these features were recorded in dense concentrations (Section 9.1, Fig.40).

Of all the HLC types in the project area types 26 and 21 contain by far the most enclosures.

Many of the site types which are rare in the project area, including ring ditches, long barrows, lynchets, and prehistoric field systems, are found mainly in type 21 and, to a lesser degree, in type 26 (Figs. 39 and 41).

Medieval-derived fields form the historic farming heartland within the project area and consequently the focus of settlement from the medieval period and earlier. They contain the largest numbers of recorded sites and the most diverse range of archaeological features. NMP mapping suggests that the archaeological potential of Barton fields (type 21) is of particular significance.

9.2.2 Post medieval-derived fields

This category comprises

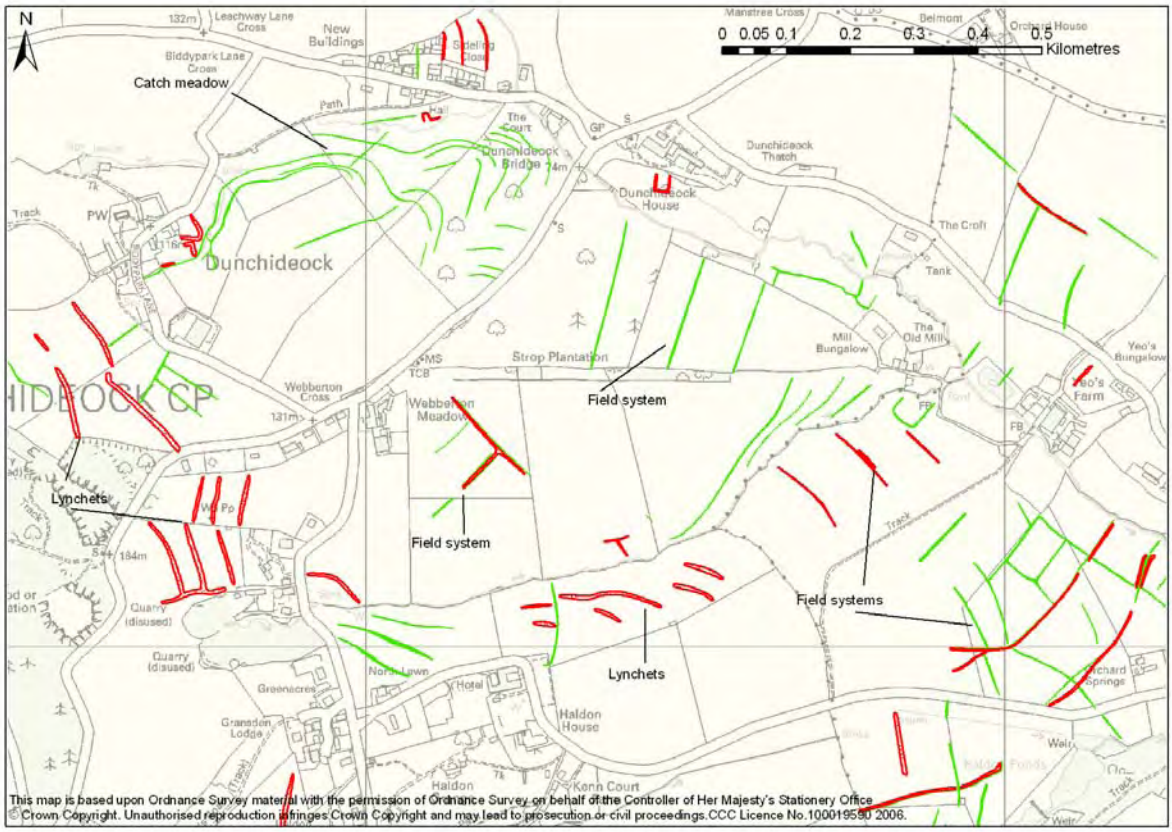
- Post medieval enclosures (types 19 and 50)
- Orchard (type 11)
- Park/garden (type 10)
- Post medieval water meadow (type 52)

Post medieval-derived fields cover 8,613ha (22%) of the project area. Obviously proportionately high numbers of orchards and catch meadows were recorded, and a considerable percentage of the cultivation marks and drainage systems identified were within type 19 fields. The predominant features from these types are field boundaries and field systems. These were usually interpreted, using morphological criteria, as post medieval in date.

On the other hand, a number of prehistoric sites were recorded from type 19 fields. These include round barrows but also enclosures, for instance Broadbury Castle in Beaworthy (SX 483 958). This enclosure (and others mapped during the project) and the barrows are located in land that was formerly rough ground. In other instances enclosures and associated prehistoric features occur in type 19 fields which probably represent reorganisation of earlier field systems. Post medieval fields often erase traces of such earlier systems and it was not always possible during Devon's HLC to recognise all cases involving this type of reorganisation (Turner, 2004, 49). During the project prehistoric features were sometimes recorded in type 19 fields lying adjacent to medieval-derived field types suggesting, in those particular locations, that either post medieval reorganisation has erased evidence of the medieval layout or that the full extent of the prehistoric farmed area was not enclosed during medieval reorganisation (Fig. 43). Instances like this demonstrate one way in which NMP mapping can help refine the HLC process.

Fig. 43 *NMP mapping of probable medieval and/or prehistoric field ditches overlain by later trackways in post medieval fields (HLC type 19) south of Haldon House, SX 879 861. Ditches are shown in green; banks in red.*

Fig.44 *NMP mapping of archaeological remains in the grounds of Haldon House and Dunchideock Barton (SX 884 873). Ditches are shown in green, banks in red.*



One of the HLC types included in this category, parks and gardens, is of particular interest. Parks and gardens cover 694ha (2% of the project area). In several cases former landscapes are visible in parkland and were recorded. The most extensive relict landscape to be mapped is that in the grounds of Haldon House and Dunchideock Barton (Fig. 44), comprising the most extensive catch meadow recorded in the project area, a number of lynchets and traces of several field systems.

In general the archaeological resource of post medieval-derived fields is less rich and significantly less diverse than that of medieval-derived areas and relates largely to activity dating from the post medieval period. However an important qualification is that in some instances earlier features were recorded from land classed as post medieval enclosures.

9.2.3 Rough ground

Within the project area there are two classifications of rough ground.

- Rough ground (type 13). Rough grazing ground, heathland or moorland.
- Rough ground (type 14). Rough ground showing signs of earlier historical use as agricultural land.

Between them these two types cover 5,598ha, 14% of the project area. In general terms the visible archaeology in rough ground within the project area is neither as rich nor diverse as that in areas of medieval-derived fields. However it should be borne in mind that the Devon HLC makes no formal differentiation of rough ground into the sub-categories presented in Section 3.4.3. The archaeological resource differs significantly within each of these sub-categories.

Major areas of moorland

Although the northern part of Dartmoor and the southern part of Exmoor are included in the generator catchment area, neither of these falls within the four transects and no major areas of moorland were included in the project area.

Minor areas of rough ground

The extensive areas of upland rough ground (parts of it enclosed by type 19 fields during the eighteenth and nineteenth centuries) around Broadbury in the West transect fall into this category, as do other smaller pockets of upland rough ground elsewhere. A significant feature of the archaeological resource of these areas is the frequency with which round barrows have been recorded there. One third of all round barrows recorded during the project are located in upland rough ground, many occupying land presumably peripheral to the main areas of settlement (Fig. 14). However it is also significant that a number of prehistoric enclosures were also recorded. In many cases the enclosures are sited in areas that were rough ground on the 1st Edition OS map but which have since been improved. This is particularly true of the West transect where eleven enclosures were recorded as cropmarks.

In addition to these important prehistoric features a number of field boundaries and field systems were recorded from this type of rough ground, most interpreted as being ‘historic’ or post medieval in date.

Valley-bottom rough ground

This category includes quite extensive areas of low-lying, marshy ground (for instance Hollow Moor, in the West transect). In these areas a limited range of archaeological features were recorded. These primarily comprise post medieval field boundaries and field systems and extensive traces of cultivation marks; these are interpreted as being post medieval or twentieth century clearance and improvement and are often accompanied by drainage features.

This is another area where NMP mapping might suggest refinements to the HLC process: sub-division of categories of rough ground might better reflect inherent differences in past land use.

In the most general terms NMP mapping demonstrates that within the project area rough ground contains an archaeological resource largely characterised by post medieval or later land clearance and improvement features. Where earlier archaeological features are evident they tend to be sited in upland areas and land, with important exceptions, peripheral to areas of settlement. Generally the visible resource in low-lying rough ground is less rich and diverse than that of medieval-derived fields, whereas areas of upland moorland may contain archaeologically important monuments

9.2.4 Woodland

Various woodland types occur in the study area.

- Conifers (type 17)
- Other woodland (type 18)
- Ancient woodland (type 24)
- Woodland with old field boundaries (type 36)

Taken together these types cover 3,433ha or 9% of the project area.

A small number of sites were recorded from woodland areas. These include quarries, a hillfort and three prehistoric enclosures in addition to a number of field boundaries. In these instances areas of woodland had been cleared (in particular the harvesting of conifers), allowing these features to be identified.

In general very few features were recorded from woodland in comparison with any of the other landscape types.

9.3 Gaps and areas of low site density

There are several parts of the project area where the density of site distribution is noticeably lower than the average. A number of factors help explain this.

Given that the evidence base for the survey is aerial photographs, very few sites were recorded from woodland areas. The main woodland zones are found in the East transect, in the southern half of map sheet SX89NE, on the border of SX89SE and SX88NE and in the southern half of SX88NE. A further wooded area is situated in the southern half of SS61SE, the most northerly map in the Middle transect.

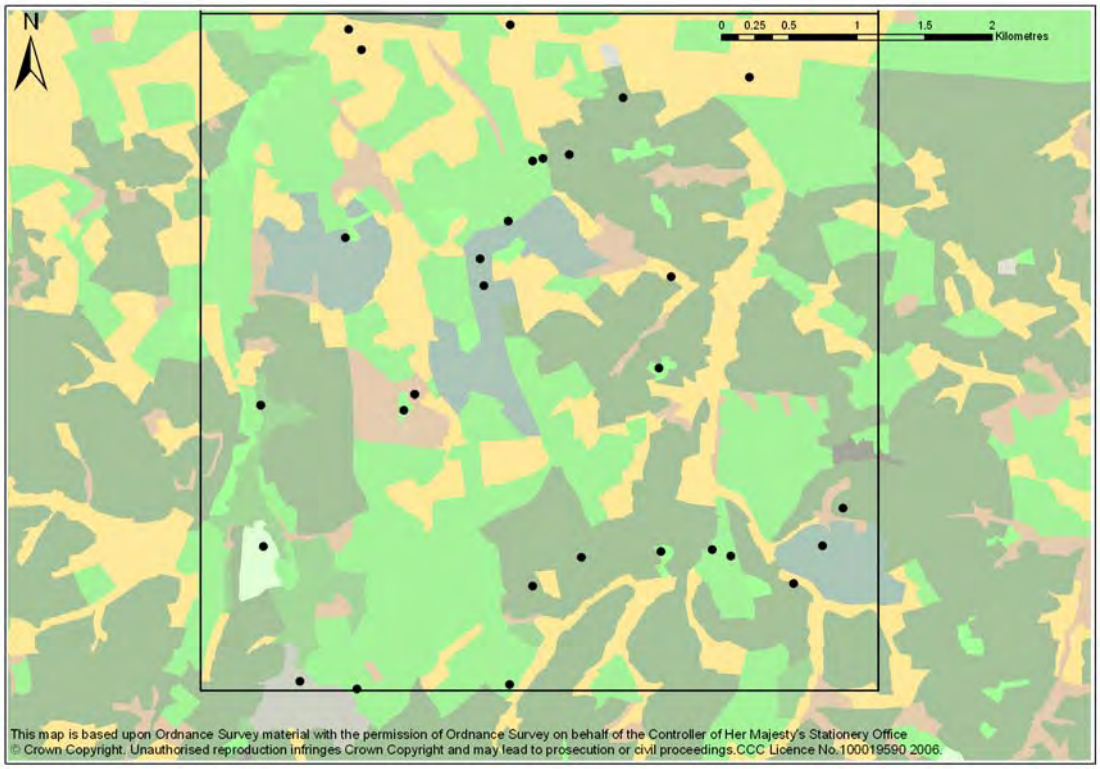
Land use history also acts as a determining factor in the nature of the resulting archaeological record. Historic Landscape Characterisation can serve as an indicator of the likely density within each landscape type. Despite a number of important qualifications discussed in Section 9.2 above, it is fair to say that four of the most widespread HLC types within the project area are, for the most part, characterised by relatively low site densities comprising a limited variety of site types. These are rough ground (types 13 & 14) and post medieval enclosures (types 19 & 50).

Post medieval enclosures occur in a variety of topographical situations. In Fig 40, showing site distribution in SX89NE, there is a very obvious band of post medieval enclosures virtually free of archaeological sites. This band constitutes the valley of the river Creedy which was not cleared and enclosed until relatively recent times. The valley of the Taw is similarly recently-enclosed where it cuts through SS62SW in the northern transect. Both of these areas are relatively blank in terms of recorded archaeology. Elsewhere areas of post medieval enclosures represent the recent improvement of rough ground which was perhaps formerly used as grazing land.

Some areas of rough ground, particularly in valley bottoms and low-lying areas contain few visible sites and consequently appear as blank areas.

The comparative dearth of visible archaeological remains recorded from post medieval enclosures and some areas of rough ground is seen most graphically in the southernmost map sheet of the Middle transect, SX69NE. Only 32 sites were recorded from this map – far fewer than on any of the other maps in the four transects (Fig. 45). It contains extensive tracts of post medieval enclosures and rough ground. Although its HLC alone does not account for the low archaeological record of this map, it is certainly an important factor.

Fig.45 *Distribution of site records in map sheet SX69NE (Middle transect) against HLC types. Rough ground (types 13 and 14) shown in yellow, post medieval enclosures (type 19) in bright green, ancient woodland (type 18) in brown. Medieval-derived fields are shown in grey and green/brown.*



If the HLC types woodland, rough ground and post medieval enclosures are removed from the map, the extent to which they coincide with areas of low density across much of the project area becomes apparent (Fig. 46).

The only part of the project area in which this is not obviously the case is the northern half of the West transect. In the northernmost map sheet there is an extensive area which is blank in the background map but in which archaeological sites are plentiful. These features are almost exclusively post medieval/modern cultivation marks associated with improvement of rough ground (Fig. 36). In the map sheet below there are concentrations of round barrows on upland rough ground in the Broadbury and Beaworthy areas (Fig. 14).

Other than in these two areas, the amended HLC map in Fig 46 illustrates that the much of the archaeology recorded during the project lies within areas of medieval-derived fields.

Fig. 46 *The four transects showing Historic Landscape Characterisation with areas of woodland, post medieval enclosures and rough ground left blank. Barton fields are shown in blue, other medieval-derived HLC types in green.*

10 Archaeological potential of the project area

The four transects represent roughly 10% of the overall project area. Any attempt to extrapolate the results of a sample of this size across such a wide area is bound to some extent to be subjective. Nonetheless certain patterns can be distilled from the results of the mapping which are replicated in varying degrees across all the 16 map sheets surveyed. As a result a more inclusive assessment of the archaeological resource of the project area is now possible.

Much information already exists about the archaeological resource of the wider project area in the form of HER, NMR, and Scheduled Monument data. Supplementing this known data with inferred data from the North Devon Mapping project enables a more accurate indication to be made of the potential resource of the project area as a whole.

- ***Many new sites were recorded. This was the case with each of the four transects.***

  It is likely that within the wider project area a similar archaeological aerial survey would identify between 40 and 50% more sites than are currently recorded in the HER.

- ***A large number of new cropmark features were mapped. This is the case not only in areas where very few or no cropmarks at all had previously been recorded, but also in previously well-flown areas.***

  It is likely that within the wider project area a similar archaeological aerial survey would increase the known cropmark resource by between 60 and 95% from place to place, and by 80% on average.

- ***Large numbers of new records for a range of site types were created during the project.***

  It is likely that within the wider project area a similar archaeological aerial survey would increase the known number of certain types of site by the following amounts.

  - Second World War features by more than 90%
  - features representing the medieval or post medieval farming landscape by 75% or more
  - quarries by up to 60%
  - prehistoric (or potentially prehistoric) enclosures by between 40% and 50%
  - round barrows by up to 30%

- ***The distribution of recorded sites, both in terms of numbers and diversity, was not uniform. Patterns of distribution can be understood by linking them to HLC.***

  It is likely that the majority of settlement features from prehistoric periods onwards occur in areas characterised by medieval-derived fields, and that archaeological features generally occur in greater numbers in these areas.

- ***The range of site types making up the potential archaeological resource is only fully visible in locations where favourable conditions exist for the production of cropmarks.***

  It is likely that features such as unenclosed settlements, ring ditches, pits, prehistoric field systems and small enclosures, confined mainly to the argillic soils under arable, occur more widely throughout the project area in areas of medieval-derived fields.

- ***Prehistoric sites recorded during the project are indicators of more extensive archaeological potential.***

These sites represent only the visible part of the spectrum. There will be, in addition, other features not visible from the air and other evidence of occupation; for example prehistoric activity represented by flint scatters.

11 Sensitivity to change in landscape management

When the potential archaeological resource and the Historic Landscape Character of the catchment area are considered in tandem, it becomes apparent that the historic environment in this part of Devon is doubly sensitive to change.

Particular attention is drawn to two factors.

1. Where little arable cultivation has taken place the buried archaeological resource is only partially visible on aerial photographs. On the other hand the historic character of the landscape in these areas is very much intact and may be threatened by potential changes in land use.
2. Where the historic landscape character has been altered as a result of extensive arable cultivation, a very rich buried archaeological landscape has been recorded in the form of cropmark features. This buried landscape would be threatened by any potential change in land use involving deep ploughing, such as root crop cultivation.

11.1 Sensitivity of buried archaeological remains

The amount of new information provided by the NMP mapping project makes clear that existing information contained in the Devon HER does not constitute a sufficiently full account of the archaeological resource of the project area to inform strategic decisions regarding the archaeological impact of change in landscape management. For this reason, and because NMP mapping provides only a partial (rather than definitive) statement of the archaeological resource, further survey work in the area would be desirable.

Nonetheless, using the data provided by NMP mapping in the four transects it is possible to suggest broad guidelines regarding the nature and extent of the archaeological resource across the wider project area. In particular the results can be used to predict which parts of the project area might contain the richest archaeological resource and are therefore most sensitive to change. Using the HLC map in conjunction with NMP data is the obvious starting point for this exercise because HLC, unlike HER site-specific recording, considers the historic character of the whole landscape.

Through analysis of the mapping and HLC a number of general observations can be made regarding the archaeological sensitivity of the project area.

- **The Mid Devon Farming Belt is especially sensitive.**

  A very rich cropmark resource was recorded in the Farming Belt comprising many prehistoric features. Whilst these include a number of nationally important individual sites, the principal benefit of NMP recording has been its mapping of the whole archaeological landscape. The extensive prehistoric landscape mapped here consists of below ground remains only and would therefore be vulnerable to any change involving more intrusive ploughing than it is currently subjected to.

- **Barton fields (HLC type 21) are especially sensitive.**

  Firstly Barton fields are relatively rare, both in the immediate project area and throughout the wider catchment area. Secondly below-ground archaeological features were recorded from Barton fields in proportionally higher numbers than from other HLC types and the range of site types recorded is particularly diverse. Sites recorded include a high percentage of prehistoric settlement enclosures and ceremonial sites, and a number of relatively insubstantial features, such as ring ditches and pits.

- **Other medieval-derived fields (HLC types 20, 23, 25, 26, and 27) are very sensitive.**

  Where these HLC types occur within the Farming Belt and have been altered as a result of cereal cultivation they are seen to host a cropmark resource almost as rich and diverse as that in the Barton fields. Away from the Farming Belt the medieval character of these types is largely intact; here a lesser number of cropmark sites indicate that a buried, pre-medieval landscape exists, but whose full extent may not be visible on aerial photographs. This potential resource would be vulnerable to certain changes in land management.

- **Rough ground in upland areas (HLC types 13 and 14) is very sensitive.**

  One weakness in the use of Devon's HLC for site prediction across the wider catchment area is that it contains no distinction between upland and low-lying rough ground. A smaller number of features were recorded from upland rough ground than from medieval-derived fields but many of them have surviving above-ground remains and they include archaeologically significant sites such as round barrows. This valuable archaeological resource is very sensitive to a range of land management changes.

- **Parks and gardens (HLC type 10) are very sensitive.**

  Several good examples were recorded of medieval-derived (or possibly pre-medieval) landscapes surviving (both as cropmarks and low earthworks) in land reorganised in the post medieval period as parks and gardens. Although these earlier landscapes are sensitive to change there is perhaps less likelihood of land management change in this HLC type than the others in the catchment area.

- **Post medieval enclosures (HLC type 19) are sensitive.**

  Post medieval enclosures generally contain a less diverse archaeological resource than medieval-derived fields. In some instances, however, they are characterised by a wide range of site types. This is the case firstly where they are adjacent to medieval-derived fields in which parts of the pre-medieval landscape appear not to have been reorganised by medieval enclosure; secondly where they enclose areas of former upland rough ground and sites which once survived with above-ground remains are visible as cropmarks.

- **Rough ground in low-lying areas (HLC types 13 and 14) is less sensitive.**

  The archaeological resource recorded in low-lying rough ground is significantly more limited and less diverse than that from other HLC types, being characterised in the main by post medieval and later improvement features. For this reason it may more easily be able to absorb change than most other types.

These conclusions are based solely on an assessment of archaeological features visible on aerial photographs. The limitations of this evidence base should be recognised. In overgrown areas of rough ground, for instance, many features may not be visible and will not have been recorded. Nor could the project take account of factors such as the palaeoenvironmental potential of low-lying rough ground.

The schematic map in Fig. 47 is based on these observations and on Devon's HLC. HLC types have been colour-coded to reflect three degrees of archaeological sensitivity.

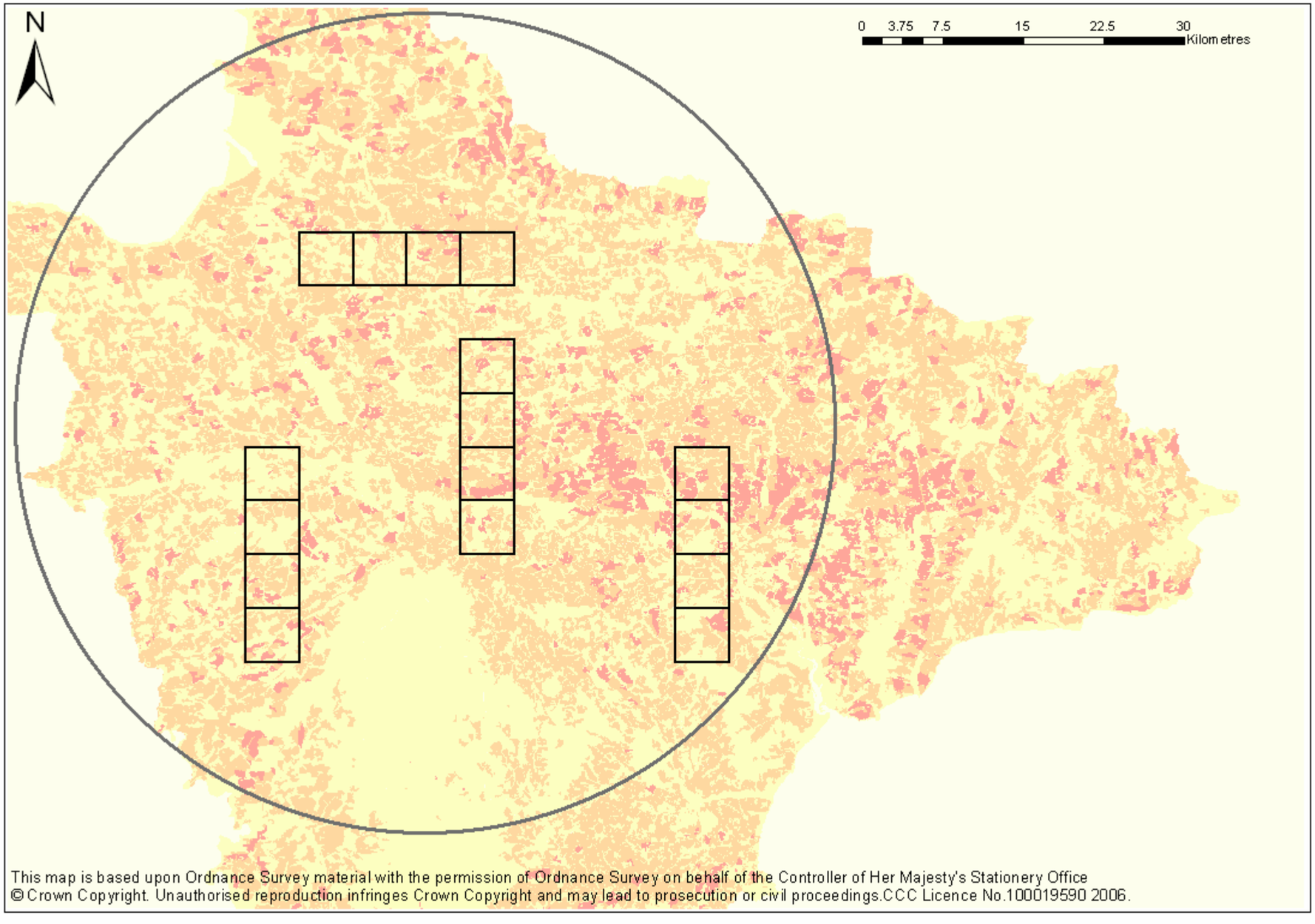
RED corresponds to especially sensitive areas comprising Barton fields (type 21).

ORANGE corresponds to very sensitive areas comprising medieval fields (types 23, 25, 26, 27) and post medieval fields with medieval elements (type 20). It also includes parks/gardens and water meadows (types 10, 16, 52, and 53).

YELLOW corresponds to sensitive areas comprising post medieval enclosures (types 19 and 50), rough ground (types 13 and 14), and orchards (type 11). An important caveat to this is that areas of upland rough ground are depicted as ‘sensitive’ in this map rather than as ‘very sensitive’ (see above) owing to the fact that no distinction is made between upland and low-lying rough ground in the Devon HLC. There is, consequently, no mechanism for sub dividing rough ground in the map.

All other HLC types have been left blank.

Fig. 47 *Map showing schematic grading of the project area according to levels of archaeological sensitivity based on numbers of archaeological features visible on aerial photographs and mapped during the project. Red = especially sensitive, orange = very sensitive, yellow = sensitive.*



11.2 Sensitivity of the Historic Landscape Character

The landscape of Devon preserves an unusually rich historic character with a remarkable degree of time-depth. The features that together make up the 'historic landscape' and create historic character date from many periods and together create a landscape palimpsest that is virtually unparalleled in western Europe. There are extensive upstanding features dating to virtually every period since the Bronze Age, and there is a particularly rich legacy from the last millennium.

Medieval-derived field types

Historically, the vast majority of fields in this zone will not have seen scrub or woodland for many millennia. In many parts of Devon and Cornwall the open medieval strip fields that these enclosures are based on were probably established during the early medieval period (AD *c.*500-1000) (Turner 2003), and the majority will have been in continuous agricultural use ever since. NMP mapping shows that this was probably also the densest zone of prehistoric settlement, and that fields were also associated with these earlier settlements. Hedgerows planted on banks became a defining characteristic of this HLC type in the medieval period, but these banks would have always been well-defined linear features. Thus any change in land management which affected these most historic boundary features would significantly alter the character of this HLC type.

Post medieval-derived landscape types

In general, the historic character of these types has remained relatively stable for the last 150-250 years. The main areas of change are in the orchards and post medieval water meadow types. Orchards have declined severely during the twentieth century, and few now occupy their nineteenth century extent. Although very few post medieval water meadows still operate in the traditional way, most are still used for grazing stock and so have maintained the open, grassy aspect that they generally took on over 150 years ago.

Post medieval enclosures were often cleared initially for arable crops, and the Tithe records of Devon show that in the first part of the nineteenth century many were under arable. However, from the mid-Victorian agricultural recession onwards, most fields in this zone were grazed. Their historic character is defined by their straight, narrow, and relatively regular boundaries and their use for grazing livestock.

Finally, Devon's landscape has a plethora of post medieval parks/gardens ranging from the few associated with major houses such as Filleigh to small designed landscapes around squirearchy residences (Wilson-North 2003). Although they are associated with tree-planting, this is traditionally in carefully-designed patterns. Otherwise the open landscapes of the parks perpetuate earlier patterns as most have been created from medieval-derived fields (e.g. type 26).

Rough Ground landscape types

Major areas of moorland have had a relatively stable historic character for several thousand years and the effect of any more than minor changes in land management would have a potentially significant impact.

However, some minor areas of rough ground (particularly away from hill- and ridge-tops) and valley-bottom rough ground have witnessed a more changeable history over the course of the last few hundred years. In many areas their landscape character is likely to have altered several times. It could be argued that such zones *may* be able to absorb change more easily than other historic landscape character types. However, care should be taken to avoid disrupting areas where the historic character has been stable for longer than 150 years or where change might impact on other neighbouring

types. The palaeoenvironmental potential of low-lying rough ground should also be taken into account when changes in land management are considered.

Woodland landscape types

Ancient woodland (type 24) has by definition been stable for a few centuries and would be extremely sensitive to change. However, other woodland types may be less sensitive as their landscape character has often been relatively dynamic. Conifer plantation sees periodic harvesting, and Other Woodland (particularly scrub) has often replaced another HLC type in the last 150 years. In particular, scrubby woodland on valley-bottoms and valley sides has commonly regenerated on areas that were formerly rough ground.

A caveat must be that it has been hard to identify the HLC type of woodland accurately using maps and air photographs. During HLC mapping the Forestry Commission's maps of woodland types proved highly unreliable. Care must be exercised to verify the nature of any area of woodland targeted for potential changes in management in order to avoid disturbing unmapped areas of Ancient Woodland or areas with significant archaeological remains.

12 Conclusions

The project has fulfilled its aims and objectives. The Devon HER and the NMR have been enhanced by the identification of a large number of new sites. The mapping of these sites in their landscape context has provided a fuller awareness of the range, character and extent of the archaeological resource within the project area.

In arable areas a rich and diverse archaeological cropmark resource was recorded including significant numbers of prehistoric settlement and ceremonial sites.

Over much of the project area only a limited amount of arable cultivation has taken place. Here the buried archaeological resource is only partially visible on aerial photographs whereas the historic character of the landscape (derived mainly from the medieval field pattern) remains largely intact.

Any potential change in landscape management may have implications for the historic environment in the project area. In arable areas the fragility of surviving below-ground archaeological remains is the main consideration in terms of sensitivity; in areas where the pattern of medieval-derived fields is largely intact, the maintenance of the historic landscape character would be the main consideration.

The results have demonstrated that the existing HER and the NMR for this part of Devon need to be enhanced by further archaeological survey to better inform strategic decisions regarding the archaeological impact of potential change in landscape management.

Further survey might include systematic NMP style recording and mapping (involving the consultation of all available photographs – in particular all vertical photography). This is especially important in areas under arable, where the below ground archaeology is particularly vulnerable. In areas of non-arable this might be supplemented by rapid field survey (a useful model is the Culm Measures Survey, undertaken by Exeter Archaeology for EH).

13 Data storage and archiving

Digital copies of the AutoCAD drawings and a copy of the project database are deposited with the Devon HES for incorporation into their GIS and HER.

The project archive is deposited at the NMR in Swindon. It contains the following:

Project Outline, Project Design, Project Report, digital copies of the AutoCAD drawings, a copy of the Project Database, completed Map Note Sheets, correspondence. These will be archived as part of the NMR collection in line with current guidelines for NMP project archives. Data from the Project will be incorporated into the NMR AMIE database.

14 Copyright

Data generated by the project is copyright of DCC, and EH are licensed to use the data as they require.

The views and recommendations expressed are those of the Historic Environment Service projects team and are presented in good faith on the basis of professional judgement and on information currently available.

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Appendix 1 Aerial photograph collections

All readily accessible aerial photographs were consulted during the project. In total this amounted to 3,167 vertical prints and 2,117 obliques held in the three collections listed below.

1. **The National Monuments Record (NMR) in Swindon**

   This collection holds 2,902 monochrome vertical prints from 80 different sorties ranging in date from 1945-1994 and at scales of between 1:2,800 and 1:15,000. In addition the NMR holds 1,079 specialist oblique photos of the project area taken by a number of archaeologists between 1952 and 1998. Some of these oblique photographs replicate those of the DCC and CUCAP collections listed below.

   This collection can be accessed by contacting

   Fiona Matthews

   NMR Enquiry and Research Services

   English Heritage

   National Monuments Record

   Kemble Drive

   Swindon

   SN2 2GZ

   01793 414700

2. **Devon County Council (DCC)**

   This collection contains approximately 920 specialist oblique photographs of the project area taken by Frances Griffith and Bill Horner since 1979, many replicated in the NMR collection. The collection holds county wide colour vertical photography taken by Geonex in 1992 at 1:25,000 scale, of which 74 prints were relevant to the project area. The collection also contains 117 black and white verticals of the project area taken in 1977 by BKS Ltd at a scale of 1:3000. County wide vertical cover taken in 2000 was available in digital format.

   This collection can be accessed by contacting

   Frances Griffith

   County Archaeologist

   Matford Offices

   Topsham Road

   Exeter

   EX2 42W

   01392 382266

3. **Cambridge University Committee for Aerial Photography (CUCAP)**

   This collection holds 45 monochrome and 29 colour verticals of the project area at scales ranging from 1:6,200 to 1:20,300. In addition it holds 118 specialist oblique photographs, some replicated in the NMR collection.

   This collection can be accessed by contacting

Bernard Devereux
Air Photo Library
Cambridge University
Unit for Landscape Modelling
Sir William Hardy Building
Tennis Court Road
Cambridge
CB2 1QB
01223 334578

Appendix 2 Archaeological scope of the project

Plough-levelled features and earthworks

All cropmarks and soilmarks representing buried "negative" features (i.e. ditches and pits), plough-levelled earthworks or stonework of archaeological origin were recorded. All upstanding earthwork sites visible on aerial photographs were recorded, whether or not they had been previously surveyed (including those marked on the OS maps), and whether or not they are still extant on the most recent photography. The Project Database recorded which elements of any particular archaeological site survive or have been levelled and/or destroyed.

Ridge and furrow and water meadows

All areas of medieval and post medieval ridge and furrow were mapped using a standard convention to indicate the extent and direction of the furrows. The same convention was used to map areas of pre-1945 cultivation marks. The standard convention distinguishes between plough-levelled and upstanding ridge and furrow but not differences in date. Suggested dates were, however, recorded in the project database.

Areas of water meadows thought to pre-date 1945 were transcribed and recorded.

Buildings and structures

The foundations of buildings and structures appearing as ruined stonework, earthworks, cropmarks, soilmarks or parchmarks were recorded. Standing roofed or unroofed buildings and structures were not, except in a few instances in which no other adequate map record existed. A specific exception was the recording of military installations; all buildings associated with these installations were fully mapped.

Industrial features and extraction

All extractive features believed to pre-date 1945 were mapped. These included large-scale features such as quarries, pits, mines, etc, as well as small-scale extraction of resources for local use (e.g. minor stone quarries and gravel extraction).

Twentieth century military features

Twentieth Century military features were fully recorded at an appropriate level of detail.

Field boundaries and field systems

Removed field boundaries and field systems were plotted as long as they were considered to predate the OS 1st Edition map (c.1880) and were not already recorded on that or any other OS map.

Parkland, landscape parks, gardens and country houses

All park and garden landscape features (including deer parks) visible on aerial photographs but not previously recorded by the OS were plotted. Similarly former Country Houses, completely or partially demolished during the period of photography, were mapped in detail.

Transport features

Major transport features (i.e. disused canals and main railways) were included in the Ordnance Survey sphere of interest and subsequently appear on OS mapping; these were therefore not mapped. Smaller features (e.g. local trackways associated with quarries), which were outside the Ordnance Survey sphere of

interest, were mapped as were trackways, pathways and roadways considered to be post medieval or earlier in origin and not already recorded by the OS.

Natural features

Geological, geomorphological, and other natural features were not mapped except in a few cases when alternative, archaeological interpretations were possible. In these cases the site records were double-indexed with both interpretations.

Appendix 3 Project database

The results of the project presented in Section 9 are based on a summary analysis of the project's Access database

Sites were recorded in the project database using a glossary conforming to National data standards (English Heritage, 1992 Thesaurus). Periods used in the project are defined as indicated below.

Unknown	Date unknown
Prehistoric	Prehistoric unknown
Historic	Historic unknown
Neolithic	4000-2500BC
Bronze Age	2500-800BC
Iron Age	800BC-43AD
Romano-British	43-410
Early medieval	410-1066
Medieval	1066-1540
Post medieval	1540-1900
Modern	1900-1999

Project data

The stand-alone project database was populated with 1,536 site records. The structure of the database (using single-field entries for site type and period) resulted in many of these records being double-indexed according to either confidence in interpretation or complexity of the remains.

1. In some instances more than one site type interpretation was considered possible (example: 'field boundary' or 'trackway').
2. In some instances more than one possible date could be attributed to the site (example: 'Iron Age' or 'Romano British').
3. In some instances, a single record number was attributed to a group of individual features containing a range of site types (example: 'enclosure', 'pit' and 'field boundary').

This double-indexing presents difficulties to accurate data analysis in that it effectively increased the total of individual records in the database to 2,258. Therefore some adjustment of the data prior to the analysis was required.

In the main adjustment of the data involved the amalgamation of alternative dates attributed to sites.

- In cases where two date ranges were suggested for a site, these were amalgamated into a single, generic date. There were two frequent instances of this. Field boundaries interpreted as either 'medieval' or 'post medieval' were treated as 'historic' in the analysis and field boundaries (or other site types) considered either to be 'historic' or 'prehistoric' were treated as being of 'unknown' date.
- In cases where more specific data ranges or a broad date and an alternative, more specific date were suggested, this information was retained by using combined date

categories for analysis purposes. So, for instance, sites recorded in the database as either ‘Iron Age’ or ‘Romano-British’ were treated as ‘Iron Age/Romano-British’ rather than the more general ‘prehistoric’. Sites recorded as being ‘historic’ or ‘post medieval’ were treated as ‘historic/post medieval’ rather then simply ‘historic’ because the interpretation suggests that post medieval is the most likely date.

Records with alternative site type interpretations were, for the most part, left double-indexed. Similarly records comprising a range of different site types have also been left double-indexed.

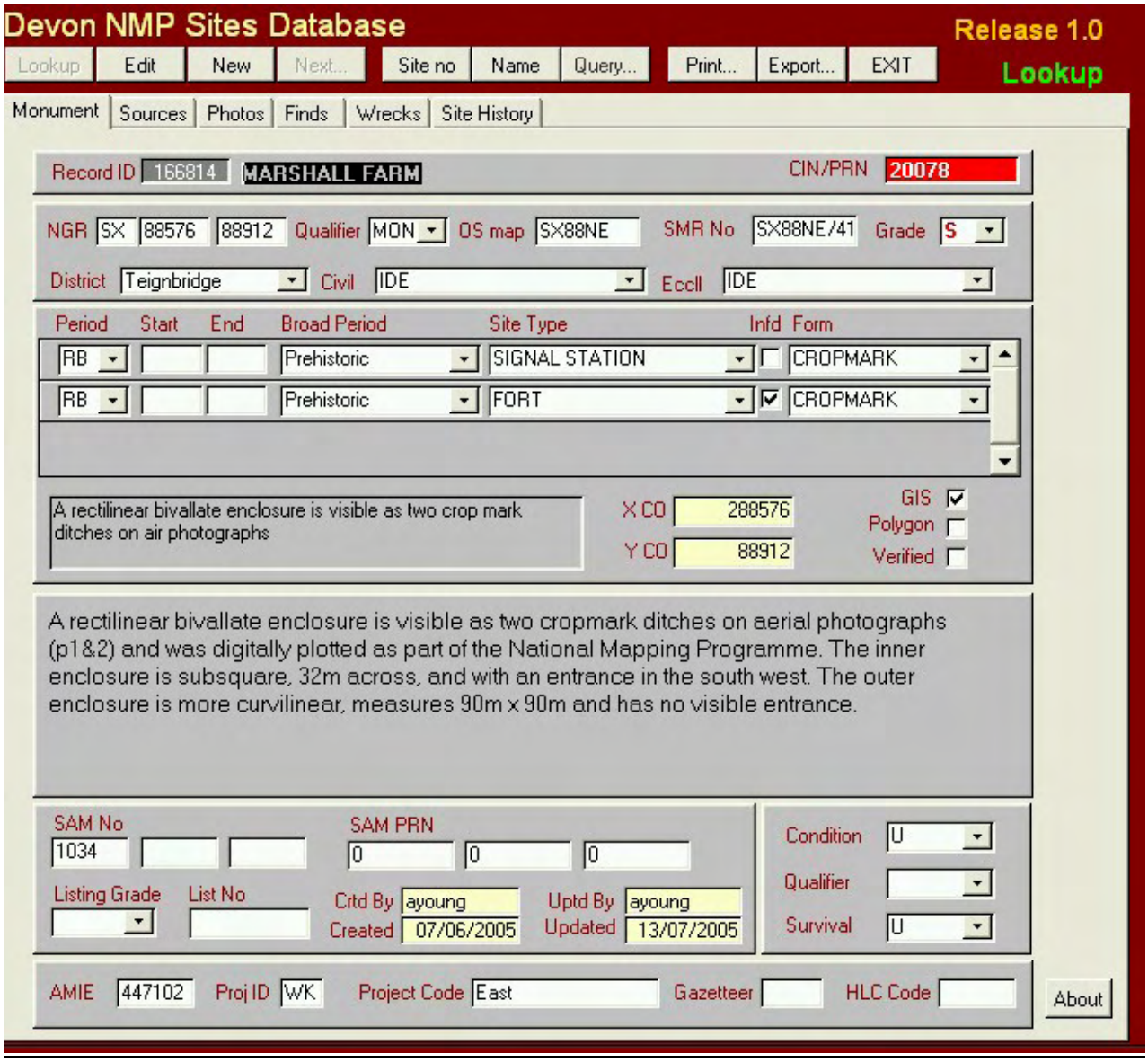
Having rationalised the data, the number of individual site records considered in the analysis was reduced to 1,678. This figure is considered to accurately reflect the number and range of individual archaeological features recorded during the project whilst avoiding any unnecessary or misleading duplication.

Confidence of interpretation

One of the fields in the project database, ‘Alleged’, enables the flagging of sites for which insufficient evidence is available for any more than a tentative interpretation. A common example is the interpretation of mounds as ‘alleged’ barrows. This field is also used where there is uncertainty over the potential dating of archaeological features. The field was occasionally used is as a qualifier for features considered to be possible archaeological deposits, but which could equally be caused by recent agricultural activity.

Roughly a quarter of all records in the database were entered as alleged, most of these sites are cropmark enclosures (whose assumed prehistoric/Romano-British date is alleged) and field boundaries (which may alternatively be trackways or drainage ditches, or were of uncertain date). A slightly higher proportion of new sites have been entered as alleged (27%). Again the predominant types are field boundaries and cropmark enclosures, possible barrows visible as mounds, and traces of ridge and furrow where the date is uncertain.

Appendix 4 Sample database record



Appendix 5 AutoCAD layers

Layer name	*Colour*	*Linetype*

BANK 1 (red) CONTINUOUS

Outline of broad banks and thin banks defined by a single line.

BANKFILL 1 (red) CONTINUOUS

All bank outlines (created on "bankout" layer) will be filled with stipple, "dots", at a scale of 2.25 and an angle of 53 degrees. Thin banks will also go on this layer as a single line

DITCH 3 (green) CONTINUOUS

All features seen as ditches, including small area features e.g. ponds and pits

DITCHFILL

Solid fill

EXTENT OF AREA 8 (grey) DASHEDX2

Used to depict the extent of large area features e.g. airfields, military camps, mining/extraction

GRID 7 (white) CONTINUOUS

Grid at 1km intervals equivalent to one OS 1:10,000 scale quarter sheet.

HACHURE 30 (orange) CONTINUOUS

Hachures used to depict extant earthworks at 1:2500 scale

LARGE CUT FEATURE 5 (blue) ISO02W100

Used for large cut features such as large quarries and ponds.

MONUMENT POLYGON

Polygon defining the extent of a group of AutoCAD objects corresponding to a single monument in the Project Database.

RIGARRLEVEL 6 (magenta) ISO03W100

Arrow depicting direction of rigs in a single block ridge and furrow, seen as earthworks or cropmarks, but known to have been ploughed level.

RIGARREWK 4 (cyan) CONTINUOUS

Arrow depicting direction of rigs in a single block of ridge and furrow seen as earthworks on the latest available aerial photographs.

RIGDOTSLEVEL 6 (magenta) DOTX2

Outline of a block of ridge and furrow, seen as earthworks or cropmarks, but known to have been ploughed level.

RIGDOTSEWK 4 (cyan) DOTX2

Outline of a block of ridge and furrow still surviving as earthworks on the latest available aerial photographs.

SHEET 7 (white) CONTINUOUS

Used in conjunction with printing macros.

STONEWORK 8 (grey) CONTINUOUS

Used to depict exposed stonework e.g. walls, cairns, standing stones and could be used for building platforms that are concrete.

STRUCTURE 9 (grey) CONTINUOUS

Used to depict features which do not easily fit into other categories because of their form, e.g. tents, radio masts, painted camouflaged airfields

TRAMWAY 200 (purple) TRACKS

Used to depict tramways mainly associated with industrial areas

VIEWPORT 7 (white) CONTINUOUS

Used in conjunction with the printing macros

Appendix 6 AutoCAD attached data tables

RECORD:

Field	PRN	enter PRN from Project database
	HER CIN	enter Devon HER CIN number
	AMIE Hob UID	enter AMIE Hob UID

INDEX:

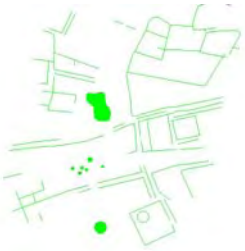
Field	PERIOD	enter date e.g. BRONZE AGE
	TYPE	enter monument type e.g. ENCLOSURE
	EVIDENCE	enter form e.g. CROPMARK
	PHOTO REF	enter photo reference which feature was plotted from
	PHOTO DATE	enter date of photo reference (DD-MM-YY)
	COMMENT	any other information which may aid later analysis will be recorded in this field

SURVEY:

Field	AUTHOR	enter author e.g. Carolyn Dyer
	DATE	enter date e.g. 6th September 2004
	SCALE	enter given scale of OS mapping used for plot e.g. 1:10,000
	LEVEL	enter level of survey e.g. 2
	COPYRIGHT	enter copyright holder e.g. EH/Devon CC

Appendix 7 AutoCAD mapping conventions

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



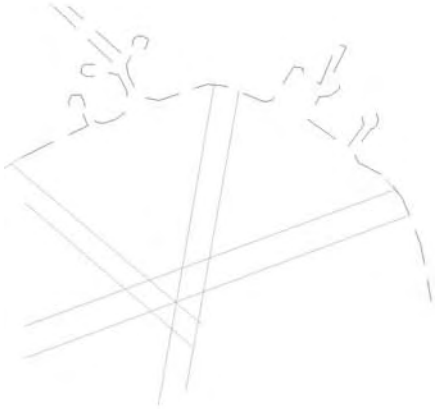
Earthwork or Cropmark Banks
(at 1:10,000 scale only)
using Bank and Bankout layers in AutoCAD

Buildings, walls etc
Using stonework layer in AutoCAD

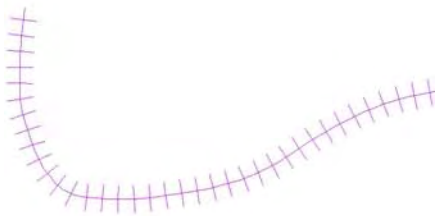
Ridge and furrow see as cropmarks, or seen as earthworks and known to be ploughed level. Using the Rigdotslevel and Rigarrlevel layers in AutoCAD.

Ridge and furrow seen as earthworks on the latest available aerial photographs. Using the Rigdotsewk and Rigarrewk layers in AutoCAD.

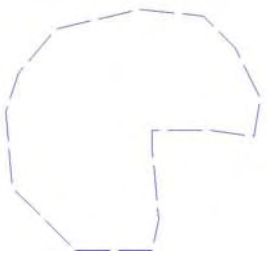
Large area features, such as airfields, depicting the extent of the feature (using the Extent of area layer in AutoCAD), and the main features (using the Structure or Stonework layers in AutoCAD).



Railways and tramways, using the Tramway layer in AutoCAD



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



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