RESEARCH DEPARTMENT REPORT SERIES no. 28/2006 ISSN 1749-877

GLOUCESTERSHIRE
FOREST OF DEAN NMP

NATIONAL MAPPING PROGRAMME REPORT

Fiona Small and Cathy Stoertz (Eds), Sharon Bishop,
Edward Carpenter and Helen Winton

AERIAL SURVEY
AND INVESTIGATION

ENGLISH HERITA

Gloucestershire

FOREST OF DEAN NMP

National Mapping Programme Report

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Aerial Survey and Investigation

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ACKNOWLEDGEMENTS

The project was initiated and carried out in collaboration with Gloucestershire County Council Archaeology Service (GCCAS). We would like to thank Tim Grubb, John Hoyle and the GCCAS team for their advice and assistance throughout the survey and for provision of data from the Sites and Monuments Record (SMR).

The following members of English Heritage staff contributed to this project: air photo interpretation and transcription, research, illustration and report writing – Sharon Bishop, Edward Carpenter, Fiona Small, Cathy Stoertz and Helen Winton; maps and distribution diagrams – Fiona Small with the invaluable help of Deborah Cunliffe.

The project team would also like to thank the National Monuments Record Enquiry and Research Service team for their assistance and patience in providing the mapping team with the vast number aerial photographs essential for this survey.

English Heritage would like to thank the Cambridge University Unit for Landscape Modelling (ULM) for the kind loan of photographs from their Air Photo Library.

We are also grateful for the help of members of both the Dean Archaeology Group and the local University of the 3rd Age (U3A) in identifying and providing first hand knowledge of local industrial and World War I and II sites identified during the course of the survey.

SUMMARY

The Forest of Dean Mapping Project is part of the Gloucestershire Mapping Project which is being carried out by English Heritage to National Mapping Programme (NMP) standards. The purpose of NMP is to enhance the understanding of past human settlement, by providing primary information and synthesis for all archaeological sites and landscapes from the Neolithic period to the twentieth century. NMP aims 'to map, describe and classify all archaeological sites recorded by aerial photography in England to a consistent standard' (RCHME 1994, English Heritage 2001).

The Gloucestershire Mapping project was initiated by Gloucestershire County Council Archaeology Service (GCCAS), and a programme of field work was established by GCCAS, headed by Jon Hoyle, to run concurrently with the survey of aerial photographs. The Forest of Dean, Gloucestershire National Mapping Programme Project Design (Hoyle 2001), and The Gloucestershire Cotswolds National Mapping Programme Project Design (Grubb 2001) were produced at the beginning of the project. A secondary phase of field work was carried out by GCCAS using the data generated by the aerial survey.

The Forest of Dean was recognised as an area of relatively low monument density with poor representation in the National Monuments Record (NMR) and the SMR and, although much of the area is heavily afforested, it was believed that the area would benefit from archaeological aerial survey. Very few confirmed Prehistoric monuments had been recorded within the Forest of Dean project area, and it was hoped that NMP survey would help to explain the apparent absence of early sites. This survey identified a number of enclosures of possible Prehistoric date, although further field investigation is required to confirm their interpretation and chronology.

Prior to the survey 779 individual monument records existed in the NMR's database (AMIE) for the entire survey area. The survey created an additional 1832 new AMIE monument records, increasing the total number of records for the area to 2611.

From the medieval period onwards the area of Royal hunting forest (latterly the Statutory Forest) saw a total exclusion of permanent settlement and agricultural activity. Some pre-Conquest early medieval settlement sites, as well as fragments of Offa's Dyke, were recorded in areas subsequently appropriated by the Royal forest. Because of the exclusions within the Forest, very few medieval or post medieval features were recorded within this area. Exploitation of both the mineral resources and the forest itself was permitted, however, and extensive remains of industries such as charcoal burning litter the Forest. In the zones around the Forest core, especially along the margins of the Severn Estuary, extensive evidence of both settlement and agriculture and traces of early land reclamation were recorded.

As anticipated, the survey has added significantly to the number of sites in the Forest of Dean, and has led to the discovery of numerous previously unidentified monuments. This is an area where a vast amount of work by numerous individuals has built up a comprehensive record of industrial sites, and it was no surprise that the majority of

features recorded by the NMP survey were associated with the Forest's industries. By combining the aerial photographic evidence with the information available within existing documentary records, especially those held by Gloucestershire SMR, and the valuable knowledge of local interest groups, the NMP survey has provided a unique overview of the surviving remains, particularly those associated with post medieval industry.

The Forest's historical importance as a source of minerals is demonstrated by the remains of extensive coal and iron ore extraction and stone quarrying. Of particular interest were the remains of surface mining of iron ore deposits known locally as 'Scowles'.

The Forest is still an important aggregates resource area, and the surviving remains of historic extractive industries are continually under threat from further exploitation. In addition to this, parts of the forest are being adapted to serve the rapidly expanding leisure industry. Spoil heaps are being flattened or landscaped and former tram and railways converted into cycle paths making the recording and understanding of this rapidly disappearing landscape more and more important.

A considerable number of sites of military origin were also recorded. The majority of these dated from the Second World War, but there were also sites from the First World War and the 19th century. The large number of RAF vertical photographs taken immediately after the Second World War recorded sites which were soon to be decommissioned and destroyed.

1 INTRODUCTION

Fiona Small

The aerial survey of the Forest of Dean forms part of the Gloucestershire Mapping Project and has been carried out in accordance with English Heritage NMP standards. The total survey area covers 25 complete OS 1:10,000 scale quarter sheets.

With the exception of areas extending into Wales, entire OS quarter sheets were mapped for the area of the Forest of Dean; as a result, parts of Herefordshire and North Somerset have been mapped (see Appendix 6 for further detail).

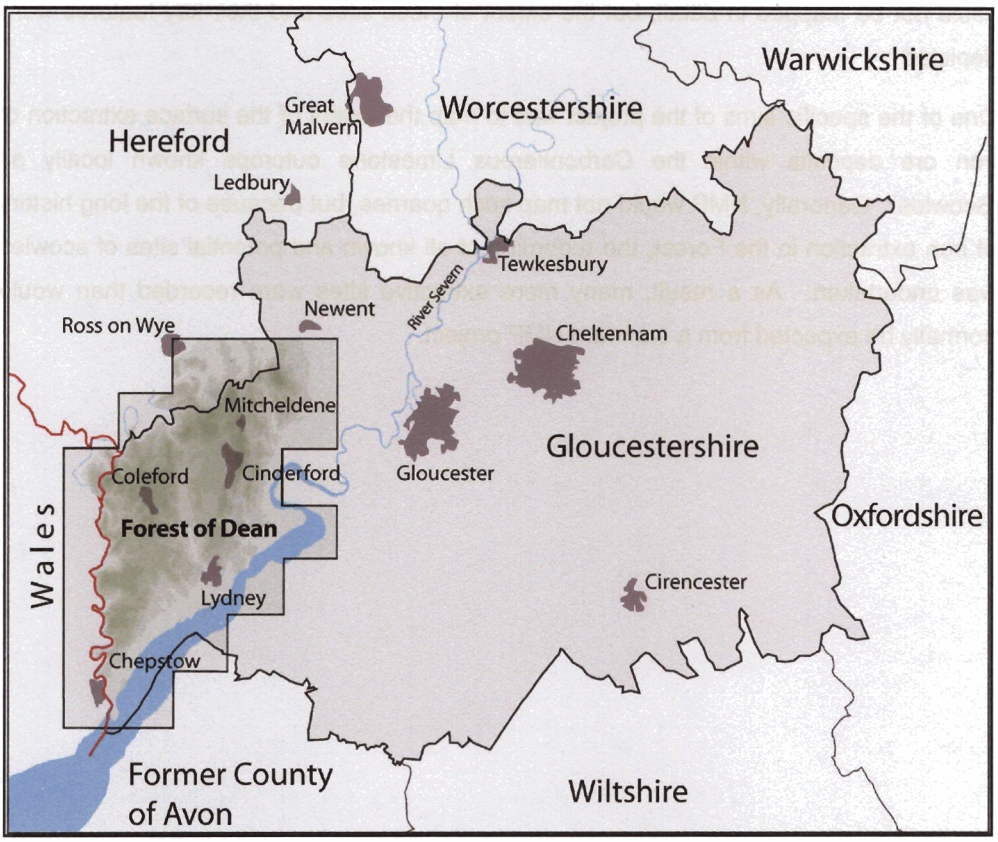

Figure 1. Location of the Forest of Dean and the Cotswolds Mapping project areas. (Based on OS map of the region)

The aims and objectives of the Forest of Dean NMP project were to identify, transcribe digitally, record and describe all archaeological features showing as cropmarks, soilmarks or earthworks on aerial photographs. The scope of the survey was to record all plough-levelled and upstanding archaeological remains from the Neolithic period to the twentieth century (1945), including military and industrial features, which were visible on aerial photographs. A summary of the classes of monument recorded is provided below, and a detailed description can be found in Appendix 1. (For the purposes of this survey and report, all period classifications used are those specified by the AMIE database – see Appendix 3).

Medieval or later ridge and furrow, water meadows and associated features were all recorded. Destroyed and surviving fields of ridge and furrow were depicted using different conventions.

Buildings were only recorded if they were no longer in existence or their remains were visible as earthworks, cropmarks, soilmark or traces of masonry. Military features pre-dating 1945 were included in the survey. Most of these sites were from the Second World War, though a small number of First World War and earlier sites were also recorded. Some of the larger complex sites, such as camps and military installations, could not be mapped in detail, but the extent of these sites and their key features were depicted.

One of the specific aims of the project was to map the extent of the surface extraction of iron ore deposits within the Carboniferous Limestone outcrops known locally as 'Scowles'. Generally, NMP would not map such quarries, but because of the long history of iron extraction in the Forest, the recording of all known and potential sites of scowles was undertaken. As a result, many more extractive sites were recorded than would normally be expected from a standard NMP project.

2 THE NMP PROJECT AREA

Fiona Small

The Forest of Dean NMP project area comprises 25 OS 1:10,000 scale quarter sheet maps, with a total area of 625km2. Of these, 15 maps fall entirely within Gloucestershire and four border the adjacent county of Herefordshire. The remaining maps link the contextual area of the Forest of Dean and its hinterlands – the lower tidal reaches of the River Severn to the south and south-east, the lower ground to the north of the Forest where Gloucestershire borders Herefordshire and the area between the Forest and the River Wye to the west. NB. The parts of the five western-most maps extending beyond the Welsh border were not included in the survey.

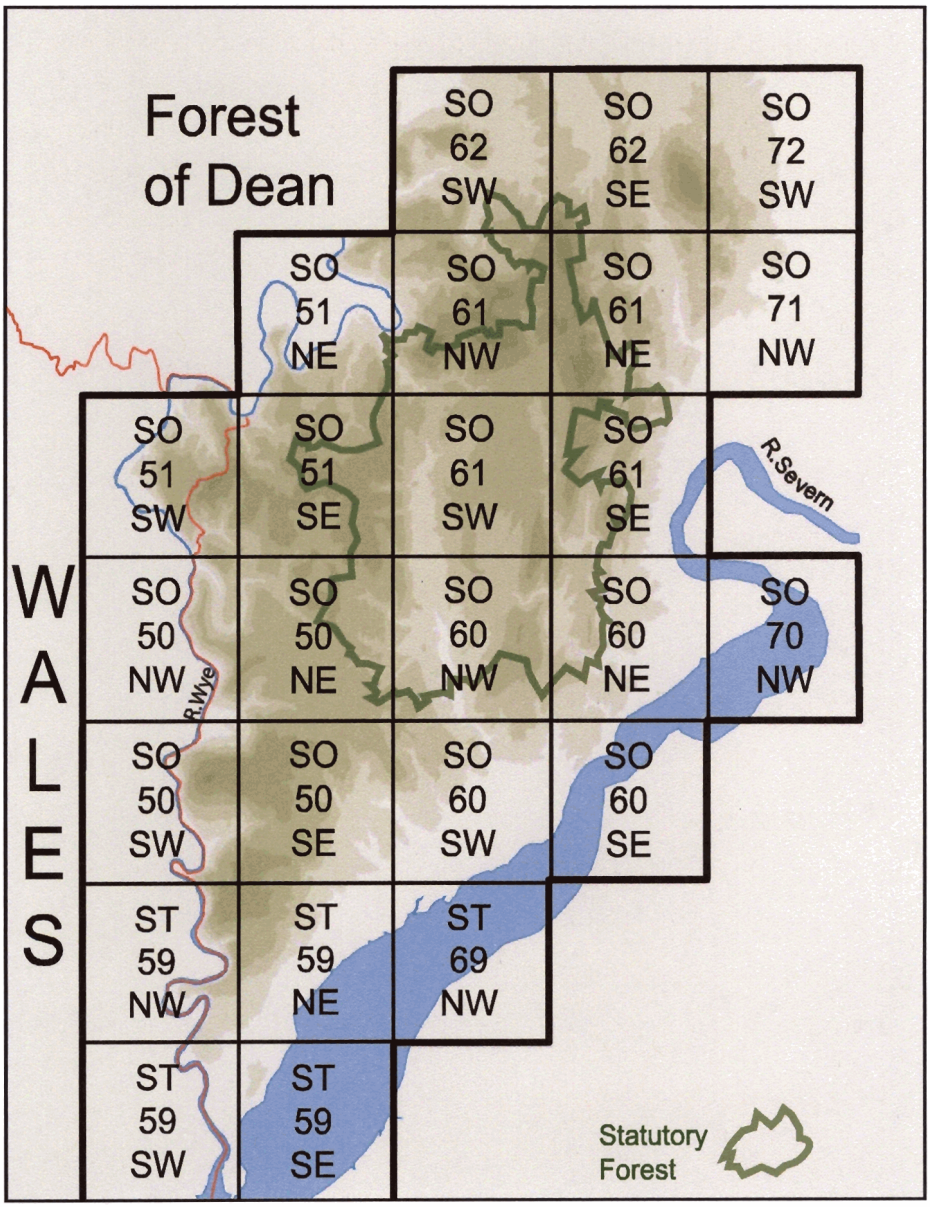

Figure 2. Forest of Dean Quarter sheets.

(Based on OS map of the region)

3 TOPOGRAPHY AND LANDUSE Fiona Small

The Forest of Dean incorporates a dramatic range of topographies, shaped by the underlying geology and soils and the actions of the Rivers Severn and Wye. Within this relatively small area five main topographical zones can be identified – these are described below.

The Forest of Dean is largely rural in character. Only approximately 5.5 % of the survey area is classified as either urban or suburban development, 34.2% as pasture or meadow, with an additional 13% classified under categories which indicate open rough grassland or heath. 33.7% of the area is classed as woodland (23.99% deciduous, 9.76% coniferous). Nearly 90% of this woodland is owned and managed by Forest Enterprise, the largest single owner in the area. Only 9.7% of the area is classed as arable. The remaining 3.9% is classified as scrub/orchard, undefined, or consists of beaches, tidal flats, cliffs and salt marsh. (Data derived from LandSat satellite landscape images held as part of the Gloucestershire County Council corporate GIS (LandSat 1992)).

A major factor influencing the pattern of settlement and land use in the Forest of Dean is the long history of exclusion from the Royal hunting forest, enforced by the Forest Law. The result can be seen in the pattern of settlement today – the major towns in the area are located around the peripheries of the Forest. There is also considerable evidence of illicit assarting which occurred at various times in the past, and resulted in numerous small holdings and dispersed villages with no apparent nucleus.

In contrast to settlement, the patterns of industrial activity and agricultural land use have been influenced more directly by the underlying geology. The undulating nature of the region, with areas of difficult terrain and frequent outcrops of rock, does not make good agricultural land, but the complex geology has provided rich mineral resources. This is reflected in the long history of extraction which is known to date back, in some instances, to Roman or earlier periods. Much of the core of the Forest is dominated by Carboniferous coal bearing shales. Further out from the centre bands of limestones rich in iron deposits (including the Crease Limestone) outcrop at the surface. Within the Crease Limestone, reserves of easily accessible coal, ironstone and iron-rich deposits are found in close proximity to one another. As a result, the region was an ideal location for the development of iron smelting industries. In addition to this, both limestone and sandstone have been quarried from the area throughout the history of the Forest.

3.1 The Topographical Zones of the region

Due to its topographical diversity, the region has been divided into seven distinct landscape zones (illustrated in Figure 3). The zones were specified in the Forest of Dean, Gloucestershire National Mapping Programme Project Design (Hoyle 2001), and are described below.

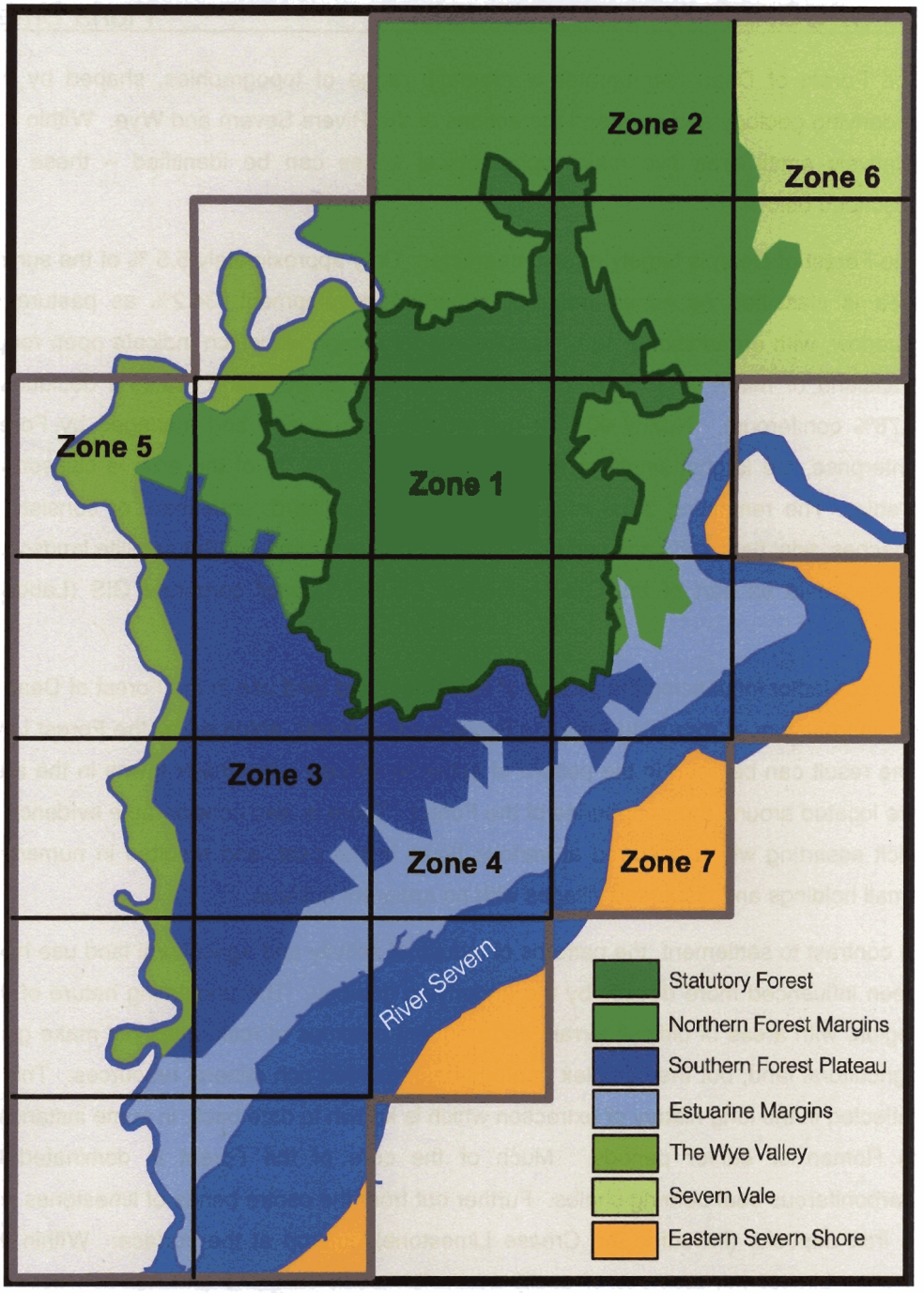

Figure 3. The Landscape Zones of the Forest of Dean.
(After Hoyle 2001) (Based on OS map of the region)

Zone 1: The central wooded area: the Statutory Forest

A large area of woodland and waste within the bounds of the modern Forest of Dean was used as a royal hunting reserve by the Anglo-Saxon kings prior to the Norman Conquest of 1066. The Norman kings were able to utilise an already established hunting forest which formed the basis of the later 'Royal Forest', ie an area reserved as a royal hunting ground and subject to separate Forest Laws, which had been established in the Forest of Dean by the time of the Domesday Survey of c. 1086 (Herbert 1996; Grant

1991). Most of the area covered by the NMP survey was subject to Forest Law between the 11th and 13th centuries (Hart 1945) although, for much of its history, the term 'Forest of Dean' referred to the relatively small area (c 9,308 ha) used as a royal hunting ground. This reserved area comprised the royal demesne and remained extra parochial until the 1840s (Herbert 1996). It formed the basis of the Statutory Forest, which was defined by a perambulation in 1831. Much of the area has been either wooded, or within the woodland management cycle, since at least the medieval period and still comprises the core of the Forest Enterprise landholdings in the area.

Much of the Statutory Forest lies between 200m and 290m OD, and consists of a high plateau bisected by the vale of the Cannop Brook and incised by the valleys of numerous streams flowing west into the River Wye and east into the lower reaches of the River Severn.

Settlement in this area consists largely of sprawling hamlets of scattered cottages and small holdings, which have encroached into the edges of the central wooded area of the Statutory Forest (Herbert 1996, 293). Many are the result of post medieval assarting, but most were established in response to 19th century population expansion to meet the housing needs of the growing industry of the area. In places, such as Cinderford, these squatter settlements have grown to become small towns. Within the core of the Statutory Forest there is still very little habitation other than the scattered lodges such as Speech House.

Zone 2: The Northern Forest Margins

This landscape area comprises the woodland to the west of the Statutory Forest which borders Herefordshire and Monmouthshire. Much of this zone also lies above 200m OD and is incised by a number of steep valleys which drain westwards into the River Wye.

The major settlements in this zone, such as Littledean, Micheldean, Ruardean and Coleford, are medieval in origin and tend to be sited close to the edge of the Statutory Forest. Patches of enclosed farmland (generally pasture but also some arable) are found close to these settlements, particularly to the north and west of the Statutory Forest.

Zone 3: The Southern Forest of Dean Plateau

To the south of the Statutory Forest, the survey area comprises an undulating plateau of rolling ridges and valleys tilting to the south, but maintaining heights of c. 200m OD. These valleys drain both eastwards into the River Severn and westwards into Wye. The hills on the eastern edge are characteristically steep and rounded, separated by narrow valleys, whilst the western edge is defined by the steep gorge of the Wye Valley (Zone 5 below).

This is predominantly a landscape of enclosed farmland under pasture, although some areas of arable cultivation also occur. On the higher ground and at the edges of the

zone along the Wye valley, where the ground is too steep for cultivation, there are large tracts of woodland. Settlement is concentrated in the river valleys, avoiding the central region of this zone.

Zone 4: The Estuarine Margins

The south-eastern zone comprises the low-lying regions of the alluvial flood plain adjacent to the Severn Estuary (including the southern reaches of the River Wye). This is relatively level ground defined by the 50m contour, but does include some higher ground around Sedbury on the southern edge of the area.

Zone 5: The Wye Valley

The fifth landscape zone comprises the dramatic valley of the River Wye which flows southwards, marking the southern extent of the border with Wales for approximately 29km. The valley is generally less than 0.5km wide and is bounded by precipitous slopes or vertical cliffs which in places rise 100m directly from the river.

The dominant vegetation consists of remnants of early woodland clinging precariously to the steep slopes around the river. There is considerable evidence of extensive limestone quarrying in this area.

Zone 6: The Severn Vale

This zone comprises the area between the northern margins of the Forest of Dean and the River Severn. The area descends from the Forest, to form a region of low gentle hills reaching heights of between 35m and 40m OD. The settlement pattern is one of scattered villages and farms with arable cultivation.

Zone 7: The Eastern Severn Shore

The survey area extended beyond the Severn Estuary to the river's eastern shores. The north-eastern and south-western extents of Zone 7 comprise flat, low lying land, requiring active drainage. Much has been reclaimed or protected from tidal incursions by several phases of sea wall construction along the shore. Reclamation and construction of sea defences was established in the medieval period and extensive swathes of medieval ridge and furrow survive across the region behind the sea walls.

3.2 Geology: Solid and Drift

Zone 1: The central wooded area: the Statutory Forest

The solid geology of the central area is extremely complex and can only be shown in a simplified form (see Appendix 8). It consists of layers of sandstones of the Upper Carboniferous Series, which contain over 20 separate coal seams. These strata form a basin (the Dean Syncline) and coal seams outcrop or lie close to the surface throughout

the area (Dreghorn 1968). The sandstones overlie limestones of the Lower Carboniferous Limestone Series, including the iron ore bearing Crease Limestone, which forms a 'necklace' around the edge of the higher ground. This in turn overlies sandstones of the Tintern Sandstone Group of the Upper Old Red Sandstone Series (including a band of quartz conglomerate). The eastern part of this zone comprises Brownstones and St Maughan's Sandstone of the Lower Old Red Sandstone Series (BGS 1974; IGS 1979).

With the exception of some thin bands of alluvium in river valleys, no drift geology is recorded in this part of the zone (BGS 1974; IGS 1979).

Zone 2: The Northern Forest margins

Much of Zone 2 overlies the same solid geology as the western edges of Zone 1 with Upper Carboniferous Sandstone giving way to Lower Carboniferous Limestone which in turn gives way to Upper Old Red Sandstone. In the north eastern part of the zone, the geology becomes more complex. The Old Red Sandstone gives way to bands of limestone and shales of the Ludlow, Wenlock and Llandovery groups of the Silurian Series. At the eastern edge of this zone, these are overlain by much more recent Triassic Mudstones (BGS 1974; IGS 1979).

Drift geology in this zone is limited to narrow bands of alluvium in river valleys (BGS 1974; IGS 1979).

Zone 3: The Southern Forest of Dean Plateau

The central spine of zone 3 overlies a solid geology of Lower Carboniferous Limestone which gives way to Upper Old Red Sandstone and Lower Red Sandstone as the ground slopes towards the Rivers Severn and Wye to the east and west (BGS 1974; IGS 1979).

Zone 4: The Estuarine margins

The earliest solid geological stratum in Zone 4 consists of the Lower Old Red Sandstone, part of the same series which underlies Zones, 1, 2 and 3. Along the northern banks of the Severn Estuary these are overlain by Triassic Mudstones, which are overlain by Lower Lias Clays in some areas.

Zone 4 is the only landscape zone within the Forest of Dean with significant deposits of drift geology: bands of terrace deposits (sand and gravel) and alluvium are found adjacent to the Severn Estuary.

Zone 5: The Wye Valley

In the northern and southern parts of this zone the River Wye runs through a steep gorge, between cliffs made up of the Lower Carboniferous Limestone. The sides of the central part of the Wye Valley are less steep where they overlie a solid geology of both Upper and Lower Old Red Sandstone.

The Wye valley, within the survey area, has no discernible floodplain, and no drift geology is recorded.

Zone 6: The Severn Vale

This zone is dominated by a wide, deep deposit of Keuper Marl capped by patches of terrace gravels. Narrow deposits of alluvium occur along the numerous streams which flow into the River Severn to the east.

Zone 7: The Eastern Severn Shore

This zone comprises the low-lying ground adjacent to the shores of the eastern bank of the Severn Estuary. Geologically this zone is generally a continuation of the strata outcropping in Zone 4 on the northern side of the estuary. The upper geological beds of the north-eastern and south-western parts of this zone comprise gravels and alluvial deposits overlying clays. Between these two areas, in the region of Sharpness, the outcropping strata mirror those of the eastern edge of the Dean Syncline with a broad band of Raglan Marl, and Silurian limestones and shales.

3.3 Soils

The complexity of the geology within the survey is reflected in the complexity of the soils.

Zone 1: The central wooded area: the Statutory Forest

Zone 1 overlies a complex pattern of stagnogley soils, brown podzolic soils, and brown earths. The soils tend to consist of poorly drained fine loams, often subject to seasonal water logging. They are frequently found on steep slopes, and outcrops of the parent solid geology are not uncommon. Bands of brown rankers are found in places on the periphery of this zone. This soil generally consists of well-drained loams found on steep slopes with frequent rocky outcrops (OS 1983).

Zone 2: The Northern Forest margins

The correlation between soils in Zone 1 and 2 reflects that of the solid geology, with stagnogley soils, brown podzolic soils, brown earths and brown rankers found in the northern and western parts of Zone 2. In the eastern part of the zone, bands of argillic brown earths, and stagnogleyic argillic brown earths are found. These fine silty soils tend to be better drained than those found to the north and west, but are still subject to some seasonal water logging (OS 1983).

Zone 3: The Southern Forest of Dean Plateau

Much of Zone 3 is made up of the poorly drained fine loams characterised as brown earths, with a small area of stagnogley soils, and bands of better drained loams

characterised as brown rankers. Argillic brown earths (well-drained fine silty soils) are, however, found in the central part of the zone (OS 1983).

Zone 4: The Estuarine Margins

Zone 4 has a relatively complex soil pattern made up of brown rankers, brown earths, stagnogley soils, and stagnogleyic argillic brown earths. More clayey soils (pelo-calcareous alluvial gley soil, calcareous pelosols, pelo-alluvial gley soils, argillic pelosols and pelo-stagnogley soils), silts, (gleyic calcareous alluvial soils) and some fine loamy soils (gleyic argillic brown earths) are found on the northern bank of the Severn Estuary, where they overlie river terrace deposits and alluvium.

Zone 5: The Wye Valley

The soils in the northern and southern parts of Zone 5 are made up of shallow well drained loams (brown rankers) whilst poorly drained fine loams (brown earths) are found on the less steep slopes of the central part of the zone.

There is no discernible floodplain of the River Wye in this area, and no alluvial soils are recorded.

Zone 6: The Severn Vale

The soils of the Severn Vale are a complex mixture, but the western part of the zone is generally characterised by slowly permeable calcareous clayey soils, whilst to the east there are areas of fine loams over clay with a tendency to waterlogging.

Zone 7: The Eastern Severn Shore

This zone comprises three separate areas along the estuarine shore. The south-western region of the zone is dominated by deep calcareous clayey soils derived from marine deposits and riverine alluvium. These are low-lying areas and the soils are prone to flooding and waterlogging; ground water has to be controlled by drains. The middle region (centred on Sharpness) is dominated by reddish fine to coarse loamy soils with a tendency to light seasonal waterlogging. To the north-east of Sharpness the coastal region is more low-lying and flat (centred on Slimbridge). The soils here are deep stoneless calcareous clays prone to flooding and requiring drainage. The adjacent area in the bend of the river at Arlingham the soils are slightly more permeable fine loams.

3.4 Factors affecting the visibility of archaeological remains

The topography, geology and soils are all closely linked to one another and have all influenced the land use, settlement and industrial patterns within and around the Forest of Dean.

Grazing within the Forest was permitted as part of the commoners' rights, but cultivation was prohibited under Forest Law. The undulating topography in the centre of the Forest

is agriculturally unfavourable, generally remaining as woodland, and most modern cultivation within the Forest provides pasture for grazing. The predominance of pasture, coupled with the heavy soils, which do not lend themselves to cropmark formation, means that few plough-levelled archaeological sites have been detected within the Forest.

Conversely, due to the low level of cultivation, many of the recorded sites have survived as earthworks and it is likely that more will be discovered within the denser parts of the Forest. The NMP survey has benefited greatly from photographs taken during cycles of forestry clearance, and others taken in winter when sites can be seen through the thinned canopy (the sites of several World War II dispersed storage depots were seen in this way). However, even in these favourable conditions many known sites were partially or totally obscured. This suggests that many unrecorded sites could have been missed through aerial survey.

Because the rich mineral resources in the Forest have been heavily exploited through history, vast numbers of industrial remains have been recorded here. It is possible that these sites have themselves obscured or destroyed earlier sites. The surviving remnants of the industrial landscape are currently at risk from continued quarrying and also from landscaping for leisure activities within the Forest.

Beyond the limits of the Forest, the terrain becomes far more gentle and low-lying to the north-east, east and south-east due to the proximity of the Severn Estuary. Most of the cultivated land lies under pasture and much, towards the Severn, requires heavy drainage, especially where reclamation has occurred. This area has been heavily cultivated through time and is covered with the extensive remains of medieval ridge and furrow which has survived because of the subsequent dominance of pasture and orchards. However, what remains of the medieval cultivation is under continued threat from modern ploughing. The soils in the peripheral areas, like those within the Forest, are also poor at cropmark generation and in consequence very few ploughed sites have been recorded.

4 PHOTOGRAPHIC AND DOCUMENTARY SOURCES

Fiona Small

The survey was based on the interpretation of aerial photographs supported by relevant documentary sources and archives. The photographs consulted were from a number of sources, the majority of which are held by English Heritage in the National Monuments Record (NMR), Swindon. These photographs comprise a large collection of vertical reconnaissance photographs from the RAF which were taken just after the end of World War II (1946–8), and vertical photographs taken by the Ordnance Survey between the 1960s and 1980s, for mapping purposes. Other verticals held in this collection were from United States Army Air Force and some from Meridian Airmaps. In addition to these vertical photographs the NMR also holds a collection of oblique photographs taken specifically for archaeological purposes. These made up only a small proportion of those consulted during this survey, but were supplemented during the survey by further aerial reconnaissance undertaken by English Heritage. The additional sorties targeted sites identified during mapping, as well as areas where the photographic cover was poor. In total approximately 450 oblique and 6690 vertical photographs held by the NMR were consulted.

In addition to the photographs held by the NMR, the Cambridge University Unit for Landscape Modelling collection of air photographs was also consulted. These photographs were loaned to the project by special arrangement with Cambridge University (see Appendix 2).

The survey was carried out in close collaboration with Gloucestershire County Council Archaeology Service, who provided advice and guidance on various aspects of the archaeology of the Forest of Dean and surrounding region. A small collection of GCC planning photographs were also loaned for consultation.

The monument records held on the NMR AMIE database and those held by Gloucestershire and Herefordshire Sites and Monuments Records were consulted for concordance with existing records and to aid identification of the sites mapped from the aerial photographs.

Maps from many sources were used. The current edition OS 1:10,000 maps, in digital form, were used as a base for all mapping in AutoCAD, and the OS 6" first edition maps and OS Archaeology Division 1:10,560 field sheets were also consulted for information on removed buildings and field boundaries.

Published research covering subjects relevant to the archaeological understanding of the region's sites was consulted throughout the survey. Local history and interest groups from the Forest of Dean, including the Dean Archaeology Group and the University of the 3rd Age (U3A) were also consulted.

5 THE ARCHAEOLOGY Fiona Small

The Forest of Dean has been identified as an area of relatively low monument density with a particularly low number of sites from the Prehistoric and Roman periods in comparison with surrounding areas. It was hoped that aerial survey would help to shed some light on this period of the regions archaeological record, despite the difficulties caused by tree cover.

The region is known to have been occupied and heavily exploited in the Roman period, and numerous finds and sites of Roman settlements have been recorded throughout the region. However, due largely to the terrain, Roman roads are confined to the valley bottoms and almost certainly lie beneath the current roads. Roman settlements have probably also been obscured beneath current towns, and it is unlikely that many Roman sites within the Forest can be recorded from the air.

The Forest of Dean is rich in minerals, with abundant deposits of both coal and iron ore concentrated in the area of the Forest. Consequently, the area has a long history of extractive industries and the Forest is littered with the remains of the extraction and processing of these resources. This activity reached its peak during the industrial revolution, resulting in extensive coal and iron mines with associated tips, buildings, railways and tramways. However, much of this industrial heritage has already been lost through redevelopment for industry and landscaping for leisure, or has disappeared under subsequent forestry plantation.

Of particular interest were the remains of the surface mining of iron ore deposits known locally as 'scowles'. They are thought to originate as semi-natural fissures within the Crease Limestone, from which secondary iron ore deposits were extracted, enlarging the fissures to form linear quarries and surface pitting following the ore deposits within the strata. Some scowles are known to have originated in the Roman period, but many were worked well into the post medieval period, making it extremely hard to date these quarries. Many of the large modern quarries are also believed to have originated as scowles. Because the Forest is still an important source of aggregates, the surviving monuments from historic extractive industries are under continued threat from further quarrying.

5.1 Previous archaeological work in the region

The English Heritage AMIE database was consulted for records of all events and monuments within the survey area. Very little landscape survey work has been carried out in the Forest of Dean. No earlier archaeological aerial survey projects are recorded, and very few field surveys have been carried out within the study area. The only relevant survey recorded on the AMIE database was the RCHME field survey of Welshbury Hillfort, whose results and plans of which were consulted during the aerial survey of the site.

However, this is not a little studied area. On the contrary, a vast amount of information has been gathered, and there have been numerous studies by various individuals and local interest groups on aspects of the local history and, in particular, the industrial archaeology of the region. These sources have proved invaluable in the identification and concordance of the complex remains of mines, quarries, tramways, railways, factories, shipyards and military features.

The aerial survey has enabled the entire area of the Forest of Dean to be surveyed to a consistent standard and the archaeological remains of the region to be mapped accurately for the first time. It was also possible to locate named mines and associated tramways for which documentary records existed, but whose exact locations were unknown. The survey has also identified a considerable number of previously unrecorded archaeological sites, benefiting from sets of historical photographs which coincided with periods of felling in the forestry cycle, revealing sites which would otherwise be obscured by trees.

This is a topographically challenging area, with undulating terrain and a large proportion of the core being densely forested. Ground survey is particularly difficult to undertake where the forest undergrowth is dense, but it is hoped that future fieldwork can be targeted on specific sites identified from the aerial photographs. Maps and monument data resulting from the aerial survey were provided to Gloucestershire County Council Archaeology Service to aid further ground survey.

5.2 Summary of results of the survey

The Forest of Dean represents an extensive area of continuous afforestation, and is possibly a remnant of Prehistoric woodland. Historically the Forest was important as a forest for its valuable game and timber resources, and also for its mineral resources, with deposits of coal and iron ore, and outcrops of limestone and sandstone.

Though recognised as a Royal Hunting forest from Norman times it is clear that the Forest had been established as such in the Saxon period. Although primarily reserved for the harbouring of the 'King's beasts' for the purposes of the Royal hunt, the Forest continued to be heavily exploited for both timber and mineral resources. Occupation of the Forest and cutting of timber were illegal under Forest Law, but were managed, through licences, rents and fines, to the financial benefit of the Crown. The laws were gradually relaxed from the 17th century onwards and the area began to be encroached upon by settlement and industry. In the 18th and 19th centuries ironstone and coal mining became more intensive as technology advanced, enabling deeper mines to be sunk. With the extraction of coal and ironstone came iron processing with forges and furnaces being set up throughout the forest.

The whole area is littered with the remains of these industries – numerous quarries, remains of iron stone and coal mines, networks of tramways and railways, ponds, leats and buildings. The Forest is still recognised as an important source of aggregates with

many active sites of extraction which means that the surviving remains of historical extractive industries are continually under threat from further expansion.

Apart from the industrial features, the Forest of Dean has been identified as an area of relatively low monument density. The region was poorly represented in the NMR and, although most of the area is heavily afforested, it was believed that the area would benefit from blanket aerial survey. In particular, there were very few confirmed Prehistoric and Roman monuments within the Forest, and it was hoped that through the use of aerial photographs some light would be shed on the apparent absence of these early sites. This apparent lack of early archaeological features within a wooded area is not unique to the Forest of Dean: a similar pattern was encountered during a field survey of the New Forest (Smith 1999) where Prehistoric sites, especially enclosures, were noticeably absent. In the New Forest, as in the forest of Dean, it was unclear whether potential sites had been destroyed through the processes of forest management or simply had never existed.

As anticipated from the outset, the NMP survey has greatly added to the number of sites, and has mapped, in their context, the remains of industrial sites dispersed through the Forest. The aerial survey has provided a unique overview of the surviving remains, while detailed interpretation, particularly in the case of the post medieval industrial sites, relied heavily on concordance with documentary sources, especially those held by Gloucestershire SMR, and on the valuable knowledge of local interest groups.

The survey benefited particularly from blanket cover of aerial photographs taken during two periods of forest clearance in the managed forest. Of particular value were RAF vertical photographs taken in 1946 and 1948, and OS vertical photographs taken in 1968. The earlier photographs also recorded former mining and quarrying sites which were largely open in the 1940s, but have since been afforested or developed in the latter part of the 20th century.

A more detailed numerical and statistical analysis of the results of the survey is provided in Appendix 3. A broader thematic discussion of the archaeological remains recorded from the aerial photographs is provided in the following sections.

6 THE PREHISTORIC AND ROMAN FOREST OF DEAN

Sharon Bishop

6.1 Introduction

Relatively few Prehistoric and/or Roman sites are known in the Forest of Dean, compared with elsewhere in southern Britain (Darvill and Fulton 1998). The previously known Prehistoric sites in the region comprise a few scattered Bronze Age round barrows and several Iron Age hillforts, such as those at Spital Meend and Welshbury. Curvilinear hilltop enclosures, as at May Hill, and smaller curvilinear enclosures such as in Lord's Wood are also potentially of Prehistoric date and may have Bronze or Iron Age origins. The aerial survey has added two new earthwork enclosures to the list of Prehistoric sites within the study area. In addition, the survey recorded extra details which allowed the re-interpretation of some of the known Roman sites. Many of the industrial sites featured elsewhere in this report could also be later Prehistoric in origin.

The past lack of intensive agriculture in the Forest suggests that a higher proportion of Prehistoric and Roman earthwork features might survive here than in more cultivated areas, although archaeological remains may have suffered damage from forestry and industrial activity. Archaeological sites in wooded areas can often be masked by rows of trees, shadows and undergrowth so that even well-preserved earthwork features can be missed by both ground and aerial survey (Smith 1999).

The dense tree cover of the Forest core undoubtedly hides other Prehistoric and later earthwork remains, which could be revealed by complementary remote sensing techniques. Airborne remote sensing techniques have proved particularly useful in a woodland context: a recent LIDAR survey of Welshbury Iron Age hillfort near Cinderford revealed slight linear earthworks which were obscured to traditional aerial survey by the vegetation (Devereaux et al 2005). Unfortunately, smaller features remained hidden to this technique.

Roman sites in south-western England are mostly known from cropmark evidence, but the combination of unresponsive soils and the dominant forestry and pastoral land-use means that the project area is not conducive to cropmark formation. The overall lack of specialist archaeological photography may also contribute to the lack of known Prehistoric and Roman sites in the project area.

The dating of archaeological features on the basis of aerial photographic evidence is problematic due to an historic lack of field investigation and the comparative data this could provide. Several of the recorded earthwork and cropmark enclosures have been dated by morphological comparison with excavated sites elsewhere in southern Britain, although the direct transfer of interpretations from one limited excavation to another morphologically similar site can be overly simplistic: each site will have its own history of construction and use which can only be understood through the application of complementary investigative techniques. Small-scale industrial sites (eg extractive pits, charcoal burning platforms) are particularly difficult to date and may have very long

histories of use, from the late Prehistoric through to post medieval periods (see Forest Industries and Small-scale Extractive Industries, Sections 9 and 11 below).

In this report, sites that could be Prehistoric or Roman are discussed in the Prehistory section, and those sites that are thought to be definitely of Roman date are discussed in the Roman section.

6.2 Prehistory

The nature of archaeological evidence for periods before the Neolithic is such that it is seldom visible from the air: pre-Neolithic evidence in the Forest comprises several Middle Palaeolithic cave sites situated along the River Wye and scatters of Mesolithic flints. Layered deposits from within the caves suggest they were used sporadically from the Palaeolithic period onwards, and stray finds of axes gradually become more widespread throughout the Forest into the Bronze Age. It is not until more monumental ritual sites such as long barrows and causewayed enclosures start to be constructed in the Neolithic period that archaeological sites have a more lasting and consequently more visible impact on the wider British landscape, but no examples of such monuments have yet been recorded within this project area.

This section will examine the contribution that the Forest of Dean NMP survey has made to the existing knowledge of the Neolithic, Bronze Age and Iron Age periods in the Forest. Previously known Prehistoric sites comprise a few scattered Bronze Age round barrows and several Iron Age hillforts, such as those at Spital Meend and Welshbury. Curvilinear hilltop enclosures, such as the enclosure on May Hill, and a smaller curvilinear enclosure in Lord's Wood, are also potentially of Prehistoric date and probably have Bronze Age or Iron Age origins.

6.3 Neolithic

No Neolithic monuments were positively identified during the project, although finds from field-walking collection and evidence of sporadic occupation as a result of cave exploration suggest that the natural resources of the Forest were exploited periodically, possibly in a pattern similar to that found in the New Forest (Smith 1999). No features were visible on the available aerial photographs at, or around, the site of the Neolithic or Early Bronze Age short-stay campsite identified by fieldwalking at St Briavels, but this is not surprising given the ephemeral nature of any structures likely to be involved.

The Cotswold-Severn group of Neolithic long barrows are located in fairly close proximity to the east of this region, and similar monuments might be expected within the Dean study area, although none was found during this survey. It is perhaps possible that Neolithic long barrow mounds could have been mistakenly interpreted as medieval or post medieval spoil heaps. They may also already have been destroyed or disturbed by forestry, industrial activity (see below) or agriculture, or simply hidden by the vegetation.

This is unlikely, however, given the apparent lack of any Neolithic monuments from this period in the contextual areas around the Forest that are less affected by these activities.

6.4 Bronze Age

Round barrows represent the earliest recorded earthwork remains in the project area. Of the nine or more Bronze Age burial mounds already identified within the project area, only Soldiers Tump at Tidenham was partially visible through trees. Other round barrow sites have suffered from ploughing (eg one at Tidenham), are thought destroyed by forestry (eg one on the Doward) or have been levelled for development (another at Tidenham). Two possible Bronze Age ring-ditches, which may have surrounded circular burial mounds typical of this period, were recorded as cropmarks near Mitcheldean. The dimensions of these ring-ditches, at 8m and 11m in diameter, suggest they may be the remains of either hut circles or ditches around barrows. Unfortunately, the site has been built over since the aerial photographs were taken and therefore is presumed to be at least partially destroyed.

Three standing stones of probable Bronze Age date are known in the Forest (Darvill 1987), but only is visible from the air: the Queen Stone at Huntsham is situated to the north of the Forest beside the river Wye. Similar monoliths could be hidden by trees or may have been utilised in later buildings.

No Bronze Age settlements have been identified positively in the Forest except for the St Briavels 'camp' site, nor does the region possess large-scale, man-made land divisions of the type found in areas of more extensive Middle- to Late-Bronze Age agricultural occupation such as Wessex (eg Bradley et al 1994).

The apparent lack of settlement evidence is at odds with the number of Bronze Age artefacts (over 30 Bronze and flint axe- and spear-heads) recovered in the area. The fact that many are stray finds from fields and extractive workings perhaps indicates that seasonal settlement, not involving the construction of large permanent structures, was predominant in Bronze Age Dean. The finds could also suggest that some Bronze Age mineral or stone extraction took place in the Forest, but confirmation of this possibility requires further field investigation.

The aerial survey has not been able to clarify the extent of Bronze Age activity in the Forest: that people were present in the area at that time is clear from the artefacts they left behind, but what they were doing there (other than burying their dead) and where they lived remains elusive. The evidence is probably either still hidden beneath the Forest's vegetation, or has been substantially altered by subsequent activity. Permanent settlement may have been established as early as the Bronze Age at one or more of the curvilinear hilltop enclosures associated with Iron Age occupation, but excavation is required to establish the detailed chronology of these sites.

6.5 Iron Age

The Iron Age hillforts of southern Britain seem to exist within complex networks of different settlement types, probably representing some form of social and/or economic hierarchy (Cunliffe 2000). Nine hillforts are known within the project area, frequently situated on promontories along the River Wye. On the basis of morphology, it has been suggested that two of these, at Spital Meend and Symonds Yat, were remodelled in the Middle Iron Age (Darvill 1987), whereas the only excavated hillfort within the bounds of the Forest, at Lydney Park, has been given a much later date of c 100 BC. The date of the forts along the Wye suggests an early need to protect the resources of the Forest, while the contrasting later date of the site in the central Forest may imply a shift of focus away from the west in the Later Iron Age. The complex history of construction and use at individual hillforts, and their place within the Prehistory of the region, will only be understood after much more detailed investigation.

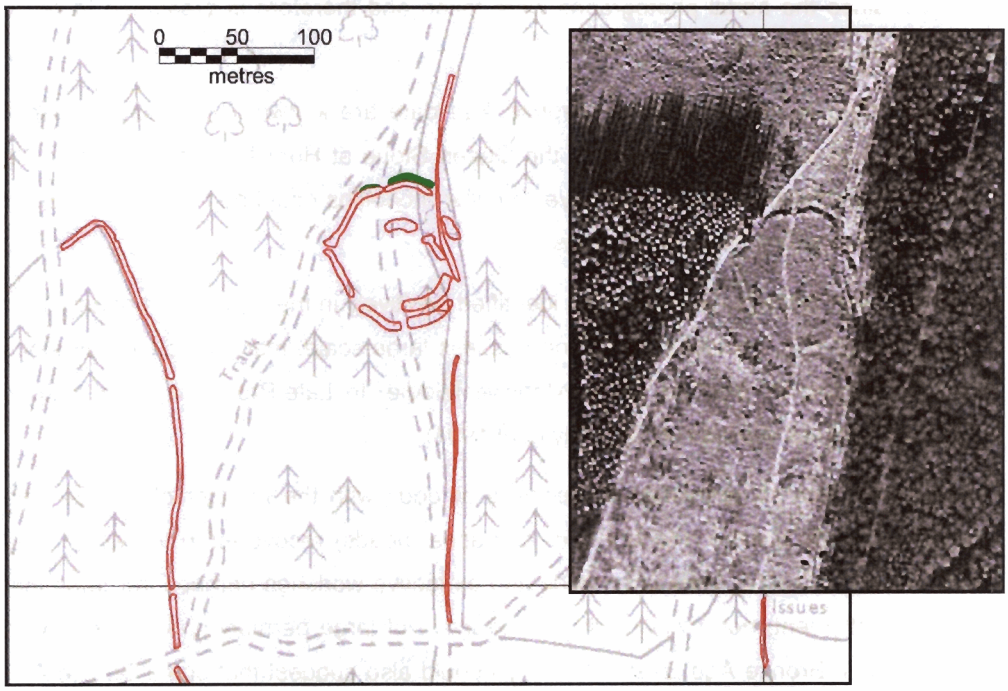

Figure 4. The Dry Wood enclosure discovered by the Forest of Dean NMP project, seen on the survey map (left) and the 1946 vertical photograph (right). The eastern side of the enclosure has been altered by a post medieval woodland bank which extends north–south.

Extract from RAF CPE/UK/1913 4029 30-DEC-1946 © English Heritage (NMR) RAF photography.

Background map acquired from the Ordnance Survey

Small Iron Age enclosures, found in great numbers to the west of the River Wye (Stoertz 2004, 27–29, 34; Whimster 1989, 35–57), appear to have been much less common in the Forest of Dean, although a few were recorded. The NMP aerial survey discovered the earthwork remains of a previously unknown sub-circular enclosure in Dry Wood, which is probably Prehistoric (Figure 4). A similar small oval earthwork enclosure was also discovered at East Dean. The example in Lord's Wood was dated, on excavation,

to the Roman period and evidence for iron-working was found at the Sallow Vallets enclosure. Some of the medieval earthwork ring-works and mottes mapped by the project may possibly have re-used earlier, Prehistoric enclosures.

A curvilinear hilltop enclosure at May Hill (Figure 5) is also potentially of Prehistoric date and probably have Bronze or Iron Age origins. Located on the north-eastern edge of the Forest of Dean, May Hill is a common used for recreational purposes today, but its diverse surviving earthworks hint at a long history of exploitation including quarrying, charcoal burning and grazing. The hill top is dominated by a plantation of trees known as The Firs which sits asymmetrically within a circular 19th century common enclosure. This delimits an area of 4 acres awarded to Longhope parish at the time of enclosure of May Hill common in 1874. The enclosure is defined by a thin bank broken in two places by the entry of a contemporary carriage road which defined by two parallel banks which are continuous with the enclosure boundary.

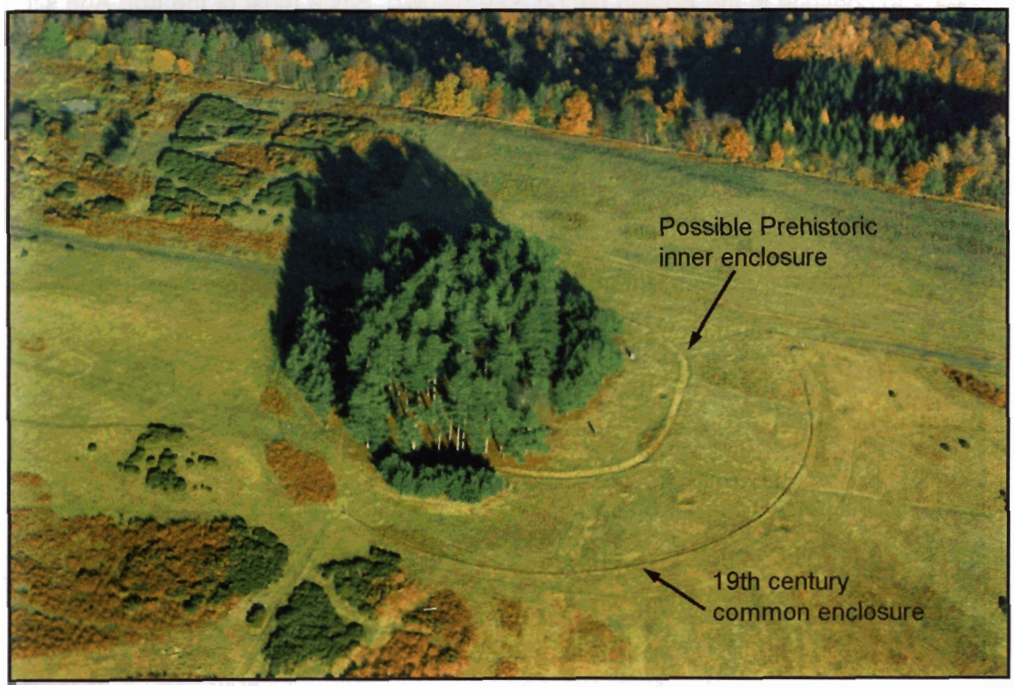

Figure 5. May Hill common, with its 19th century common enclosure and possible Prehistoric inner enclosure partially obscured by trees.

NMR SO 6921/6 (23276/22) 07-NOV-2003 © English Heritage. NMR.

Within the common enclosure the earthwork remains of a second enclosure have also been noted. The inner bank and ditch are more substantial and less regular than the common enclosure; although the northern half is obscured by the plantation, it is clearly sub-circular in plan, flattened on the south-eastern side. No entrances or internal features, other than a single pit of uncertain date, were visible on the aerial photographs, but further structures may well lie obscured within the plantation. This inner enclosure has variously been interpreted as a Roman Camp or an Iron Age camp, although no field investigation appears to have taken place. The morphology of the enclosure is closer to that of later Prehistoric hill top enclosures, but the question of its date will only be answered by further investigation.

The only previously identified Iron Age site to appear as a cropmark is an enclosure complex at Huntsham, apparently precursors to the Roman villa there (see Figure 6). Two new possible Iron Age cropmark sites immediately north of Mitcheldean were recorded by the aerial survey. The latter is the most convincing and comprises an incomplete, probably circular, ditched enclosure measuring just over 80m in diameter. No associated features, such as hut circles, were recorded near or within the site, but a number of extraction sites situated around 500m to its west could indicate industrial activity associated with the enclosure.

Although the aerial survey has not significantly changed the understanding of the Iron Age Forest of Dean, it has added to the number and distribution of recorded sites. Evidence of iron-working, in the form of bloomery slag, is a common feature of many of the project area's hillforts and other Prehistoric enclosures, contributing to an overall picture of an industrial function and focus to Iron Age settlement in the Forest which appears to continue in the Roman period (see below). Since most of the Iron Age sites are at least partially hidden by the tree cover, targeted ground investigation and excavation are needed to establish individual site histories which can then be compared across the wider landscape.

6.6 Summary of Prehistoric activity

Early Prehistoric activity in the ancient wooded Forest seems to have focused on the rivers and the natural mineral and ecological resources. The aerial survey results reinforce a view of a gradual increase in later Prehistoric activity, and the growing importance and utilisation of the raw material wealth of the Forest, especially in the Iron Age. The Forest's topography has meant that its land-use has substantially differed from that of surrounding areas and it has retained a distinctive character. Although some potentially Prehistoric field systems, indicating agricultural land-use, have been identified, field work and excavation increasingly link later Prehistoric sites with iron-working and its associated industries (i.e. charcoal).

6.7 Roman

No new Roman sites were positively identified during the aerial survey, but NMP data have made a small contribution to the wider knowledge of settlement and industry in the Roman Forest of Dean.

6.7.1 Settlement

The few known Roman settlement sites in the project area are distributed around the periphery of the central Forest. The lack of agricultural estates and farmsteads common elsewhere in the Roman villa landscape of southern Britain (Dark 1997) indicates a difference in character of the Forest landscape and a lack of large-scale forest clearance. Roman iron-working sites are known around the Forest's periphery and there is some evidence of an increase in this industrial activity in the 3rd and 4th centuries AD,

which could be related to the decline of the Wealden iron industry at about this time (Sindrey 1990).

Four villas are situated along the Roman Road which extends along the vale, between the Forest and the Severn shore, at Aylburton, Woolaston, Boughspring and Lydney Park (McWhirr 1981), but only the neatly exposed stone foundations of Lydney Park villa were visible from the air. Two villa sites situated to the north of the Forest, at Huntsham and Stock Farm, are represented as cropmarks but they appear to be isolated from any other Roman features.

The Huntsham villa complex (Figure 6) occupies a position that is unique within the northern project area, on the fertile low-lying land of the first gravel terrace in a loop of the River Wye. Excavations in the 1960s and 1970s revealed corn-driers within both an aisled barn and a 100ft long building wing (the villa), clearly indicating that the site had an agricultural focus (Bridgewater 1962). The aisled barn, lying among the cropmarks of a probable Prehistoric complex of enclosures and pits, was visible on aerial photographs. The 100ft long building wing, however, was not: the local land use and the material used to backfill the excavation may both have been unfavourable for cropmark production, and few specialist oblique photographs had been taken.

Figure 6. The aisled barn (red) and possibly earlier complex of enclosures and pits (green) at Huntsham. The 100ft long wing of the main villa house (not shown) is situated to the south of the cropmarks.

Background map acquired from the Ordnance Survey

The Stock Farm villa site (Figure 7) is situated approximately 9km to the south of the Huntsham example, on a limestone hilltop immediately north of Clearwell. The main villa building has only been photographed once, during the extremely dry summer of 1976, although its location has appeared at other times as a diffuse parched area. A small-scale excavation, inspired by the 1976 photographs, revealed evidence of animal husbandry, and the site has been interpreted as a farm, although no evidence of arable cultivation was found (Atkinson 1986).

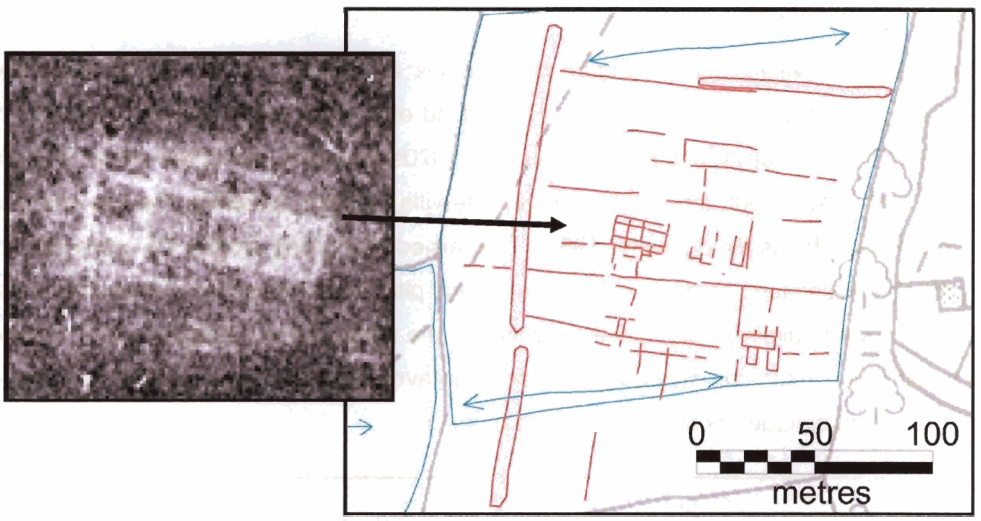

Figure 7. The villa complex and pattern of field boundaries or walls at Stock Farm.
Extract from NMR OS/76156 022 11-JUL-1976 © Crown copyright. Ordnance Survey.
Background map acquired from the Ordnance Survey

The presence of pieces of slag and iron ore in the topsoil, plus the close proximity of scowles to the east, could indicate an additional industrial function similar to that found at several of the Severn Valley villas, such as Woolaston or Lydney Park (Hart 1967; Sindrey 1990).

The site of Ariconium, the only Roman small town within the project, appears on photographs as extensive but fragmentary cropmarks. Ariconium was originally identified as a small town due to its mention in Iter XIII of the Antonine Itinerary and its location roughly midway between the Roman towns of Glevum (Gloucester) and Blestium (Monmouth) (Hart 1967). The aerial survey evidence highlights the presence of at least two settlement phases, both apparently lacking a formal town layout, although the poor clarity of the cropmarks and the obliqueness of the photographs make any structures difficult to discern. Surface and excavated evidence is dominated by an extensive spread of bloomery slag and it might be appropriate to reinterpret Ariconium as a villa estate or a small industrial settlement and posting station close to an iron-working belt (Sindrey 1990). Two roadside rectangular enclosures situated c 1km to the north of Ariconium were initially suggested as military, but have been re-interpreted by the NMP project as domestic enclosures.

A bronze-working site at the Mount, Lydbrook (Figure 8) is similar in size to the small oval enclosures at East Dean, Lord's Wood and Sallow Vallets. The earthworks were only visible to aerial survey after the covering trees were removed in the early 1950s. Excavation in the mid-1980s uncovered rectangular and circular buildings and a 4th century shaft furnace (Walters 1988) but the lack of any published plans means that the exact relationship between the earthworks recorded by aerial survey and the excavated features is not clear.

Figure 8. The Roman bronze-working industrial settlement at The Mount, Lydbrook. Extract from NMR SO 5916/2 (23327/10) 07-NOV-2003 © English Heritage. NMR.

6.7.2 Summary of Roman activity

Although the aerial survey has not added to the number or distribution of Roman settlement sites, it has provided some clearer definition of the extent and number of phases of known sites (eg Ariconium). It has also recorded part of a possible Roman road, visible as earthworks leading to the Roman bridge over the Wye.

The NMP evidence appears to reflect the known Roman settlement pattern although several of the previously recorded sites are at best only partially visible to aerial survey. Other small industrial sites may still be hidden within the Forest. Possible furnace, charcoal and extraction sites (see below) belong to industrial practices that have continued for a very long and it is difficult to date these sites from aerial photographic evidence in the absence of complementary field and excavation data.

6.8 Recommendations for further archaeological investigation

Ascribing dates to the Prehistoric and Roman enclosures mapped by the project is problematic due to lack of archaeological past investigation in the project area and the comparative data it could provide. Many of the sites have been dated provisionally on morphological grounds, although in each case there may be several phases of occupation spanning several archaeological periods. Targeted ground investigation, including excavation, should help to establish individual site histories which could then be compared across the wider Forest landscape.

Similarly, ground investigation of the extraction sites will, it is hoped, aid their dating and establish when, and how early, they were worked. A combination of field survey, targeted excavation and the application of scientific techniques such as Radiocarbon dating and archaeometallurgical analysis to charcoal burning platforms and possible Roman furnace sites should help to establish chronologies and patterns of use for these sites.

The application of other remote sensing techniques such as LIDAR in the wooded areas of the Forest may reveal subtle earthwork features. This technique has already been shown to be of value in the Forest, confirming the presence of a possibly Prehistoric field system to the north of Welshbury hillfort. The LIDAR survey did not, however, reveal the two-dimensional soilmarks of the overlying charcoal platforms, and should only be considered as a complementary technique. Further aerial reconnaissance should also increase our knowledge of the Prehistoric and Roman periods in the Forest.

7 THE EARLY MEDIEVAL PERIOD IN THE FOREST OF DEAN

Cathy Stoertz

The Saxons are known to have crossed the River Severn shortly after the battle of Dyrham in AD 577 (Hart 1967, 45). Their presence in the Forest of Dean region is shown by a variety of indirect evidence but very few physical traces that could be recorded on aerial photographs.

Documentary evidence provides some information about aspects of the pre-Norman economy. Charters from locations along the Severn and Wye mention fisheries and weirs, tax records note payments of fish and eels, and the Domesday survey refers to salt production at Awre (Darby and Terrett 1954, 37–9). The existence of a local iron industry may be inferred from a passage in Domesday stating that, before 1086, the city of Gloucester paid a tax of '100 drawn iron rods for nails for the King's ships' (Moore 1982). Although the origin of the iron is not specified, the Forest of Dean is a likely source: evidence exists for Roman iron mining, and it seems probable that exploitation of the ore continued after that period (Moore 1982; Hooke 1985, 126).

By the 11th century, the Forest of Dean probably covered the area between the Severn and the Wye as far north as Newent and Ross-on-Wye, and was accorded special status. Domesday notes that tenants of west Gloucestershire (known as 'Dene') held their lands free from geld in return for looking after the Forest (Darby and Terrett 1954, 31). As a royal hunting preserve, the core of the Forest was probably virtually uninhabited and, because of its royal status, this central area fell outside the remit of the Domesday Inquest (Darby and Terrett 1954, 29), further reducing the already small possibility of documentary information.

Place names of Saxon origin appear on the fringes of the Forest. The ending *–loe* or *–low* refers to a hill or tumulus, and is often taken to indicate a site associated with pagan burial. Bledisloe, Hagloe, Etloe, Baglow and Henlow all take that form, although no supporting Saxon finds are known from those villages. A location to the northwest of Newnham bears the name 'Mutloes', possibly meaning 'moot hill', but no archaeological evidence exists for the site, and no artificial mound is known: it should be noted that *–loe* could also refer to a natural spur or hill (Hart 1967, 46).

Despite indications of Saxon settlement in the region, very few early medieval features were recorded by the NMP survey. Apart from burial mounds and other earthworks, the early medieval features most commonly recorded on aerial photographs in other regions are sunken-featured buildings and timber buildings, visible as cropmarks (Wilson 2000, 127–9 and figs 50, 54, 63, 64). Because very few locations within the Forest of Dean survey area have so far produced cropmarks, the possibility of recording features of this type was significantly reduced. It is also likely that some of the evidence of Saxon settlement is concealed beneath later phases of development within existing villages.

7.1 Early medieval earthworks in the Forest of Dean

Although no early medieval features in the Forest of Dean appeared as cropmarks, a small number of earthworks from this period were recorded from aerial photographs. These comprise linear earthworks belonging to Offa's Dyke, one possible small enclosure or promontory fort, a double bank representing a possible early trackway through Offa's Dyke, and a field system which may have had early medieval beginnings. Some features in this region once thought to have early medieval associations are now known to belong to other periods: the mound called Bledisloe Tump appears to be 12th century in date rather than Saxon, and a 19th century theory that the Iron Age promontory forts overlooking the Wye at Lancaut and Symonds Yat were re-used during the construction of Offa's Dyke is now largely discounted (Fox 1955, 194–5; Hill and Worthington 2003, 146).

7.1.1 Offa's Dyke

Linear earthworks identified as parts of the 8th century boundary known as Offa's Dyke were recorded along the western edge of the NMP survey area. The course of the Dyke in this region begins on the western bank of the River Severn at Sedbury cliffs, where a discontinuous linear earthwork about 1.2km long crosses the Beachley peninsula to Tallard's Marsh, opposite Chepstow. There, its route turns north and roughly follows the course of the River Wye as far as Redbrook, a distance of nearly 20km. The earthwork then disappears for 7km, to reappear for a short distance at English Bicknor, near Symonds Yat, where its course diverges from the edge of the Forest of Dean (Figure 9).

For most of its course, the Dyke follows the upper edge of the wooded slopes overlooking the River Wye and, where possible, the linear earthworks along this route have been mapped from aerial photographs. Information supporting the identification of parts of the Dyke was derived from field surveys carried out by Sir Cyril Fox in the 1920s and 1930s (Fox and Phillips 1931; Fox 1955) and by GCCAS in 1995 (Hoyle and Vallender 1997). Even those sections which have been marked on the Ordnance Survey map were not always visible: in Caswell Wood, for example, the Dyke was only discernible on photographs as a difference in tree height. Where the earthwork emerges from Caswell Wood and runs down the arable land on the slope of Madgetts Hill it has been severely eroded by ploughing and appears as a cropmark.

On St Briavels Common, the Dyke crosses open ground, rather than forest. Here, it comprises a series of fragmentary, discontinuous segments of linear bank, frequently interrupted by lanes, tracks and field boundaries. Just to the north, on the slope of Bigsweir Valley, its course is crossed by an embanked trackway which is also visible on aerial photographs, and may be contemporary (see below).

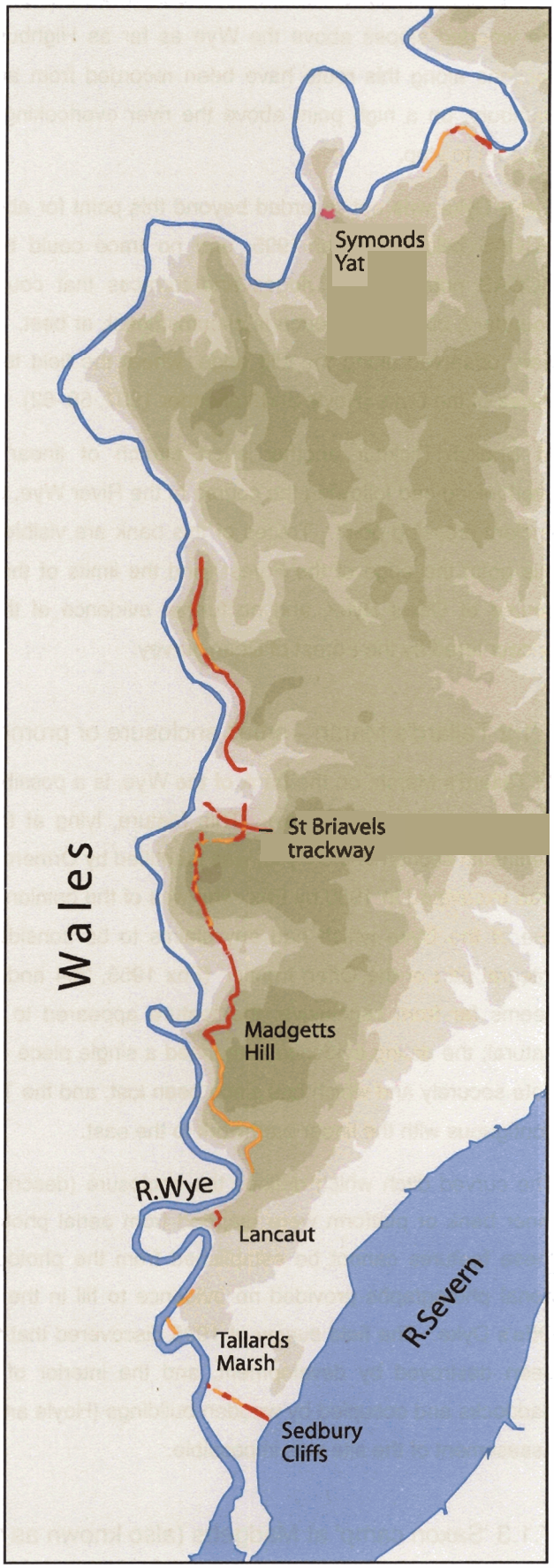

Figure 9. Offa's Dyke and other, possibly associated, earthworks along its course.

Sections of the Dyke visible on aerial photographs are shown in red.

Parts not visible on photographs, but mapped by Gloucestershire Archaeology Service field survey are shown in yellow.

Detail derived from the OS map is shown in purple.

To the east of Bigsweir, on the north side of Mork Brook, Offa's Dyke follows the edge of the wooded slopes above the Wye as far as Highbury: two long, fairly uninterrupted sections along this route have been recorded from aerial photographic evidence. At Highbury, on a high point above the river overlooking Redbrook, the linear earthwork appears to stop.

Offa's Dyke was not recorded beyond this point for about 7km, either by Fox or by the GCCAS field survey of 1995, and no trace could be found on aerial photographs. GCCAS noted natural ridges and terraces that could have been utilised by Offa's boundary, but this evidence is circumstantial, at best. Some remains of later quarrying were observed along the cliff edge, where the field team might have expected to find traces of the Dyke (Hoyle and Vallender 1997, 58–62).

At English Bicknor another short stretch of linear earthwork has been recorded overlooking and following the course of the River Wye, perhaps constructed to control an ancient crossing point. Traces of this bank are visible on aerial photographs, but after this point the edge of the Forest (and the limits of the survey area) diverges from the course of Offa's Dyke, and no further evidence of the early medieval boundary was encountered by the Forest of Dean survey.

7.1.2 Tallard's Marsh – small enclosure or promontory fort

At Tallard's Marsh, on the bank of the Wye, is a possible small enclosure which may be associated with Offa's Dyke. This feature, lying at the western end of the Beachley peninsula section of the Dyke, was identified by Ormerod as a 'fortlet' (Ormerod 1842). It was excavated in 1930 by Fox, who was of the opinion that 'this was the only fort on the line of the Dyke which had any claims to be considered as a Mercian work and an integral part of the Offan frontier' (Fox 1955, 204 and fig 90). His evidence, however, seems far from conclusive: the feature appeared to be partly man made and partly natural; the dating evidence comprised a single piece of metalwork which Fox could not date securely and which has since been lost; and the Tallard's Marsh enclosure was not contiguous with the linear earthwork to the east.

The curved ditch which defines the enclosure (described by Fox) and part of a broad inner bank or platform were mapped from aerial photographs of 1946 but the date of these features cannot be established from the photographic evidence alone, and the aerial photographs provided no evidence to fill in the gap between the enclosure and Offa's Dyke. The field survey of 1995 discovered that the area of Fox's excavation had been destroyed by development, and the interior of the enclosure was divided into paddocks and occupied by wooden buildings (Hoyle and Vallender 1997, 76), so that re-assessment of the site was impossible.

7.1.3 'Saxon camp' at Madgetts (also known as Modiete or Modesgate)

Perpendicular to, and apparently abutting, the east side of Offa's Dyke, between Caswell Wood and Madgetts Farm, are two or three linear earthworks which have been depicted

on OS maps since at least 1881. The area defined by the two longest banks covers about 1.75 hectares and, at various times, has been interpreted as an enclosure in its own right. On OS maps it has been labelled both 'Camp' (1:2500 1881–6, 1921 editions; 6" 1924 edition) and 'Roman Camp' (6" 1890–91, 1903 editions; 1:2500 1902 edition), although it ceased to be captioned from the 1954 6" edition.

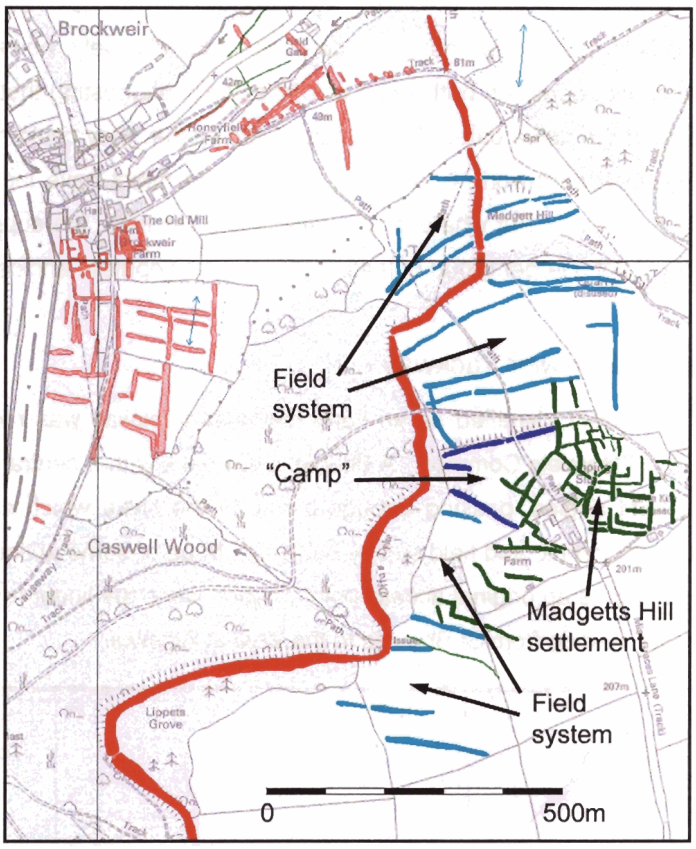

Figure 10. The earthworks on Madgetts Hill. The banks defining the supposed 'Camp' (dark blue) are clearly part of a larger field system (light blue) located between Offa's Dyke (solid red) and the settlement (green). The probable medieval earthworks around Brockweir (hatched red) are visible to the west.

Background map acquired from the Ordnance Survey

The 19th century antiquarian T D Fosbroke identified this supposed enclosure as a 'Saxon camp' (Gentleman's Magazine 1831; noted by Ormerod 1842), although his contemporary, George Ormerod, attributed it to the Romans (Ormerod 1842, 9), and the site has also been assigned 'British' origins. Fox was not convinced that the earthworks on Madgetts Hill represented a 'camp', feeling instead that the earthworks were 'Saxon lynchets (cultivation terraces) [that] do not cross the Dyke, but one runs right up to it' (Fox 1955, 203). He suggested that the cultivation terraces were probably associated with a vill recorded by the Domesday survey at Modiete, later named Madgetts (Fox 1955, 218–9).

The aerial photographic evidence (see Figure 10, above) seems to support Fox's interpretation: the two or three banks shown on the OS map are part of a more extensive rectilinear pattern of earthworks or lynchets, probably representing a field system, which

stretches to the north and south along Madgetts Hill. To the east of the field system, a complex of smaller enclosures around Madgetts Farm almost certainly represents the Domesday vill mentioned by Fox. The visual evidence strongly suggests an association between the settlement and the field system, and the appearance of Modiete in Domesday points to early medieval beginnings for the earthworks on Madgetts Hill, with probable further developments in the medieval period.

The date of the field system has not been determined conclusively, however: some of the northern lynchets appear on both sides of Offa's Dyke, suggesting that they and the Dyke may not be of the same date. If the lynchets are earlier, they could have been cut by the early medieval earthwork; if later, the field system might have incorporated the Dyke as a field boundary. But whatever the date of the lynchets, the supposed 'Saxon camp' is clearly part of a larger group of features, and not a separate enclosure.

7.1.4 St Briavels–Bigsweir trackway

An earthwork tentatively identified as an early medieval trackway was recorded at the northern edge of St Briavels Common. A double linear bank with a central ditch crosses Offa's Dyke at right angles, passing through a gap in the Dyke which seems, on the basis of aerial photographic and field survey evidence, to be of some antiquity. This gap has been interpreted as an original access point or gate, while the linear feature appears to be a hollow way leading from St Briavels to the Wye at Bigsweir.

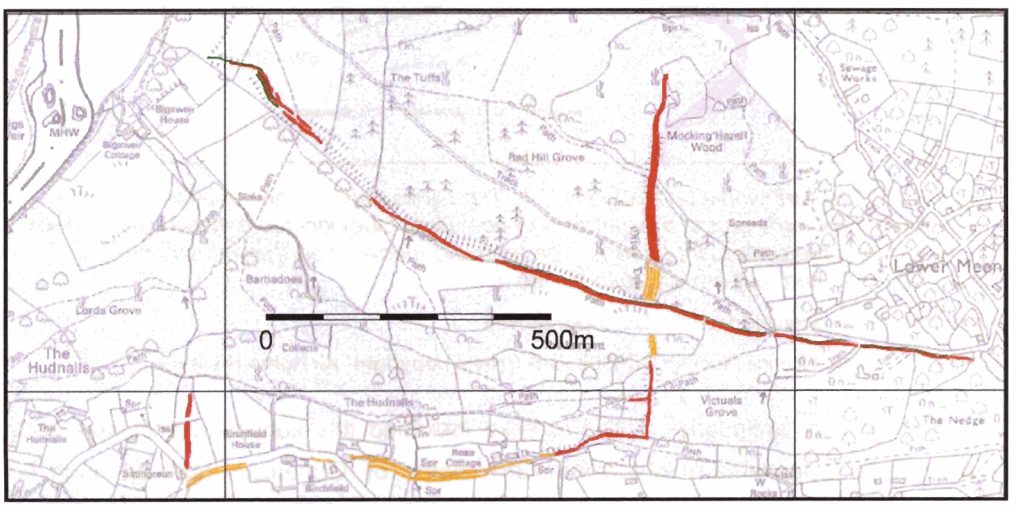

Figure 11. The linear banks of St Briavels trackway run through a gap in Offa's Dyke, linking St Briavels, in the east, to the River Wye, in the west. Earthworks mapped from aerial photographs are shown in red; ditches are in green. Earthworks mapped by the Ordnance Survey but not recordable from aerial photographs appear in yellow.

Background map acquired from the Ordnance Survey

The Gloucestershire County SMR states that 'the hollow way is undated, but geographical evidence would suggest that it pre-dates some local road realignments and is likely to date to at least the early medieval period' (Cross 1982, 72; Hoyle and

Vallender 1997, 73). Most of the trackway's southern bank and the central ditch have been recorded from aerial photographs, while both banks are visible at the western end.

7.1.5 Bledisloe Tump – supposed Saxon barrow

The mound known as Bledisloe Tump was once thought to be a Saxon barrow but an excavation in 1964 found it to be 12th century in date, constructed over the remains of a dismantled 12th century timber structure, possibly a watchtower. The purpose of the mound was unclear, although it may have been intended as a motte or a hundredal meeting place (Dornier 1966). It is visible on aerial photographs of 1946, but since then has been almost completely destroyed.

7.2 Offa's Dyke in the Forest of Dean – questions of date and continuity

The origin, date and integrity of the series of linear earthworks known collectively as Offa's Dyke have been the subject of discussion since at least the first half of the 19th century. Like many similar earthworks, the Dyke has attracted a variety of explanations and interpretations, some more plausible than others.

The creation of a physical boundary between Mercia and the Welsh kingdoms was first mentioned in Asser's *Life of King Alfred*, written in AD 893. The results of extensive fieldwork, by Fox in the 1920s and 1930s and the Offa's Dyke Project of Clwyd–Powys Archaeological Trust in more recent years, continue to support a late 8th century date for its construction, with King Offa of Mercia as its instigator (Fox 1955; Bapty 2000; Hill and Worthington 2003). Between Asser's history and the Clwyd–Powys Trust's work, however, many theories about the earthworks' dates and architects have been considered.

Suggestions of a Prehistoric date were current in the 19th century. The antiquarian George Ormerod accepted the agency of Offa, but considered that the Mercian king had probably re-used and adapted earlier earthworks when building parts of the Dyke, including the southern sections (Ormerod 1842, 9). McKenny Hughes was positively dismissive of an early medieval date (McKenny Hughes 1893), preferring to see the Dyke as a series of 'British' entrenchments. A Roman date for at least part of Offa's Dyke, particularly the segment along the River Wye north of Lancaut, was suggested by T D Fosbroke in the 1830s (*Gentleman's Magazine*, noted by Ormerod 1842), and this idea may well have appeared earlier.

The possibility of a Roman date was recently revived by S Blake and S Lloyd in *The Keys to Avalon*, a book on King Arthur (Blake and Lloyd, 2000). These authors attributed the English–Welsh border earthworks to the Roman Emperor Septimius Severus, who was said, by late Roman and early medieval historians, to have built 'a wall from sea to sea'. Although most modern archaeologists believe that the early historians were referring to Septimius Severus' repair work on Hadrian's Wall, Blake and Lloyd concluded that the early authors were actually describing the north–south Dyke

more usually attributed to Offa. This re-identification of the 'Severan Wall', apparently based on a single piece of inaccurately interpreted dating evidence (Matthews website), has been used to support a relocation of the Arthurian stories to north Wales, via a reinterpretation of the place names cited in Geoffrey of Monmouth's *History of the Kings of Britain*. The resulting alternative chronology and paternity for Offa's Dyke have not been given much credence by mainstream archaeologists (Matthews website; Bapty 2000; Hill and Worthington 2003).

The straight section across the Beachley peninsula from Sedbury cliffs to the Wye was even assigned a Civil War date at one time, because that part of the earthwork was strengthened in 1644 by the Royalist landowner, Sir John Winter. This interpretation was considered valid by some 19th century writers, although Ormerod was able to refute it with confidence. In 1842, he was himself the owner of the land and the earthwork in question, and one of his own deeds, dated 1638, mentioned the 'fforce ditch' at this point (ie between Beachley and Sedbury), proving that the feature pre-dated Winter's fortifications (Ormerod 1842, 17).

The strongest evidence still supports a late-8th century date for the earthwork boundary or boundaries between Mercia and the Welsh kingdoms, with Offa as the initiator of the project. The suggestion of a Prehistoric date seems to be based on morphology alone, whereas an early medieval date is supported by finds (albeit only a few) and documentary evidence.

The difference in character and continuity between the Dyke's relatively uninterrupted central section and its more fragmentary northern and southern portions has also been the cause of frequent debate. This question has particular relevance to the linear earthworks along the western side of the Forest of Dean. Fox was convinced that all of the earthworks along the English–Welsh border formed a single system that could be given the name 'Offa's Dyke'. Other archaeologists and historians have had little difficulty in accepting that title for the central section but several authors, both before and since the publication of Fox's survey, have expressed doubts as to whether the southern and northern earthworks are truly part of Offa's border.

One of the most recent publications, *Offa's Dyke: History and Guide* by David Hill and Margaret Worthington (published in 2003), discusses the problem in some detail. The authors point out that the central parts of Offa's Dyke, in Herefordshire and Shropshire, faced Powys – the most powerful and threatening of the Welsh kingdoms, and the one against which Offa would have needed to provide the greatest show of strength. They feel that the part of the system forming the boundary between Mercia and Powys can be given the title 'Offa's Dyke' with confidence and accuracy.

The lesser kingdoms to the north and south of Powys, however, were more closely under Mercian control and the earthworks in these regions, particularly those in the south, are separated from the main Dyke. Fox interpreted the gap on the Herefordshire Plain, and other breaks in the southern line, as places where natural features such as impenetrable forests or marshes had provided enough of a barrier to make the construction of an

earthwork unnecessary. Despite their discontinuous nature, he felt that the southern earthworks were all part of Offa's unified campaign of border construction.

Hill and Worthington suggest that the discontinuous lengths of earthwork in Gloucestershire are more likely to have been separate works designed to control specific points, such as river crossings, where closer control or a greater show of strength was needed. If this were the case, they argue, the individual southern sections need not have been constructed by Offa, and may not date to the early medieval period at all. They are of the opinion that Fox's convictions about the original length and unity of the Dyke inspired the reinterpretation of a collection of possibly unrelated features and that, after his survey was completed, earthworks previously captioned 'ancient entrenchments' by the Ordnance Survey were relabelled 'Offa's Dyke' (Hill and Worthington 2003, 143–148). However, J Hoyle, of Gloucester Archaeology Service, notes that the identification of the Gloucestershire linear earthworks as parts of Offa's Dyke, by the OS and others, predates Fox's survey by many years (Hoyle and Vallender 1997, 11–14; Hoyle pers comm).

The only earthwork within the Forest of Dean survey area that Hill and Worthington accept as an Anglo-Saxon feature is the bank at Sedbury cliffs: it appears on a charter of AD 956 as 'dic', and thus must be earlier than that date (Hill and Worthington 2003, 148). The research carried out during the Clwyd–Powys Archaeological Trust survey leads the authors to conclude that the earthworks along the River Wye are not all of the same character, and that, overall, their form seems to differ from the central sections of the 'true' Offa's Dyke.

The GCCAS field survey report observes that the linear earthworks in Dean fall into two main types and that, while the differences between them may indicate different dates or purposes of construction, they are more likely to be the result of topographical factors. The report concludes that 'the possibility that the discrete portions of earthwork in Gloucestershire represent a single contemporary monument whose construction was varied to meet the demands of local conditions, cannot be discounted' (Hoyle and Vallender 1997, 40–1).

Aerial survey has recorded many segments of this series of roughly aligned linear earthworks, but photographic evidence alone cannot prove that these segments comprise a single entity. Appearance and geography suggest that the identification with Offa's Dyke is acceptable but, without more concrete evidence, an element of doubt remains about the definitive interpretation of the linear earthworks along the western edge of the Forest of Dean.

7.3 Recommendations for further work

The linear earthworks along the River Wye have already been the subject of several campaigns of study, yet questions about their date and nature persist. The task of establishing a definitive interpretation poses significant practical problems: the excavation of relatively small trenches across linear earthworks is notoriously

inconclusive, and field survey may yield similarly disappointing results. Aerial photographic mapping of linear earthworks is even less informative, especially where there is significant tree cover. The most constructive course of action could be to focus further aerial and ground survey, including geophysical prospection, on the gaps in the alignment, and on those earthworks whose form differs from the longer sections of Offa's Dyke.

More generally, aerial photographic survey targeted on areas of potential cropmark production, particularly around the margins of the Forest, could eventually identify sunken-featured buildings and timber structures indicative of early medieval occupation.

8 THE MEDIEVAL AND POST MEDIEVAL FOREST OF DEAN

Fiona Small

8.1 The history of the Royal Forest of Dean

8.1.1 Establishment of the Royal reserve

The Forest of Dean was established as a Royal reserve by the Saxon Kings. Some of the earliest records for the Forest relate to Cnut levying heavy penalties on illegal hunting, and Edward the Confessor is known to have hunted in the forest. After 1066 the Forest was taken over and expanded by the Norman kings who continued to use it as a Royal hunting reserve, setting out a Forest Law to control use and exploitation of the Forest. It is probable that the restrictions and laws dictating the use of the Forest were based on those established by the Saxon Kings. The Domesday Book entry for the Forest of Dean states that it was to be exempted from taxation to prevent it from being despoiled, thus preserving the forest for the sports of the chase. These restrictions on exploitation and dwelling in the Forest have had far reaching effects on the history and development of the area, both within and around the forest core, shaping the distribution of settlements and the pattern of agricultural practices.

8.1.2 Forest Law and the control of the Royal Hunting Forest

Forest Law was established by William the Conqueror to protect the King's beasts by preserving cover and prohibiting hunting and any other activity which would harm the forest.

Around 1130 St Briavels became the centre of the forest law administration. The Assize of Woodstock of 1184 is the earliest surviving body of written regulations enacted to 'preserve the "peace of the King's venison"', 'venison' being all beasts of the forest – red, fallow and roe deer, hawks, falcons and bees. Various people were granted rights to hunt and exploit the forest, but deer were strictly a Royal preserve. To regulate the activities in the Forest, numerous officials were employed to mete out punishments, in the form of fines or imprisonment, for misdemeanours. Overstaffed, and rife with corruption and embezzlement, the administration was haphazard and inefficient at best. In 1217 the Charter of the Forest was brought in to curb the activities of high handed officials and halt the expansion of the forest into adjacent lands: the Forest had been enlarged by Henry III and the boundaries were ill-defined and hard to police.

The forest continued to be heavily exploited both legally and illegally and the laws were unable to hold it in check. The Forest was a Royal reserve, but it was also a good source of income for the Crown through fines and rents. Fines for damage to woods (vert offences) were usually small because it was recognised that people had to break the law to live. As well as the pilfering of 'Greenhue' – trees, underwood, pasture or other vegetation – poaching was also rife despite the heavy fines it incurred. The poaching of deer (the sole preserve of the King) incurred a prison sentence, even if the

animal had been found as a carcase. Despite these measures, stolen wood and venison could be and were easily transported by river, and there was always a ready market.

The deer population became so depleted through hunting that it became necessary to create parks, enclosed by pales, in order to hold the deer within the bounds of the Forest (see Appendix 9). In the 13th century chases, parks and warrens were established within the forest.

8.1.3 Hunting lodges

Lodges were established within the Royal forests to provide a base for hunting parties. These varied in size and complexity; accommodation typically included a chamber for the king, kitchens, stables and a variable number of other buildings, depending on the size of the lodge. They were generally located deep within the forest, away from settlement, usually in a clearing within a defensive bank with a gated palisade.

The NMP survey has identified one possible medieval hunting lodge to the east of the Forest's core at Ley Park (Figure 12). This polygonal earthwork enclosure, discovered after tree clearance, has morphological similarities to hunting lodges identified in the New Forest (Smith 1999).

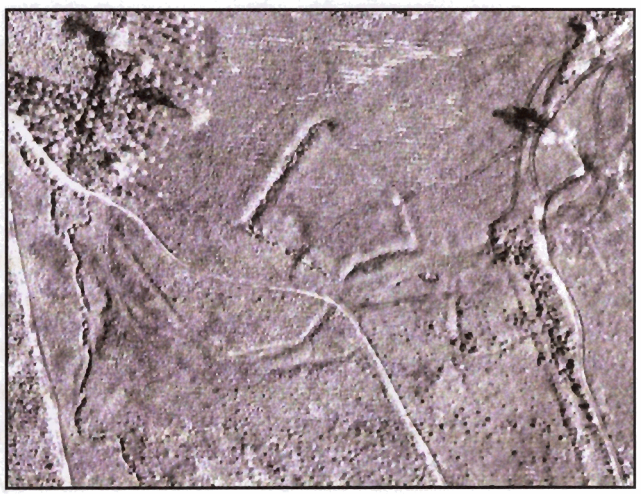

Figure 12. Earthworks of a possible hunting lodge site at Ley Park.

Extract from NMR OS/70124 280 24-MAY-1970

The site appears to fall within a medieval deer park: by 1282 the 'ancient park' at Ley, within Tidenham Chase, had been granted by the king and was enclosed, being held jointly by three knights (Hart 1966, 1971). The location of the enclosure, and its morphological similarities to New Forest lodges, suggests that the earthwork is an enclosure around a gamekeeper's dwelling.

8.1.3 Common rights

The site appears to fall within a medieval deer park: by 1282, the 'ancient park' at Ley, within Tidenham Chase, had been granted by the king and was enclosed, being held jointly by three knights (Hart 1966, 1971). The location of the enclosure, and its morphological similarities to New Forest lodges, suggests that the earthwork is an enclosure around a gamekeeper's dwelling.

8.1.4 Coppicing and assarting

Forest dwellers were subject to many restrictions, but they were also granted certain privileges, including common and herbage (grazing of cattle, pannage for pigs) and estovers (the collection of dead and dry wood). In practice there was widespread uncontrolled grazing, leading to over-grazing, throughout the Forest. Goats and sheep were generally considered uncommonable because of the damage their grazing did to the undergrowth, and areas of the forest preserved for coppicing had to be fenced to prevent damage to the new shoots by grazing animals. The traces of some woodland banks have been recorded by field survey, but only a few were visible on aerial photographs (see Section 9.3).

Over time, the Crown increasingly saw the Forest as a means of generating revenue and profit, but was it was badly managed and over exploited. In 1586 a survey by Roger Taverner found that the woods had been severely depleted by charcoal burning for the iron industry: only trees reserved for ship-building were left standing with all their branches. In the 17th century large scale abuse and exploitation again occurred, with the leasing of areas of the Forest to ironworkers for the extraction of cordwood. But, however damaging to the forest these activities were, they have left very little in the way of archaeological evidence today.

Because of the restrictions under forest law there is no evidence of permanent medieval agricultural activity or settlement within the Forest, although the widespread practice of assarting was responsible for destruction of areas of the forest. Assarting is the practice of reclaiming areas of woodland for agricultural purposes, creating clearings of varying size and shape (from the Latin *exsartare (ex-sar(r)ire)*: to hoe, weed). The clearings were generally small scale and short lived and, once abandoned, regeneration of the forest undergrowth would have covered any vestiges of cultivation and temporary dwellings. Even the larger assarts would rapidly have disappeared under subsequent rotations of tree plantation, and no evidence of this early assarting was recorded from aerial photographs.

The forest laws were greatly relaxed in the post medieval period, especially during the Industrial revolution. As a result, there was an explosion in the number of small dwellings which sprang up, still illegally, around the edges of the Forest. These later assarts and dwellings are those which were recorded during this survey (see Figure 14).

The area of the forest reserved by the Crown remained a royal demesne until the 1840s. This area is now maintained by the Forestry Commission and Forest Enterprise.

8.2 Medieval and Post Medieval Settlement and Agriculture

The Forest of Dean today is classified as a region of dispersed settlement interspersed with agricultural land, commons and woodland. With the exception of the southern part of the peninsula the rural settlement density is typically low (Roberts and Wrathmell, 2000).

A number of larger towns have grown up in the region, but most of these are found on the peripheries of the Forest. They owe their existence and expansion to the extractive industries within and around the Forest and date from the 18th and 19th centuries, with further residential expansion in the 20th century.

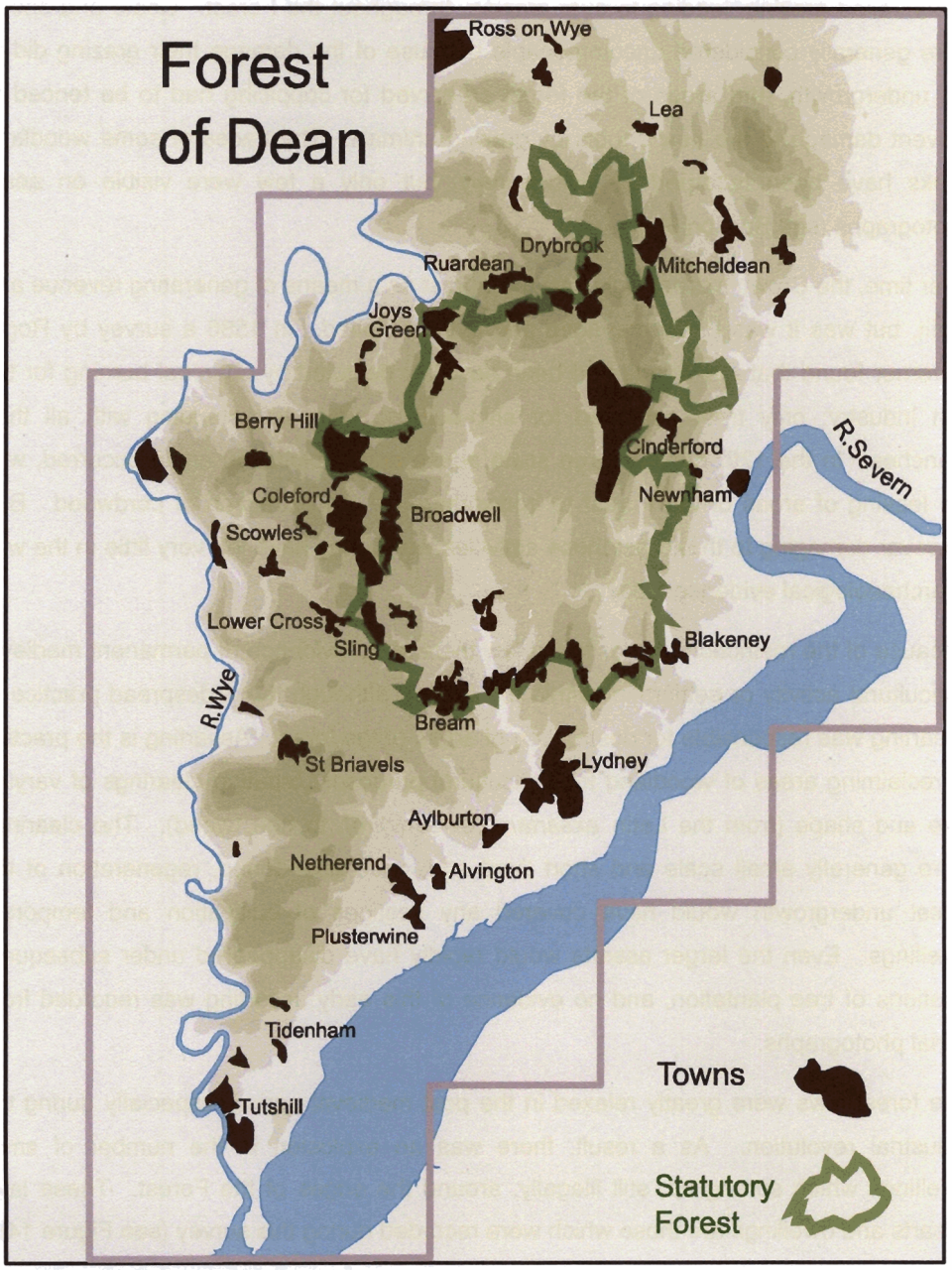

Figure 13. The major towns and villages of the Forest of Dean.
Based on Ordnance Survey plan of the area

The towns of Cinderford and Lydbrook and the smaller settlement of Parkend grew up around areas of ironworking. In many settlements, such as Plump Hill, Ruardene Walk and Lydbrook, the 19th-century houses encroach into the sites of numerous earlier quarries which pock-mark the area.

Medieval and post medieval agricultural sites formed one of the two largest groups of new and amended records within the NMP survey area. However, virtually all of these sites were found outside the limits of the Statutory Forest reflecting the constraints of Forest Law during the period.

Despite the Saxon origins of the Forest of Dean and several of the early medieval manors surrounding the Forest, very few Anglo-Saxon or Scandinavian place names indicating woodland have been recorded within the survey area. Place names with elements such as *–leah* (Old English: a forest glade or clearing), *–hyrst/hurst* (OE: a wooded hill), *–thveit/thwaite* (Norse: a clearing, meadow or paddock), and *–feld/field* (OE: open country) are numerous in all regions to the north and east and to the south beyond the Severn Estuary, but are absent within the Forest and scarce in the remaining area between the Rivers Wye and Severn. This absence could reflect the unbroken nature of the forest, which is known to have existed as a Royal hunting reserve as early as the later Saxon period.

8.2.1 The Statutory Forest

This area comprises a large area of woodland and waste, formally the royal hunting forest. The Statutory Forest was defined by a perambulation of 1831 and much of it has been either wooded or within the woodland management cycle since at least the medieval period. Today it comprises the core of the Forest Enterprise landholding.

From the medieval period until the 18th century permanent dwellings were not permitted within the royal demesne of the Forest of Dean, and anyone working within the Forest as miners, quarry men and wood cutters had to live on the edges of the forest and travel into the forest each day. The only legal settlements within the Forest would have been the temporary huts and encampments of charcoal burners and ironworkers using portable forges.

Today, the majority of the central core of the Forest is so densely covered with plantations of both deciduous and coniferous woodland that any traces of these small scale industries would probably remain undetected from the air.

By the late 16th century a few dwellings were recorded within the Forest, but with the establishment of the Kings Ironworks within the demesne of the Forest in the early 17th century, this number began to grow. Licences were granted to lessees and ironmasters, who built cabins for their workmen; many others set up illegal settlements. The number of unofficial settlements peaked in the 1640s and although there were attempts to clear them throughout the 17th century, the perpetrators usually returned. In the late 17th century there was a campaign to re-settle 'cabiners', as they became known, on waste land to the north of Littledean, in parts of Lea Bailey and in new cottages on Lydney and Woolaston commons (VCH Glos V 1996, 300). In the late 17th and early 18th centuries settlement within the Forest decreased, but by the mid-18th century, with a lapse in administration, the quarrymen and miners slipped back and established permanent settlements of primitively constructed dwellings amongst the mines and quarries.

Encroachments continued well into 19th century, but in 1838 the Crown conceded Freehold status to all encroachments, giving holders the right to buy or lease land which had been enclosed between 1787 and 1834. With an expansion in mining and iron working, more cottages were built, others were improved or rebuilt in stone, and the first purpose built terraced workers houses were provided by some employers. Continued illegal settlement in the 1830s was further discouraged by the reinstatement of the verderers court and a ruling that new building could only occur on land which had already been granted as freehold. (VCH Glos V 1996, 300–301).

After 1855 more land was released by the crown for churches and schools, and further housing estates were established outside the Forest close to Cinderford and Coleford by land societies, in response to the demands of a growing population. Within the Forest new houses were built adjacent to old dwellings on established holdings, and former industrial buildings were also converted for accommodation. By 1871 4,232 dwellings were recorded within the confines of the Forest, though there were still few in the centre of the Forest which was poorly served by roads and had suffered few encroachments before 1843. Even today, there is still very little settlement within the core of the Forest.

Although many houses were rebuilt in the 1840s, many others were still little more than hovels with poor sanitation into the 1920s. In the later 1930s many were demolished and replaced by council estates, and others were privately rebuilt (VCH Glos V 1996, 302).

8.2.1.1 The evidence for settlement

No evidence of medieval settlement was found through aerial survey within the limits of the Forest. Settlement was not permitted in the Forest and the transient nature of illegal settlement, coupled with the density of tree cover, means that any trace of medieval squatter settlements is unlikely to be detected. The extent of the Forest has been ever changing: after the Norman Conquest it was extended far beyond the limits which exist today. Its size continually altered as lands were granted, or taken illegally, and then returned to forest. Consequently, traces of medieval settlement lying immediately outside the current Statutory Forest may well have been assarts within a larger forest. The settlement pattern seen today developed from the mid-18th century; much of it was a direct result of the post medieval phase of legal acquisition of formerly assarted holdings. This pattern is characterised by isolated dwellings or clusters of small holdings, typically enclosed within a small irregular boundary wall, fence or hedge and separated by common land.

These un-nucleated hamlets and villages sprawl haphazardly around the edges of the Forest, linked to each other and to the sites of quarries and mines by an intricate network of small lanes and trackways. A number of dispersed settlements were recorded around St Briavels, and numerous tracks linking settlements to coal mines and quarries were seen on Horsley Hill to the east of Lydbrook. Many have since been obscured by subsequent plantations of trees.

Figure 14. Scattered dwellings and enclosures on common land, many arising from post medieval assarts and squatter settlements.

Extract from RAF 106G/UK/1355 7029 02-APR-1946
©English Heritage (NMR) RAF Photography

Several former assarts were recorded during the course of the survey, three examples of which were located to the south of Mitcheldean. All were probably post medieval in date, having fallen out of use by the 1940s when they appeared on RAF photographs as isolated irregular embanked enclosures which were not shown on the OS map. One site, at Horsepool Bottom to the south of Plump Hill, was made up of two enclosed paddocks and had traces of a track or hollow way leading into it (see Figure 15). Adjacent to the site was a disused quarry identified as the southern-most extent of a line of Scowles (see Section 11.1).

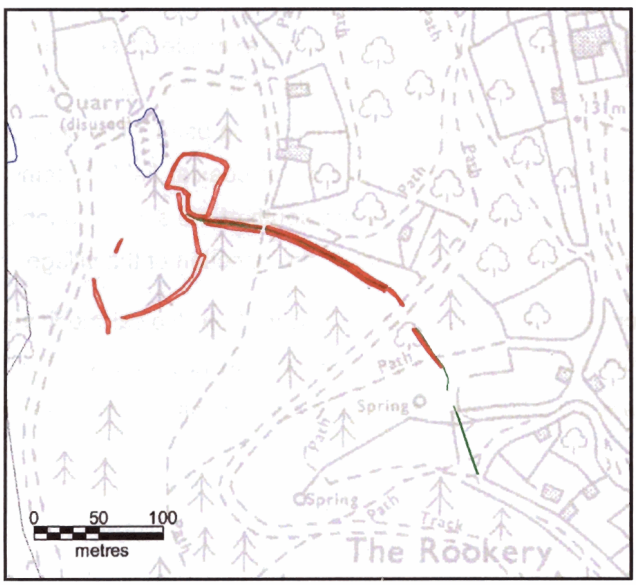

Figure 15. Probable post medieval assart enclosures with associated trackway at Horsepool Bottom to the south of Plump Hill.

Background map acquired from the Ordnance Survey

Settlements established by charcoal burners and iron workers within the Forest were transient in nature and have left very little trace. Excavation evidence from a site at Blakeney Hill revealed a charcoal burner's shelter constructed on the levelled platform of a former charcoal hearth which was subsequently used again as a hearth (Johns 1991). Although the sites of numerous hearths have been recognised on aerial photographs, it has been very difficult to identify any associated settlements.

8.2.2 The Southern Forest Plateau

This area forms a triangular area of rolling ridges and valleys with the Rivers Wye to the west the Severn to the east and the boundary of the Statutory Forest to the north. The western edge of the zone is defined by the steep gorge of the Wye Valley.

By the later Saxon period this area had been divided into a number of well established manors with settlements at *Modesgate* or Madgetts; *Wulflafs-tun* or Woolaston, *AElfwynn's-tun* or Alvington, *Hygeweald's-tun* or Hewelsfield/Hiwoldstone and *AEthelbeorht's-tun* or Aylburton (Faith 1994).

The region is situated beyond the boundaries of the Forest, and was free of the constraints of Forest Law. However, in the period immediately after the Norman Conquest, the Royal hunting forest was extended to encompass a large part of the lands around the Forest. Lands and settlements were confiscated and returned to forest and waste, though some manors began to be re-formed in the 12th century. In addition to the manorial demesnes, the area was divided up into a series of commons, chases, woods and parks associated with estates and houses, all of which have affected the pattern of medieval and post medieval settlement and agriculture. In this area, the distribution of medieval and post medieval sites recorded from aerial photographs reflects the documented land use: settlement earthworks and traces of medieval open fields were concentrated within the bounds of the manorial estates such as St Briavels and Hewelsfield (both pre-Conquest in origin).

8.2.2.1 Hewelsfield

Hewelsfield (known before the Conquest as Hiwoldstone) is an example of settlement that was forcibly depopulated to expand the hunting forest after 1066, but reconstituted into a manor by the 12th century with both old and new names being used. The core of the shrunken village is surrounded by the extensive remains of coaxial field systems, some enclosing traces of medieval ridge and furrow. To the south of the site a probable trackway defined by the field banks runs through the fields in the direction of the village.

The fields around Hewelsfield appear to be very different in form from typical medieval field boundaries, and more reminiscent of Iron Age or Romano-British coaxial field systems. It is possible that they are a survival from the Saxon holding with perhaps even earlier origins.

In the centre of Hewelsfield the remains of a possible motte mound with traces of a bailey to the north were also recorded amongst the settlement earthworks immediately to the west of the church. The church itself lies within an oval church yard reminiscent of pre-Christian enclosures (see Figure 16 below).

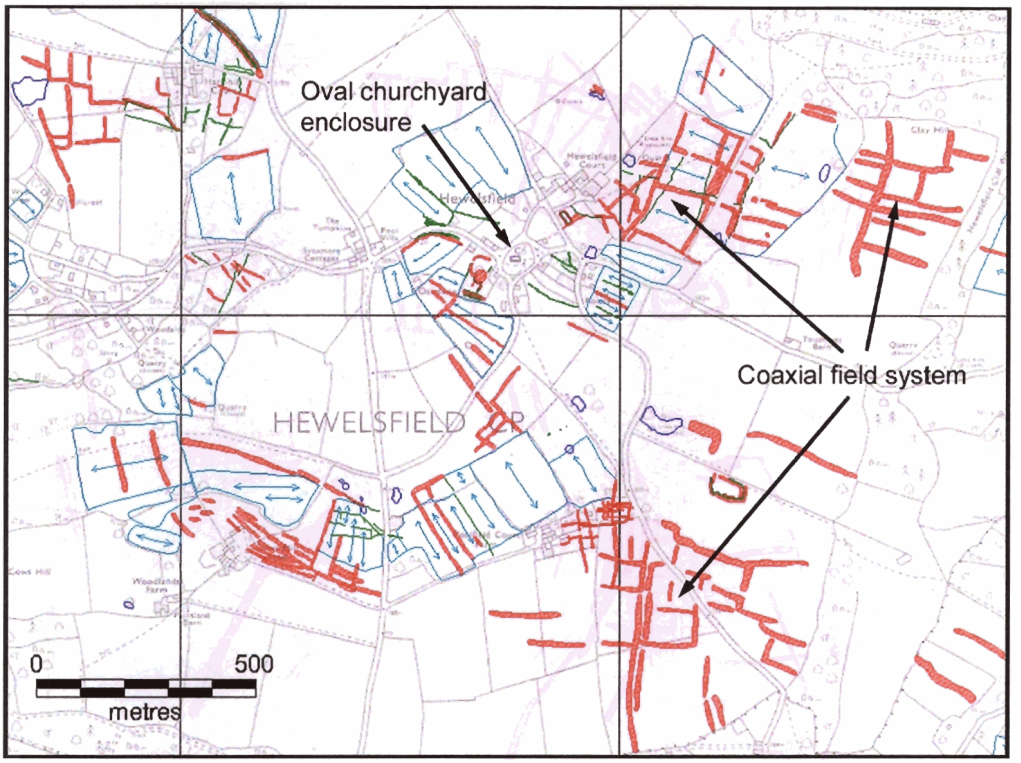

Figure 16. The extent of medieval and possibly earlier earthworks around Hewelsfield village.
Background map acquired from the Ordnance Survey

Approximately two kilometres to the south-west of Hewelsfield, the earthwork remains of further fields and the complex earthworks of a possible settlement were recorded between Madgetts Farm and Beeches Farm (see Figures 10 and 22). In Domesday Book a Saxon vill was recorded at Madgetts (or Modiete), and it is possible that these earthworks represent the remains of this earlier holding. This site and its association with Offa's Dyke have been discussed in greater detail in the previous section (see section 7.1.3).

8.2.2.2 St Briavels and English Bicknor

Prior to the establishment of Speech House in the centre of the Forest in the 14th century, St Briavels was the administrative centre for the Forest of Dean. In the heart of the town are the remains of the medieval royal castle, of which the twin-towered gatehouse, much of the inner keep and the partial remains of the dry moat survive. Around the edges of the existing town, the aerial survey revealed traces of the previously unrecorded extent of the medieval settlement. This includes associated property boundaries extending north and south of the current village centre and the extensive

remains of ridge and furrow in the fields to the east, extending as far as the southern parish boundary. The modern town of St Briavels now only occupies an area one-third the size of the medieval settlement, indicating that considerable settlement shrinkage has occurred since the medieval period (Figure 17).

Figure 17. St Briavels, surrounded by the earthwork remains of the medieval township.
Background map acquired from the Ordnance Survey

English Bicknor has the remains of a 12th- and 13th-century motte and bailey, and fragmentary traces of a number of dispersed toft boundaries centred on either side of a lane extending eastwards out of the village. The lane continues as a path, but also survives as a hollow way for part of its 600m length with further settlement earthworks in the vicinity of Lower Tump Farm (see Figure 18).

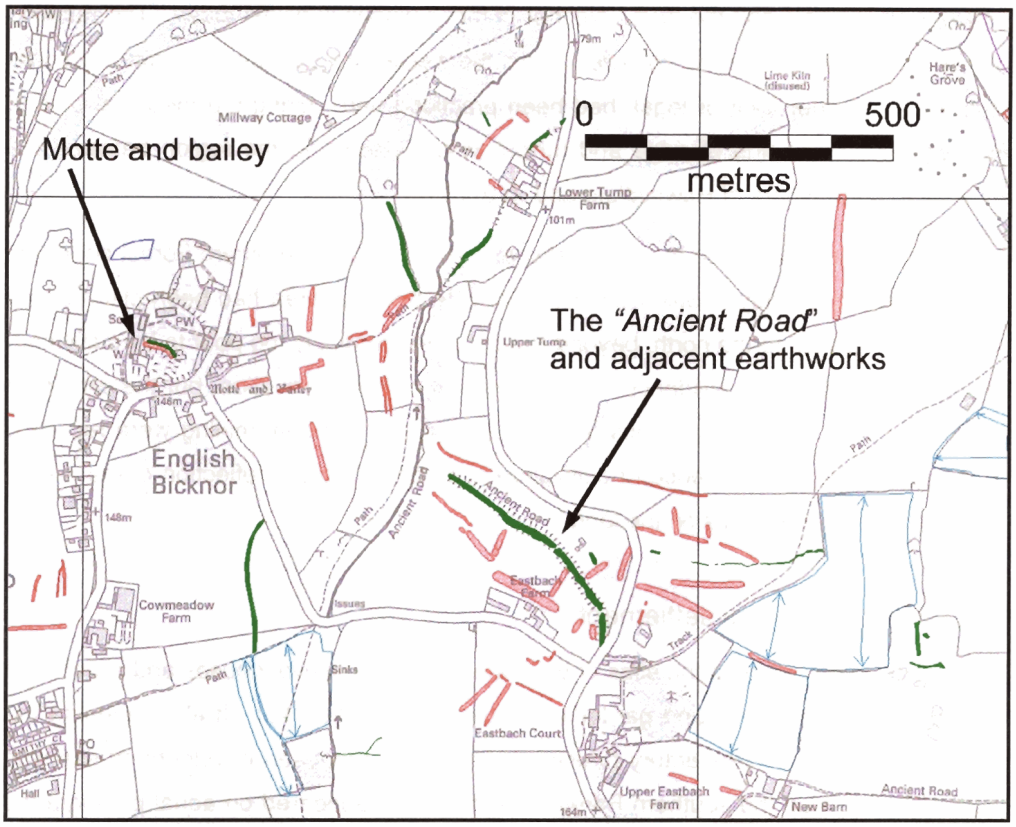

Figure 18. Medieval settlement and cultivation earthworks in the vicinity of English Bicknor.
Background map acquired from the Ordnance Survey

8.2.2.3 Hunting chases and woods

Beyond the royal forest, further areas of land were appropriated and taken out of agricultural use and designated as hunting chases. One such chase, first recorded in 1228, was Tidenham Chase which encompassed the Royal manor of Tidenham and the parish of Woolaston. It extended from Chepstow Bridge to the Cone Brook on the Woolaston–Alvington boundary and presumed to be confined to the north by the Woolaston Hewelsfield boundary. This chase suffered regular incursions and numerous assarts from the outset, and aerial photographs revealed the remains of a number of fields of ridge and furrow within its bounds. The locations of two further small chases to the west of the Statutory Forest were also noted from documentary sources. One was located to the west of Staunton (a manor site), and another lay to the north within the curve of the River Wye. Both are still largely afforested so any traces of incursions or assarting would be hard to detect from aerial photographs.

In the 12th and 13th centuries, following the initial post-Conquest expansion of the forest, the Crown began to grant areas of woodland individuals or estates. Three of these early woods were located in the Southern Forest Plateau, and have been noted from documentary sources. One was attached to the southern side of the Manor of St Briavels, lying close to Hewlsfield common, while a second was located to the west

between St Briavels and the Wye. Neither of these woods survives today. The remains of medieval ridge and furrow, detected within the western-most wood, indicate that some cultivation, whether illicit or legal, had been practiced here during the medieval period. Further dispersed fields of ridge and furrow were detected in the region between the River Wye and manors of Hewelsfield and St Briavels.

A third wood was granted in the area between Lydney and the southern Forest boundary (from Bream to Yorkley). Saxon charters indicate that this area had been cleared and settled but the soils to the north, beyond Bream, were generally too poor to be cultivated. There appears to be no evidence of any medieval or later cultivation, but the extensive remains of both medieval and post medieval ironstone and coal mining were recorded across this area. The absence of cultivation is probably more a reflection of the poorer soils than other constraints on the land.

8.2.2.4 Post medieval settlement

The NMP survey recorded the sites of a number of post medieval houses and associated planned landscape parks and gardens (discussed in Section 10). It also revealed the site of a failed later 19th-century housing estate. The proposed development site was located just outside the southern Forest boundary, and appeared on aerial photographs as the earthwork of four roads laid out on the valley side south of Whitecroft.

This site was identified as part of the Peaseley housing estate which was constructed during the 1870s by a land society sponsored by a Conservative building society, and was one of a number of estates built to accommodate the expanding population drawn to the growing industries within the Forest.

Figure 19. Extracts from the 1881 OS map (left) and the NMP transcription (right) showing the plan of the failed 1870s Peasley housing estate near Whitecroft.

The roads of the estate were laid out, named (from north to south: Winstanley Road, Strod Road, Meyrick Road and Ranelagh Road) and mapped by the Ordnance Survey in 1881, but the venture failed after only three houses had been built, two on Ranelagh

Road and a third on Strod Road. The latter was visible on an aerial photograph taken in 1951, but on photographs taken in 1981 it appears to have been demolished (VCH Glos V 1996, 319).

The road plan and the three houses were included on several successive editions of the OS map, although the detail and information was reduced with each revision. In the 1959–60 and the 1979 editions of the 1:10,560 map, only Strod Road remained as an unsurveyed track leading to its single house, while Ranelagh Road was visible as an earthwork cutting. By 1985 the remaining house had disappeared, as had Strod Road, leaving only the enigmatic earthwork of Ranelagh Road skirting the hillside. The latest edition of the OS 1:10,000 map, published in 2000, shows no vestige of the failed development.

8.2.3 The Northern Forest Margins

The Northern Forest Margins, adjacent to the Statutory Forest on its western, northern and eastern sides, contain sparse traces of medieval and post medieval settlement and agriculture. The woodland in this zone is the result of early 19th-century plantation, and the main 18th- to 20th-century urban developments of the Forest Margins are located here.

The more accessible parts of the Forest have been under continual threat from assarting (clearing within the Forest). Encroachment on the Forest edges, known as purpresture, also took place, mainly illegally, although some was carried out under Royal Licence. This method of extending established areas of cultivation was responsible for depleting large areas of the Forest, but lands acquired through purpresture are hard to identify from the aerial photographic evidence alone. A number of blocks of medieval cultivation recorded close to, or just within, the current Forest margin could have resulted from this practice.

The Western part of this zone contains the large town of Coleford and a line of other small towns and villages, such as Broadwell and Berry Hill, which follow the western edge of the Statutory Forest. To the west of the towns a considerable amount of medieval cultivation and settlement remains was detected, much of which appears to have been centred on the sites of several medieval manors. Such remains are more sparse between Berry Hill and the River Wye, probably due to the presence of two large medieval chases where cultivation would not have been permitted. The area is heavily afforested today, and not responsive to aerial survey.

The northern section of this zone is also relatively poorly represented by medieval settlement and agricultural remains. A few scattered fields of ridge and furrow have been recorded around Ruardean, once part of a medieval manor. This area benefited from the outcropping of the Coleford High Delf coal seam, and has been an important coal mining area through the centuries. Immediately to the north of the manor a large swathe of woodland was granted by the crown. Now clear of trees, only two small groups of medieval fields were detected. The NMP survey area extended to the outskirts

of Ross-on-Wye, encompassing Penyard castle and its park and adjacent chase. Again, very few examples of medieval cultivation and very few settlement earthworks were recorded; many sites were only represented by scraps of earthwork or isolated units of ridge and furrow. The locations of at least six separate areas of medieval woodlands to the east of Lea and Mitcheldean also appear to coincide with an absence of evidence of medieval cultivation.

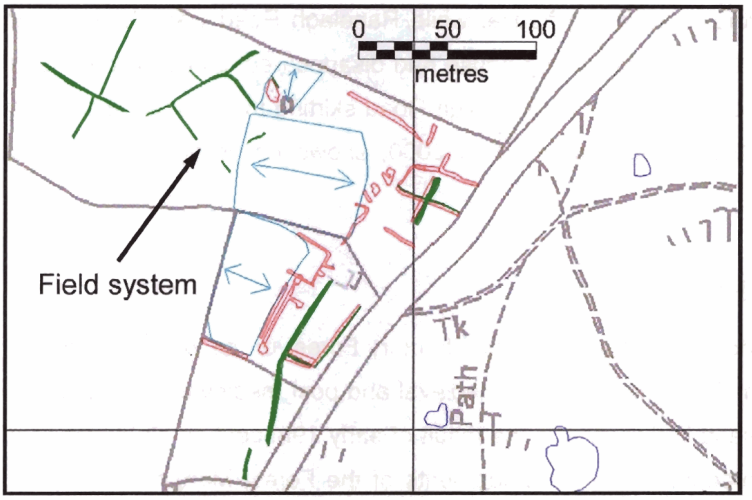

Figure 20. The medieval settlement earthworks and earlier field system at Yartleton Farm.

Background map acquired from the Ordnance Survey

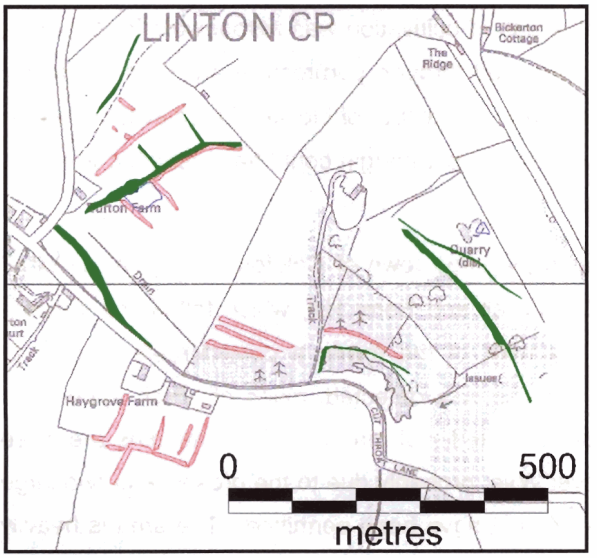

Figure 21. The probable medieval settlement earthworks at Burton Farm.

Background map acquired from the Ordnance Survey

The most substantial of the few sites recorded on aerial photographs was a settlement near Aston Ingram to the north-east of the Forest, north-east of Yartleton Farm (see Figure 20 above). A number of well preserved settlement earthworks including platforms, toft enclosures and a hollow way extended over two fields. The ruined walls of a building were also seen, but it is not clear if this is contemporary with the settlement. A number of fields of ridge and furrow were associated with the settlement. To the north-west of site lie the cropmark remains of a number of coaxial ditched rectilinear

enclosures, thought to be the remains of an earlier field system. These appeared to be on a different alignment from and to pre-date the medieval open fields, possibly dating from the later Prehistoric period.

Two other probable medieval settlement sites in this northern region were recorded as earthworks. The ditches and ridge and furrow at Bollitree Farm, and the earthwork remains of hollow ways, property boundaries and associated features close to Burton Farm and Burton Court (see Figure 21 above) are situated less than 1km to the north-east of Eccleswall Court and the site of Eccleswall Castle.

8.2.4 The Wye Valley

The eastern side of the valley of the River Wye forms the western edge of the Forest of Dean. The valley side is generally a mixture of steep wooded slopes or vertical cliffs, rising in some places 100m directly from the river. The earthwork remains of Offa's Dyke can be traced along the eastern edge of this zone.

Although it is not ideal agricultural land, there are some remnants of medieval cultivation west of St Briavels and Netherend on St Briavels Common. A number of earthworks, possibly associated with settlement were also detected. Much of this area is wooded, making detection of surviving sites from any period difficult.

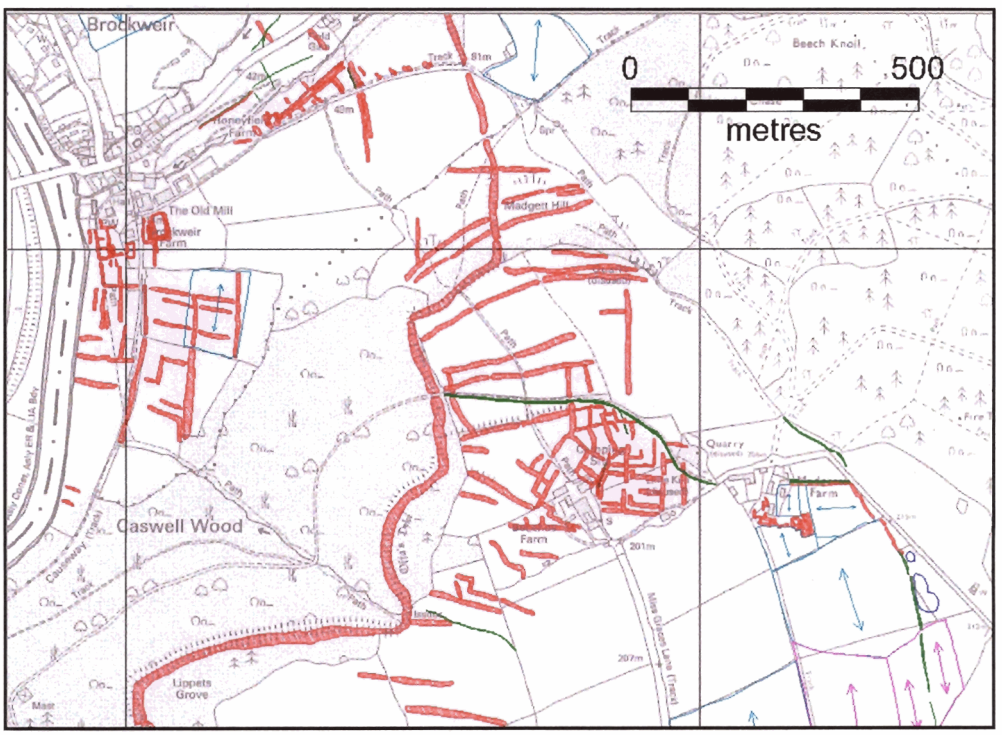

Figure 22. Field systems and settlement earthworks around Brockweir (left) and Madgetts Farm (right), on either side of Offa's Dyke.

Background map acquired from the Ordnance Survey

The most substantial settlement remains recorded in this zone are those at Brockweir. To the south of Brockweir Farm on the southern edge of the village are the earthwork

remains of a number of rectilinear enclosures, thought to be part of a settlement. To the south of these lies an embanked field system, probably associated with the settlement. However, part of the field system appears to be overlain by the faint earthwork remains of medieval or later ridge and furrow. It is possible that the origins of this site, like those of nearby Madgetts Farm, could be early medieval (Saxon) or earlier.

Brockweir has been an important crossing point of the River Wye throughout history, and is approached by a reputedly ancient cross-peninsular trackway. The weir from which the village gets its name is first documented as a gift to Monmouth priory from Baderon, Lord of Tintern in c 1120; it was held by Tintern Abbey in 1331. This was obviously a lucrative weir which, coupled with the river crossing, would have made Brockweir an important location; settlement probably sprang up there at an early date. The high tidal range and steepness of the river banks meant that no trace of any early weir structures were detected on the aerial photographs.

8.2.5 The Estuarine Margins — Helen Winton

The estuarine margins comprise the low lying regions of the alluvial flood plain adjacent to the Severn Estuary. This relatively level area is bounded to the west by the 50m contour and includes the settlements stretched out along, and to the east of, the A48 between Sedbury and Awre. On the west side the land rises up to the southern Forest of Dean Plateau and parts of the northern Forest margins.

By the 17th century this zone included the eastern parts of Westbury Hundred, including Tidenham and Woolaston parishes (VCH Glos X 1972) and Bedisloe Hundred, including Alvington, Lydney and Awre parishes (VCH Glos V 1996, 30–38). The Victoria County History (VCH) provides a detailed historical account of the development of the settlement, agriculture and industries in these hundreds. The NMP results complement these historical records with an accurate map of the archaeological evidence for settlement and agriculture visible on aerial photographs. A study combining the documentary evidence with the NMP interpreted mapping could begin to address more detailed research questions which are beyond the remit of this report. This section provides a general overview of the settlement pattern between the Forest and the western shore of the Severn and suggests some areas for further research arising from the NMP results

8.2.5.1 Settlement on the Estuarine Margins

The medieval and post medieval settlement pattern in the estuarine margins comprises a number of small and scattered landholdings with a few small villages. The evidence from Domesday Book, place name evidence, and the settlement pattern itself suggest that this is a reflection of piecemeal assarting and enclosure of woodland from at least the early medieval (pre-Conquest) period (VCH Glos X 1972). The villages, with the exception of Awre, all developed along the (originally Roman) Gloucester to Chepstow road. It is a possibility that some of the settlements may have origins as early as the Roman period but there is no material evidence of this. Through the medieval, and much of the post medieval, period the road formed the main street, and apparently the only focus, of each settlement. The communication links afforded by the road were presumably an important reason for the establishment of these villages.

Most of the villages seem to have comprised scattered plots along the roadside although it has been suggested that Alvington was a planned village. Its lay-out, in the regular series of long narrow house plots and gardens still seen today, appears to have been the result of confirmation of a grant of Alvington Manor from the Bishop of Hereford in 1145 (VCH Glos V 1996, 46–84). Attempts in the 13th century to establish Alvington and Lydney as market centres by the respective lords of manor both failed. Only Lydney eventually became a small town as a result of successful industry in the mid-19th century, and the housing boom in the mid-20th century. At Awre the village was the largest of the parish settlements but was overtaken by Blakeney which expanded as a result of industrial activities in the Forest.

The documentary evidence seems to suggest that the settlement pattern on the estuarine margins was relatively stable from the medieval period until the 19th century when many of the farms along the estuary edge were amalgamated. In contrast to other parts of the county, for example on the Cotswolds, there appears to have been no large scale decline of villages and farms in the 14th or 15th century.

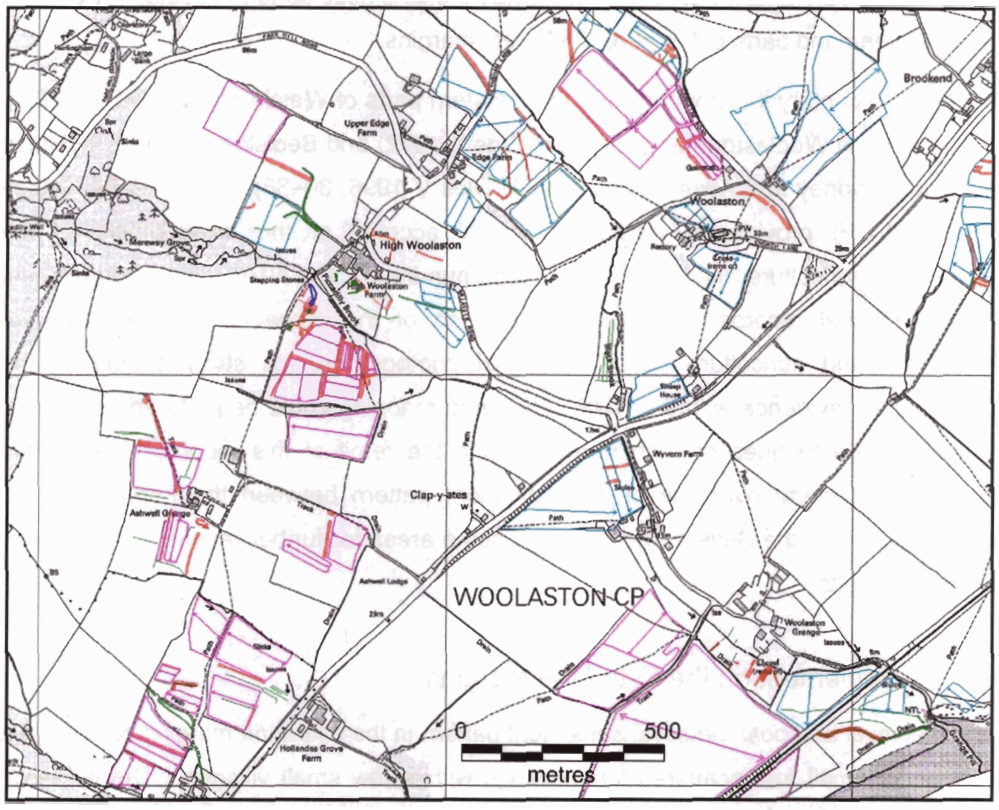

Figure 23. Scattered ridge and furrow across Woolaston parish indicating a mix of arable and pasture, with some possible settlement remains at High Woolaston.

Background map acquired from the Ordnance Survey

In most cases, as at High Woolaston and around Plusterwine (Figures 23 above and 24 below), the medieval and/or post medieval remains on the estuarine margins are characterised by dispersed blocks of ridge and furrow interspersed with fragments of former trackways, boundaries and the occasional building platform. Most of these remains are situated on the edges of villages and scattered between the modern farms and settlements. Without further research it is difficult to unravel what seems to be a complex pattern of land use and ownership. The documentary evidence suggests a medieval and post medieval settlement pattern of small villages and dispersed farms with mixed arable and pasture, and some 19th-century orchards; this appears to be reflected by the aerial survey results.

In contrast to the other villages on the estuarine margins, Awre (Figure 25 below) shows significant evidence of abandoned medieval settlement. There are possible tofts, or house plots, with crofts extending behind them, to the south east of the church. Fragments of other possible plots are situated around, and in some cases damaged by,

the present houses near Guy Hall Farm. These former property boundaries have a similar alignment and size to the currently occupied properties, suggesting continuity in the development of the layout of the village, probably from the medieval period onwards. In contrast the fragments of enclosures and boundaries to the south-east of Upper House Farm appear to be on a slightly different alignment. This indicates that they could be part of an earlier phase of development in the village.

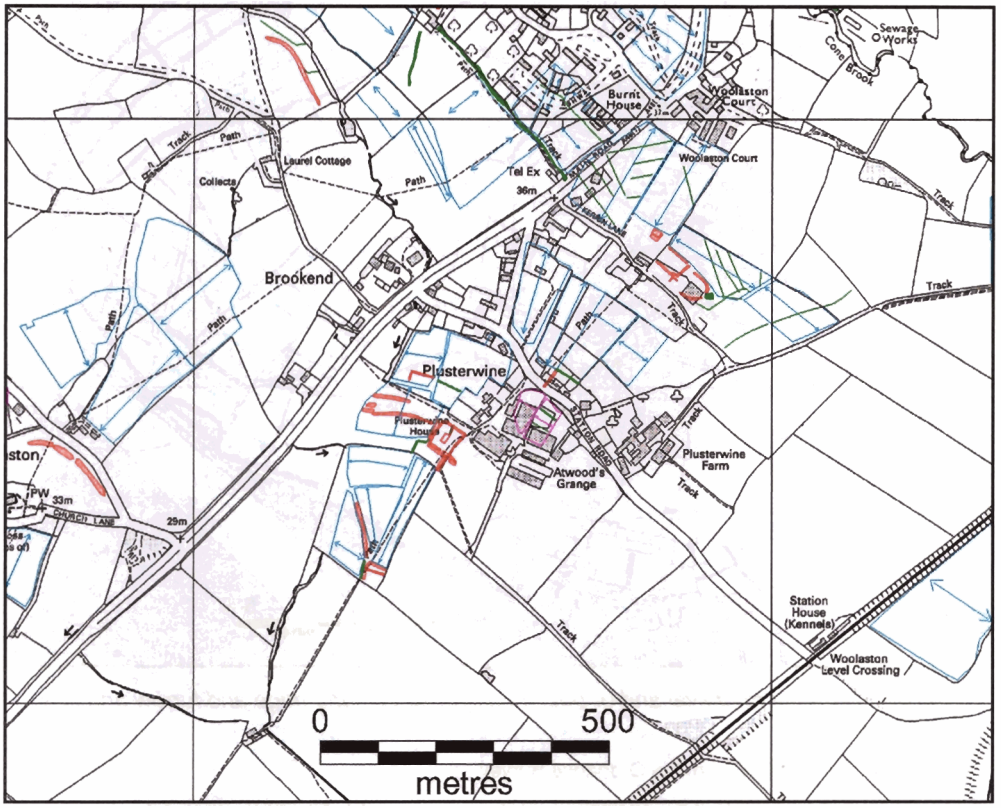

Figure 24. Possible building platforms north of Kennels Lane and near Plusterwine House, amid some former property boundaries and a mix of medieval/post medieval ridge and furrow and 19th century orchards.

Background map acquired from the Ordnance Survey

The reasons for the abandonment or shift of the house plots at Awre are unclear. Although Awre was overtaken in importance by Blakeney there appears to be no documentary evidence of a decline in the village (VCH Glos V 1996, 14–46). The tenants of the parish depended largely on agriculture, which seems to have remained fairly steady throughout the medieval and post medieval periods: the available land actually increased slightly due to reclamation from the river.

The inhabitants of the parish could also supplement their incomes from river trade (reflected in the number of drowned parishioners and sailors in the graveyard at Awre) as well as by fishing. The river trade continued from at the least the 13th century, well into the late 19th and early 20th centuries, at various points along the river. Gatcombe, nearby, was a major port from the 15th century onwards. The abandonment of plots in the village may have occurred relatively late, perhaps as a result of the amalgamation of farms and a change from mixed farming to dairying and stock rearing in the 19th and

20th centuries. This change in land use is, however, a trend that is seen throughout the estuarine margins and does not explain why the 'shrinkage' is more apparent around Awre village than elsewhere.

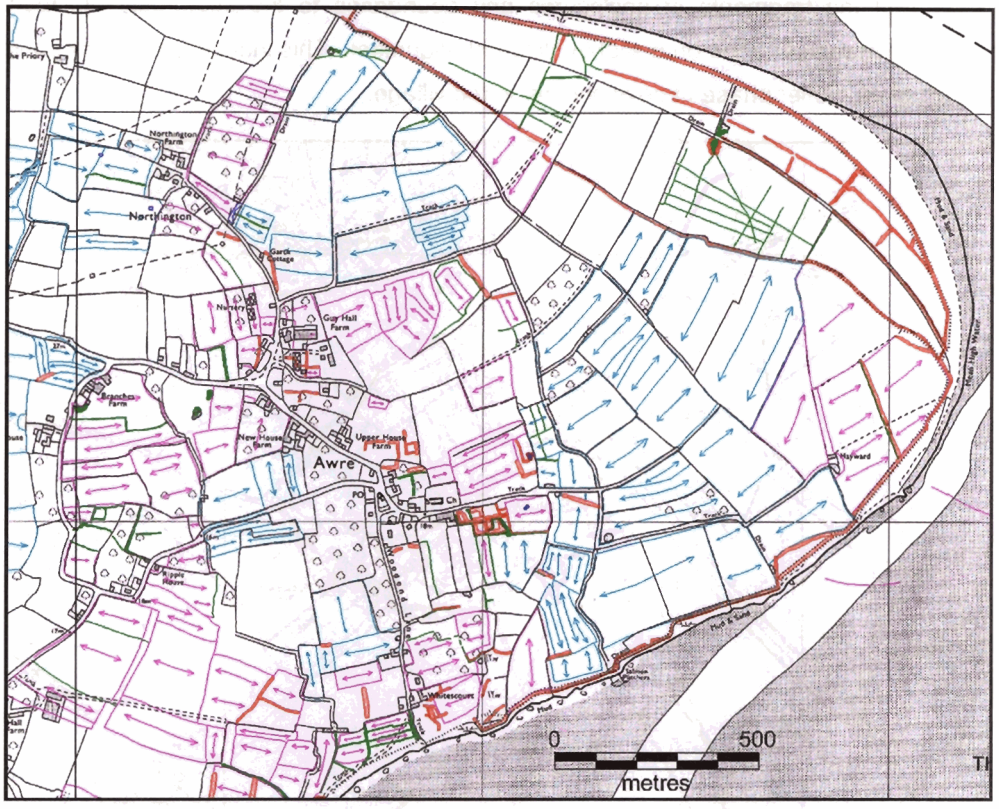

Figure 25. Possible medieval and/or post medieval settlement, ridge and furrow and sea banks at Awre.

Background map acquired from the Ordnance Survey

8.2.5.2 Agriculture on the Estuarine Margins

Documentary evidence suggests that the parishes on the estuarine margins shared a broadly similar agricultural development and economy. By the time of the Domesday survey, much of the land on the estuarine margins, particularly around and on the river side of the Gloucester to Chepstow road, had been disafforested and was under arable, pasture or meadow. Unenclosed wooded areas and commons were generally located on the slopes and hills on the western edges of each parish. Enclosure of common land and woodland continued, particularly in Lydney, throughout the medieval and post medieval periods. There are also frequent references to intercommoning between the parishes and, as most of them had been disafforested by the perambulation in 1300, the parishioners appear to have paid herbage annually throughout the medieval and post medieval period (VCH Glos V 1996; X 1972). Much of the belt of common and woodland that ran along the slopes parallel to the river still remains but only Poor's Allotment, in Tidenham parish, retains an appearance similar to the original medieval commons (VCH Glos X, 50–57).

The NMP survey has recorded some possible evidence of the commoners' activities. Tracks from Boughspring, or the fragment of a path at Turnip's Grove, that lead to commons on Tidenham Chase (now Poor's allotment and Parson's allotment) may follow medieval or post medieval routes used by commoners from the eastern fringes of Tidenham parish. It is also probable that commoners carried out some, if not all, of the charcoal burning whose remains were recorded at Upper Common in Aylburton parish, and at Tingley Wood, Haytuft Wood, Horage Wood and The Purlieu in Lydney parish (see also Section 9.2 Figure 32).

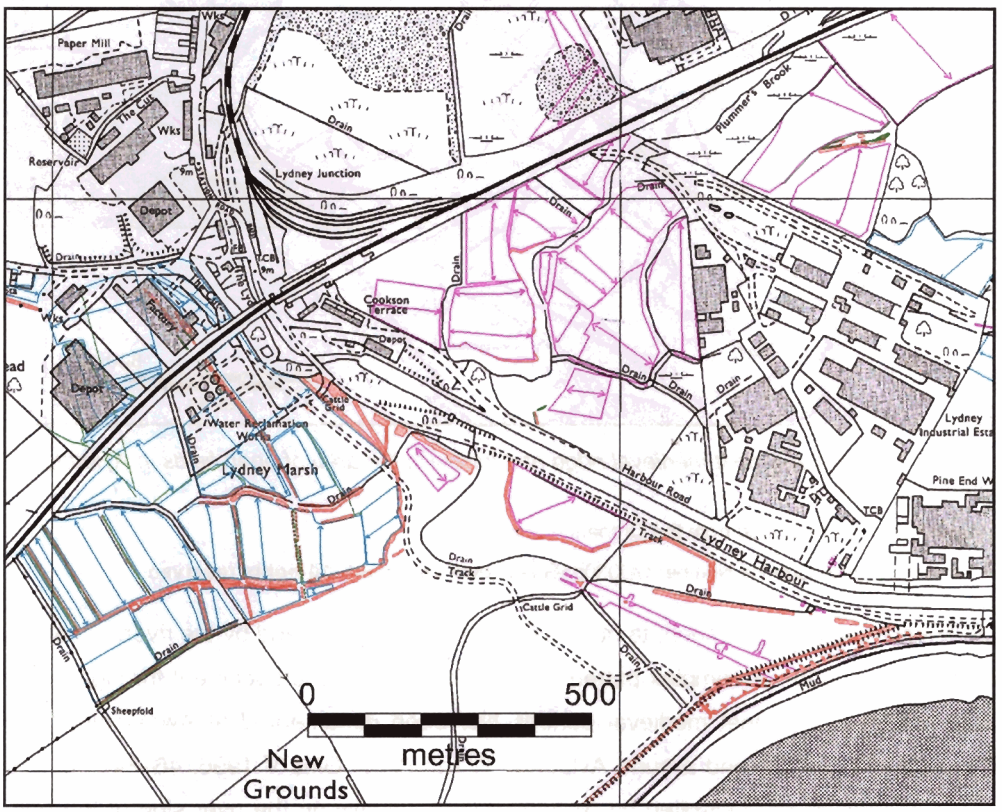

Figure 26. Former open fields of ridge and furrow on Lydney Marsh (also known as Great Cowleaze and Little Cowleaze). The ridge and furrow to the east of Lydney Harbour appears to have been part of a more extensive system of open fields which has been partially obscured by the industrial estate and cut by the railway.

Background map acquired from the Ordnance Survey

The NMP survey accords best with documentary evidence in the identification of large areas of open fields. Documents from Domesday through to the 18th century have recorded open fields and arable land scattered across each of the parishes, with the highest concentrations appearing near the river. This is reflected in the findings of the NMP survey, which recorded large tracts of medieval and post medieval ridge and furrow in the eastern parts of the riverside parishes. Good examples can be seen at Lydney and near Aylburton and Alvington (Figures 26 and 27).

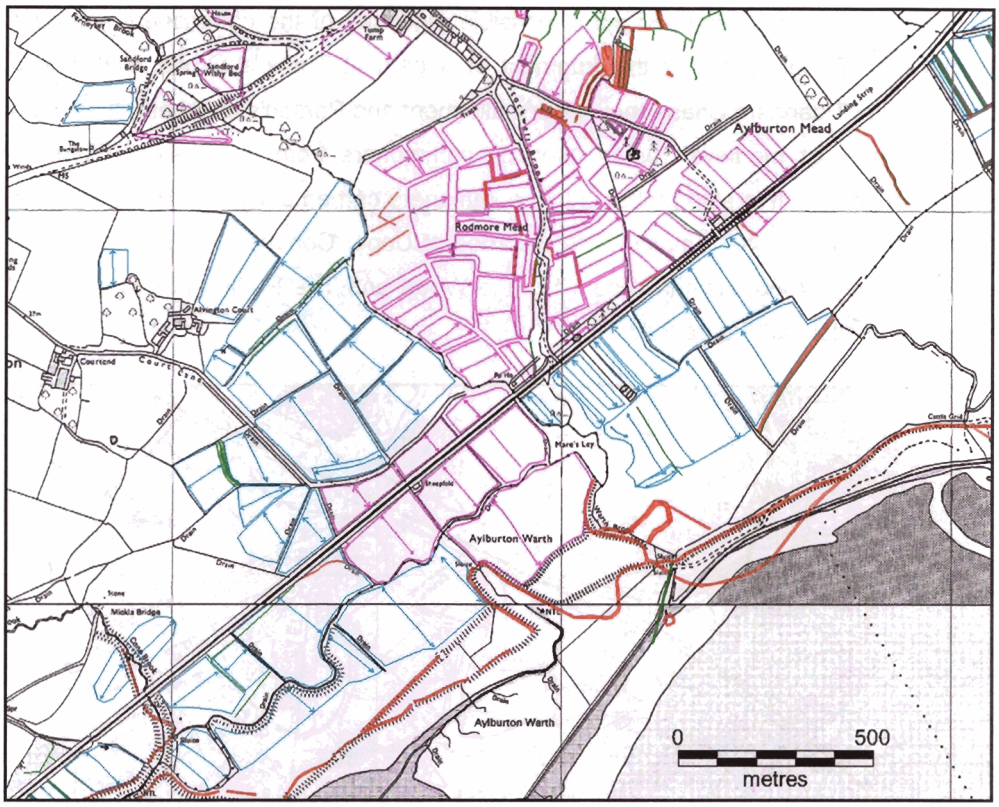

Figure 27. Medieval/post medieval ridge and furrow in the area of open fields in Aylburton and Alvington.

Background map acquired from the Ordnance Survey

Medieval meadows also seem to have been concentrated on land by the river, especially on reclaimed land. A complex pattern of reclamation and encroachment throughout the later medieval and post medieval periods has been documented at Awre point (VCH Glos V 1996, 14–46) and around Aylburton Warth (VCH Glos V 1996, 46–84). In both areas, meadows were situated on reclaimed land, usually on the river side of the open fields. Areas of meadow can usually be seen behind the various phases of sea banks (Figure 25) often covered by drains and, in some cases, more substantial rhines. Some of the fields contain straight, narrow ridges and furrows which are probably associated with post medieval improvement of the pasture.

Numerous orchards were established in the area in the 19th century and records show that many farms had cider mills. Some of these orchards remain but most have been removed. Orchard remains are relatively easy to identify: they appear as areas of narrow, straight ridges and furrows, usually clearly defined within inclosure or 19th-century boundaries. Many former orchards have been recorded by the NMP survey and mapped using the ridge and furrow symbols and can be identified specifically from the NMR or SMR database.

Arable farming gradually declined along the estuarine margins from the 18th century and by the 19th century the farmland was predominantly grassland and meadow with dairy farming and stock rearing most commonly practised. Medieval and post medieval

earthworks have therefore been well preserved in pasture and have been recorded on aerial photographs from the 1940s onwards. However, with the late 20th century reintroduction of arable farming in this area, many of these earthworks, especially the ridge and furrow, are being ploughed level.

8.2.6 The Severn Shore

A considerable amount of archaeological work has been carried out in the intertidal zone along the Severn, and is routinely recorded in the Annual Reports of the Severn Estuary Levels Research Committee. Sites recorded as a result of the NMP survey, although relatively few in number, are significant and suggest that there is potential for combined aerial and field based work in the Severn estuary. A number of fish weirs, barges and wrecks were recorded in the intertidal zone, and there is good evidence of sea banks and reclamation at several points along the river edge.

8.2.6.1 The nature of the evidence in the intertidal zone

As with terrestrial sites, the archaeological evidence recorded from the air in the intertidal zone represents relatively large features, such as oyster pits, former jetties, fish traps etc. Material eroding from cliffs, and small archaeological deposits, are not usually visible from the air. Activities such as hand-, net- and spear-fishing, although economically important, usually leave little or no trace (Putley 1999). There were, however, many small ports, landing places and fisheries along the western shore of the Severn from at least the medieval period (Green 1996; Putley 1999, 10) where one would now expect to find archaeological evidence of quays, jetties and other structures. Permanent fisheries in the Severn are also well documented (Geraint Jenkins 1974; Putley 1999) and any remains of these substantial structures could be visible from the air.

Other coastal surveys which combine aerial and field survey have shown that the results from each technique complement one another (Newsome and Hegarty 2004; S Massey pers comm). A comparable situation seems to exist on the shores of the Severn. For example, none of the archaeological features recorded during fieldwork on the 'Forest Shore' between Stroat and Woolaston (Townley 1998) was positively identified on aerial photographs. However, a fish weir at Horse Pill, visible on aerial photographs as late as 1970, is not mentioned by Townley: this suggests that it had been removed, or had deteriorated to such an extent that it was no longer visible by the time of the 1998 survey.

Identification and characterisation of archaeological features in intertidal estuarine and coastal environments can be achieved effectively from the air if an appropriate methodology is applied. Aerial reconnaissance can provide easier access to the potentially dangerous intertidal zone but, if it is to yield results, it must be carried out repeatedly over a number of years with the right combination of low tide and weather conditions (Strachan 1995; Newsome and Hegarty 2004). This partly explains why so

few specialist oblique photographs of the Severn Estuary were available for the NMP survey. An additional difficulty for reconnaissance between the Severn bridges and Gloucester is the restriction on flying over the nuclear power stations at Berkeley and Oldbury on Severn and the hazard involved in flying over the bird sanctuary at Slimbridge (D Grady, pers comm; Topographical Air Chart of the United Kingdom 1:250,000 scale, Sheet 8, England South, Edition 7). Most of the sites recorded on the shores of the Severn during the Forest of Dean NMP survey therefore came from historic vertical photographs, in particular from a few runs taken fortuitously at low tide in 1945 and 1946.

The nature of estuaries can also have an effect on the distribution of archaeology visible from the air, reflecting both a difference in survival of archaeological remains and in the original use of the estuaries (Newsome and Hegarty 2004; Hegarty and Newsome 2004). Estuaries with different tidal ranges, steeper sides, or unstable intertidal areas will inevitably vary in use compared to stable shores: the range of archaeological remains thus depends on the topography. Such a contrast can be seen in the NMP results for the Forest of Dean. No archaeological features were recorded in the intertidal zone along the River Wye, although they undoubtedly exist, for example the 'Roman' bridge by Chepstow (Hart 1967 plate XVII). This absence near the Wye contrasts sharply with the results from the Severn, where archaeological features have been seen in the wider intertidal zone, particularly on the eastern shore. The lack of evidence along the Wye was probably due to many factors, including lack of specialist archaeological reconnaissance, as outlined above, and that river's steep sides and relatively narrow tidal range, as it approaches its confluence with the Severn.

Changes in the estuary due to erosion, accretion or reclamation may mean that archaeological landscapes have become isolated from their original topographical context or masked by the effects of reclamation and alluviation (Newsome and Hegarty 2004; Hegarty and Newsome 2004). A range of survey techniques are therefore required to identify and survey archaeological features eroding out of cliffs, or isolated inland from their original context (Newsome and Hegarty 2004; Hegarty and Newsome 2004). The results of the limited area recorded as part of the Forest of Dean NMP project, and other surveys (Allen 1992; Allen and Fulford 1992) do, however, suggest there is potential for archaeological survey, using aerial photographs, of the whole Severn Estuary and the lower Severn shore as far upriver as Gloucester.

8.2.6.2 Sea banks and reclamation

Sea banks are usually well recorded on historic maps but, where relict sea banks or coastal changes have not been depicted, they can in some cases be recorded from aerial photographs. The possible medieval sea defences at Awre point and at Slimbridge, for example, have been recorded where they are 'trapped' behind the current shore defences (see Figure 25 above).

The sea bank between Aylburton Warth and Lydney was recorded from 1940s aerial photographs. These photographs show evidence of changes to the course of the sea banks which are not recorded on 19th- and 20th-century maps. Documentary records indicate that the land on the river side of Lydney and Aylburton was being farmed by the early part of the 13th century. The sea banks are thought to have been originally constructed around this time to prevent inundations from the river.

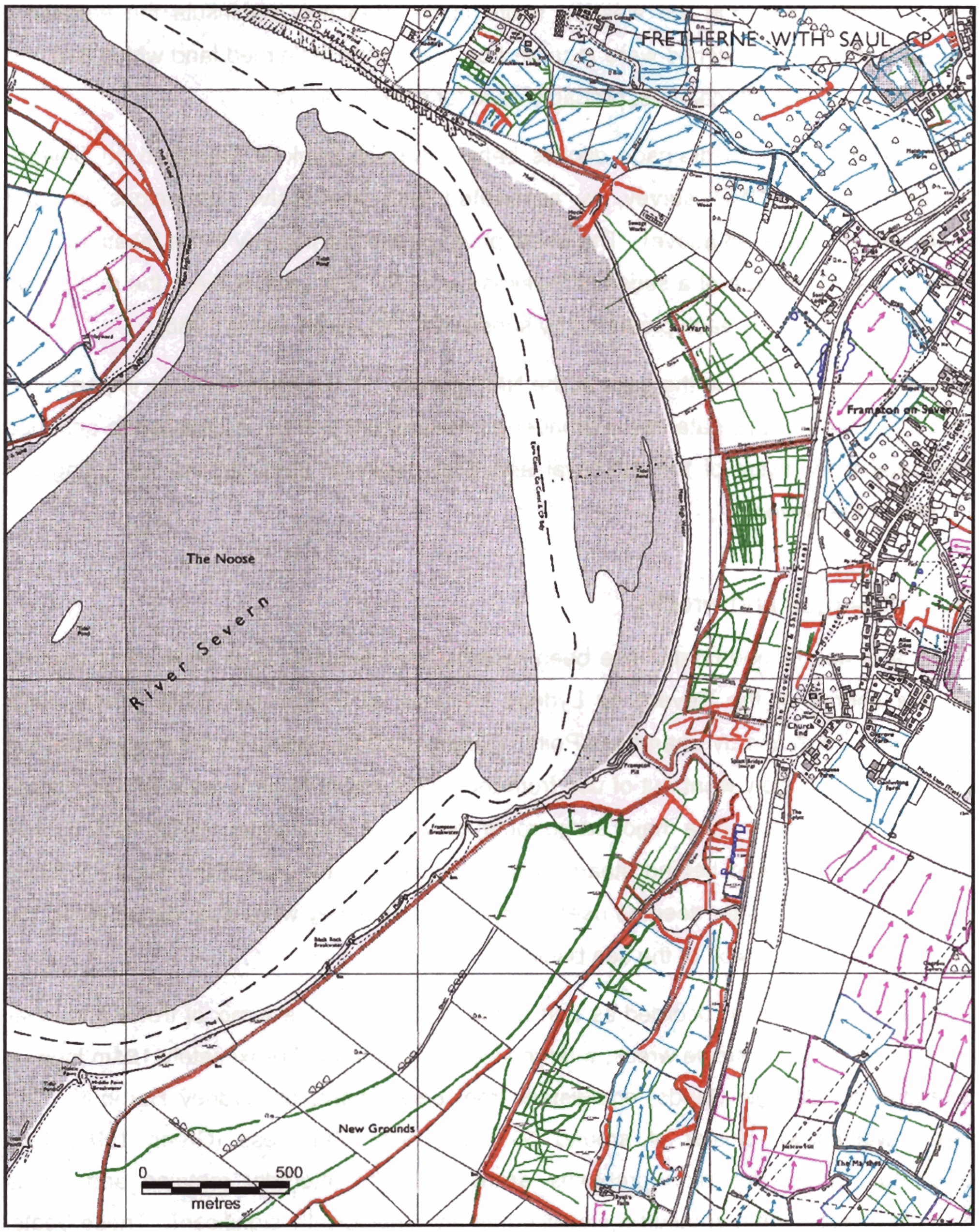

Figure 28. Complex patterns of drainage and reclamation at Frampton on Severn.

Background map acquired from the Ordnance Survey

From the 16th century, changes in currents caused deposition of silts. This process created new land which was subject to flooding and severe erosion; it washed away in the 1680s, only to re-form in 1730. A sea wall was constructed in the 19th century to

protect this area, known as 'New Grounds' (VCH Glos V 1996), and the NMP mapping shows a number of possible phases of the bank.

It has been suggested that the drainage of the Severn Edge was established in the Roman period and that the current drainage pattern at the Wentlooge Level, north-east of Cardiff, was established in a single phase during this time (Allen and Fulford 1986). It is possible that comparable evidence may be found along the shore of the Severn in the NMP survey area. On the western shore of the Beachley peninsula the earthwork remains of drainage ditches were recorded on apparently reclaimed land which is noted on early maps as salt marshes, probably used for sheep grazing.

A complex network of drainage ditches behind the sea bank at Frampton on Severn, mapped by the NMP survey, is associated with successive campaigns of land reclamation (Figure 28 above). The aerial photographs, particularly those taken in 1947, provide a clear picture of a series of in-takes dating to 1335 (and earlier), the mid-1700s and the 19th century, each protected by substantial sea banks (Allen 1986)

Further mapping to fill in the gaps in the NMP survey, on the eastern shore in particular, and integration of this data into a broader archaeological survey, is required to enhance the detailed analysis of the medieval and post medieval land reclamation along the shores of the Severn.

8.2.6.3 Barges and wrecks

Groups of abandoned boats have been recorded and mapped from aerial photographs, on the shores of the Severn by Lydney Harbour, at Marshfield timber ponds, near Dauncey's Farm and by Sharpness Point. Barges, particularly the local variety called the Severn Trow, largely went out of use from the 1890s onwards as a result of the gradual decline of the Severn as a major cargo route; only three were under sail by 1939 (Green 1995). Trows, towed behind steam tugs, were used in the mid-20th century to carry cargo. When no longer deemed useful for that purpose they were abandoned along the shore to prevent erosion of the sea bank.

The abandoned boats recorded as part of the NMP survey are a mix of trows and other types of vessels. A single wreck, a large vessel measuring approximately 124m long, is stranded on Saniger Sands, equidistant from each shore, off Lydney Harbour. The large, well-known cluster of around 50 boats near Sharpness (Green 1995, 105) illustrates the preservation problems associated with intertidal remains and raises questions about what should be classified as archaeologically significant. These boats, once an important part of the estuary's trade network, have fulfilled a further purpose as sea defences but it is unclear at which point they become archaeological remains worthy of preservation. Aerial photographs, and the NMP maps, are one method of recording the boats' process of decay. By mapping from historic aerial photographs and specialist archaeological aerial reconnaissance, it is possible to record both their past and current preservation, and to view the remains in a wider landscape setting than that provided by ground photographs.

8.2.6.4 Fish weirs

A significant group of fish weirs was recorded on the Severn shore within the survey area. The main source for the identification of individual weirs was J Geraint Jenkins' work 'Nets and Coracles' which identifies the location of those fish weirs along the Severn which were licensed in 1865, and John Putley's work on the Riverine Dean (Putley 1999). Many of the weirs recorded as part of the NMP survey correspond to those identified by Jenkins: the NMP survey complements Jenkins' work by providing accurate locations and extents for the fish weirs.

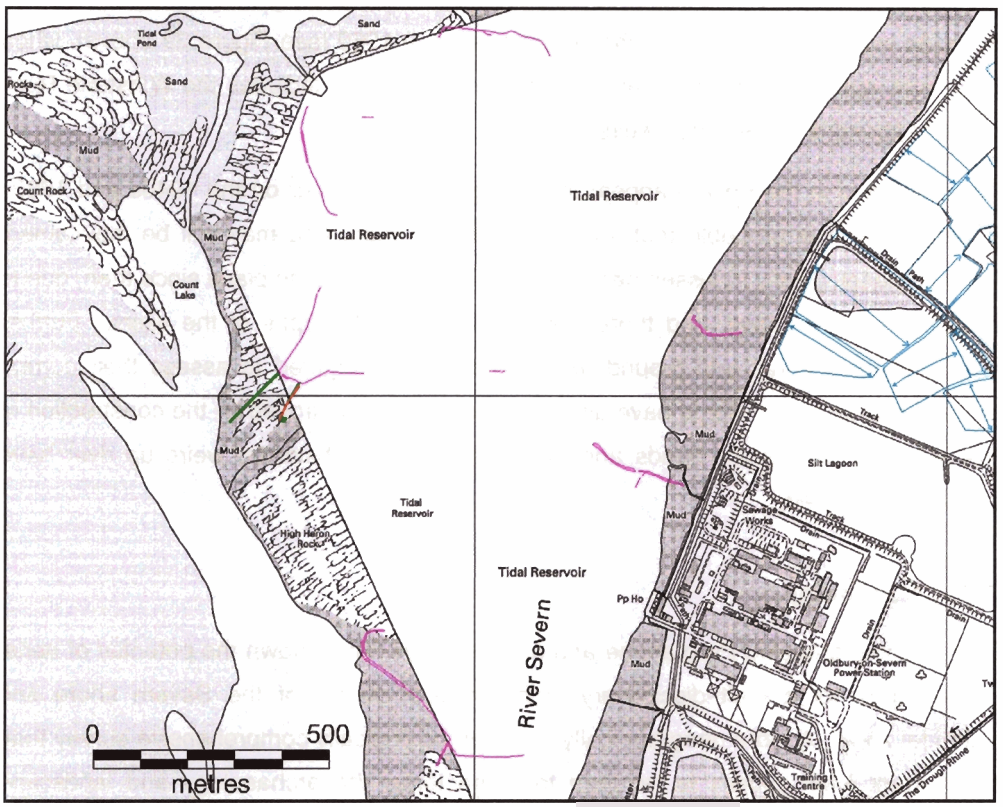

Figure 29. 'Complex' fish weirs (in pink) destroyed by the construction of the reservoir at Oldbury Sands.

Background map acquired from the Ordnance Survey

The Severn fisheries have been heavily regulated since the mid-19th century and no new weirs have been constructed since then. Many of the weirs recorded by the NMP survey were probably established by the 1860s, but some may have earlier origins. Fish weirs were an important part of the economy of the settlements and manors along the Severn shore throughout the medieval, post medieval and early modern periods. There is documentary evidence for licensed fisheries in, for example, Tidenham parish since the Saxon period (VCH Glos X 1972, 70–72) and in Awre parish since 1300 (VCH Glos. V 1996, 30–38).

Medieval fisheries on the Severn took a number of different forms; the fish weirs recorded as part of the NMP survey all seem to be of the types known as Putchers or Putts. Putchers comprise rows of cone shaped baskets arranged on a stout timber

framework, called a Hedge, which was built across the main tidal flow of the river. Putts are much larger wicker baskets, possibly of an earlier design than the putchers, comprising three interlocked sections, which form a large cone. Putchers are designed particularly for salmon, while putts catch a wider range of fish, including shrimp, flat fish, salmon and even sturgeon.

The weirs in the upstream parts of the survey area, for example at Brim's Pill, Awre, are of comparatively small and simple construction. Further downstream the weirs are larger and more complex, with double arms, a method of construction perhaps enabled by the more stable nature of the exposed bedrock. At Oldbury Sands a cluster of relatively complex weirs can be seen on photographs taken in 1960 (see Figure 29 above), when they were apparently still maintained. This group possibly includes the Winstone Rock and Shepperdine Lower Shon weirs.

The fish weirs in the Severn appear in varying states of repair on the 1940s and 1960s photographs: it is probable that some were in use then, and may still be maintained. Little archaeologically focussed aerial reconnaissance has taken place since then, due to reasons outlined above, and there are few recent photographs of the weirs. Further work, including aerial and ground reconnaissance, is required to assess their current state of preservation. Some have almost certainly been destroyed by the construction of the reservoir at Oldbury Sands and many of the less substantial weirs up river have probably collapsed.

8.2.6.5 Summary

The National Mapping Programme and other surveys have shown the potential of aerial photographs for a multi-disciplinary archaeological survey of the Severn shore and intertidal zone. A more geographically and methodologically comprehensive survey than the current NMP project is required to characterise the archaeology and landscape change in the Severn Estuary.

8.2.7 Settlement and agriculture on the Eastern Severn Shore

On the eastern side of the river, the NMP project has mapped extensive tracts of ridge and furrow between small, dispersed settlements. Pastoral land use in this area, from the later post medieval period, has resulted in good survival of medieval and post medieval earthworks and these are recorded on aerial photographs from the 1940s and 1950s. The areas mapped as part of the NMP project are now predominantly pasture, with a few areas recently taken back into arable. Allen has suggested that in the Vale of Berkeley this process took place as part of relatively early enclosure and was complete by the 17th century (Allen 1992).

Although not all of the eastern shore has been surveyed as part of the project, the initial NMP results suggest that, while the distribution of ridge and furrow may vary in density, it is much more extensive and continuous here than on the western shore. This can be seen clearly in the parishes of Fretherne With Saul, between Hamfallow and Hinton, and

between Hill and Shepperdine, and perhaps suggests a contrast in the complexity of land use between the western shore and Forest.

The extensive ridge and furrow shows that during the later medieval and early post medieval periods the eastern shore, in contrast to the Forest shore, had only small scattered settlement, and little or no woodland and common. Allen has suggested that this pattern probably reflects the culmination of an eastward shift in settlement during the medieval period (Allen 1992), away from the alluvial plain to higher, or more solid, ground.

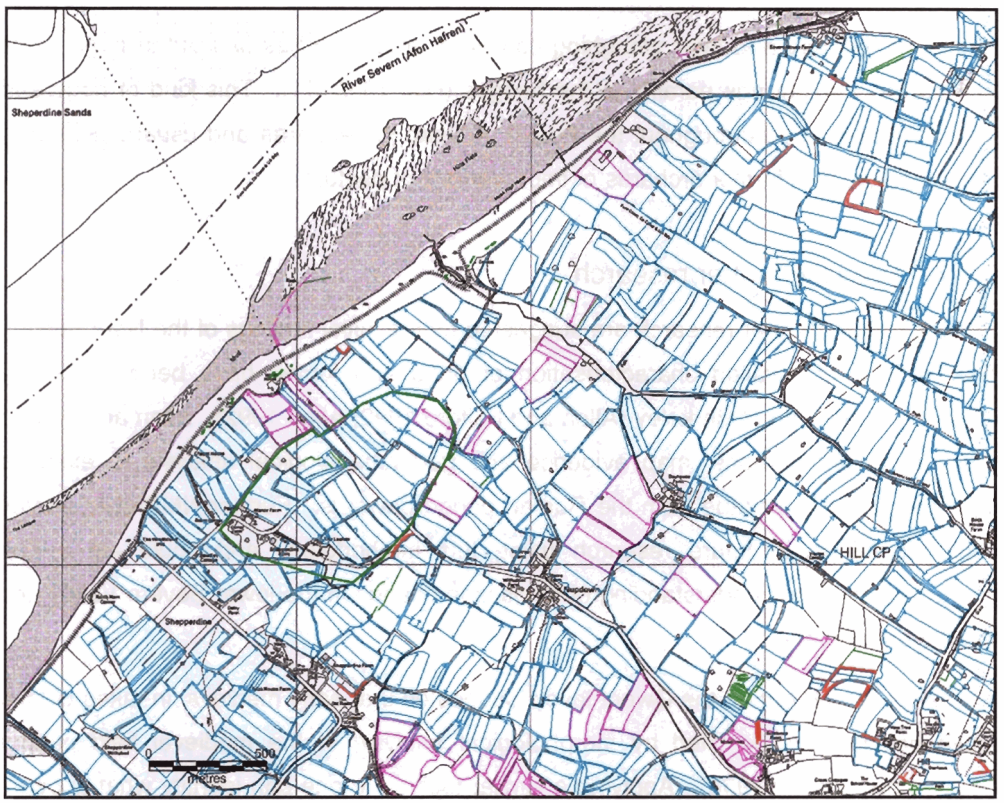

Figure 30. Ridge and furrow on the eastern shore. Potential early intake is outlined in green.

Background map acquired from the Ordnance Survey

Aerial photographs have long been recognised as a useful tool for surveying ridge and furrow (Beresford and St Joseph 1979) but any further analysis of the development of the settlement and field pattern on the shores of the Severn will encounter some problems in dating the agricultural remains. The dating of ridge and furrow has been much discussed in the published literature on medieval fields; it seems clear, from detailed comparisons with documentary evidence, that broad dating based on the form of the rigs is reasonably reliable (Hall 1982, 10).

The majority of the ridge and furrow recorded as part of the NMP survey comprised curvilinear, medieval, rigs. The term 'medieval' in this context, however, encompasses dates as early as the 12th century and as late as the 18th century (Hall 1982, 11–13, Wilson 1989, 185). Changes and differences in soils, land use, ownership and the underlying economics can all support continuity or drive change, and a more

sophisticated form of analysis is required if detailed conclusions on the dating of the eastern shore's ridge and furrow are to be reached. This is illustrated by a huge swathe of medieval and post medieval ridge and furrow which extends from immediately south of the Hill and Oldbury upon Severn parish boundary and the edge of the area covered by OS 1:10,000 scale quarter sheet ST 69 NW (Figure 30). The cultivation remains can be broadly categorised and can provide valuable basic information, comparable to that used in the survey of Vale of Berkeley (Allen 1992). However, on the eastern shore there is no obvious organisation of land holdings apparent in the pattern of the fields as, for example, blocks of ridge and furrow appear to cross parish boundaries.

Nineteenth-century and later ploughing can be characterised as laid out in large fields with narrow straight rigs parallel to the hedges (Hall 1982, 11). This kind of ridge and furrow was recorded throughout the Forest of Dean project area and usually proved to be associated with former orchards or improvement of pasture.

8.2.7.1 Possible further research

Some areas for further research are suggested by the initial findings of the NMP survey. The benefits of detailed characterisation of ridge and furrow have been shown by research in the Vale of Berkeley (Allen and Fulford 1992; Allen 1992). Allen and Fulford used aerial photographs, map evidence and geoarchaeological analysis to examine changes in the landscape from the Roman period onwards. Further NMP-style survey could contribute to future research using this methodology and could aid in the characterisation and understanding of landscape change in the lower Severn Valley and the Severn Estuary.

Research carried out on the Gwent levels suggested that early medieval in-takes of land could possibly be identified by morphological analysis of the medieval field pattern (Rippon and Turner 1993). Applying a similar technique one can identify what appears to be a large oval area within the pattern of rectilinear fields in part of Shepperdine parish, between Manor Farm, Shepperdine Farm and the current parish boundary (Figure 30). It is not clear, however, whether this block of land was taken into cultivation earlier, or later, than the rest, or whether it is simply a series of boundaries dictated by the natural topography and unrelated to the development of the field pattern.

8.2.7.2 Summary

The ridge and furrow recorded as part of this project is more sporadic in and around the Forest. By the Severn, especially on the eastern shore, there appears to be evidence of extensive, and fairly intensive, arable cultivation almost certainly originating in the medieval period and probably continuing well into the post medieval period. Before a detailed analysis can be carried out, to examine the development of agriculture and settlement, further survey is required to map a coherent study area encompassing the vale between the river and the southern Cotswolds. This mapping could then be used as

the framework for a full study including the examination of all the available documentary sources, a task which is beyond the remit of the NMP project.

9 THE FOREST AND FOREST INDUSTRIES Sharon Bishop

9.1 Introduction

The aerial survey has added a large number of forestry related sites to those already known within the project area. This is especially true of charcoal burning platforms, which have a potential date range from the Iron Age to the early modern period. The NMP project has also recorded several linear earthwork banks which partially define post medieval timber plantations and lumber roads, and enclose mine shafts.

Today, the Forest covers only about a third of its former extent (Hart 1971) due to a combination of industrial activity and encroachment. At its core many of the remains of past woodland practices are still hidden by the trees of the Forest. The woodland resources of the Forest have been used primarily for charcoal (associated with the area's iron industry), for ship-building timber, as fuel for lime kilns and as a source of tannin. The wood would also have been exploited through the common right of estovers – the taking of wood necessary for household use and making implements, and in particular in the Forest of Dean, for making quarrels for crossbows (Hart 1971; Webb 2002b). Competition for the Forest's resources intensified in the later 16th century, with a massive rise in demand for both charcoal and timber.

Charcoal production is the only one of these activities whose traces are visible from the air. Earthwork platforms were constructed as a level base upon which to burn the charcoal, and the blackened heat-damaged soil and stone left by the process can be detected using aerial photography. None of the huts used by the charcoal burners was identified by the aerial survey, although this is not surprising: these structures were temporary and unlikely to leave any trace on the ground surface (Bowden 2000).

Identification of other forestry activities from air photographs, such as sawpits, is also problematic as they can easily be mistaken for the numerous extraction sites throughout the Forest. Many sawpits were in use in Dean by 1612 (Hart, 1966) and what was thought to be the last example, at the Weighbridge, Westbury, was filled in around 1948 (Phelps, 1983). Saw-pits were recorded in association with a number of charcoal burning platforms by the RCHME's ground survey of the Welshbury Iron Age hillfort and its environs. This suggests that other examples could remain elsewhere in the Forest, awaiting recognition.

9.2 The Charcoal Industry

The aerial survey has recorded several hundred previously unknown charcoal burning hearths, visible either as dark soil- or cropmarks formed by a spread of burnt material in flatter areas, or as extant earthwork platforms terraced into steeper slopes. Nearly 3000 charcoal hearths were recorded in Dean by the Forest Regarders in AD 1282, along with several hundred charcoal burners (Foard 2001, 89). Many of these hearths may still survive, hidden in the woodland, but most will probably have been destroyed by modern forestry and industrial activity.

In preparation for use, each charcoal burning platform was levelled and cleared of stones and cord wood was carefully stacked in concentric rings around a central tripod which acted as a chimney. The semi-circular stack was then covered with turf and finely sieved soil, with small ventilation holes left in the covering. The stack was fired by dropping charcoal embers down the central fire hole which was then covered by a lid of turf. The process takes several days to complete and a number of stacks would have been burnt simultaneously (Bowden 2000; Walker 2001). After cooling, each stack was dismantled and the charcoal sorted and removed from the site, leaving a slightly dished hollow surrounded by a low bank or rim of debris. The extreme heat of the burning process damaged the soil and blackened the underlying stone, marking the hearth site with an intensely black stained earth (Johns 1989; Foard 2001).

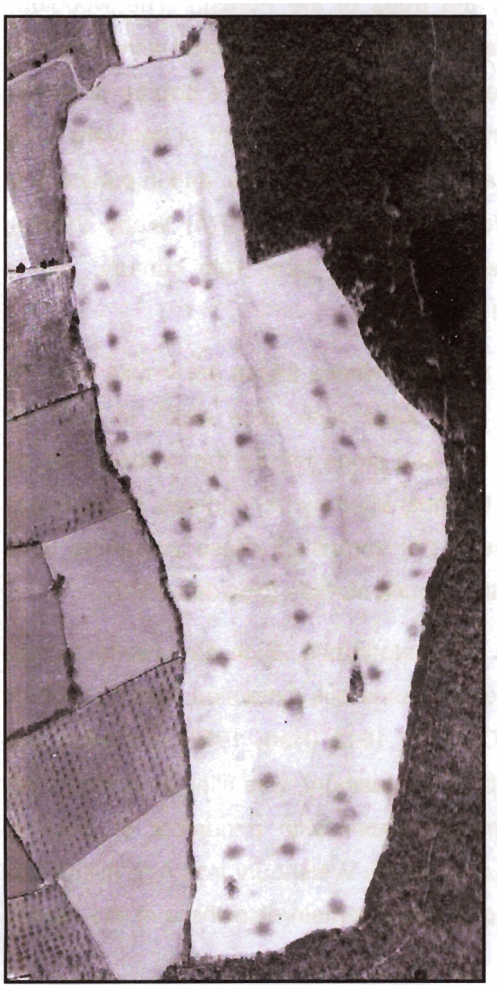

Figure 31. The traces of former charcoal burning platforms of uncertain date at Hope Wood. The dark marks indicate the build-up of charcoal from successive charcoal clamps. This is one of the largest groups recorded by the project.

The faint earthwork traces of field banks from an earlier, possibly Prehistoric, field system were also recorded with the aid of a LIDAR survey.

Extract from
RAF 106G/UK/1355 7027 02-MAR-1946
© English Heritage (NMR) RAF Photography

The majority of the charcoal burning sites recorded by the NMP project appear as circles of black stained earth, located on flatter land that is no longer covered by woodland (Figures 31 & 32). These sites may have changed more rapidly than their earthwork counterparts on slopes, where more effort had been expended in creating a suitable platform (Bowden 2000). Ground survey in Blakeney Hill woods suggests that platforms on steeper slopes are generally in a better state of preservation than those on flat ground (Johns 1989), although most of them remain hidden by vegetation.

The majority of the charcoal burning hearths identified by the aerial survey are located outside the statutory Forest, in arable land where the woodland has been cleared (Figure 31). The hearth sites are all circular or oval and occur singly or in groups of up to sixty or more. Their presence and distribution hints at the former extent of coppiced woodland. A particularly large group of charcoal burning hearths clusters around Tingley Wood, 2km to the north-east of Lydney (Figure 32).

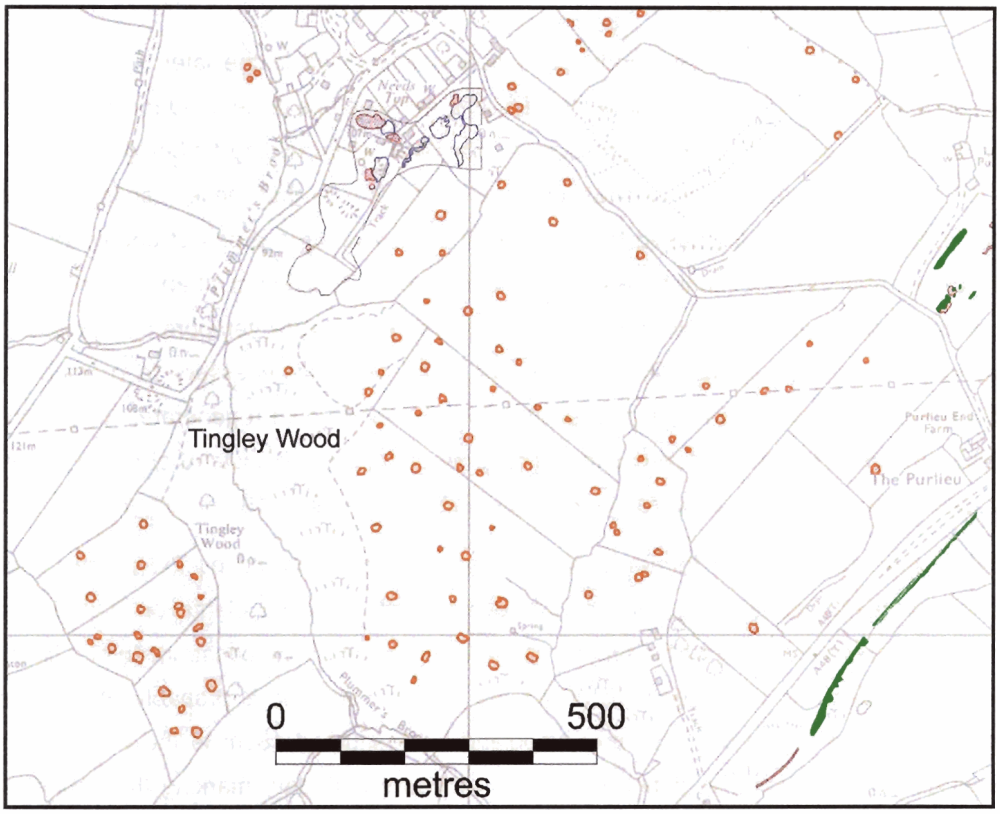

Figure 32. A large number of dark soil- or cropmarks (shown in orange) reveal the locations of charcoal burning hearths and hint at the former extent of Tingley Wood, situated 2km to the north-east of Lydney.

Charcoal production was a mobile process, moving from coppice to coppice each year in a cyclical pattern that may have spanned centuries (Bowden 2000; Foard 2001). Coppices could only regenerate if they were protected from animal grazing and other clearance, and were often fenced after cutting (see below).

The distribution and concentration of charcoal hearths revealed through aerial and field survey within the Forest indicates that large tracts of the woodland were being managed through coppicing.

Most of the charcoal produced in Dean was for used for smelting and forging iron, and small amounts were also used for domestic heating and cooking (Hart 1971). Consequently, the timeframe for charcoal production sites is as long as for the iron industry in the region and the potential dates of the platforms could range from the Iron Age through to the mid-20th century. Some may even have been created and re-used in

different periods. The hearths were clearly located close to supplies of cord wood, within coppices, and not necessarily close to the iron workings although there is some evidence of re-use of iron-working sites for charcoal production. An excavated platform at Blakeney Hill appeared to have been used intermittently for iron-working and charcoal production from the 13th to the 19th centuries (Johns 1991).

9.3 Woodland banks

Competition for the Forest's woodland resources intensified in the later 16th century, when the introduction of blast furnaces caused a massive rise in demand for charcoal in direct conflict with the growing pressure to conserve ship-building timber (Hart, 1966; 1971). From the 16th century onwards, in order to ensure that these resources were protected, the Crown increased the practice of enclosing large areas of coppicing and timber plantations with linear banks, ditches and fences. The Forest inhabitants' rights of common and pannage over these areas of woodland were temporarily cancelled, although later re-instated. These measures were deemed necessary to protect the coppices from grazing animals and ensure the cut wood could regenerate. Enclosure also protected 'standards' (trees allowed to grow on into timber instead of being cut as coppice) required for their future use as naval timber (Hart 1966, 1971; James 1981).

While the sites of some former coppices are probably indicated by the presence of charcoal platforms (above), sections of several post medieval plantation boundaries have also been recorded by the project as earthwork banks. The construction of a linear woodland bank in Dry Wood disturbed the eastern side of a probably Prehistoric enclosure (see Figure 5). A further woodland bank situated 180m to the west of this enclosure can be seen to define part of an inclosure boundary marking the boundary between Dry and Foundry Woods that is still in use today.

Elsewhere in the Forest linear banks were constructed around old mines after orders issued in the 17th century required deep and dangerous shafts to be enclosed (Marsden 1987). It was stipulated that these enclosures must extend to the nearest waste land or track so that the horses used by the miners would not interfere with woodland management. A possible example of such safety measures is shown at Old Thatch Pit, where a thin bank surrounds the shaft and the area as far as the road in the west (see Figure 46). The shape of the bank is almost unique in the Forest and its close proximity to the mine shaft could suggest an early date, since later orders required the enclosure of a larger area around a shaft. Excavation of the bank revealed no dating evidence (ibid). The bank is much less substantial than other boundary banks in the Forest and has spread significantly; other similar banks may be equally degraded. Some early safety banks may have been removed when the enclosed areas had to be enlarged and others may be hidden beneath the trees, or obliterated by subsequent industrial activity.

9.4 Lumber Roads

One example of a lumber road has been recorded at Ruardean Woodside (Figure 33). The road is defined by two narrow parallel earthwork banks. Several linear ditches or ruts between the banks provide evidence of 'tushing' – the use of horses to drag the timber along the road (Phelps 1983, 50). This road was probably used to take timber out of the Ruardeanhill Plantation towards the main road at Brierly; many similar low parallel banks are probably hidden by trees at other Forest locations.

Figure 33. A Forest lumber road defined by two parallel banks, now partially covered at its northern end by a spoil heap from a later mine.

Extract from RAF 106G/UK/1359 5054 02-APR-1946

9.5 Discussion

The woodland resources of the Forest have been extensively exploited, especially the region's iron industry, over centuries, if not millennia. A marked intensity in competition over these resources is evident in the increasingly enclosed Forest landscape which developed from the 16th century onwards. The range of functions fulfilled by the Forest has expanded over time and it is increasingly managed as a multipurpose resource.

The NMP results have provided useful insights into the management of this wooded landscape which will be enhanced by the application of complementary survey techniques. It is probable, for example, that hundreds of charcoal burning platforms still remain beneath the vegetation and might be identified by systematic ground survey, such as that conducted in Blakeney Hill woods (Johns 1989). Targeted radiocarbon dating of excavated sites will help to establish their pattern(s) of use (Foard 2001). Although LIDAR survey may not reveal small discrete features such as charcoal platforms, it can be expected to reveal linear earthwork features such as plantation banks within wooded areas. Documentary research should also help to broaden our understanding of the management of the Forest's coppices, plantations and parks.

10 MANSIONS, GARDENS AND LANDSCAPE PARKS

Cathy Stoertz

10.1 Introduction

Within the Forest of Dean survey area there were many estates and manors, both great and small. The first substantial structures built by the medieval owners of these properties were defensive: castles, mottes and moated houses, undoubtedly designed to impress, as much as to protect. Later land owners commissioned high status houses, some with formal gardens or landscaped grounds, as an expression of their importance, wealth and taste.

The construction and development of Dean's high status residences span several centuries and styles. Many of the houses have their origins in medieval estates and monastic foundations, and most eventually became associated with the main phases of Dean's industrial development. That development began in the late Tudor period, and the wealthy families of the area became Dean's first industrialists.

The grand houses of Dean are located around the outer parts of the survey area (see Figure 34). It is no surprise, given the constraints of the Royal Forest and industrial exploitation, that none appears to have been constructed within the central part of the Forest. The houses and estates show something of the non-industrial side of life in the Forest of Dean, at least for the upper strata of society. The majority of those estates eventually passed from the original dynasties to new land owners who, in their turn, sought to create country residences to reflect their wealth and importance. As in earlier periods, many of the 19th-century house builders were associated with the industries of Dean.

This essay cannot hope to undertake a full discussion or comprehensive description of all of the important properties in the Forest of Dean. Records from the Gloucestershire Sites and Monuments Record and other sources indicate at least a hundred sites – mottes and defensive structures, manorial earthworks, wealthy houses and formal gardens and landscapes – that have the potential to leave their mark in the archaeological record. Only a proportion of these would be expected to be visible on aerial photographs: houses located within built-up areas, and those lacking recordable garden or landscaping features, are beyond the remit of a survey based on aerial photographic evidence. This essay aims to illustrate sites of architectural or historical interest, and places where aerial photographic evidence has either helped to identify 'lost' information, or has been augmented by knowledge of the history of Dean's houses.

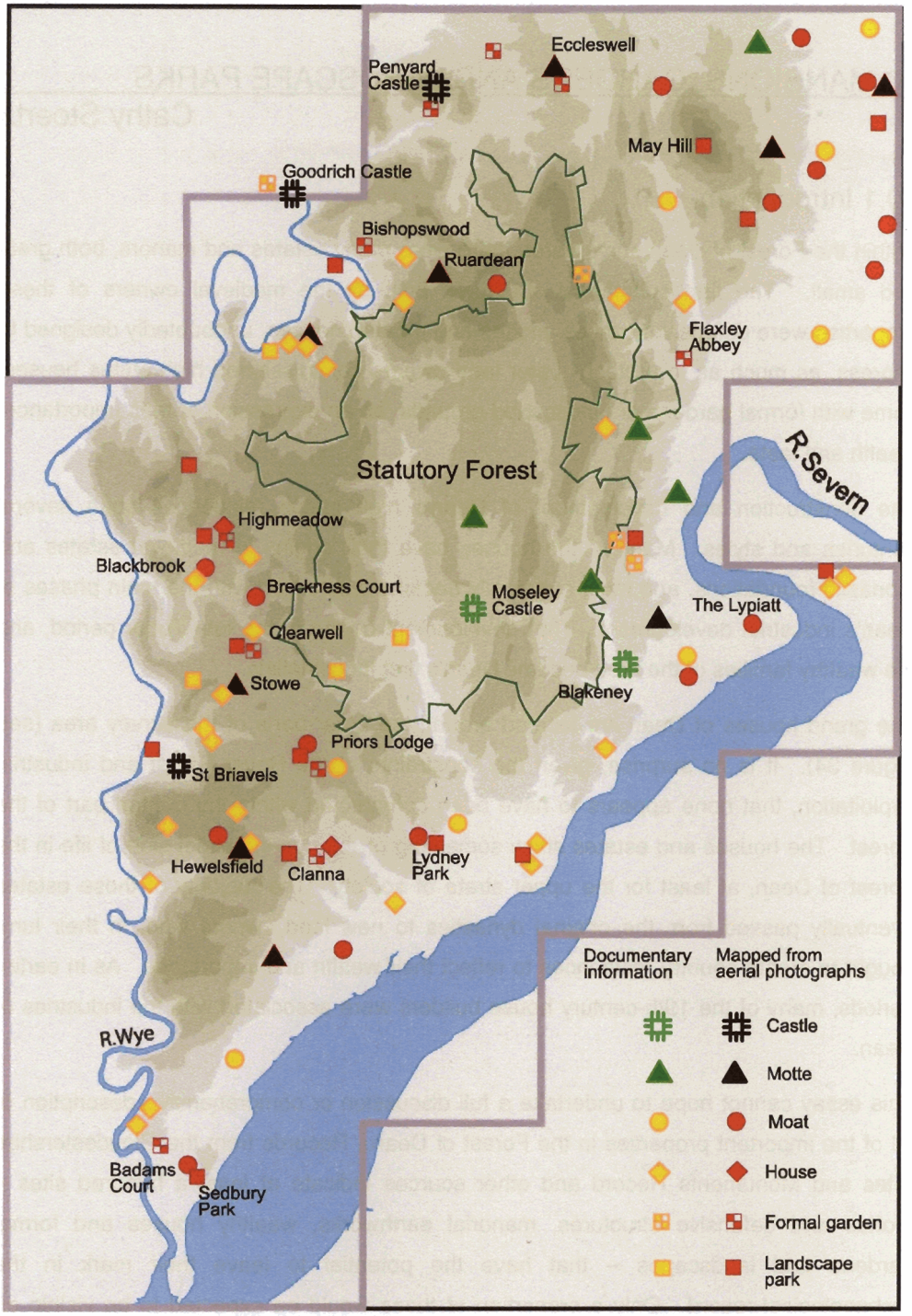

Figure 34. The distribution of castles, high status houses, landscape parks and gardens in the Forest of Dean survey area.

Background map based on Ordnance Survey data

10.2 The earliest structures – small Norman castles and mottes

The manorial structure which formed the basis of large land holdings around the edges of the Royal Forest of Dean had its origins in the 11th and 12th centuries. Eleven mottes or small castles were mapped by this survey, while another seven were noted by the county SMR and other sources but were not mapped, either because their existence could not be confirmed, or because they were invisible beneath tree cover.

A typical early fortification can be seen at Stowe, 2 km to the north of St Briavels, where a simple single earthwork encloses an area of 70m x 52m on top of a small knoll. Although originally identified as a possible Iron Age hillfort, its form is characteristic of a Norman 'ring motte' – it may have been the precursor to St Briavels Castle. Most of the outer rampart was visible on aerial photographs, although no internal features were recorded, and the earthwork has been damaged by quarrying.

The majority of medieval defensive sites around the Forest are small ringworks like Stowe, or castles of the motte and bailey type. Eccleswell Castle, just beyond the northern edge of the Forest, provides an example of a more developed motte and bailey, whose setting has been embellished with the addition of non-defensive features. The castle was probably built by Richard de Talbot, to whom the land was granted in the reign of Henry II. The surviving motte is a D-shaped mound with a flattened top. Possible remains of a moat appear to the east and a hollow way leads up from the south-east into the southern side of the motte (see Figure 35).

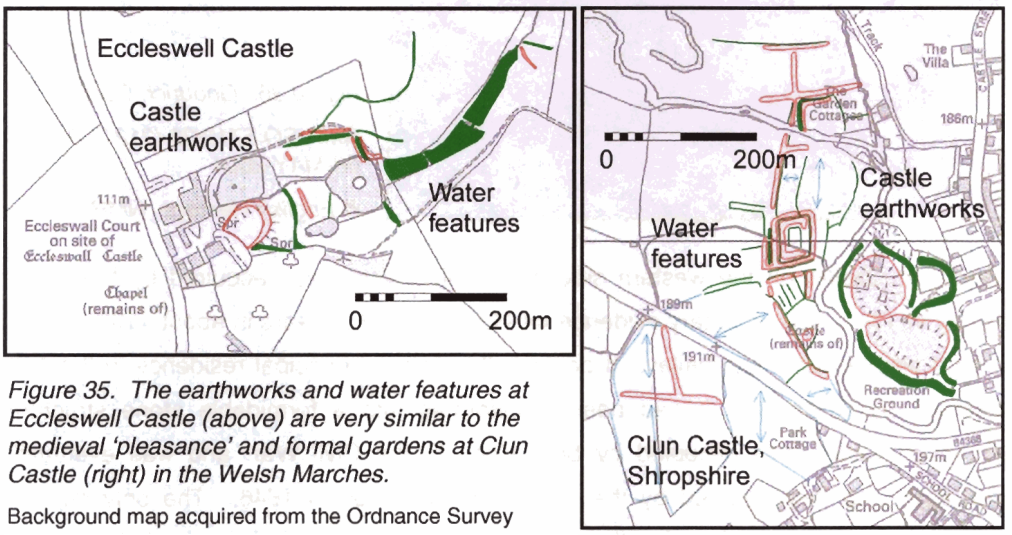

Figure 35. The earthworks and water features at Eccleswell Castle (above) are very similar to the medieval 'pleasance' and formal gardens at Clun Castle (right) in the Welsh Marches.

Beyond the moat are a number of linear earthworks and a large pond. Three further elongated fishponds, separated by dams, extend to the east along the valley. The pond nearest the moat may also be a fishpond, but could represent a water feature created as part of a medieval pleasure ground or garden. The arrangement of features at Eccleswell is similar to a small number of late 13th-century gardens and early designed landscapes recorded in the Welsh Marches (Stoertz 2004, 58–9). At Clun Castle (see Figure 35), a moat-like feature has been interpreted as a medieval 'pleasance' or formal pleasure garden with water features, and a 13th-century designed landscape incorporating water features was also recently identified at Stokesay Castle (Taylor 1998, 4–5). Eccleswell probably fell into ruins shortly after the Talbots moved their base to Goodrich (see below).

10.3 Larger castles

The great castles at Gloucester, Chepstow and Monmouth, must have exerted a considerable influence on the life and politics of Dean but, whatever their effect, they lie outside the survey area, and beyond the scope of this report. However, many large fortifications of interest lie within the Forest and its more immediate environs.

Figure 36. Goodrich Castle
NMR SO 5719/39 (21216/01)
08-MAY-2001
© English Heritage. NMR

Goodrich Castle, on the western side of the River Wye, was acquired by the Talbot family in 1342. Documentary evidence for Goodrich first appears in about 1100, when it was a simple motte and bailey. It became the Talbots' principal residence in the 14th century, by which time it had been transformed into a formidable stone structure. Goodrich Castle was occupied by both sides in the Civil War, and was eventually besieged and then slighted by the Parliamentary forces in 1646. The only remains visible at Goodrich today are the ruined fortifications: no evidence of gardens or domestic features could be detected on aerial photographs.

The small castle at St Briavels played a more direct part in the history of the region. Possibly preceded by the Norman ringwork at Stowe, St Briavels Castle was built before 1130, when it was recorded as a Royal castle. At an early point in their history, the castle and manor of St Briavels became established as the administrative centre of the Forest, and even as late as 1842, the castle was used as a civil court and debtors' gaol. During the 13th and 14th centuries, the rights to the castle were held by the constable of St Briavels and warden of the Forest.

In 1680 most of the outer parts of the castle had fallen into ruin and were demolished (VCH Glos V 1996, 255–8), although fragments of the outer bailey bank to the west of the moat are traceable with the aid of aerial photographs. The motte and parts of the 13th-century domestic buildings, gatehouse and curtain wall survive today as listed buildings.

10.4 Fortified manor houses and moated sites

Ruardean, on the northern edge of the Forest, is the site of a 13th-15th-century fortified manor house. Under a licence to crenellate, granted in about 1311, Alexander of Bicknor built a house defended by a perimeter wall and a substantial earthwork. This house may have stood as late as 1611, but by 1831 most of the masonry was gone (VCH Glos V 1996, 236). Aerial photographs show that the ruined house or castle is surrounded by the remains of further earthworks, some of which may have been garden features. A ditch that runs along the southwest side of the castle earthworks is probably a path or hollow way linking the site to the town of Ruardean.

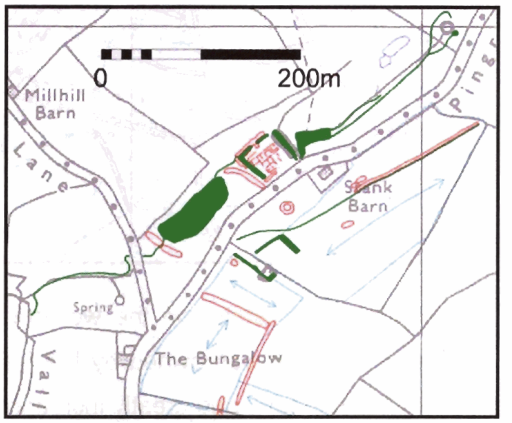

Figure 37. Breckness Court. The large ponds on either side of the moated site may be garden water features.

Background map acquired from the Ordnance Survey

Another early estate was created on lands assarted to Hugh of Kinnersley before 1225 between Clearwell and Newland, near the south-western corner of the Forest. Aerial photographs taken in 1976 revealed not only a moated site, whose existence was known, but also the foundations of a large house within the moated area (see Figure 37). The moated house marks the original site of Breckness Court, known in 1334 as Kinnersley Court and in 1358 as Brecknocks Court. To the north-east and south-west of the moated area are two large ponds, generally interpreted as fishponds – but in the light of recent discoveries at Stokesay and Clun Castles, in the Marches, and bearing in mind the ponds at Eccleswell (see Figure 35 above), these ponds should perhaps be reconsidered as possible garden features. In the 18th century the moated house was replaced by another house, also called Breckness Court, built on higher ground c450m to the north of the original site. The new house eventually declined in status, became a farmstead, and is now deserted.

10.5 Tudor and 17th-century developments

The first industrial developments in Dean took place in the early 1600s, when the arrival of blast furnace technology enabled a rapid increase in iron smelting. Many of Dean's land-owning families became the region's first industrialists, constructing furnaces and forges fed by charcoal from their own coppice woodland (augmented by purchases, grants or leases from Crown lands in the central Forest), and producing enormous quantities of iron. The Winters, Halls, Baynhams, Throckmortons and others greatly increased their fortunes during this period, and developed their estates in keeping with

their rising wealth. During the 17th century, several fortified houses or castles in the region were demolished or significantly altered in response to changes either in fashion, or in the wealth of their owners.

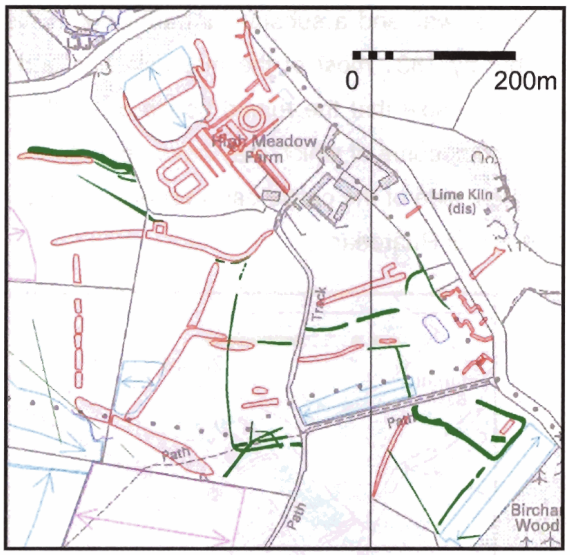

Figure 38. Earthwork traces of the mansion and gardens at Highmeadow, with medieval village remains to the south.

Background map acquired from the Ordnance Survey

The Highmeadow estate, on the western side of the Forest, was one of the largest estates in Dean. It was owned by the Hall family, one of Dean's industrial dynasties, from the 13th century, and greatly increased in size and wealth during the 16th and 17th centuries. A late 15th-century house existed at Highmeadow, part of whose gatehouse range survives as a disused barn at High Meadow Farm. In about 1670 Henry Benedict Hall built a very important proto-Baroque house, the only example of a house in that style in west Gloucestershire (Verey and Brooks 2002, 321–2). The construction of this mansion, on terraced ground, with a walled outer court and a circular carriage drive, involved the demolition of much of the medieval village of Highmeadow, which had occupied the site since at least the early 14th century. The mansion itself was little used by the late 18th century, and was demolished soon after 1805, as was most of the rest of the village (see Figure 38). Traces of Highmeadow House and its garden terraces survive as earthworks and have been recorded from aerial photographic evidence. Significant remains of the medieval village are also visible as earthworks.

10.6 18th-century houses and landscaped parks

Although the Forest of Dean was not generally in the forefront of architectural fashion, one of the earliest Gothic Revival houses in England was built at Clearwell Court (known as 'Clearwell Castle' since 1908) in 1727–8, on the site of a mid-15th century house (Verey and Brooks 2002, 310; VCH Glos V 1996, 211). The Clearwell estate was one of the most important in the region, and its ownership passed through several of the families at the centre of Dean's iron industry.

In 1728, Clearwell Court was rebuilt in the Gothic style. The new crenellated house was enclosed on three sides by a small park, whose boundaries are preserved today. The aerial photographic evidence for Clearwell shows the park and possible garden features

close to the house, including paths and a possible ha-ha between the 19th-century terrace gardens and the park. A small mound in the parkland to the west of the house was revealed, on early Ordnance Survey maps, to be the site of a statue of Hercules.

The 18th century also saw the creation of romanticised landscapes and parks for the enjoyment of the wider public. Along the southern bank of the Wye, between Symond's Yat and Bicknor Court, part of Court Wood was landscaped to provide scenic walks with views over the river to the north (VCH Glos V 1996, 102). At the southern end of the survey area a walk at Piercefield Park, on the west bank of the Wye, gave views across the river to the dramatic high ground of the Lancaut peninsula (Mowl 2002, 108, Figure 50). Unfortunately, neither landscaped walk could be recognised on aerial photographs.

10.7 19th-century landscapes

A 19th-century landscaped woodland or wilderness, and the house to which it belonged has been recorded at Clanna. The property was originally part of the Alvington estate, which had pre-Norman origins, and a house existed on the site by 1586. Some time after 1820 the woodland at Clanna was landscaped, former millponds were turned into a fish pond and an ornamental waterfall, and the house became known as Clanna Falls. The gardens and grounds were enhanced, in 1885, with a mock timber-framed home farm and gardener's cottage, and a walled kitchen garden.

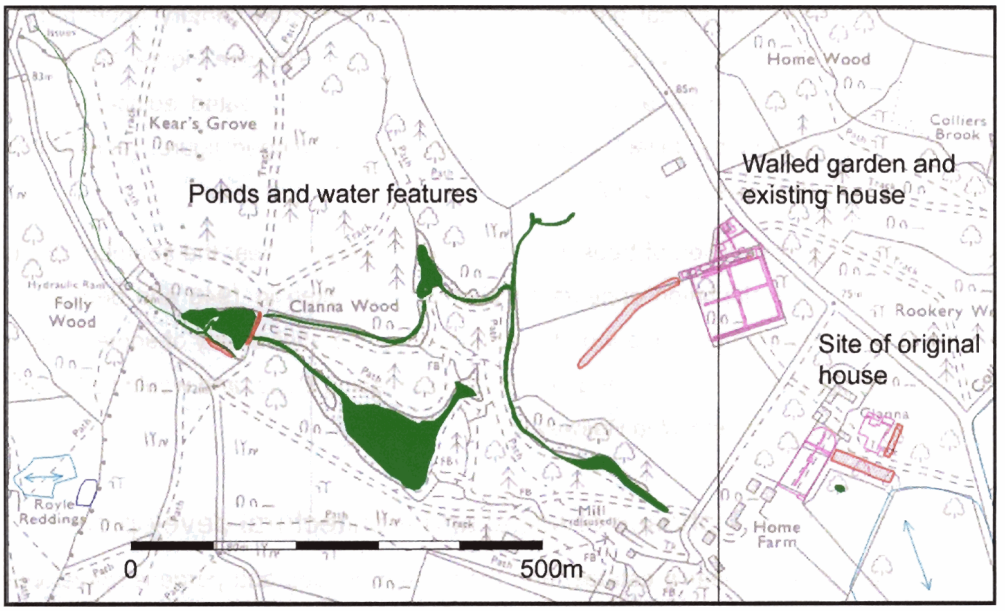

Figure 39. The landscaped grounds of Clanna House. The ponds and water features were based on former millponds. The walled garden now belongs to a house built in 1989.

Clanna House was demolished in about 1952, but the kitchen garden, to the northwest of the main house, survives as the garden to a new house which was built in 1989, at the northwest end of the walled garden (VCH Glos V 1996, 8–9). The evidence provided by

aerial photographs is now the best record of the original house, formal gardens, landscaped woodlands and water features (see Figure 39).

Sedbury Park, on the eastern side of the Beachley peninsula, provides another example of 19th-century park development. Aerial photographs provide evidence of features associated with Sedbury's late 19th-century garden and park, comprising an earthwork platform (possibly a former terrace), one or more carriage drives, and additional earthworks to the north which may also represent landscaping features. The principal carriage drive leads from the park to the banks of the Severn at Slimeroad Pill, passing through a gap in the southernmost segment of Offa's Dyke.

During the 19th century at least one site, on May Hill, appears to have been landscaped for the enjoyment of the general public. Four acres of land were awarded to Longhope parish in 1874, at the time of the enclosure of May Hill common – a circular Common enclosure and linear carriage drives on the hilltop date to that time. The area was used as a public park, and a recreation ground is still shown on the OS map. A distinctive group of fir trees was planted on the hill in 1887 (Verey and Brooks 2002, 594). Within the Common enclosure is a smaller earthwork which may have Bronze Age or Iron Age origins (see Section 6.5 and Figure 5).

10.8 20th century

An unusual example of formal garden construction in the 20th century appeared on aerial photographs of the POW Camp at Sedbury, taken in 1945 (see Figure 62, Section 12.3.2). Vegetable patches and formal parterres had been created adjacent to the officers' huts, probably by Italian or German prisoners. A winged figure, representing Pegasus or a Griffin, was also visible.

A commemorative plantation of trees was recorded at Allaston, near the southern extent of the Forest. The plantation appears on photographs taken in 1946 and depicts the initials 'G VI R', no doubt in honour of the coronation or the anniversary of some event in the King George's reign. It is located on a southwest-facing slope, and would have been visible from the Severn and Wye Railway line.

10.9 Lydney Park – phases of social and architectural development

Most of the Forest of Dean's estates, and their grand houses and gardens, developed and changed over many centuries, according to the fortunes of their owners. A good example can be found on the eastern side of the area at Lydney Park.

The earliest structure at Lydney Park was a 12th-century motte, possibly built by the Talbot family, the original owners of the estate. When the manor of Lydney was sold to Sir William Winter in the early 1560s, the manor house was located in Lydney village.

By 1565, Sir William had built a new mansion called White Cross on the western outskirts of Lydney (Hart 1995, 1). During the Civil War his grandson, Sir John Winter, first fortified this house and then, in 1645–6, burned it down to prevent it falling into

Parliamentary hands. Although no trace of White Cross was recorded by the Forest of Dean survey, a group of rectilinear banks or enclosures just to the north of its site could possibly be associated with Sir John's fortifications.

In 1692 Sir John's son Charles built Lydney Old Park, the first grand house within the parkland, to replace the lost White Cross. By that time, however, the Winter family's fortunes were in decline and, in about 1723, the estate and ironworks were taken over by the Bathursts, another of Dean's industrial families.

Benjamin Bathurst landscaped the parkland and improved the house in the late 1720s – an area to the northwest of Old Park, marked 'Old Pleasure Gardens' on the Ordnance Survey map, may be associated with this phase of development. As a further improvement, in 1736, Bathurst caused the Chepstow Road, which ran past the front of the house, to be diverted about 130m to the southeast, to its present course. In 1874–6, a new Gothic Revival house was built about 520m to the northwest of the original site and, in 1889, Old Park was demolished.

Aerial photographs provide evidence for several phases of Lydney Park's history. Fragmentary earthworks are visible on the site of the motte, although nothing has been recorded of the two later houses. Features recorded within the Park, including linear banks or terraces to the south of the present (1870s) house, could be associated either with the landscaping of the 1720s, or with the construction of the Victorian house. A straight linear earthwork to the east of the Old Park site, at first interpreted as a field boundary, may in fact be part of the original course of the Chepstow road, diverted away from his front door by Benjamin Bathurst.

10.10 The contribution of aerial photographic evidence

The number and extent of the Forest of Dean's estates and high status residences is known through documentary evidence and historic maps. The addition of aerial photographic evidence has assisted in the identification of physical remains of some 'lost' sites, and has suggested possible interpretations for other features in the landscape.

At Hewelsfield, aerial evidence has confirmed the existence of a possible medieval motte and has identified traces of the bailey. The earthworks lie immediately to the west of the church, and are associated with probable medieval fields and areas of ridge and furrow (see Figure 16).

About 2 km to the west, near Brockweir, an alleged motte at a site labelled 'Castle-a-buff' on OS maps (1:2500 and 1:10,560: 1881–1954 editions) was reinterpreted as a natural feature. Field survey results had already cast doubt on the earlier interpretation, and examination of the aerial photographs supported the conclusion that the location is a natural round knoll covered with trees: no convincing evidence of artificial earthworks could be identified.

Aerial photographic evidence may have helped to identify the location of a lost moated house near Sedbury. Badams Court, an ancient manor-house, disappeared in the 17th

century: it lay within the area defended by Sir John Winter during the Civil War, and was probably destroyed with White Cross in about 1644 (see above). A new house, also called Badams Court, was built on a different site by 1843, and the exact location of the original house is now unclear. In about 1860, the remains of burnt walls and traces of a moat were observed somewhere in the vicinity. The compilers of VCH assumed this sighting to have taken place in a field named 'Old Badams Court' (VCH Glos X 1972, 57, 65), but Ordnance Survey field investigation in the 1960s failed to identify any remains there. An alternative location is suggested by the NMP survey, which has recorded a low mound with ditches on three sides midway between the present Badams Court and Sedbury Park – this feature could be the remains of the missing moated site, although it could also be a landscape feature associated with Sedbury Park.

The aerial photographic survey has also recorded a small number of features which may have been associated with the development of gardens or landscaped parkland. One of these is a circular bank, possibly representing a tree enclosure ring, at Cherry Orchard Farm; this may have been part of the grounds of Highmeadow, the 17th-century mansion, which lies 500m to the east (see above). An isolated tree enclosure ring, at the north-eastern edge of Huntley Hill Wood, is probably associated with woodland management within the eastern part of the Forest.

At the Hermitage, a 17th-century (and earlier) house near Welsh Bicknor, the SMR lists a folly mound. That mound was not recorded by this survey, but another mound to the northwest, at Courtfield Farm, may have been a prospect mound or folly, and may indicate another possible landscaped site.

10.11 Aerial photographic evidence elucidated by other information

At several locations, the interpretation of features mapped from aerial photographs was assisted by research into the houses of the region.

At Awre, on the lowlands near the Severn, there was once a medieval manor house called 'the Lypiatt', built in about 1327 and demolished before 1879 (VCH Glos V 1996, 19, 25). A series of rectilinear enclosures associated with medieval settlement in the village of Awre almost certainly includes the site of that former manor house.

To the southwest of Bream are three properties – Prior's Lodge, The Warren and Willsbury House – whose grounds seem to contain traces of garden features possibly explained by information about the houses' development.

Prior's Lodge and The Warren were each part of a large estate assarted to Llanthony Priory in 1306. After the Dissolution, a house called Prior's Mesne was built on the estate in 1581, but destroyed in 1584 due to a dispute over ownership of the manor. Another house, Prior's Mesne Lodge, was built on the property in 1656 and remodelled in the late 18th and early 19th centuries. A lake in its grounds, known as Prior's Pool, existed in 1608 and may have originated as a priory fishpond. The lake was enlarged in the early 19th century. Map evidence indicates that the present house, called Prior's

Lodge, was built between 1878 and 1903. Possible garden terraces have been recorded adjacent to the house, and its grounds also contain an embanked pond or lake which is probably post medieval, but may have monastic origins.

A large rabbit warren in the southern part of the Prior's Mesne property, sold off in the late 17th century, became the pleasure grounds for several houses in the mid-19th century. Within the Warren there is said to be a possible moat, or perhaps a prospect mound, but the site is now wooded, and nothing was recorded from aerial photographs. However, linear earthworks to the north and south of the supposed moat site may represent landscape features within the wooded area.

About 1km to the west of Prior's Lodge was Willsbury, a small manor which became part of the Clanna estate in the 1860s. A house was built there just before 1270, possibly on illegally assarted land, and was rebuilt in the late 18th and early 19th century. According to the entry in VCH, 'at the south end of the farm, near Rodmore Grove, the owners had a large fishpond in 1689. By the mid-19th century it had been filled in' (Glos V 1996, 262). Aerial photographic evidence showed a square pond in about the right location, which could be the feature noted by VCH. A series of paths or terraces on the slopes below the house may also be the remnants of garden landscaping.

10.12 Future work

Many features associated with Dean's wealthy estates and residences have been recorded by aerial photography during the course of this NMP survey. Whilst none of these high status sites has been 'discovered' from photographic evidence alone, one or two could be said to have been 're-located' (eg Badam's Court) or confirmed (eg Hewelsfield motte). The limited documentary and historical research undertaken for this report has identified the location of many of the region's wealthy properties, and has helped to suggest interpretations for a number of fragmentary or enigmatic features in their vicinity. The linear earthworks of the original Chepstow road at Lydney Old Park and the rectilinear enclosures possibly associated with the Lypiatt, the 14th-century house at Awre, exemplify sites whose interpretation has been enhanced by the historical evidence. This extra layer of information has also allowed disparate features such as the ponds, house and gardens at Clanna to be seen in context, as elements of a larger designed landscape. A more detailed comparative study of documentary and aerial photographic evidence, supported by field survey, would almost certainly lead to the identification of additional features belonging to Dean's high status residences.

11 EXTRACTIVE INDUSTRIES OF THE FOREST OF DEAN

Fiona Small

The complex geological make-up of the Forest of Dean has resulted in a concentration of mineral rich strata confined to a relatively small area centred on the Statutory Forest. The mineral reserves have been heavily exploited throughout history with evidence of extraction from the Iron Age and Roman period onwards (Hart 1971). Today it is hard to imagine the sheer scale of the industrial activities and quantities of the mineral resources which have been extracted from the region over time. It has been suggested by Cyril Hart that '...some 200 million tons of coal, 10 million tons of iron ore, several million of stone, clay and sand, and half a billion tons of waste soil and rock...' had been mined and quarried from the Forest (Hart 1971).

The centre of the Forest is dominated by Carboniferous coal-bearing shales which outcrop at the surface. These easily accessible coal measures have been exploited for the best part of two millennia (Hart 1971). The NMP survey has recorded traces of surface extraction in the form of numerous bell pits and the workings of the Free Mines concentrated where the coal seams outcrop. In contrast to these small-scale extraction sites are the extensive spoil tips and associated tramways, railways and buildings of the larger post medieval commercial mines which could mine the deeper seams of coal. Many of the post medieval (mostly 18th-20th century) spoil tips have now been levelled or landscaped. For many of these sites the historic photographs are the only surviving record of their extent and location, highlighting the importance of aerial survey to the history of the region.

The Forest rocks are also rich in iron deposits which are a result of secondary deposition from iron rich surface run-off from iron bearing rocks. This has created pockets of iron ore within the more permeable rocks of the region. These deposits are known to have been exploited heavily in the Roman period. For much of Dean's early history, the iron workings were generally shallow operations. Later, as techniques and technology advanced in the post medieval period, deeper mining became possible.

Despite the Forest of Dean being a Royal Hunting forest, and subject to the strict regulations of Forest Law, mineral extraction within the Forest appears to have continued unhindered throughout the history of the region (Hart 1966).

11.1 Scowles

One of the primary goals of this survey was to locate, and map the extent of, a particular form of mining, known locally as 'Scowles'. The maps and data from the aerial survey were supplied to Gloucestershire County Council Archaeology Service to enable previously unrecorded scowles to be located and surveyed on the ground for their 'Scowles and Associated Iron Industry' survey. Many scowles sites are currently under forestry or scrub (difficult terrain for ground survey), or have been filled and ploughed

making them hard to locate without the use of aerial photography and mapping (Hoyle et al 2004).

Scowles are the remains of surface extraction of iron ore deposits within the Carboniferous Limestone, particularly the Crease Limestone. The name is believed to have been derived from the old British word 'crowll' meaning caves (Nichols 1966). They are thought to be natural fissures within which secondary deposits of iron ore were formed as a result of surface run-off from the adjacent iron-rich sandstone. These deposits of iron ore have been exploited at various times in history, resulting in a narrow 'necklace' of quarries and surface pitting encircling the forest where the limestone outcrops at the surface. By their very nature these sites are hard to date. Surface iron mining is believed to have been practised in some of the quarries from the Roman period or earlier. An Iron Age coin of Coriosolites c 50 B.C, was recovered from Bream Scowles in 1946 (Hart 1967), and numerous references to Roman finds amongst cinder deposits within old scowles indicate Roman mining or perhaps Roman re-working of older deposits. The presence of an iron smelting centre at the Roman town of Ariconium to the north of the Forest suggests a high level of extraction and processing of local iron ore in the Roman period, much of which must have come from the Forest of Dean.

Figure 40. Scowles being surveyed by Gloucestershire County Council Archaeology Service for the Scowles and Associated Iron Industry Survey.

Others scowles were worked through the medieval period with some being exploited into the post medieval period. A number of the large post medieval and modern stone quarries are also believed to have originated as scowles.

Some scowles have become part of the region's folklore and superstition, bearing names such as Devil's Chapel and Hobbs Quarry, and the village of Scowles was named after the numerous workings which riddle the local limestone outcrops.

Scowles commonly occur either as linear quarries (believed to be enlarged natural cavities in the limestone) or as areas of small-scale surface extractive pits following the surface outcrops of the narrow bands of limestone which encircle the forest. These quarries are important not only in themselves, but because they may signal the presence of potential, as yet unidentified, iron ore smelting and processing sites nearby.

Figure 41. Extract from an NMR OS vertical photograph and the NMP transcription showing an example of a linear series of Scowles at Hobbs Quarry.

NMR OS/70123 218 24-MAY-1970 © Crown copyright. Ordnance Survey

The survey recorded 86 scowles sites, some known and included on the current OS map base, but many others not previously recorded. Of these 86 sites, five were already known to the NMR. The remaining 81 sites were new records to the NMR, 51 of these also having no previous SMR records.

The geology maps for the region were an essential tool in locating the narrow band of Crease Limestone where these quarries were likely to occur. However, it became

apparent during the survey that these quarries were not only confined to the Crease limestone, but occurred in the adjacent Whitehead Limestone. The quarries could appear either as lines of small quarries and continuous linear cuts following the outcrop of the limestone, or as areas of smaller surface pits known as 'pit scowles'. As a result of the aerial survey, similar areas of extraction in the form of both pit and linear scowles were also located on the adjacent sandstone which would have iron-rich deposits worth extracting, and could technically be called scowles.

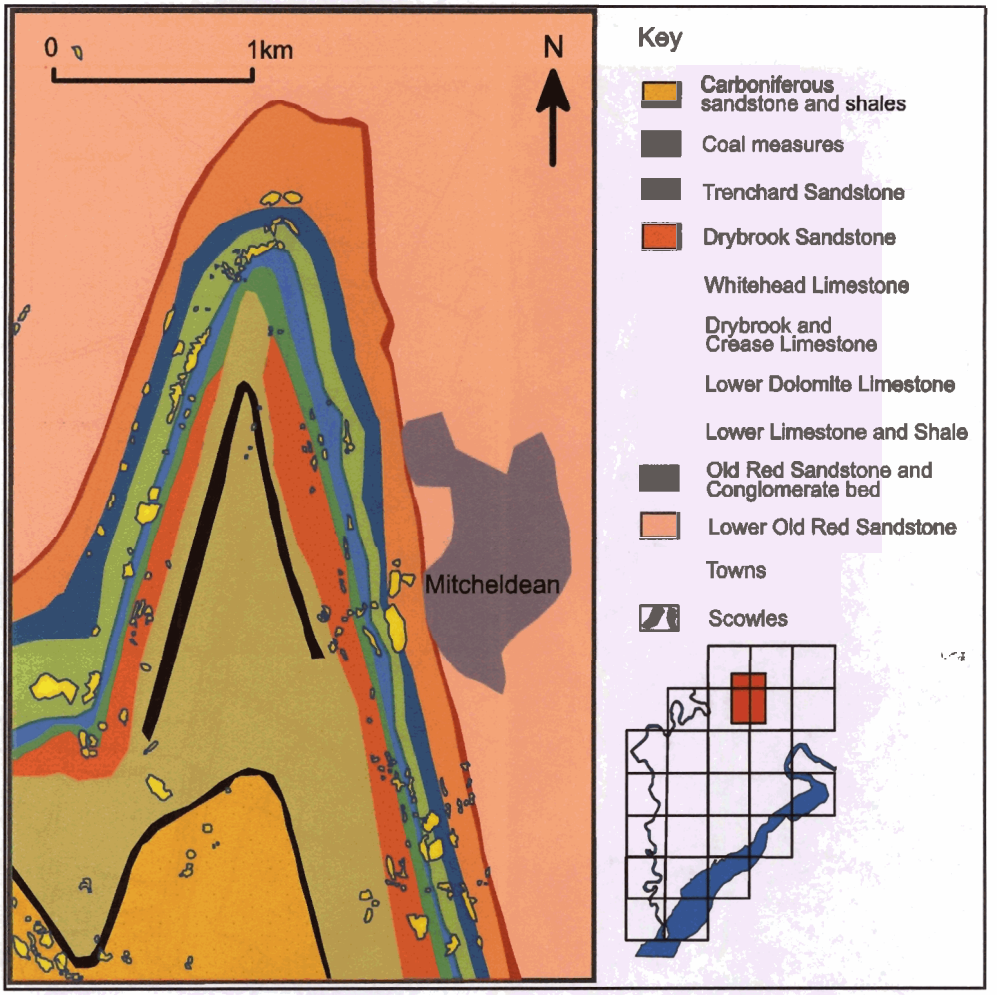

Figure 42. The distribution of Scowles and other quarries in relation to the underlying geology to the west and south of Mitcheldean.

Within the Forest many areas where scowles might be expected were almost always concealed by tree cover. However, the aerial survey benefited from two sets of vertical photographs which recorded the forest during cycles of forest clearance – one RAF survey flown in 1948 and an OS survey flown in 1970. These photographs enabled the mapping of formerly concealed features during periods between felling and replanting. Some areas which were open ground in the 1940s have since been planted by the Forestry Commission thus concealing numerous sites. In certain areas of the forest the limestone outcrops give rise to difficult terrain which has remained wooded. The result of this is a continuous narrow band of trees mirroring the surface geology. Other linear

quarries within the sandstone, in areas some distance from the limestone outcrops, have also been recorded. However, these are believed to be quarries for the extraction of stone from a harder band of sandstone, rather than the semi-natural scowles occurring in the limestone. It was clear from the aerial photographs that these quarries followed raised ridges: an example of this can be seen in Figure 44 (below) which illustrates linear quarries within the Old Red Sandstone outcrops to the north of Welshbury Hillfort.

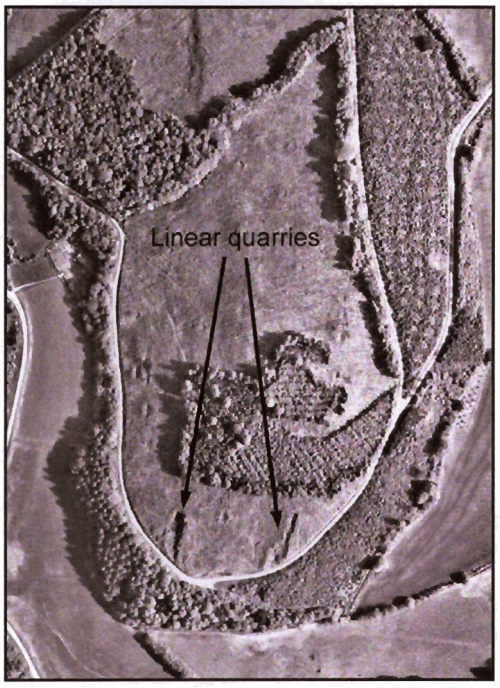

Figure 43. Linear quarrying of sandstone to the north of Welshbury Hillfort.

Extract from NMR OS/70123 204 24-MAY-1970

The use of aerial photographs to identify scowles and other forms of extraction within and around the Forest of Dean has proved very effective in an otherwise difficult area to survey. The NMP survey has enabled more focused ground survey to be undertaken in areas of dense undergrowth and difficult terrain. It has also illustrated that scowles occur not only in the Crease Limestone, but within the adjacent Whitehead, and Lower Dolerite Limestones as well.

11.2 Small-scale Extractive Industries — Sharon Bishop

11.2.1 Introduction

The aerial survey recorded hundreds of sites associated with the small-scale surface extraction of iron-ore (see Scowles, Section 11.1), coal, stone, lime, sand, clay and gravel and also, to a lesser extent, the mining of deeper deposits of coal, iron ore and ochre. The sites range from small pits or linear excavations following geological bands to larger opencast workings. Their remains are visible as earthworks on aerial photographs from the few sorties which coincided with cycles of tree-felling. Filled-in extraction sites are sometimes indicated by dark amorphous cropmarks. In many cases, associated spoil heaps and infrastructure elements, such as trackways and embanked tramways, could also be identified.

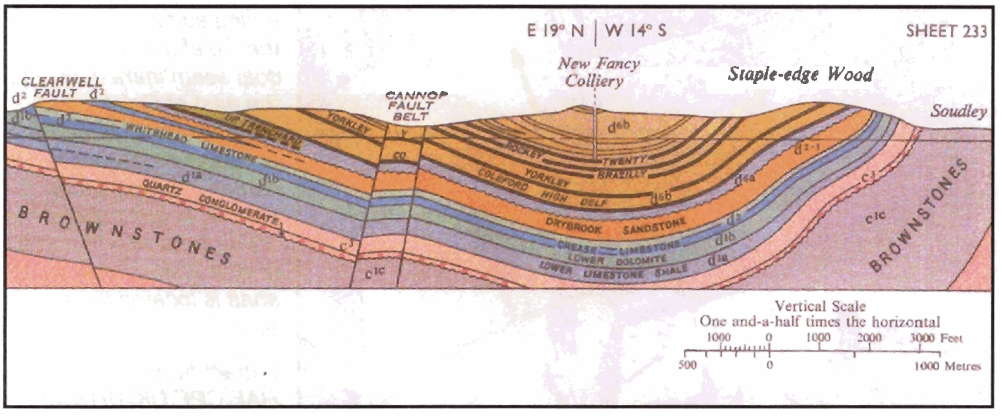

Figure 44. A geological cross section of the Forest, showing the coal measures (thick black lines) and the bands of limestone and sandstone.

The patterns of mineral extraction were dictated by the geological bedding of the Carboniferous rock which forms a basin beneath the Forest. By studying the aerial photographic evidence in conjunction with the geology map, it was possible to tell, with a fair degree of confidence, which minerals were being sought at a given location. Bands of exploitation following the surface outcrops of coal and iron-ore were particularly apparent.

Small-scale extraction sites are not normally recorded by NMP, but an exception was made for this project because these sites, especially the 'Scowles', are such an important part of to the region's landscape history. The earliest exploitation of surface mineral outcrops, especially of iron, dates from at least the Iron Age and it is probable that similar outcrops of coal were mined for domestic purposes from the Roman period onwards (Hart 1966).

11.2.2 Coal extraction

The many seams and strata of the coalfield rise to the surface in several places (Figure 44). This is especially clear near Coleford, where weathered outcrops of the Coleford

High Delf seam are marked by dense concentrations of small pits and spoil heaps (Figure 45), or by areas of disturbed ground which extend along the exposed strata.

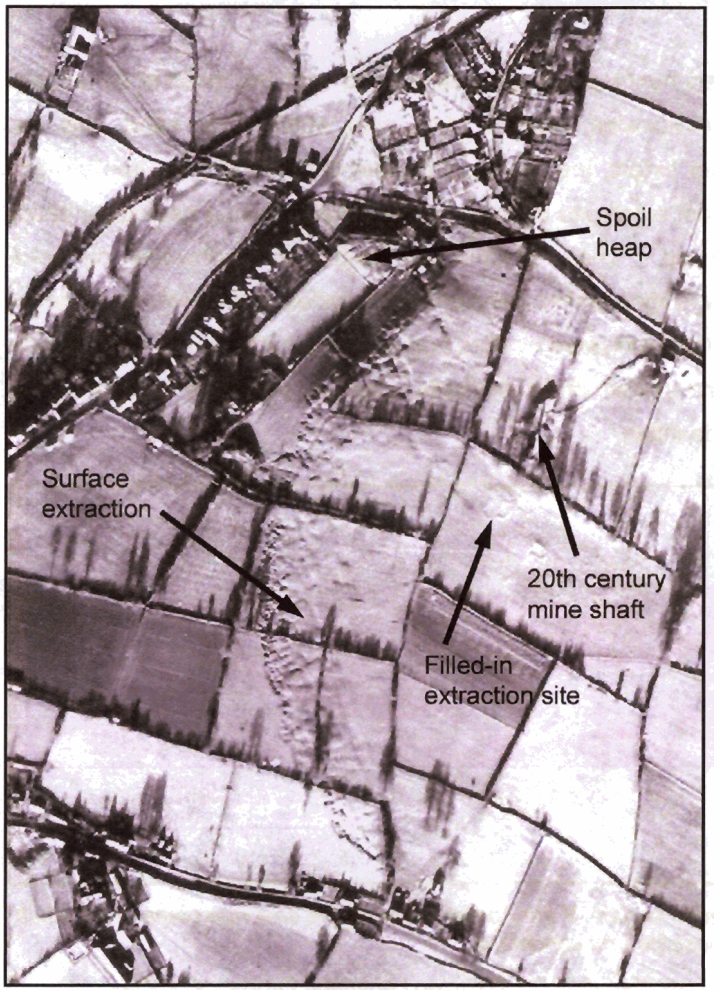

Figure 45. Surface extraction follows the arcing surface outcrop of the Coleford High Delf coal seam immediately to the east of Coleford. A triangular spoil heap from subsequent deeper mining is visible as an earthwork just beyond the arc's northern end and a further 20th-century mine shaft is located to the east.

Extract from RAF CPE/UK/1913 4013 30-DEC-1946

Former surface coal-workings which have been filled in are recognisable as amorphous black soil- or cropmarks, which can be up to 50m across. Like the earthwork remains described above, many are situated near Coleford, where the coal seam starts to fall away eastwards beneath the Forest core. The site of Arles Colliery is also indicated by darker areas, probably caused by coal-stained soil, in an arable field at Shortstanding.

It would not have been possible to identify these amorphous marks as coal workings without the use of documentary evidence: the early edition Ordnance Survey maps, which depict and name many of the small-scale colliery sites, have been particularly important in this regard.

Place names that include elements such as 'cole' and 'coller' are also useful in identifying mining or charcoal sites (Foard 2001). The place name Coleford Meend, for example, combines 'cole' with 'meend' – an area of waste or open ground in the Forest (Webb 2002a). At this location, the ground is covered by a number of small-scale coal extraction sites (bell-pits, shafts and spoil heaps), together with several small-scale quarries and numerous interconnecting trackways forming a complex and interwoven pattern (Figure 46). The small settlement of Ninewells, just west of the Meend, has

clearly taken its name from these wells or mine shafts. This indicates a long mining history in the area, which continued into the mid-20th century at some of the shafts.

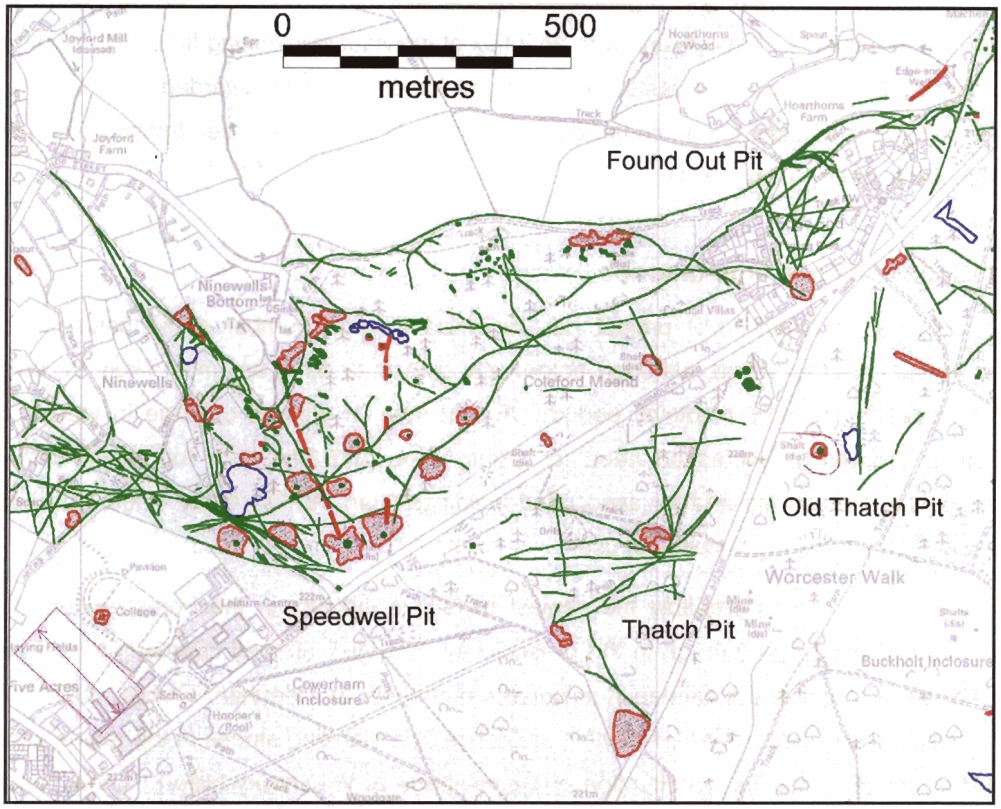

Figure 46. Speedwell, Found Out, Thatch and Old Thatch collieries at Coleford Meend. Green indicates trackways and pits. Red shows mounds of spoil, embanked tramways and the possibly 17th century bank enclosing Old Thatch Pit. Quarries are outlined in blue.

These easily accessible surface outcrops of minerals must have been highly prized in the past. Evidence of exploitation from the Roman period has been found at excavated villa sites (Hart 1971), where the presence of outcrop coal in domestic contexts suggests that it may have been used as domestic fuel.

The coal mined in the Forest was probably used domestically and for lime burning, from the Roman period until the advent of the blast furnace in the 16th century. Forest coal was not suitable for producing good coke so charcoal continued to be used for this process (Hart 1966). The medieval use of coal (rather than charcoal) was also mostly domestic, although it could have been used to roast iron ore prior to smelting.

In the 17th century surface mining of coal continued and was supplemented by shallow, increasingly dangerous, underground working. Deeper small-scale coal workings are evident as earthwork bell pits and shafts and their associated spoil heaps and trackways. These cannot always clearly be associated with individual mines, especially as the extent of the underground workings, which could interconnect, is not visible from the air.

The opening of blast furnaces, tin-plate and wire works around the beginning of the 19th century started a period of deep mining aided by steam engines to lift the coal. Drift

mine adits were driven into hillsides for easier access to the coal (eg at West Dean), although surface mining continued to accompany the deeper mines into the 19th century. A change in the scale and organisation of the extractive industries in the Forest is evident in the early 19th century, with an influx of individuals investing financially and an integration of transport interests. Many small 'gales' – rights awarded over specific mines – were amalgamated into large colliery holdings at this time (see Intensification of industries, below) (Hart 1971).

11.2.3 Stone and lime quarries

The Forest of Dean NMP project has recorded a large number of sandstone and limestone quarries which, although notoriously difficult to date, are most likely to have originated in the post medieval period. At that time, a general upsurge in industrial activity created an increased need for stone, sand and lime both for the industrial processes themselves and for associated buildings (Hart 1971). Many of the quarries undoubtedly had long histories of use.

Stone quarrying was probably the earliest extractive industry in the Forest, extending from the Bronze Age through to the present day. Roughly shaped quarried limestones have been found in the Bronze Age burial monuments at Tidenham Chase. Old Red Sandstone was also used for Neolithic or Bronze Age standing stones in the region and, in the Iron Age, for the construction of the ramparts at Welshbury hillfort. Local stone and sand was quarried in the Roman period and used for the construction of villas and roads (Hart 1971).

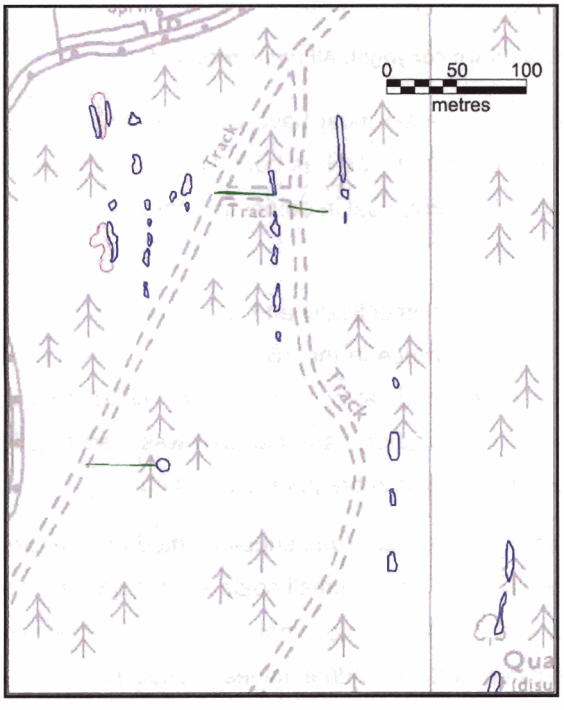

Figure 47. Linear sandstone quarries (outlined in blue) following the geological bedding in Flaxley Woods.

Background map acquired from the Ordnance Survey

Stone quarrying seems to have retained its small-scale domestic character in the medieval period. By the beginning of the 17th century the working of stone was an important livelihood to some inhabitants of the Forest: grindstone and millstone hewers

were recorded in 1608 (Hart 1971; Webb 2002b). Increased demand for building materials accompanied the growth of the iron ore and coal industries in the 18th and early 19th centuries, while in the early 20th century Dean stone had a more widespread market, meeting the demand for building stone in cities as far away as London and Belfast (Hart 1971). By this time some of the limestone quarries had become huge mechanised affairs linked by tramways (often shared with collieries) to the wider railway network (eg at Bixslade).

The quarry earthworks can appear as individual pits or groups of pits, as linear quarries following narrow bands of a particular rock type (Figure 47), or as large amorphous holes in the ground. As with the mineral deposits, the close correlation of these features with the mapped geological bands has made it possible to identify which material was quarried at each site. Limekilns are documented from the 13th century (Hart 1971) and form part of the infrastructure at many of the limestone quarry sites, indicating that some of the limestone was burnt on site. This process would also have required wood from the Forest as fuel.

11.2.4 Clay and gravel pits

Seven clay pits and four gravel pits have been recorded by the project. These sites appear as amorphous holes, many of which were identifies on the early edition Ordnance Survey maps. It has been suggested that Jugshole Pool and Kings Pool, two large ponds near Coleford, were originally dug for clay to make tiles and bricks in the medieval or post medieval period. These subsequently filled with water and were later used by travellers and Forest dwellers to water their animals (Marsden 1987). Larger 19th and 20th century brickwork sites have also been recorded as large earthwork brickearth pits and associated buildings in the Forest at Marians Inclosure near Staunton, and on the lowlands to the north-east of the Forest at Taynton.

11.2.5 Discussion

Although it is too simplistic to suggest a linear progression from the exploitation of surface outcrops at the edge of the Forest to deep mining at its core, a general pattern of small- to large-scale extraction is clearly evident (see also: Intensification of industries, below). The overall picture is one of the initial small-scale exploitation of surface outcrops followed by increasingly deeper mines and larger open quarries, although many open quarries and mines were in use simultaneously. The extractive industries also had strong associations with other activities in the Forest: quarried stone and clay bricks, for example, were used to build furnaces, limekilns and other structures.

The aerial survey has successfully identified and mapped over four hundred new extraction sites, complementing documentary sources and helping to identify the extent of small-scale extractive industries, although more of the physical evidence for mining is undoubtedly hidden underground or beneath the Forest's vegetation. A large proportion of these small-scale extraction sites were previously unrecorded. Their sheer number

highlights the importance of the mineral wealth of the Forest, which has dominated its land-use.

The NMP data should now feed into further analysis of the small-scale extractive industries in the Forest. The mapped evidence of the form and distribution of sites needs to be more closely tied to documentary research, and to surface and underground survey, in an attempt to date them more closely. Early edition Ordnance Survey maps were particularly useful in identifying and naming extractive sites, but these maps also show that other sites, also requiring investigation, were not all visible from the air.

11.3 The intensification of industries — Edward Carpenter

The Forest of Dean NMP survey has enabled accurate mapping and recording of the surface evidence of the large scale mining activities throughout the Forest. This was achieved by combining the evidence from aerial photographs with that drawn form documentary sources and historic maps. The survey has been able accurately to locate and map mines and industrial sites, many for the first time. The results of the survey have tied these sites into the industrial landscape as a whole – mines (shafts and spoil heaps), railways, tramways, engine houses etc. The documentary evidence has provided the means of identifying the individual operations and sites which were linked underground and owned by the same company. Much of the survey has been taken from RAF vertical photographs which captured many of these sites while they were still intact. Since then many of the surface remains of mining have been removed and the sites developed for light industry or landscaped for recreation purposes. Large areas of former mining have since been planted with trees, obscuring any remnants of these industries.

11.3.1 Coal mining

The varying width of layers of sandstone and coal measures and the 'dished' form of the Dean syncline (see figure 44 above) mean that although coal seams are found at a considerable depth at the centre, they outcrop at the surface towards the edge of the forest. Many of these coal seams are too thin to be worked but fourteen were thick enough to be exploited profitably (VCH Glos V 1996, 326). Unlike other areas of the country, miners in Dean benefited from the absence of firedamp (a combustible gas given off by coal) and thus were able to use naked flames while working. However, problems were caused by the ring of permeable rocks and the basin-like formation of the strata which meant that the area was continually inundated with water below ground: deep mining was impossible here without the use of powerful water pumps.

The mineral outcrops have long been exploited in the Forest of Dean. Originally the rights to mine in the Forest were reserved to those born within the hundred of St Briavels and those exercising their rights became known as Free Miners. It is thought that their rights had been obtained by the reign of Edward III (VCH Glos V 1996, 327). Free Miners could operate anywhere within the Forest; they paid a duty on all minerals that they won from their 'gales' (the area a miner worked), and any disputes were dealt with by the mine law court. The rules determining exactly who could or could not become a Free Miner have changed over the years but the distinction has always remained between Free Miners and 'foreigners', as those not born in the hundred of St Briavels are known.

The industrial revolution saw an intensification in this exploitation which can be illustrated by the large quantities of coal won from the Forest of Dean shown in the table below.

Year	Tons of coal raised	Year	Tons of coal raised
1841	145,136	1894	860,312
1850	337,948	1900	1,050,000
1860	590,470	1920	1,206,000
1862	474,168	1930	1,303,000
1871	837,893	1940	1,204,200
1877	638,319	1950	723,000
1885	826,167	1965	46,000

The last of the deep mines closed in 1965 but some small scale mining continued with most of the coal going to power stations; in 1992 there were seven mines employing 20 men, nine of whom were part-time (VCH Glos V 1996, 337).

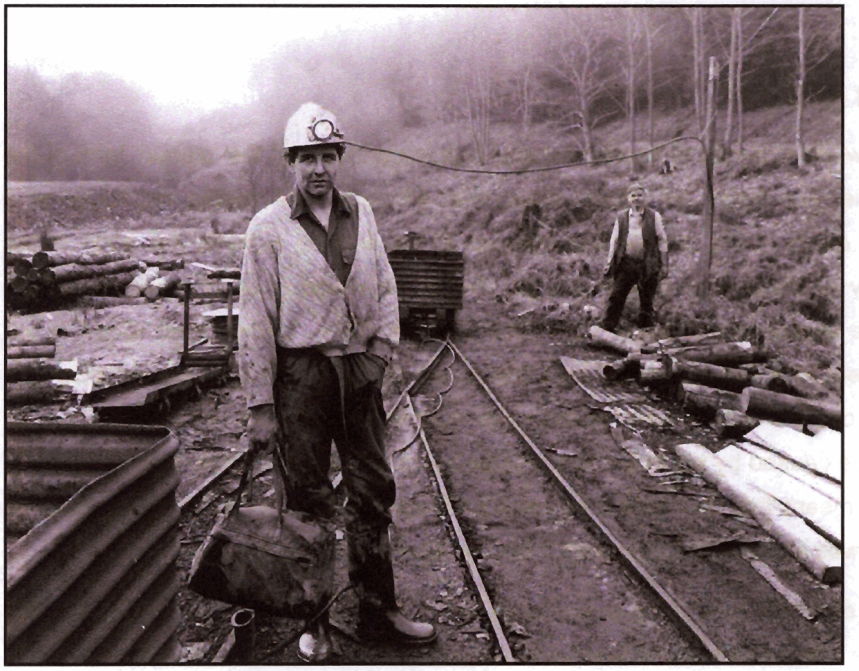

Figure 48. Modern-day Free Miners working in the Forest of Dean, 1993.
NMR photograph BB93/08474 © Crown copyright. NMR

Most Free Miners in the late 18th century lacked the finances to purchase pumping and winding machines (VCH Glos V 1996, 331). As a result their workings were small and when they became flooded they were abandoned in favour of a new mine. As mines became deeper with the greater industrialisation of the mining process, the spoil heaps became larger.

Considerable investment in machinery was required to prevent deeper working flooding and to raise the coal. The investment that made deeper mining possible generally came from 'foreigners' who saw potential profits from Dean's mineral resources. They sometimes formed partnerships with free miners but, after the lapse of the mine law

court in 1775, many were able to buy or lease their own gales. By the 1820s 'foreigners' operated nearly all the large mines in the Forest. Their considerable financial investment meant that they were producing coal competitively with other regions (VCH Glos V 1996, 331).

11.3.2 Spoil Heaps

Although the majority of colliery buildings were demolished when the mines closed, the location of coal mines in Dean can generally be identified by the presence of spoil heaps. These heaps are the most obvious and long lasting remains of the coal mining industry in the Forest of Dean visible on aerial photographs although some have been levelled (VCH Glos V 1996, 337). Many of those that have survived have been planted with trees or landscaped; the spoil heap belonging to New Fancy Colliery, for example, is now used as a viewpoint for tourists.

The NMP survey has shown both the varying sizes of spoil heaps and their distribution throughout the Forest. Two questions can be asked: why are the collieries located where they are and what is the relationship between the size of the spoil heap and the amount of coal won? Despite the fairly even distribution of coal throughout Dean the spoil heaps are not evenly spaced and some distinct grouping of mines is evident. The sizes of the spoil heaps recorded vary considerably; a typical example of a smaller heap might measure approximately 50m by 40m, while the larger heaps could be up to 440m by 360m.

The distribution of workings can be partly explained by the underground expansion of pits. As the mines expanded there was a growing distance between coal face and pithead: for example, the gales belonging to Speech House and Lightmoor Colliery met underground, and yet their surface works were over 2.5km apart. Further expansion of the industry involved the amalgamation of gales and even deeper mining, neither of which necessitated new surface workings and so were not visible from aerial photography.

Colliery spoil heaps comprise the by-products of the mining and processing of coal. The amount of waste can vary depending on whether the workings followed the seam of coal closely or whether they were driven through the surrounding rock as well. Not all waste was necessarily brought to the surface. Midland collieries in the 19th century did much of the screening below ground and it was expected that spoil would be dumped in areas of the mine that had been worked out (Griffin 1971, 105). Conversely the increased mechanisation of coal mining through the 19th and 20th centuries resulted in a greater quantity of waste being produced and brought to the surface.

The various factors affecting the final size of a spoil heap suggests that there cannot be an accurate estimation of how much coal was won based on a spoil heap's size. However, there is a connection between spoil heap size and output, with the largest spoil heaps belonging to collieries that produced the greatest quantities of coal. Some of the largest spoil heaps identified from aerial photographs belonged to Lightmoor,

Crumpmeadow, Foxes Bridge and Trafalgar all of which are to the west of Cinderford. These four collieries were responsible for 500,000 tons of the 720,123 tons of coal won in Dean in 1880.

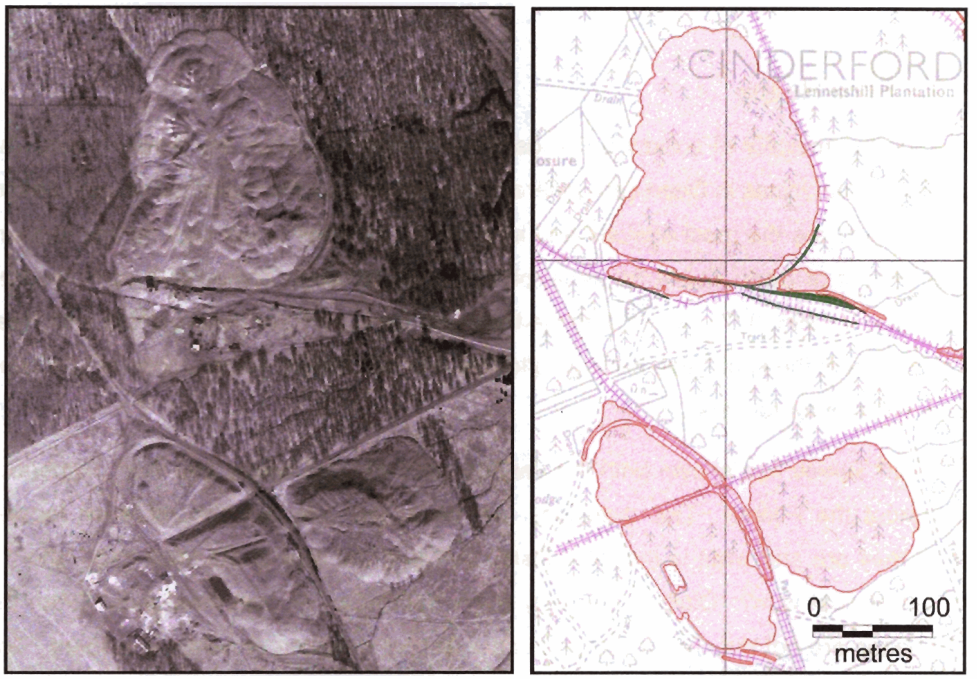

Figure 49. The spoil heaps of Foxes Bridge and Crumpmeadow collieries, near Cinderford, seen on an RAF vertical photograph taken in 1946 and on the NMP transcription. Foxes Bridge spoil heap (top of frame) measures over 430m by 350m.

Extract from RAF CPE/UK/1355 7145 02-APR-1946 © English Heritage (NMR) RAF Photography

The date of a colliery's closure cannot be determined from aerial photographs, but abandonment is indicated by the absence of buildings and equipment on the surface. Photographs taken in the 1960s and 1970s show spoil heaps partially levelled or covered in trees or scrub. The closure of some of the collieries at Moseley Green in the early 1870s is inferred by the visible reuse of some of the spoil heaps as embankments for the Severn and Wye Mineral Loop Railway which was constructed between 1870 and 1874. Many of the larger collieries closed in the early 20th century as reserves ran out or when flooding became too great a problem making the operations uneconomical. Foxes Bridge colliery, for example, was forced to close in 1930 due to flooding from neighbouring disused workings, leaving behind estimated coal reserves of well over a million tons.

11.3.3 Rail Transport

The intensification of the coal and iron industries in Dean led to the development of a network of tramways and then railways forming a large network of lines connecting various concerns with each other, the rivers and the wider railway network of Britain. Much of this network of cuttings and embankments is visible on aerial photographs and

many elements were still in use when the 1940s photographs were taken although, in places, tree cover has obscured the detail if not the actual route. Since the dismantling of most of these lines during the mid 20th century some of the cuttings and embankments have been filled in but considerable lengths survive and some of these have been designated as cycle paths.

The lack of good roads in Dean meant that until the 19th century coal and ore could only be transported through the Forest by packhorse. More distant markets were supplied via the docks on the rivers Severn and Wye to a large part of Gloucestershire as well as Hereford, Monmouth, Chepstow and Bristol (VCH Glos V 1996, 331). However, because of these poor transport arrangements, by the 1790s Dean coal became prohibitively expensive to outside markets and sales were lost to mines in Monmouthshire, Staffordshire and Shropshire (VCH Glos V 1996, 331).

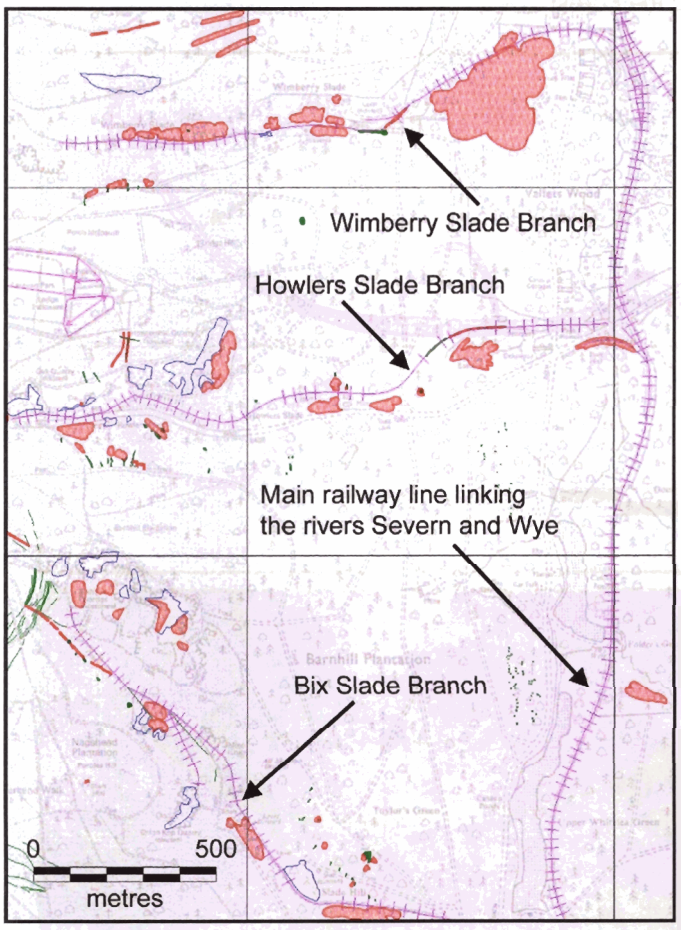

Figure 50. Part of the main line originally built by the Severn and Wye Railway and Canal Company, showing three of the branches which served numerous coal mines and quarries within the Forest of Dean.

Background map acquired from the Ordnance Survey

Poor communications elsewhere in England had led to the creation of tramways linking mines to waterways such as those built in Nottinghamshire and Staffordshire in 1603–04 and 1605. The number of these 'railways' in England grew during the 18th century when a number of improvements relating to the quality of engineering were made (Morriss 1999, 21). Traces of the one of the oldest tramways in Dean have been identified on aerial photographs. In 1795 by James Teague built two horse drawn tramways to serve his coal pits High Beeches and Engine Pit. The southernmost of two embankments seen

at Engine Pit is likely to have been built for this tramway as were further earthworks near Probersbarn Lane west of Lydbrook.

In 1801 the engineer and advocate of rail transport, Benjamin Outram recommended the construction of tramroads throughout Dean to the Severn and Wye rivers. His aim was primarily to serve the coal industry, but he highlighted their potential advantage to Dean's ironworks as well. The rivers were eventually linked in 1809 by a tramway built by the Severn and Wye Railway and Canal Company. The line ran from Lydney dock in the south on the River Severn north through the Forest of Dean's western valley to Lower Lydbrook on the Wye; twelve branches ran off this line to serve various mining concerns (see Figure 50 above). The Forest of Dean Tramroad, also built in 1809, linked the valley of the Cinderford–Soudley Brook in the east of the forest to the Severn at Bullo Pill and required the construction of Haie Hill tunnel. The Monmouth Tramway was built in 1812 and linked Coleford and the Forest to Monmouth.

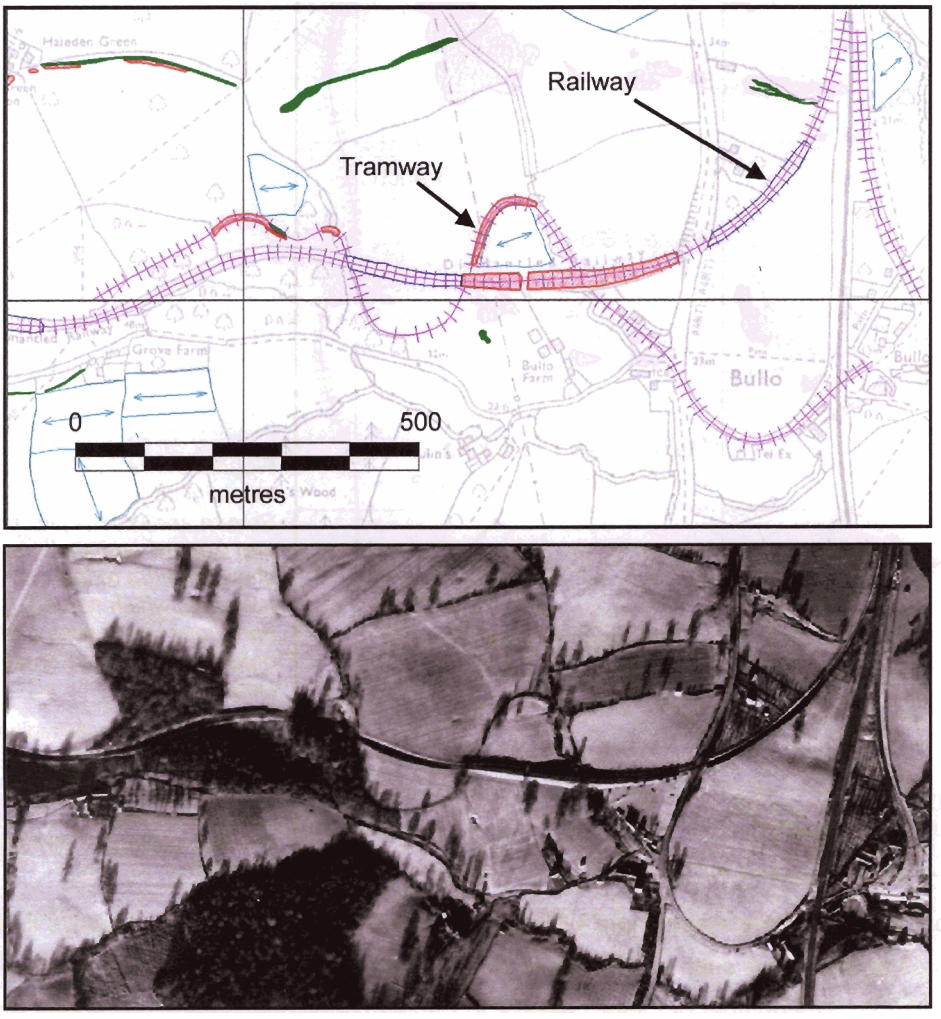

Figure 51. The railway and tramway between Bullo Pill and Haie Tunnel, on the NMP transcription and on an RAF vertical photograph taken in 1946.

Extract from RAF CPE/UK/1913 4031 30-DEC-1946 © English Heritage (NMR) RAF Photography

Background map acquired from the Ordnance Survey

Some remains of these tramways, in the form of cuttings and embankments, have been mapped but generally little survives; the railway lines that succeeded them tended to be laid directly over the old routes utilising existing cuttings, embankments and tunnels. The area between Bullo Pill and Haie Hill tunnel (Figure 51 above) is one where tramway remains can be seen. Here the Forest of Dean Railway took a more direct route cutting across, rather than following, the more sinuous curves of the earlier tramway.

Not all tramways in Dean were replaced by railways and lines of different gauges continued in operation throughout the 19th century. These different lines met at Interchange sidings where the coal could be transferred from one set of wagons to another. Aerial photographs clearly show one such set of sidings at Bilson Green, to the west of Cinderford. Here coal from Cornelius Brain's Strip-and-at-it and Trafalgar collieries was transferred from his tramway to the Forest of Dean Railway (Figure 52 below).

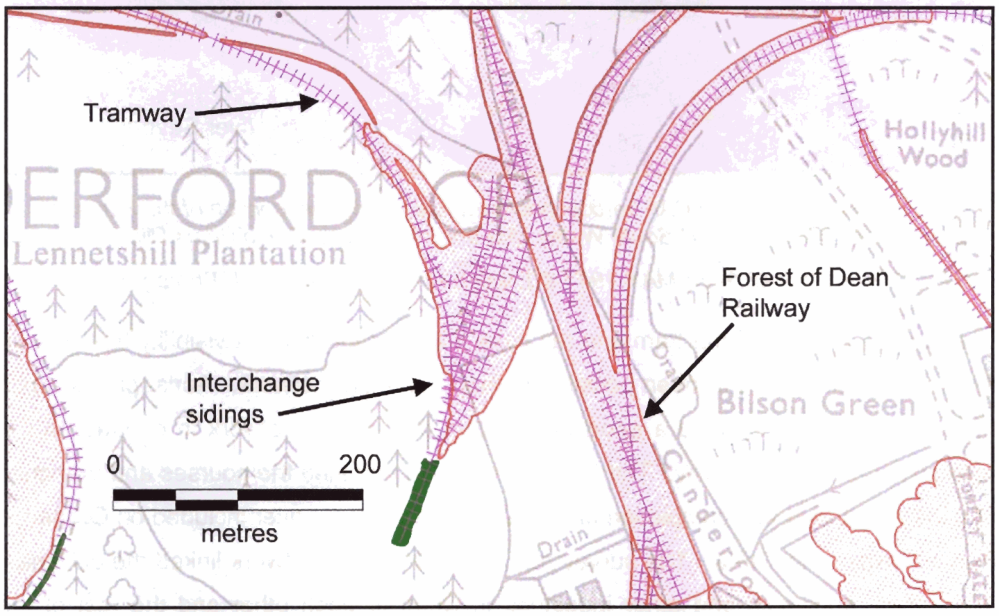

Figure 52. Interchange sidings at Bilson Green, west of Cinderford.

Background map acquired from the Ordnance Survey

Other earthwork traces of cuttings and embankments seen on aerial photographs are the remains of unfinished railway lines. Cuttings and embankments to the south of Blakeney, north-west of Purton, are the remains of the uncompleted 1830 Purton Steam Carriage Road. This line was intended to link with Purton Pill, but was stopped because of opposition from the Severn and Wye Railway and the Forest of Dean Railway. Some of the 1830 route as far south as Blakeney was eventually used in 1856 for the Forest of Dean Central Railway. As with the Purton Steam Carriage Road, the intention was to link with the Severn, this time at Brims Pill. Instead it formed a junction with the GWR South Wales line at Awre. The unused earthworks of the final embankment can be seen in Figure 53 below.

The expansion of the railways was at the expense of the waterways. Bullo Pill lost trade to the railways after the construction of the GWR South Wales line (Parr 1965, 38). The River Severn was eventually crossed by the Severn Railway Bridge in 1879 (Parr 1963, 106), to the further detriment of the Severn ports.

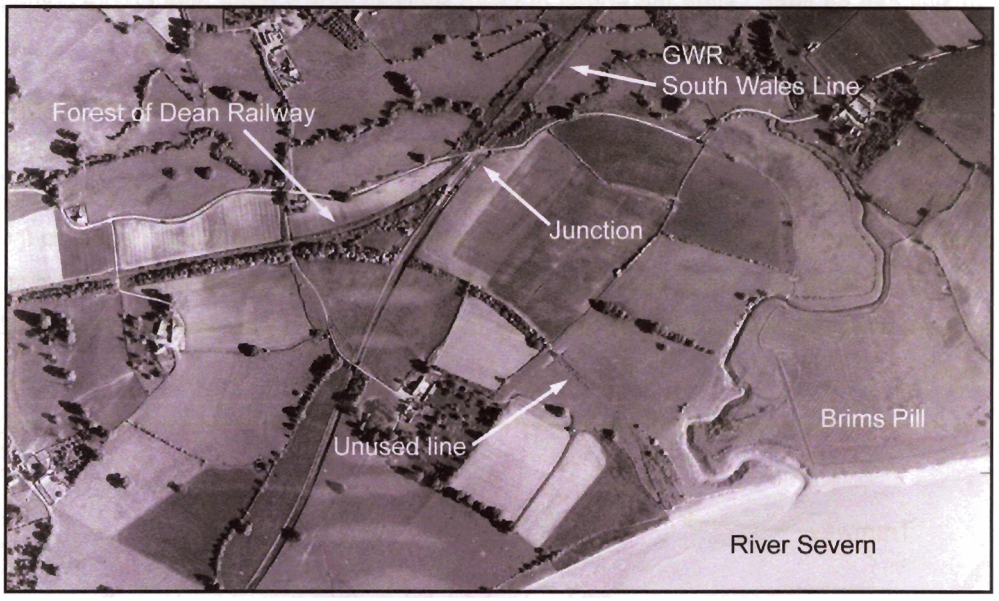

Figure 53. Extract from an RAF vertical photograph showing the junction of the Forest of Dean Railway with the GWR South Wales Line and the unused line to Brims Pill.

RAF CPE/UK/2098 4276 28-MAY-1947 © English Heritage (NMR) RAF Photography

The varying survival of the tram and rail lines and their intermittent visibility from the air has meant that it has not been possible to map the entire network. Aerial photographs have nevertheless provided a good overview of the railway network in contrast to the restrictions of ground survey. The NMP survey also revealed the courses and branches of lines which, due to incompletion and abandonment, were never included on Ordnance Survey maps of the area. The survey has shown how this network linked the collieries, iron mines, ironworks and other industries in Dean to each other and the rest of the country. It was this integrated transport system that enable the Forest of Dean to compete and prosper, but because the railways in the region were primarily built to serve these industries, they rapidly went into decline as the mines and ironworks closed.

11.3.4 Later Iron Working

Blast furnaces were introduced to Britain from the continent – the first blast furnaces near Dean were in operation during the late 16th century. In 1612 the Crown allowed the operation of these furnaces within the Forest with a lease allowing the building of ironworks, the felling of timber and the mining of ore and cinders. The lease also included water courses and permission to build ponds and channels (Hart 1971, 11). The four furnaces and three forges built as a result became known as the King's Ironworks (VCH Glos V 1996, 340). They were situated on the best streams in Dean (Hart 1971, 11) because the blast furnaces were reliant on a constant supply of fast flowing water to operate the bellows which enabled high temperatures to be achieved;

once lit, they were kept in operation for six to nine months at a time (Hart 1971, 8). The high temperature allowed these furnaces to utilise cinders from earlier iron workings mixed with ore to produce cast and pig iron.

The early ironworks continued in use throughout the 17th century, although they were sometimes shut down due to concerns about illegal felling for charcoal (VCH Glos V 1996, 340). Little survives of these early works: the remains of part of the King's Ironworks at Soudley, in the form of cinders and stonework shown in Hart (1971, 40), were not identifiable from aerial photographs.

In 1709 Abraham Darby working at Coalbrookdale (Shropshire), successfully smelted iron in a furnace fired by coke instead of charcoal. Attempts to use coke in Dean had been tried in 1716–17, 1773 and in 1795 and 1799 with the construction of ironworks at Cinderford and Parkend (Hart 1971, 119). Both of these works fell idle about 1806–7 (VCH Glos V 1996, 342) partly due to the poor coking qualities of the local coal but also because of the inefficient transport arrangements between ore mine and iron works (Nicholls 1996, 225). Experimentation by Moses Teague in the early 1820s led to the successful manufacture of iron with coke made from Dean coal (VCH Glos V 1996, 342). As a result Teague and others formed the Forest of Dean Iron Company and reopened both Parkend and Cinderford. Parkend, Cinderford and Lydbrook became the main centres of ironworking in Dean (VCH Glos V 1996, 342).

Figure 54. The preserved ruins of Darkhill Ironworks.
NMR SO 5808/4 (15614/10) 28-MAY-1997 © English Heritage. NMR

When an ironworks closed, its buildings were usually quickly demolished; very few remains survive to be seen on aerial photographs. Cinderford Ironworks, for example, were closed in 1894 and the buildings demolished soon after (Hart 1971, 129). One notable exception is at the Darkhill Ironworks (see Figure 54 above). Closed by1874, and partly destroyed by the building of an embankment of the Severn and Wye Railway,

the remainder of the site fell into disrepair. Aerial photographs taken in 1945–6 show substantial masonry remains of the iron works, blast furnace and brick works.

Little of the waste created by the ironworking process has survived to be identified on aerial photographs either. This is due to the further uses to which slag could be put. Machines known as stampers, such as those erected at Parkend in 1810, were set up to crush the slag. The resulting product was then transported to Bristol's glassmakers to be used as an ingredient in the manufacture of glass. Crushed slag could also be used in the production of concrete or as ballast. The Lower Soudley Ironworks were idle by 1877 and in 1895 the Cinderford Crushing Company bought the slag heap and set up crushers on the site.

With the relatively swift demolition of buildings and the removal of slag the best evidence of ironworking seen on aerial photographs relates to water management. Many of the ponds created for the industry survive to this day, such as Lower Cannop Pond (1825) and Upper Cannop Pond (1829) made for the ironworks in Parkend (Figure 55). Some ponds have not survived: aerial photographs show the earthwork remains of a dam at the southern edge of Cinderford built to form a pond for the Soudley Valley Ironworks. Pond remains are also evident at the western edge of Cinderford at the site of the Forest Vale Ironworks.

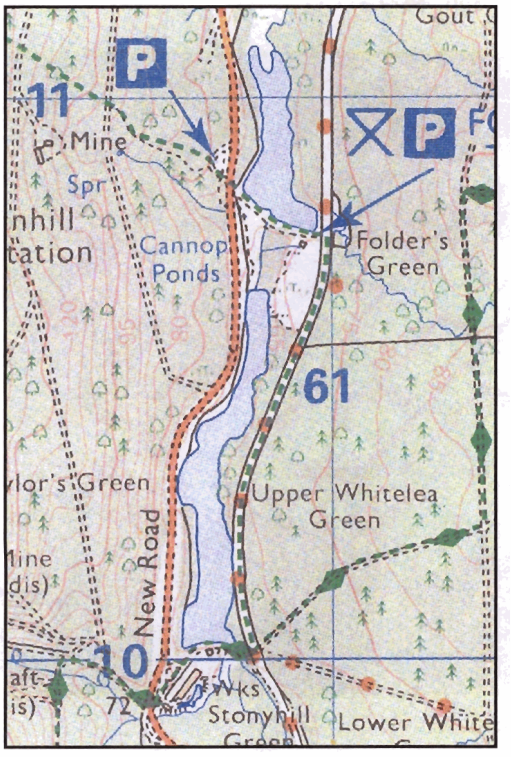

Figure 55. Cannop Ponds – surviving earthwork remnants of the Parkend Ironworks complex as depicted on an extract of OS map OL14, 1997, 1:25,000.

The location of these ponds does not always coincide with the site of the ironworks. The Cannop Ponds were over 1.5km away from the Parkend Ironworks they were created to serve. Water from these ponds was taken south by a leat, to be collected in a small pool. From here it was taken via a pipe to the waterwheel. Part of the leat and the now waterless pool survive as earthworks (Figure 56 below).

Relatively little of the ironworks of Dean remains to be seen on the aerial photographs. This is due to the fact that the furnaces, engine houses and other buildings that make up the ironworks were demolished soon after closure. The value of the waste products of iron working, particularly for glass making, meant that slag was either not allowed to accumulate or was removed after the closure of a works. The absence of iron working evidence is compounded by the fact that most of these works were closed during the late 19th century and all trace was removed before the first aerial photographs were taken.

Figure 56. The earthwork remains of the leat and pool that fed Parkend Ironworks. NMR SO 6108/7 (23323/12) 07-NOV-2003 © English Heritage. NMR

11.3.5 Conclusion

Industrial activities have shaped the landscape of the Forest of Dean throughout its history; by far the greatest impact on the area has taken place in the last 300 years, with the onset of the industrial revolution. However, the remnants of the large scale extraction and processing of the mineral resources which litter the region are rapidly disappearing as the towns expand and the area is redeveloped for light industry and recreation.

There exists a large amount of documentary evidence relating to the mining and industrial activities of the area, and many individuals and local interest groups have carried out studies of various aspects of the region's industrial history.

The NMP survey has provided a detailed overview of the industrial landscape of the Forest of Dean to a consistent standard and scale. It has enabled the identification and accurate location of sites referred to in documents, and illustrated the relationship of

these sites to one another and to the network of tramways and railways which grew up to serve the region. Through the use of historical aerial photographs taken in the late 1940s, NMP has captured many of the regions industrial sites immediately prior to their destruction.

12.1 Post medieval military features

A small number of military features pre-dating the two world wars have been found. These include two early rifle ranges and butts. One is located to the south-east of Ross-on-Wye and may date from the Civil War or later. A rifle range is marked on the current OS map, but the earthwork remains of spaced firing points belonging to three other ranges lie on a slightly different alignment, indicating an earlier date than the existing range.

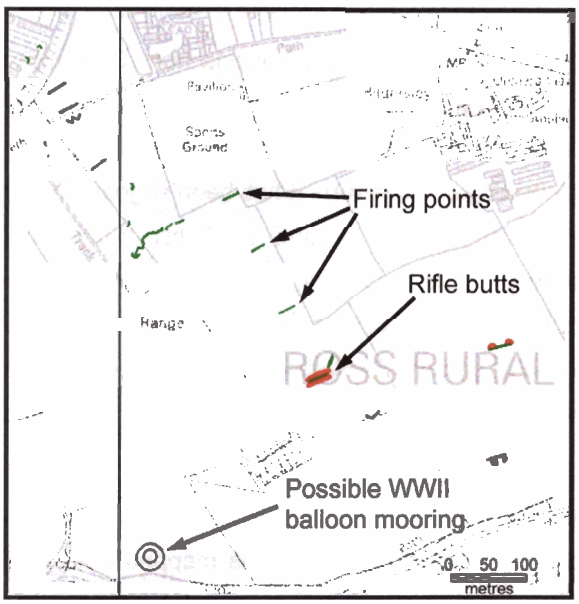

Figure 57. The remains of a Post Medieval firing range to the south of Ross-on-Wye. The modern ranges are marked on the OS base map.

Background map acquired from the Ordnance Survey

The second example was a possible Victorian rifle range, where two probable targets were visible on aerial photographs. It is marked on the 1891 OS 1st edition map (Gloucestershire Sheet XLVII NW, surveyed 1878–9) as 'Rifle Range (volunteer)' and extends south-east for 150m out of Lower Dodmore wood, to the north-west of Lydney.

12.2 Evidence from the First World War in the Forest of Dean

With the exception of a few sites on the Channel coasts, it is extremely rare to be able to identify First World War remains on the British mainland using aerial photographs alone. Very few contemporary aerial photographs were taken and even fewer have survived. Military sites were rapidly dismantled after 1918, so that very little early evidence remained to be recorded by the more extensive military reconnaissance sorties that were flown during and after the Second World War.

The First World War saw the emergence of aerial warfare, with the development of German air ships by Count Von Zeppelin. Britain suffered her first aerial attack at Great Yarmouth in January 1915, and towards the end of the war aeroplanes began to take the place of the slow and less manoeuvrable air ships. The threat from aircraft was greatly reduced the further West one went, and would have been minimal in the Forest of Dean.

Similarly, the threat from naval assault and invasion during 1914–18 was greatest along the Channel and North Sea coasts.

Away from the east coast with its anti-invasion defences, there were military camps, munitions factories, airfields and docks but, generally, First World War developments have left no lasting mark on mainland Britain. Many sites such as prison camps and some troop barracks had utilised existing buildings such as large houses and stately homes, and other sites were re-used during the Second World War. A small number of sites from the First World War have been identified within the forest, but the majority of sites from this period were located in the estuarine region of area, adjacent to the Rivers Wye and Severn.

Two Prisoner of War camps were set up on the Beachley peninsula from September 1917 and all villagers were evicted under the Defence of the Realm Act. A large camp was built on Beachley point and a smaller one at Sedbury to the north (thought possibly to be for officers of the German Navy (A Webb pers comm.)). It has been suggested that the camp at Sedbury might initially have been built as a camp for British troops, and adapted later to accommodate prisoners. The prisoners from both camps were employed to make concrete blocks for building houses at Hardwick Garden Village, Bulwark Garden Suburb and Pennsylvania at Sedbury (A Webb pers comm). They were also thought to have assisted with the construction of the shipyard at Beachley (Allen 2000).

No contemporary photographs of either site were available, but Sedbury Camp was re-used as a POW camp in the Second World War and the site was mapped from RAF aerial photographs taken in 1945 (described below).

During the latter stages of the First World War a number of shipyards were rapidly established in response to massive Allied merchant shipping losses to German U-boats in the Atlantic. Two of these shipyards were set up on the River Wye, one at Chepstow and a second at Beachley. The shipyard at Beachley was built by Royal Engineers assisted by German POWs, some of whom may have come from the POW camps at Sedbury and Beachley (Allen 2000).

The aerial photographs of the area revealed the extensive remains of the National Shipyard No. 2 at Beachley with its slipways, sheds, accommodation blocks and network of railway lines. The plan of the site can be seen on the 1918–20 OS map of the Beachley (see Figure 58 below). The extensive remains of the network of railway lines and sidings which served the shipyard during its brief life were detected on aerial photographs as faint cropmarks and the remnants of embankments along the whole length of the peninsula.

The aerial survey also recorded the shipyard sheds and numerous slipways on the banks of the River Wye, and the water tank and concrete hard standings of the shipyards dedicated power station (north of the shipyard), used for a time as a swimming pool when the site was a campsite in the 1970s (K Underwood 2004, pers comm.).

The war ended not long after the National Shipyard No. 2 at Beachley had been constructed, and War Odyssey, the only ship started at the site, was never completed. The site remained in Government hands and was then taken over by the Boys Technical College, later known as the Army Apprentices College (Allen 2000).

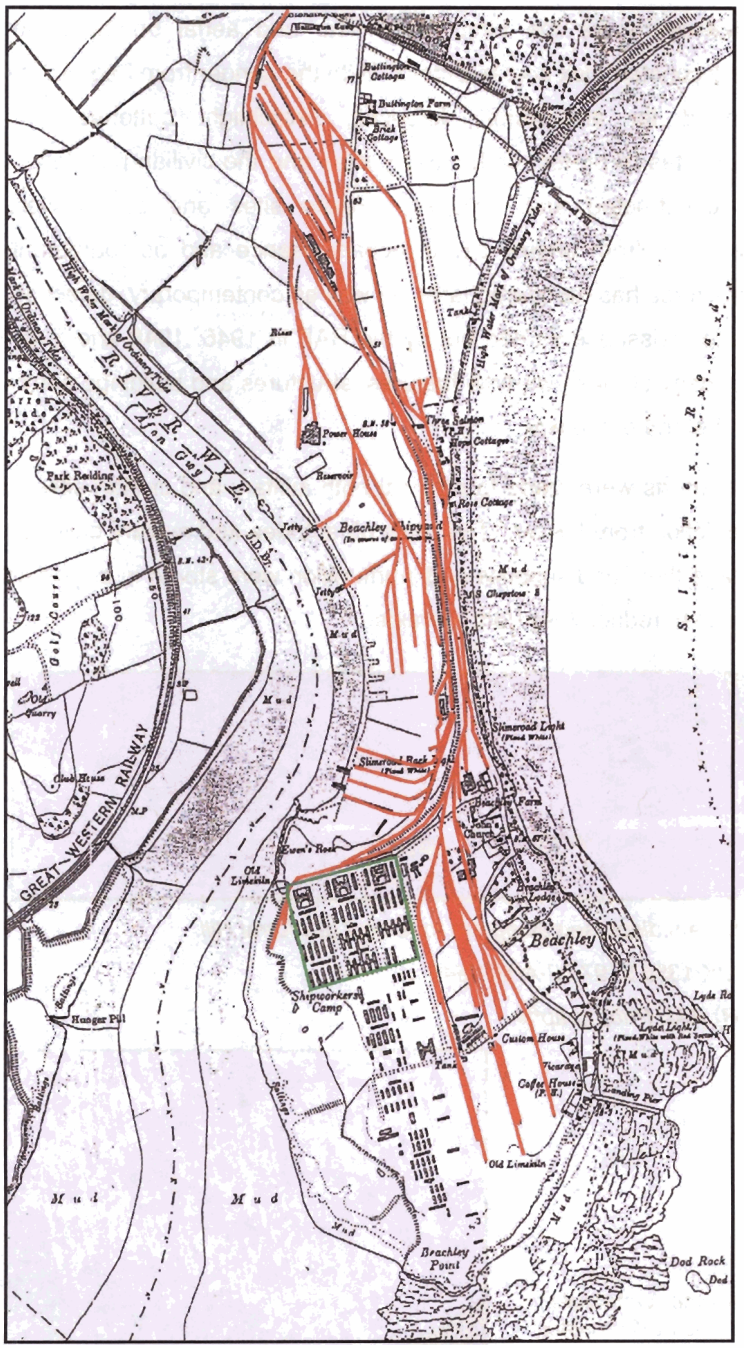

Figure 58. 1918–20 OS map of Beachley, with the shipyard railway network and accommodation barracks highlighted.

Background map acquired from the Ordnance Survey

In contrast to National Shipyard No. 2, the National Shipyard No. 1, located just across the River Wye at Chepstow, continued to be used throughout the Second World War in the manufacture of landing craft for the D-Day landings.

12.3 The legacy of the Second World War

The Second World War had a far greater impact on the country as a whole. With the constant threat of invasion, coastal defences were constructed around the British Isles: gun emplacements and pill boxes were placed at the coast and along roads.

Aerial warfare had advanced since the First World War and aerial bombardment represented a serious and constant risk across Britain. With the danger from frequent air raids there was a need for anti-aircraft defences, searchlight batteries, gun emplacements and decoy sites to protect both military sites and the civilian population. Air-raid shelters were constructed and factories, military sites and stores were camouflaged to conceal them from enemy aerial reconnaissance and bombardment. This effort to conceal structures has hampered later, as well as contemporary, detection, but the blanket aerial reconnaissance carried out by the RAF in 1946, 1948 and a few sorties in 1945 recorded many of these wartime features, structures and buildings before they were dismantled at the end of the war.

During the war immense efforts were made to conceal both military and civilian sites to reduce the chance of detection from the air. The roofs of factories and military buildings were painted to camouflage them and supplies and ammunition were stored in dispersed units, often in remote areas to reduce loss from air-raids.

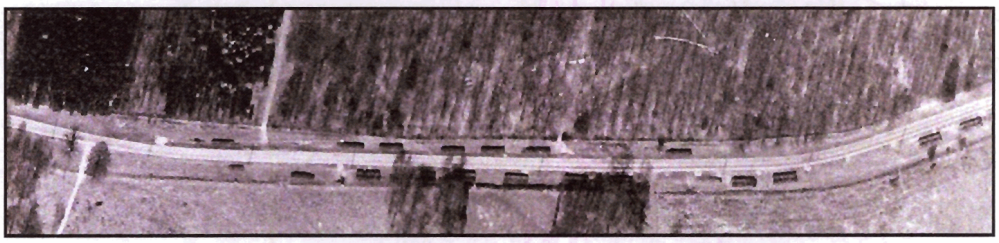

Figure 59. Storage containers dispersed along the road east of Worral Hill.

Extract from RAF 106G/UK/1355 5197 02-APR-1946

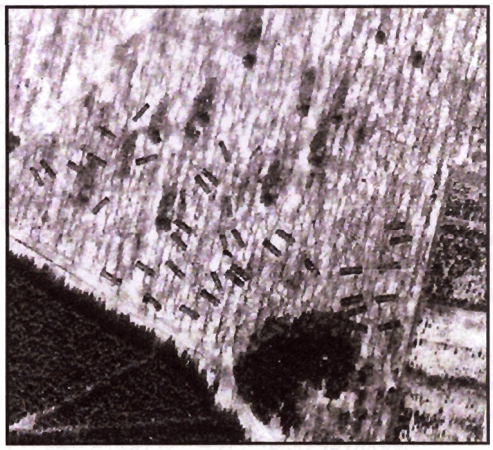

Figure 60. Dispersed storage containers visible through leafless trees at Worcester Walk.

Extract from RAF 106G/UK/1355 5197 02-APR-1946

The Forest of Dean NMP survey detected several groups of features associated with dispersed storage – probably of munitions, parts, fuel and chemicals – hidden amongst the trees or spread out along the side of roads to reduce the risk of damage or destruction by air raids.

One site had the traces of an associated railway siding used to deliver and move the supplies. Dispersed supply stores, comprising elongated crates or sheds, are known to have been spread throughout the Forest during the war.

Two examples were recorded at Worral Hill and Worcester Walk (Figures 59 and 60 above). The site of a poison gas store in the woods near Speech House was recorded on a ground photograph taken in 1948 (Phelps 1983).

The aerial photographs recorded the wartime Mosquito factory close to the docks at Lydney with its camouflaged roof. Adjacent to this large depot was also recorded. The harbour itself still showed signs of wartime defences: two buildings had blast walls and a possible pill box appeared to be defending the entrance to the goods yard by the harbour. A second pill box was located on the south side of the harbour. A number of other unusual features, interpreted as possible beach defences, were also recorded to the south west of the harbour.

12.3.1 Prisoner of war camps

Prisoner of War camps were detected at Sedbury, Broadwell and Lydney. Sedbury Camp is unusual because it is known to have been a military or prisoner camp during the First World War. Photographed in 1945, it was confirmed as a POW camp based on the morphology of the site – it comprised 30 huts within a gated perimeter fence, guard towers and a recreation ground. Although Sedbury was not listed amongst the known camps, its status as a prison camp has been confirmed by a number of local amateur sources including members of the Dean Archaeology Group.

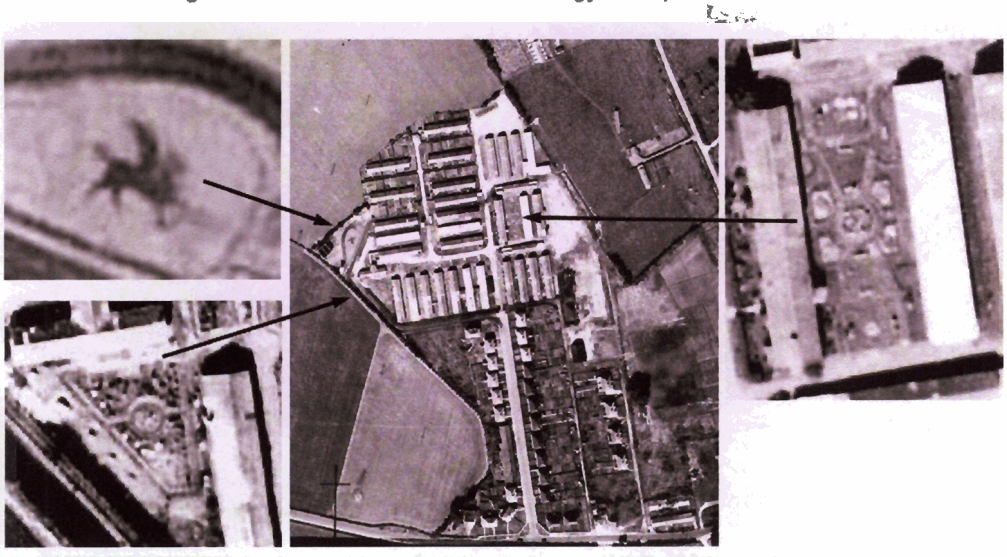

Figure 61. The POW camp at Sedbury with its ornamental beds and parterred gardens amongst the accommodation huts.

Extracts from RAF 106G/UK/2020 26-JUL-1945

On closer inspection this site was found to have several well established gardens, two of which were parterred (Figure 61). The most unusual part of the site was the ornamental garden or bed in the shape of a gryphon or a winged horse, possibly a regimental cap

badge of one of the groups of prisoners. The widely spaced huts with interspersed cultivation are believed to have been the Officers' huts.

Sedbury camp continued in use as post war housing for ex-servicemen and their families. Some huts were demolished and gardens were laid out between the blocks. Many of the huts on the eastern side of the spine road were converted into bungalows (rebuilt in stone or brick or re-clad with brick over the original timber frame), some of which are still occupied today. The western half of the site is now used as a light industrial estate (A Webb, pers comm).

Another POW camp was identified on aerial photographs at Naas House, Lydney (Figure 62). When the site was photographed in 1944 the accommodation was in huts supplemented with tents. The camp was surrounded by a fence with guard towers and a gate to the west.

The presence of tents, and the unusual lay-out of the huts at Naas House, may be evidence of a massive increase in the prisoner population later in the war. After D-Day in 1944, additional tented encampments were needed to accommodate the vast number of new prisoners arriving from France. By 1945–6, Axis prisoners who had been held in Canada and the USA also began to be returned to Europe. (In the early stages of the war many prisoners had been relocated to North America, for fear that they might provide a ready-made enemy army in the event of an invasion.) Where possible, tents were replaced with huts, but many prisoners remained under canvas for a considerable length of time.

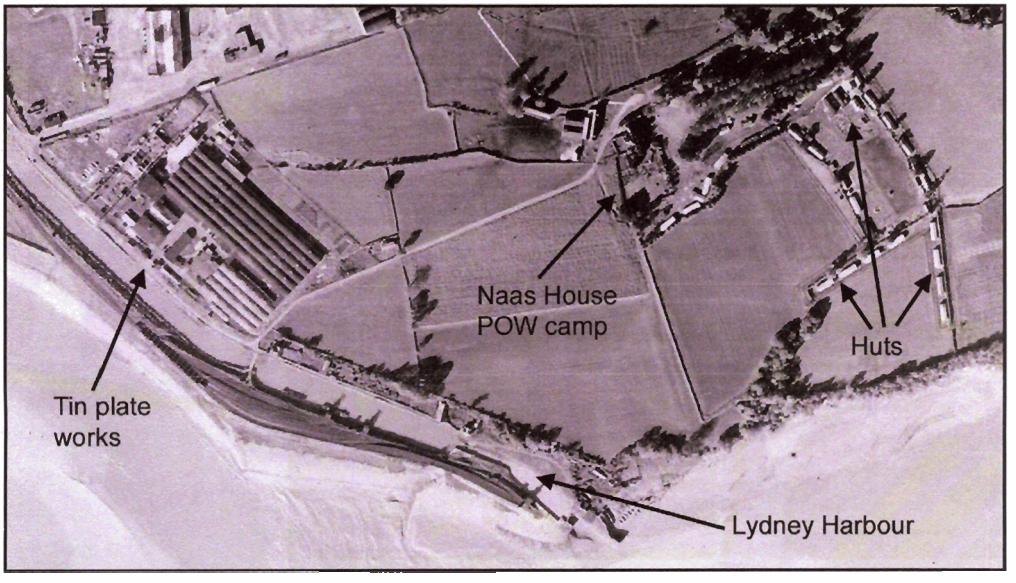

Figure 62. Naas House POW camp and adjacent tin plate works to the south of Lydney. Extract from RAF 106G/LA 121 3013 09-FEB-1945
© English Heritage (NMR) RAF Photography

The Naas House Camp has an unusual plan – the huts appear in lines around the edges of two fields, rather than in blocks and, particularly in the second field, the perimeter fence forms an awkwardly-shaped enclosure. The arrangement of the huts is more

typical of an army camp or supply depot, with accommodation and storage buildings placed around the edges of fields to make them less obvious from the air. It is possible that this site was originally intended for storage or for housing troops or factory workers, and only became a POW camp in the latter stages of the war.

It was common practice for low risk prisoners to be employed and billeted out on farms, but those at Lydney are believed to have worked at the tin plate works near to the prison camp, formerly Lower Forge Lydney, originally called Pill Forge. A concrete path was seen to link the camp and factory.

Wynolls Hill Camp at Broadwell held mostly Italian prisoners, housed in approximately 45 huts within a double barbed wire perimeter fence.

During their time of imprisonment the inmates at Wynolls Hill were able to obtain enough concrete and strengthening rods to construct an elaborate memorial to Marconi. It was painted to look like pink marble, decorated with heraldic shields and topped by a narrow spire. The crescent-shaped base of the structure was mapped from aerial photographs.

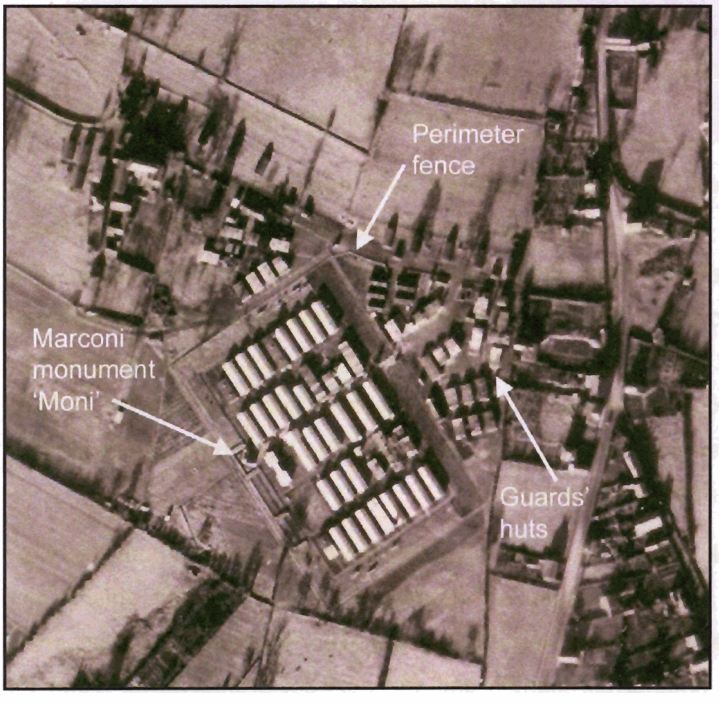

Figure 63. Camp 61 – Wynolls Hill POW camp, Broadwell, Coleford as it was in 1946. Note the triangle of guards' huts outside the NE edge of the perimeter fence. The Marconi monument is visible midway along the SW side of the camp.

Extract from RAF CPE/UK/1913 4014 30-DEC-1946

The badly vandalised remains of the monument, known as the 'Moni', were finally demolished along with the remaining foundations of the prison huts in 1977 to make way for a housing estate.

To the NE of this camp the remains of a small tented prisoner camp, enclosed within a triangular fence with three corner guard towers, were also recorded from aerial photographs (Figure 64). Outside the fence to the north was a group of dispersed huts,

presumed to be the guards' huts, and to the south-east of enclosure was the camp's sewage works. This site was photographed in October 1945 and December 1946, during which time the number of tents had reduced by half, possibly due to repatriation or relocation. This small camp has no existing record and may have been a short-lived temporary overflow camp.

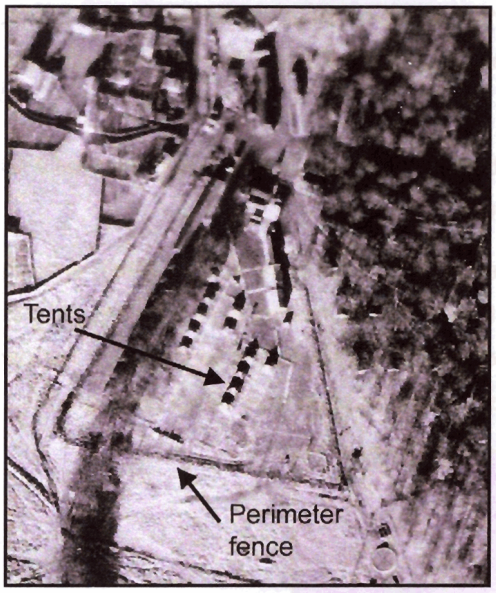

Figure 64. A tented prison camp within a triangular perimeter fence, to the north-east of Broadwell.

Extract from RAF CPE/UK/1913 1176 30-DEC-1946

Although POW camps and other military facilities were documented during the war, it has been difficult to find contemporary references to the camps in the Forest of Dean. Only Wynolls Hill Camp at Broadwell has a camp number in the surviving listings. The wartime lists are known to be incomplete, and it was also common practice to re-allocate numbers from redundant camps, so that the same number could belong to up to four camps at various times during the war. The only available contemporary list of POW camps was a condition survey carried out in 1947–8 of the remaining camps holding prisoners awaiting repatriation after the war.

The first repatriations took place in 1946, but prisoners were not released until they were considered re-educated and had passed an interview to determine their attitude and loyalty to the Nazi regime. These interviews took place every six months, and prisoners who failed were held for another six months until the next set of interviews. After the Nuremberg trials the Waffen SS was deemed to be a criminal organisation and many of these hard-line prisoners were detained longer for being Waffen SS members. Many prisoners were not repatriated until 1948; the last few went home in 1949. The poor state of the infrastructure and lack of adequate resources in post-war Europe also contributed to the delay in repatriation. By the later 1940s, most of the remaining prisoners were German soldiers, so many camps are listed as 'German Working Camps' even though many, like Broadwell, had originally held Italians in the early years of the war.

12.3.2 Air raid shelters and gun emplacements

At Beachley, the former First World War shipyard became the Boys Technical School, later known as the Army Apprentices College. The site was used throughout the Second World War, and the aerial survey recorded the earthwork remains of over forty air-raid shelters. The majority were long earthen mounds (approximately 18m x 9m) with rounded ends, the entrances and escape hatches clearly visible. Others were crescent-shaped, again with clearly visible entrances. Also noted was a line of smaller mounds approximately 10m in diameter which are presumed to be air raid shelters. Two pill boxes were recorded on the southern end of the peninsula.

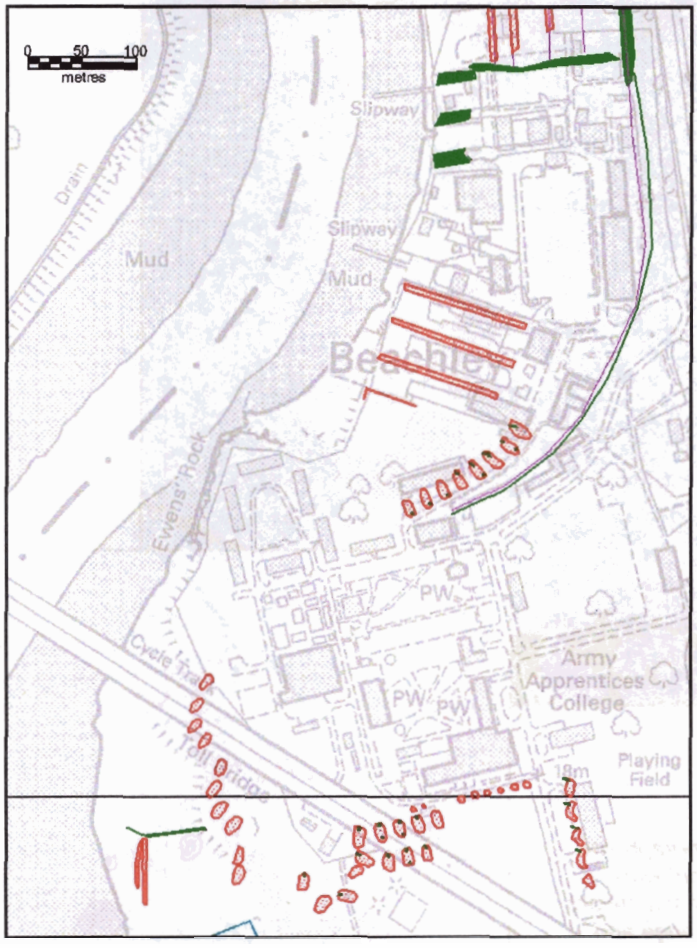

Figure 65. Groups of air-raid shelters at Beachley. Note the three slipways to the north. Also note the course of the first Severn Bridge, which crosses the southern tip of the Beachley peninsula.

Background map acquired from the Ordnance Survey

Numerous slit trenches were recorded around various sites. These were generally intended as emergency refuges during air raids, and were provided in addition to more substantial air raid shelters.

A concentration of war-time sites was identified around the town of Coleford. These included a possible gun emplacement and searchlight battery as well as a number of more ambiguous features almost certainly of military origin.

At Whitehouse Farm, to the north of Coleford, the cropmark remains of a mixed camp of huts and tents in a dispersed arrangement were seen on photographs taken in 1946.

Overlooking the eastern bank of the Severn Estuary another searchlight battery was recorded to the north-west of Fretherne (Figure 66 below). This site was still visible in 1999 as an arc of five sub-circular banks overlying the earthwork remains of the medieval ridge and furrow. The site was classified as a 'Killer' type searchlight battery in the records of the Searchlight Battery Unit No 349 (37th Searchlight Regiment) of 14th October 1941.

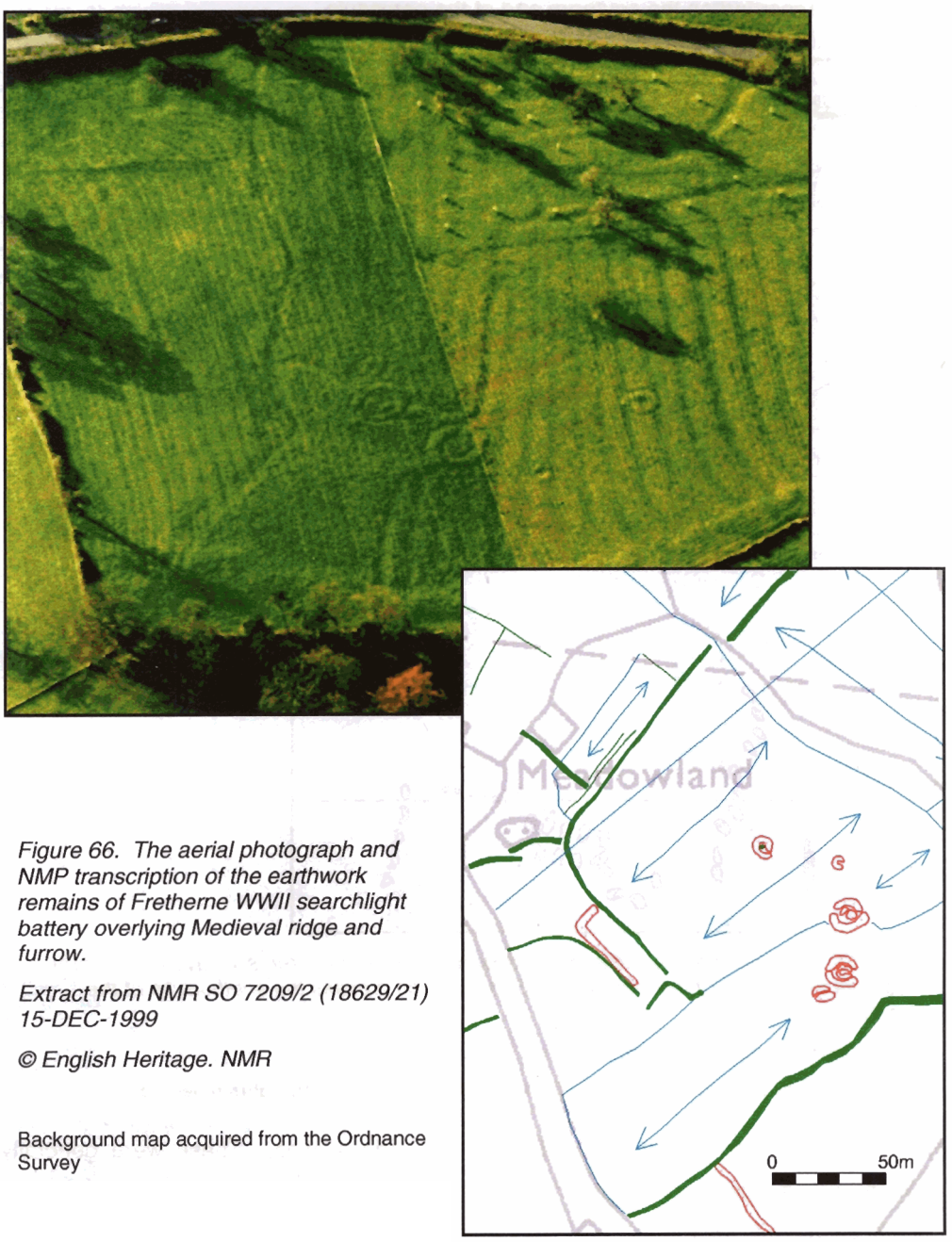

Figure 66. The aerial photograph and NMP transcription of the earthwork remains of Fretherne WWII searchlight battery overlying Medieval ridge and furrow.

Extract from NMR SO 7209/2 (18629/21) 15-DEC-1999

© English Heritage. NMR

Background map acquired from the Ordnance Survey

The site of a possible balloon mooring was also recorded to the south of the rifle ranges at Ross-on-Wye. This was visible as two faint concentric rings (see Fig 58 above).

12.4 Conclusion

Many features associated with the Second World War were removed in the years immediately following the war's end, and very few sites from either that or the First World War survive today. Although records were kept during the war, the archives are now incomplete, and identification of sites is further hampered by the frequent re-use of site reference numbers. Consequently, both the physical and documentary traces of many military features are ambiguous or have been lost, and the remaining sites are hard to identify.

Aerial photographs have proved a vital source in the identification and recording of military sites. The survey benefited from a large number of RAF vertical photographs taken between 1946 and 1948, which effectively capture a snapshot of post-war Britain.

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APPENDIX 1

ARCHAEOLOGICAL SCOPE OF THE SURVEY

The objective of the National Mapping Programme is to identify and transcribe all probable and possible archaeological features visible as cropmarks, soilmarks or earthworks on aerial photographs. As part of the NMP, the Gloucestershire Mapping Project set out to record all archaeological monuments seen on aerial photographs, both plough-levelled and upstanding remains, dating from the Neolithic period to the 20th century, including industrial and military features. For the purpose of this survey the following definitions were used:

1.1 Plough-levelled features

All cropmarks and soilmarks representing filled 'negative' features (ie ditches and pits) or levelled earthworks of archaeological origin were recorded. For the purposes of the NMP the term 'cropmark' was taken to be inclusive of soilmarks.

1.2 Earthworks

All earthwork sites visible on aerial photographs were recorded, whether or not they had been previously surveyed, and whether or not they were still extant on the most recent photographs. The full extent of earthwork sites were transcribed where visible, but it was made explicit in the accompanying database record (see Appendix 5, Section 5.2 below) which elements of any particular group of earthworks survived and which had been destroyed.

Extant earthworks such as hillforts and barrows, defined by hachures on the current Ordnance Survey (OS) 1:10,000 base maps, were depicted with the appropriate NMP conventions. Previously surveyed earthworks which could be identified on aerial photographs were traced from existing survey plans where possible, or from the base maps. The information was depicted using the appropriate NMP convention, with any additional information or changes depicted as seen. Sites appearing on the OS base map which had not been photographed, or which were completely obscured by vegetation, were not shown, but were identified on the Map Note Sheet.

1.3 Ridge and furrow and water meadows

Areas of ridge and furrow were recorded using a standard convention to indicate the extent and direction of the furrows. A distinction between destroyed and surviving fields of ridge and furrow has been made by recording on two separate layers in AutoCAD. Longer furlong boundaries and linear earthworks such as headland banks have been shown in stipple as earthworks, but individual strip fields have not been depicted.

1.4 Buildings

Only buildings that appeared as earthworks, cropmarks or soil marks representing earthworks or buried foundations were recorded, using the convention appropriate for the form of remains. Standing buildings which have been destroyed were not recorded unless there was no other adequate record. In such cases they were depicted on the transcription, or where appropriate, recorded on the map note sheet. Buildings which formed part of an industrial complex have been noted.

1.5 Industrial archaeology

Areas of industrial archaeology were recorded using the appropriate conventions where they could be recognised as pre-dating 1945. The Forest of Dean has a long history of mining, quarrying, iron working and forestry; as a result, a large percentage of records for the area were of an industrial nature.

The project focused specifically on locating and mapping the extent of surface mining of iron ore deposits within the Carboniferous Limestone – outcrops known locally as 'Scowles'. The nature of these remains means that there may be a broader coverage of extractive sites than would normally be included in an NMP survey, which would not generally record small-scale extraction sites.

The centre of the Forest is dominated by Carboniferous coal bearing shales. These coal measures have been exploited for the best part of two millennia. Traces of small scale surface extraction in the form of numerous bell pits and the larger Free Mines were concentrated where the coal seams outcropped at the surface. In contrast to these were the extensive spoil tips and associated tramways, railways and buildings of the larger post medieval commercial mines which exploited the deeper seams of coal. Many of the post medieval (mostly 18th–20th century) spoil tips have now been levelled or landscaped; it is therefore all the more urgent that a record of their extent and location be made from historical photographs.

1.6 Military archaeology

It is within the scope of the NMP to record military features which pre-date 1945. Individual buildings within military complexes such as prisoner of war camps and military shipyards were not recorded, but the extent of the sites were mapped and their presence was be noted on the Map Note Sheet. Isolated military structures such as pill boxes, air raid shelters and buildings associated with searchlight batteries were mapped.

1.6 Field boundaries

Recently removed field boundaries seen as cropmarks were not recorded if they could be seen on the 1:10,000, 1:10,560 or OS First Edition maps. Where they were extensive, and in danger of being confused with the remains of earlier field systems, their presence and extent were noted on the Map Note Sheet.

1.7 Geological and geomorphological marks

Geological features visible on aerial photographs were not plotted, although their presence may sometimes have been noted on the Map Note Sheet, eg if the presence of former river channels defined the limits of an archaeological site, or if the nature of the marks was such that they could be confused with those of archaeological origin.

The standard conventions used in the depiction of all features transcribed in AutoCAD are outlined in Appendix 4.

APPENDIX 2

SOURCES

2.1 Specialist oblique aerial photographs

2.1.1 National Monuments Record Air Photographs (NMRAP)

The National Monuments Record was the main source of oblique photographs for the project; the collection comprises both black and white and colour photographs and transparencies. The photographs were derived from a variety of sources, including EH (formerly RCHME) reconnaissance, University of Cambridge Air Photography Library (formerly Cambridge University Committee for Air Photographs – CUCAP) now housed within the Unit for Landscape Modelling, and a number of other smaller collections. All available photographs in the collection were consulted. The photographs range in date from the mid 1950s to the present. Aerial reconnaissance by Aerial Survey, English Heritage was also carried out in advance of the survey and further reconnaissance was undertaken throughout the course of the survey targeting areas and sites of particular interest.

2.1.2. Cambridge University Unit for Landscape Modelling: Collection of Air Photos (ULM)

The project was carried out in collaboration with Cambridge University's Unit for Landscape Modelling (ULM) who kindly loaned the project photographs from their Air Photo Library.

This collection held 327 oblique photographs for Forest of Dean project area which were mostly taken for archaeological purposes from the 1940s until the early 1980s. These were loaned to the project by special arrangement with Cambridge University.

2.2 Vertical aerial photographs

2.2.1 National Monuments Record Air Photographs (NMRAP)

The NMR held 8,107 vertical photographs for the Forest of Dean. The vertical photographs for the project area were primarily from the RAF and the OS, with a small number from other sources, eg Meridian Airmaps and United States Army Air Force. Prints for the majority of frames were held. The photographs date from 1942 onwards but most were post-war.

2.2.2 Cambridge University Unit for Landscape Modelling: Collection of Air Photos (ULM)

The project was carried out in collaboration with Cambridge University's Unit for Landscape Modelling (ULM): who kindly loaned the project photographs from their Air Photo Library.

The Cambridge University ULM collection held 689 vertical photographs for the area, but a large number of these covered the Severn Estuary and the Wye Valley rather than the core of the Forest of Dean. These were loaned to the project by special arrangement with Cambridge University.

2.2.3 SMR photographs

All relevant aerial photographs available from the Sites and Monuments Records and the Planning Office of Gloucestershire County Council were consulted. These photographs were few in number, many of which were duplicated elsewhere in other collections, except in the case of extremely low level cover following the route of new roads. However, they represented a useful photographic source, and were loaned to the project team for the duration of the survey.

2.2.4 Other Photographic Sources

The Borough Councils generally hold additional photography. This, however, is usually taken for planning purposes and covers only the towns and villages. These sources were not consulted.

2.3 Documentary sources

A number of archival sources were consulted in order to understand more fully the archaeology being transcribed and to aid interpretation and dating of archaeological features on aerial photographs.

2.3.1 National Monuments Record (NMR)

Copies of the most up to date record maps were borrowed from the map library and consulted during transcription and recording and the relevant Monument and Event records from the AMIE database (including the Excavation Index) were also used as an aid to mapping.

2.3.2 Local Sites and Monuments Record

The SMR records for both Gloucestershire and Herefordshire were consulted. Gloucestershire SMR provided SMR reports by quarter sheet as Word files and Excel spread sheets together with jpeg images of each SMR map. Herefordshire SMR was consulted via their on-line database.

2.3.3 Historic Ordnance Survey maps

The OS 6" first edition maps are a useful aid to mapping as they provide information about removed buildings, field boundaries and industrial remains. These could be consulted on-line at old-maps.co.uk. Larger scale maps were ordered where necessary.

The 1955–6 edition OS Archaeology Division 1:10,560 field sheets (the precursors to the current NMR record maps) were also consulted.

2.3.4 Other sources

A wide range of documentary resources were consulted during the survey, and have been listed in the bibliography. Also a number of local interest groups including Dean Archaeology Group, Tidenham Local History Society and the Royal Forest of Dean U3A were consulted for background history and identification of particular sites, especially those from World War I and World War II, which were seen on aerial photographs.

The site data held in both the English Heritage NMR (AMIE) database and the relevant SMRs were consulted to concord the information held by these sources. Prior to the survey, 779 individual records for the project area were held by the AMIE database. These included records of monuments such as buildings, industrial features (mines, quarries, dismantled railways, ponds and leats), maritime records of wrecks within the Severn Estuary, as well as archaeological sites recorded from field survey and aerial survey, sites of excavations and find spots.

As a result of the Forest of Dean NMP survey, an additional 1832 monument records of archaeological sites were added to the AMIE database bringing the total to 2611.

APPENDIX 3

PROJECT RESULTS AND ANALYSIS

The aerial survey resulted in the creation of 1832 new monument records and the revision of 176 existing records within the NMR (AMIE) database, bringing the total number of records for the area to 2611. These statistics clearly demonstrate the value of aerial photographs when surveying large areas with challenging terrain and vegetation.

The numbers of new and revised/amended monument records for each OS quarter sheet are listed in the table below:

QUARTER SHEET	OLD RECORD TOTAL	AMENDED RECORDS	NEW RECORDS	NEW TOTAL
SO50NW	17	13	37	54
SO50NE	62	10	169	231
SO50SW	11	26	35	46
SO50SE	30	13	110	140
SO51NE	82	19	116	198
SO51SW	15	2	3	18
SO51SE	45	10	177	222
SO60NW	38	6	102	140
SO60NE	30	2	102	133
SO60SW	42	6	90	132
SO60SE	30	1	63	93
SO61NW	30	1	170	200
SO61NE	41	3	101	142
SO61SW	16	3	87	103
SO61SE	60	8	123	183
SO62SW	31	5	39	70
SO62SE	29	4	52	81
SO70NW	21	11	51	72
SO71NW	16	5	31	47
SO72SW	18	7	27	45
ST59NW	9	4	17	26
ST59NE	43	14	61	104
ST59SW	15	2	25	40
ST59SE	34	1	16	50
ST69NW	14	0	27	41
Total	**779**	**176**	**1832**	**2611**

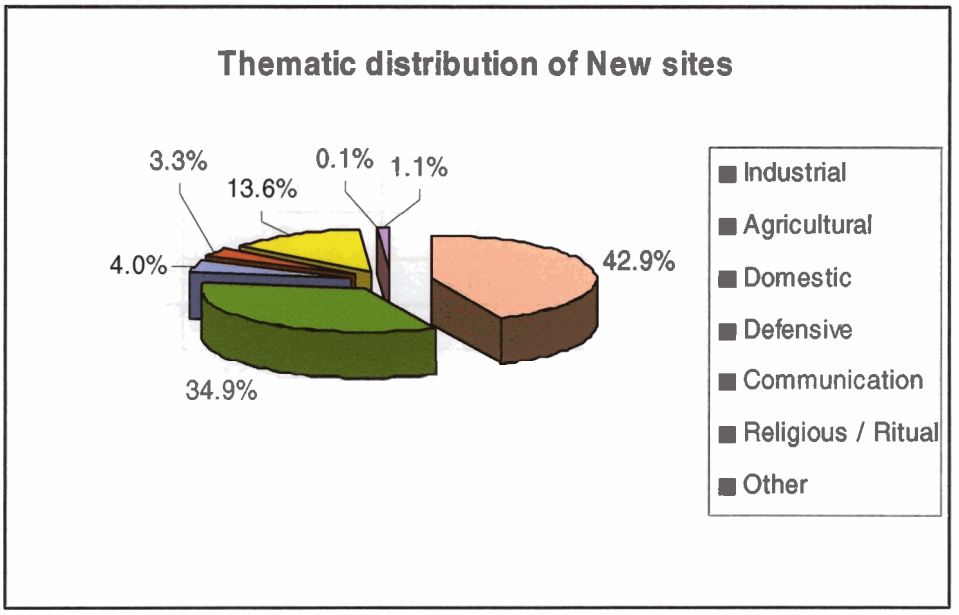
3.1 Thematic and Period Summaries

All the sites recorded during the course of the project were analysed by theme and period.

The sites were categorised into six separate thematic groups: industrial, agricultural, domestic, defensive, communication and religious/ritual. Sites which did not fit any of these groups were recorded in a seventh group called 'other'.

The sites were also categorised into ten broad historic periods, with an eleventh category for sites of uncertain date. The overall results and observations from the survey have been described by period and are discussed in detail below.

3.1.1 Thematic summaries



3.1.1.1 Industrial

Sites of an industrial nature were found to form the largest group (42.9%) of newly recorded sites. The majority of these industrial sites were associated with the various extractive industries within the Forest. There were 349 new records for limestone and sandstone quarries, 349 records of coal extraction and mining, and 144 for iron extraction.

3.1.1.2 Agricultural

The second largest thematic group comprised sites associated with agricultural activity. The project area is dominated by the Forest of Dean. This is a region of managed forestry, but little of this forest area is given over to agriculture in the general sense and sites associated with forest management were very few in number. The majority of the records for agricultural sites were for medieval and post medieval ridge and furrow. However, there was very little evidence of open field cultivation within the region of the

Forest: most occurred to the east and north-east around the Severn Vale and the Vale of Evesham, and to the south of the Severn Estuary. There were no records of ridge and furrow from within the area of the Statutory Forest, though it is likely that evidence for any such cultivation would be obscured by later plantations of trees or dense vegetation.

3.1.1.3 Communication

New sites classified as communication features numbered 253, just over 13% of all new records. These included 97 records of post medieval or modern railways and tramways associated with the post medieval collieries and ironstone mines. Some sites revealed a chronology of means of transportation, with the course of a tramway overlain by a later (and usually more direct) course of a railway. However, the majority of the records represented sections of hollow way and trackway. This is not entirely surprising: throughout the medieval and early post medieval periods there were initially only two roads through the region and wheeled vehicles were prohibited from entering the Forest. All transportation was on foot or horseback, and coal, ironstone, timber and other materials had to be transported by packhorse.

The region was criss-crossed by numerous paths, many of which have been seen on aerial photographs, linking the settlements on the peripheries of the Forest with the mines and quarries. Many appeared as multiple incised braided tracks, visible on open ground between the trees, and most date from the massive intensification of industry in the 18th and 19th centuries. Many of these tracks have since been obscured by recent phases of forestry plantation. Numerous fragments of hollow way were also recorded outside the core of the Forest, generally associated with the remains of medieval and post medieval fields and settlements. At Lea, in the north of the survey area, the earthwork remains of part of the former turnpike road were recorded as a distinct hollow way cutting through arable fields into the village. The modern road appears to have been redirected to follow a better-graded course into the village.

3.1.1.4 Domestic

Sites classified as 'domestic' accounted for only 4% of new records. This comparatively low number is due to the fact that there are very few settlements within the Forest, and the sites of many former settlements immediately outside the Forest may be obscured beneath existing towns and villages or have already been recorded. The few sites of settlements within the Forest, which would generally have been the result of illegal assarting, have disappeared, are obscured by the trees or still exist as current dwellings today.

3.1.1.5 Defensive sites

A number of diverse sites associated with defence and fortification have been recorded throughout the survey area. The more substantial sites such as hill forts, medieval and post medieval castles, mottes and baileys, moats and Offa's Dyke have existing records,

and in many cases have been surveyed prior to this particular survey. Consequently, the number of newly-recorded sites of this nature was fairly low, making up 3.3% of the total of new records.

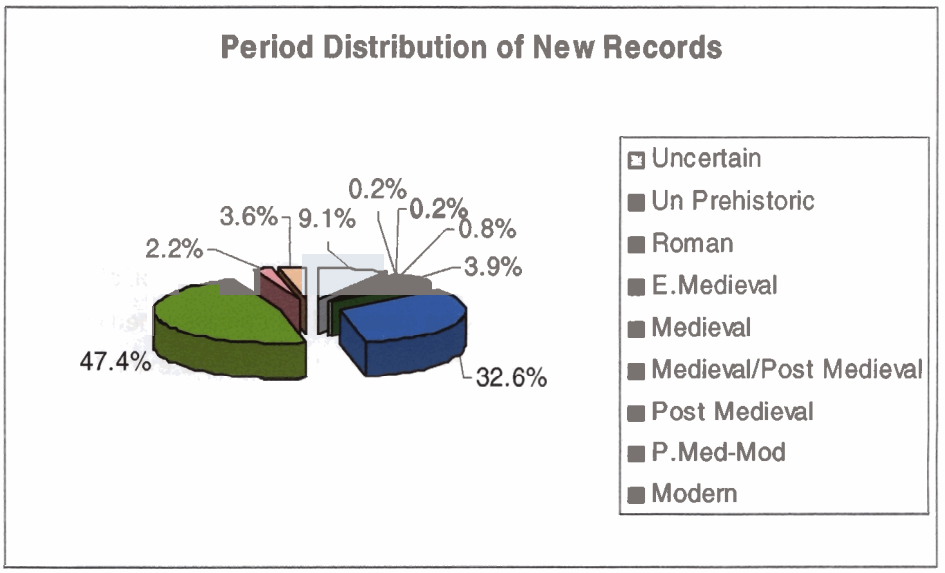
3.1.1.6 Religious and ritual

Religious and ritual sites encompass such sites as Bronze Age round barrows, Neolithic long barrows and Christian and pagan sites. Because of the restrictions on occupying the Forest from the medieval period onwards, very few chapels or churches were built within the confines of the Statutory Forest. Roman and Prehistoric use of the Forest prior to the imposition of Forest Law would normally have been expected. However, only two new sites, the cropmark remains of two ring ditches which may be potential round barrows, were recorded within this category. There is a distinct lack of any ritual sites recorded within the confines of the Forest of Dean. Overall, remarkably few sites in this class have been detected in the region, whether on the ground or by aerial survey. The paucity of religious and ritual sites from the Prehistoric period has been discussed in detail below.

3.1.2 Period Summaries

For the purposes of this survey and report, all period classifications used are those used for the NMR's AMIE database. These classifications are as follows:

Prehistoric	?500 000BC	43AD
Prehistoric/Roman	?500 000BC	43AD
Neolithic	4500BC	2200BC
Bronze Age	2500BC	700BC
Iron Age	800BC	43AD
Roman	43AD	410AD
Early medieval	410AD	1066
Medieval	1066	1540
Post medieval	1540	1901
Modern	1901	present
World War II	1939	1945
Uncertain		



3.1.2.1 Prehistoric

The three Prehistoric and three new Roman sites from the survey when combined accounted for just 0.4% of all new sites. The low number of new Prehistoric records reflects the difficulties of detecting such features in a wooded landscape and the also the scarcity of known sites throughout the Forest of Dean. The most important of these new discoveries was that of a probable Prehistoric sub-circular enclosure in Dry Wood discovered on RAF vertical photographs (described in Section 6).

3.1.2.2 Roman

There is considerable evidence of Roman activity within and around the Forest of Dean. However, little evidence of this activity was detectable from aerial photographs. Within the Forest, much of the activity would have revolved around mineral extraction, but this is impossible to date from the air photo evidence alone. The three new Roman records were a section of road, some ironstone workings and a leat. The remains of a number of known Roman villas and the cropmark remains of the town of Ariconium were mapped. Although this survey was able to add to the known plan and extent of such sites as Ariconium, no new settlement sites were recorded.

3.1.2.3 Early medieval

The survey recorded 14 new records which could be classed as early medieval. These sites were all records for sections of defensive earthwork which are thought to be part of Offa's Dyke or a similar contemporary boundary. These records accounted for 0.8% of all new records, but doubled the number of early medieval sites in the record, which comprised 12 existing records for Offa's Dyke and a contemporary promontory fort abutting the dyke on the eastern bank of the River Wye.

3.1.2.4 Medieval

Sites classified as medieval formed 3.9% of all new sites. This is a fairly low figure because many of the medieval sites already had existing records and a considerable number of the newly recorded medieval sites were double-indexed and included in the medieval/post medieval group of sites. Most of the purely medieval sites were records for ridge and furrow, all of which lay outside the boundaries of the Statutory Forest.

3.1.2.5 Medieval/post medieval

New sites double-indexed as medieval/post medieval formed 32.6% of all new sites recorded. These were sites which could not be classified as definitely medieval or post medieval or whose history of use began in the medieval period and extended into the post medieval. The group was dominated by agricultural sites, the majority of which (200 records) were records of ridge and furrow, which accounted for 37% of sites in this period. Industrial sites numbered 171, or 31% of the group, dominated by quarrying (67 new records), sites of coal workings (43 new records) and sites of charcoal burning hearths (47 new records). A single record for charcoal burning hearths ranged from isolated platforms to large clusters of closely spaced platforms.

3.1.2.6 Post medieval

Post medieval sites formed the largest group, accounting for over 47% of all 'new' records, and were dominated by remains associated with the various extractive industries within the forest. The high number of industrially-related sites reflects the vast increase in activity within the Forest from the 16th century onwards, which reached its

peak in the 18th and 19th centuries. The largest individual group of new industrial sites were the 188 quarries, followed by 101 collieries. Associated with the industrial sites were records for 59 sections of tramway, 26 railways and 22 trackways. There were also 51 new records for lengths of hollow way, two disused sections of turnpike road, and a failed housing estate from the 1870s.

3.1.2.7 Post medieval and modern

Post medieval and modern sites were all associated with larger-scale commercial extractive industries whose use started in the post medieval period and continued into the 20th century. Most were concentrated within the Forest and included iron mines and pits, quarries, spoil heaps, and a number of reservoirs and railways associated with mines. There were also two brickworks which were located within the survey area, but outside the Forest region.

3.1.2.7 Modern

A total of 68 new sites were classified as modern (dating from 1901 to 1945). Over half of these (40 sites) were associated with the Second World War, most of which were concentrated within the Forest or around the towns and ports close to the Severn and Wye estuaries. These included defensive features such as anti-aircraft guns, beach defences and pill boxes, military camps, troop accommodation and three prisoner of war camps. Within the forest, several areas of dispersed military storage were also recorded.

Two sites dating from the First World War were also recorded. These were a prisoner of war camp and a wartime shipyard, both located on the Beachley peninsula.

The relatively low number of modern industrial sites reflects the massive decline in industrial activity at the end of the 19th century. Many local industries had ceased to operate by 1945, though several of the quarries are still working today. The group includes 12 quarries, 6 collieries, 1 freemine, 1 ironstone mine and two brickworks. The brickworks were both situated beyond the limits of the Statutory Forest adjacent to the River Severn. This group does not include sites which began their operations in the post medieval period.

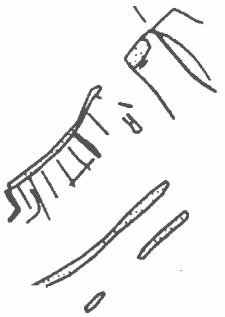
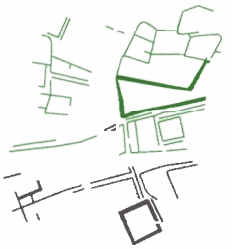
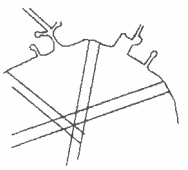
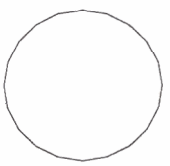
3.1.2.8 Uncertain

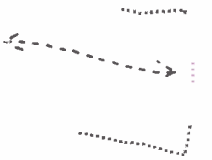
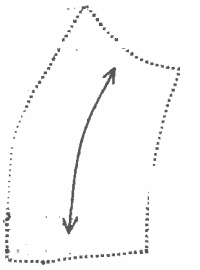
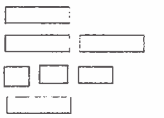
Just over 9% of New sites could not be ascribed to a particular period from the photographic evidence alone and were classified as 'Uncertain'. This group encompassed sites which could be ascribed to a number of periods and, therefore, could not be included in one single period section. Ones such group of sites were the extractive sites known locally as 'Scowles' which could date from any time from the later Prehistoric to the post medieval period. In total 79 such sites were recorded.

Other sites recorded as 'Uncertain date' included nine earthwork enclosures of varying sizes and shapes and a number of extractive sites including 18 quarries, 2 coal workings, 5 extractive pits, 2 spoil heaps and 2 sites of ironstone workings.

APPENDIX 4

AUTOCAD NMP CONVENTIONS AND LAYERS

Layer name	Colour	Linetype	
BANK	1 (red)	CONTINUOUS	
The outline of all features seen as banks or positive features, eg platforms, mounds and banks; also to be used for the agger of Roman Roads. Thin banks will appear on this layer as a single line.			
BANKFILL	1 (red)	FILL: DOT SCALE: 2.25 ANGLE: 53	
A stipple that fills the bank outline 'bank'.			
DITCH	3 (green)	CONTINUOUS	
All features seen as ditches; also excavated features, eg ponds and pits.			
DITCHFILL	3 (green)	FILL – SOLID	
EXTENT OF AREA	8 (grey)	DASHEDX2	
The extent of large area features such as the perimeters of airfields, military camps, mining/extraction areas.			
LARGE CUT FEATURE	5 (blue)	ACAD_ISO02W100	
Formerly the 'T-hachure', now represented by a dashed line. To be used for large cut features such as quarries, ponds, and perhaps scarps that can not easily be depicted with the use of either bank or ditch.			
MONUMENT POLYGON	7 (white)	CONTINUOUS	
Used to define the extent of a group of AutoCAD objects corresponding to a single monument in the NMR database.			

Layer name	Colour	Linetype	
RIGARRLEVEL	6 (magenta)	ACAD_ISO03W100	
Arrow depicting direction of rig in a single block ridge and furrow, seen as earthworks or cropmarks, but known to have been ploughed level.			
RIGDOTSLEVEL	6 (magenta)	DOTX2	
Outline of a block of ridge and furrow, seen as earthworks or cropmarks, but known to have been ploughed level.			
RIGARREWK	4 (cyan)	CONTINUOUS	
Arrow depicting direction of rig in a single block of ridge and furrow seen as earthworks on the latest available aerial photographs.			
RIGDOTSEWK	4 (cyan)	DOTX2	
Outline of a block of ridge and furrow still surviving as earthworks on the latest available aerial photographs.			
STONEWORK	8 (grey)	CONTINUOUS	
Exposed stonework, eg walls, cairns, standing stones; also used for concrete building platforms.			
STRUCTURE	9 (grey)	CONTINUOUS	
Used for features which do not easily fit into other categories because of their form, eg tents, radio masts, paint (camouflaged airfields).			
TRAMWAY	200 (purple)	TRACKS	
Used to indicate the presence (or implied presence) of tramways, mainly associated with industrial areas.			
Other Layers:			
(VIEWPORT)	7 (white)	CONTINUOUS	
Used in conjunction with the printing macros			
(SHEET)	7 (white)	CONTINUOUS	
Used in conjunction with printing macros			
GRID	7 (white)	CONTINUOUS	
Drawn automatically by a macro at correct NGR			
RASTER	7 (white)	CONTINUOUS	
Used to load raster images so they can be easily switched off.			

APPENDIX 5

METHODOLOGY

5.1 Digital Transcription

All available NMR oblique and vertical photographs were consulted for each map. CUCAP photographs were be ordered by post on a map by map basis. The SMR data for Gloucestershire was provided in a digital form at the beginning of the project, whilst that for Herefordshire was accessible via their internet site.

Transcriptions were produced, whenever possible, with the aid of the computer-based AERIAL rectification programme. Control information was taken from digital OS 1:10,000 scale base maps with an expected level of accuracy of 5–15m. The steep and undulating terrain of the Forest necessitated the use of the digital terrain model (DTM) function in AERIAL 5 or AERIAL 4.2 for most sites. To assist in this 1:10,000 Land-Form Profile digital height information was obtained from the OS.

Once rectified, images were imported into the AutoCAD drawing for the appropriate map and archaeological detail was transcribed using the appropriate layers and conventions for the form of archaeological remains. Features associated with a particular site were linked to Object Data tables containing details of the UIDs (unique identifiers) for associated monument records created in the AMIE database.

Appendix 4 illustrates the NMP conventions and layers in AutoCAD.

5.2 Database Records

5.2.1 AutoCAD

Object data, consisting of a single field with the relevant AMIE unique identifier number was attached to groups of objects that comprise each site within each drawing.

5.2.2 AMIE

An Event and a skeleton Collection record was created for the project (English Heritage: Gloucestershire NMP (Cotswolds and Forest of Dean) Event UID: 1362224; Collection UID: AF00056). Skeleton collection records, linked to the parent collection record, were also created for each map sheet.

Individual Monument records were created for each site transcribed, and where a record for the site already existed, this was updated.

5.2.3 Aerial Survey Records

Morphological records were created for appropriate sites using the Interim Morphological Recording Module and the Maps Database updated with relevant progress and statistical records pertaining to each map in the project.

5.3 Paper records

5.3.1 Map Note Sheet

A map note sheet for each quarter sheet was used to record any information about the geology, soils and other physical factors that may be relevant to the understanding of a particular map. These were also used to record major landscape change or other features worthy of note (for example negative evidence, or very general evidence for settlement change) which could not be incorporated into the transcription. These will be archived with the drawings.

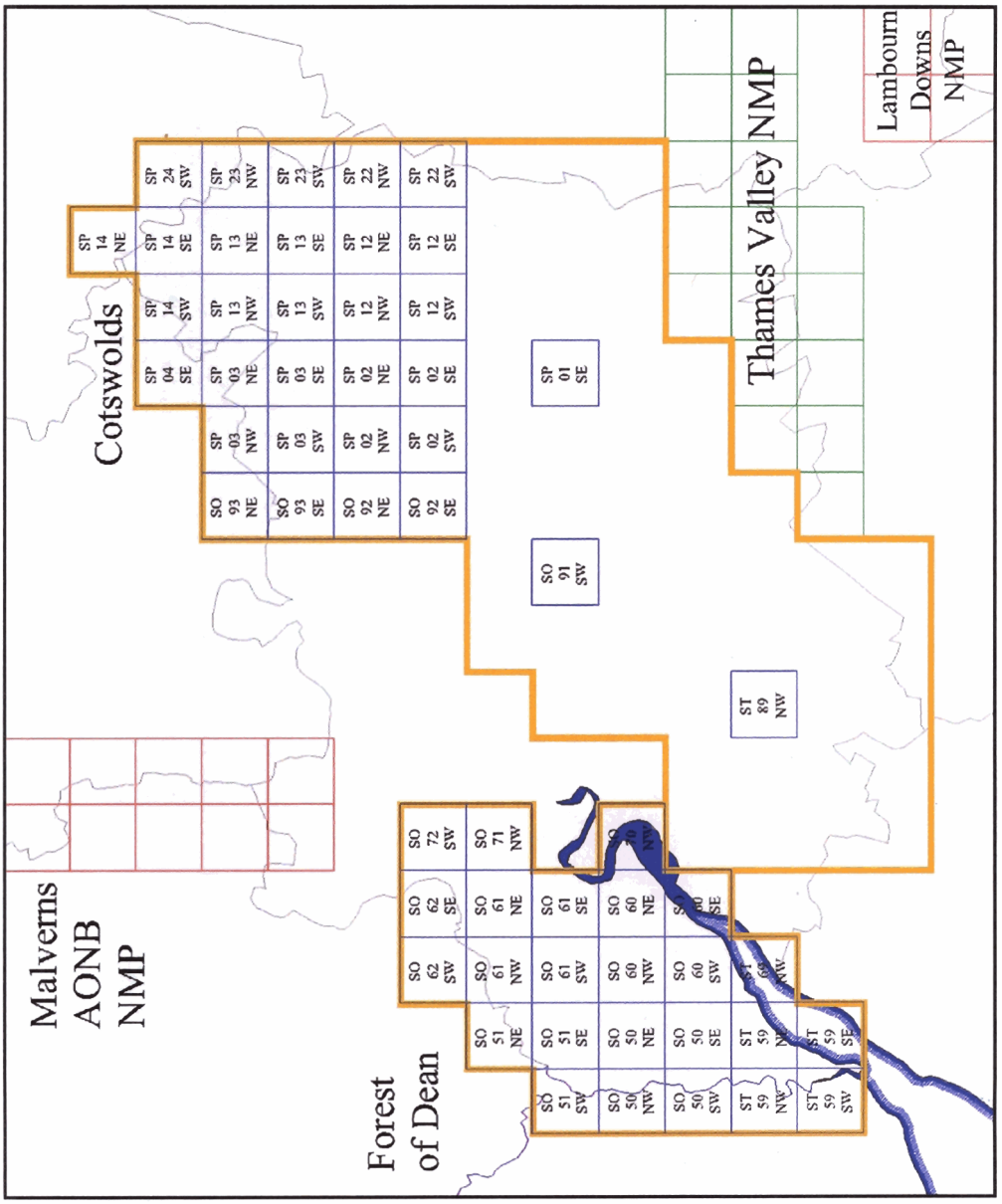
5.4 Field work

An initial field visit was carried out to familiarise the team with the general topography and main archaeological sites for each area. Later visits were made to areas that had raised specific problems or where it was felt that a site visit would clarify matters of interpretation.

APPENDIX 6

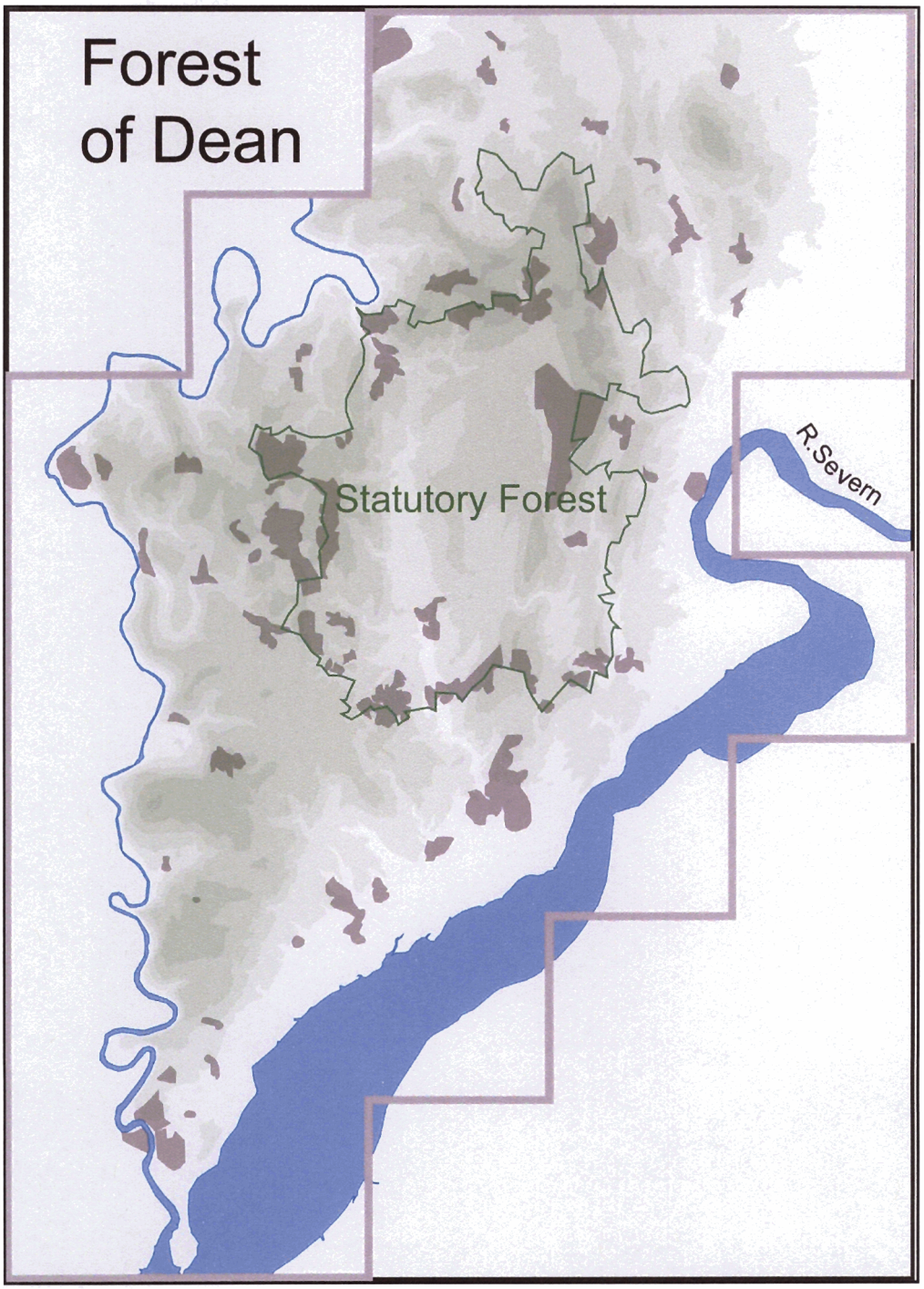
GLOUCESTERSHIRE NMP PROJECT AREA

This map illustrates the Forest of Dean and Cotswolds project areas and the proximity of other completed NMP projects.



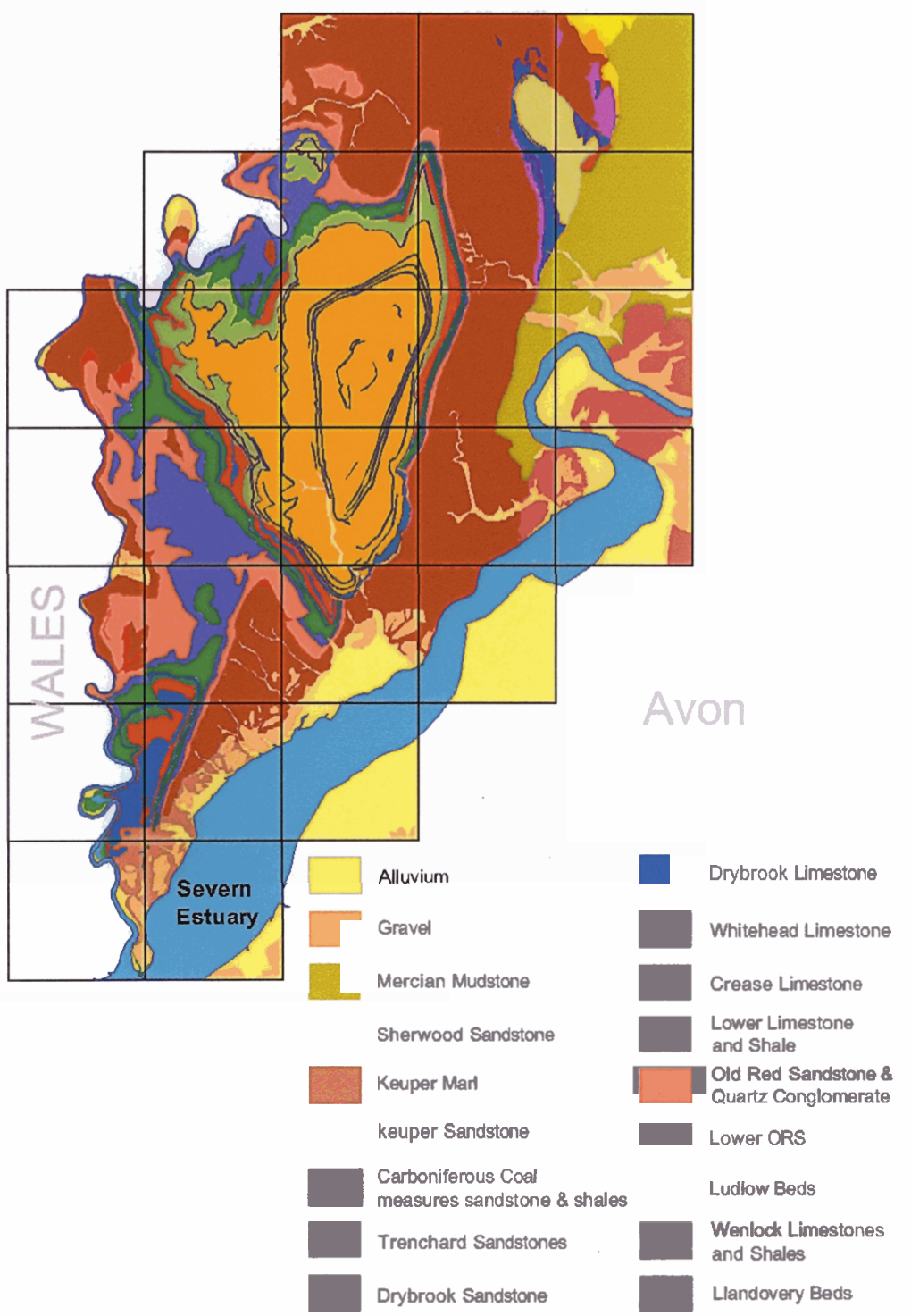
APPENDIX 7

RELIEF AND DRAINAGE OF THE FOREST OF DEAN



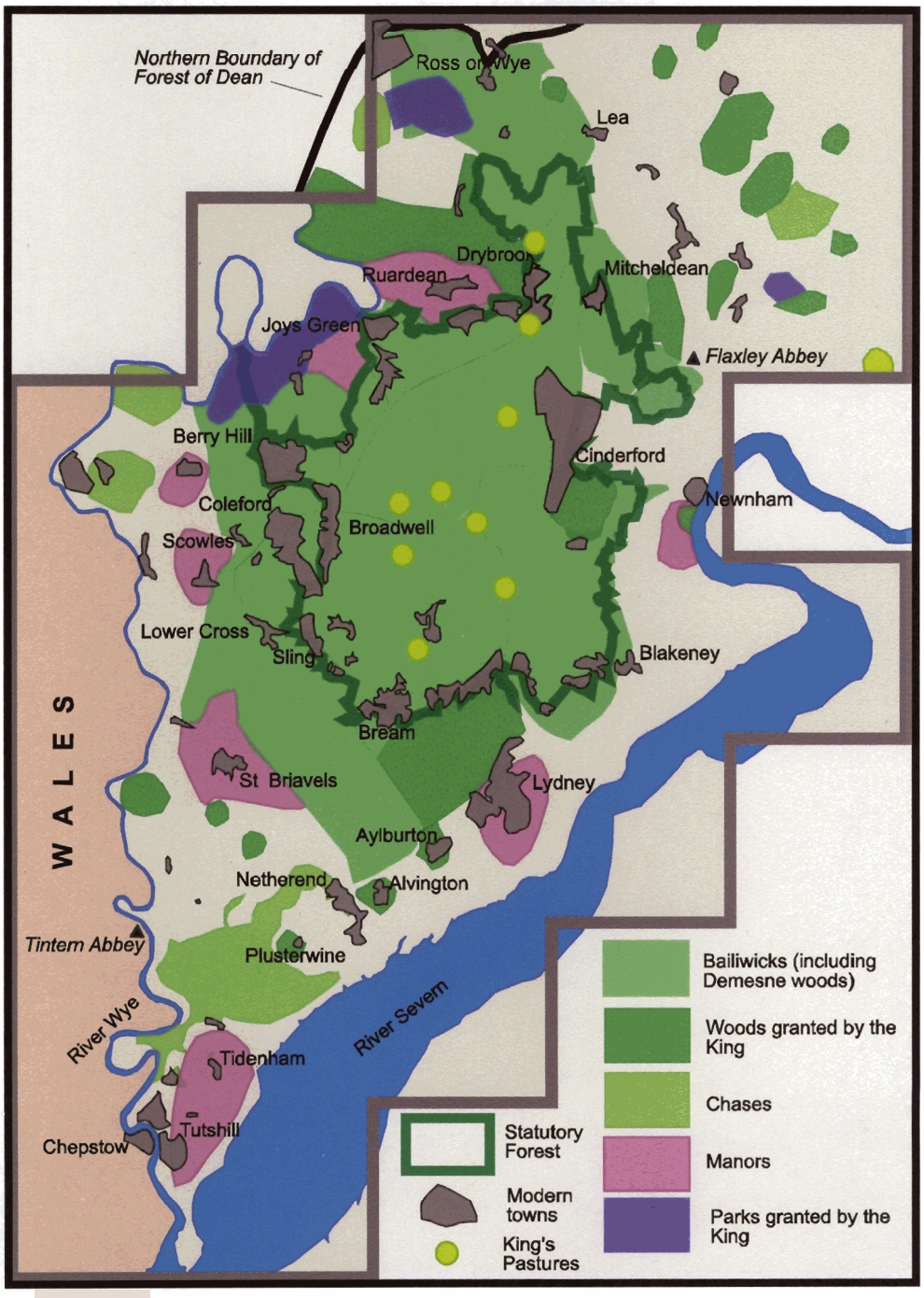
APPENDIX 8

THE GEOLOGY OF THE FOREST OF DEAN



APPENDIX 9

THE ROYAL FOREST AND SURROUNDING HOLDINGS c1282



The Forest of Dean c.1282. (After C. Hart 1971)