THE WEALD MOORS AND WALL CAMP: AN INVESTIGATION OF GEOMORPHOLOGY, HUMAN HISTORY, AND PALAEOENVIROMENT

by

SHELAGH MARGARET NORTON

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Department of Classics, Ancient History and Archaeology

School of History and Cultures

College of Arts and Law

University of Birmingham

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ABSTRACT

This thesis reviews the archaeological heritage of the Weald Moors, a wetland of low-lying, peat-based farmland in North Shropshire, dominated by the Iron Age 'marsh-fort' of Wall Camp; lithic scatters, Bronze Age metalwork deposition and a high number of burnt mounds also characterise the area.

Analysis was made of the published and unpublished literature, geomorphology, and archaeological records, and the palaeoenvironmental history was contextualised within the area of the North Shropshire Wetlands. Environmental samples, taken proximal to Wall Camp, were dated and analysed for coleopteran remains. The conclusions are that the peat, although it is known to be wasted in certain areas, preserves an early Holocene record (8550-8300 cal BC - 6370-6220 cal BC), and contains an insect fauna associated with reed-bed and fen-carr; microscopic charcoal is also present, although the origin is currently unknown.

The organic deposits of the Weald Moors contain considerable potential for further investigation despite their desiccated condition viz. the Mesolithic presence on the Weald Moors and the possibility of environmental manipulation; the environment contemporaneous with metalwork deposition and burnt mounds; and the purpose of Wall Camp, including its relationship with contemporary marsh-forts, both locally, e.g. the Berth, and nationally, e.g. Sutton Common.

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ABBREVIATIONS

BIIS	British Irish Ice Sheet
BSW	Bog Surface Wetness
GIS	Geographic Information System
HER	Historic Environment Record
LGM	Last Glacial Maximum
MNI	Minimum Number of Individuals
NWWS	North West Wetland Survey
OD	Ordnance Datum
PAS	Portable Antiquities Scheme
RDB	Red Book
SMR	Sites and Monuments Record
TLP	Total Land Pollen

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THE WEALD MOORS AND WALL CAMP

INTRODUCTION

The Weald Moors lie within the wider landscape of the wetlands of North Shropshire, immediately north of Telford and the River Severn, east of Shrewsbury, and south-west of Stafford (Fig. 1). They comprise around 14 linked moors covering an area of approximately 70^2km, characterised by a flat gradient and low-lying, marshy landscape. At the end of the Devensian Ice Age, the area was a pro-glacial lake basin; currently, the land is intensively farmed, shallow peatland, which maintains its wetland character in places, and which has yielded numerous archaeological finds spanning prehistory.

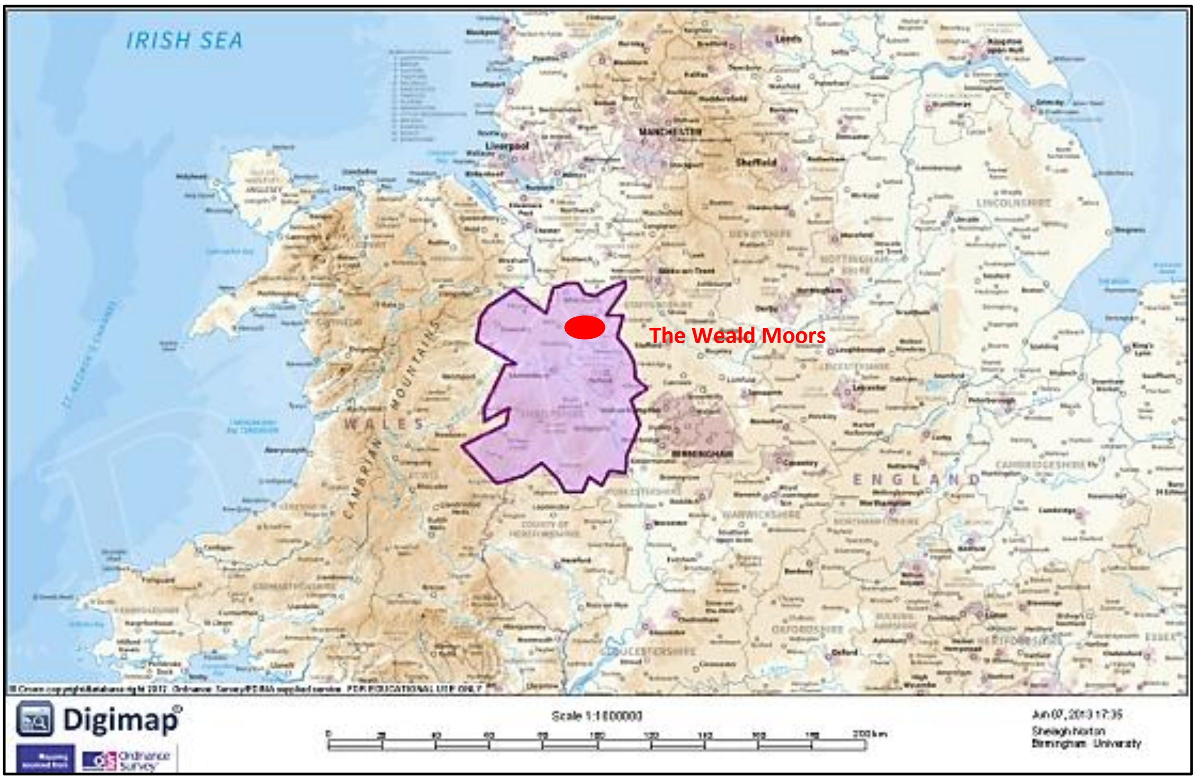

Fig. 1 Shropshire and the Weald Moors (Edina Digimap: Accessed March 2013)

As a microcosm of wetland archaeology, the Weald Moors is charged with questions, reflective of the 'wetland paradox' (Van de Noort 2004) – their considerable resources contrasting with the difficulties of day-to-day living; the open, surrounding landscape contrasting with the dangers and mysteries of living in a place of unpredictability and the need for 'inside knowledge'. The Mesolithic presence on the Moors is apparent in the quantity of lithic scatters, but anthropogenic burning at near-by King's Pool, Staffordshire (Bartley and Morgan 1990) may also indicate that the local reed-beds were managed environments; Neolithic artefacts are more elusive. Metalwork deposition on the Moors suggests a ritual landscape had developed by the

Bronze Age (Chitty 1953), perhaps amplified by the presence of ring-ditches at confluences on the River Tern overlooking the Moors (Mullin 2003; Buteux and Hughes 1995). The number of burnt mounds is significant; these may be 'boiling mounds', used for cooking, but may also hold ritual significance (Ó Néill 2009). Over time, and at a more practical level, the Moors may have developed into an area of food production and livestock management, controlled from the Iron Age enclosures which occupy areas of slightly higher ground.

It may be misleading to distinguish too strongly between ritual and domestic activity (e.g. Buteux and Hughes 1995), and these concepts coalesce in questions regarding the purpose of the dominant archaeological feature of the Weald Moors - the Iron Age 'marsh-fort' of Wall Camp. Shropshire is rich in upland hillforts, and Wall Camp is the third largest 'fort' in the county; however, its topography and construction has conceivably more commonality with forts and enclosures in the Fens (e.g. Sutton Common; Van der Noort *et al.* 2007) than with its neighbours in the Welsh Marches, and suggestions regarding its purpose range from a ranch/stockade (Bond 1991) to a ritual maze (Malim and Malim 2010). By contrast, the Roman presence at Wall Camp, and on the Moors as a whole, is minimal especially given the proximity of *Viroconium Cornoviorum*, modern Wroxeter.

An investigation of the palaeoecology of the Weald Moors has the potential to address some of these questions, by contextualising the prehistoric landscape, and providing insight into past usage. However, the only palaeoecological survey undertaken to date, as part of the North West Wetlands Survey (NWWS) of Shropshire and Staffordshire (Leah *et al.* 1998), was marred by high levels of desiccation and peat wastage; nevertheless, NWWS drew a generic conclusion that the Weald Moors were reed-bed and fen-carr throughout prehistory (*ibid:*75). The rest of North Shropshire has fared better in palaeoecological terms, and a substantial archive exists which can be mined for evidence of landscape change to provide a regional context.

Despite its archaeological richness and potential, the Weald Moors lies on the fringes of investigation, always on the edge of a different study (e.g. Carver 1991); consequently the area remains under-researched both archaeologically and palaeoenvironmentally. This thesis aims to identify the nature of the environment of the Weald Moors during the Holocene and contextualise the archaeological records within the regional landscape, with particular reference to Wall Camp. Chapter 1 will review past literature to provide a backdrop for subsequent analysis. Chapter 2 will investigate the geological and topographical character of North Shropshire and the Weald Moors, and highlight the importance of wetlands as archaeological archives. Chapter 3 reviews the geomorphology of the landscape, its impact on the archaeological record, and the potential for archaeological prospection. This thesis would be incomplete without an evaluation of Wall Camp. This is addressed in Chapter 4, which summarises previous excavations, and compares Wall Camp with other forts and enclosures both locally and elsewhere; of necessity, this can only be the beginning of a much larger piece of work. Chapter 5 reviews the palaeoenvironmental sequence for North Shropshire in relation to the Weald Moors, together with the results of a palaeoentomological study of organically rich samples from close to Wall Camp. The objective of the study was to identify the environmental signature prevailing at the time of the marsh-fort's occupation. A temporal discontinuity meant that this was not possible, but newly acquired information, supported by radiocarbon dates, provides evidence for the palaeoenvironment of the Early Holocene, and contextualises the environment for later occupation. Chapter 6 draws conclusions, and highlights areas for future research.

The modern Weald Moors is relatively isolated farmland, pocketed by a few small villages, whilst the growing conurbation of Telford encroaches from the south. There is a concern that peat wastage and developments in arable farming will continue to undermine the archaeological archive. This is true, but substantial peats deposits are still to be found, and given its heritage, the area should be thoroughly investigated before the remains are lost.

Dates

All the dates referred to in the text have been recalibrated (95.4% confidence) using Oxford Radiocarbon Accelerator Unit (OxCal[1]), and a list is available in Appendix 3. When it is not possible to discuss recalibrated dates, radio carbon determination is signified by the use of BC, AD or BP depending on the source text.

[1] http://c14.arch.ox.ac.uk/embed.php?File=oxcal.html

THE WEALD MOORS AND WALL CAMP

CHAPTER 1

1. North Shropshire and the Weald Moors - previous archaeological research

'From the point of view of the archaeologist, (Shropshire) can claim to be one of the least interesting localities in the whole of the British Isles' (Pevsner 1958:13)

Perhaps Pevsner, writing in 1958, underestimated Shropshire. Contrary to his view, North Shropshire, and the Weald Moors in particular, are rich archaeological landscapes which continue to be under-researched, and this chapter will begin the argument to prove that conclusion.

Given the wealth of the archaeological record, references to the Weald Moors are surprisingly few; where they do occur, it is usually within volumes covering the wetlands of North Shropshire, Shropshire as a whole, the Welsh Marches, or the West Midlands. This chapter presents a chronological overview of previous archaeological and palaeoenvironmental research for the Weald Moors, and places it within the wider context of the North Shropshire wetlands.

1.1.Early Excavation and Research

Lily F. Chitty was a local prehistorian active in archaeology from the 1920s, and from the 1930s, local secretary of the Royal Archaeological Institute. As a prominent member of the Shropshire Archaeological Society until her death in 1979, she worked with archaeologists to document the prehistory and history of Shropshire and the Welsh Marches (e.g. collaborating with Fox to produce the Highland and Lowland zone model; Wigley 2002b). Some of the evidence and artefacts available to Chitty have gone missing over the years (e.g. artefacts from a study of metalwork deposition on the Weald Moors; Chitty 1953), and part of the value of early recordings is in capturing contemporary evidence. Chitty's collected papers are deposited in the Shropshire County Council archive (e.g. Chitty 1992). 'An Introduction to the Archaeology of Shropshire' (Chitty 1956), summarises much of what was then known for the area.

Chitty is a point of reference for those who came after her. Between the 1950s and the 1980s, a group of academics at University of Birmingham, specialising in archaeology and geomorphology, looked locally for their inspiration at the under-represented and on the face of it, empty landscape of Shropshire and the West Midlands. Archaeological excavation of upland hillforts in the Welsh Marches and Shropshire included The Berth Iron Age fort (Gelling in Guilbert *et al.* 1977) and the Wrekin (Stanford 1984), and Carver (see 1.3 below) identified Stanford's work as *'the proper point of departure for any consideration of prehistoric Shropshire'* (1991:1). Covering a broad sweep of history from the Mesolithic to the Middle Ages, Stanford (1991) was perhaps the first to raise the question of the extent to which findings – from the multi-period sites of Sharpstone Hill, south of Shrewsbury, to Bronze Age barrows in Bromfield, to Roman Wroxeter – represented a culture that was localised and settled, or transient, and thence whether the region had a coherent identity, and this question continues to be debated (e.g. Garwood (Ed) 2007). Wall Camp was Stanford's focus for the Weald Moors.

1.2.Aerial Photography

Rightful acknowledgement is given to aerial photography as a method of transforming knowledge of Shropshire's past, notably the contributions by J. K. St. Joseph, Baker (1992) and Whimster (1989). Hundreds of ring-ditches and enclosure sites were identified in Shropshire by this method of archaeological prospection. The ring-ditches are interpreted as the remnants of Bronze Age round barrows, overturning the perception in some older texts that Shropshire was *'something of a wasteland prior to the Iron Age'* (Wigley 2002a:1). The enclosures are assumed to be of Iron Age date, but may also mask earlier occupation e.g. at Meole Brace, part of the Sharpstone Hill complex south of Shrewsbury (Hughes and Woodward 1995). Together, these discoveries began to argue the case for Shropshire as a well-populated area from at least the Bronze Age.

1.3.'A Strategy for Lowland Shropshire'

'A Strategy for Lowland Shropshire' (Carver 1991) presented the case for the archaeological heritage of lowland Shropshire, highlighting *inter alia*, excavations at Sharpstone Hill, Castle Farm and Wall Camp (see 1.8 below). 'Lowland Shropshire' in this instance is interpreted as the Upper/Middle Severn Valley (particularly the Shrewsbury Plain, but not including the North Shropshire wetlands) and the Upper Teme Valley (the area to the north-west of Ludlow). The Weald Moors are referred to only in relation to Wall Camp (Carver 1991:7). With reference to Iron Age hillforts and enclosures, Carver makes the point that there appears to be a '*spectrum from the simple enclosure of Site A, and the defended Site E (at Sharpstone Hill), through the hillfort-like enclosure and outworks at Wall Camp with its round house and four posters, to the Berth, Old Oswestry, Bury Walls and the rocky Wrekin, which suggest a chronological, functional* *or social hierarchy of a most complex kind*.' (*ibid*:4). In this statement, there appears an ambivalence towards Wall Camp – is it hillfort or enclosure? The debate regarding its purpose is material to this thesis.

1.4.North West Wetland Survey

'The Wetlands of Shropshire and Staffordshire' (North West Wetlands Survey 5; Leah *et al.* 1998) concluded a programme of wetland surveys of north-west England that had previously included sites in Merseyside, Cheshire, Greater Manchester and Cumbria. Undertaken by the University of Lancaster, their volume for Shropshire and Staffordshire is a major source of data for this thesis. The surveys combined historical research, a review of the Sites and Monuments Record (SMR, later the Historic Environment Record (HER)), fieldwalking, and palaeoenvironmental research. The meres, mosses and mires reviewed in North Shropshire included Baggy Moor, the Mid-Shropshire Wetlands, Top Moss, the Ellesmere Meres, and the Weald Moors; several meres and mosses were surveyed in Staffordshire - Aqualate Mere and King's Pool being of most relevance.

NWWS added 164 sites (of all periods) to the Shropshire SMR (Leah *et al.* 1998:137-151). The Mesolithic, Neolithic and Early Bronze Age were represented by lithic scatters, and the Middle Bronze Age by a number of burnt mounds or areas of burnt stone. In terms of structures, the Berth near Baschurch, Wall Camp on the Weald Moors, and Bury Walls at Top Moss, were all noted as important sites representing Iron Age development. Roman and post-Roman evidence was sparse and scattered. NWWS identified that, in addition to what could be gleaned from fieldwalking and site observation, the major value of these wetlands lay in their palaeoenvironmental archive (see 1.9 below).

47 prehistoric finds were made on the Weald Moors, a significant 28% of the total, covering lithics scatters on areas of higher ground, burnt mounds or scatters of burnt stone, and a small amount of Roman pottery. The Moors were, and are, largely under arable farming, and perversely, the intensiveness of the farming practices probably increased the number of finds made by providing fieldwalking opportunities. Wall Camp is protected as a Scheduled Monument (see Chapter 4), and is grazed.

NWWS made general recommendations for further research e.g. into the distribution and usage of burnt mounds, and suggested repeated fieldwalking in some areas for lithics scatters and Roman pottery (notably, at Adeney on the Weald Moors). Further palaeoenvironmental investigation was also recommended, and this was endorsed in *The Archaeology of the West*

Midlands (Watt 2011:120, see 1.7 below). NWWS also highlighted potential threats to hitherto undisturbed archaeology, notably arable farming and the growth of certain crops (e.g. commercially grown miscanthus).

1.5.Hillforts and enclosures of the Welsh Marches

It is not the purpose of this thesis to review the extensive archaeological research of the upland hillforts and enclosures of the Welsh Marches, many of which have been subject to excavation. Breiddin Hill (Musson 1991) establishes a sequence for hillfort development in the Welsh Marches, and nearby Collfryn has some similarities, in terms of construction and artefacts, with Wall Camp (Britnell 1989). Although the Weald Moors/ Wall Camp lie on the easterly fringe, the monuments of the Welsh Marches nevertheless provide a temporal and topographical context for this study. Wigley addressed the chronology and the spatial alignment of ring-ditches, pit alignments, enclosures and hillforts, arguing the need to re-evaluate the hillforts and other structures of the Welsh Marches on their own merits rather than simply as a poor reflection of the established histories of Southern England (Wigley 2002a); references to the Weald Moors are limited to the numerous burnt mounds and to Wall Camp. Many of his conclusions feed directly into the West Midlands Research Framework (see 1.7 below), and have relevance to this thesis. Investigations of the hillforts and enclosures closest to the Weald Moors are detailed below (see 1.8 below).

1.6.The Wroxeter Hinterland Project

The Wroxeter Hinterland Project was instigated '*to investigate the effects of Romanisation within the area of the Roman town of 'Viroconium Cornoviorum', present day Wroxeter'* (White 1997); the Weald Moors lie within the subject area, 13km north-east of Wroxeter. At its heart lay the question of why Roman Britain's fourth largest *civitas* appeared to lack a domestic and economic hinterland, concluding that this interpretation was more apparent than real. Although the project centred on the use of *'GIS (Geographical Information Systems) software as the primary analytical tool'* (White 1997:2), the work was supplemented by fieldwalking (which also produced a '*background scatter'* of '*only 94'* flints (Barfield 2007:99), yet to be incorporated into the HER) and palaeoenvironmental analysis. The research concentrated on the Roman era, and incorporated part of the Weald Moors, in particular Tibberton Moor immediately north of Wall Camp, and Longden-on-Tern on the south-west edge of the Moors. However, *'neither site produced significant clusters of Roman material'* (White 1997:7); the general lack of Roman finds in the area is discussed below (see Chapter 3.4.4).

1.7. The West Midlands Research Framework/ The Archaeology of the West Midlands

'The West Midlands Research Framework', an initiative funded by English Heritage and led by the University of Birmingham, focused attention on the wider West Midlands as an under-researched area. The resulting published monograph - *The Undiscovered Country* (Garwood (Ed) 2007) – summarised the early prehistory of the West Midlands, which included North Shropshire, and referencing the Weald Moors; this and later historical periods were summarised in the 'round-up' volume, *The Archaeology of the West Midlands* (Watt (Ed) 2011). The conclusions *inter alia,* were that there were far more prehistoric and Roman sites in the region than had been previously identified, and that sites were highly likely to have been re-used; it also indicated that more opportunities should be taken for palaeoenvironmental and geophysical research.

Modern administrative units (i.e. Staffordshire, Shropshire, Herefordshire, Worcestershire, Warwickshire and the Birmingham conurbation) provide a convenient border for this framework, albeit that there is a danger that the borders may artificially limit research e.g. the spatial distribution of round barrows and their affinities with those in neighbouring counties (Garwood 2007). This echoes Stanford's earlier concerns (see 1.1 above) regarding the extent to which the modern West Midlands had a coherent identity in prehistory.

1.8. Investigation and Excavation in the vicinity of the Weald Moors

An examination of the grey and published literature reveals a number of excavations of hillforts and enclosures which throw light on the prehistory of the North Shropshire area. Those within a 30km radius of Wall Camp are summarised for the purposes of this chapter as follows:-

- Set on a promontory overlooking Top Moss and 16km north-west of Wall Camp, **Bury Walls** (SJ559213) was an Iron Age hillfort, re-used as a Romano-British settlement (with a possible Roman temple), and as a medieval village. Excavated in 1930 (Morris 1932), no further activity is recorded until a geophysical survey of the fort in took place in 2003 (Murdie *et al.* 2003).
- **Castle Farm** (SJ747078) was excavated in 1980 (Roe 1991) and lies 12.5km south east of Wall Camp, outside the Weald Moors. It is recorded as an Iron Age enclosure with some Romano-British evidence.
- **Pave Lane** (SJ758166) is 8.5km east of Wall Camp, on the fringes of the Weald Moors. This Iron Age farmstead was initially identified from aerial photographs, and was

investigated in 1990; its ditches and banks are still extant. A palynological survey indicated a contemporary pastoral environment (Smith 1991).

- **The Wrekin** (SJ628080) is one of Shropshire's most prominent landmarks, and overlooks the North Shropshire Plain, with good visibility in all directions. The substantial defences of its hillfort follow the contour close to the summit. Excavations were by Wright in 1872, Kenyon in 1939 (Kenyon 1942), and Stanford in 1973 (Stanford 1984). Its history dates from the Bronze Age to its destruction and final abandonment in the Romano-British era. Wall Camp lies 10.7km to the south-west; the Wrekin in the only hillfort with which it has intervisibility.
- **Haughmond and Ebury** (SJ542134 and SJ514149) are neighbouring Iron Age hillforts, 3km apart, and 15km to the west of Wall Camp. A small investigation took place at Ebury (Stanford 1977) which produced Iron Age pottery and two small pits.
- An important concentration of prehistoric activity lies immediately south of Shrewsbury. **The Burgs** (SJ489084) at Bayston Hill is a small hillfort, 20km from Wall Camp and close to Shomere and Bomere Pools. Chitty found a plano-convex knife and pottery sherds and produced a short report but no modern excavation has occurred. The known information was summarised by Tyler (1983). **Sharpstone Hill** (SJ492089; Barker *et al*.1991) and **Meole Brace** (SJ489106; Hughes and Woodward 1995; Bain 2007, 2011) comprise adjacent multi-period sites covering approximately 9 acres between the Rea Brook and the River Severn. These were the first prehistoric lowland sites to be investigated in Shropshire, evincing human activity in the northern part of the county from the Neolithic onwards, and confirming the area's rich prehistoric past. Remains include a Neolithic/Beaker pottery, three Middle Bronze Age barrows with evidence of cremation, Late Bronze Age/Iron Age pits and post holes, a bronze awl, an Iron Age sub-square enclosure with a causeway and other structures, and a Roman field system and settlement.
- A small multivallate lowland hillfort exists at **Pimhill** (SJ470190), at Bomere Heath, 20km from Wall Camp, but no excavation record exists (Shropshire HER2418)
- At a further distance, **The Berth** at Baschurch (SJ423218) lies 27km west of the Weald Moors. It is an easterly outlier of an important group of hillforts that lie at the northern end of the Welsh Marches, and include Old Oswestry and Llanymenych. It was excavated by Gelling and Stanford in 1962-3 (Guilbert *et al.* 1977), and although there have been subsequent finds including a glass bead and an Iron Age cauldron, perhaps

the greatest interest lies in its structure - two fortified sites on glacial mounds surrounded by water/peat bog connected by a causeway. There are similarities with other low-lying 'forts' in the eastern Fen country e.g. Sutton Common, near Doncaster, and with Wall Camp.

- The **Weald Moors** have been subject to survey (see 1.4 above) and limited excavation, centring mainly on Wall Camp, is described in Chapter 4 (Pagett, summarised by Malim and Malim 2010; Bond 1991). A geophysical survey was made on behalf of Severn Trent Water to establish the route for a pipeline immediately outside the northern embankments of Wall Camp (Hale 2008; see 3.3.1.4 below). A burnt mound has been excavated at Rodway (Hannaford 1999; see 3.4.2.3 below).

1.9.Palaeoenvironmental Research

Examination of the palaeoenvironmental record for the wider area of the West Midlands has been generally sparse (Greig 2007); however, North Shropshire has fared better, and research was summarised by Twigger and Haslam (1991) and by NWWS (Leah *et al.* 1998). In their turn, all these studies build upon earlier geomorphological research for the West Midlands e.g. at Upton Warren (Coope *et al.* 1961); in the Severn/Avon catchment (Shotton 1967, 1978); the River Severn (Brown 1987a; 1987b; 1988; 1990; 1991;1992) and Ripple Brook (Brown and Barber 1985).

The pattern of geomorphological and palaeoenvironmental development for the North Shropshire Wetlands is constructed from the following studies:-

- The geology and ecology of the North Shropshire meres and mires was summarised in early studies by Whitehead *et al*. (1928), Sinker (1962) and Reynolds (1979); although these studies provide a backdrop for the area, the Weald Moors are not addressed in detail.
- Early research into the history of three mosses in the **Ellesmere area** was undertaken by Hardy (1939). Subsequently, Turner (1964) provided an early pollen diagram for **Whixall Moss** showing repeated forest clearances and woodland recolonisation throughout the prehistoric period.
- The pollen evidence from **Crose Mere** (Beales 1980)**,** northwest of Shrewsbury established a sequence for palaeoenvironmental reconstruction in the North Shropshire area, and covers the period from the Late Devensian onwards.

- Bartley and Morgan (1990) undertook palynological analysis of a 13m core at **King's Pool, Staffordshire**, 23km north-west of the Weald Moors, covering a time span from the Late Devensian to the Early Medieval.
- Twigger undertook a series of studies of the **Mid-Shropshire Wetlands,** encompassing Berth Pool, Birchgrove Pool, Marton Pool, Fenemere, Boreatton Moss and New Pool; this study was incorporated into the synthesis of North Shropshire's palaeoenvironmental record by Twigger and Haslam (1991).
- Brown (1988) investigated the decline of *Alnus sp.* within tributaries of the River Severn, focussing on the Wilden Brook in Worcestershire, but also including the area around **Ruyton-xi-Towns** (within the River Perry catchment). More specific catchment analysis of the **River Perry,** a tributary of the River Severn which flows through the western section of North Shropshire's wetlands, included vegetation and sedimentation analysis (Brown 1990).
- NWWS included nineteen palaeoecological assessments (mainly pollen records) in their survey of the North Shropshire area. Their study at **Top Moss** (Leah *et al.* 1998:173-180), a relict raised mire below the Iron Age hillfort of Bury Walls, provided an environmental archive spanning Mid/Late Neolithic to Late Iron Age.
- Although the potential for palaeoenvironmental investigation on **the Weald Moors** appears to be good, NWWS concluded that the organic residues had wasted to such an extent that the value of the archive was severely jeopardised (Leah *et al.* 1998:120); this conclusion is re-evaluated in this thesis.
- Pollen evidence from **Bomere and Shomere Pools** was sampled part of the Wroxeter Hinterland Project (Gaffney *et al.* 2001).

In very broad terms, the picture painted for North Shropshire is one of sporadic, short term clearance and regeneration from the Neolithic onwards, reflective of human agency and climatic variations. A pattern of repeated woodland clearance and human disturbance developed in the Bronze Age, accelerating in the Iron Age, and can be traced into the Roman era; throughout, analysis reflects a pastoral rather than an arable economy. Although these conclusions broadly reflect a national model, there is scope for more detailed investigation to clarify land-use and societal development at local level (see Chapter 5). The question – the extent to which climate change or human agency is reflected in the environmental samples, and the human response to poorer climatic conditions - is ripe for investigation, and the variations exhibited within the North Shropshire area are of relevance to this study.

1.10. Previous Research - Summary

Contrary to Pevsner's view, perceptions of the region's history have changed, and Shropshire is now viewed as an area potentially rich in archaeological resources. The palaeoenvironmental record especially, is comprehensive enough to create a framework of environmental change for the area, albeit that the mosaic lacks fine detail. Much of the research summarised in this chapter has occurred since 1980, but in spite of the strategies put forward for archaeological research (Carver 1991; Watt (Ed) 2011), no body of work exists to draw together the threads of existing research and expand into new areas.

This conclusion is particularly applicable to the Weald Moors – an area of substantial peat deposits, traversed by Mesolithic and Neolithic hunters, the focus for deposition practices and burnt mound activity during the Bronze Age, and containing one of the largest Iron Age forts/enclosures in the region. In much the same way as the West Midlands/Shropshire could be viewed as under-researched and peripheral, these concepts can also be applied to the Weald Moors. It is liminal to other areas mentioned – on the border with Staffordshire, on the edge of the Shrewsbury Plain, part of the Severn catchment by virtue of its drainage into the River Tern, on the outermost fringes of the Welsh Marches hillforts, sitting in a triangle between three major Roman roads - all of which tends to place the Moors on the outskirts of people's interest. Hence it 'flies beneath the radar' and is neglected as a consequence. Perhaps the name is a clue – equating 'weald' (Old English for *forest*[2]*)* with 'wild' – a wild wetland area, on the outskirts of immediate consideration, with consequences for its interpretation from prehistory to the present day. The following chapters of this thesis will go some way to addressing these omissions.

[2] http://www.lexilogos.com/english/english_old.htm

2. North Shropshire and the Weald Moors – geology, geomorphology, and the archaeological importance of wetlands

This thesis is fundamentally about wetlands, in particular the wetlands of North Shropshire and the Weald Moors. The current landscape is the product of a range of interrelated features and influences. This chapter provides an overview of wetland archaeology, a regional context for the geological and geomorphological factors which give the wetlands of the North Shropshire Plain, and the Weald Moors in particular, their special character, and describes their development during the Quaternary.

2.1. Shropshire

2.1.1. Location and Overview (Fig. 2)

Shropshire lies between the West Midlands Plain and the Welsh Marches. In broad geographical terms, the county is divisible into an upland south and west, with the Shropshire Hills to the south of the county and the Longmynd and the Stiperstones to the west towards the Welsh border; and a lower lying region to the north and east, where the land merges with the Cheshire Plain and North Wales to the north and the Midlands Plain to the east.

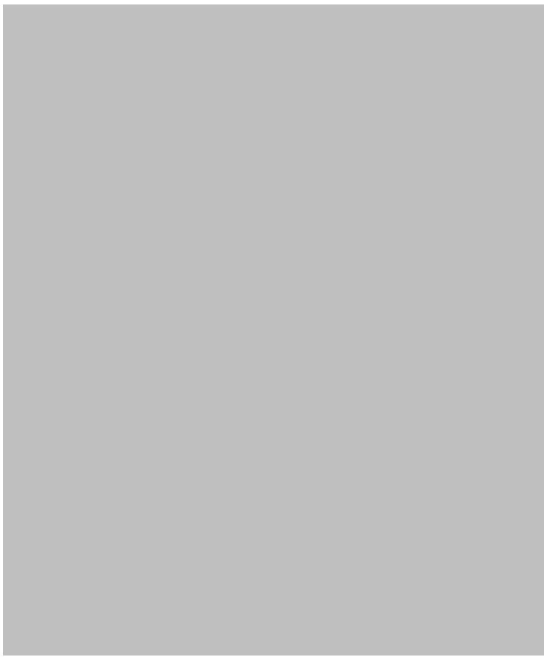

Fig. 2 Shropshire boundary (Source: Wikipedia 2013)

2.1.2. Shropshire Geology (Fig. 3)

Shropshire's geology is old and varied for a county of its size, with rocks of almost every period from the Pre Cambrian to the Jurassic, and this has shaped human usage of the land (Dineley 1960; Toghill 1984,2006).

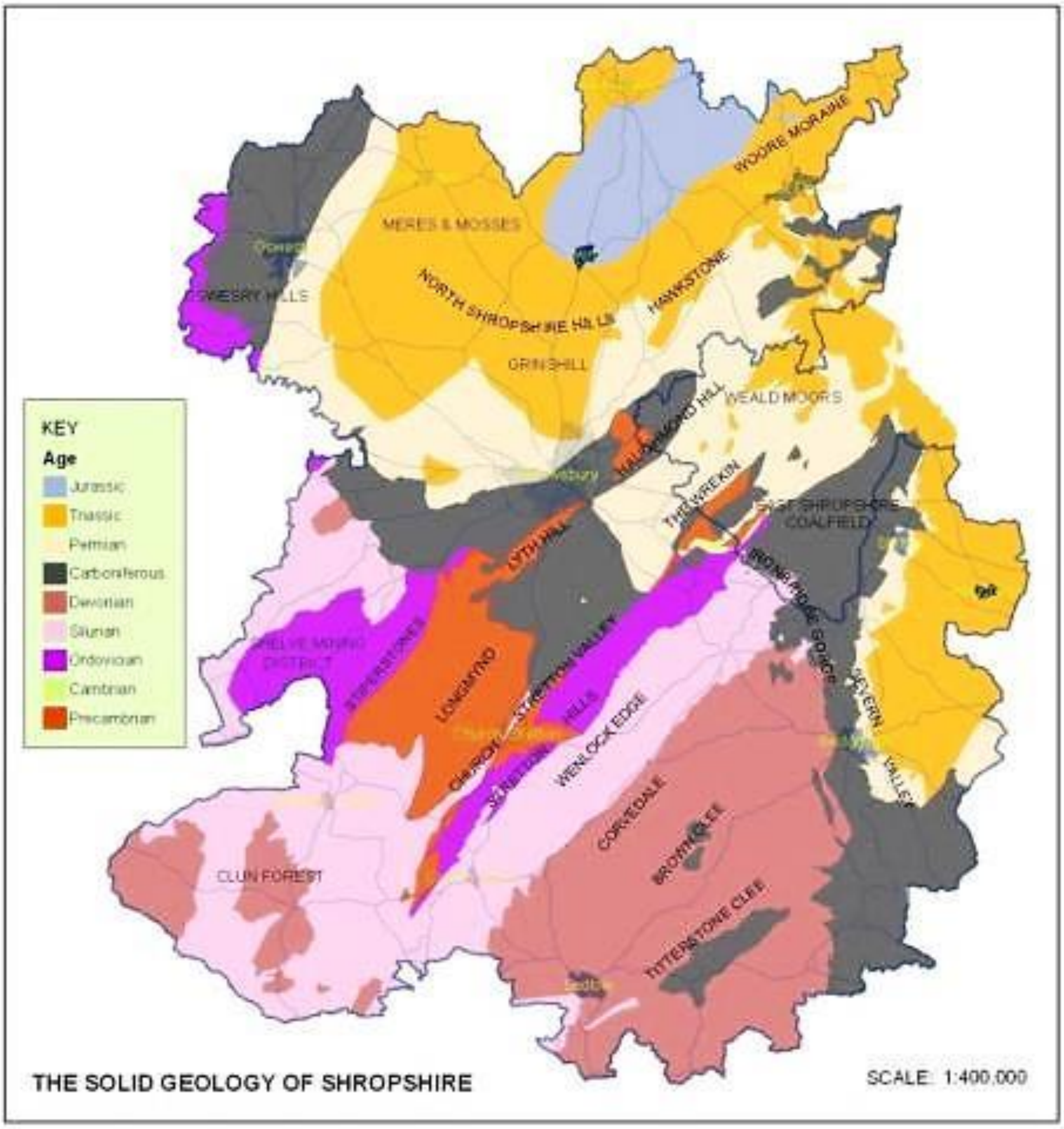

Fig. 3 Shropshire: Solid Geology[3]

The county can be divided into three geological regions. The northern and eastern plain consists of glacial deposits, resting *'upon an irregular "buried landscape" surface of Carboniferous and*

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[3] http://www.shropshire.gov.uk/planning.nsf/viewAttachments/GFRH-8YHE25/$file/shropshire-geology-map.jpg

other rocks' (Dineley 1960:104) i.e. Carboniferous, Permo-Triassic (Sherwood Sandstone Group) and Jurassic (Liassic clays). The basin of the Cheshire and North Shropshire Plains began to subside during the Triassic (Dineley 1960:104), and the area is punctuated by the results of glaciation in the form of meres, mosses and moraines (see 2.3 below).

The south and west of the county is dominated by some of the oldest rocks in Britain dating from the PreCambrian and the Palaeozoic (541 - 252.2mya). At their north-eastern extremity, these rocks appear as outcrops of, for example, Pre-Cambrian gritstone, quarried at Sharpstone Hill (SJ486088) and Haughmond Hill (SJ542134) near Shrewsbury (Toghill 2006:39), and iconic landmark of The Wrekin (SJ628080), a hill of volcanic origin rising to 407mOD, overlooking the North Shropshire Plain, which comprises layers of Uriconian rhyolite and tuff, overlain by deposits of sandstone and shale (Toghill 2006). The northern tip of these outcrops is also exposed on the Wrockwardine (SJ625118) and Lilleshall Hills (SJ732154), on the southern edge of the Weald Moors. Looking south-west, other landmarks such as Caer Caradoc (SO476961), the Longmynd (SO425944) and the Stiperstones (SO368986) are made up of Precambrian and Ordovician rocks, and these rocks extend westwards into the Cambrian Mountains (Toghill 2006). Many of the higher outcrops were utilised as hillforts in the Late Bronze Age/Iron Age, including Caer Caradoc, The Wrekin and Haughmond Hill.

Carboniferous deposits (coal, ironstone and limestone) extend discontinuously north-west to south-east across Shropshire's central area. Carboniferous limestone makes up Wenlock Edge, and substantial Coal Measures exist in the area of the Ironbridge Gorge and to the south of Shrewsbury (Toghill 2006). The mineral wealth of the county is sufficient to have been of historic interest; for example, lead was mined as early as Roman times at Snailbeach near the Stiperstones (SO373022; Shropshire HER984), and the mines at the large Late Bronze Age/Iron Age hillfort at Llanymynech (SJ269207; Shropshire HER 8401, 1117) on the western edge of the county were a source of lead and copper (Musson and Northover 1989, cited in Wigley 2002a:276). The presence of the raw ingredients for smelting – coal, limestone and iron ore – was a significant factor in the birth of the Industrial Revolution.

The county's main faultline is the Church Stretton Fault, running NE: SW through the county from just south of Newport (SJ747190) along the main 'grain' or strike of the geology (Dineley 1960:91; Fig. 3).

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2.1.3. Glaciation

The Devensian Cold Stage (115,000 – 10,000ya) included the last major glaciation to have affected the British Isles, and had a pronounced effect of the Shropshire landscape. In its later stages, the Welsh Ice Cap joined with the Irish Sea Glacier to form the British-Irish Ice Sheet (BIIS) (Fig. 4) which extended south and east, reaching its most southerly limit (the northern Scilly Isles and the Thames Valley) during the Late Devensian (Dimlington Stadial 26,000-13,000ya) (Chiverrell and Thomas 2010). It obliterated deposits of previous glaciations, and it is the effects of this ice sheet that are visible today.

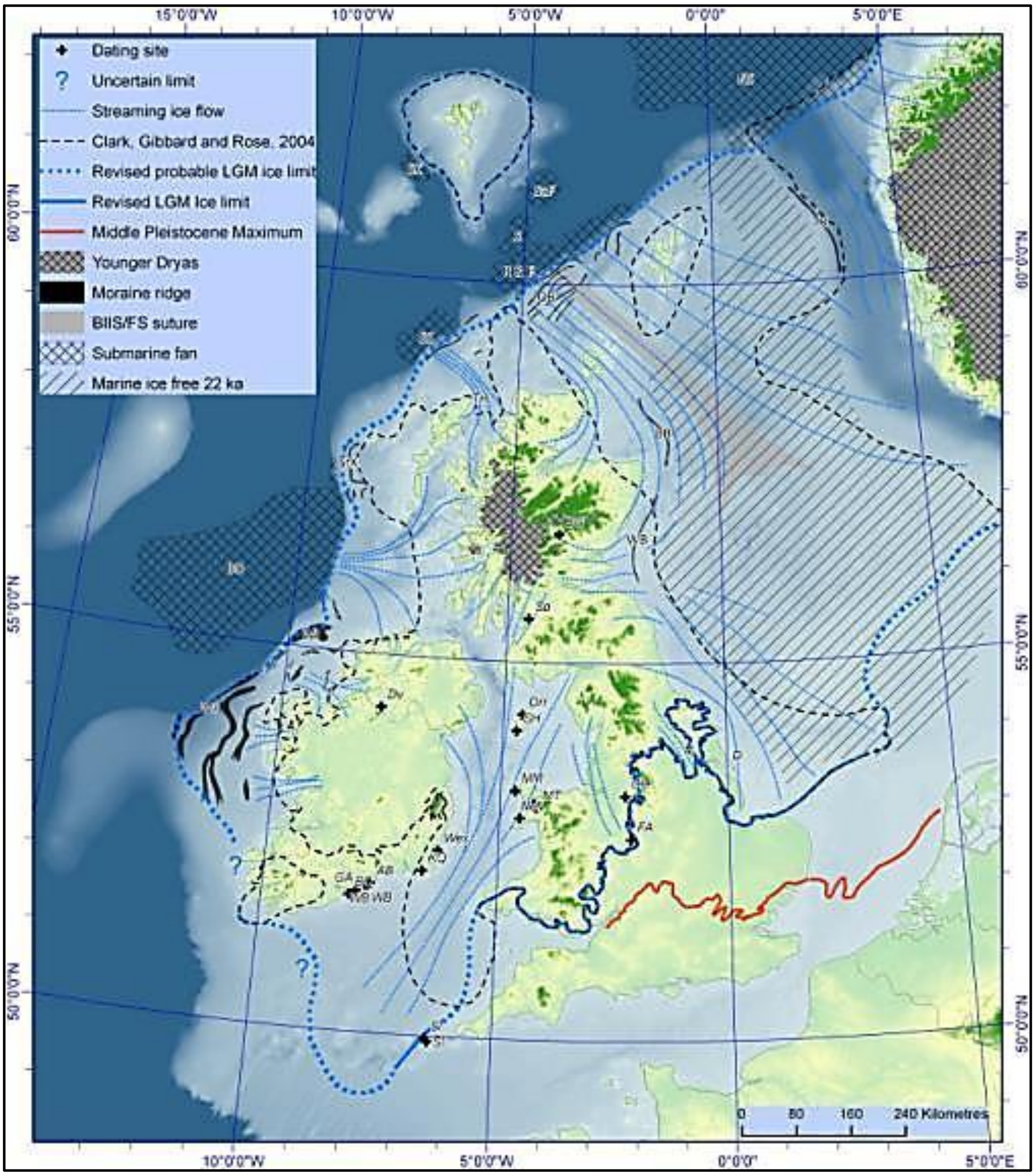

Fig. 4 Last Glacial Maximum (Chiverrell and Thomas 2010:537)

THE WEALD MOORS AND WALL CAMP

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At the Last Glacial Maximum (LGM) around 18,000ya, the ice sheet extended south from Stoke to Stafford; then curved south and west around Wolverhampton to cross the River Severn south of Bridgnorth (SO712930); thence northwest to Shrewsbury (Chiverrell and Thomas 2010:541). Although defining the limits of the LGM in the English Midlands requires further work, Chiverrell and Thomas have established that the BIIS was thicker and more extensive than had previously been defined and reveals a two phase sequence with ice advancing after ca. 34,000-32,000ya to reach a maximum between 30,000 and 21,000ya, with retreat and subsequent re-advance in the period 19,000-17,000ya (Chiverrell and Thomas 2010:544). A disused gravel pit at Four Ashes in Staffordshire, 20km east of the Weald Moors, has yielded an 11m sequence of palaeoecological and palaeoclimatological information (Huddart and Glasser 2002:136), covering the full extent of Devensian environmental change and showing evidence for the glacier's advance and retreat.

Glaciation dramatically alters landscapes by diverting river courses, expanding drainage networks, excavating basins, reworking solid geology and depositing large quantities of glacial material. In terms of drainage, before the Late Devensian glaciation, the proto-River Severn initially flowed south from its source in the Cambrian Mountains, then north-east to Welshpool (SJ225075), then north to the present River Dee, with higher ground, essentially part of the Wenlock Edge, forming the catchment watershed to the south around Ironbridge. When the BIIS began to retreat, the outflow for the upper Severn was still to be created. The ice-melt created pro-glacial Lakes Buildwas and Newport, which combined with other pro-glacial lakes i.e. Lakes Bangor and Prees (Murton and Murton 2012) to form Lake Lapworth (Fig. 5) (Dixon 1920, cited in Pannett 2008:88; Whitehead *et al.* 1928; Murton and Murton 2012), which at one point in the glacial melt, extended as far north as Manchester (Murton and Murton 2012). The southern part of the lake eventually discharged through the Ironbridge Gorge, forming the path of the modern River Severn. The previous existence of meltwater lake(s) is evident across the region, and in particular can be found in the superficial geology (lacustrine deposits and laminated clays and loams) underlying the Weald Moors (Whitehead *et al*. 1928:176).

The ice left a wide glacial legacy. The border between northern Shropshire and Cheshire is marked by the low hills of the Ellesmere/Whitchurch moraine (SJ395347/SJ542414), this watershed separating northerly flowing (e.g. the Dee) and southerly flowing rivers (e.g. the Roden) (Murton and Murton 2012:127). Eskers, sinuous ridges of sand left by glacial meltwater, are present as low hills in an otherwise flattish landscape; the esker system at Aqualate Mere (SJ780205) was formed during Late Devensian glacial retreat and demonstrates the link between eskers and fan deposits formed in the proglacial lakes (Huddart and Glasser 2002:144); the 'strines' (small rivers) of the Weald Moors rise in this esker system.

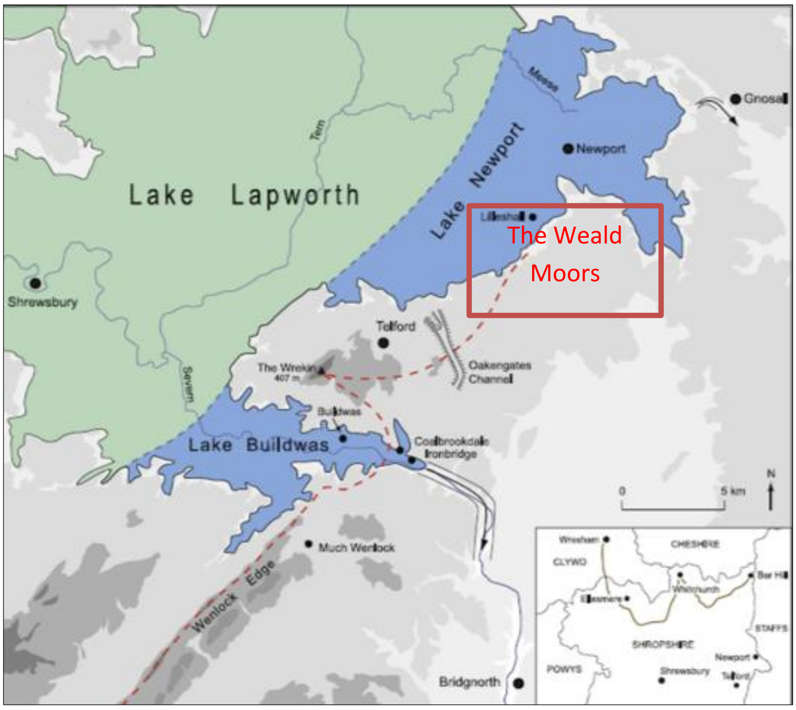

Fig. 5 The Weald Moors in relation to Lakes Buildwas, Newport and Lapworth (Murton and Murton 2012:Fig.10)

The transportation by ice and subsequent deposition of 'exotic' rocks is demonstrated by the presence of erratics from North Wales, the Lake District and Scotland (e.g. The Bell Stone, an igneous rock from either North Wales or the Lake District, displayed in Shrewsbury town centre; Pannett 2008:87). Glaciation could also be the source of raw material for '*the occasional battered flint'* (Whitehead *et al.* 1928:174) and black chert, subsequently crafted into tools during both the Mesolithic and Early Neolithic periods (e.g. those recovered from the Weald Moors around Adeney; Leah *et al*. 1998:73). Nodules containing black chert could have arrived via the ice from more northerly areas; there are sources at Alderley Edge on the Cheshire Plain, in the Derbyshire Peak, and in the North Flintshire limestone deposits (Hind 1998), although the possibility exists that it could have been imported by humans before being worked as tools (see 3.4 below).

2.1.4. Shropshire Hydrology – The River Severn

The county's drainage is dominated by the River Severn, Britain's longest river, which runs through the World Heritage Site of Ironbridge (SJ677034). It rises on Plynlimon (752mOD) in the Cambrian Mountains, is 354km long, and flows through Welshpool and Shrewsbury before turning south through the Ironbridge Gorge, thence through Worcestershire and Gloucestershire where it is joined by the Teme and Avon, before discharging into the Bristol Channel (Fig. 6). It is currently classified on a worldwide scale as a '*small, low relief catchment with a maritime, temperate climate'* (Brown 1991:147). The Upper Severn is generally classed as the reach from source to the River Vrynwy, the Middle Severn as the reach between the Vrynwy and the Ironbridge Gorge, and the Lower Severn as the remainder of the river before forming the Severn Estuary (*ibid:*149). In common with other rivers, the Severn underwent a transformation at the end of the last glacial from a high-energy braided system to a low-energy anastomosing-meandering system (*ibid*: 165). The river has been subject to human interference by the creation of reservoirs, water abstraction, canalisation, and straightening, and it is regarded as a semi-regulated river system (*ibid*: 150). Historically, the river was navigable up to Pool Quay near Welshpool (Pannett 1987).

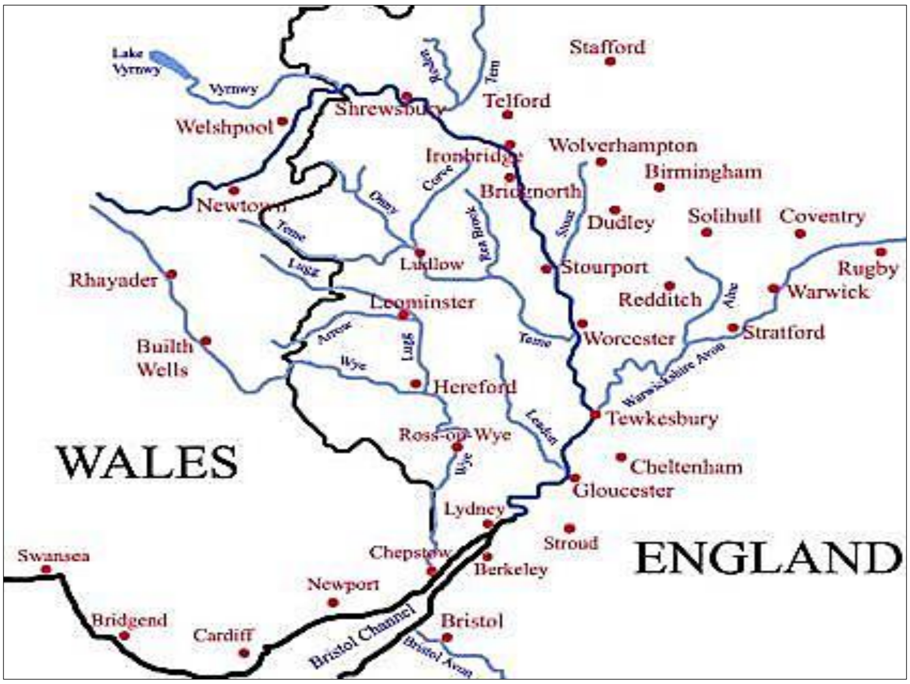

Fig. 6 The River Severn[4]

In summary, the county has a wealth of landscape features. In geomorphological and archaeological terms, it is the wetlands of the North Shropshire Plain (including the Weald Moors), together with the fluvial system and alluvial terraces of the River Severn, which are of direct concern to this thesis.

4 http://en.wikipedia.org/wiki/File:RiverSevernMap.jpg

2.2.The development and archaeological importance of wetlands

Wetlands are some of the most productive systems on earth (Dinnin and Van de Noort 1999:71; Keddy 2000:59), highly utilised in prehistory, and the opportunity for archaeological investigation increases accordingly. They develop around abandoned river channels, on alluvial terraces, in river valleys and estuaries, in any area which is flat and low-lying, with a source of water and poor drainage. Throughout history, these have been places for hunting, gathering and production, and also potential living places for those who understood both the advantages and disadvantages of wetlands, where natural defences and protection from fire are offset against flooding, maintaining the foundations of buildings, and keeping dry. In many interpretations, wetlands are positive areas - economically viable as common land, with seasonal grazing and plentiful resources (birds, fish, eels, and mammals, plus industrial resources such as coppicing, bog ore, peat as fuel, marsh hay, thatching reed, and flax). The movement of goods and people is easier through wetlands than through a forested landscape and a number of boats have been recovered from prehistoric wetland contexts (e.g. the Humber Wetlands; Van de Noort 2004:81). Their 'specialness' may set them apart as sacred places or places of ritual. Any islands or ridges overlooking wetlands are useful as vantage points for observation and habitation, as routeways, and for agriculture (Limbrey 1987). However, the value of wetlands must be weighed against the problems of everyday living - 'wild' places that flood, needing trackways and boats for access, liminal, dangerous places where detailed knowledge is needed to live in safety, not an area in which to grow food, perhaps an area for outcasts, or ritual deposition (e.g. Flag Fen (Pryor 2005); Fiskerton (Parker Pearson and Field 2003)) and sacrifice (e.g. Lindow Man; Stead *et al.* 1986); negative places, 'female places' (Giblett, cited in Van de Noort 2004:167). It is important to understand wetlands from the point of view of those who occupied the landscape - the perception, be it positive or negative, would have differed depending on whether you were an 'insider' or an 'outsider' (Van de Noort and O'Sullivan, in Barber and Green (Eds) 2005).This juxtaposition of positive and negative is summarised by Van de Noort as '*the wetland paradox'* (2004:165).

Notable examples of wetlands' archaeology include Star Carr (e.g. Mellars and Dark 1998), Meare and Glastonbury Lake Villages and the trackways on the Somerset Levels (Coles and Coles 1986), and the Humberhead Levels (Van de Noort 2004). Athough many wetlands are resource-rich environments, not all wetlands were exploitable throughout the whole of prehistory. The impact of, for example, sea level or climatic change would alter geomorphological processes by erosion and sedimentation (Howard and Macklin 1999), and transform the settlement signature of the area (e.g. the Humber wetlands; Fig. 7).

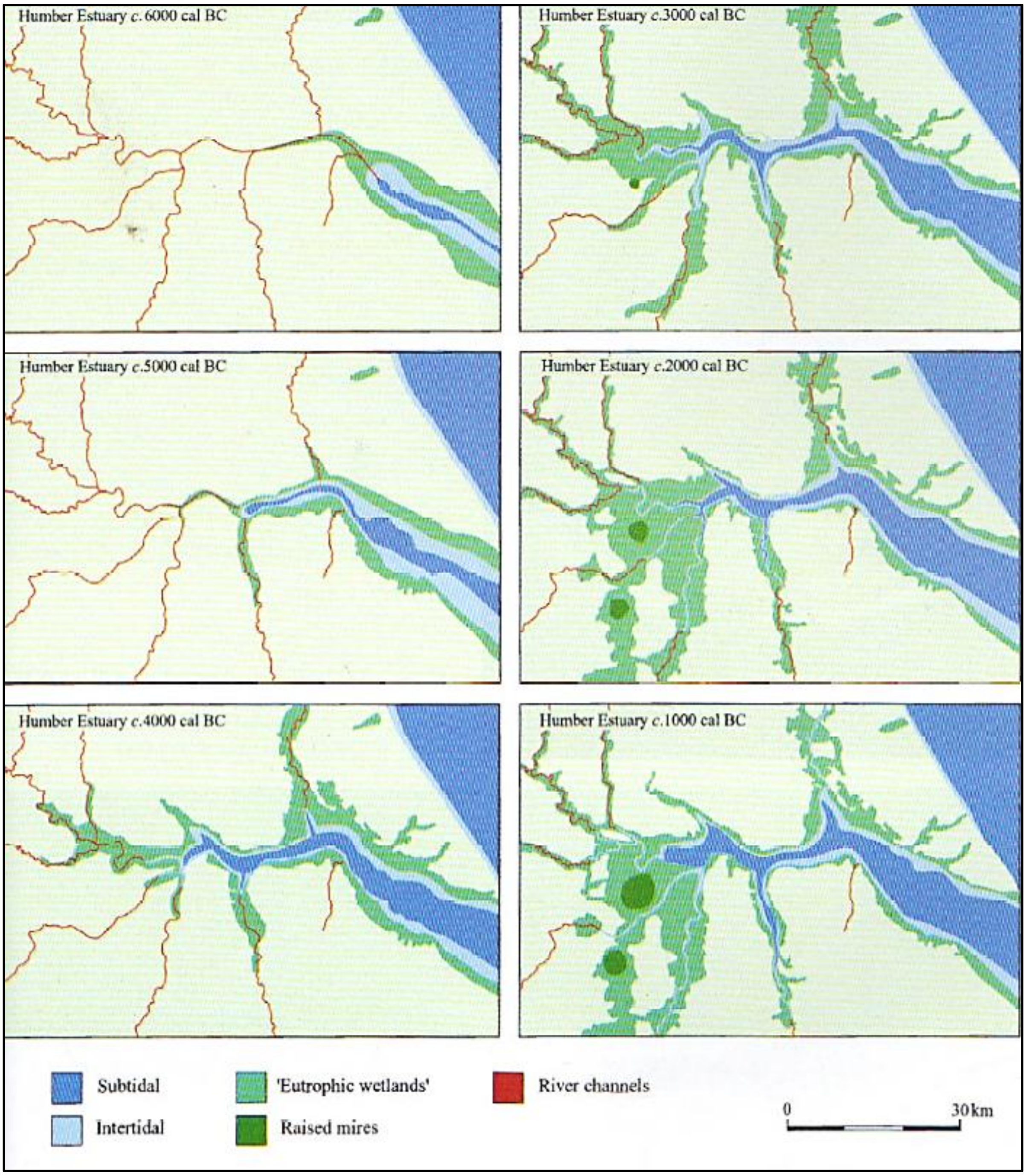

Fig. 7 Palaeogeographic maps of the Humber Wetlands, from 6000 cal BC – 1000 cal BC (Van de Noort 2004: Plate 1)

The way in which a wetland was valued and interpreted would have changed through time, and the demise in the importance of wetlands correlates with changes in subsistence and the advent of agriculture (Dinnin and Van de Noort 1999:73). Establishing an environmental change sequence for any wetland consequently aids interpretation. The relationship between biological productivity (defined in terms of biodiversity) and exploited resource potential differs according to the type of wetland (Dinnin and Van de Noort 1999:69); minerotrophic fens are more productive systems than stagnant raised mires, owing to a constant in-wash of nutrients; riparian habitats are particularly species-rich and biologically productive (*ibid:*73). Haslam (2003:5) saw wetland history is a '*discontinuous process to arable'* where the story of drainage is the story of climatic change (drier/wetter, with water tables higher/lower) interlinked with human impact, and where, until recently, community effort was required to manage them.

'*A wetland is an ecosystem that arises when inundation by water produces soils dominated by anaerobic processes and forces the biota, particularly rooted plants, to exhibit adaptations to tolerate flooding.*' (Keddy 2000:3). Types of wetland include mires or peatlands (bogs, fens and swamps or carrs), alluvial wetlands, temporary lakes and marshes, and permanent water bodies (Keddy 2000:28), and in order to be classified as a wetland, the ground must be waterlogged for half the year (Haslam 2003:31). A wetland develops either by 1) terrestrialisation (hydroseral succession) where plants colonise a once open-water basin, a natural process which requires time and not necessarily any external change, or 2) paludification i.e. the constant wetting of dry ground, indicating possible change in climate or environment often preceded by podsolization. Increased acidity attracts more plants e.g. *Sphagnum sp.* which aid water retention and further increase acidity. A water table just beneath the surface plus an acidic substrate reduces decomposition; if there is no drainage or means to remove the debris, it accumulates, decomposes and forms peat, and it is peat-based fenland (defined as sedges and grasses rooted in shallow peat, with considerable water movement (Keddy 2000:15)) that characterise the North Shropshire area and the Weald Moors.

2.2.1. Meres, mires and peatlands

Many areas now dominated by peatlands were deglaciated less than 10,000ya (Keddy 2000; Charman 2002). Generally, warmer and wetter climatic conditions are more conducive to peat development (e.g. Frolking *et al*.2001), and the Atlantic period (ca 8900-5700BP; Blytt Sernander Climatic Sequence), has been identified with the onset of peat accumulation and the likely start of blanket mires. The anaerobic nature of wetland environments is unique in preserving both archaeological and palaeoecological evidence - no other environment preserves organic remains in the same way or with the same time depth (Littleton Bog in Ireland provides a stratigraphic sequence of 8m of peat covering 12,000 years (Mitchell 1965)). The evidence can encompass fluctuations in climate and anthropogenic land-use within the local and the wider landscape, and a number of analytical techniques are available to aid archaeological research (e.g. palynology; palaeoentomology).

A link between peat initiation and deforestation (and thence a possible indication of human development) is apparent in many examples (e.g. Durno 1961; Moore 1975) as increased moisture reaches the soil and evapo-transpiration lessens. A connection has been proposed between peat formation and the decline in elm (Moore 1975; Charman 2002:80) and from that, a possible link with human impact in the early Neolithic, although evidence for the anthropogenic cause of the elm decline is circumstantial (e.g. Parker *et al.* 2002; see 5.2.1.1 below). A combination of both climate and human activity is held responsible for expanded peat development on the Isles of Lewis and Uist (Fossitt 1996, cited in Charman 2002:83). Other causes include changes in water table, or fire, either of which can be natural or human in origin, altering soil composition and increasing susceptibility to waterlogging (Charman 2002:78). At a very local level, windthrows impede drainage and induce paludification, as do the actions of beavers, which were present in the ecosystem of Great Britain until the 16th Century (e.g. Coles 2006). The conditions that caused peat to form can also be reversed e.g. changes in climate and human intervention; for example, by drainage activity and peat cutting for fuel (known from Roman times (Van de Noort 2004:166)).

Peat development is regulated by hydrological, physical, biological and geochemical processes operating within a time capsule (Charman 2002:25). Knowing the rate of peat development can provide an estimate of the chronology of a deposit, however this is not an easy science as so many variables are involved, the balance lying between vegetation growth and decay, temperature, water chemistry and human impact. As a very rough rule of thumb, Keddy has estimated 1000 year's accumulation for every 1m of peat, with basin peats accumulating at 2-2.5 times the rate of hill peats (Keddy 2000). Charman has estimated that, in temperate Britain, rates vary from 20cm to 100cm per 1000 years, with peat on sloping ground developing more slowly (Charman 2002:112), and with the caveat that a few centimetres up or down a profile may make a difference of several hundred or even a thousand years in some cases (Charman 2002:79). These estimates are subject to fluctuations in climate and vegetational mix (Durno 1961), and the rate also varies according to the type of mire e.g. bogs are more sensitive than fens to climate conditions. In ancient times, as the peat encroached, the wetlands may have seemed ‘alive’ (Van de Noort 2004:168).

Peat deposits develop in a stratified sequence, and peat profiles are used to track climate change and human impact. Analysis of ombrogenous mires (mires which receive their moisture exclusively from rainfall) have provided a proxy record of climatic change through analysis of Bog Surface Wetness (BSW) (e.g. at Bolton Fell Moss; Barber *et al.* 2003). These records are all the more reliable as they correlate with other climatic indicators, such as alluvial records (Fig. 8; see 2.2.2 below) and speleotherms (Brown 2008:7). Ombrotrophic peatlands are mainly used as BSW records but basin and valley peats also show the same variations (Charman 2002:182).

Approximate Period BC	Bog Record (BSW)	Alluvial Record
2300-2000	cold/wet (4.2 Ka event)	high activity
2000-1800/1500	reduction in BSW	low activity
1800/1500-1200	increase in BSW	
1200-850	warm/dry phase	
850-650/550	cold/wet phase (2.6 Ka event)	sharp rise in activity
650/550-400	reduction in BSW	fall in activity but to levels higher then previous low activity periods
400-100	cold/wet phase	increase in activity

Fig. 8 Climate change from alluvial and BSW records throughout the Bronze Age (Brown 2008:12)

One human response to deteriorating climatic conditions in wetlands was to build trackways, and the remains can be found in the archaeological archive. A sequence of track building on the Somerset Levels reflects the vagaries of climate change. The Neolithic Sweet Track provides the earliest known example, but track building on the Levels was a regular occurrence, accelerating in the Bronze Age and thereafter, with later examples including the Viper’s and Nidon’s trackways (Coles and Coles 1986). Examples of the value and importance of peatlands to the archaeological and palaeoenvironmental record given in this chapter scratch the surface of what is available. The Somerset Levels and the Humber Wetlands are just two lowland examples of how human endeavour coped with challenging environments and climate change, and provide comparators for development in North Shropshire and on the Weald Moors.

2.2.2. Alluvial sequences

Alluvial deposition is the product of sediments formed by erosion, and laid down by flood action, often in terrace sequences on major rivers such as the River Severn and its tributaries, throughout the Holocene. Although the quantity of alluvial deposition is a product of climate (and geology), it has been shown to be exacerbated by human intervention (e.g. Ripple Brook; Brown and Barber 1985). Although no separate subject of 'alluvial archaeology' exists (Macklin and Needham 1992:9), alluvial sequences, like peat deposits, provide a chronological and spatial record of climatic, vegetational and human-induced landscape change, from hinterland to floodplain. *'Holocene alluvial sequences are arguably unique in the way that they integrate and record environmental change (natural and anthropogenic) over a wide range of spatial and temporal scales. They therefore constitute an invaluable 'library' which can be read using appropriate geological, archaeological and palaeoecological techniques.'*(Macklin and Needham 1992:20).

Climatic changes recorded in alluvial units are well documented (e.g. Macklin and Needham 1992), with fluctuations throughout the Holocene between warm and wet (Atlantic period) to warm and dry (Sub Boreal; ca 5700-2600BP), with a return to cooler wetter conditions at the climatic downturn ca 2600BP (Sub Atlantic), and correlate with BSW records (see Fig. 8 above). A summary of periods of major alluviation since 5000BP shows that they occur in cycles of between 600 and 150 years duration with gaps between cycles of between 800 and 200 years, each episode coinciding with a period of climatic downturn (Macklin and Lewin 1993).

However, alluviation occurred at different times across Britain, arguing against exclusively climate-driven change (Macklin and Lewin 1993:116).Episodes of alluviation coincide with periods of dramatic expansion in farming, and numerous studies demonstrate a connection between changes in alluvial deposition and anthropogenic activity from the early Neolithic onwards, as people cleared vegetation in a move towards arable farming and livestock management. In broad terms, early Holocene river systems were pristine environments with floodplains covered by a mosaic of woodland, and a lack of riverine sediment; the pattern changed around 5000BP, to one of lower forest density and increased alluviation creating flat river terraces (Macklin and Lewin 1993), at a time when human impact on land-use was becoming increasingly visible. The process of alluvial deposition accelerated markedly from the Bronze Age onwards (Brown 2008). Acceleration in hilltop erosion (and consequent lateral change in river systems downstream) is coupled with evidence for increased human occupation in the Late Holocene in the catchment of the River Hodder in north-west England (Chiverrell *et al.* 2009). In the Howgill Fells (Chiverrell *et al*. 2008), woodland clearance in the Bronze Age is followed by the regrowth of felled areas in the

Late Bronze/Early Iron Age, more substantial change in the Late Iron Age/Romano British times, and a final widespread clearance after AD1000; although human impact is chiefly cited, climate change and individual storms, creating '*high magnitude/ low frequency events'*, are seen as triggers for wider erosion. Different and flexible anthropogenic responses would have been needed to short-term pulses of sediment (the result of flood events), as opposed to an influx of sediment of longer duration from a wider catchment, the result of climate and land-use changes; unpredictable and destructive flooding could wipe out communities and render unusable previously productive land.

As an environmental phenomenon, the causes of increased alluviation are argued as climatic and anthropogenic, summarised by Macklin and Lewin as '*climatically driven but culturally blurred'* (Macklin and Lewin 1993:119).From the perspective of modern archaeology, alluviation can mask archaeological sites but also enhance their preservation (Howard and Macklin 1999:537). Examples include the archaeological complex on the River Trent at Whitemoor Haye/Catholme (Buteux and Chapman 2009), and a sequence which connects a rising water table with flooding, thence with increased alluviation, in the Upper Thames (Robinson and Lambrick 1984).

2.2.3. Alluviation in the Severn/Avon Catchment

The Severn's palaeohydrology reflects the process highlighted above, the landscape being dominated initially by glacial factors to about 10,000BP, then by forest to about 5000BP, and increasingly anthropogenically dominated from 5000BP onwards (Thornes 1987: 33), and studies of the Severn's wider catchment provide a context for climatic change and anthropogenic development throughout the Holocene in North Shropshire and the Weald Moors. High rainfall on the Cambrian Mountains results in regular flood events, beginning just north of Shrewsbury and continuing throughout the catchment. Alluvial deposition by overbank sedimentation and the ability of the river to incise into its stream bed, combined with isostatic uplift, has resulted in a lengthy sequence of well stratified alluvial terraces throughout the river's course (e.g Maddy *et al.* 1995). The terrace sequence enables the build-up of a 4-dimensional chronostratigraphical landscape – vertical, 2 way-horizontal, and chronological. Whilst terrace height provides a good indication of age, analysis of the composition of alluvium refines and clarifies the picture (Taylor and Brewer 2001).

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The River Severn's terraces below Bridgnorth (Fig. 9) provide a chronostratigraphy for the Lower Severn and its floodplain which can be correlated with sequences elsewhere in the wider catchment e.g. at Welshpool on the Upper Severn (Maddy *et al.* 1995; Bridgland *et al.* 2004). The attractiveness of terraces for human habitation – flat, with good soils and a water supply, with protection from further flooding and channel movement afforded by the 'staircase effect' – makes them valuable places for archaeological prospection (see Chapter 3).

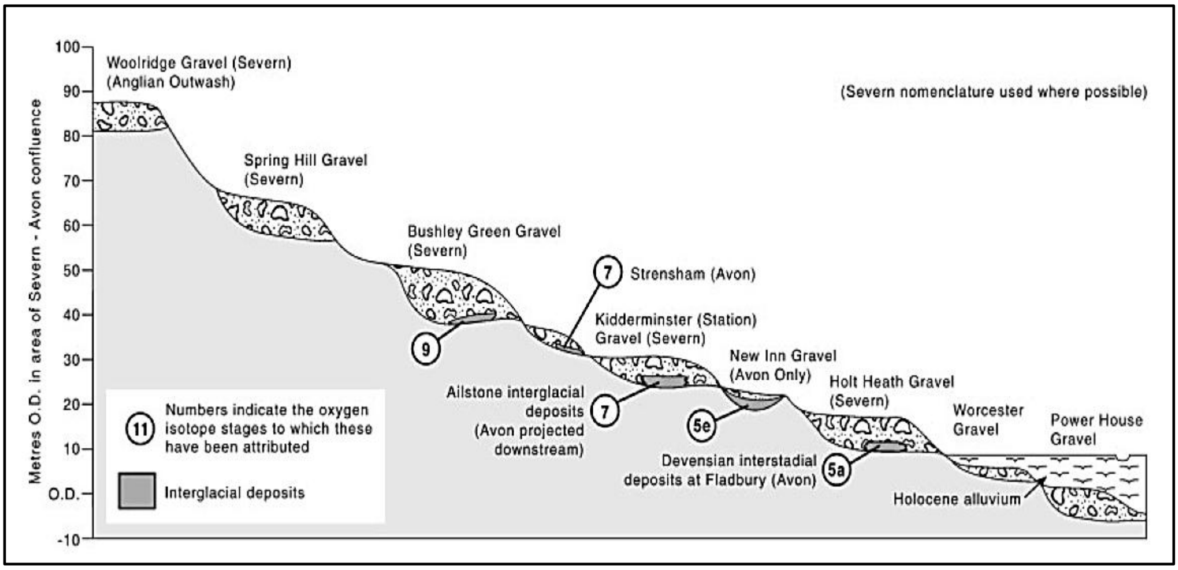

Fig. 9 Idealised transect through the Severn terrace sequence. Equivalent Avon units are shown where possible (Bridgland *et al.* 2004:2005)

Alluviation events across the Severn/Avon catchment have been shown to be broadly synchronous at a time of climatic deterioration in the Late Bronze Age/Early Iron Age (see also Fig. 8). Dramatic hydrological change is recorded ca 3300 - 2600BP at Wilden Moss (near Stourport; SO844710) (Brown 1988:435; Brown 1991:155). This corresponds with other incidences of increased sedimentation across the Severn/Avon catchment during the Late Bronze/Early Iron Age, first noticed by Shotton on the River Avon at Pilgrim Lock (SP120516), the River Severn at Worcester (SO 833582) and the River Arrow at Ipsley (SP067652), producing what Shotton referred to as organically poor, stoneless, '*buff-red silty clay*' ('*ca650bc*'; Shotton 1978:28). A study of the 'Leighton Silts' near Welshpool on the Upper Severn, comprising deposition of fine sand and silt overlying gravels, produced a slightly earlier date (Taylor and Lewin 1996:82).

The impact of human activity within these alluvial sequences is also visible. Shotton attributed the change in Late Bronze Age/Iron Age alluviation across the Severn/Avon catchment to new farming practices, highlighting the lack of organic material in the sediment and concluding that it represented rapid run off from recently ploughed fields. Further evidence is provided by the geomorphological and palaeoenvironmental study at Ripple Brook, which joins the Severn north of Tewksbury, indicating a '*dramatic increase in sediment deposition during the late Bronze Age and early Iron Age (2900-2300 yr B.P.) due to deforestation and cultivation of the catchment slopes and resultant soil erosion'* (Brown and Barber 1985:87). Ripple Brook's catchment is small and discrete, and pollen analysis revealed that '*over a few hundred years, from about 920 B.C. to about 400 B.C., the vegetational character of the area around the Ripple Brook was changed from a heavily wooded area, with probably some pastoral activity, to a landscape almost totally cleared of trees and intensively farmed. The people responsible for this transformation probably also built Towbury Hill fort and it is likely that the area has remain farmed since that date'* (*ibid*: 93).

These examples of alluvial deposition during the Late Bronze Age/ Iron Age in the Severn catchment further indicate that it was the combined effects of climatic and anthropogenic activity which affected the landscape dramatically. *'Whilst climate supplied the 'power' it was Bronze Age* (and Iron Age) *agriculture that supplied the sediment'*. (Brown 2008:13). They provide the backdrop for environmental and human development in North Shropshire and on the Weald Moors.

2.3. North Shropshire - geology, palaeohydrology and wetland development

The wetland development of North Shropshire is the product of its underlying geology, glaciation, climate change and anthropogenic influences. The underlying geology is Permo-Triassic red/brown sandstone (Sherwood Sandstone Group) and Liassic Clays, overlaid by Keuper Marls (Mercia Mudstone Group). During the Permian/Triassic, the area was hot desert and playa lakes, evaporating in this area, left leave salt pans, the source of salt depositions across parts of the west of England (e.g. Cooper 2002); these are apparent, for example, around Middlewich (SJ6966), Northwich (SJ6573) and Nantwich (SJ6552) in Cheshire, Wem (SJ5128) and Whitchurch (SJ542414) in North Shropshire, and Droitwich (SO8963) in Worcestershire (Toghill 2006:151) (see also 2.4 below, salt deposits on the Weald Moors).

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The end of the last glaciation left a ’textbook’ pattern of ridges and wetlands across North Shropshire. Large blocks of ice left stranded within the glacial drift (46m thick around Oswestry (Cantrill, cited in Leah *et al.* 1998:11)) has resulted in an arc of wetlands of varying types – a raised mire at Fenn’s/ Whixall Moss, a mere bounded by an esker at Aqualate Mere, kettle holes at Bomere and Shomere Pools, and mosses which frequently occur in clusters, for example, the Ellesmere Lakes (Fig. 10).

Fig. 10 North Shropshire Wetlands (Leah *et al*. 1998:8)

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The North Shropshire Plain is drained by tributaries of the River Severn, the middle reaches of which is define its southern edge (Fig. 11). The path of glacial melt can be seen in the deposition of sands and gravel ridges (aligned NW/SE) between which the river makes its present course (Pannett 1994; Pannett 2008:88). Gradually the river organised itself into a deeper meandering single channel following the same course as the old glacial discharge (*ibid*). The river banks are clay based and its channel is deep, allowing the river relative channel stability over the last 10,000 years (Brown 1987a); this is borne out by records of fish weirs in the Upper and Middle Severn (Pannett 1987), which indicate that channels have altered only slowly in historical times. The geomorphological processes of alluvial deposition and lateral channel movement which have shaped the Severn throughout the Holocene also shaped its tributaries – the Middle Severn is joined by the Cound Brook and the Rea Brook from the south, and the Rivers Perry and Roden/ Tern from the north. The River Perry drains the wetland of Baggy Moor. It is the only study of a floodplain undertaken in the area, and illustrates the inextricable connection between fluvial processes, alluviation and wetland development. A major change in vegetation and alluviation was identified at 5887 – 5673 cal BC (6890±50BP SRR-2797; Brown 1990:46), resulting in floodplain mire initiation and peat accumulation; true floodplain clearance was delayed until 1300BP. Brown also identifies that the drainage pattern as a unified catchment has not remained constant throughout the Holocene, and that floodplains can develop as the result of catchment changes without necessarily any changes to climate or vegetational cover (*ibid:*50).

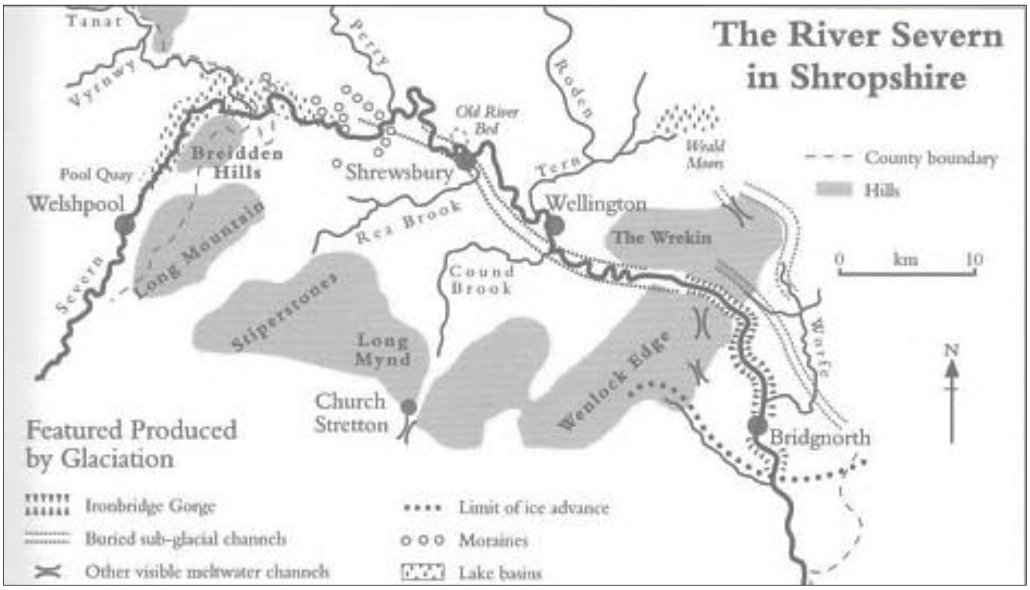

Fig. 11 The River Severn in Shropshire (Pannett 1994:49)

The wetland mosaic which covers North Shropshire has yielded a rich range of deposits, providing information on climate and vegetational change, and human occupation. The prehistoric archaeological evidence (see 3.4 below) includes lithics scatters (e.g. Baggy Moor (SJ399289); Leah *et al.* 1998:39); a number of Bronze Age metalwork depositions e.g. a rapier from Baggy Moor (Shropshire HER 2647) and the Preston Hoard from the Weald Moors (Shropshire HER 697); three bog bodies at Whixall Moss (SJ503362) discovered in the 19th Century; and burnt mounds, present in numbers on Baggy Moor and the Weald Moors. Low-lying Iron Age forts are also present on the wetlands, for example at the Berth (SJ430236; Shropshire HER129), and Wall Camp (Shropshire HER 1108). Palaeoenvironmentally, examples evidencing changes in climate include a palaeoentomological study at Church Stretton (SO458936) (Osborne 1972). Crose Mere (SJ439302) (Beales 1980), in the Ellesmere region, provided a 6m sediment core from within the deepest part of the lake, which has been used to reconstruct Late Devensian and Holocene vegetational history through pollen analysis, with radiocarbon dating providing chronological control. From the Late Devensian (pre-10,300BP), the organic remains indicate mainly herb pollen with increasing birch; the early Holocene is dominated by arboreal pollen, with a sharp decline in elm at 4448-3791 cal BC (5296±150BP Q-1235; Beales 1980:151), relating to the wider mid-Holocene elm decline across Britain (e.g. Parker *et al.* 2002). Significant human impact is noted '*around 3900BP'*, coinciding with a decline in arboreal pollen and a rise in cereal (*ibid:* 152).The pattern of woodland clearance and regeneration continues throughout pre-history accelerating in the Iron Age. The significance of Crose Mere is in providing a benchmark against which other palaeoenvironmental analysis in the area can be measured (see Chapters 1 and 5, and Appx. 5).

2.4. The Geology and Palaeohydrology of the Weald Moors (Fig. 12-Fig. 17)

The Weald Moors is one of North Shropshire's largest wetlands. Neither a mere nor a moss, this is an area of ancient, low-lying peats and organically rich soils which formed along the River Strine and its tributaries. It was subject to the same glacial and geomorphological processes as elsewhere in North Shropshire, and shares the same potential for archaeological and environmental preservation.

Made up of a string of inter-connecting moors, the Weald Moors lie between the West Midlands plain and the south-east corner of the North Shropshire Plain. The area is bounded by the Telford suburbs to the south, Lilleshall to the south-east and Newport to the north-east. The B5062 cuts across the northern moors (Tibberton Moor, Day House Moor) between Crudgington and Newport. The River Tern describes the Moors' western boundary, and merges with the River

Roden before draining into the River Severn between Atcham and Wroxeter. The area covers approximately 70km^2, and has an isolated quality in spite of its proximity to Telford; the villages are small and sparse and the land is farmed. The villages of Kynnersley (SJ670170), Preston-upon-the-Weald Moors, and Eyton-upon-the-Weald Moors, are mentioned in Pevsner (1958) mainly with reference to their churches and, in the case of Preston-upon-the-Weald Moors, the Lady Catherine Herbert Hospital, founded in 1716 (Pevsner 1958:232-3).

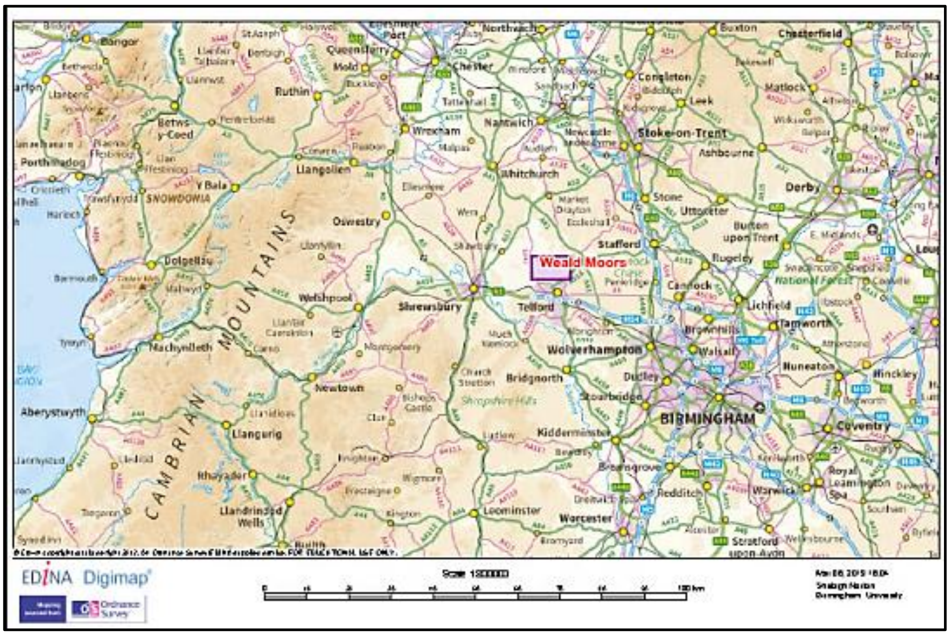

Fig. 12 North Shropshire and the Weald Moors (Edina Digimap: Accessed March 2013)

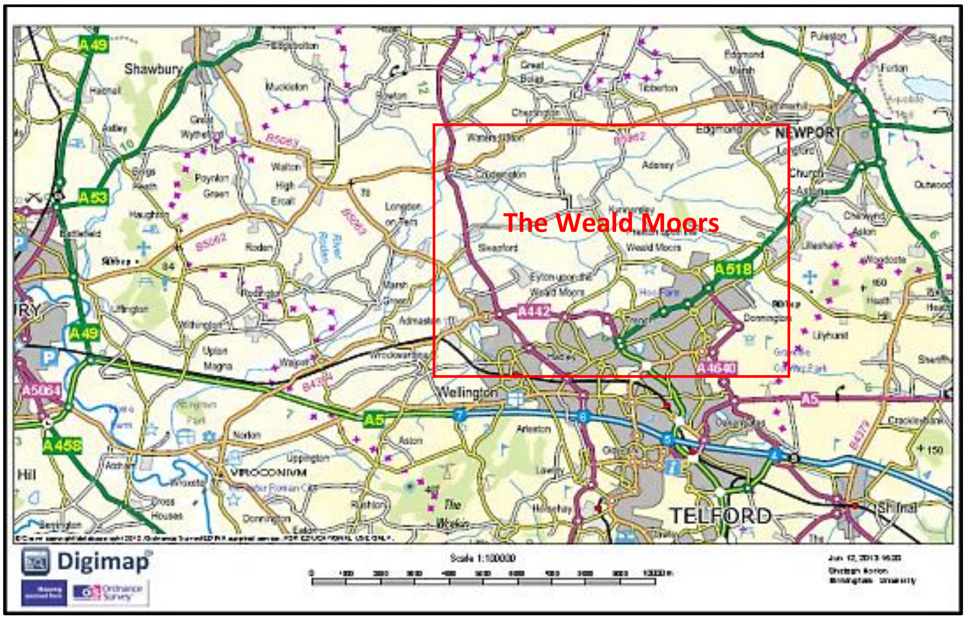

Fig. 13 The Weald Moors and Wroxeter/*Viroconium* (Edina Digimap: Accessed March 2013)

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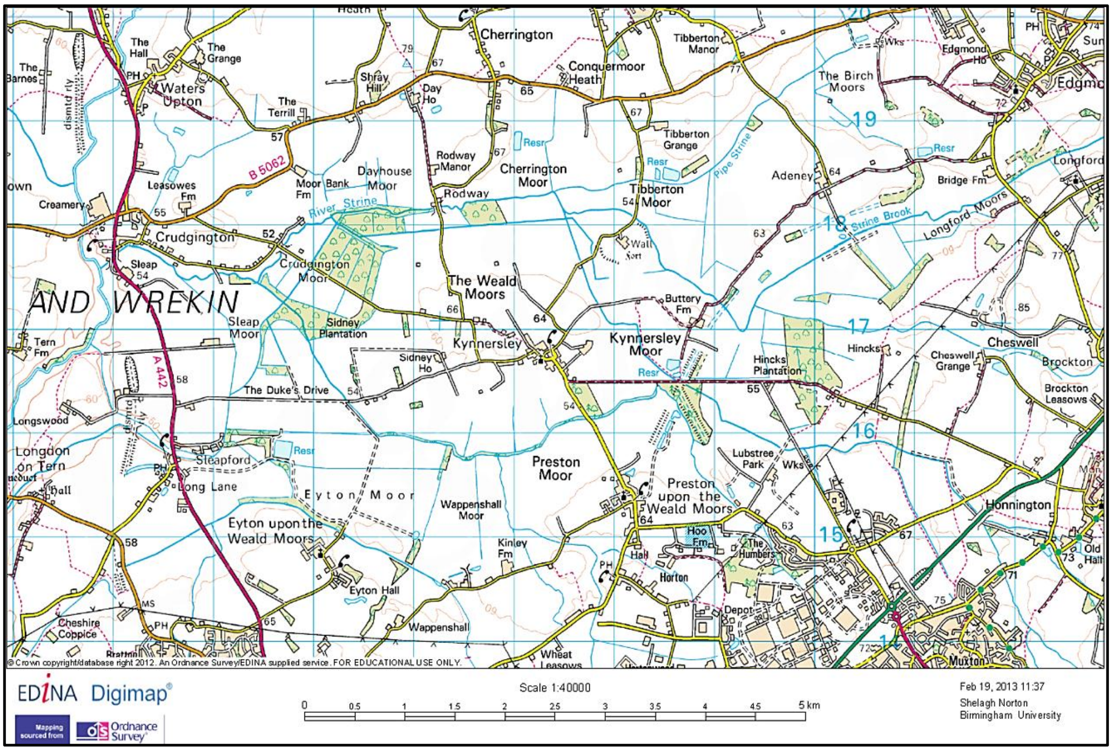

Fig. 14 The Weald Moors - study area (Edina Digimap: Accessed March 2013)

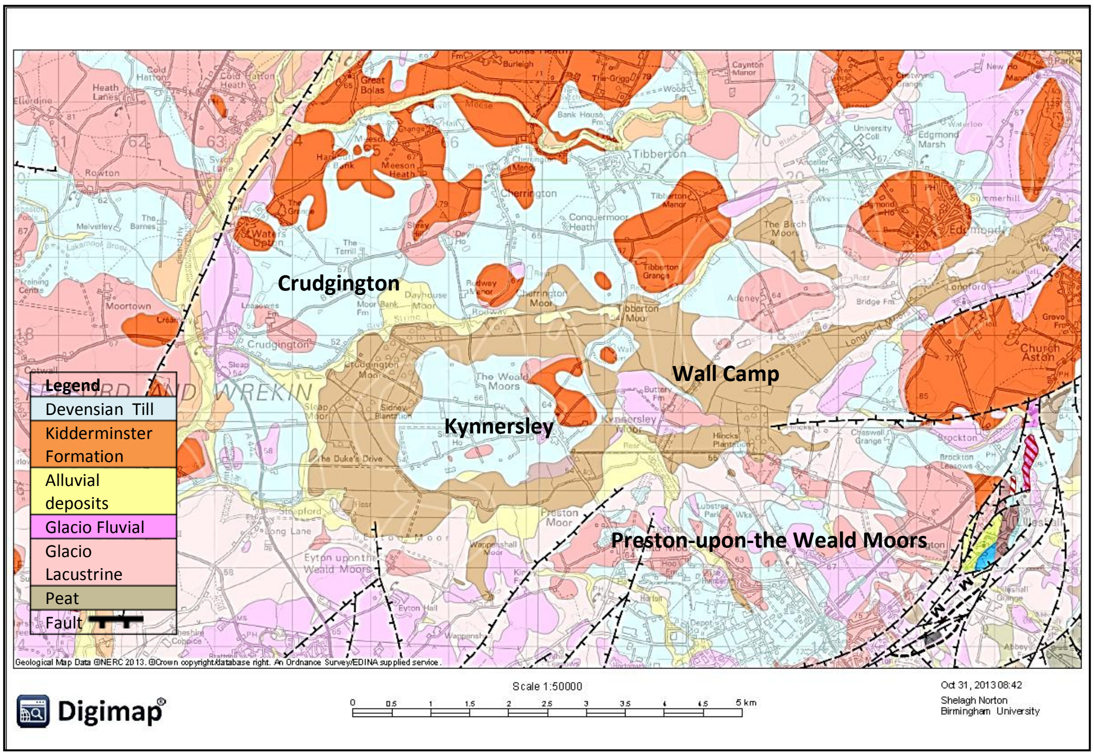

Fig. 15 The Weald Moors - Geology (Edina Digimap: Accessed July 2012)

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The underlying geology is Kidderminster Formation sandstone (Sherwood Sandstone Group), and the superficial geology is made up of Devensian till, glacio-fluvial and glacio-lacustrine deposits, alluvium and peat (Fig. 15). Sinker (1962) identifies the Weald Moors with Baggy Moor on the River Perry, describing them as wide river-drained peat flats, and classifying both as valley mires, originating in temporary ice-dammed lakes (see 2.3 above) at the end of the last glaciation; NWWS described the Weald Moors as a '*mire which began life as a reed-dominated system which developed into a fen-carr with abundant sedges*' (Leah et al. 1998:75).The small rivers ('strines') which drain east-west from the Aqualate Mere esker negotiate their way around the solid geology and drift, gradually deepening their courses to join the River Tern. The River Meese skirts slightly higher ground to the north of the Weald Moors around Tibberton; the River Strine/Pipe Strine and the Strine/Beanhill Brook flow west across the flatness of the Weald Moors to join the Tern at gaps in the 'drift' at Crudgington and Longden-on-Tern respectively.

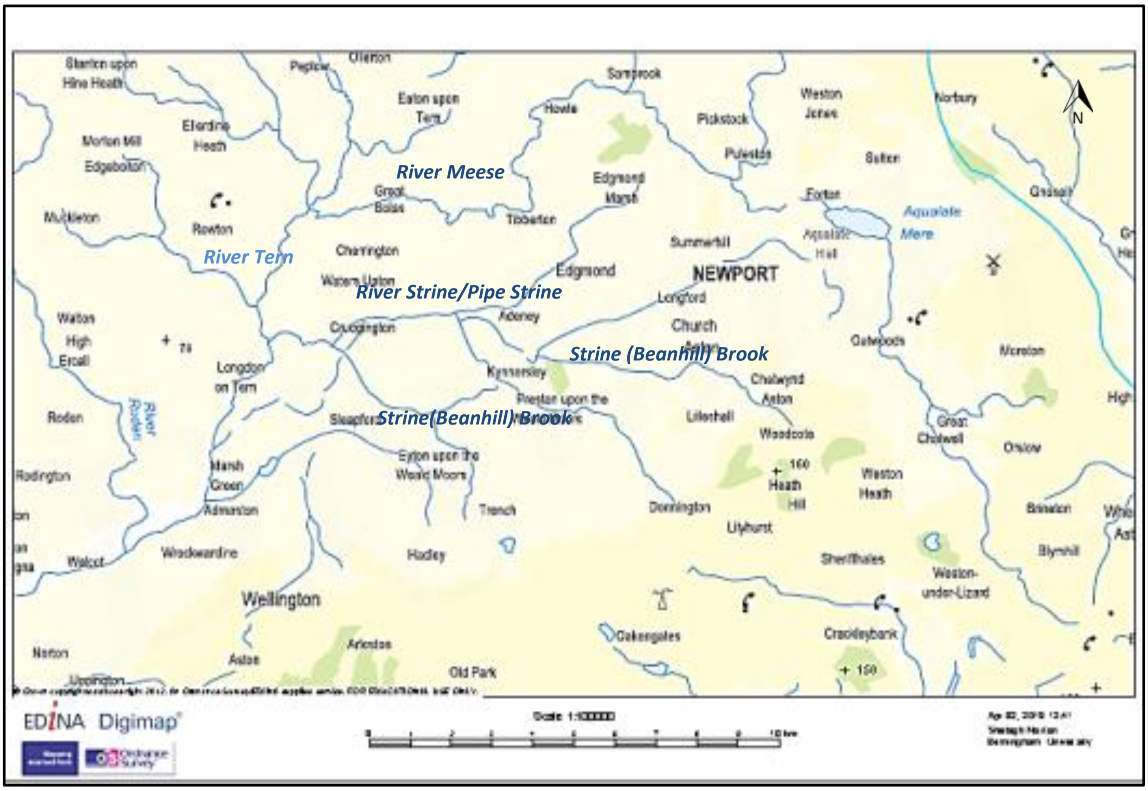

Fig. 16 The Weald Moors - modern river courses (Edina Digimap: Accessed April 2013)

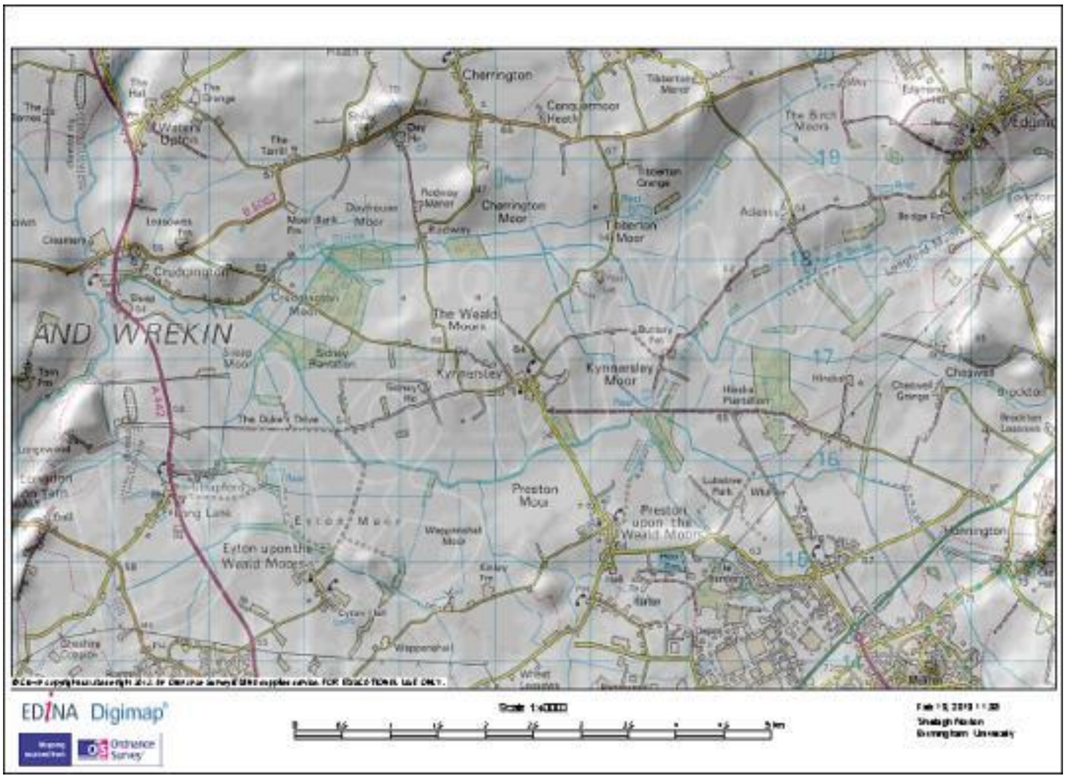

Fig. 17 The Weald Moors - relief (Edina Digimap: Accessed February 2013)

The flatness is interrupted by slightly raised areas or 'islands' where the solid geology and mineral soils rise above the low-lying alluvium and shallow peat deposits e.g. Kynnersley lies on a raised area of sandstone, till and glacio-fluvial deposits above the 55m contour, and Wall Camp occupies a smaller island of similar geology at 61mOD. The peats are recorded as dry and wasted (Whitehead *et al.* 1928; Leah *et al.* 1998); those that survive form some of the most intensively farmed land in Shropshire, and are classified as '*eutro-amorphous peat soils of the Adventurers' Association fringed by a number of till derived mineral soils*.'(Leah *et al*.1998:69). At Kynnersley the glacial till that wraps around the 'solid' rock passes southward under the peat, which completely encircles the village and was said to be 6ft thick in places in the early part of the 20thCentury, and recorded as comparatively dry at that time (Whitehead *et al.* 1928).The glacial till rises again to encircle the higher ground of Preston-upon-the-Weald Moors. Low mounds of sand and gravel overlie or perhaps rise through the peat in places e.g. either side of the Crow Brook where it is crosses the Admaston road south west of Preston. A relief map (Fig. 17) shows this marginally higher ground, which has proved fruitful in terms of fieldwalking (Leah *et al.* 1998).

Mineral and brine springs feature on the Weald Moors. Salt was extracted from a brine spring in the late 18th Century at Kinley (SJ670146; Kingley Wich Brine Well and Salt Works - Shropshire

HER 1369), and mineral springs are present immediately south-west of the Weald Moors at Admaston (SJ633129) (Shropshire HER 1375). A spring is recorded at Rodway on the Weald Moors (Shropshire HER1381), although its mineral content is not known.

Without intensive survey, it is difficult to provide a robust geochronology for the development of the area. This is further exacerbated by intense drainage activity which has altered the natural river flow by adding and altering ditches and drains since at least medieval times (see 2.4.1 below)**.** However, the alluvium and peat deposits are sinuous and appear to roughly follow the current courses of the River Strine and Strine Brook, and provide indications of geomorphological development. The Weald Moors are flat and the relief outside the valley is comparatively steep (the Aqualate esker rises to 130mOD). The low gradient on the Weald Moors suggests slow channel velocity, with a fluvial system likely to deposit silt once the Moors are reached (evidenced by the alluvial deposits). This could be indicative of floodplain metamorphosis, identified on a larger scale during the period ca 4500BP to 2500BP on the Rivers Nene, Soar, and Severn, with '*vertical accretion, a reduction in floodplain relative relief, changed floodplain soil conditions, a reduction in channel W/D ratios and a resultant increase in the silty clay proportion of channel perimeter sediments'* (Brown and Keough 1992:433). Secondary channels were filled in (*ibid*:440) as floodplains were progressively buried during the Holocene, with implications for contemporary usage of the wetlands, and modern archaeological prospection and preservation.

Further work would be needed to determine whether peat development began via a process of terrestrialisation due to gradual lake infill or paludification due to changing hydrology, and either process could have been subject to human agency. Given the fertility of the land, the peat is more likely to have formed under minerotrophic fen conditions (Charman 2002), in line with NWWS's conclusions (see above).

2.4.1. Routeways, drainage and reclamation

The Weald Moors comprises some of the lowest (failing to reach 65mOD) and wettest ground in Shropshire. This is apparent in the historic record (see below) and also in the names of some landmark features e.g. Osierbed Covert. The major landowners on the Weald Moors were the Leveson family (later the Dukes of Sutherland) and the Eyton family. Both acquired land from the estate of Lilleshall Abbey after the Dissolution of the Monasteries (1536-1541) and thereafter pursued active drainage and land management programmes (Chitty 1953:241; Trinder 1983:48). For example, on a map of 1580 (part of the Sutherland Collection in the Shropshire County archive; Fig. 18), Black Dyke is highlighted as a newly cut channel just south of Kynnersley - '*Black* *dyrke latly made by M^s Eaton to drene hys gronnde'* (Hill 1953:255). The current channels are maintained and improved by the Internal Drainage Board and Severn Trent Water Authority.

Although the wetlands would have been a valuable resource, the high water table suggests obstacles to travel and transport; as with other wetlands, knowledge of the through-routes would have been invaluable. One routeway may be implied in the name of the small settlement of Rodway where, crucially, there is a bridge over the River Strine (Fig. 18). Chitty (1953:251) equates Rodway to 'roadway', and suggests that those travelling north from a crossing point on the River Severn at Buildwas would travel via Preston-upon-the Weald Moors, across to Kynnersley island and thence to Rodway, aiming for the high ground at Day House Moor/Shray Hill, '*which would stand up like a beacon to a traveller from the Wellington side' (ibid*). Chitty saw this route as '*the best natural track across the Weald Moors'* (*ibid*) (albeit that no man-made trackways have yet been discovered). There have been various finds of metalwork deposits along this line of travel (see 3.4.2.2 below), and the route was a known haunt of highwaymen and bandits in the 17th Century (*ibid*).

A combination of the Moors' low-lying character, flooding (at least in winter), alluvial deposition and peat development would have had a profound effect on the way in which the Weald Moors were utilised, and managing livestock presented challenges. In the 17thCentury George Plaxton, Rector of Kinnersley (*sic*) wrote '*All that vast morass was called the Weald Moor, or Wild Moor, i.e. the Woody Moor…… and I have been assured from aged people that all the Wild Moors were formally so far overgrown by rubbish wood such as alders, willows, salleys, thorns and the like, that the inhabitants commonly hang'd bells about the necks of their cows that they might the more easily find them*' (cited in Rowley 1972:169). A 17thCentury document describes how the men of Wrockwardine were accustomed to take their beasts along Humbrey Lane '*the direct Streake way from Wrockwardine Manor House unto the Wildmoor which ran past Allscott and through Long Lane to the Moor'* (cited in Trinder 1983:29). In winter, Plaxton also recorded that the area around Kynnersley was approachable only by boat (Plaxton, 1706-7:2420, Houghton 1873:103-12, cited in Leah *et al.* 1998:83), which would have severely limited movement of livestock, goods and people.

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Fig. 18 The Weald Moors - 1580 (Hill 1953: Plate 1)

Over time, streams have been straightened, widened or embanked, ditches dug, the fen-woodland drained, and certain areas have been subject to peat cutting (e.g. around Tibberton Moor; Leah *et al.*1998:83-84).It has been suggested that the cutting of totally new channels is a comparatively modern development (Brown and Keough 1992) and that during the Medieval period, existing channels were simply straightened (for example on the River Nene; *ibid*:439), however, The Black Dyke appears to be a channel newly cut in the 1580s. The active management of streams and drains increased dramatically in the early 19thCentury, when the area, like others (e.g. Baggy Moor), was subject to drainage by Act of Parliament (Wildmoor Inclosure and Drainage Act 1801). Overseen by the agent of the Dukes of Sutherland, James Loch, the extent of this work on the Weald Moors can be seen in contemporary maps (Leah *et al.* 1998:81-82). Construction of the Newport Branch of the Shrewsbury canal in the 18th and 19th Centuries also altered the drainage[5], as did the creation of the Commission Drain in the late 19th Century. As a very broad generalisation, drainage on the Weald Moors that runs east-west is more likely to be natural, and that which runs north-south, more likely to be artificial.

2.4.2. Peat Wastage

Fig. 19 Peat Wastage at Wall Farm (S Norton: July 2012)

[5] http://www.sncanal.org.uk/maps&plans2.htm

The historic and modern drainage of the Weald Moors via new channels and channel maintenance has implications for the viability of the peat. Ground drainage leads to the twin processes of peat consolidation and wastage, and this is evident on the Weald Moors (Leah *et al.* 1998:120; personal observation (Fig. 19); Mr.Eudale, farmer, Sidney Plantation, pers.comm.). By consolidation, a lowering of the water table alters the composition of the peat, increasing density and reducing volume. Wastage occurs when drained peat oxidises into gases and disappears, as a simple biodegradable process (Waltham 2000:51). In drained land, wastage continues until all the peat is gone (*ibid*).

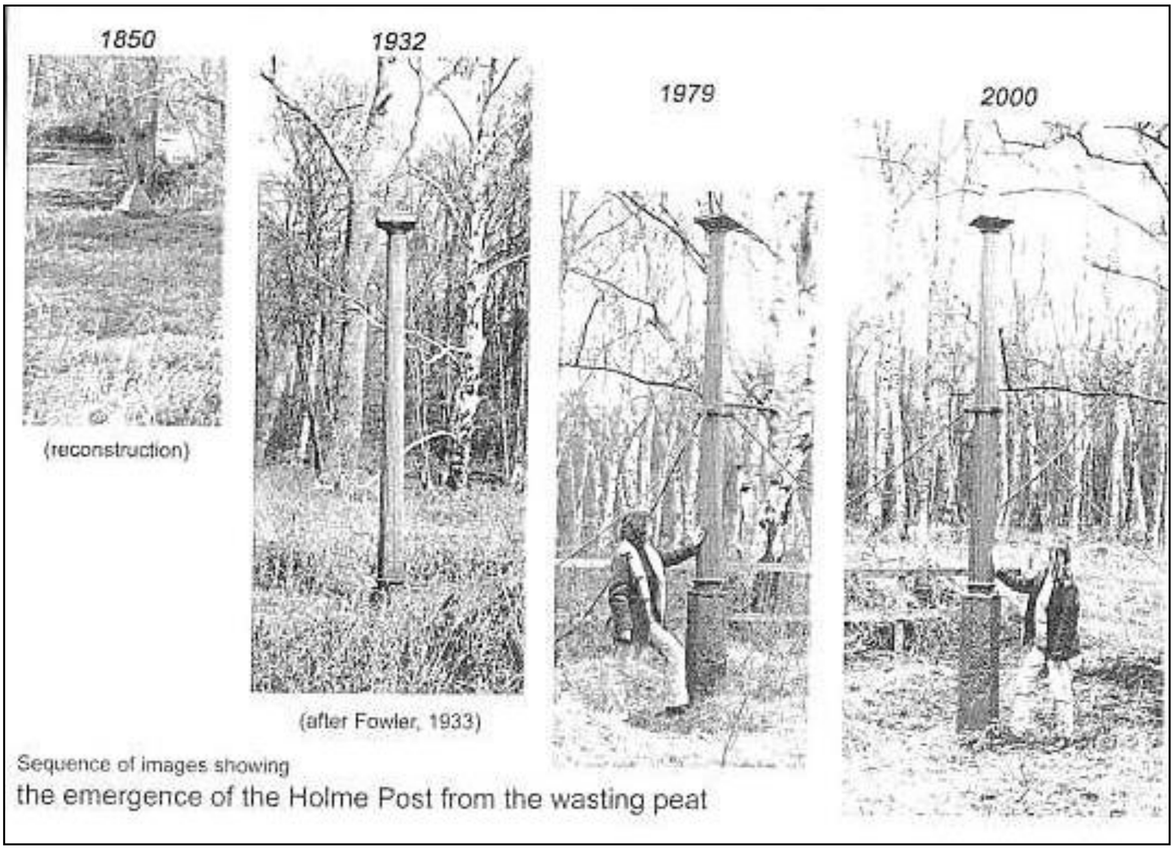

Fig. 20 The Holme Fen Post (Walton 2000:50)

Holme Fen lies 9km south of Peterborough in the Eastern Fens, and the Holme Fen Post provides a striking example of the scale of peat wastage in deliberately drained areas (Fig. 20). Whereas some parts of this area were drained by the Romans, channel cutting began in earnest from around AD1600 (Waltham 2000). An iron post was sunk into the peat near Denton Fen, Holme (TL193892), in the mid -19th Century, to monitor the loss of peat, at the same time as the drainage of Whittlesey Mere. 3.7m of peat was lost over 100 years, illustrating the scale of peat wastage in a deliberately drained environment.

Modern drainage is cited as problematic for archaeological preservation in recent assessments at Star Carr (Brown *et al.* 2011), where *'the overriding hydrological control of the site over the last few years has been the insertion of effective under-drainage which has caused increased oxidation of the peat*' (*ibid*:53). This process is undoubtedly happening on the Weald Moors with implications for the sub-surface archaeology, and many of the areas of burnt stone described by NWWS were identified as a result of peat wastage (Leah et al 1998:74). However, the area may still hold substantial peat deposits, and these areas are identified in Chapter 6.

2.5.Geology and Geomorphology - Summary

This chapter explored the natural history of the wetlands of North Shropshire with particular reference to the Weald Moors, providing a basis for the remainder of the thesis. The geology and geomorphology of the North Shropshire plain, drained by tributaries of the River Severn, encompasses a glacial and alluvial history which created the patchwork of meres, mosses and mires visible in the modern landscape. The unique qualities of wetlands to preserve archaeological remains and capture changes in environment and climate, with consequences for the study of human occupation, makes the archaeological and palaeoenvironmental record contained within alluvial and peat deposits a valuable if threatened resource. Examples from elsewhere in Britain illustrate the importance of wetland landscapes in archaeological research (see above, e.g. The Humber Wetlands (Van de Noort 2004); the Somerset Levels (Coles and Coles 1986)). However, investigations which combine archaeological and palaeoenvironmental records in the North Shropshire area, and the Weald Moors in particular have been limited and do not form a cohesive picture. The opportunities for archaeological prospection on the Weald Moors, including an analysis of the existing archaeological record will be explored in the next chapter.

3. The Weald Moors –archaeological prospection and interpretation of landscape

'*To recognize territorial behaviour amongst a human population becomes relatively trivial; it is the mechanism by which access to resources is negotiated through time which is of greater importance*.' (Barrett 1994:140).

The low-lying, wetland landscape of North Shropshire in general, and the Weald Moors in particular, provided access to substantial natural resources in prehistory. By uncovering ways in which people occupied this landscape over successive periods, a picture of human development can be created. This chapter concentrates on landscape and landscape archaeology, the tools that enable archaeological prospection on a broad canvas, and the topographical areas within wetland environments which are likely to yield the biggest rewards. These concepts and tools are applied the Weald Moors.

3.1.Concepts of landscape in archaeology

'To see the ghostly outline of an old landscape beneath the superficial covering of the contemporary…' (Schama 1995:16)

A landscape – a zone or area as perceived by people[6] - combines physical characteristics and natural forces within the chronology of human experience. A simple, modern definition of landscape, as '*natural or imaginary scenery, as seen in a broad view'* (Oxford Concise English Dictionary), differs from the conceptualisation of landscape as '*a cultural image, a pictorial way of representing, structuring or symbolising surroundings'* (Cosgrove and Daniels 1988:1), or *'a set of relationships between named locales'* (Tilley 1994:34). However, neither 'scenery' nor 'a cultural image' is likely to have defined the relationship that past people had with the land. For example, the idea of 'owning' land was incomprehensible to New Zealand Māori when they first encountered Europeans in the 1700/1800s; as a consequence, conflict over the interpretation of the Treaty of Waitangi [7], which, in 1840, defined land ownership and formalised the union between Māori and the British Crown, continue into modern times.

[6] European Landscape Convention http://conventions.coe.int/Treaty/en/Reports/Html/176.htm
[7] http://www.waitangi-tribunal.govt.nz/treaty/meaning.asp

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The concept of landscape archaeology was born out of attempts to define the relationship that past people had with their surroundings. Drawing *'a link between field archaeology … and the infant study of landscape history',* Aston and Rowley (1974), recognised that archaeology had, by the 1970s, gone beyond the realm of simply 'sites' and now dealt with extensive, chronologically complicated, cultural landscapes. In the intervening years, this has progressed to encompass a wide range of applications, from a more processualist approach e.g. the detailed development and economics of a medieval village (e.g. Challis 2002), to theoretical and phenomenological (post-processualist) interpretations, e.g. the conceptualisation of the prehistoric South Dorset landscape (Tilley 2010:187-245). The development of post-processualist theories ensured that space was no longer seen as a neutral backdrop, but was intimately linked to social activity (Wheatley and Gillings 2002:8). It is unlikely today that an in-depth study of any area would be undertaken without combining both processualist and post-processualist concepts. By looking at the geological, fluvial and palaeoenvironmental history of an area, the distribution of sites and artefacts, their positioning and relationship, it is possible to provide an interpretation of how people created a meaningful, cultural landscape.

3.2.Archaeological Prospection; the use of GIS

Every place has the potential to be an archaeological site, especially in the crowded British Isles where human history has chronological depth (e.g. Parfitt *et al.* 2010), but although new archaeological sites are uncovered regularly, they are not necessarily uncovered systematically. Without the comprehensive approach of landscape archaeology, vital clues about how an environment was occupied may be missed, and utilising all the available data to provide likely spots for further investigation is the best alternative to extensive and expensive excavation. Strategies for systematically prospecting across a cultural landscape are now present in several framework documents e.g. *The Archaeology of the West Midlands: A Framework for Research*, where the preferred prospection strategies are fieldwalking, microrelief, aerial photography, geophysical survey, geochemical survey, and palaeoenvironmental analysis (Watt (Ed) 2011:249).

A multiplicity of sites and advances in technology create a jigsaw of archaeological information requiring solutions which maximize the potential of the data and aid further archaeological prospection. Geographical Information Systems (GIS) is the generic term for a range of software (e.g. ArcGIS[8]) used across the scientific world that enables the organisation, layering and interrogation of spatial and chronological data; for example, the 300,000 separate archaeological contexts generated by the West Heslerton Archaeological Project would have been unmanageable without software support[9]. The base data for creating landscape models is drawn from cartographic, topographical, geological, environmental (e.g. boreholes), and archival records (e.g. county-based Historic Environment Records[10]; the Portable Antiquities Scheme[11]), plus aerial photography, scanning airborne laser altimetry (or Lidar, an acronym for light detection and ranging), geophysical survey, palaeoenvironmental analysis and excavation data. Once amalgamated, interrogation of the data can:-

1) build virtual landscapes for display and enhanced understanding (e.g. the Gedleston Excavation, Vista Publications [12])
2) identify potential sites and issues, e.g. settlement and artefact distribution including gaps, defensibility of sites, vegetation and viewshed reconstructions (e.g. Wheatley and Gillings 2002)
3) predict the effort required to live on and move through the land using 'cost surface analysis'(Chapman 2006)
4) through regression analysis, envisage chronological change by the addition or removal of datable layers (Chapman 2006); and
5) use attribute queries to interrogate the data e.g. the number of known archaeological sites within a 2km buffer of a river valley.

The output can be applied to the creation of landscape-wide models or the small-scale recreation of objects[13], building images which both aid understanding and are available for public dissemination. Criticisms of the use of GIS in archaeology revolve around the incompleteness of data, the inevitability of using present-day norms to inform yesterday's actions, the artificiality of putting a frame around a landscape, and the difficulty of producing testable models (Chapman 2006); it has also been criticised for presenting a picture of a landscape that the inhabitants would hardly recognise - 'the God trick' (Harraway 1991:189, cited in Wheatley and Gillings 2002:9). These criticisms can be levelled both at a processualist and post-processualist approach to interpreting of the past, and the concerns of both

[8] http://www.esri.com/software/arcgis
[9] http://intarch.ac.uk/journal/issue5/westhes_index.html
[10] http://www.heritagegateway.org.uk/gateway/
[11] http://finds.org.uk/
[12] http://www.vista.bham.ac.uk/publications.html
[13] http://www.vista.bham.ac.uk/visualisation.html

approaches can be addressed by ensuring that GIS works within landscape archaeology in each of three main areas – normative, summarising the existing records; scientific, constructing models e.g. of route finding and food gathering; and theological (post-processual), enabling the interpretation of thought and motives for action (Chapman 2006). It is a place to think (*ibid*), and its impact on the archaeological world equates to the introduction of radiocarbon dating. By drawing together the information within a powerful tool like a GIS, predictions can be made to aid future archaeological prospection.

3.3.Prospection on the Weald Moors – techniques and areas for analysis

The remainder of this chapter looks at the creation of a GIS for the Weald Moors. Initial prospection on the Moors, undertaken by the NWWS (Leah *et al*. 1998), was geared towards the project's wider objectives for North Shropshire – to identify the extent of past human activity in relation to the lowland peatlands; to assess the state of preservation of archaeological remains; and identify potential threats (*ibid*:2,3). Hence their chosen prospection techniques were to use desk based analysis (HER/archival), rapid field survey (field-walking of arable areas and landuse assessment of the remainder) and evaluation of palaeoecological information for the presence /absence of suitable survey sites.

Working within current research frameworks developed post-NWWS (Watt (Ed) 2011), this thesis aims to provide a more detailed interpretation of the nature of the environment of the Weald Moors during the Holocene and contextualise the archaeological records within the regional landscape. The process was:

- To research published and unpublished literature (Chapters 1 and 4),
- To undertake a desk-top analysis of geological, topographical and borehole data, and
- To amalgamate the results with Shropshire's Historic Environment Record (HER) to create a GIS model for the Weald Moors using ARCGIS software and cartographic data available via Edina Digimap[14]. This enabled the visualisation of sites chronologically and spatially, and enabled the interpretation of relationships between sites, and between sites and topography (Fig. 23 *et seq*).
- Samples were also selected for palaeoenvironmental analysis (Chapter 5), which provided new data to support interpretation.

[14] http://edina.ac.uk/digimap

3.3.1. Desk top analysis of geological, topographical, and aerial data

Maps, be they geological or topographical, general or thematic (single subject e.g. soils), are base data for GIS, and a good starting point for archaeological prospection. The main advantage is clarity of presentation, and the two-dimensional constraint of maps can be overcome by creating Digital Elevation Models within the GIS; the often low-lying nature of wetland environments means that even small amounts of elevation were important in prehistory, and therefore, valuable areas for prospection. Geological (solid and superficial), topographical (detailing floodplain characteristics and contour), and historic maps for the Weald Moors are summarised in Chapter 2 (Fig. 12-Fig. 17) and provide base data for analysis of the HER below (Fig. 23-Fig. 29).

3.3.1.1. Fluvial systems and palaeochannels

Floodplain features (terraces, palaeochannels) offer excellent opportunities for archaeological prospection; notable case studies include the Trent Valley (Knight and Howard 2004), the Millfield Basin (Passmore *et al.* 2002) and the River Till -Tweed (Passmore *et al.* 2006). A template for the prospection process begins with mapping the valley floor to identify palaeochannels and landsurfaces, creating a chronology for aggradation and incision, and zoning the valley floor for alluvial units (Howard and Macklin 1999:538).

Within a definition of high -, medium -, and low - energy systems (Howard and Macklin 1999), the Middle Severn would be classified as low-energy with cohesive channel banks, and given the low gradient of the strines on the Weald Moors, these small rivers could be classified in similar vein. Although the strines are altered by modern drainage, their potential should be for levees, backswamps, palaeochannels and a high water table, and extensive wetlands (Howard and Macklin 1999:534 *et seq*). Stability of channel plus vertical accretion should both preserve and mask remains. Flooding on the Moors is more likely to be a product of the area as a low-lying ‘sink’ with water levels affected by a progressive rise in the water table during climatic deterioration rather than avulsion events caused by changes in flood frequency and magnitude in the hinterland. Riverine deposits are not extensive on the Weald Moors but are present as minerogenic soils bordering the peat (Fig. 15).

Palaeochannels, relict channels describing a previous watercourse, are important as find spots, yielding a range of artefacts from abandoned Bronze Age log-boats (e.g. at Chetwynd Park, 4km from the Weald Moors; Shropshire HER2819) to metalwork deposition (see 3.4.2.2 below); they are also an important source of palaeoenvironmental samples. A palaeochannel has been identified surrounding Wall Camp to the north and east. Initial analysis of historic maps and field conditions for this thesis (Leah *et al.* 1998: 80, 81, 84, and Fig.26; Hill 1953) led to an investigation of the area by augur (see Chapter 5 and Appendix 4). An unpublished soil analysis map, prepared for Mr Dobson of Wall Farm as a precursor to its inclusion in Natural England's Environmental Stewardship Scheme (Fig. 21), confirmed the analysis.

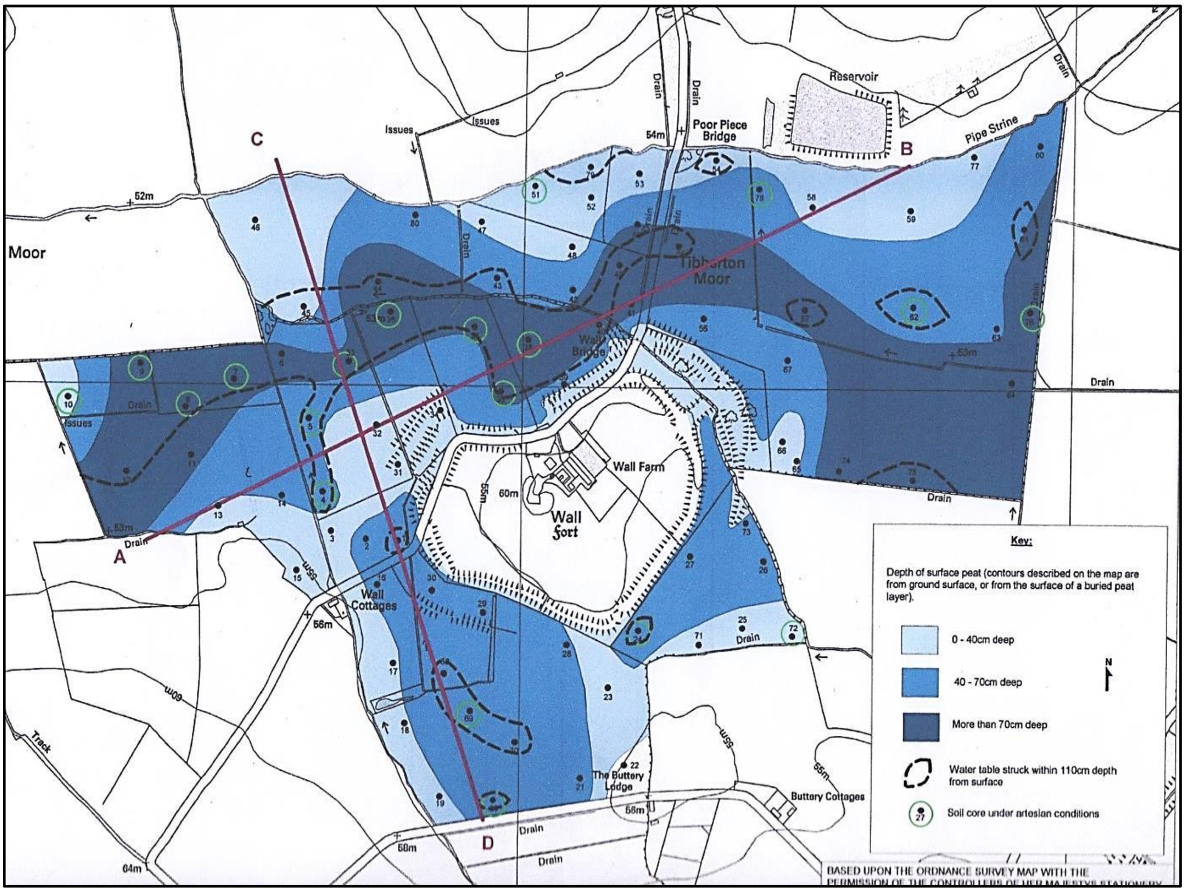


Fig. 21 Wall Camp - palaeochannel (Source: Mike Harding Consultants 2002. Fig 5a Depth of peat and water table: Unpublished report)

3.3.1.2. Soil analysis

Wetlands are made up of a variety of soils which respond differently to evaporation, and mapping at the interface can highlight archaeological features. Biogenic soils (peats) 'shrink' quicker than minerogenic soils because of their organic content (Chapman and Van de Noort 2001). In a study comparing Meare Lake Village and Sutton Common Iron Age marsh fort (*ibid*), features invisible to fieldwalking or aerial survey were subjected to differential GPS survey. By using microrelief data, Chapman and Van de Noort identified additional linear features, which had been emphasised by the 'smoothing' effects of ploughing (*ibid*:374). Peat development can mask earlier landscapes especially within lowland raised mires, and influence whether certain areas are worth prospecting; increases in surface wetness of raised mires leads to a shift in local vegetation which influences cultural activity.

Although this level of analysis was not available to this project, an informed review of soil maps indicated the potential for archaeological sites. On the Weald Moors, burnt mounds are found almost exclusively at the interface between peat and minerogenic soils (Fig. 25); NWWS identified an additional 17 concentrations of burnt stone (Leah *et al.* 1998:74) in this way, but pointed out that in modern times, the factor most responsible for uncovering these remains is likely to be peat wastage.

3.3.1.3. Borehole records

A search of the borehole records can supply information about underlying geology, both superficial and solid. Not all records are publically available, and this can limit the potential application of the data. A review of the borehole data for the Weald Moors[15] (Fig. 22) identified a line of shallow boreholes west of Preston-upon-the Weald Moors which traces the line of the Crow Brook, recording deposits of organic silty clay rather than peat. The Preston Hoard (see below) was recovered from this area and may indicate that deposition was in running water rather than organic peat. It is also the site of the Kingley Wich Brine Well and Salt Works (HER1369).

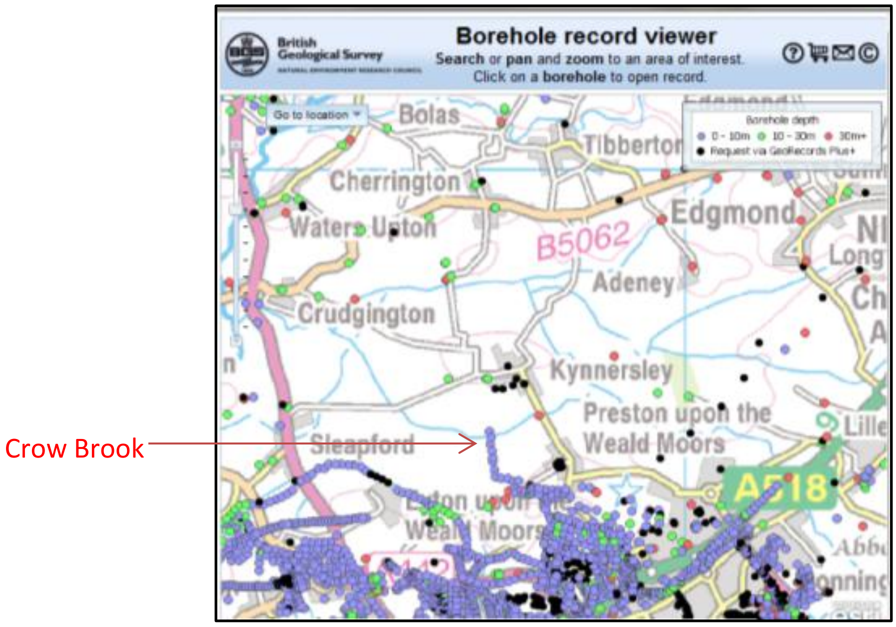


Fig. 22 The Weald Moors – borehole scan

15 http://www.bgs.ac.uk/data/boreholescans/home.html

3.3.1.4. Geophysical survey

The ability of terrestrial geophysical survey as an aid to prospection has been demonstrated over many years, providing *'a snapshot of non-invasive archaeological investigation'* (Gaffney and Gaffney 2000). Methods include resistivity, magnetometry, ground penetrating radar etc., and results from multiple surveys provide subsurface spatial data. The Wroxeter Hinterland Project (e.g. Buteux *et al.* 2000) provides a case study for archaeological prospection, including the widespread but targeted use of geophysical survey (Chapter 1).

The only geophysical information available for the Weald Moors was from Severn Trent's survey for a water pipeline (Hale 2008). A geomagnetic survey was taken of a 2ha area within a 20m corridor bordering the edge of the Wall Camp Scheduled Monument area. Of the anomalies revealed, one was interpreted as an area of burnt stone, its crescent shape possibly indicating a burnt mound (Hale 2008: 6); no ground truthing was undertaken to confirm this hypothesis. Identifying the area disturbed by the pipeline also ensured that no palaeoenvironmental samples were selected from the area.

3.3.1.5. Aerial prospection - photography and Lidar

Archival libraries of aerial photography are maintained by a number of sources, notably English Heritage and CUCAP[16] (Cambridge University Collection of Aerial Photography). The use of aerial photography strengthens a landscape approach, with ploughed-out features indicating anthropogenic activity. The Welsh Marches has proved a rewarding area for crop-marks of Iron Age/Roman origin (e.g. Baker 1992; Whimster 1989; Watson 2001). The majority represent defended settlements *'reflecting the evolution of a complex system of upland and lowland agricultural settlement'* (Whimster 1989:64), a pattern which is maintained in the modern distribution of dispersed farms. The Marches Upland Survey (as part of the National Mapping Programme [17]; Dinn and Edwards 2006), undertaken for the West Shropshire/ Herefordshire area, followed Whimster's interpretation of the aerial resource with a systematic identification of new sites.

The distribution of crop-marks in the area is uneven (in upland areas crop-marks are absent over 500m) and is reflective of a combination of:-

[16] http://www.geog.cam.ac.uk/cucap

[17] http://www.english-heritage.org.uk/professional/research/landscapes-and-areas/national-mapping-programme/marches-uplands-nmp/

1) differing reconnaissance practices - not every area benefits from having been flown at a time appropriate to show crop-marks to best advantage e.g. a light covering of snow or drought conditions, and
2) the varied nature of local soils; soil types in North Shropshire which favour crop-marks are the well-drained brown sands, brown earths and cambic stagnogleys (Whimster 1984:16) used for agriculture. Because of their depth and moisture retaining qualities, alluvial soils produce few crop-marks, but gravel soils produce good results from deeply cut or comparatively shallow structures. Crops grown on deeper and less permeable soils may show only more massive features (Whimster 1989:17).

Major concentrations of crop-mark enclosures are visible around Shrewsbury/Wroxeter and south of Oswestry. Whimster's analysis excludes the Weald Moors, the eastern limit being the Roden valley before its merger with the River Tern. There are some crop-marks along the Tern valley, but none in the low-lying area of the Moors (

Fig. 26, Fig. 28). Soil type must play a part, the well-drained brown sands of the Roden valley favouring visibility. The Roden/Tern valley, with the wetlands of the Weald Moors to the east, may have been a natural border in prehistoric times; however this may be a modern construct, and the areas to the north and south of the Moors have not been investigated.

There are advantages of using Lidar in conjunction with aerial photography. Lidar does not identify crop-marks, but is able to 'see through' superficial land features (Digital Surface Model - DSM) including buildings and vegetation, to the underlying earth surface (Digital Terrain Model - DTM); the palaeochannels of relict river systems and indications of peat wastage can be identified in this way (Challis 2006). Lidar is a potential source of data if further work is undertaken in the area.

3.3.1.6. Summary

A wide variety of archaeological techniques provide data that can be interrogated within a GIS; if it can be digitised, it can be included, and manipulated to present a range of graphics – terrestrial models, virtual landscapes, and reconstructions of landscape details (farming patterns, routeways) – which can be used as aids to understanding. The greater the amount of data, the more accurate the end result, and the more fruitful archaeological prospection will be.

3.4.The Weald Moors – the existing record and potential for future prospection

The techniques described above were combined with the Shropshire Historic Environment Record using ArcGIS software to create a GIS model for the Weald Moors.

Shropshire County Archive Dept. provided the HER for prehistoric and Roman sites against the following co-ordinates – SJ62502000; SJ62501350; SJ73002000; SJ73001350. The Shropshire HER and the NWWS survey results (prefix SH) are not currently combined; therefore the databases were cleaned and merged before mapping onto Ordnance Survey data sourced from Edina Digimap. The archive produced 102 sites (Appx. 1), which were grouped in broad chronologies (after Heritage Gateway dating protocol) as follows:

- **Prehistoric period** - categorised as 'Prehistoric' on the HER (46% of total); these comprise lithic records only
- **Early Prehistoric period** – 10,000-4000BC - Mesolithic and Early Prehistoric lithics from the HER/NWWS (no ceramics, structures or artefacts have been identified for this period), representative of hunter/gatherer communities.
- **Middle Prehistoric period** – 4000-800BC - Neolithic and Bronze Age, grouping together sites and artefacts representing major changes in technology, the transition to farming, and an increasingly settled way of life. Burnt mounds and burnt stone are grouped in this category.
- **Late Prehistoric/Iron Age period -** 800BC – AD43 – Early Iron Age/Romano-British artefacts and structures (as evidenced by crop-marks), representative of a settled population
- **Roman period** – AD43 - 410 - Roman artefacts and pottery
- **Undated/Unknown** – 6 records fall into this category – a spring near Rodway, a piece of worked bone, and 4 crop-marks
- **Post Medieval period -** an 18th Century brine works, potentially relevant to prehistoric sites.

The results are seen in Fig. 23Fig. 29. The HER and NWWS also record post-Roman, medieval and post-medieval artefacts and sites including numerous medieval potsherds, which are outside the scope of this study. The records have not been investigated beyond preliminary analysis of broad spatial relationships. Finds from each period are summarised in the remainder of this chapter and conclusions drawn. The dominant site on the Weald Moors is Wall Camp; given its size and the potential for comparison to other Iron Age forts, it is considered as a separately in Chapter 4.

Period	Site type/Findspot
Prehistoric	▲ lithic
Early Prehistoric	⬟ structure/ cropmark
Middle Prehistoric	✚ burnt mound
Late Prehistoric	● metal
Roman	■ artefact , ceramic or pot
Undated	★spring
Post Medieval	♦ bone

NB. This legend is generic throughout the following maps and diagrams

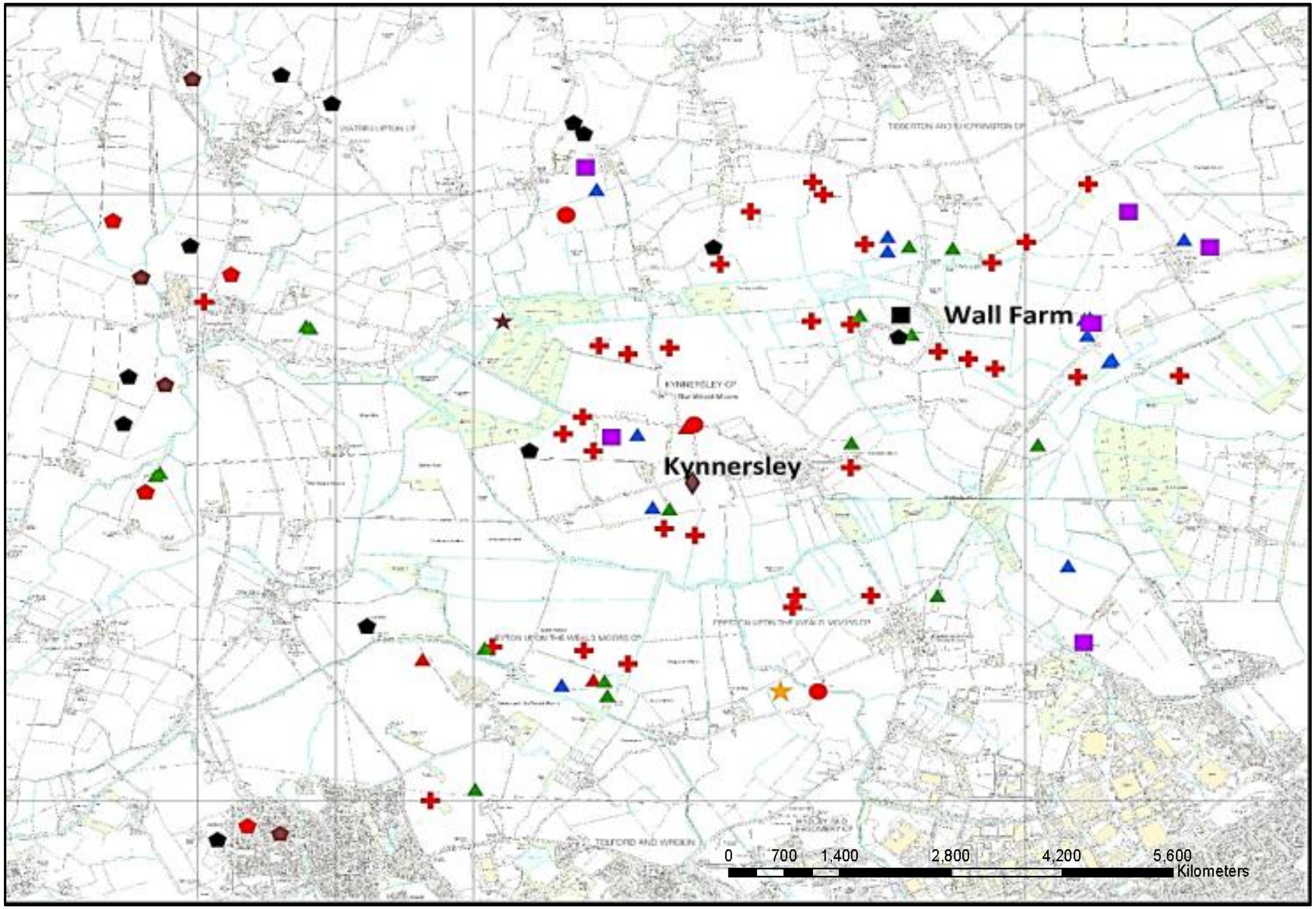


Fig. 23 The Weald Moors - Prehistoric and Roman sites (Source: Shropshire HER; Leah et al. 1998; Edina Digimap)

3.4.1. Prehistoric and Early/Middle Prehistoric period - Lithics

Evidence from the Prehistoric (existing HER) and Early/Middle Prehistoric (Mesolithic/Neolithic artefacts from NWWS) periods on the Weald Moors are exclusively of tools made of flint or chert (37 records; Fig. 24). These comprise flakes (mainly), plus cores, scrapers, and arrowheads. Some are multiple finds e.g. SH18 was retrieved from just north of Wall Farm, on the 60m contour, comprising 7 pieces of worked black chert and 3 pieces of worked flint; neither material is autochthonous.

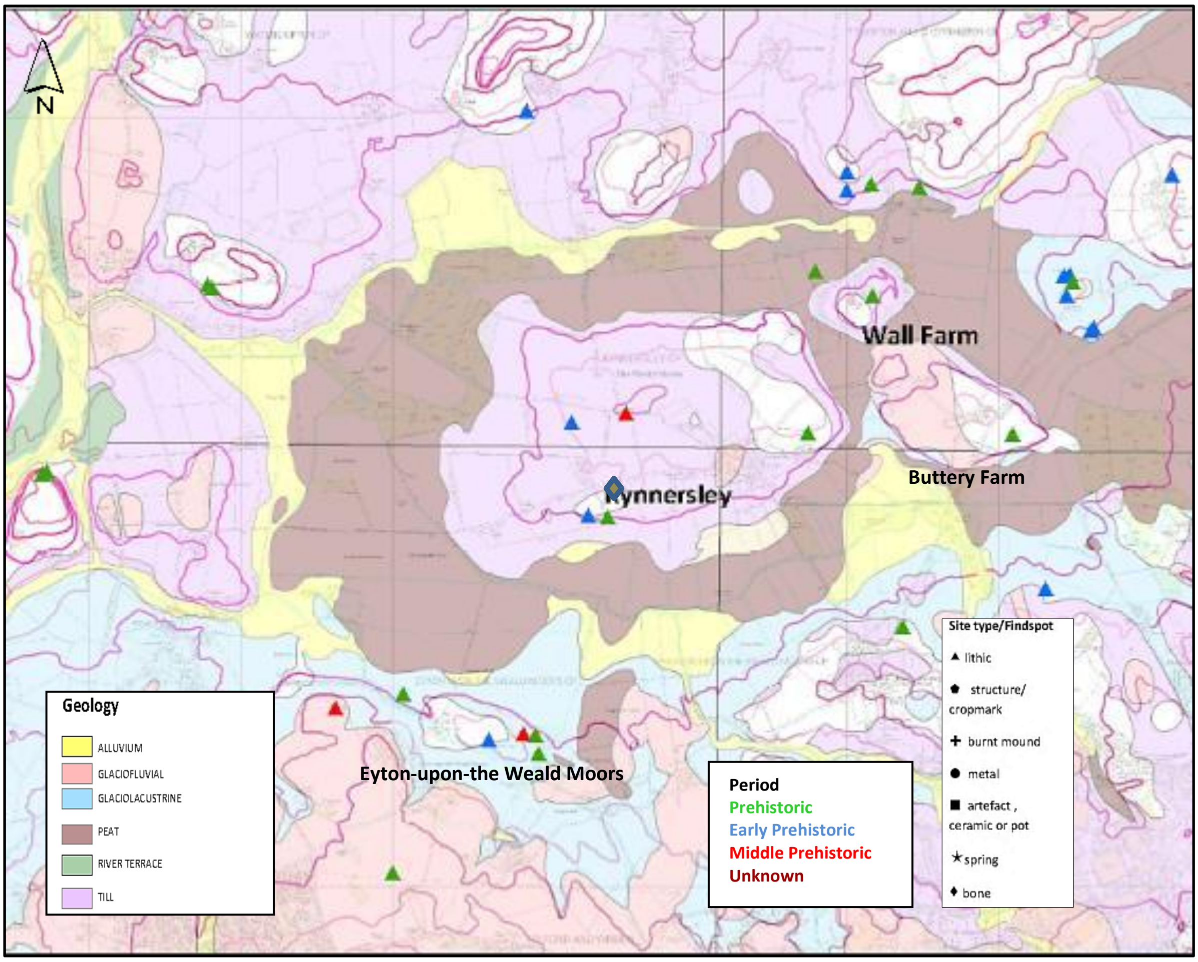


Fig. 24 Prehistoric and Early Prehistoric - lithics/bone distribution

Lithics on the Weald Moors were found on minerogenic soils on raised ground; there are clusters immediately north of Wall Farm, around Adeney north east of Buttery Farm, and around Eyton to the south. Whether these clusters represent true assemblages is hard to determine, as recovery was not systematic, and fieldwalking by NWWS was limited to the available ploughed land. However in 1993-4, a more systematic recovery was made of lithic artefacts from a field in nearby Newport (SJ754196), 2km from the Weald Moors and 1.5km from Aqualate Mere; these were mainly Mesolithic blades and cores together with a few pieces of Bronze Age date. This site was on ground around 70mOD, and was probably '*a favoured location used intermittently over a long period of time. It was, perhaps, one of the spots from which the resources of the surrounding wetlands were exploited between the Mesolithic and the Bronze Age' (*Leah *et al.* 1998:121,195), a description equally applicable to the Weald Moors. Records of Mesolithic and early Prehistoric activity appeared to be confined to upland sandstone outcrops e.g. Grinshill (SJ 530234, 17km west of the Weald Moors; Shropshire HERs 1629, 4726, and 8370), however NWWS recovered flints assemblages indicating a more varied distribution, including the Ellesmere region (Leah *et al.* 1998:29), and Baggy Moor, where 32 pieces of struck flint were recovered from Wykey Weir (Leah *et al.* 1998:39). A summary of Mesolithic sites in the West Midlands indicates a small but significant grouping immediately to the east of the River Tern (Myers 2007:30,Fig. 3.2), which includes the Weald Moors area. Neolithic and Bronze Age sites are rarer and finds from the Wroxeter Hinterland Project and NWWS indicated a possible decrease in Neolithic activity towards the north into Shropshire (Barfield 2007).

The types of lithics found in an assemblage and the raw material from which they were made indicate food procurement strategies and mobility, however, the concept of landscape held during the Mesolithic may not have been exclusively subsistence. Places were remembered and re-used for practical reasons, and also because, especially by the end of the Mesolithic, they formed part of collective memory (e.g. Tilley 2010). An example at Nab Head, Pembrokeshire indicates how a working site may have been selected over generations by virtue of its sensory (visual) stimulation– colourful rocky areas appear to have been favoured for activity over and above adjacent areas (Cummings 2000:93).

The Weald Moors lithics include flakes, cores, arrowheads and scrapers, covering activities from tool preparation to hunting, and the preparation of carcasses (e.g. Myers 1989). Tools of the Late Mesolithic/early Neolithic make up the majority of finds, but three lithics signify later evidence – a flake knife, flake and core – probably late Neolithic/early Bronze Age (Leah *et al.* 1998:73). The majority of the tools are unretouched (where stated), indicating single usage, and/or that raw materials were readily available. The source for the raw material is most likely to be nodules transported to the area by glacial action during the Late Devensian, but there is a possibility that the chert was deliberately sourced from around Alderley Edge, Flintshire or the White Peak in Derbyshire (Evans et al. 2007; Hind 1998; see Chapter 2). The tools made of black chert were mostly from the early Mesolithic, but also included 3 pieces from the late Neolithic.

The palaeoenvironmental record for the wider area of North Shropshire indicates a drop in arboreal pollen in association with Mesolithic finds, suggestive of woodland management (Myers 2007:32), and environmental management may also have extended to the Weald Moors (see Chapter 5), perhaps indicating a population that lived and hunted locally. According to Barrett, *'we should interpret the debris as the product of specific activities and not simply as 'calling cards' indicative of any human presence*.' (1994:139). Further Mesolithic activity may be supported by the recovery of a piece of worked bone/antler near Kynnersley (SH57, although this has not been dated).

Lithics have poor chronological resolution, and because of their virtual indestructability, are frequently found in secondary contexts, and this limits their interpretation. Many of the lithics in the Shropshire HER for the Weald Moors are generically classified as 'Prehistoric', and lack provenance. Additionally, the flint and chert tools of the Weald Moors are not 'assemblages' and so cannot provide anything more than a general indication of activity. However, the lithics record indicates that Mesolithic and Early Prehistoric activity was regular on the Weald Moors area, possibly amounting to management, and resources were exploited on both the Moors and across the North Shropshire wetlands. Combining together the range of artefacts, their source material, and palaeoenvironmental data, a case can be made for a local and comparatively settled population, living and hunting year-round on the outcrops and around the wetlands that comprise North Shropshire and the Weald Moors. The extent to which the population managed the Weald Moors and other meres and mosses in North Shropshire, together with settlement and foraging strategies would be the subject of further research.

3.4.2. Middle Prehistoric period

The Middle Prehistoric period (4000BC-800BC) covers a broad time span which saw profound social and practical changes – the development of hunter/gatherers into more settled communities, an increase in arable farming practices, a transformation in the remembrance of the dead, and major changes in technology (e.g. Whittle 2010; Parker-Pearson 2010). Applying this to the Weald Moors, the archaeological record for the Middle Prehistoric period (Fig. 25) shows a more settled but possibly still domestically transient population during the Early Bronze Age (as evidenced by ring-ditches). As the Bronze Age progressed, the area continued to hold cultural and possibly ritual importance as evidenced by metalwork deposition. However, the most dominant site type for this period is burnt mounds. Of the 45 records for this period, 35 are burnt mounds/stone – 77% of the total. There are only 3 recorded lithics finds (see above), and no pottery.

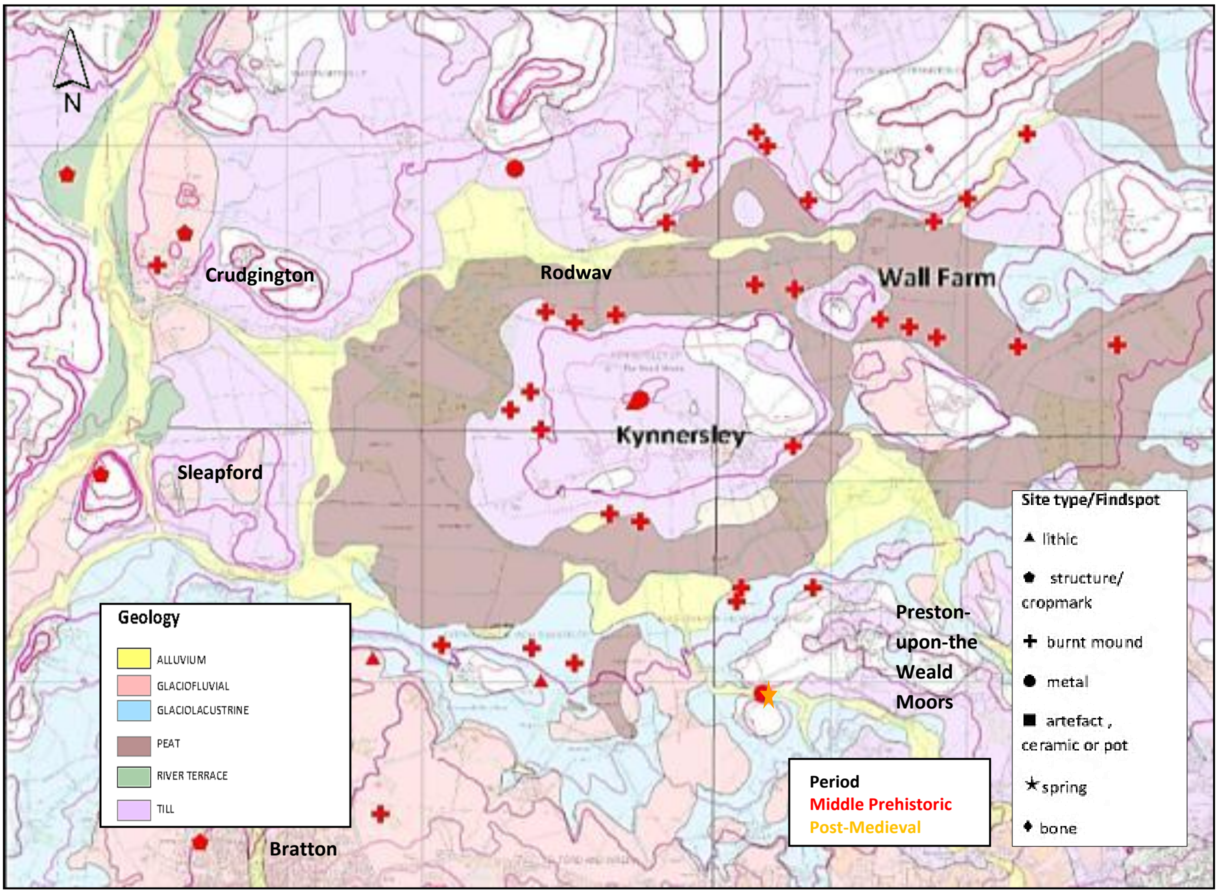


Fig. 25 Middle Prehistoric period sites and find spots

3.4.2.1. Ring-ditches

Ring-ditches frequently indicate ploughed-out vestiges of round barrows (i.e. the refilled quarry ditches surrounding mounds) of Early Bronze Age date (Watson 1991:13; Buteux and Hughes 1995:160), and there are several clusters of this monument type in Shropshire (e.g. at Bromfield and at Meole Brace; Buteux and Hughes 1995). The four ring-ditches which occupy the River Tern valley to the west of the Weald Moors are potentially northern outliers of the Withington nucleated settlement (Mullin 2003:16), which in turn is part of the concentration of ring-ditches in the Upper/Middle Severn valley. Three ring-ditches in the Tern valley are on terraces at river confluences, and strategic points in fluvial landscapes have been shown to be important areas for ritual and funerary monuments e.g. confluences on the Rivers Trent/Soar (Howard *et al.* 2008), and fording points e.g. Rhydwhyman, Powys (Britnell *et al.* 2000; Gibson 1998). Although the drainage of the Moors has been altered since prehistory, the river junctions have possibly remained the same (see Fig. 26; and Chapter 2). The ring-ditch at Bratton is near a stream but not obviously at a confluence; it is also near to a linear crop-mark of unknown date (Fig. 25; Fig. 28). None have been excavated.

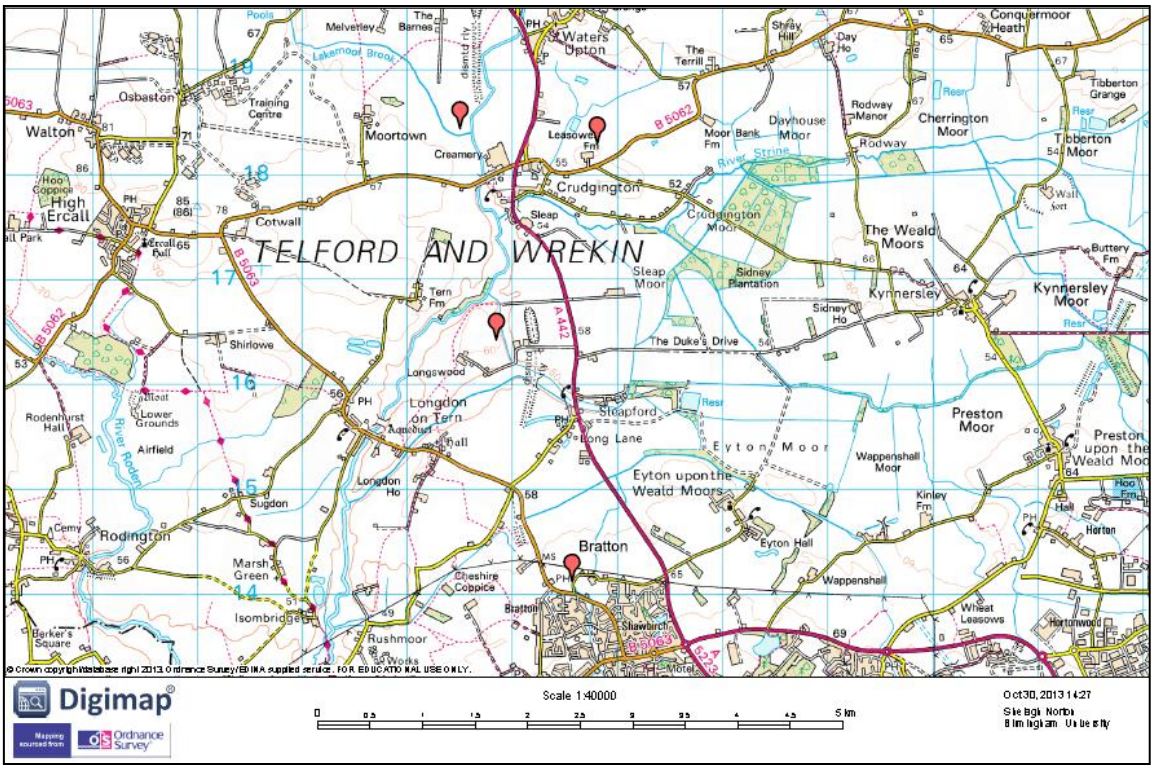


Fig. 26 Ring ditches along the River Tern at tributary junctions

No ring-ditches are found actually on the Weald Moors, however there is confusion in the HER of the precise location of HER3350 (Appx. 1), which may be situated near Crudgington Moor and as such would be unusual for its wetland setting.

As so few settlement sites exist, an understanding of Late Neolithic and Bronze Age society relies heavily on interpretation of funerary monuments, their location, and their distribution across the wider area (Barrett 1994:70-85). The ring-ditches (and some round barrows) along the Upper/Middle Severn are at approximately 5km intervals (Buteux and Hughes 1995), in areas of long-term arable farming (Garwood 2007:134), indicating settlement activity over a long period by (possibly) dispersed groups (Garwood 2007:148). It is also possible that such communities retained their identity with a shift towards hillfort construction in the Iron Age (Buteux and Hughes 1995:160). The Tern/Roden valley appears to be the easterly limit for the North Shropshire cluster (Garwood 2007:135 Fig.10.1). Comparing the ring-ditches overlooking the Weald Moors with other areas, there is a Bronze Age cemetery near Baschurch (SJ420230), adjacent to The Berth Iron Age fort and close to Baggy Moor (which also has yielded lithics scatters, metalwork depositions, and a concentration of burnt mounds). Human remains were also discovered in the early 19th Century at Anc's Hill, a natural mound overlooking Aqualate Mere. Although they were thought to be Roman, the additional presence of a unique 'twin' food vessel has led to suggestions that they were older, and that the 'natural mound' had ritual associations (Mullin 2003).

Burial practices in the Late Neolithic and Early Bronze Age are diverse but generally fall into an 'open' category - more public, with wider access, and acting as communal centres for social elites - or alternatively, 'closed' or one-off monuments, more likely to be localised and small scale (Garwood 2007:144). The ring-ditches in the Upper/Middle Severn, including those along the Tern valley, appear to be small scale local monuments in the 'closed' tradition. Evidence also suggests that ring-ditches and barrows frequently reference earlier places of significance, but two examples south of Shrewsbury present an interesting contrast. At Meole Brace A (SJ489106), a ring-ditch is found adjacent to a Neolithic pit group (Hughes and Woodward 1995:160); conversely, excavations nearby at Sharpstone Hill (SJ486088) appears to show the truncation of a ring-ditch by Iron Age farming (Barker *et al.* 1991: 21-61), possibly indicating that collective memory had been eclipsed over time. Ring-ditches were likely to be on land which was marginal, used largely for grazing, which in turn would place settlement away from the river valleys. This gives added credence to the concept of the Weald Moors as marginal and possibly of ritual significance.

The monument clusters of the Upper/Middle Severn have been interpreted as focal points for social gatherings and exchanges between interrelated communities for whom lifestyle was transient and settlements scattered (Buteux and Hughes 1995:161-2). Further research would be required to determine the exact nature of the Tern valley ring-ditches, but on the face of it, these appear to be funerary monuments situated at strategic points along the river valley, on the fringes of the North Shropshire community, overlooking and possibly laying claim to an important wetland area, indicative of an increasingly settled population.

3.4.2.2. Metalwork Deposition

Three metalwork deposits have been recovered in the Weald Moors, in an apparent line running NNW/SSE across the centre of the Moors, possibly indicating the line of a routeway across the Moors (see 2.4.1; Chitty 1953). The Preston Hoard (HER697; 5 palstaves; Middle Bronze Age) was recovered in 1832-3 from beside the Crow Brook, west of Preston-upon-the Weald Moors; this hoard is now lost, but one of the palstaves formed part of a collection at Eyton Hall, and is now in the Shrewsbury Museum (*ibid*). A bronze spearhead was recovered further north at Day House Moor (HER 775, Middle Bronze Age); this area has also produced multiple finds of later date (see below). A bronze axe was found near Kynnersley (HER1385).

Deposition is a practice dating from the Early Bronze Age, occurring in places wet and dry, high and low, caves and mountain tops (Bradley 1984; 1990; 2000). In some instances, the practice continued well into the Late Iron Age and beyond (e.g. at Fiskerton; Parker Pearson and Field 2003), and arguably, it continues to this day whenever a coin is thrown down a well for luck. Initially, metal, specifically bronze, must have seemed a magical substance, but the realisation of its practicality and flexibility, its significance as wealth, and the status it conferred, would have quickly followed (Bradley 1990).

Like funerary and ceremonial monuments, deposition marked places of significance and the rise in depositionary practices during the Bronze Age links with profound changes in the societal structure. Bradley (2000) proposes natural places as original and continued foci, which attracted different deposits, possibly by different groups of people (*ibid*:63). Some deposition was in man-made places e.g. at Moel Arthur, Flintshire where a hoard of three flat axes was found within a hillfort (Halsted 2007:171), however originally, these may have been significant natural places commemorated by later fort construction (Bradley 2000:35). The proposed reasons for deposition are almost as numerous as the locations – votive offerings to access a spiritual world (Bradley 2000), the deliberate removal of valuable objects from the everyday world together with (on occasion) their deliberate breakage signifying the end of the object's life, the marking of special events or places, or the demonstration of wealth by conspicuous consumption (Bradley 2000). Items were removed from circulation, and therefore made invisible in much the same way as previously placing items in tombs would remove them from the everyday (Bradley 2000). There is always the possibility that the artefacts may have been inadvertently lost, even stashed, but these were not items to be given up lightly.

Flag Fen is a notable example of a long tradition of deposition in a wetland context, with deposits of metal, animal bone, and pottery, structured spatially and chronologically, and a platform possibly for deposition purposes, was also constructed at a time of climatic deterioration around 1000BC (Pryor 2005). Although the tradition of metalwork deposition at the site covered 1200 years and lasted well into the 1st Century BC (Bradley 2000:51), the nature of the deposits changed markedly over time. The River Thames also has one of the highest densities of Late Bronze Age metalwork in Europe, but only in certain places, with other locations containing bone deposits (human and animal) which in certain instances were marked by posts (Bradley 2000:54). No ceramic or bone deposits, or deposition platforms, have been identified on the Weald Moors to date.

Regionally, 75 Bronze Age metalwork deposits have been recovered across the North Shropshire meres and mosses (Mullin 2012:53) including a looped palstave at Whixall Moss (Shropshire HER 1572) and multiple finds at Baggy Moor (e.g. the Bagley Shield (Leah *et al.* 1998:36, 37)). Although most of the Bronze Age metalwork finds (in the West Midlands) have been in low lying wetland areas (Halsted 2007:171), some are recorded at hilltop sites (e.g. a flanged axe and a decorated axe found at Titterstone Clee Hill (Halsted 2007:171)). In the area immediately surrounding the Weald Moors, Bronze Age metalwork deposits were recovered from near the Wrekin (e.g. the Willow Moor Hoard; Shropshire HER 1779/1780); the Ercall Hoard (Shropshire HER 1702) at Child's Ercall (SJ665263); and casting waste has been recovered from the Telford area (Portable Antiquities Scheme : HESH-AB1DC5; Bronze Age:Roman).

Of the Weald Moors depositions, only the Preston Hoard (Shropshire HER697) comes from a definite wetland context; this hoard was recovered from the Crow Brook, apparently close to the site of the brine spring at Kinley (Shropshire HER 1369), at a point '*where the Crow Brook runs through boulder clay between two more elevated patches of glacial sand; the site, now bridged, is below the 200ft contour at a point where the higher ground on each bank dips to a short gap: it would thus be a natural crossing place to and from the outcrop of the Keele Beds on which Preston stands*.' (Chitty 1953:243). A separate find was made of '*a Bronze Celt'* a mile further south of the Crow Brook at Hadley Park, just outside the study area (Shropshire HER699) which '*helps to define the traffic route that extended towards the Severn'* (Chitty 1953:244). Chitty concluded that the Preston Hoard was deposited during a dry period in the Middle Bronze Age which preceded a period of cooler wetter climate at a time when the Weald Moors *'were more easily crossed than at any other time before their draining in the nineteenth century*.' (*ibid*: 249-250). This would place the deposition ca1200-850BC (Brown 2008; see Fig. 8). The Whixall Moss palstave was also deposited during a dry phase (Chitty 1953:249-250), although these dates are now subject to revision (Leah *et al.* 1998:16; see Chapter 5). However, the chronology is too imprecise to draw firm conclusions about a relationship with climate.

The other two recoveries on the Weald Moors – a Bronze axe and a spearhead - were chance finds in fields, which may have been wetland contexts at the time of deposition; their precise location is unclear, and may have altered over time by changes through drainage and the drying out of pools (cf Baggy Moor; Brown 1990). The 'Telford Torc' (Portable Antiquities Scheme WMID-C53CB8), was also recently recovered near Lilleshall (SJ732157) (see Chapter 4). A high status object of Iron Age date, and deliberately broken before deposition, this denotes an ongoing tradition of deposition in this area.

The Weald Moors' metalwork deposits also highlight two significant relationships – between Bronze Age deposits and burnt mounds (e.g. Halsted 2007:174; see below), and between metalwork deposition and burial (Mullin 2003:21). Reviewing the connection between metalwork deposition, burnt mounds and settlement, Halstead concluded that neither metalwork deposition nor true burnt mounds were to be found close to settlement areas (Halsted 2007:176), although recent work suggests that metalwork deposition was more associated with settlement than was previously considered (Barber 2001, cited in Hunter and Ralston 2010:141). Mullin (2003) explored the link between the disposal of metalwork, burial, and the 'rites of liminality', where the dead undergo a series of rituals before joining the realm of the ancestors. In North Shropshire, a number of barrow cemeteries adjacent to wetlands have associated metalwork deposition (e.g. Whixall Moss) *'where emphasis is placed on an extended and complex liminal period with the disposal of objects away from the grave rather than on the burial act or rite of incorporation'* (*ibid*:21). The ring-ditches overlooking the Moors to the west may represent such a connection.

The differences between deposition in rivers and those in wetlands have been explored by Mullin (2012) with particular reference to the River Severn, and to an extent, the North Shropshire meres. The number of metalwork deposits recovered from the Severn and other rivers in the west of England (the Ribble and the Dee) is strikingly low by comparison with that recovered from meres and mires, and from rivers further east. Mullin's conclusions centre on the role of the Severn as a feature of the economic landscape, connecting extensive areas, and by inference, different tribal groups; this stands in contrast to the smaller scale and more insular qualities of wetlands. As each locale is conceptualised differently, there are consequences for depositionary practices; perhaps where deposition of metalwork occurred in rivers, it took place at boundaries between groups, whereas wetland deposits took place within areas controlled by one group (Fontijn 2002, cited in Mullin 2012:53).

Together with the ring-ditches which overlook the Weald Moors from the west, these ideas begin to argue for a local landscape that was both spiritual and temporal. The Weald Moors was, possibly, an area which was both culturally and practically important, claimed by a local tribe and overlooked by their funerary monuments, whose people made significant deposits of high status metalwork along a path which followed a well-known routeway across the wetland.

3.4.2.3. Burnt mounds

Burnt mounds (*fulachta fiadh*) and areas of burnt stone are the most numerous site type in the Weald Moors landscape. Generally, a '*mid/late Bronze Age date is accepted for these monuments'* (Ehrenburg 1991:41), although the record covers a much broader timespan, from ca. 3500BC - AD1600 (Ó Néill 2009:8). A recent review of burnt mounds in North Wales summarised the activity as *'starting shortly after 2500 cal. BC and probably ending by 800 cal. BC'* (Kenney 2012:266), pointing out that single dates should be treated with caution. NWWS assumed a date range for those on the Weald Moors of late 3rd millennium to the earlier half of the 1st millennium BC (Leah *et al.* 1998:122). All have been included in the Middle Prehistoric period in this study.

Burnt mounds occur across north-west Europe, with concentrations in Scandanavia, Ireland, Scotland, Isle of Man, Wales, the West Midlands and East Anglia (Ó Néill 2009); they are numerous in Birmingham and the Black Country (Hodder 2002). Typically, burnt mounds are characterised by a crescent shape of heat affected stone, close to a water course, with either a single or several troughs made of wood, or a clay lined pit; they frequently appear in pairs (Hodder 2002). Although some have associated structures (e.g. Ripper 2012), this is true of <5% of examples (Ó Néill 2009). Some are upstanding, but many, especially on the Weald Moors, are ploughed out or affected by the processes of deflation, where peat wastage has revealed many more mounds and scatters of burnt stone since recordings in the early 20th Century (Leah *et al.* 1998:70). They can be associated with river terraces (e.g. at Clifton Quarry on the River Severn near Worcester; Jackson and Dalwood 2006:Fig. 17), wetlands (although not near mosses and meres in North Shropshire; Leah *et al.* 1998:122), and springlines (Laurie 2003:224). On the Weald Moors they appear in lines or clusters at the interface between the peat and the minerogenic soils, and in several instances, appear to follow the line of an existing or earlier water course (see Fig. 27). There is a possible association between spreads of burnt stone and Late Prehistoric enclosures (Leah *et al.* 1998:44); this may include several near Wall Camp (Chapter 4). 18 burnt mounds/burnt stone scatters are recorded on Baggy Moor (Leah *et al.* 1998:39-44), further evidence of the association between burnt mounds and metal deposition (see above), and of the similarities between the Weald Moors and Baggy Moor. The connection between burnt mounds and settlement is not proven. Ehrenburg has associated burnt mounds with neighbouring ‘structures’ (Ehrenburg 1991:53-55), and Kenney points out that although the need for a water source may preclude close settlement activity, repeated use indicates they were not remote from settlement sites (Kenney 2012:263).

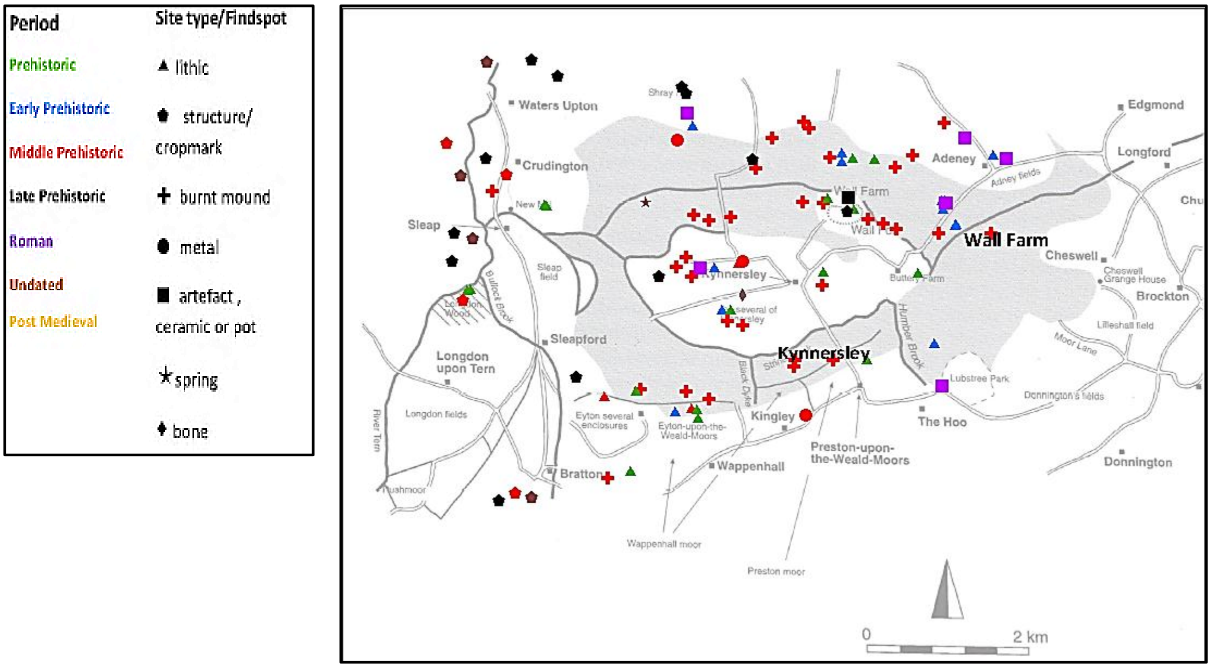


Fig. 27 Water courses on the Weald Moors ca1580 (Leah *et al*. 1998:84), together with archaeological site records, specifically burnt mounds

Burnt mounds are frequently almost devoid of artefacts, and their purpose has been extensively debated (e.g. Ó Drisceoil 1988; Barfield and Hodder 1987, 1989; Ó Néill 2009; Kenney 2012). Their main function is thought to be for cooking meat (Ó Drisceoil 1988; Ó Néill 2009) although excavation does not consistently reveal animal bone; this is possibly explained by a combination of acid soils, and consumption of food away from the cooking area (Ó Drisceoil 1988:675; Barfield and Hodder 1987: 371). Their use as sweat lodges for cleansing and/or ritual (Hodder 2002; Ó Néill 2009) has been promulgated e.g. at Cob Lane, Birmingham (Barfield and Hodder 1987). Other theories include a link between burnt mounds and metal working, especially copper. Although this was considered unlikely (Thelin 2007), it is not dismissed in the general literature, but the apparent association may be the product of chronological synchronicity. More industrial purposes include fulling (using heated and cold water to process fleeces e.g. Ripper 2012), brewing, leather processing, and boat building (Ó Néill 2009). They are indicative of any technology that requires hot water or steam (Ó Néill 2009). It is likely that, whatever the purpose, they would have been used during the summer months, avoiding winter flooding. Usage may have changed over time and perhaps attempts to categorise burnt mounds into a single purpose is equivalent of trying to narrow down the usage for a multipurpose modern object; however that would not explain their prevalence in certain geographic locations.

Hodder also suggested a possible association with brine production, comparing the structure of burnt mounds with that of an Iron Age salt production hearth in Droitwich (Hodder and Barfield 1990:63). Given the presence of at least one salt spring on the Weald Moors (at Kingley Wich, Shropshire HER1369), this idea is worth pursuing. One possible scenario is that salt evaporation by burnt mound technology followed the lines of salt springs or briney water courses, a new burnt mound being created as each source was exhausted. Possibly, this technology prevailed until it became more economical to import salt from Cheshire in the Iron Age (see 4.3 below), but more work would be needed to explore this concept further.

Burnt stone is a by-product of burnt mound technology, and more informative evidence (possible structures, troughs and pits) would lie sub-surface. Encouraging signs of preservation come from the only excavation of a burnt mound on the Weald Moors at Rodway (Hannaford 1999). Topsoil stripping for 450m of pipe for Severn Trent Water revealed an area of blackened soil and heat fractured stones. The newly identified burnt mound was close to one that had been recorded by NWWS (SH64), which had been obliterated by the presence of an agricultural reservoir. Excavation revealed a slightly mounded area of burnt material, 16.5m in diameter, plus a sub-rectangular pit, interpreted as a water trough; a second feature may have been another water trough or a stream source. A radiocarbon date of 1312-1168 cal. BC (dated by QUB but sample or reference method of calibration not supplied) was obtained from carbon-rich deposits at the base of the mound. There was evidence that the site was used repeatedly (a common feature e.g. Ó Néill 2009; Hodder 2002); one site, at Willow Farm Business Park, Castle Donnington (Leicestershire and Rutland HER MLE9682) was used 35 times, but for what remains an open question. The only artefact recovered from the Rodway site was a grinding or rubbing stone. It has possible associations with food production, as a sharpening tool for butchery, or the grinding of meal (Hannaford 1999:73); however, it may also reflect a ritual deposit, as seen in other contexts (Ó Drisceoil 1988:675). A sherd of Late Bronze Age/Iron Age pottery was also recovered 300m away from the excavation.

That burnt mounds were communal appears to be a shared conclusion. Ó Néill envisages burnt mounds as social arenas and likens them to communal washing areas found in pre-industrial societies (Ó Néill 2009); Kenney (2012) supports the idea of cooking and brewing, associating both with feasting, a concept also shared by Wigley (Wigley 2002a:119). Bayliss (in Hodder and Barfield 1991) compared those on ‘wet’ sites such as lake margins with ‘dry’ sites on the alluvial floodplain, concluding the necessity for a proximal water course, and the likelihood that, whatever the purpose, they were a community enterprise.

A summary from an excavation near Galway City covers the arguments - *'The survey and subsequent excavations at Doughiska show that a community of people utilised this area in the Bronze Age. Whether seasonal or permanent use was made of the mounds, their concentration suggests that this area was particularly important to community needs. The location of the mounds and the possibility of flooding is likely to have rendered them unsuitable for daily use and strengthens the argument for seasonal usage. The lack of associated habitation evidence suggests that the people who used them did not live at the sites, but may have had a settlement close-by'.* (Fitzpatrick and Crumlish 2000:143).

3.4.2.4. Middle Prehistoric period – summary

The period of the Middle Prehistoric saw marked social and technological changes across Britain and the sites recorded on the Weald Moors provide a skeletal backdrop for those changes – the number of stone tools declined markedly, the earlier tradition of burials in round barrows eventually became obsolete, the use of metal signals new technology and its deposition indicates changes in ritual practice or evidence of conspicuous consumption. The evidence for human activity on the Weald Moors during this period comes from the presence of ring-ditches, metalwork findspots/hoards, and burnt mounds, none of which have strong associations with domestic or settlement activity; if the burnt mounds are excluded from the analysis, evidence for the Middle Prehistoric period becomes quite scanty perhaps re-emphasising the peripheral nature of the area. Although this could lead towards a conclusion that the Weald Moors was a place of ritual, or a 'place apart', the current archaeological record may be skewed by the masking of archaeological sites by encroaching peat, fluvial action, or simply the absence of field work, making an accurate view of how society operated during this lengthy period difficult to gauge without further work.

3.4.3. Late Prehistoric/Iron Age period

By comparison with the Middle Prehistoric period, the Later Prehistoric is short, covering the timespan from the Early Iron Age to the Romano-British period – approximately 800 years. There are 18 records for this period (Fig. 28), including 5 records of crop-marks of prehistoric or unknown date which have been classified within this section by reference to the HER - 12 enclosures, one of which includes a trackway, one ditch, one pit alignment and one pit which contained an Iron Age pot (interpreted as a cauldron), one field system, one blue glass bead and one hillfort (Wall Camp at Wall Farm). The crop-marks on the periphery of the Weald Moors are interpreted as settlement enclosures. Given its prominence, Wall Camp and the (possibly associated) bead will be dealt with in detail in the next chapter (see Chapter 4). Therefore, this section sets the context for Wall Camp, by looking at the surrounding area and summarising the other records for the Early/Late Iron Age.

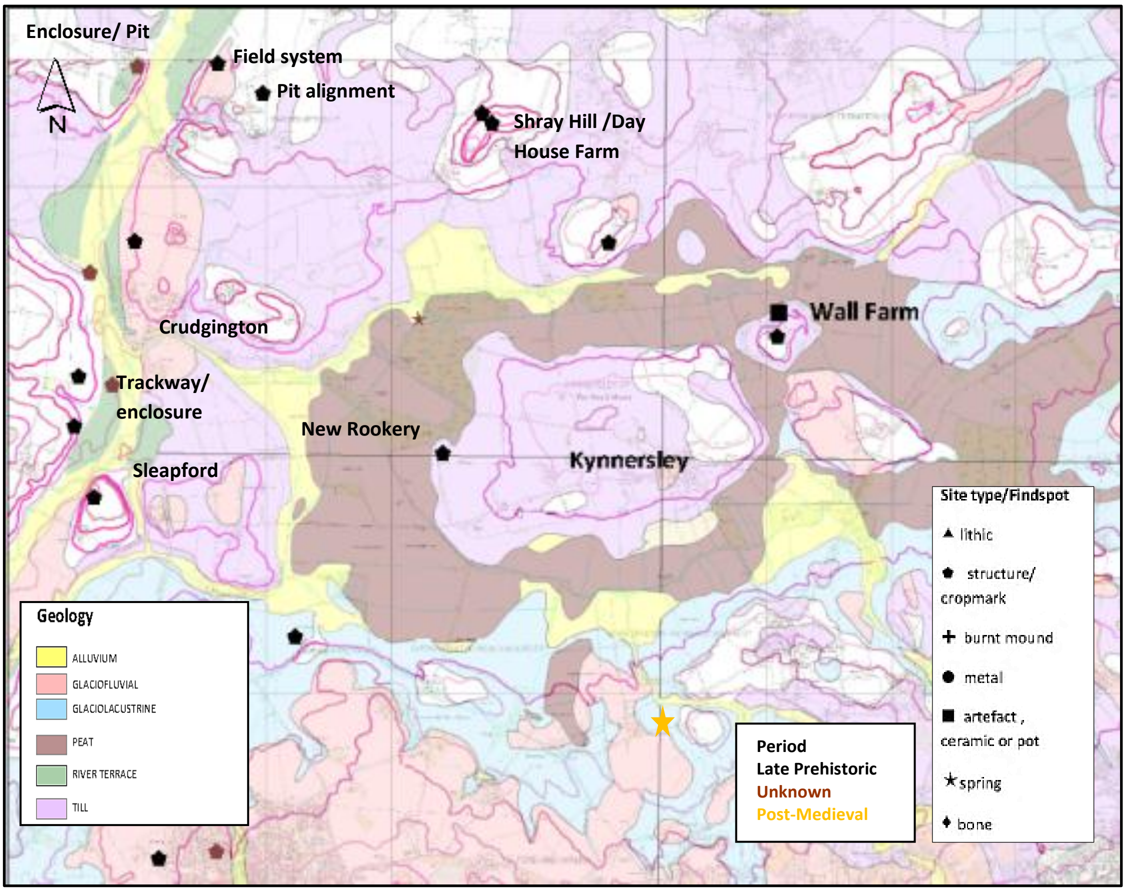


Fig. 28 Late Prehistoric/Iron Age period - sites and findspots

The Early Iron Age archaeological record indicates the first evidence of settlement in the area, or at least on the free draining soils of the river valley on the edges of the Weald Moors. No indications exist as to whether the economy was agriculture or pastoral, but the land around ring-ditches has been suggested as marginal and used for grazing (see 3.4.2 above), and the habitat surrounding the nearby Pave Lane enclosure (see 4.4.2 below) was assessed as grassland at the time of occupation.

The enclosures around Crudgington are situated on river terraces or slightly higher ground, hugging the Tern valley and in the vicinity of the Bronze Age ring-ditches. The crop-mark interpreted as a trackway south west of Crudgington is of unknown date, but may be the entrance to an enclosure, a droveway or a track made to allow access over flooded ground (Shropshire HER4522), and trackways were a feature of wetlands, created at times of climatic deterioration (see 2.2 above). This example appears to lie on the interface between alluvial deposits and the river terrace. No evidence of a trackway structure has been reported for this feature, and further analysis would be needed to determine its nature.

North of Crudgington near Waters Upton, an interesting arrangement of a pit alignment, an enclosure and a field system overlook the junction of the Tern and the Meese (to the north). Pit alignments are associated with linear boundaries of the late 2nd/early 1st millennia (Wigley 2002a) and therefore at the earlier part of the Late Prehistoric period in this chronology, therefore this arrangement of sites could cover an extended time span. The construction of pit alignments (and that of cross ridge dykes) has been linked to 'gang building' and inter-communal activity (e.g. Wigley 2002a:170; Buteux and Chapman 2009:102). There also appears to be a mutual exclusivity between pit alignments and metal deposition/burnt mounds (Wigley 2002a:175). Therefore the configuration of sites to the north-west of the Weald Moors could be interpreted as the marking of a territorial boundary, protecting the area to the south-east where burnt mound activity and metal deposition occurred. This pit alignment is an outlier of the Roden/Tern group (Wigley 2002a:167), and *'… the pit alignments within these groups appear to represent a strategic redefinition of the rights of access to the land.'* (Wigley 2002a:168).

The New Rookery double ditch enclosure within the area of the Moors and on the edge of the peat is an anomaly. Having little height advantage, it would have been prone to flooding in winter; however, the enclosure may have been seasonal. It is proximal to 3 areas of burnt stone (see above), which, if associated with the burnt mounds near Wall Camp (see Fig. 37), may indicate that burnt mound technology was being used into the Iron Age.

Several locations incorporating Iron Age enclosures indicate a time depth which spans Mesolithic to Roman. Shray Hill to the north of the Moors rises to 82mOD, with Day House Farm 350m to the west. This hilltop is occupied by an Iron Age enclosure (Shropshire HER79), and an Iron Age pit with 'pot boiler' (Shropshire HER 83); the pit was sectioned during the installation of a gas pipeline, and burnt stone and Iron Age pottery were recovered (Leah *et al.* 1998:70). The immediate vicinity records two Prehistoric flakes (Shropshire HER 27), a Bronze Age spearhead (Shropshire HER71), and a Roman gaming piece (Shropshire HER92). This low hill provides uninterrupted and commanding views to the south across the Moors and the Severn valley as far as the Wrekin and its hillfort (highlighted as part of the routeway across the Moors by Chitty (1953:251; see 2.4.1)), and to the north, across the River Meese valley. It would have been favoured as a vantage point, and in the Early Iron Age, may have been connected with the territorial boundary discussed above. The single and double Iron Age enclosure at Sleapford is co-located with a Bronze Age ring-ditch (however, the spatial co-ordinates of the enclosure may be incorrect, and it may lie at a lower level closer to Eyton); nevertheless, Sleapford occupies a pronounced rise above the river valley overlooking a tributary junction and two Prehistoric lithic finds have also been made there. The area around Bratton also has multi-period sites, covering Bronze Age ring-ditches and Early Iron Age/Romano-British enclosures. These clusters – Shray Hill, Sleapford and Bratton - denote reuse over a lengthy time span either for practical (good vantage points) or cultural (sites of remembrance and tradition) reasons; they could be both.

During the Iron Age, climatic deterioration may have made it impossible to live very close to the river or actually on the Moors (although that likelihood was never strong given the wetland conditions). The slight height advantage enjoyed by the enclosures may have made the difference, providing access to fertile alluvial soils and wetland for grazing livestock. Assuming the crop-marks discussed above are Early Iron Age, then, by the Later Iron Age, it possible that power had centralised at Wall Camp, and these enclosures had become satellites to this big and influential monument.

3.4.4. Roman period

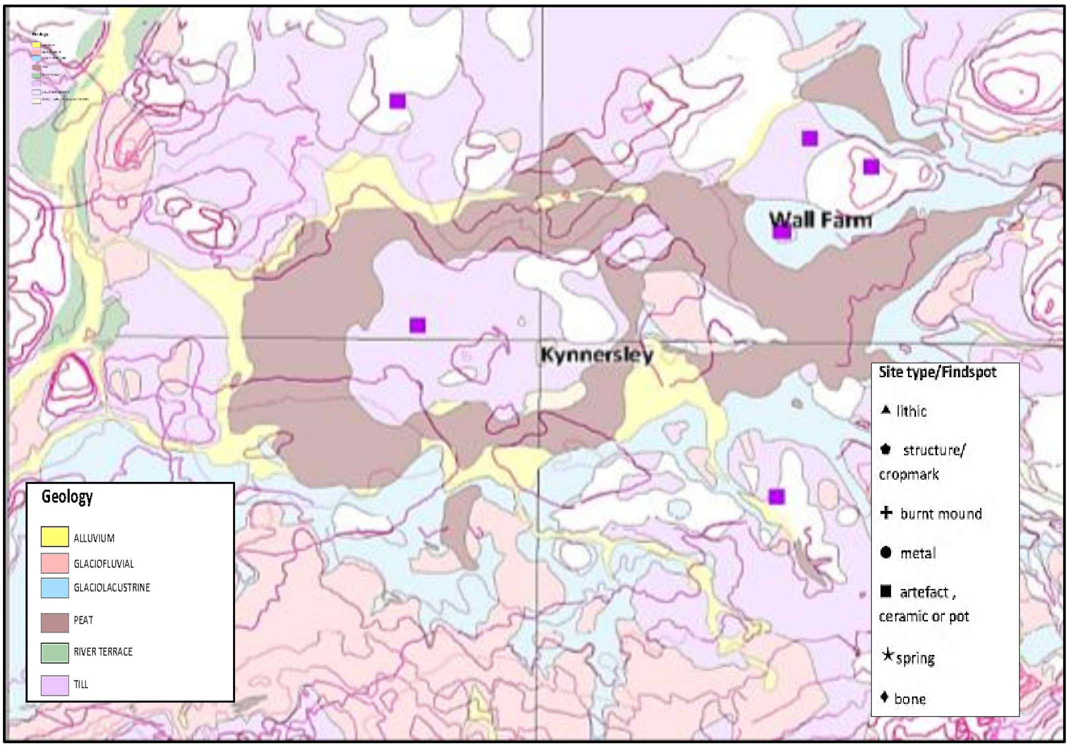


Fig. 29 Roman period - findspots

'Shropshire was a major, pivotal point in the conquest and control of the Welsh Marches' (by Rome) (Watson 2001). Given this statement and the Weald Moors' proximity to *Viroconium Cornoviorum*, perhaps the most interesting thing about the Roman finds is how few there have been – a bronze brooch (HER3221), a Samian Ware gaming piece (HER790), a hoard of 4thCentury coins (HER785, found in the 1840s, now lost) and 2 pieces of Samian Ware identified within pottery sherds of Severn Valley ware (Fig. 29). NWWS identified the pottery in '*two contained groups'* near Adeney as part of a fieldwalking survey (Leah *et al.* 1998:76-77); these groups appear to be more than coincidence, and there is an inference that there may have been some degree of presence on the Moors in Roman times. However, the fieldwalking transects undertaken as part of the Wroxeter Hinterland Project (see Fig. 30) produced nothing significant in this area (White 1997:7). There is always the possibility that the pottery could be the result of medieval manuring, and therefore at some distance from their original location.

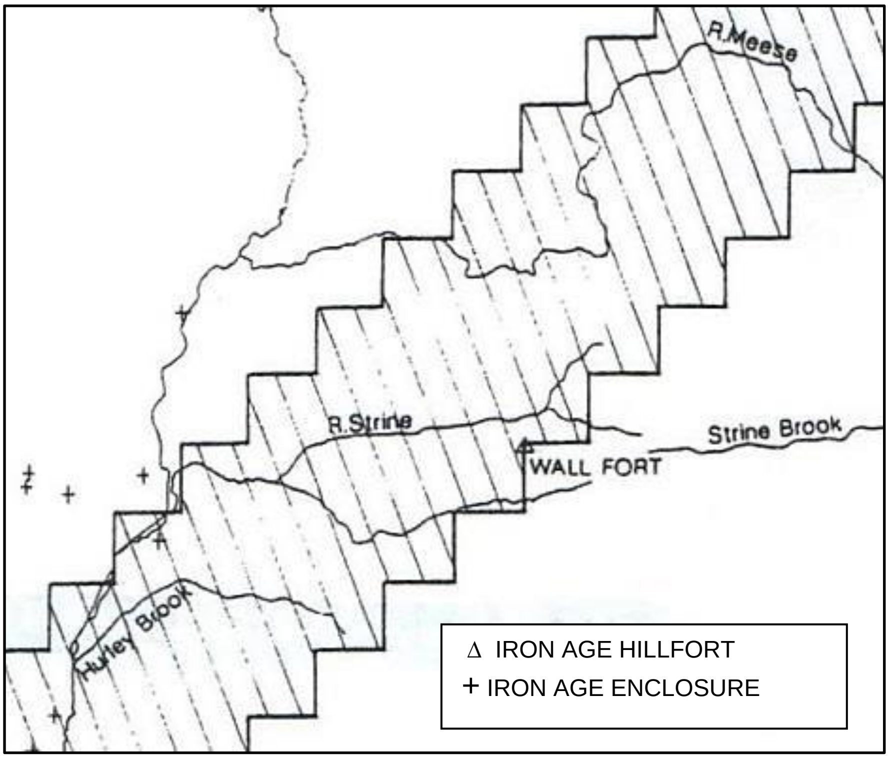


Fig. 30 Wroxeter Hinterland Project - fieldwalking transect across the Weald Moors (adapted from Figure 1, White 1997:2)

3.5.The Weald Moors through time

The archaeological record paints a picture of an important wetland used and re-used over a lengthy time span. The Early Prehistoric era is represented by the lithics left by a Mesolithic/early Neolithic population, possibly localised, who hunted and foraged on the Weald Moors, using the higher vantage points as places for tool production - '*places of importance and purpose'* (Barratt 1994:139) - probably whilst waiting for game to arrive in the low-lying reed bed. The Moors may have been a managed locale at this time (see also Chapter 5).

Evidence of a human presence on the Moors during the Middle Prehistoric period is apparent in ring-ditches, burnt mounds and metalwork deposition; there are few lithics. No evidence exists of settlement, ceramics, weaponry, arable farming or animal husbandry which could indicate the nature of domestic life or the development of social structures. Two main interpretation could be gleaned from this - the Weald Moors were special, a place of ritual or ceremony, and therefore kept separate from the everyday; alternatively, the Weald Moors were a larder, a place to hunt, forage, manage livestock, and possibly to extract salt. Evidence in support of either idea may be masked by geomorphological processes, but may still be present.

The Later Prehistoric period saw settlement on the fringes of the Moors, perhaps because this was a resource-rich wetland to be accessed for pastoral farming, but which required protection against competitors. However, it is the location of one of the largest forts in the region, Wall Camp, with substantial defences, that presents greatest interest during this period. There are also many parallels with Baggy Moor throughout this story viz. the Mesolithic presence, metalwork deposition and the use of burnt mounds.

Evidence for Roman activity is curiously lacking, given the proximity of *Viroconium*; possibly the Iron Age enclosures including Wall Camp continued to be viable into this period, but NWWS found little evidence (Leah *et al.* 1998:76). Given that a Roman presence has been recorded at other Iron Age enclosures in the area, this lack of evidence is notable.

3.6. Landscape Archaeology and Archaeological Prospection in the Weald Moors – Summary

This chapter has identified a range of prospection techniques which aid landscape archaeology. Combining geological, topographical, geomorphological, geophysical, aerial photographical and palaeoenvironmental studies within a GIS application, a new understanding of the cultural and practical approach that humans took to managing their world can be reached, and additional places for archaeological prospection can be identified. Analysis of the archaeological record of the Weald Moors emphasises that sites do not exist in a vacuum, but are part of a dynamic landscape seen through time, inextricably linked with a spiritual, cultural and practical interpretation of a past world, which in some part mirrors the developments seen elsewhere in North Shropshire and in Britain as a whole.

So far this study has not evaluated the largest monument on the Weald Moors - Wall Camp. This is one of the largest Iron Age enclosure/forts in Shropshire, and as such, somewhat anomalous given its location. It is the subject of the next chapter.

THE WEALD MOORS AND WALL CAMP

CHAPTER 4

4. Wall Camp

The existence of the large earthwork enclosure known as Wall Camp (Shropshire HER1108; Scheduled National Monument No.1020282) on the Weald Moors has been recorded since the 18th Century (Plaxton 1706-7 and Houghton 1865-70, cited in Leah *et al.* 1998:69). The earthwork, also known as The Wall or Wall Fort, is a 12ha multivallate, multi-phase Iron Age fort situated 1km north-east of Kynnersley. In this low-lying environment, the fort occupies the entirety of a slightly raised island (61mOD) underlain by Kidderminster Formation Sandstone, covered and surrounded by a thin layer of mineral soils and peat. There is a small quarry at the centre of the fort, and the stone was possibly used to build the Shrewsbury Canal (Bond 1991:101).

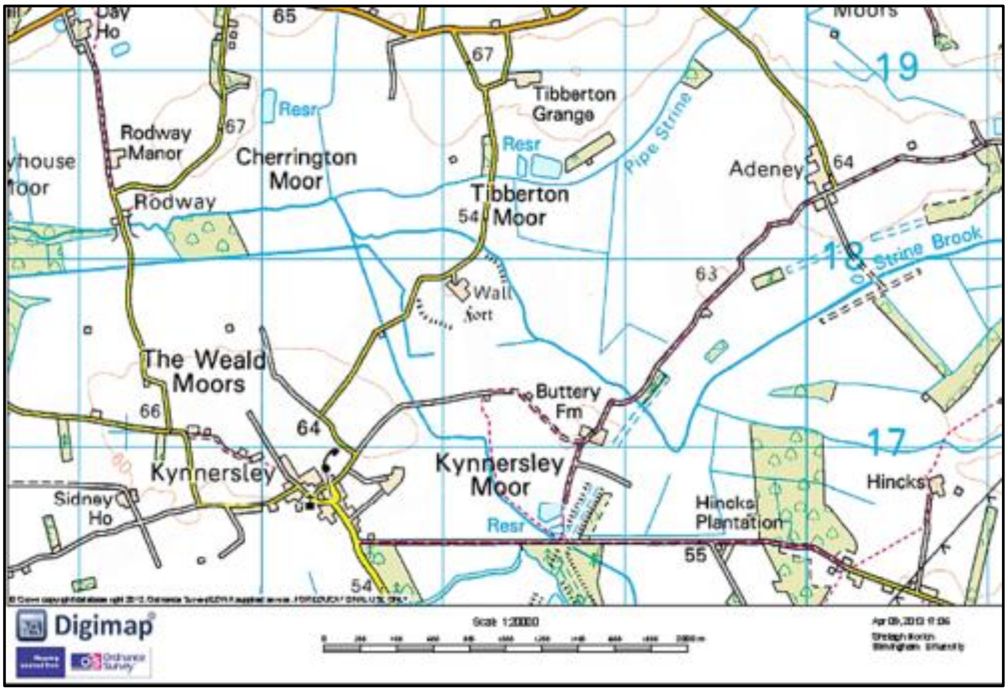


Fig. 31 Wall Camp (Edina Digimap April 2013)

As a large multivallate fort (Jackson 1999), Wall Camp is a rarity (National Heritage List for England[18]) with the majority of examples lying in Wessex and the Welsh Marches. There are still fewer large, low-lying marsh forts, the main comparators lying in the fen country of eastern England – Stonea Camp (Hall and Coles 1994; Malim 2005) and Sutton Common (Van de Noort *et al.*2007) provide good examples. In spite of three small excavations and one geophysical survey

[18] http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=1020282&resourceID=5

(see Chapter 1), Wall's purpose remains speculative. Little is known about the fort's development, its purpose within the wetlands of the Weald Moors, its relationship to neighbouring forts, enclosures and settlement sites, or its importance, especially given its size and location within the territory traditionally ascribed to the Cornovii. This chapter will position Wall Camp chronologically and spatially, summarise the known information, and draw comparisons with similar monuments.

4.1.The Iron Age – background

The Wellington Wrekin Archaeology Group, who undertook excavations in the 1960s, presumed the large multivallate earthwork of Wall Camp to be of Iron Age construction (Pagett, in Malim and Malim 2010:83) and this date was supported by subsequent excavation (Bond 1991); there are no indications of earlier construction, and apart from 5 isolated Prehistoric lithics, no artefacts of earlier date. Iron Age chronology is not uniformly understood across Britain (Haselgrove *et al.* 2001) and there are many chronological and regional variations in settlement structure and material culture – from the open settlements and 'territorial oppida' of south and east of England to the hillfort zones of the Welsh Marches and Wessex. Hence generalisations about 'the Iron Age' are difficult to sustain. Nevertheless, a broad overview of the changes in the use of landscape, settlement patterns and the material culture, with associated implications for social change, provide a context for Wall Camp's development and occupation.

The majority of British archaeologists see the start of the Early Iron Age ca800BC (e.g. Haselgrove 2010:149), with changes in landscape patterns, settlement evidence and material culture. However, many of the aspects that define the Early Iron Age – hilltop enclosures, pit alignments, trackways and a suite of domestic innovations - have their origins in the Late Bronze Age; examples of hillforts in the Welsh Marches with Late Bronze Age ancestry include Breiddin (Musson 1991) and the Wrekin (Stanford 1991:50). This was also a time of climatic deterioration. Bog surface wetness (BSW) and alluvial records indicate a change from a warm/dry climate between ca1200-850BC, to a cold/wet climate ca850-650/550BC, which lasted until ca400BC (Brown 2008:12).

The cumulative evidence indicates stresses on the landscape at this time. Early Iron Age studies show a change in subsistence strategies involving a move away from uplands (but not abandonment) especially in northern and western areas, towards greater utilisation of low-lying sites (Haselgrove and Pope 2007:18). A greater degree of organisation of the landscape is apparent in the form of linear earthworks (*ibid*), and track and field systems. Settlement evidence sees an increase in enclosure, frequently palisaded or with ramparts, and the widespread adoption of roundhouses often orientated towards the mid-winter sunrise (*ibid*:7); houses were repaired rather than rebuilt (*ibid*) and structured deposits indicate increased domestic organisation possibly linked with cosmology, ritual and new belief systems (*ibid*; Giles and Parker Pearson 1999). Variations in the size of buildings could indicate different uses e.g. shrines as opposed to dwellings (Haselgrove 2010:154). In the Welsh Marches, the landscape is characterised by a combination of hillforts in the uplands and farmsteads in the river valleys, although the economic relationship between them is not clear; it is possible that upland 'forts' were used more for livestock whilst low-lying farms were used more for agriculture.

An increase in communality can also be inferred from the archaeological record during the Early Iron Age, with growth in house size, communal food production (Haselgrove and Pope 2007:7) and community feasting (*ibid:*18), possibly indicating a society which relied on local relationships and strength in numbers. A key concern with foodstuffs is apparent at this time (Haselgrove and Pope 2007:7), including preservation (by salting, smoking or drying) and storage (in four- and six-post structures in the north and west of Britain, but in pits in the south and east, Haselgrove 2010:150). A more close-knit society would also provide insurance against the consequences of climatic deterioration, and there is evidence of famine, disease and a lowering of the population (*ibid:* 6). Communality is also proposed by Wigley (2002a), who sees linear earthworks being constructed and maintained as community projects, which may also have been a means of legitimising land claims.

Culturally and materially, the Early Iron Age is evidenced by a cessation in both the use of bronze and associated metalwork deposition, and an increasing use of iron. The social value system, previously associated with bronze, altered as the substance became devalued (Needham in Haselgrove and Pope 2007) and gift-exchange systems collapsed (Sharples in Haselgrove and Pope 2007). These changes in practice allowed new ways of demonstrating social hierarchy (Haselgrove and Pope 2007:8), with display through domestic architecture, ceramics and conspicuous consumption (*ibid*: 6-8).

The transition from Early to Later Iron Age is put at ca350BC but the date is variable across England (Haselgrove and Pope 2007:2). Climatic conditions appear to have improved ca650/550BC-400BC (indicated by a reduction in BSW and alluvial activity), although further deterioration towards colder and wetter conditions is apparent ca400BC, lasting until ca100BC (Brown 2008:12). Technological and social change accelerated (Haselgrove and Moore 2007:2). The milder climate appears to coincide with a return of settlement to upland-based transhumance, and to the occupation of marginal areas such as wetlands (Haselgrove and Pope 2007:8). Organisation of the landscape and settlement changes are further evident in increasingly enclosed and defended settlements (rectilinear enclosures), and the multivallation and enlargement of certain high profile forts at the expense of others (Haselgrove 2010:156); Croft Ambrey provides an example in the southern Welsh Marches (Stanford 1991:60). The increase in fortifications and the abandonment of outlying farms from ca350BC suggested a period of increased warfare, but although there were obvious battles and atrocities (e.g. Fin Cop, Derbyshire; Waddington *et al.* 2010), the evidence now suggests that the Middle/Late Iron Age was no more violent than other periods (Haselgrove 2010:172). The upgrading of hillforts is now interpreted more as a demonstration of status than defence (*ibid* :172), although evidence from hillforts at Maiden Castle, Dorset and Danebury, Hampshire indicates the subjugation of nearby settlements at this time (*ibid :*158). Economically, some settlements focused on the production of specialist items (Haselgrove and Moore 2007:4); for example, Meare and Glastonbury on the Somerset Levels became centres for exchange, and Meare was a centre for the production of glass (Haselgrove 2010:165). In some areas such as the Welsh Marches, local ceramic workshops all but disappeared in favour of production concentrated in a few locations during the Later Iron Age, in this instance producing Severn Valley Ware (*ibid*:170).

Further organisation of the landscape is seen in the increasing construction of structures such as trackways in wetlands (e.g. the Somerset Levels (Coles and Coles 1986), causeways (e.g. Fiskerton (Parker Pearson and Field 2003) and Beccles (Geary *et al.* 2011)) and bridges e.g. at Dorney (Buckinghamshire HER0689600001)(Brown 2008:15), and although the practical application (the spanning of increasingly watery places) is clear, it is possibly too crude to lay these developments entirely at the door of climatic change. Brown argues for climate to be seen as a *'critical'* but not exclusive factor affecting the archaeological record, and sees the need for such structures being prompted by increasing trade, heightened territoriality and a desire for prestige and control (*ibid*:15).

Evidence for ritual activity including feasting and sacrifice is found on domestic sites and, frequently, on hillforts (Haselgrove 2010:160). Shrines are often identifiable from votive offerings, and the practice of metalwork deposition returned (Haselgrove and Pope 2007:11); spectacular examples from later in the period include the gold hoards found at Snettisham[19] and Winchester[20]. The Iron Age in general is noted for its lack of burial evidence except for a few regions e.g. the 'Arras' burials of East Yorkshire (Haselgrove 2010:161). Some bog bodies, apparently the subject of ritual execution, may also be of Iron Age date e.g. Lindow Man from Lindow Bog, Cheshire (Stead *et al.* 1986).

The material record for the Later Iron Age generally also sees the appearance of coinage, currency bars, glass, wheel-made pottery, rotary querns, decorated 'saucepan pottery' and iron tipped ard-ploughs, an increase in personal ornamentation and new habits of consumption e.g. wine (Haslegrove and Moore 2007:8), albeit that many of these (coinage, glass, wheel-made pottery) are absent from the record in Shropshire (Millett 1994). Many innovations were influenced by Continental Europe as contact across the English Channel strengthened, however, in northern and western Britain, the adoption of some of these innovations was delayed until the Roman invasion (Haselgrove 2010:170). The coalescence of groups into tribal units increased (Haselgrove and Moore 2007:10), although it is also argued, in the case of the Cornovii, that some tribal units was less a reality and more an idea promoted by Roman historians (Wigley 2001:6-9).

The archaeological sequence at Sharpstone Hill, just south of Shrewsbury, is continuous from the Neolithic (Barker *et al.* 1991), but in its later stages, illustrates the development of settlement and enclosure during the Iron Age. Sharpstone Hill covers a relatively small area (around 4km^2), possibly lying on a track system which linked the Portway, a major route over the Longmynd, to the Severn below Shrewsbury (*ibid*: 17-19). Five sites were initially identified, labelled A – E; Sites A and B have Neolithic and Bronze Age antecedents. Around the Late Bronze/Early Iron Age, at Site A, an unenclosed settlement and field system was replaced by a small square enclosure with at least one round house. Nearby, at Site E, a larger enclosure became increasingly well defended after the later 1st millennium BC, at first by a palisade, then by a single ditch, and

19 http://www.britishmuseum.org/explore/highlights/highlight_objects/pe_prb/t/the_snettisham_hoard.aspx
20 http://www.britishmuseum.org/explore/highlights/highlight_objects/pe_prb/t/the_winchester_hoard.aspx

finally by a double ditch (Barker *et al.* 1991), indicating an increase in defence, and possibly, territoriality.

The social and material developments of the Iron Age see society pass through a period of communality in the Early Iron Age, to emerge in the Later Iron Age with new technology, hierarchical societies, the emergence of a visible elite and the widening of social networks (Haslegrove and Moore 2007:11) - a societal fabric that, in spite of regional variations, was still in evidence at the time of the Roman invasion of AD43. The landscape and settlement evidence shows a bounded landscape, with enclosed farmsteads and areas of specialisation, in some regions dominated by enlarged hillforts. Against this backdrop emerges Wall Camp, one of the largest 'forts' in the Welsh Marches, on the fringe of a highly fortified region, not on a hilltop but in the low-lying wetlands of the Weald Moors, with impressive defences, but with questions existing over its scale and purpose.

4.2.Wall Camp - Physical Description

Wall Camp is by far the largest monument on the Weald Moors, and the third largest fort in Shropshire (larger forts are at Titterstone Clee (Shropshire HER427; 28ha) and Llanymynech (Shropshire HER1117; 57ha), both hillforts). It has been excavated twice – by Pagett in the 1960s (in Malim and Malim 2010) and by Bond in 1983 (Bond 1991). Excavation and mapping (Fig. 33) has revealed a system of inner and outer banks and ditches which encircle the whole 'island', with the most complex outer earthworks to the east and north in the area of the Strine Brook.

Fig. 32 Wall Camp ramparts, west side; cattle provide scale (S. Norton May 2012)

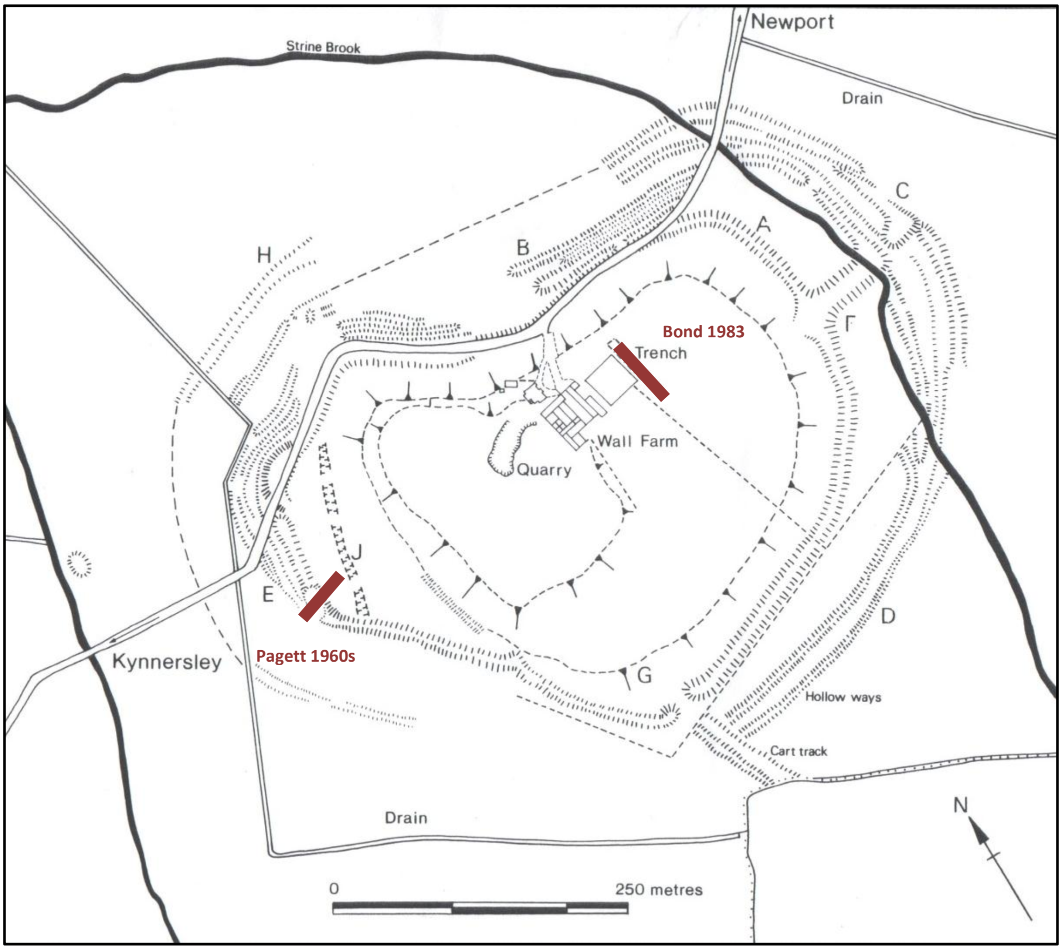


Fig. 33 The earthworks and excavations at Wall Camp (Bond 1991; Malim and Malim 2010)

The bank on the west side of the enclosure is currently around 2m high, and although other banks are lower, this gives some indication of the sizeable nature of the earthworks given slighting and degrading over time (Bond 1991:98). An entrance is apparent to the south, with possibly a causewayed entrance to the north-east.

Although no datable finds were recorded, Pagett's investigations indicated '*at least three periods of construction'*, possibly four for the main bank (Malim and Malim 2010:81-94). The banks were revetted with stone, but stake holes indicating a small wooden revetment were also identified in one area (*ibid*). Chronologically, the construction of the initial earthen bank was followed by period of stabilisation (possible abandonment), which was then remodelled and the ramparts enlarged. This could coincide with a general upgrading and expansion of some Iron Age forts into 'developed hillforts' around 350BC (see above) but no dates are available. The Wrekin also went through a period of enlargement around this time (Stanford 1984), and Bury Walls, 16km to the north-west, was also enlarged although the date in unknown (Murdie *et al.* 2003:261). Based on Pagett's field notes, the Malims indicate abandonment of the fortifications in the Roman period, citing *'growth of turf over the unmaintained monument'* (Malim and Malim 2010:94). There is no confirmed evidence of a Roman presence at the fort, except one piece of possible Samian ware, recorded by Malim and Malim in the assemblage produced by Bond (*ibid*). The chronological sequence applies only to one area of the ramparts, and it is not known whether all the earthworks are contemporary. The concentration of earthworks is most apparent to the north side of the monument, where a main rampart is supported by a further 3 ditches and ramparts. The arrangement to the east is also complex, whereas those to the west and south sides are comparatively simple.

The siting of the fort and the building of its entrances and defences would have taken into account not only the raised nature of the 'island' but the proximity of the water courses in providing defence. The main water courses lie to the east and north, with the Strine Brook currently running through the eastern embankments and ditches; it is not certain whether this water course occupies its Iron Age position, although the palaeochannel (see Chapters 2 and 3) surrounding Wall Camp (Fig. 34) runs mainly outside of the fortifications. The 1580 map (Fig. 35 and Chapter 2) suggests that the drainage has remained approximately the same since the Middle Ages. A modern Environment Agency flood map[21] (Fig. 36) shows that the island and the area to the west is not at risk from flood (alluvial deposits are found to the north - Fig. 15; Chapter 2), whereas all other perimeters are; this should be treated with caution given drainage activity since the Middle Ages (Leah *et al.* 1998:80,81). However, both modern and ancient watercourses would have effectively 'moated' the site on at least 2 sides, especially during the winter months (see also 2.4.1 above), with dry access available through the south entrance year round. Arguably, the north-east entrance was a water-gate (at least, at certain times of the year), comparable with that at Sutton Common (see below).

[21] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=floodmap#x=365956&y=316922&lg=1,&scale=8

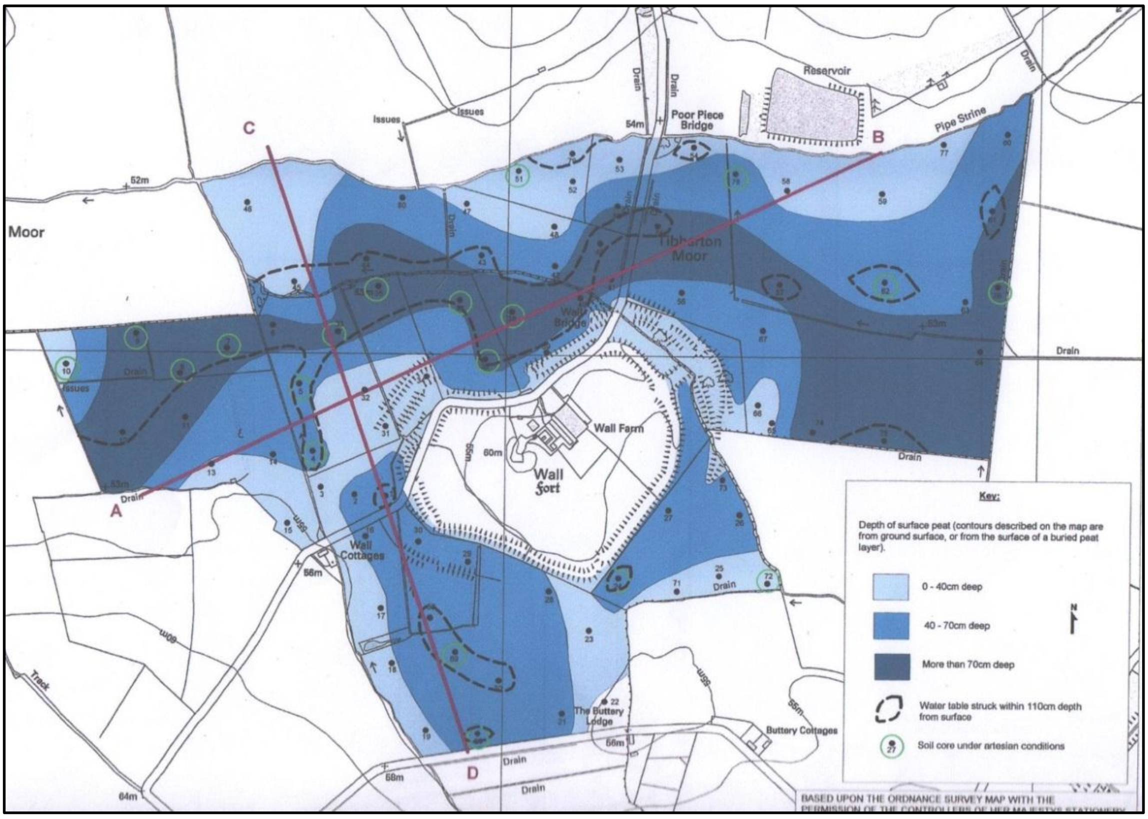


Fig. 34 Wall Camp - palaeochannel (Mike Harding Consultants 2002: Fig 5a: Unpublished report)

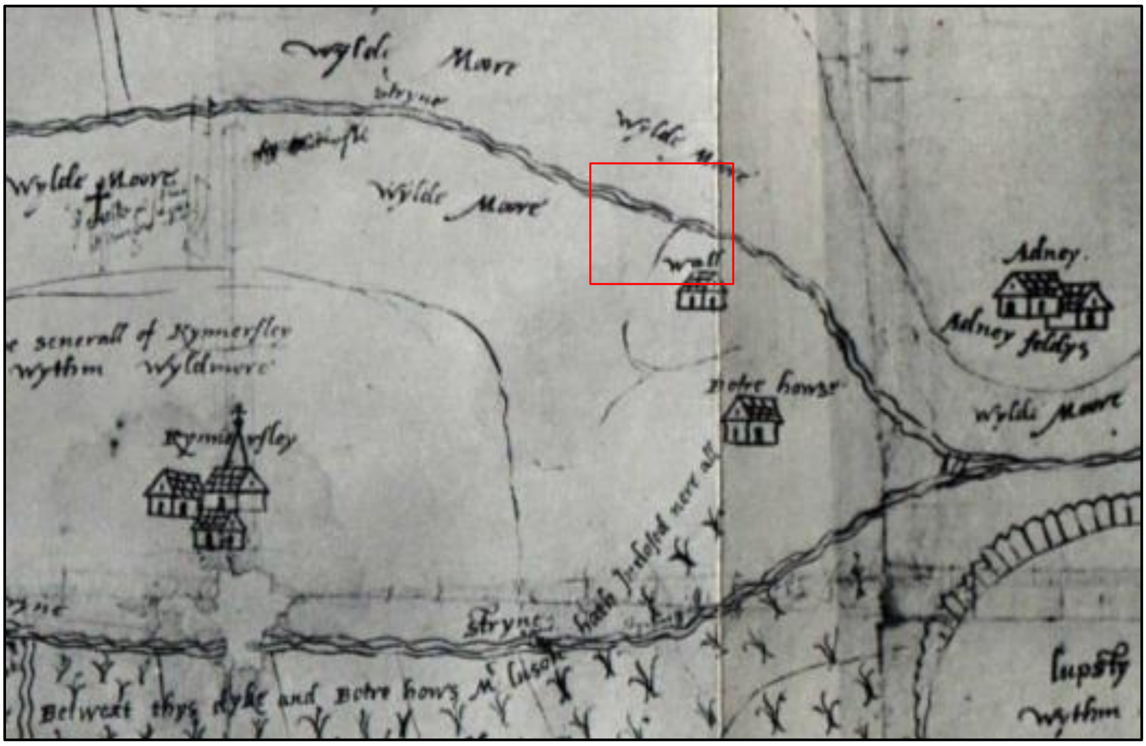


Fig. 35 Wall Camp - 1580s map (Hill 1953)

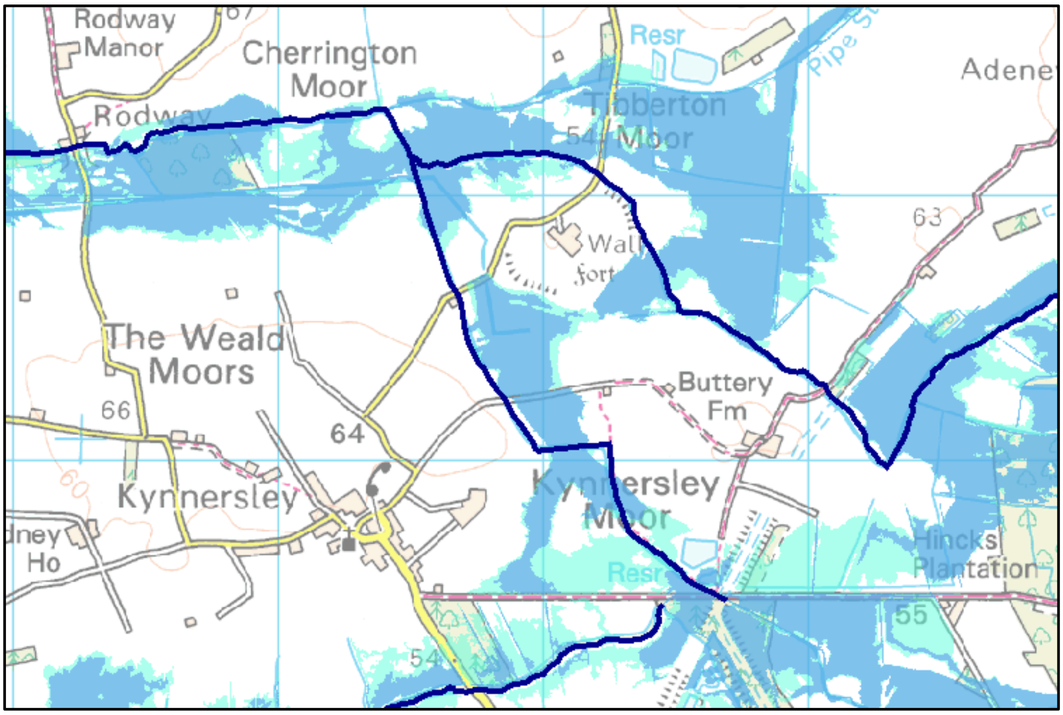


Fig. 36 The Weald Moors around Wall Camp - modern flood zones (Environment Agency: October 2013)

The defensive and entrance arrangements for local enclosures at Pave Lane, Bury Walls and Castle Farm show some similarities. Pave Lane (Shropshire HER 3446), a multi-ditched enclosed farmstead 7km to the east of Wall Camp, was excavated in 1991 (Smith 1991:34), and has one entrance at the south-west, and another, causewayed, at the north-east, connecting with the encircling ditches. This small/medium sized enclosure is on slightly higher ground (100m OD) than Wall Camp, and may not have been subject to the same flooding issues. Excavation also produced a cobbled surface at the south-west entrance, and pollen samples confirmed that the area was surrounded by open grassland during the Iron Age. Bury Walls (Shropshire HER1139), a multivallated hillfort, 16km to the north-west of Wall, has entrances to the north-east (possibly the main entrance), north-west and south-west (Murdie *et al.* 2003:255). Although the topography differs markedly (a higher elevation on a pronounced escarpment), Bury Walls also overlooks a wetland (Top Moss), and there is an implication that the south-west entrance was causewayed (Murdie *et al.* 2003:256). Castle Farm (Roe 1991:78), a double ditched, palisaded enclosure 12.5km to the south-east of Wall, may have an entrance to the east. All the enclosures in this localised sample have an entrance which looks east or north-east, possibly orientated to the mid-winter sunrise.

Decisions about the size and shape of the ramparts and ditches, the positioning of entrances and whether or not to erect wooden palisades would have been made on practical, defensive and/or cultural and symbolic grounds. Wall Camp has impressive earthworks, but no evidence exists of a palisaded enclosure. Given that other local forts/enclosures (e.g. Meole Brace; Hughes and Woodward 1995; Castle Farm; Roe 1991) indicate the presence of palisades, various reasons can be postulated for this apparent absence. Palisades feature from the Late Bronze Age at both higher and lower elevations e.g. high elevation forts at Old Oswestry and Breiddin (Stanford 1991:48,49) and the Wrekin (Stanford 1984), and also enclosures at lower locations e.g. Sharpstone Hill and Castle Farm (see above). Palisades were a high cost investment (in terms of labour and materials), and their purpose can be considered under defensive and symbolic headings. Defensive palisades may not have been necessary at Wall Camp, as the surrounding marshland would provide defence enough. If Wall Camp was used more as a large corral than a fort, the complicated arrangement of overlapping banks and ditches may have been sufficient to direct valuable livestock (Bond 1991:102), as suggested for Collfryn, a high status Iron Age enclosed settlement in the Welsh Marches (Britnell 1989), as well as providing protection from rustling. Practically, there may have been insufficient local wood of the right size from the surrounding fen-carr to enclose such a large area, notwithstanding coppicing, although as great effort would be needed to construct Wall's earthworks, the effort of obtaining timber for a palisade may also have been justified. The symbolic and ritual nature of palisades may have been as important as defence. A large wooden wall indicates status, intended for public show. Wall Camp occupies a low-lying, wetland area and its status is indicated by its size and prominence; therefore palisades may not have been necessary, indeed, perhaps one of Wall Camp's greatest assets lay in 'invisibility', important for both ritualistic purposes and during times of inter-tribal disturbance. The earthworks have been interpreted as a ritual labyrinth (Malim and Malim 2010), which may have precluded the need for palisades. Some conclusions from recent work at Sutton Common provide an interesting comparison (Van de Noort *et al.* 2007). Sutton Common, a 'marsh-fort' situated in fen near Doncaster (South Yorkshire HER133/01), comprises two enclosures (one large, one small) linked by a causeway over the Hampole Beck. The larger enclosure appears to have been used for ritualistic and mortuary purposes, and its palisade and construction is rationalised in terms of its symbolic significance *'..in the same way that the symbolic position of the Iron Age warrior was expressed with intricately decorated armour, so the symbolic significance of enclosure was expressed with an architecture that was recognised and understood in military terms'* (*ibid:*180). The ritualistic elements of a large enclosed site such as Wall Camp may have been further emphasised by its proximity to water (Bradley 1990).

4.3.Wall Camp – Findings

Bond's excavations (1991) were of the interior of the monument, identifying one (probably two) structures 11m in diameter and interpreted as round houses, which were separated by a ditch. The two buildings differed in their construction, suggesting a functional distinction or a chronological gap; one building had a western entrance, and a clay floor was also found. A minimum of two four-post structures were identified and interpreted as storage facilities, although no environmental analysis was undertaken in Bond's excavation, and therefore it is not known whether these were grain stores. There were also a number of other post holes and pits. A date of 2110±90BP Har-6392 (371 cal BC-cal AD 53) was obtained from a mixed sample of oak and willow from a gully within the interior, suggesting that the enclosure was inhabited in the Mid/Late Iron Age. Some animal bone is present in the archive (Malim and Malim 2010:94), but it was not analysed or included in Bond's report. It is not known whether the buildings were contemporary, the extent to which they filled the internal area, their purpose or their construction. Round houses are common features of Iron Age settlements e.g. Sharpstone Hill (Barker *et al.* 1991), but evidence from the local enclosures at Pave Lane, Bury Walls, and Castle Farm is equivocal.

The majority of the ceramic material recovered by Bond came from a trench (ditch?) between the two round structures, suggesting middening (Bond 1991:104), and from post holes related to the four-post structures. There were some sherds of Group D (Severn Valley Ware) originating from the Martley area north of the Malvern Hills, and some fired clay. However, a much larger quantity (80%) of Stony VCP (Very Coarse Pottery) or briquetage (Morris in Bond 1991) was recovered, the type used to transport salt, all of which originated in Cheshire (Morris 1991; Morris and Gelling 1991). The assemblage was dated typologically from the 3rd Century BC to immediately prior to the Roman period (Morris 1991). There is a tentative suggestion that the pottery could indicate a sequence, with certain areas of the excavation producing exclusively VCP, which could indicate an earlier use of the enclosure (Morris in Bond 1991:107).

The presence of briquetage indicates that Wall Camp was part of the exchange network of salt across western Britain in the latter half of the 1st Millennium (e.g. Matthews 1999), possibly controlled by the Cornovii, whose territory included south Cheshire. Briquetage has been found in a number of forts and enclosures locally in North Shropshire (at the Berth, the Wrekin hillfort, Ebury Camp, Sharpstone Hill and Castle Farm) and in several hillforts and enclosures of the Welsh Marches, including Breiddin hillfort and Collfryn, where 2800 sherds of VCP were excavated (Britnell 1989:124). It was also recovered from the enclosure at Fisherwick, Staffordshire (Buteux and Chapman 2009:116) and from as far east as Crick in Northamptonshire (Hughes 1998). Salt was a key commodity of the Iron Age, used for preservation of meat, in cheese making, as a dietary supplement, and also in the dying of textiles; if Wall Camp was a stockade/ranch, salt is likely to have been required in large quantities. The source of the salt, either sea salt or inland brine springs, is identifiable from the briquetage used for its storage and transportation (Morris 2010), the inland brine springs of Cheshire and Droitwich being prominent sources for the West Midlands. Cheshire VCP is the most abundant type; Droitwich VCP is scarce in North Shropshire (Morris 2010), although four sherds were found at Sharpstone Hill indicating some contact with sources to the south (Barker *et al.* 1991:38). From the briquetage evidence, the distribution of Cheshire and Droitwich salt throughout the River Severn valley appears to have been mainly by river (Morris cited in Matthews 1999:179-180). Cheshire briquetage was initially confined north of the Severn, but extended further south (as far as Gloucester) after ca500BC as sea transport became more reliable (*ibid*). However, most journeys would have required a certain amount of road transport. One possible salt route crosses the Severn at Wroxeter (*Viroconium*), passing west through Sharpstone Hill (see above) on Margary #64, a Roman Road with Iron Age antecedents, and into the Welsh Marches (White and Wigley 2010:7). From this same crossing, the Roman road north to Chester *(Deva*) passed through Whitchurch (*Mediolanum,* itself a source of salt production at the end of the Roman sequence (Matthews 2001:20)) and along the western edge of the Weald Moors. Given the Weald Moors proximity to the Cheshire courses (approximately 30 miles to the north), it is most likely that salt was transported by road, although river transport may have formed part of the journey. The potential also exists for salt to have been exploited on the Moors in prehistory, possibly using burnt mound technology (see 3.4.2.3 and Fig. 27 above); the burnt mounds and artefact finds, in relation to the palaeochannel surrounding Wall Camp, are shown in Fig. 37. The salt spring at Kinley Farm is 4km to the south west of Wall, and may have formed part of the Weald Moors' prehistoric resources before its actively exploitation in the 18th Century (Shropshire HER 1369).

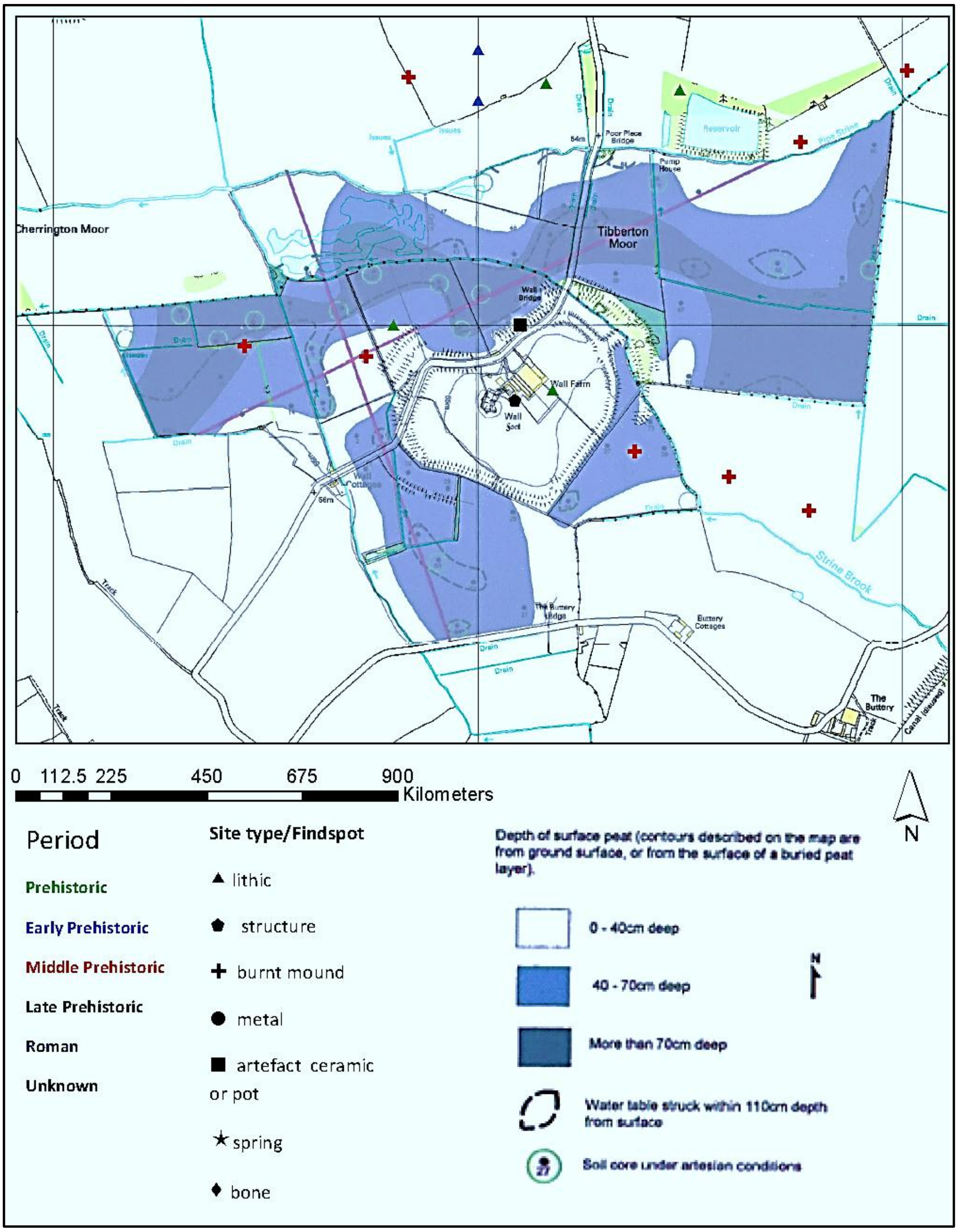


Fig. 37 Artefact finds, burnt mounds, palaeochannel and earthworks at Wall Camp.

Few other artefacts have been recovered from the fort and its environs. These comprise two flint arrowheads classified as Prehistoric (Shropshire HER 776 and 1384), and a blue glass bead of the Oldbury type (Shropshire HER 3649; blue glass with white spiral decoration, Guido Class 6 (Guido 1978, 155ff.); Fig. 38), found in the immediate vicinity of the enclosure. Such beads are typical of a class with raised spiral decoration, imported from the Continent from the middle of the 1st Century BC and into the 1st Century AD; however, as durable, re-useable items, beads are difficult to date conclusively (e.g. Musson 1991:180). As an exotic material, glass was used in specific ways in Iron Age society, adorning both the living and the dead (Van de Noort *et al.* 2007:157) as beads or armbands. Although not common, this type of bead has been found locally, at the Berth (recorded as a Romano-British blue glass bead, Shropshire HER 129); at Breiddin Hillfort and at Collfryn (along with other glass bead artefacts (Musson 1991:158 *et seq.*;Britnell 1989); in Staffordshire (e.g. PAS WMID4489, east of Bridgnorth; a glass bead was also found at Aqualate Park, Staffordshire HER1841, which may be similar); and at Beeston Castle, Cheshire (Ellis 1994, cited in Leah *et al.* 1998:70). Others have been recovered nationally, for example, in Yorkshire (PAS SWYOR-EBF2F4) and Northamptonshire (PAS LVPL- 26BA21). The bead may indicate high status, but whether it was a deliberate deposition or a loss is not known.

Fig. 38 The 1st Century Triskele Glass Bead (Malim and Malim 2010 Fig. 2.12)

Recently (2008), the Telford Torc (Fig. 39; PAS- WMID-C53CB8) was found in the wider vicinity of Wall Camp (location protected, but not within the Wall Camp boundary). Made of gold, silver and copper alloy, this simple twisted torc with single loop terminals was deliberately broken before deposition (Reavill pers. comm.) and was almost certainly a ritual offering. This is a torc of well-known type, dating to the Iron Age 200-50BC, and in design resembles several in the Snettisham Hoard. Its presence indicates a wealthy upper class. Three torcs of similar design were found nearby at Alrewas, Staffordshire (Buteux and Chapman 2009:122) indicating a possible local tradition of deposition, however the Telford Torc is the most westerly so far discovered in England.

Fig. 39 The Telford Torc (http://finds.org.uk/database/artefacts/record/id/248427))

4.4. Wall Camp and its relationship with other monuments

Wall Camp must have existed in relation to its neighbours. Small unexcavated enclosures are apparent on the fringes of the Weald Moors (see 3.4.3), and the enclosures of Castle Farm and Pave Lane lie in the immediate vicinity. The Wrekin hillfort is Wall's nearest upland neighbour. The Berth and Bury Walls occupy or overlook low-lying marsh environments in the nearby North Shropshire wetlands. The Burgs near Shrewsbury is another comparator, although little is known about its development. Further afield into the Welsh Marches, Collfryn (CADW NPRN 306992) adjacent to Breiddin Hillfort (CADW NPRN 141162) has similar structural details to Wall Camp. In the fen country of the east of England, comparable structures include Sutton Common (SE563120, South Yorkshire HER130/1) and Stonea Camp (TL448929, Cambridgeshire HER6033). A table of comparisons can be found in Appx. 2.

A study of the intervisibility of the Iron Age forts of Shropshire and Cheshire is shown diagrammatically in Fig. 40. Taken at face value (for example, without consideration of whether occupation was contemporary), it illustrates that the main axis of intervisibility for Shropshire/Powys Iron Age forts lay between Old Oswestry in the north and Titterstone Clee and Caynham Camp in the south. It further emphasises Wall Camp's remote and isolated nature, lying on the outskirts of both the Welsh Marches and of Cornovii territory (Cunliffe 2005). The only fort with which Wall had intervisibilty was the Wrekin. Hillforts in Staffordshire are few, and intervisibility (e.g. the nearest is at Berry Ring, 21km north-east of Wall; Staffordshire HER 00024) is not known.

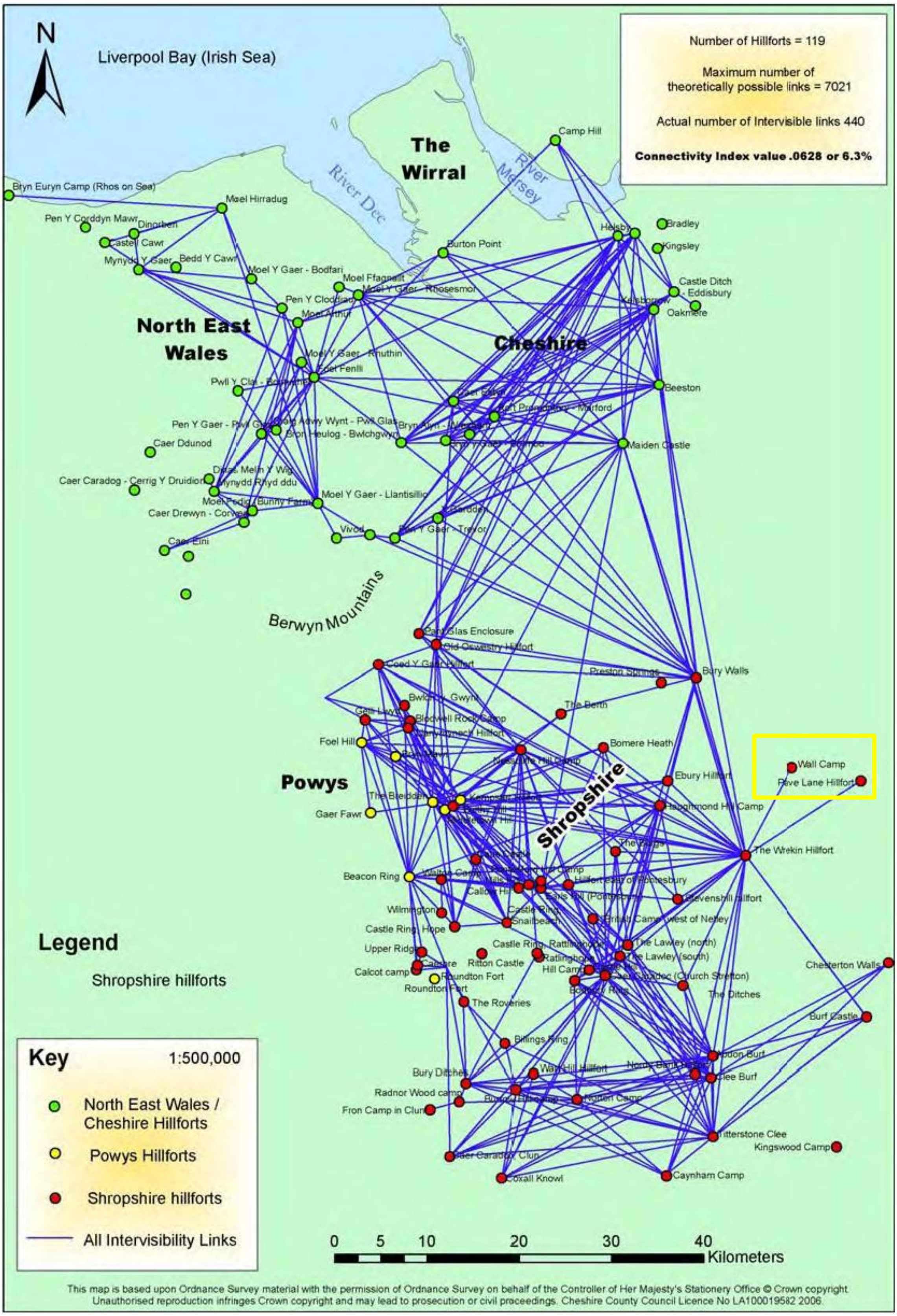


Fig. 40 Intervisibility between Shropshire and Cheshire hillforts based on photographic and GIS viewshed analysis (Matthews 2006:16)

4.4.1. The Wrekin

The only visible link that Wall Camp shares with another hillfort or enclosure is with the Wrekin (Shropshire HER1069), 10km to the south-west (Fig. 41). The Wrekin hillfort holds a prominent position overlooking the Shropshire Plain, and also has intervisibilty with a large number of other fortified sites. From a Late Bronze Age enclosed settlement, the Wrekin developed into a univallate and ultimately, multivallate Iron Age hillfort, with defences which followed the contour and encompassed the natural steepness of the hillslope. Signs of domestic occupation cover several hundred years into the Late Iron Age, but ultimately, its purpose was defence (Stanford 1991:50). It was the site of a battle against the Romans ca AD47. The last sign of occupation was the burning of a haystack in 90 cal AD (further information on this date is unavailable; Stanford 1991:50), but the fort had been in decline prior to this event. It is mythologised as a last refuge for the Cornovii against the Roman invasion.

Fig. 41 The Wrekin from Wall Camp (S Norton May 2012)

Malim and Malim have proposed a link between the Wrekin and Wall. At a practical level, both were refortified during their lifetimes and both were apparently abandoned before, or at the time of, the Roman occupation. The relationship between the *'airy heights of the Wrekin'* in contrast to *'the 'other' world of The Wall'* suggests a spiritual link (Malim and Malim 2010:103), which positions Wall Camp and the Weald Moors as a possible ritual environment; but if Wall is conceived mainly as a large corral managing cattle which were grazed on the Weald Moors in the summer months, the relationship becomes more prosaic. Additionally, Wall is not alone on the Weald Moors during the Iron Age, with smaller enclosures occupying higher points around the fringes of the marsh. Possibly Wall held a pre-eminent place as a large 'focal point' (cf. Van de Noort *et al.* 2007:170) in a smaller scale, hidden environment, with the enclosures as its satellites, standing its ground against the apparent dominance of the imposing Wrekin to the south and Bury Walls to the north, providing a place for the marshland community behind its massive defences during times of cultural importance, or as a refuge.

Malim and Malim have also compared the link between the Wrekin and Wall with the relationship between Old Oswestry and a possible Iron Age enclosure at Whittington (within the area of the medieval castle, Shropshire HER1003). Both pairs of monuments occupy high and lowland settings respectively, and both have intervisibility (Malim and Malim 2010:97).

4.4.2. Pave Lane, Castle Farm and Bury Walls

The physical similarities and differences between Pave Lane, Castle Farm and Bury Walls have been explored (above), and as these enclosures are close to Wall, they warrant comparison. Wall is by far the largest of the four, and like Castle Farm and Pave Lane, occupies a low-lying position. Both Castle Farm and Pave Lane appear to be pastoral in their usage. Murdie's conclusion of the construction of Bury Walls – that it implies a large well organised workforce, mobilised within a society governed by a military or religious elite (Murdie *et al.* 2003:261) – could be equally applicable to Wall Camp. Bury Walls indicates a considerable Roman presence, with a possible Roman temple and altar recorded in its environs; Castle Farm also provided Roman evidence, but Wall and Pave Lane provide none. Both Pave Lane and Bury Walls reference the Wrekin. Bury Walls, occupying a prominent though not particularly high ridge overlooking Top Moss, also has intervisibility with other hillforts in Shropshire, and also with a wide range of settlements in Cheshire.

4.4.3. The Berth

The Berth Enclosure, 25.7km west of Wall Camp, is a mound fort within a peat-fringed pool; a pair of defended hillocks is connected across the surrounding wetland by a causeway. The Berth lies near Baschuch in the hinterland of Baggy Moor (2km to the south), in the area of the Fenemere Pools; other structures (identified through cropmarks) including Bronze Age ring ditches (cf. Wall Camp), lie in the vicinity (Leah *et al.* 1998:53). It is possible that the causeway, as well as providing access to the enclosures, acted as a dam for Berth Pool (Gelling in Guilbert *et al.* 1977). Excavation has been limited, and the monument remains poorly understood (Leah *et al.* 1998:51). Although three separate occupation layers were recorded (Gelling in Guilbert *et al.* 1977), no internal features were identified. This is potentially a high status settlement, given the effort put into a (small) 3.5ha site, of the Middle/Late Iron Age and the quality of the artefacts recovered - The Berth Cauldron (recovered 1906; now in the British Museum[22]), slave chains, a La Tene III brooch, a Romano-British blue glass bead of the similar type as that found at Wall Camp, as well as burnt stone and VCP from all layers. The recovery of Roman pottery has led to the idea that the Berth may have continued to hold high status into the Roman period. The construction of the enclosure and the unusual nature of some of the artefacts lend the monument 'ritual' status, and tradition links it with Arthurian legends (Leah *et al.* 1998:62).

The similarities with Wall Camp lie in its wetland surroundings, its causewayed setting (possibly), and some of its artefacts (the glass bead and VCP). In physical form, there are greater similarities between the Berth and Sutton Common, both of which have a causeway across a channel linking separate enclosures (Van de Noort *et al.* 2007:173), which perhaps support the concept of the Berth as a place of ritual (see 4.4.4 below).

4.4.4. Sutton Common

Sutton Common is a banked and ditched earthwork on marshy ground, lying north of Doncaster on the western edge of the Humberhead Levels (South Yorkshire HER 133/01; see Fig. 42). This 'marsh-fort' encloses an area of 4ha across two enclosures connected by a causeway or 'ceremonial crossing' over the Hampole Beck palaeochannel (Van de Noort *et al.* 2007:112), which was a peaty hollow rather than running water (*ibid*: 54) at the time of its usage during the Iron Age. Geologically, topographically, and in terms of construction, date, and to a lesser extent, artefactual remains, there are similarities with Wall Camp. The area was a glacial lake (Lake Humber) at the end of the Late Devensian (*ibid*:53), and the superficial geology is of drift deposits overlying sandstone. The most recent analysis of the site (Van de Noort *et al.* 2007) has dated the felling of the timber for the site to 372BC and 362BC, and the entire construction is placed within the second quarter of the 4th Century BC (*ibid*:175), making it contemporaneous with interior occupation at Wall Camp.

There is '*ample evidence'* for the use of the Common as a hunting ground during the Mesolithic (an early Mesolithic occupation site lies close by), Neolithic and Bronze Age (*ibid*:66). There is

[22] http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=1360232&partId=1

also evidence for Bronze Age deposition of metalwork and it was also the site of a Bronze Age mortuary enclosure, which is conceptualised as fulfilling a social memory for later activities (*ibid*).

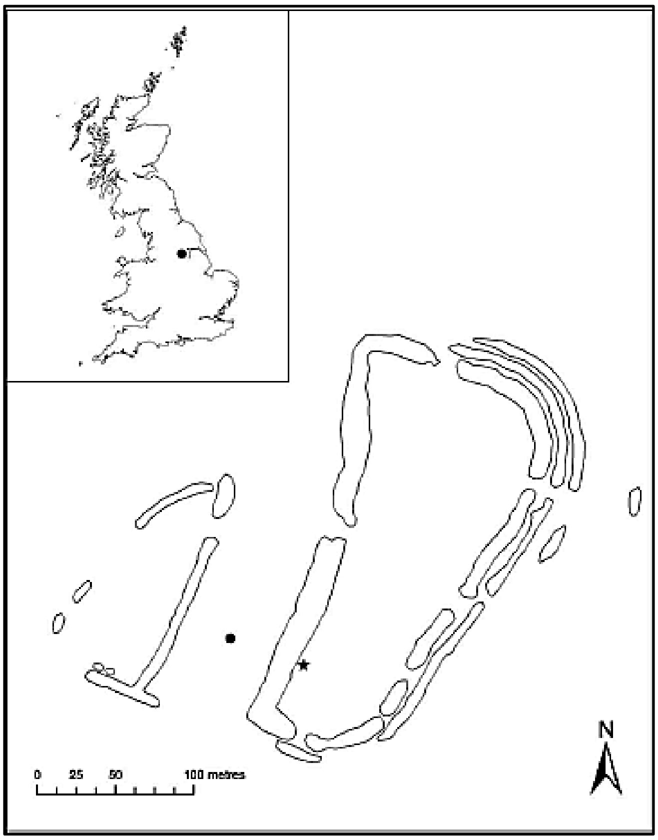


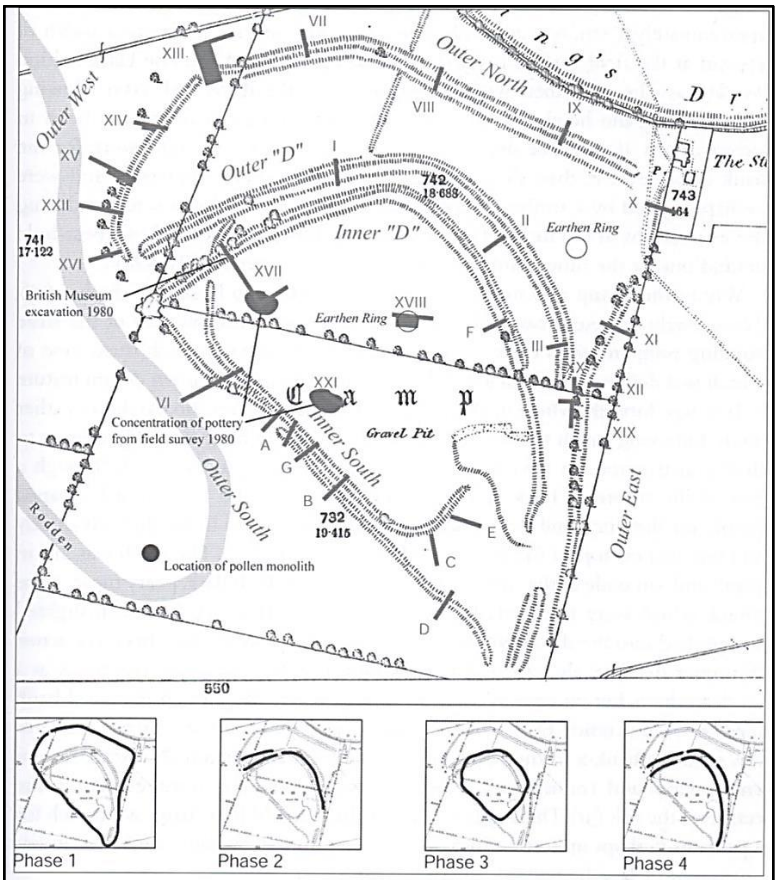
Fig. 42 Plan and location of Sutton Common (Geary *et al.* 2009:1478)

Its defences comprised complex earthworks and a palisade. There are entrances to the north, south-west and east, this last being a possible ‘water-gate’ with an impressive gateway (*ibid*:112). The causeway which linked the enclosures is no mere path, but a 9m wide avenue lined with wooden posts (Van de Noort 2004:68). Such large impressive constructions imply construction and occupation over many generations, but fort-type sites like Sutton Common, Wall Camp and The Berth may represent relatively short lived periods of exceptional socio-political or ritual activity (Van de Noort *et al.* 2007:179); the earthworks are impressive, but a period of construction lasting less than ten years has been suggested for multivallate forts, with the act of construction representing more a community effort than a demonstration of individual power (*ibid*:179).

There is no evidence for occupation within the enclosure of Sutton Common, but there is plenty of evidence for grain storage, in the form of more than 150 four- and six-post structures aligned in rows, plus charred grain remains. Human and animal remains were also recovered, and interpreted as ritual deposits. At least 12 small square-ish enclosures within the main enclosure are interpreted as 'mortuary rings', places for scattering pyre debris (Van de Noort *et al.* 2007:175-185), and these also produced glass beads, similar but not identical to those found at Wall Camp and The Berth (*ibid*:151,157-9). A 'well' was also discovered (but with no evidence that it was ever used as a place of deposition), as well as a brushwood floor.

The overall interpretation of Sutton Common is of a low-lying marsh-fort ('fort' for want of a better description) used for ceremonial activities, a place of retained social memory and ongoing ritual (*ibid*: 177). It is not alone in the area, with other examples including Little Smeaton and Moorhouse Common.

4.4.5. Stonea Camp



28 Plan of Stonea Camp based on the 1926 Ordnance Survey map, showing excavated trenches and probable main phases of construction. © *Caroline Malim*

Fig. 43 Stonea Camp - plan (Malim 2005:61)

Stonea Camp (Cambridgeship HER6033) lies in the Cambridge Fens, south-east of March (Hall and Coles 1994:96-99; Malim 2005), on a gravel and clay outcrop surrounded by peat. A series of defensive earthworks are designed to enclose areas of about 9ha and 4ha respectively, which was further protected by a system of water channels outside its perimeter, in similar fashion to Wall Camp. Excavated on several occasions (e.g. in the 1980s by the British Museum, cited in Malim 2005), the Late Iron Age 'fort' overlies evidence of Neolithic activity and Bronze Age ring ditches, supporting the Sutton Camp model of retained memory of ritual activity. It lies on the Iceni/Corieltauvi boundary, and the Romans defeated the Iceni on this spot in AD47 (Malim 2005:93). There is very little evidence of occupation (cf. Sutton Common) and finds are scarce, lending weight to the concept of Stonea Camp as a ritual monument. Excavation also recovered human remains of Late Iron Age/early Roman date, including those of a child who had died violently (Malim 2005:69-71).

4.5.Discussion and Summary

Wall Camp provides plenty of opportunity for considered speculation about its development and purpose, supported by excavation evidence and comparison with other similar monuments. It is the third largest fort-like structure in Shropshire, a county with a concentration of Iron Age hillforts. Wall lies not on a hill, but in the peat lowland of the Weald Moors, an environment which flooded in antiquity, and continues to do so in spite of active modern drainage. Upland hillforts are conceived as strategically defendable places, dominating their surroundings; at a practical level, they may be communal centres, places of exchange and trade in times of peace and of refuge during conflict; at a ritualistic level, they may be places of sacrifice and deposition. There is no reason why a low-level 'fort' protected by wetland should not also perform these functions.

Its occupation is dated to the Middle/Late Iron Age, but its construction spanned a wider date range, and the ramparts and ditches went through at least three major changes. This does not necessarily mean that construction or alteration was a lengthy process (Van de Noort *et al.* 2007:179). Potentially, the reinforcement and extension of the ramparts and ditches was contemporary with similar upgrading of many hillforts around 350BC. There is no inference of Roman occupation, and the fort may have been abandoned by that time.

A number of ideas present themselves as possible reasons why Wall exists as such a large marsh-fort with such extensive defences. On the one hand, the explanation is pragmatic. If the round structures were domestic, it would appear that the interior of the fort was inhabited and the main purpose was probably livestock herding, meat preparation and preservation; the four-post structures were for grain storage. It was a farm. Its size is related to the extent of the 'island'. No palisades were required as no status statement was needed, and defensively, the wetland was sufficient. Livestock could graze throughout the summer on the lush common land of the Weald Moors, as they did on common land in the Middle Ages and do today, and the enclosure would act as a 'round-up' corral at the end of the season. Salt was imported from Cheshire and used for meat preservation (hence the VCP); additionally, some salt may have been produced on site. Extensive earthwork defences could be a means to deter cattle rustlers, for separating livestock into groups, or defence against flooding; livestock management may also have included links with the Wrekin. The size of Wall Camp is further justified if Wall acted as a focal point for the outlying enclosures of the Weald Moors, or on an even wider basis, enclosures at Pave Lane and Castle Farm. At this practical level, Wall Camp is comparable with Collfryn, which also has impressive defences, large quantities of VCP, internal houses (rebuilt a number of times) and four-post structures; a high-status settlement with high status artefacts (glass beads), and with, no doubt, links to Llanymenych and Breiddin hillforts, 7km away.

None of this answers the question of why Wall Camp appears to have been abandoned in Roman times. *Viroconium* is only 17km to the south-west, and *Uxacona* (a small Romano-British settlement on Watling Street, at the modern settlement of Redhill) 7km to the south, and Wall occupies the centre of a triangle made by three Roman roads. If the fort was essentially a farm, it has to be queried why it was not utilised as a resource when Roman troops occupied the region, or why Castle Farm appears to have traces of a Roman connection, and Pave Lane and Wall do not. Possibly, Wall (and Pave Lane) had been abandoned before either of these settlements was fully established, but why?

Set against a bucolic picture of egalitarian communality, Wall could alternatively be conceived as a centre for ceremonial or ritual, a refuge, or the centre for an elite. Wall was high up in the settlement hierarchy with defences designed to impress (Carver 1991:4). Its defences, its easterly entrance, and its topographical situation within a 'mysterious' wetland could argue for ritual use (especially when considered as a possible labyrinth), and it can be compared to Sutton Common in terms of its structure and location; the round structures are not guaranteed to be dwellings. Apart from three lithics found in the environs, there is no earlier archaeological evidence, therefore any obvious link with collective memory from the Mesolithic, Neolithic or

Bronze Ages is unavailable, but it is known that the Weald Moors were well-used during these times, and Bronze Age evidence in the form of ring ditches, metalwork deposition and burnt mounds may support ceremonial and ritual use. But excavation produced no unusual artefacts, and the only high status artefact recovered (an Iron Age glass bead) was a chance find. However, the evidence for the Weald Moors as a place of deposition continued into the Iron Age with the Telford Torc.

Wall Camp existed for several hundred years at least, during a time of climatic, economic and social change; its purpose, maybe never precise in modern terminology, may have altered during that time (perhaps supported by the tentative suggestion that VCP deposits were not chronologically consistent). Investigation of the palaeoenvironmental record could throw light on this enigma (see Chapter 5). *'Monument building creates a sense of time and space and, in due course, territoriality'.* (Van de Noort 2004:51). Whatever its purpose, Wall Camp is likely to have been created by, and served, a large local population who would have established themselves as the controllers of the Weald Moors, and the creation of a large enclosure at its centre would have confirmed their claim to this resource rich territory.

5. North Shropshire and the Weald Moors – palaeoenvironmental research

'..if we are to understand how human individuals functioned, and the community of which they formed a part, we have to know first what their world was like.'(Renfrew and Bahn 2001:225)

The value of palaeoenvironmental research to archaeological understanding cannot be overstated. It provides context, in the form of climatic conditions, vegetation and human landuse, to the existing record of ecological, social and economic development. This chapter will summarise the palaeoenvironmental chronology for North Shropshire and apply it to the Weald Moors and Wall Camp. *The Archaeology of the West Midlands: A Framework for Research* (Watt (Ed) 2011) also highlighted the need for additional palaeoenvironmental study in the West Midlands (*ibid:* 249), and to this end, the existing record is supplemented by a palaeoentomological study of Coleoptera taken from the palaeochannel adjacent to Wall Camp.

5.1.Palaeoenvironmental archaeology

Wetlands and river floodplains provide rich environmental archives and deposits of organic materials, deliberate or accidental, can inform about aspects of climate, landscape change and human action. The nature of the palaeoenvironmental material available for investigation depends on geology, topography, the depositional environment and the potential for preservation (see Chapter 3), and organic remains frequently accumulate in palaeochannels beneath coverings of alluvium, or in peat deposits. The anaerobic nature of such deposits can preserve macrofossils (e.g. charcoal, plant macrofossils, bone, insects, wood and molluscs) and microfossils (e.g. pollen, algae and spores), and the stratigraphic layering of deposits allows for radiometric dating, illustrating change (or not) through time.

Samples can contain autochthonous material (existing, living or breeding locally within the site), and/or allochthonous material (known or likely to have originated away from the site; also known in palaeoentomological analysis as 'background' species; Kenward 1975:87). The material can also be eurytopic (adaptable and with a wide range, living on a variety of plant species or in a variety of environments) or stenotopic (specific to one type of plant species or environment). , Therefore, evidence obtained from autochthonous, stenotopic species can be definitive, but can also paint a limited picture.

The quality of the archive can vary, and preservation of samples depends on local conditions. The level and consistency of waterlogging will affect the preservation of wood, faunal remains such as sclerites, and plant macrofossils. Soil acidity affects the preservation of bone and molluscs; the soils of the West Midlands are not a good preservation medium as they tend towards acidity (Greig 2007:39), however the Weald Moors, an area where peat developed in contact with groundwater creating fen-carr, may have better than average preservation qualities (Burnham and Mackney 1964:108). The degree of fragmentation of remains can indicate the speed and energy with which the deposit was initially laid down, as well as subsequent perturbation. Although high quality samples are obviously more informative, nevertheless, each sample tells a story, and even without any accompanying artefacts, a dated, high quality environmental sequence (e.g. Crose Mere; Beales 1980) provides contextual background onto which other studies can be calibrated, and conclusions drawn.

Pollen is widely used in palaeoenvironmental analysis (Birks and Birks 1980; Moore *et al.* 1991). It is ubiquitous, microscopic, and accumulates naturally in deposits such as palaeochannels and pits. Uniqueness of form enables pollen to be identified at the level of taxa and, in some instances, species, and the percentage proportions of Total Land Pollen (TLP) allocated to each taxon indicate which vegetation was the most prevalent in a given area. Its robust nature means that it is well preserved in a variety of conditions; acidic and anoxic conditions are best, but degradation under drier conditions can also be informative (Moore *et al.* 1991:170). Changes in the percentage of TLP indicate how the vegetation cover fluctuated, and, if the sample can be independently dated, when those fluctuations occurred.

There are pitfalls, however, which can distort the analysis. The amount of pollen produced varies with taxa (for example, pine produces more pollen than oak), and although pollen is usually distributed by wind, rain and water, there are other methods, for example, by insects (e.g. Greig 1982). Arboreal pollen is more widely distributed than pollen from grasses and sedges, and cereal pollen is not widely distributed in airstreams (e.g. Vuorela 1973). The source of the vegetation may be at some distance from the sample site and the pollen diagram can indicate vegetation over a wide catchment; therefore the direction of the prevailing wind and an understanding of pollen behaviour must be taken into account if the pollen is to be ascribed to the right location (Moore *et al.* 1991: 12-14). Other issues to be aware of include alteration to the pollen sample by soil processes and the nature of the pitfall trap, including whether there are may be multiple sources of deposition. Conversely, insects paint a more localised picture, and are more sensitive to changes in temperature (e.g. Atkinson *et al.* 1987; Robinson 2001:128; Smith *et al.* 2010). A more rounded picture is obtained when a range of sources such as pollen, charcoal or insects, are combined to form a definitive palaeoenvironmental reconstruction.

5.2. North Shropshire wetlands – Holocene palaeoenvironmental sequence

NB

- For the North Shropshire palaeoenvironmental chronology - see Appx. 3; dates were re-calibrated using OxCal (Version 4.2.2; June 2013)
- The following analysis of the palaeoenvironmental sequence of North Shropshire and the Weald Moors continues the generic chronological headings used in Chapter 3.
- Pollen diagrams for selected sites (Crose Mere, Fenemere, King's Pool and Top Moss) can be found in Appx. 4

The palaeoenvironmental record for North Shropshire is currently made up of palynological spectra, summarised in Chapter 1. The sites are within a 30km radius to the north-east and north-west of the Weald Moors (Fig. 44); the area is not large, but some differences in development can be identified.

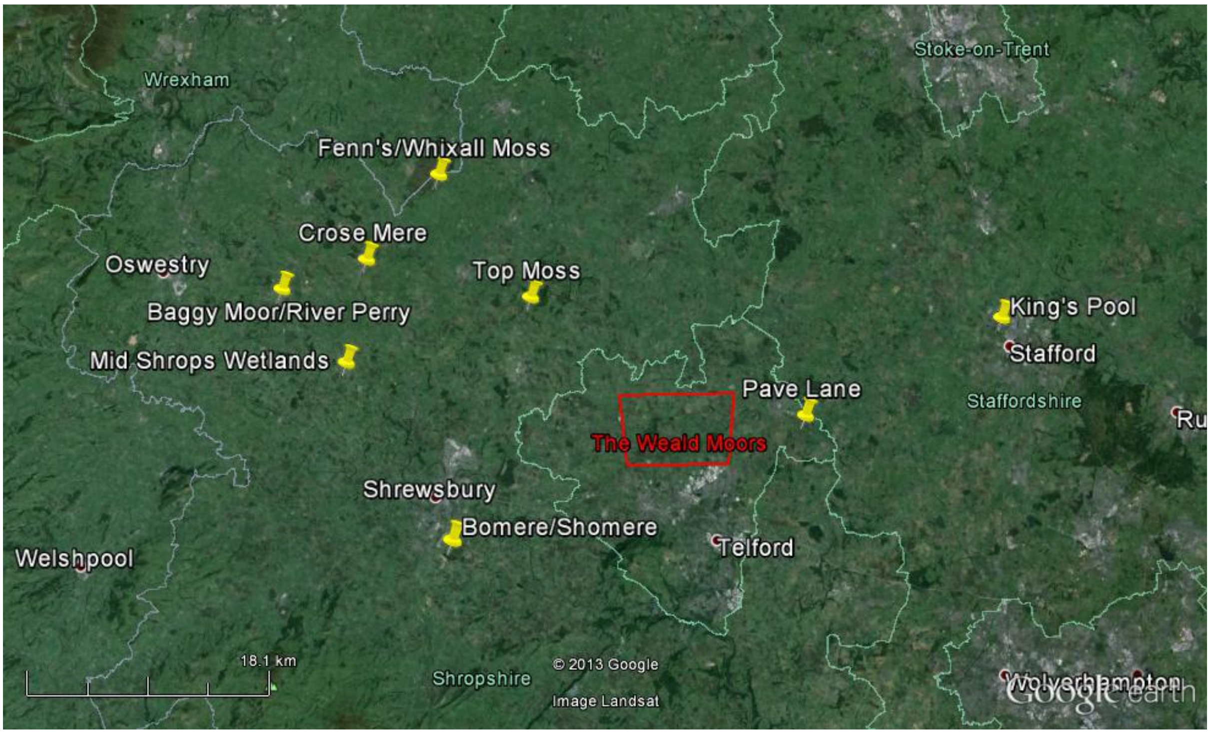


Fig. 44 Palaeoenvironmental sites referred to in this text. (Source: Google Earth June 2013)

Crose Mere (Beales 1980) provides the benchmark as the first lengthy sequence with robust dating (from ca11000BC to the post-Roman era) although in certain parts of the sample, dating is ambiguous e.g. an in-wash of older soils around the time of the first major forest clearance (Beales 1980:139,153). It lies in the northerly Ellesmere region, where studies were also undertaken by Hardy (1939) and Turner (1964) at Whixall Moss. The Mid-Shropshire Wetlands (Berth Pool, Birchgrove Pool, Fenemere, Marton Pool, New Pool, and Boreatton Moss; Twigger 1986; 1988; Twigger and Haslam 1991) lie slightly further south, and are around 3km from Baggy Moor and the River Perry catchment (Brown 1990). NWWS (Leah *et al*. 1998) analysed pollen and plant macrofossil at 19 sites across North Shropshire and 12 in Staffordshire, providing chronological control for one, at Top Moss (*ibid*:173-180). Top Moss is mid-way between the Mid-Shropshire Wetlands to the west and King's Pool, Staffordshire to the east. King's Pool represents one of the most detailed Late Glacial/Holocene palaeoenvironmental studies in Staffordshire, from ca13000BP to the end of the Roman period (Bartley and Morgan 1990); the area denotes a line of transition between hazel dominated woodland to the north and pine dominated woodland to the south in the Mesolithic, and between lime-rich and lime-poor woodland later in the Neolithic (Bartley and Morgan 1990; Colledge and Greig 1988, cited in Leah *et al.* 1998:98). The area around Bomere and Shomere Pools lies near the southerly limit of the North Shropshire Plain, and was analysed as part of the Wroxeter Hinterland Project (Gaffney *et al.* 2001).

From a review of these studies, a contrast can be drawn between people in the Early Prehistoric era (Mesolithic and Early Neolithic) whose impact on their environment was often limited and temporary in its effect, and those in the Middle Prehistoric era and thereafter (from the later Neolithic and Bronze Age onwards) who, by deliberate manipulation of their surroundings, created an increasingly 'cultural landscape' (Greig 2007). Such a landscape is chronologically and spatially inferred via the palaeoenvironmental analysis, although separation of anthropogenic from natural causes is not always clear-cut.

5.2.1. Early Prehistoric period - 11000-4000BC

The climate fluctuated across the British Isles between ca11000BC-8000BC, with warmer conditions prevailing from ca10000BC (e.g. Atkinson *et al.* 1987; Brooks and Birks 2001; Coope and Rose 2008). Crose Mere (Beales 1980; Appx 4) revealed a predominantly treeless late-glacial landscape with a relatively harsh climate. Climatic amelioration allowed the development of birch, only to be followed by a return to poorer conditions with developing grassland; woodland then developed as the climate warmed further.

5.2.1.1. The 'wildwood' and the Elm Decline

The 'wildwood' (*Urwaldrelikt* or primary forest) describes mixed broad-leafed woodland of oak, alder, hazel, elm, lime and some ash, synonymous with a pre- and early anthropogenic landscape. This mosaic of trees developed according to differing conditions, with openings in the canopy created by natural disturbance and by human agency (Smith and Whitehouse 2005:136-7).

The wildwood was developing at Crose Mere by ca7000BC *(*Twigger and Haslam 1991:744), and also at King's Pool, Staffordshire (Bartley and Morgan 1990). Wetter areas such as floodplains and valley floors were favoured by carr woods of willow, oak and alder. An increase in alder is recorded across North Shropshire ca5000BC, linked to a shift towards a damper climate (Twigger and Haslam 1991:744), although earlier evidence is recorded on the River Perry floodplain at 6437-6228 cal BC - 5805 –5629 cal BC (7480±60BP SRR-2798 - 6820±50BP SRR- 2901 (Brown 1990:46)), 3km from Baschurch Pool and the Mid-Shropshire Wetlands, and at King's Pool ca6000-5000 cal BC (Bartley and Morgan 1990:184/189, although this date is ambiguous; see also Appx.4). An increase in alder may also signify the opportunistic colonisation of land cleared by Mesolithic people (*ibid*; Twigger and Haslam 1991:744), which may amount to woodland management. Peat accumulation linked to floodplain inundation is visible in deposits dated 5887 – 5673 cal BC (6890±50BP SRR-2797) on Baggy Moor (Brown 1990:44, 46), which may have anthropogenic cause. Elsewhere on better drained, slightly higher ground, wildwood species included lime, elm and oak, with pine on drier heathland (Greig 2007:42).

Analysis of both the palynological and faunal record from a number of studies in the UK (e.g. Smith and Whitehouse 2005) has suggested that alterations to the proportionate mix of wildwood species may be associated with human interference and climatic change; disease is also suggested as a factor. The decline in elm (*Ulmus sp.*) is detectable in pollen records across Britain commencing ca6343–6307cal yr BP (1σ), with a mean average date across Britain of 5036±247 cal yr BP (1σ) (Parker *et al.* 2002). The date recorded for elm decline at Crose Mere is slightly earlier than the average, at 5296±150 BP Q-1235 (4448-3791 cal BC; Beales 1980:151), and was also associated with an increase in ash (*Fraxinus sp.)*, as elm death allowed light into the woodland canopy. The elm decline was initially associated with the Mesolithic/Neolithic transition with elm being felled to create woodland clearance for farming (e.g. Beales 1980:151-156, who associated the decline in elm with pollarding for fodder at Crose Mere). However, natural causes have also been highlighted. The argument is threefold. Firstly, there are instances where early arable farming significantly preceded any loss of elm, e.g. at Diss Mere, Norfolk (Peglar 1993, cited in Greig 2007:44; Edwards and Hirons 1984), and at Wellington, Herefordshire (SO489479) where an early date for cereal cultivation has been recorded ca5500BC (Jackson pers.comm., cited in Greig 2007:47). Secondly, a shift towards a more continental climate ca5000BP, with colder winters and late spring frosts, may have affected the flowering and fruiting abilities of elm (Parker *et al.* 2002:18). Thirdly, the elm decline has been associated with Dutch Elm disease, brought to the Britain by the beetle *Scolytus scolytus* (F) (Girling and Greig 1985), its arrival reflecting a change in climatic conditions. The loss of elm spanned over 1000 years (Parker *et al.* 2002) and attributing it to one cause exclusively is likely to be an oversimplification. The small clearings created by dead elm may have been used opportunistically for livestock and possibly cereal production in the Early Neolithic and dying elm would have been easier to fell than healthy trees (Bonsall *et al.* 2002; Parker *et al.*2002; Clark and Edwards 2004; Limbrey 1987). This combination could have prompted a more long-term change in subsistence behaviour (Brown 1990:142).

5.2.1.2. The evidence for microscopic charcoal

Microscopic charcoal in the palaeoenvironmental record can originate through accident, by lightning strike or a camp fire that got out of control (see 3.4.1 above; Chambers *et al.* 1996), or indicate purposeful anthropogenic activity, as people created pathways (e.g. through reed bed), clearings for camps (e.g. Hather, in Mellars and Dark 1998; Simmons and Dimbleby 1974) and areas of land where new growth would attract game. At King's Pool, Staffordshire, microscopic charcoal, indicative of significant burning, is apparent in the record ca6000-5000 cal BC (date ambiguous). This has been interpreted as environmental manipulation (Bartley and Morgan 1990:189), and is synchronous with a change in forest composition, after which pine decreases and alder increases (see 5.2.1.1 above). NWWS identified a pronounced charcoal peak at Wolfshead Moss (SJ369206, just south of Baggy Moor), which was ascribed a Mesolithic date (Flandrian 1/11 transition; Leah *et al*. 1998:172), and charcoal is present in other palaeoecological studies for North Shropshire and Staffordshire (Leah *et al.* 1998). Later instances of significant burning, occur at Top Moss (ca3500 cal BC, Leah *et al.* 1998:66-67; see Appx 4), and more regionally, on the Cheshire mosses at Danes Moss (SJ905715) and Walkers Heath (SJ866875)

(Leah *et al.* 1997), but none are recorded in between. This gap may reflect the 'Atlantic hiatus' (ca7000-4000BC), a period covering the Mesolithic/Neolithic transition which is poorly represented in pollen diagrams (Greig 2007:44); such a gap is acknowledged in the King's Pool sequence (Bartley and Morgan 1990).

5.2.1.3. Early Prehistoric period – Summary

Piecing together these various changes in the environmental record (growth of alder, decline in elm, opportunistic use of woodland clearance, peat accumulation, and the presence of microscopic charcoal) with the archaeological record (mainly lithics), the Mesolithic/Neolithic presence in the North Shropshire area appears to amount to more than simply 'passing through'. These valuable indications of human interaction and active manipulation of the environment during the Early Prehistoric era indicate an emerging cultural landscape, albeit there are no signs of early agriculture. None of the examples are conclusive on their own, nor are the dates as early as, for example, records of human interaction and active manipulation as seen at Star Carr, North Yorkshire, where microscopic charcoal from lake edge deposits peak at 9700±70bp and 9580±70bp (further details for these dates are unavailable; Mellars and Dark 1998:120). Nevertheless, these instances in North Shropshire/Staffordshire justify further research (see also 5.3.2 below).

5.2.2. Middle Prehistoric period - 4000-800BC

5.2.2.1. Lime Decline and Woodland Clearance

The broad span of the Middle Prehistoric period sees humans move towards an increasingly settled culture of early farming and agriculture, synonymous with the more obvious management of woodland. Forest clearance, linked with pastoralism and some evidence of cereal, features at King's Pool between 3895-3113 cal BC (4760BP ±120BP WAT-274; Bartley and Morgan 1990:190), and at Top Moss, charcoal and possible cereal pollen are associated with organic deposition at ca3500 cal BC (Leah *et al.* 1998:66) (see 5.2.1.2 above). Fluctuations in tree pollen are visible; as with the elm decline, anthropogenic and natural causes must be jointly considered.

Lime (*Tilia sp*.) was a dominant part of the wildwood, especially in the West Midlands (Greig 2007:45), and fluctuations and decline in its palynological record act as a touchstone for woodland clearance. Two main periods of lime decline have been identified across lowland Britain, between 4500-3000 cal BP (Late Neolithic/Bronze Age) and 2500-2000 cal BP (Mid-Late Iron Age) (Grant *et al.* 2011:405). Of the instances of lime decline investigated by Grant *et al.*

(2011), 66% were attributed to human activity (deforestation and land-use change), whilst 44% were attributed to changes in the depositional environment, indicated by paludification and breaks in sedimentation (lime is intolerant of waterlogging) (Grant *et al.* 2011:394). With climatic deterioration as the probable cause of environmental change, the peaks noted in lime decline coincide with two major phases of change to colder and wetter conditions, as derived from Bog Surface Wetness (BSW) records, firstly from ca4400 cal BP, with the second major phase from ca2750 cal BP (Barber *et al*. 2003:536).

Grant *et al.* ascribed all instances of lime decline in North Shropshire to anthropogenic causes (2011:400). An initial decline, part of small scale woodland clearance, is apparent in phases from ca2500 cal BC e.g. at Boreatton Moss and Berth Pool (Twigger 1988, cited in Leah *et al.* 1998:53), associated with 'forest harvesting' and possibly cereal production. A secondary overlapping phase of lime decline commenced 1617 cal BC – 1317 cal BC (3190±60BP SRR-2923; Boreatton Moss and Baschurch Pools), which Twigger associated with cereal cultivation and some basic land rotation (Twigger and Haslam 1991:747-8), part of a general trend. At Whixall Moss, longer term woodland clearance associated with a decline in lime occurs between 1873-1220 cal BC (3238±115BP Q-467; Turner 1964) in line with the earlier of the two phases of lime decline across Britain (see above). However, pollen diagrams for North Shropshire suggest the virtual elimination of lime after the Middle Bronze Age (e.g. Fenemere (see Appx 4), Twigger and Haslam 1991; Top Moss, Leah *et al.* 1998:67; Whixall Moss, Leah *et al.* 1998:16). Lime can survive felling and mutilation but reduction to such low levels suggests the removal of the root system or the repeated destruction of vegetative regrowth before flowering could occur (Pigott, 1991, cited in Grant *et al.*2011:403). This is potentially the result of browsing or coppicing (Grant *et al.* 2011:403) linked with repeated and locally intensive human activity by the Middle Bronze Age and thereafter, indicating a tipping point for the destruction of primary woodland. A connection has been drawn between the lime decline, climatic deterioration, vegetational clearance, pastoralism and the deposition of at least one human body in Whixall Moss (Mullin 2003:21).

The first long term woodland clearances at Crose Mere '*ca3900BP'* (Beales 1980:152) are synchronous with lowland clearance slightly further south at Bomere and Shomere Pool (Gaffney *et al.* 2001:376). These clearances are of potentially similar date to Bronze Age barrows/ring ditches in the area, with low intensity exploitation changing to a more widespread felling from around 1600BC, and this 'parkland' environment has been linked with the management and control of open land (Wigley 2002a:318). During this period, instances of human habitation become more defined e.g. at Breiddin Hill, 20km to the west into the Welsh Marches, where an occupation site containing hearths and a possible floor area was dated to 2134 -1562 cal BC (3500±100BP HAR-470; Musson 1991:20,21) and at Sharpstone Hill, Bronze Age cremations have been dated to ca 1255±130BC and 1020±188BC (Coles and Harding 1979, cited in Twigger and Haslam 1991:749; Barker *et al.* 1991). *'Thus, by ca1300BC, the post-glacial temperate forest had changed in several important respects',* (Twigger and Haslam 1991:748) with increases in open areas, reductions in elm and lime, and rises in herb and bracken.

5.2.2.2. Increases in arable farming

The identification of cereal pollen (Family *Gramineae/Poaceae* – true grasses) in the palynological record is a further indication of development towards a 'cultural landscape'; however the differences between domesticated cereal crops and wild herbs and grasses are not always easy to discern (Bonsall *et al*. 2002). Relative rises and falls in concentrations of grass/cereal pollen before and during the declines in elm and lime have been interpreted as human impact, especially on the drier hillcrests in North Shropshire (Limbrey 1987). The earliest incidence of cereal pollen in North Shropshire is at Top Moss, where occasional grains of *Secale* (rye) appear shortly after ca3500 cal BC (Leah *et al.* 1998:66), together with microscopic charcoal (see above and Appx 4). One instance of cereal pollen at King's Pool (3895 – 3113 cal BC, 4760BP±120BP WAT-274) has been linked to forest clearance and thence to pastoral and arable agriculture (Bartley and Morgan 1990:190). Further south, cereal appears in the pollen record at Cookley, Worcestershire (SO843799) at a similar date (Greig 2007:45). From ca2300 cal BC, cereal pollen linked to arable cultivation appears in the record at Boreatton Moss and the meres around Baschurch (Twigger 1988:118, cited in Leah *et al.* 1998:53), and also at Crose Mere, although the date is ambiguous due to a possible in-wash of older material (Beales 1980:152-3; see Appx 4). By 1615-1411 cal BC (3220±50BP OxA-6639), cereal cultivation is linked to second phase lime decline at the Baschurch Pools (Twigger and Haslam 1991:748). Thereafter the pattern of short term woodland clearance and regeneration linked to exploitation of the landscape through pastoralism and arable farming is set until the Late Prehistoric, when woodland clearance enters a more extensive phase.

5.2.2.3. Alterations to alluviation and peat accumulation

The Mesolithic/Early Neolithic period, characterized by the 'wildwood' and sedimentary stability (Greig 2007), was altered from the Early/Middle Neolithic onwards by a combination of climate change, arboreal disease, and human impact, leading to increased sedimentation and peat accumulation (see 2.2 above); however, both sedimentation and peat development vary chronologically and spatially across the North Shropshire region.

Pollen analysis from the River Perry /Baggy Moor (Brown 1990) indicates that peat accumulation linked to deforestation began around 5887 – 5673 cal BC (6890±50BP SRR-2797), with the development of fen-carr which *'persisted as the dominant vegetation type until the post-Roman period*.' (Leah *et al.* 1998:75). At Top Moss, peat accumulation began after the elm decline ca3500 cal BC (Leah *et al*. 1998:66), co-incident with increased sedimentation, burning and the presence of cereal pollen. The peat immediately above the initial lime decline at Boreatton Moss was dated to 2196-1903 cal BC (3660±50BP SRR-2831), associated with the presence of a soil layer linked to forest clearance (Twigger and Haslam 1991:748).

A step decline in *Alnus sp*. on the floodplain at several sites including Ruyton-xi-Towns (near Baggy Moor) has been linked with floodplain sedimentation and repeated woodland management from ca3000BP, with human activity rather than climatic deterioration as the main cause (Brown 1988:432-435). *'It is the coincidence of hydrological change of this nature (in extreme events) with an already deforested landscape that may have caused a decrease in the recurrence interval of large floods, increased flood magnitudes and increased suspended sediment concentrations. Climatic change may have been of a minimal magnitude and can be viewed as a contributory factor…'* (*ibid:*435).

Sedimentation changes in the North Shropshire area are reflected elsewhere in the River Severn catchment. These are attributed to anthropogenic causes, the process gathering momentum throughout the Late Bronze/ Iron Age (Shotton 1978; Brown 1988:435).

5.2.2.4. Middle Prehistoric period – Summary

The Middle Prehistoric period in North Shropshire covers a broad span of environmental change, with a landscape affected, as elsewhere, by climate deterioration and changes to the vegetational mix, as the 'cultural landscape' becomes increasingly evident. This begins slowly with evidence of burning (at King's Pool and Top Moss), and early forest clearance ('forest harvesting' around the Mid-Shropshire Wetlands (Twigger 1988, cited in Leah *et al.* 1998:53), leading to increased sedimentation and the inception of peat (e.g. at Top Moss). Woodland clearance began with small temporary clearings increasing to more permanent clearance by the Middle Bronze Age (e.g. ca3900BP at Crose Mere), and possible societal change connected with the management of open land (Wigley 2002a:318). Signs of arable farming are sporadic until ca2500 cal BC, showing slight increases around ca1600 cal BC; however, the North Shropshire landscape never achieves a high level of agricultural intensification, and the picture painted is one of continued short term woodland clearance. Neither is there much evidence to illustrate the domestic and subsistence arrangements of those living in the North Shropshire plain during the Middle Prehistoric, with the exception of a Middle/Late Bronze Age field system and settlement at Sharpstone Hill (Barker *et al.* 1991). This absence possibly supports a model of mobility in North Shropshire from the Late Neolithic to the Early Iron Age (Mullin 2003:90), or may indicate that the landscape held ritual significance. But absence of evidence is not evidence of absence, and the palaeoenvironmental evidence is necessarily skewed because it originates exclusively from wetland areas. Hence the evidence for adopted lifestyles in this period is rather 'stand-alone'. The decline in woodland slightly anticipates the suggested dates for deposition of metalwork and burnt mounds in wetland areas (see Chapter 3). Mullin (*ibid*) suggests that relationships at this time were orientated to things rather than land, perhaps reflecting structures of exchange and trade, with a consequent lack of agricultural intensification.

5.2.3. Later Prehistoric, Roman and post- Roman periods – 800BC onwards

The pattern for palaeoenvironmental change during the Iron Age and into the Roman era was one of increases and decreases in land use intensity, against a backdrop of fluctuating climatic conditions. However, the general trajectory throughout this period was increased woodland clearance, some growth in agriculture, and continued pastoralism (Leah *et al.* 1988:54, 55).

The climatic sequence is complex, showing periods of cooler and wetter conditions, initially between ca850-650CBC (Brown 2008). This is generally described as a period when the landscape became more organised and although there was an apparent move towards lowland living, uplands were not abandoned (e.g. Haselgrove and Pope 2007) (see Chapters 3 and 4). The rise in alluviation, which began in the Middle Prehistoric, became increasingly pronounced across the wider catchment of the Severn/Avon valley (i.e. Shotton's *'buff-red silty clay'* (1978), and floods at Wilden Marsh, Brown 1988), and is attributed to major woodland clearance (see Chapters 2.1.3 and 3; Barber and Twigger 1987; Brown and Barber 1985; Shotton 1978; Brown 1991; Bridgland *et al.* 2004) and an increase in farming.

In North Shropshire, bog moss spores from Fenemere, dated ca3000BP (Twigger and Haslam 1991:750; Appx 4), suggest increasing wetness, and sedimentary inundation associated with deforestation; an in-wash of nutrient-rich soil is seen at King's Pool, Staffordshire between 800 and 400 cal BC (Bartley and Morgan 1990:191). The extent of forest clearance varied between 800-600BC, but on average, up to 1/3rd of the tree cover was removed, especially in favoured localities where soils were good (Twigger and Haslam 1991:750). Widespread woodland clearance at Fenemere and Baschurch Pools is recorded ca800BC, with a decline in oak and ash, and an increase in grass, herbs and bracken. This is noticeable around the Berth and Birchgrove Pools, where relatively high grass pollen indicates an extensive pastoral environment (Twigger and Haslam 1991:750). This change also corresponds with Late Bronze/Early Iron Age settlement in the Welsh Marches at upland level. At Breiddin hillfort, the ramparts are dated to the mid-8th Century BC (from charcoal in post holes; Musson 1991:28); occupation at the Wrekin spans ca760-400 cal BC (Stanford 1991:50). Both correspond to the early phases of building at Old Oswestry (Hughes 1994), and although the relationship between upland and lowland dwelling in Shropshire is not clear, settlement and farming may have moved to drier areas away from the meres and mosses.

Woodland clearance declined after ca600BC, e.g. in the Baschurch area (Twigger and Haslam 1991:750), but appears to have increased again from around ca400BC (cooler and wetter; Brown 2008), with increases in herb and heath pollen (to about 50% of TLP at Fenemere; Appx 4) although cereal pollen continues to be poorly represented (Twigger and Haslam 1991:751). Settlement activity is more widely documented from this time, locally with occupation at Sharpstone Hill (Barker *et al*. 1991), The Berth (Guilbert *et al.* 1977), and again at a slight distance, at Breidden hillfort (Musson 1991). The pattern of fluctuations in woodland clearance may be reflected in the wider incidences of building and subsequent refortification of hillforts from around 350BC (e.g. Haselgrove and Pope 2007; see 4.1 above). This period of cooler and wetter conditions and renewed woodland clearance coincides with a date for the habitation of the interior of Wall Camp of 371 cal BC-cal AD 53 (2110±90 Har-6392). A shift to wetter conditions is noted at Top Moss at 390-114 cal BC (2195±50BP OxA-6640; Leah *et al.* 1998:67; Appx 4), with woodland clearance, pastoralism and agriculture also noted.

Pine pollen increased around this time (Twigger and Haslam 1991:751), possibly indicating a drier climate and heathland in some areas (however, pine prominence varies as it is dependent on soil type; Brown 1988:433). 'Hardy's Pine Stump Layer' at Whixall Moss comprises pine stumps covered by blanket mire. This layer was originally correlated with the presence of a Middle Bronze Age looped palstave (Hardy 1939), with the inference that the palstave was deposited at a time of climatic deterioration (although the deposition may have been of an already 'ancient' object). However, the pine stump layer was subsequently re-dated to 2307±110BP Q-383 (767-114 cal BC; 'ca360 cal BC'; Turner 1964). A problem is apparent in the wide span accorded to this date (possibly related to the known issues associated with the calibration curve between 800-400BC e.g. Haselgrove *et al.* 2001: B2.2.1), placing the event anywhere from the Late Bronze Age to the Late Iron Age, and also with the stratigraphic content of the original sample (Godwin *et al.* 1965). Turner's date corresponds with a peak in pine pollen frequencies at Crose Mere (2310±85BP Q-1233; 753-172calBC), although reservations were expressed about this date also (Beales 1980:156). Growth of pine could be placed at a time of the short-lived climatic amelioration between 650-400BC, the pine trees dying when conditions deteriorated around the time of the Main Humification Change between the Sub Boreal and the Sub Atlantic (Leah *et al*. 1998:16). The stumps were then entombed by mire growth between 384-102calBC (2180±50BP SRR-3074) (Twigger and Haslam 1991:753). The dates for Hardy's Pine Stump Layer continue to be debated and reviewed, with Twigger and Haslam (1991:753) pointing to ca50BC for a regional decline in pine values, and Chambers *et al.* (1996, unpublished; cited in Leah *et al.* 1998:16) reconfirming Hardy's original hypothesis of a correlation of the pine stump layer with the original looped palstave. Notwithstanding these anomalies, evidence indicates a cooler, wetter climate towards the end of the Iron Age when woodland regrowth occurred (Twigger and Haslam 1991:752). There could be correlation between deposition of bodies in the peat bogs and climatic deterioration; the deposition of the body of Lindow Man, ca210BC, may form part of this picture (*ibid:*753; Stead *et al.*1986), although again, the dates are contested.

A rapid opening up of the landscape is indicated at Crose Mere (Beales 1980:152; Appx 4) between 359 cal BC – cal AD 63 (2086±75BP, Q1232). Maximum woodland clearance occurred at Fenemere ca100BC (Appx.4), co-incident with improving climatic conditions and a grassland environment subject to regular cutting and trampling; the landscape is interpreted as pastoral with a concentration of human settlement, however this date too may be anomalous owing to an in-wash of older carbon into the deposit (Twigger and Haslam 1991:751,752). Woodland then regenerated in the North Shropshire lowlands between ca 50BC and 100AD (only to be cleared again), with examples at Fenemere and Berth Pool (Twigger and Haslam 1991:752; Leah *et al.* 1998:55; Appx 4). Possibly, this indicates land abandonment, but the cause is debatable, and coincides with early Romanisation. Several of the Iron Age fortifications/enclosures were occupied during the Roman era (e.g. The Berth, Castle Farm, Bury Walls overlooking Top Moss), but there is no such evidence at Wall Camp.

Pollen indicates an expansion of farmed land during the 2nd Century AD (Beales at Crose Mere 1980; Twigger at Baschurch area 1988). Cereal pollen, plus rye and hemp, increase in Anglo-Saxon times; however pastoral farming dominated during the Medieval period (*ibid*:755), at which point, drainage programmes began to alter the character of the land. The floodplain on Baggy Moor was cleared of woodland by ca1300BP (Brown 1990).

5.2.3.1. Late Prehistoric, Roman and post-Roman periods– summary

Evidence of changes in land-use in North Shropshire for this period plays out against a backdrop of changes in climate, with deterioration in the earlier part of the sequence, then amelioration, followed by colder and wetter conditions at the end of the Iron Age. Although there are gaps and anomalies in the palaeoenvironmental record, exacerbated by the known plateau in the radiocarbon dates, the pattern indicates repeated periods of woodland clearance. This could be prompted by a need to harvest timber (possibly for fortification or enclosure) and/or to clear land for farming (pastoral and agricultural), and may be synonymous with periods of territorial reorganisation, possibly associated with a growing population and the establishment of new communities (Limbrey 1987; Twigger and Haslam 1991:750). Conversely, woodland regeneration could be synchronous with land abandoned at a time of climatic deterioration and population decline. *'It is clear that land abandonment and climatic deterioration were broadly coincident in lowland Shropshire during the Iron Age. If climatic factors were not the sole cause of land abandonment, in certain areas, they might at least have exacerbated cultural stress.'* (Twigger and Haslam 1991:755). Clearance possibly indicates many people jostling for land, seeking to exercise long-established tribal land rights and building fortifications to protect resources. Regeneration could indicate famine, disease and a lowering of the population. 'Cultural stress' could describe both patterns of societal change.

The amount of genuine cereal pollen in the overall record is significantly low, with scant quantities in the palaeoenvironmental record until the late Iron Age/Roman period (Beales 1980 Appx.4). Some arable residues have been recovered (e.g. carbonised wheat at The Wrekin, Stanford 1991:68) but none have been found in North Shropshire to equate with the likes of Caynham Camp in the Welsh Marches (e.g. Stanford 1991: 68) or, further afield, Danebury Iron Age hillfort in Hampshire (e.g. Van der Veen and Jones 2006). This is perhaps surprising given the number of occupied hillforts in the North Shropshire area and the likely size of a hungry population, but may be more reflective of a lack of excavation, or excavations which did not include palaeoenvironmental analysis. Perhaps the evidence suggests that the area was not intensively agricultural because, until drained, this was poor land. Evidence for pastoral land-use is stronger, a pattern which continued into Medieval and modern times.

5.3.The Weald Moors – Palaeoenvironmental Analysis

To date, the only palaeoenvironmental sample taken from the Weald Moors has come from peat associated with a newly identified burnt mound (Leah *et al.* 1998); the conclusion was that '*… the mire began life as a reed dominated system which developed into fen-carr with abundant sedges'* (*ibid:*75). The historic record also indicates a landscape of swampy fen (see 2.4.1), and therefore the whole archaeological history of the Weald Moors – lithic scatters on the slightly higher 'islands', burnt mounds, metalwork deposition, the ring ditches at fluvial confluences, the enclosures on higher ground and the building and re-fortification of Wall Camp – appears to have developed against a backdrop of reed-bed and fen-carr. Although this may be the case, a more detailed picture is worth pursuing. Therefore, in addition to reviewing the geomorphology and archaeological history of the Weald Moors, the priority for this thesis was to establish the palaeoenvironmental context, with particular reference, given its prominence, to Wall Camp.

5.3.1. Methodology and Profile Description (see also Appx.5 for a detailed description of sample selection, excavation and analysis)

Fields outside the Scheduled Monument were initially surveyed by augur to establish suitable areas for test-pitting (Fig. 45). Three test pits were subsequently excavated spanning an area of 60 ^{2}m, and environmental samples taken for palaeoentomological study (insects providing a more localised picture of previous environmental conditions); a monolith tin was retained for possible palynological analysis at a future date. A summary of the results, including profile description, sources for dating and the presence (or not) of insects in the samples, can be seen in Table 1.

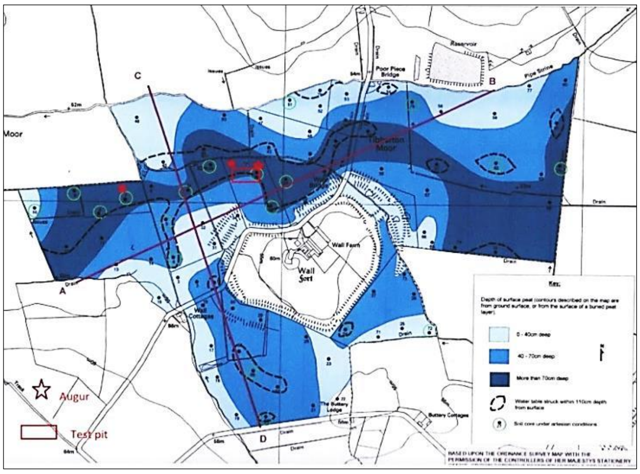


Fig. 45 Augur samples and test pits at Wall Camp. (NB. All are outside the Scheduled Monument)

Level cms	TP1	Insects	Sample contents	TP2	Insects	Sample contents	TP3	Insects	Sample contents		Dates
0-10						**Turf**					
10-20				**TP2 <1>**	Few (4)	Dark organic peaty soil; very desiccated and compacted with a few small stones and grit. Frass	**TP3** <1>	N	Dark organic compacted peaty soil; desiccated Roots and organic material	**Monolith Tin**	
20-30				**TP2 <2>**	Few (3)	Dark organic desiccated. No inclusions. Gritty.Frass	**TP3** <2>	Y (16)	Dark organic compacted peaty soil; desiccated Frass		
30-40				**TP2 <3>**	Y (24)	Dark compacted peat; desiccated with no inclusions. Grainy.Less frass than TP1 <1> and TP2 <4>	**TP3** <3>	Y (20)	Very compacted dark organic peaty soil; desiccated Plant macrofossils Clay Layer		
40-50				**TP2 <4>**	Y (60)	Dark compacted peat; some gravel residue; no inclusions (stones, bone etc). Fine organics/frass /plant macrofossils	**TP3** <4>	Y (31)	Dark organic compacted peaty soil. Plant macrofossils esp. *Phragmytes sp.* **Dating - Sample 1**		6370-6220calBC
50-60	**TP1** <1>	Y (26)	Dark organic compacted peaty soil Frass			Stream /Ground Water	**TP3** <5>	Y (15)	Dark organic compacted peaty soil. Microscopic charcoal. Plant macrofossils esp. *Alnus sp., Phragmytes sp.* and *Lemna sp.* **Dating - Sample 2** **Dating - Sample 3**		8550-8300calBC
60-70			Gravel/Stream/ Ground water						Blue green clay and a small amount of gravel. Stream		

Table 1 Diagrammatic section showing test pits, levels and sample content at Wall Camp.

5.3.2. Radiocarbon Dating and Profile Content

Three organic samples were selected and submitted for dating. These were chosen from TP3 <4> and <5>, which provided samples of the best quality; therefore although dating results can only be ascribed to this sample with total confidence, the sample profiles are highly comparable. Samples 1 and 3 were viable (Sample 2 (leaf fragment, *Phragmytes sp*.) was rejected as too small). The results (Table 2) indicate that the palaeochannel and associated deposits date from the Mesolithic period in the early Holocene.

Sample	**Lab Code**	**Nature of date**	**Material**	**13C/ 12C Ratio**	**Conventional Radiocarbon age (BP)**	**Calibrated dates (2σ calibration, 95% confidence)**	**Intercept Date(s)**
Wall Camp TP3 Sample 1 (40-50cm)	Beta-341265	AMS radio carbon	*Phragmytes sp*.root + organic sediment	-27.0 o/oo	7400±30BP	6370-6220 cal BC (8320-8170calBP)	6240calBC
Wall Camp TP3 Sample 3 (50-60cm)	Beta-341619	AMS radio carbon	*Alnus sp*.- fragment	-27.1 o/oo	9210±40BP	8550-8300 cal BC (10500-10250 calBP)	8440calBC & 8370calBC & 8350calBC

Table 2 Radiocarbon dates, Wall Camp

The samples were characterised by plant macrofossils of *Phragmytes sp.* and *Alnus sp*., suggesting a reed bed, with still pools or slow moving water, and some carr woodland. An analysis of plant macrofossils is outside the scope of this thesis, however, whilst selecting material suitable for dating, one highly spongy, broken Duckweed seed (*Lemna sp*.) was identified in Sample 3 (at 50-60cm; Dr. W. Smith pers.comm.). This fragment was unusable due to insufficient weight, but it strengthens the conclusions regarding habitat; it is also the only host for *Tanysphyrus lemnae* (Payk.) which featured in the palaeoentomological analysis (see 5.4 below).

There were also some charred remains of grass or reed plant parts e.g. grass culm (Dr. W. Smith pers.comm) in Sample 3, dated 8550-8300 cal BC. Although none were identified as charcoal, these remains do provide evidence of burning. The charred remains could indicate natural phenomenon or human accident, but human agency may be a possiblility (cf. Star Carr (Dark 2004:41); King's Pool (Bartley and Morgan 1990); Top Moss (Leah *et al.* 1998 173 *et seq.* and Appx 4)). The archaeological record is clear about the Mesolithic presence on the Weald Moors (see 3.4.1 above). If further work identifies the burning as repetetive and/or significant and therefore potentially anthropogenic, a case could be made for a managed wetland environment, anticipating similar activity at King's Pool, Staffordshire by 2500 years, and comparable with Star Carr in terms of date (see 5.2.1.3 above).

Although the stratigraphy is shallow, it nevertheless confirms that an ancient palaeoenvironmental record is maintained in these deposits. Similarly, shallow but ancient deposits have been found at Sharpstone Hill, where an open pool was rapidly colonised by herbs, shrubs and trees from ca7000BC onwards (from black peat at a depth of around 80cm, further information for this date is unavailable) (Shotton in Barker *et al.* 1991:45). Although it appears that the most recent peaty soils near Wall Camp have naturally eroded away in line with NWWS's conclusions about peat wastage (Leah *et al.* 1998:120), the stratigraphy may represent a more complete picture than at first appears. A very crude estimate of peat development and compaction at Wall Camp indicates that about 2000 years of deposits is represented by 10cm of stratigraphy, and therefore the deposits could represent close to a full stratigraphic sequence, with implications for the palaeoenvironment around Wall Camp (see below). Rowley ascribes the initiation of peat on the Weald Moors to climatic deterioration from the Late Bronze Age (Rowley 1972:162) i.e. ca1200BC-700BC, associated with a period of increased wetness and cooler climatic conditions (e.g. Brown 2008:7-8), but this does not reflect the local circumstances of the area around Wall Camp, where peat was developing in a reed bed in the early Holocene, and continued to do so throughout prehistory.

More work is needed to identify palaeoenvironmental evidence from the stratigraphy, including the chronological extent of the deposits, the nature of burning, and changes in the vegetation from reed-bed to fen-carr.

5.4. Wall Camp – Insect analysis (see Fig. 46 - Fig. 47, and Table 1).

"In attempts to discover the details of the environment in which man lived in prehistoric times, and for assessing his effect on the contemporary environment, there are probably no more sensitive biological indicators than insects." (Osborne 1988:715).

Insects live in almost every terrestrial, freshwater aquatic and maritime intertidal habitat (English Heritage 2002:10). They are characterised as invertebrates with an exoskeleton made of chitin, and jointed limbs, and are readily preserved in anoxic conditions. Several orders within the class Insecta are studied (e.g. Hymenoptera – bees, ants, and wasps (Kenward in Smith *et al.* 2005). Coleoptera (beetles) represent the largest order of Insecta (approx. 3800 species within the

British Isles); they are characterised by forewings modified into hard outer casings (elytra) and biting mouthparts. Coleoptera are mobile, plentiful and in many cases identifiable at species level, and form the base data for the Wall Camp study. Their disarticulated remains (i.e. head, thorax and elytra) survive well in both waterlogged environments and in some dry conditions such as thatch (e.g. Smith *et al.* 2005), and some assemblages comprise thousands of individuals. Although easier from whole remains, many beetles are identifiable from fragments. Palaeoentomological studies e.g. at Upton Warren (Coope *et al.* 1961) also established that fossil fauna sharing the same environmental preferences are identical with modern faunal assemblages; thus identification of fossil sclerites enables a palaeoecology to be determined for any given deposit . As research developed, insect remains became a means of interrogating archaeological deposits for information about palaeoenvironmental conditions, particularly in wetland deposits (e.g. on the Somerset Levels; Girling 1979) and areas associated with human occupation (i.e. synanthropic species e.g. Carrott and Kenward 2001).

This summary of the insect evidence from the Wall Camp samples draws conclusions about the palaeoecological nature of the area at the time of deposition (Fig. 46 and Fig. 47). No other palaeoentomological studies have been undertaken in the North Shropshire wetlands. Details of the processing methodology and sample dimensions can be found in Appx 5; Appx.6 contains Insect Tables and a full species list. The taxonomy follows Koch and Lucht (1987). Habitat preference follows Smith (Smith and Howard 2004:112) and Robinson (1981; 1983).

5.4.1. Stratigraphy/Minimum Number of Individuals

With the exception of Test Pit 3 <1>, insect remains were present in all samples, although the compacted and desiccated nature of the peat hampered recovery. The stratigraphy between 30 and 50cms was the most productive in all samples, perhaps influenced by the moist clay layer at 40cm (TP3); numbers decreased higher up the stratigraphy. The assemblage was characterised by its fragmentary nature; given the level nature of the terrain, this is likely to have been a product of the compaction of the peat and the drying out of the deposits (Kenward 1978:12) rather than water turbulence.

The results from TP1 and TP2 have been amalgamated to present a larger MNI for analysis, although they were analysed separately (see Appx. 6). TP3 provided a higher number of MNI and originated at a point slightly nearer to Pipe Strine, and is presented singly. The results were homogenous indicating no appreciable difference either between test pits, or within the stratigraphy. The samples did not yield high numbers of individuals, but conclusions can be drawn nevertheless.

5.4.2. MNI: Species ratio

The Wall Camp assemblages show moderate diversity (Total MNI:Species ratio) with Consolidated Test Pits 1 and 2 indicating a ratio of 1:2.78, and Test Pit 3 indicating 1:2.65. A highly diverse population indicates a higher level of allochthonous species (Kenward 1978:19); these ratios reflect a mid-point between a mainly autochthonous and allochthonous assemblage.

5.4.3. Habitat preferences

Wetlands produce *'...an intricate landscape which includes all the successional stages taking place in channel morphology, from main channel to field pond and finally to terrestrial meander, with dominant stands of willow or alder.'* (Greenwood and Smith 2005:60). This summary is reflected in the insects recovered from Wall Camp. Although the assemblage may span several thousand years, the habitat preferences stay roughly the same throughout.

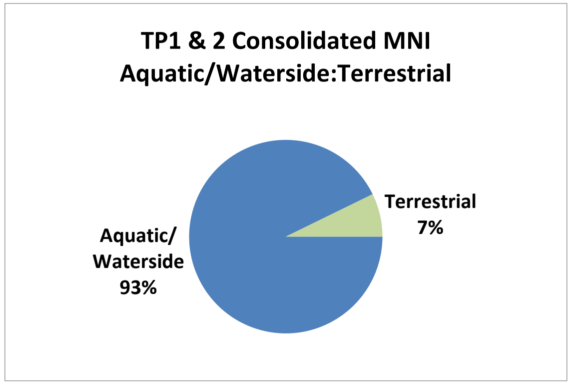
It was possible to allocate 75% (TP1 and TP2) and 68% (TP3) of MNI to habitat. Aquatic/waterside species dominate the assemblage (89%), and are present in all test pits at every level. Of these, 76% of those allocated inhabited a reed bed environment with slow moving or still water. *Bagous sp*., *Tanysphyrus lemnae* (Payk.), *Ochthebius minimus* (L.) and *Aquatic Cercyon spp*. have a strong interpretive role, denoting still water and marsh. *Plateumaris braccata* (Scop.) is associated with common reed (*Phragmytes australis* Trin ex Steud.) (Koch 1992; Greenwood and Smith 2005:61-2). and *Notaris aethiops* (F.) (TP2 <3> and <4>) is specifically associated with branched bur-reed (*Sparganium erectum* L.). Sweet grass (*Glyceria sp.*) is the host plant of *Notaris acridulus* L. (TP3); *Notaris sp*. also feed on sedges (Carex). *Limnobaris sp*. feed on on Juncaceae and Cyperaceae, and account for the highest percentage in the total assemblage (around 13%). *Panagaeus cruxmajor* (Payk.) is a species which inhabits lush vegetation and waterside/reed bed, with some affiliation to willow. It is rare (RDB1), with modern relict populations found in South Wales, Lincolnshire, Sussex and Yorkshire. It was also recorded at Yoxall, Staffordshire, in a Late Bronze Age log-jam of waterlogged timbers, some of which were worked (Greenwood and Smith 2005:57-62). It is found in this assemblage in TP2 <4>, at between 40 and 50 cm, potentially contemporary with TP3 <4> at 40-50cm, dated to 6370-6220calBC.

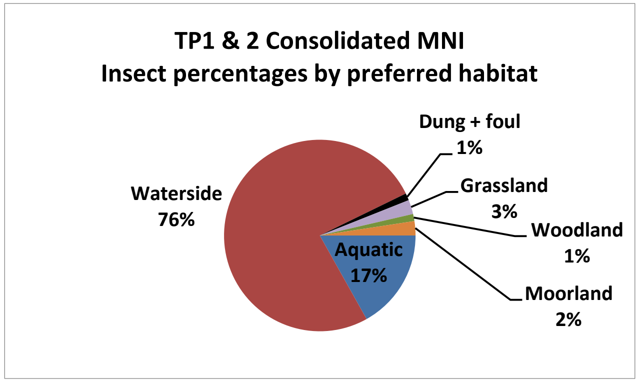
The species evidence indicates that the Weald Moors was a flat wetland from the early Holocene onwards with slow moving, meandering channels; no species within the assemblage characterise fast flowing water (members of family Dryopidae and Dytiscidae). This compares with an assemblage at Bole Ings, in the Trent valley in Nottinghamshire (Dinnin 1997, cited in Greenwood and Smith 2005:59), where a continuous and complete sequence from two cores from a basin of silty peat and clay spanned 7480-7080 cal BC – 1020-800 cal BC. The assemblage from the later chronology is similar to that at Wall Camp, but the assemblage from the early chronology was associated with beetles from fast flowing water. Only 4 Dytiscidae appear in the Wall Camp assemblage; none are diagnostic, although 1 specimen is *Hydroporous sp.*, some of which are associated with aquatic conditions in woodland (TP2 <4>, 40-50cm).

Beetles affiliated with woodland are relatively rare in this assemblage, and but are present in 2 samples and across the stratigraphy. These consist of *Dromius agilis* (F.) (TP3<4>, 40-50cm, 6370-6220 cal BC), *Rhamphus sp.*(TP2 <4>, 40-50cm) and *Polydrusus mollis* (Ström) (TP3 <1>, 10-20cm). The frequency is very low, representing between 1% and 3% of the assemblage, but possibly indicating some limited tree cover consistent with fen-carr (*Rhamphus sp.* is associated with willow, as is *Panagaeus cruxmajor* (Payk.)). The wildwood has a distinctive insect community, first identified by Osborne (1965) and later Hammond (1974) (cited in Smith and Whitehouse 2005:136), but there are no indications of wildwood species at Wall Camp. There is only one indication of species that live in grassland – *Apion sp*. (TP1<1>, 10-20cm), and only 2 sclerites (*Plateumaris discolour* (Panz.)) indicate moorland (TP1<1>, 10-20cm). A combination of 'negative evidence' for the wildwood, together with a small number of species associated with grassland and moorland, may indicate that an open environment surrounded the Moors throughout prehistory, possibly more emphasised later in the sequence. A number of species in the assemblage are associated with disturbed ground e.g. *Clivina fossor* (L.) and *Pterostichus strenuus* (Panz.).

There are two instances of *Dyschirius salinus* Schaum, a halotolerant species often found on estuarine mud, but also found in inland saline waters. The sclerites were found between 40 and 60cm in TP1 <1> and TP2 <4>, spanning the dates 8550-6220 cal BC, and their presence implies that there are more salt springs on the Weald Moors than the one exploited at Kingley Wich in the 18th Century. Specifically, there may have been salt/brackish water near Wall Camp throughout the Holocene, and could support earlier conclusions about the purpose of the burnt mounds on the Moors, including those near Wall Camp (see 3.4.2.3 and 4.3 above).

Fig. 46 TP1 and TP2 - Consolidated MNI/Habitat Groupings/Species ratio





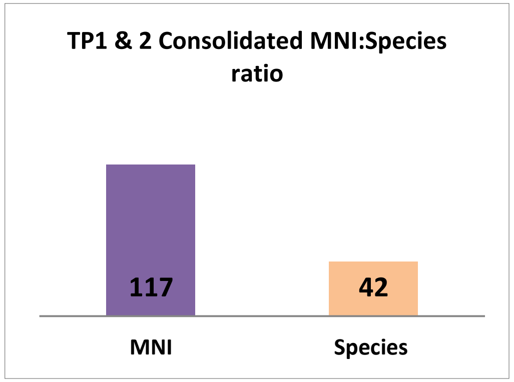
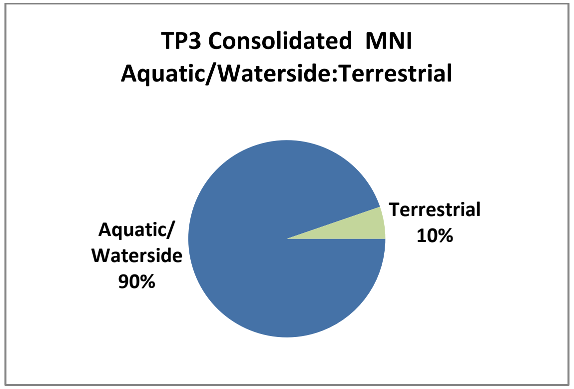
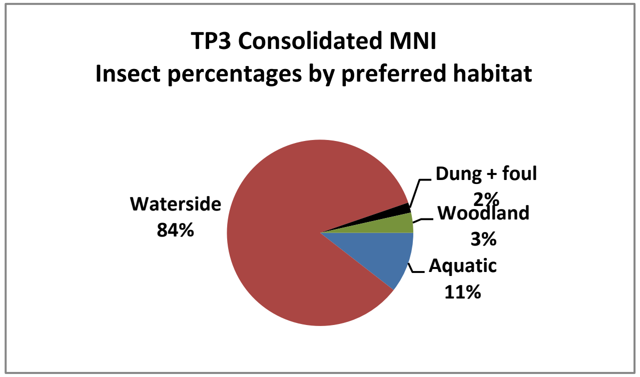
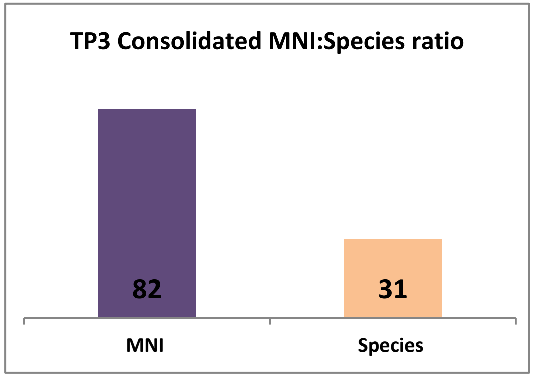


Fig. 47 TP3 - Consolidated MNI/Habitat Groupings/Species ratio







No species in the assemblage represents an exclusively dung and foul environment, however, *Hister carbonarious* (L.) (TP2<4>) and Anotylus *rugosus* (F.) (TP3<4>) could be associated with these conditions (stratigraphic depth 40-50cm, 6370-6220 cal BC). This is the only small indication that there may have been any grazing animals on the Moors, and is far from conclusive.

The total insect assemblage is homogenous, confirming NWWS's conclusions of a stable environment of reed bed surrounded by fen-carr/alder-carr woodland with limited variation, throughout prehistory.

5.5.The Weald Moors - Palaeoenvironmental history in context

The earliest palaeoenvironmental indication of human activity in the North Shropshire/Staffordshire area is deposits of microscopic charcoal at King's Pool, Staffordshire; other charcoal traces were identified by NWWS (including Top Moss, close to the Weald Moors, and Wolfshead Moss, near Baggy Moor). Potentially, these earlier findings could be amplified by the microscopic charcoal identified at Wall Camp; if further work suggests a likely anthropogenic cause, this may indicate Mesolithic wetland management of a much earlier date than previously identified in the North Shropshire area. The Mesolithic is well attested across the region, with both the Weald Moors and Baggy Moor yielding Mesolithic finds; additional evidence of possible Mesolithic activity is present on Baggy Moor in the form of alder clearance.

Palynological studies tend to look to a reduction in woodland as a primary indicator of human activity from the Neolithic onwards, together with an increase in the occurrence of cereal-type species. Unfortunately the evidence for the presence of woodland from the palaeoentomological study of the Weald Moors area is extremely limited, and can therefore offer little in support of other palaeoenvironmental studies. A lack of beetles species associated with the wildwood in the Wall Camp samples may indicate a relatively open surrounding landscape, but this is far from conclusive and can only be temporally ascribed to the Mesolithic with any confidence. Therefore, palynological studies from elsewhere in North Shropshire must provide indications of human activity, but this too is limited in the Neolithic, with evidence for woodland clearance at Crose Mere from ca 4500 cal BC, and at King's Pool from ca 3900 cal BC. A general lack of archaeological evidence for this period across the North Shropshire area may further indicate the limited scale of Neolithic activity in the area (Barber 2007), but may also be a reflection of poor preservation and/or limited archaeological excavation.

Evidence for woodland clearance, in particular a decline in lime, only becomes truly apparent across the region from ca 2500 cal BC, with evidence from the Mid-Shropshire wetlands, Crose Mere and Top Moss; this woodland reduction has been attributed to anthropogenic rather than climatic causes, with the main cause of spatial variation being soil related (Grant *et. al.* 2011) i.e. felling on calcareous soils happened before loamy soils, but this does not necessarily aid interpretation in North Shropshire. Archaeological evidence for a human presence increases across the region at this time, and specifically on the Weald Moors, with the presence of ring-ditches, metalwork deposition, and burnt mounds. The pattern of woodland management (short term clearance followed by regeneration) may reflect the provision of areas for livestock and arable farming, and could also indicate harvesting for fuel, and/or coppicing. Ring-ditches present on western edge of the Weald Moors may have occupied marginal land in an open, pastoral environment. From the Wall Camp samples, the palaeoentomological evidence for woodland on the Weald Moors throughout the Holocene is very restricted, indicating, specifically, alder and willow in a fen-carr environment. However, fuel would have been necessary for the burnt mounds; hence wood must have been available, possibly reinforcing ideas of coppicing around the Moors. The salt supplies on the Weald Moors, known at Kingley Wich and evidenced at Wall Camp by *Dyschirius salinus* Schaum., could provide additional evidence that the burnt mounds on the Moors were used for salt production.

The Late Prehistoric enclosures which occupy the higher ground on the edges of the Weald Moors, together with Wall Camp, suggest a pastoral economy. This is supported by the palynological evidence from elsewhere in North Shropshire, including Pave Lane which was surrounded by grassland and probably used for grazing livestock (Smith 1991), and Top Moss/Bury Walls which indicates an arable and pastoral landscape at this time (Leah *et al.* 1998:67). However, the palaeoentomological samples suggest that evidence for grazing livestock at Wall (in the form of dung and foul, and grassland species) is almost non-existent. The stratigraphy may be truncated and the evidence may not be present, but the current assemblage suggests that the marsh-fort of Wall Camp was not a ranch in the conventional sense.

The palaeoenvironmental sequence for North Shropshire provides the context for all the previous chapters in thesis, which will be summarised in Chapter 6.

CHAPTER 6

6. Conclusions and Future Research

6.1. Conclusions

The archaeological and palaeoenvironmental record for the Weald Moors paints a picture of a wetland landscape which held significance for those who lived on or in its environs throughout prehistory.

The earliest presence on the Weald Moors, indicated by the lithics record, forms part of a concentration of Mesolithic activity in north-east Shropshire/west Staffordshire. The higher vantage points were used as places of tool preparation and presumably, as observation posts, and their repeated use qualifies them as places of importance and purpose. The palaeochannel surrounding Wall Camp is securely dated to this period, and if further investigation indicates that the burning of the reed-bed is anthropogenic in origin, a case could be made for repeated wetland management by a comparatively stable and localised population. Further investigation of the black chert used in tool production may show links with other groups, and/or indicate foraging for raw materials at some distance from the Moors.

The sparse evidence for a Neolithic presence on the Weald Moors, and elsewhere in North Shropshire, is compounded by the patchiness of the palaeoenvironmental archive (possibly a product of the 'Atlantic hiatus' - see 5.2.1.2). The exceptions are a Late Neolithic presence at Sharpstone Hill (Barker *et al.* 1991), and occasional lithics recorded elsewhere in the North Shropshire area, mainly around the River Severn catchment (Ray 2007; Barfield 2007). A reappraisal of the lithics in the HER for the Weald Moors would aid clarification, as would additional, well-dated, palaeoenvironmental evidence.

Both the palaeoenvironmental and archaeological records show an increase in anthropogenic activity in the Middle Prehistoric period in North Shropshire generally, and on the Weald Moors in particular, where the pattern of behaviour – as evidence by ring-ditches, metalwork deposition and burnt mounds - appears to signpost ritualistic rather than domestic activity. The ring-ditches which overlook the Moors are the northerly outliers of a concentration along the Tern/Roden river valley, possibly indicating marginal lands of tribal importance. That this tract of land was clear of woodland may be supported by 'negative evidence' from the insect analysis. The pattern of woodland management across North Shropshire (short term clearance followed by regeneration) indicates repeated harvesting during this period, which would have been required for both metalworking and burnt mounds. Metalwork deposition as an act of ritual is borne out from evidence elsewhere across Britain in the Bronze Age, and for the Weald Moors, this important activity appears to have happened along the line of a suggested route-way which ran north through Rodway. The burnt mounds are an enigma, but their purpose has been suggested as having ritual connotations. They are significant by virtue of sheer numbers, and more evidence may be present beneath alluvial or peat deposits. The only excavation, at Rodway, provided a Middle Bronze Age date; therefore there is a temptation to believe they are contemporaneous. However, this may not be true, and several on the Weald Moors may be linked with Iron Age enclosures, including those near Wall Camp. Their use continues to be disputed, but the presence of salt on the Weald Moors (confirmed at Wall Camp by insect analysis) may suggest the reason for such a concentration. As salt springs are 'exhaustable', perhaps the burnt mounds 'followed' the salt springs during the Bronze Age, until it became easier to import the salt from Cheshire, as evidenced at Wall Camp by the briquetage.

In the Late Prehistoric/Iron Age, enclosures flank the Moors, occupying the higher ground, potentially as satellites to the dominant feature on the landscape – Wall Camp. Given its substantial defences and its size, Wall Camp represents a high level of investment by a large population, over several generations. It was potentially a place of high status, as indicated by its size, its defences, and the Iron Age bead. Occupation has been dated to 371 cal BC- cal AD 53 (2110±90 Har-6392), at a time of wetter, or at least fluctuating, climatic conditions. The structures in the interior may have been round houses, but comparison with other marsh-forts (Sutton Common and Stonea Camp) should guard against the automatic conclusion that they were living areas. A practical interpretation for Wall Camp is of a large ranch, possibly a centre for distribution or a place of refuge for outlying enclosures, contemporaneous with the multivallation and enlargement of Iron Age forts in general. However, no evidence of pastoral activity is apparent in the beetle analysis, albeit that the dating of environmental samples from Wall Camp are not proven for the Late Prehistoric era. A pattern of ritualistic use of the Weald Moors was established in the Middle Prehistoric period and may have continued into the Late Prehistoric period with Wall Camp as a focal point. There are similarities with the marsh-fort of Sutton Common - the possible watergate, the deliberate choice of an area which floods, the 'hidden' nature of its defences and its lack of intervisibility; the comparison with a 'classic maze' structure may also be significant. The Weald Moors clearly retained their sacred status into late prehistory, as evidenced by deposition of the Telford Torc, which may in turn signify a link with Eastern England, and support a connection with Sutton Common, Stonea Camp and other Fenland sites.

Its relationship with other local forts and enclosures, both locally and nationally, requires further investigation.

Pursuing a ritualistic theme may explain why there is such limited evidence of a Roman presence on the Weald Moors given the proximity of *Viroconium.* It has to be assumed that Wall Camp was abandoned by this time, whereas other local enclosures and forts evince a Roman presence. Positioning Wall Camp within the structure of the Cornovii would help to clarify this, as would further investigation of the limited Roman remains found on the Moors.

6.2.Future research

The original research question for this thesis was to review the geomorphology and archaeology of the Weald Moors with reference to the wider regional landscape of North Shropshire, and to identify the palaeoenvironment surrounding Wall Camp, and thus deduce its purpose. This has been achieved in part, with the environmental samples revealing the possibility of a much earlier world of Mesolithic wetland management. The original question of the purpose of Wall Camp, as either ranch or ritual, remains outstanding. This thesis has opened up fresh opportunities for future archaeological prospection, and shows that the organic deposits are more productive than was originally thought. Further work on the Weald Moors' deposits is amply justified, with palaeoenvironmental samples available from several sources:-

- The presence of microscopic charcoal on the Weald Moors should be re-investigated to determine the extent of burning and reed-bed management during the Mesolithic, creating a comprehensive picture of the Mesolithic presence in North Shropshire. This should include a reappraisal of known artefacts, including analysis of the sources for flint and black chert tools and a clarification of period if possible.
- The burnt mounds on the Weald Moors should be further investigated, with particular reference to establishing their chronology, and establishing their purpose, with particular reference to salt production.
- The purpose of Wall Camp should be re-addressed by further palaeoenvironmental research (selecting samples from the ditches around Wall Camp would be more likely to provide a contemporaneous date). The creation of sophisticated terrain models comparing Wall Camp with other low-lying Iron Age forts, both local and especially those in the Fen country, would aid analysis. Thorough comparisons with the marsh-forts of Sutton Common and Stonea Camp would be valuable.

- Further prospection for palaeochannels or to indicate routeways across wetlands should be possible using ArcGIS, with the addition of Lidar data. Additional places for palaeoenvironmental prospection have already been located on the Weald Moors which could provide a more comprehensive chronological sequence:-
    - NWWS identified three areas of peat greater than 1m deep; two lie either side of Wall Camp, whilst the third is west of Kynnersley. (Leah et al. 1998:Fig 26);
    - The BBC's Domesday Reloaded Project[23] obtained three soil samples from contrasting points (SJ642179, SJ666171 and SJ677161). Sample 3 is potentially the most promising, described as '*Almost entirely humus with no appreciable mineral content, typical of bog land'*, from just south of Kynnersley;
    - The area around Crudgington Moor retains peat deposits in deep hollows (Mr Eudale, farmer, Sidney Plantation; pers. comm.)
- There are many parallels between the Weald Moors and Baggy Moor throughout this story – the Mesolithic presence in the form of both lithics and charcoal deposits, metalwork deposition and the use of burnt mounds - and a comparison study could throw light on both.
- This thesis shows that the Shropshire border is an artificial boundary, and including more information from the Staffordshire archive would present a more rounded picture, not just for the Mesolithic, but throughout prehistory.

The North Shropshire area could be seen as a crossroads, a melting pot with good transport afforded by the Severn and along routeways avoiding the wet lowlands. Although clearance and regeneration of woodland indicates the importance of forest harvesting and a pastoral environment for stock rearing, the strong elements of ritual activity lend the area an extra dimension. In the rest of the county, in North Shropshire, and on the Weald Moors, research has started to peel away layers of both palaeoenvironmental and archaeological evidence. Both begin to tell the story not necessarily of an homogenous area, but of a mosaic where humans responded to natural resources as they discovered them, and found ways of exploiting them.

[23] http://www.bbc.co.uk/history/domesday/dblock/GB-364000-315000/page/2

THE WEALD MOORS AND WALL CAMP - APPENDIX 1 – HISTORIC ENVIRONMENT RECORD

Shropshire Historic Environment Record and North West Wetland Survey Sites - July 2012

	HER number	Mon/ NWWS UID	HER/NWWS Period	Monument Type	GridRef	HER/NWWS Description	Period summarised as	Site type summarised as
1		SH29	Prehistoric	FLAKE	SJ69491793	One unretouched flake.	Prehistoric	lithic
2		SH43	Prehistoric	FLAKE	SJ66421641	Unretouched flake .	Prehistoric	lithic
3		SH87	Prehistoric	FLAKE	SJ69091694	Unretouched, plough damaged flint flake .	Prehistoric	lithic
4		SH91	Prehistoric	FLAKE	SJ67741695	Unretouched flake .	Prehistoric	lithic
5		SH129	Prehistoric	FLAKE	SJ65011410	One unretouched flake .	Prehistoric	lithic
6		SH133	Prehistoric	FLAKE	SJ65971487	One unretouched flake .	Prehistoric	lithic
7		SH135	Prehistoric	FLAKE	SJ65951499	One unretouched flake .	Prehistoric	lithic
8		SH158	Prehistoric	FLAKE	SJ65081526	One unretouched flake with a prepared platform .	Prehistoric	lithic
9	1384	MSA13452	Prehistoric	FLINT ARROWHEAD	SJ 6817 1784	Find Spot in 1953 of a flint arrowhead, found in a drain at Wall Farm, Kynnersley	Prehistoric	lithic
10	776	MSA549	Prehistoric	FLINT ARROWHEAD	SJ 678 180	Find Spot in 1953 of flint arrowhead in Buckletts Field, Wall Farm	Prehistoric	lithic
11	1382	MSA13450	Unknown	FLINT CORE	SJ 6836 1569	Find Spot in early C20 of possible flint core, found NE of Preston on the Weald Moors	Prehistoric	lithic
12	778	MSA13369	Prehistoric	FLINT FLAKE	SJ 6847 1855	Find Spot in the 1920s of flint flake E of Poor Piece Bridge, Wall Farm	Prehistoric	lithic
13	1378	MSA13447	Upper Palaeolithic to Late Iron Age	FLINT FLAKE	SJ 6381 1789	Find Spot found between 1914 and 1921 of a flint flake, E of Crudgington,	Prehistoric	lithic
14	1718	MSA13543	Upper Palaeolithic to Late Iron Age	FLINT FLAKE	SJ 6378 1791	Find Spot of flint flake in field near Crudgington	Prehistoric	lithic
15	1722	MSA13544	Unknown	FLINT FLAKE	SJ62691668	Find Spot of flint flake in field c 440m NE of Longswood Farm, Longdon upon Tern	Prehistoric	lithic
16	1376	MSA13446	Upper Palaeolithic to Late Iron Age	FLINT SCRAPER	SJ 6272 1670	Find Spot found between 1914 and 1921 of a flint scraper at Woodfield Farm, Rodington	Prehistoric	lithic
17		SH19	Prehistoric	SCRAPER	SJ68161857	One end scraper	Prehistoric	lithic
18		SH22	Early prehistoric	CORE	SJ69631764	Core on aflake with blade scars .	Early Prehistoric	lithic
19		SH127	Mesolithic	CORE	SJ69311594	A two-platformed blade core	Early Prehistoric	lithic
20		SH99	Mesolithic / Neolithic?	CORE	SJ66191702	Unretouched flake .	Early Prehistoric	lithic
21		SH17	Early prehistoric	FLAKE	SJ68001865	Unretouched flake .	Early Prehistoric	lithic
22		SH23	Early prehistoric	FLAKE	SJ69451784	Unretouched flake blade .	Early Prehistoric	lithic
23		SH132	Early Prehistoric	FLAKE	SJ65641496	One unretouched flake. Plough damaged .	Early Prehistoric	lithic
24		SH42	Mesolithic? / Neolithic	FLAKE	SJ66301642	Unretouched flake .	Early Prehistoric	lithic
25		SH36	Mesolithic?	FLAKE BLADE	SJ70151863	Heavily plough-damaged and patinated flake blade .	Early Prehistoric	lithic
26		SH27	Early prehistoric	FLAKE/BLADE	SJ69611762	One unretouched flake blade .	Early Prehistoric	lithic
27		SH74	Early prehistoric	FLAKES	SJ65891904	Two unretouched flakes .	Early Prehistoric	lithic
28		SH25	Mesolithic? / Neolithic	FLAKES	SJ69431797	Three unretouched flakes .	Early Prehistoric	lithic
29		SH24	Early prehistoric	FLAKES/BLADE	SJ69471798	Three unretouched flakes including one blade .	Early Prehistoric	lithic
30		SH18	Early Mesolithic? and late Neolithic	FLINT FLAKES/ARROWHEAD	SJ68001853	1 micro-burin, 1irregular waste, 3 unretouched flakes, 1trimming flake, 1irregular waste (all black chert). 1 unretouched flake, 1 preparation flake, 1 late Neolithic transverse arrowhead. (all flint).	Early Prehistoric	lithic
31	717	MSA13356	Prehistoric	BURNT MOUND	SJ 6468 1400	Burnt Mound noted in early C20	Middle Prehistoric	burnt mound
32	772	MSA13365	Prehistoric	BURNT MOUND	SJ 6746 1909	A Burnt Mound S of Conquermoor Heath noted in the 1920s.	Middle Prehistoric	burnt mound
33	773	MSA13366	Prehistoric	BURNT MOUND	SJ 6753 1899	A second Burnt Mound S of Conquermoor Heath, noted in 1922 and still extant in 1990s	Middle Prehistoric	burnt mound
34	774	MSA13367	Prehistoric	BURNT MOUND	SJ 6945 1907	Burnt Mound found in 1920s SW of Oxford Bridge	Middle Prehistoric	burnt mound
35	777	MSA13368	Prehistoric	BURNT MOUND	SJ 6783 1858	Burnt Mound W of Poor Piece Bridge noted by Cantrill in 1920s	Middle Prehistoric	burnt mound
36	779	MSA13370	Prehistoric	BURNT MOUND	SJ 6859 1764	Burnt Mound c.560m ESE of Wall Camp	Middle Prehistoric	burnt mound
37	780	MSA13371	Prehistoric	BURNT MOUND	SJ 6642 1773	Burnt Mound SSE of Rodway Bridge, noted in 1920s and still extant in 1990s	Middle Prehistoric	burnt mound
38	781	MSA13372	Prehistoric	BURNT MOUND	SJ 6611 1768	Burnt mound SSW of Rodway Bridge noted in 1920s	Middle Prehistoric	burnt mound
39	782	MSA13373	Prehistoric	BURNT MOUND	SJ 6590 1774	Burnt Mound on Rodway Moor, reduced to dense scatter of stone by 1990s	Middle Prehistoric	burnt mound
40	783	MSA13374	Prehistoric	BURNT MOUND	SJ 6660 1618	Burnt Mound SW of Kynnersley, noted in 1920s.	Middle Prehistoric	burnt mound
41	784	MSA13375	Prehistoric	BURNT MOUND	SJ 6773 1674	Burnt mound S of Kynnersley House Farm, noted in 1920s	Middle Prehistoric	burnt mound
42	786	MSA13376	Prehistoric	BURNT MOUND	SJ 6731 1559	Burnt Mound on Preston Moor, noted in 1920s	Middle Prehistoric	burnt mound
43	20868	MSA23184	Prehistoric	BURNT MOUND	SJ 6878 1756	Burnt Mound c.775m ESE of Wall Camp	Middle Prehistoric	burnt mound
44	21378	MSA23939	Prehistoric	BURNT MOUND	SJ 6773 1792	Burnt mound adjacent to Wall Camp, Kynnersley	Middle Prehistoric	burnt mound
45	21387	MSA23948	Prehistoric	BURNT MOUND	SJ 6788 1569	Burnt mound c.300m NNW of Preston Hall	Middle Prehistoric	burnt mound
46	21388	MSA23949	Prehistoric	BURNT MOUND	SJ 6734 1569	Burnt mound c.750m NW of Preston Hall	Middle Prehistoric	burnt mound
47		SH2	Prehistoric	BURNT MOUND	SJ67451795	Burnt mound to the north of Wall Camp. The site was first noticed when the field was under arable. It is now under grass and the site is difficult to locate.It does, however, still appear to be partially peat buried .	Middle Prehistoric	burnt mound

Shropshire Historic Environment Record and North West Wetland Survey Sites - July 2012

	HER number	Mon/ NWWS UID	HER/NWWS Period	Monument Type	GridRef	HER/NWWS Description	Period summarised as	Site type summarised as
48		SH6	Prehistoric	BURNT MOUND	SJ70121750	Possible peat-obscured burnt mound indicated by scatter of burnt stone contained in upcast along dyke side .	Middle Prehistoric	burnt mound
49		SH33	Prehistoric	BURNT MOUND	SJ68761843	Burnt mound, c 30 m in diameter, lying alongside the Pipe Strine and surrounded by wasted peats .	Middle Prehistoric	burnt mound
50		SH34	Prehistoric	BURNT MOUND	SJ69011860	Burnt mound c 300 m north-east of SH33, and still largely peat covered .	Middle Prehistoric	burnt mound
51	20868	SH101	Prehistoric	BURNT MOUND	SJ68781756	Burnt mound, c 20 m in diameter, set on a mineral ridge surrounded by wasted peats between Wall Camp and Buttery Farm Islands .	Middle Prehistoric	burnt mound
52		SH157	Prehistoric	BURNT MOUND	SJ65141527	Burnt mound measuring c 20 m in diameter .	Middle Prehistoric	burnt mound
53		SH3	Prehistoric	BURNT STONE	SJ68371770	Scatter of burnt stone on north-eastern slopes of Wall Camp island. Identified when the field was under arable. Still recognisable on the ground but no longer mounded .	Middle Prehistoric	burnt mound
54		SH64	Prehistoric	BURNT STONE	SJ67011885	Dense concentration of burnt stone, c 10 m in diameter, on the edge of the Weald Moors' wasted peats .	Middle Prehistoric	burnt mound
55		SH65	Prehistoric	BURNT STONE	SJ66791842	Dense concentration of burnt stone, c 10 m in diameter, on the edge of the Weald Moor's wasted peats .	Middle Prehistoric	burnt mound
56	21387	SH82	Prehistoric	BURNT STONE	SJ67881569	Dense concentration of burnt stone c 15 m in diameter on the southern edge of the Weald Moors .	Middle Prehistoric	burnt mound
57	21388	SH83	Prehistoric	BURNT STONE	SJ67341569	Sparse scatter of burnt stone c 10 m across. Set on a mineral soil ridge surroundedby wasted peat on the southern edge of the Weald Moors .	Middle Prehistoric	burnt mound
58		SH96	Prehistoric	BURNT STONE	SJ65651702	Concentrationof burnt stone, c 4 m in diameter, surrounded by wasted peats. On the edge of Kynnersley Island .	Middle Prehistoric	burnt mound
59		SH97	Prehistoric	BURNT STONE	SJ65791716	Concentrationof burnt stone immediately adjacent to the Kynnersley / Crudgington road. It lies on the northern edge of Kynnersley Island, is c 10 m in diameter, and issurrounded by wasted peats .	Middle Prehistoric	burnt mound
60		SH103	Prehistoric	BURNT STONE	SJ66381624	Scatter of burnt stone c 5 m in diameter, set on a low ridge amidst wasted peats in the southern part of the Weald Moors. Is this in fact SMR 783, which could not be identified at its recorded location some 300 m to the east.	Middle Prehistoric	burnt mound
61		SH98	Prehistoric?	BURNT STONE	SJ65871688	Sparse but extensive scatter of burnt stone on the north-west edge of Kynnersley Island, covering an area c 50 m square. Possibly indicative of prehistoricactivity .	Middle Prehistoric	burnt mound
62		SH102	Prehistoric?	BURNT STONE	SJ69381749	Sparse scatter of burnt stone alongside the disused Newport canal. Possibly indicative of prehistoric activity .	Middle Prehistoric	burnt mound
63		SH141	Prehistoric?	BURNT STONE	SJ65801524	Scatter of burnt stone. One of two concentrations of burnt stone in this field on the western fringes of the Weald Moors. Both measure c 10 m in diameter and are set in a wider, more diffuse spread of burnt stone .	Middle Prehistoric	burnt mound
64		SH142	Prehistoric?	BURNT STONE	SJ66121513	Scatter of burnt stone. One of two concentrations of burnt stone in this field on the western fringes of the Weald Moors. Both measure c 10 m in diameter and are set in a wider, more diffuse spread of burnt stone .	Middle Prehistoric	burnt mound
65	2357	MSA13921	Bronze Age	DITCH, PIT ALIGNMENT?, RING DITCH	SJ 6238 1878	Cropmark ring ditch E of The Quabs	Middle Prehistoric	ring ditch/pit alignment/ditch
66	697/ 2596	MSA492	Bronze Age	BRONZE AGE AXES	SJ 6749 1490	Find Spot in 1882-3 of five bronze axes known as The Preston (Crow Brook) Hoard; 1 now possibly at Eyton Hall.	Middle Prehistoric	metal
67	1385	MSA13453	Bronze Age	BRONZE AGE AXE	SJ 666 171	Find Spot found prior to 1975 of a bronze axe, found in Kynnersley Parish	Middle Prehistoric	metal
68		SH159	Neolithic	CORE	SJ64631517	One multi-platformed core .	Middle Prehistoric	lithic
69		SH131	Neolithic	FLAKE	SJ65871500	One retouched flake, from a polished flint axe .	Middle Prehistoric	lithic
70		SH1	Late Neolithic/ Early Bronze Age	FLAKE KNIFE	SJ66541708	Flake knife.	Middle Prehistoric	lithic
71	775	MSA548	Bronze Age	SPEAR HEAD	SJ 656 188	Find Spot in c 1920 of bronze spearhead in "Gammer" field, Dayhouse Moor	Middle Prehistoric	metal
72	3350	MSA14331	Bronze Age	RING DITCH	SJ 6262 1654 : care also recorded at SJ65681657	Possible Bronze Age Ring Ditch(es)	Middle Prehistoric	ring ditch
73	102	MSA14959	Bronze Age	RING DITCH	SJ 6336 1379	Two Ring Ditches at Bratton	Middle Prehistoric	ring ditch
74	4938	MSA16682	Bronze Age	RING DITCH?	SJ 6324 1833	Possible Ring Ditches N of Crudgington Church	Middle Prehistoric	ring ditch?
75	1701	MSA13540	Unknown	MOUND	SJ 6304 1810	Mound removed during construction of Railway	Middle Prehistoric?	burnt mound
76	2027	MSA1482	Early Iron Age to Roman	ENCLOSURE	SJ 6422 1544	New Rookery irregular double ditched enclosure	Late Prehistoric	enclosure
77	4476	MSA2947	Early Iron Age to Roman	ENCLOSURE	SJ 6360 1998	Rectilinear cropmark enclosure N of Waters Upton	Late Prehistoric	enclosure
78	4667	MSA3080	Early Iron Age to Roman	ENCLOSURE	SJ 6540 1688	Sidney Plantation	Late Prehistoric	enclosure
79	789	MSA552	Early Iron Age to Roman	ENCLOSURE	SJ 6579 1949	Cropmark enclosure c.340m NW of Day House farm	Late Prehistoric	enclosure
80	463	MSA13199	Early Iron Age to Roman	FIELD SYSTEM	SJ 6294 1857	Cropmark Field System N of Crudgington Creamery	Late Prehistoric	field system
81	3649	MSA2377	Iron Age	GLASS BEAD	SJ 681 180	Blue Glass bead found at Wall Farm	Late Prehistoric	glass
82	1108	MSA819	Iron Age	MULTIVALLATE HILLFORT	SJ 680 178	Wall Camp, Kynnersley	Late Prehistoric	hillfort
83	791	MSA13379	Iron Age	PIT	SJ 6572 1958	Pit containing Iron Age pot and pot boilers, sectioned by Gas pipeline in 1971	Late Prehistoric	pit

Shropshire Historic Environment Record and North West Wetland Survey Sites - July 2012

	HER number	Mon/ NWWS UID	HER/NWWS Period	Monument Type	GridRef	HER/NWWS Description	Period summarised as	Site type summarised as
84	470	MSA13206	Early Iron Age to Roman	RECTANGULAR ENCLOSURE	SJ 6249 1750	Iron Age rectangular enclosure	Late Prehistoric	enclosure
85	471	MSA13207	Early Iron Age to Roman	RECTANGULAR ENCLOSURE	SJ 6262 1655	A Single Ditched and a Double Ditched cropmark enclosure	Late Prehistoric	enclosure
86	2020	MSA1476	Early Iron Age to Roman	RECTANGULAR ENCLOSURE	SJ 6246 1710	Tern Farm NE of	Late Prehistoric	enclosure
87	720	MSA504	Early Iron Age to Roman	RECTANGULAR ENCLOSURE	SJ 6314 1368	Cropmark Enclosure at Moor Farm, Bratton	Late Prehistoric	enclosure
88	792	MSA553	Early Iron Age to Roman	RECTANGULAR ENCLOSURE	SJ 6674 1856	Cherrington Moor rectangular cropmark enclosure	Late Prehistoric	enclosure
89	4475	MSA2946	Unknown	PIT ALIGNMENT	SJ 6397 1974	Waters Upton N	Late Prehistoric?	pit alignment
90	785		Roman	COIN HOARD	SJ 6617	4th Century coin hoard found in 18th century	Roman	coin
91	3221	MSA2081	Roman	BROOCH	SJ 6942 1530	Roman Brooch found 1978 at Lubstree Park	Roman	metal
92	790	MSA13378	Roman	GAMING PIECE	SJ 6581 1921	Find Spot in 1971 of Roman gaming piece near Cherrington	Roman	gaming piece
93		SH40	Roman	SAMIAN AND SEVERN VALLEY WARE	SJ69751885	One abraded Samian Ware rim sherd, one Severn Valley Ware sherd, four sherds in ac oarse orange fabric of uncertain origin. See SH40b	Roman	pottery/ceramic
94		SH29	Roman	SAMIAN AND SEVERN VALLEY WARE	SJ69491793	One abraded body sherd of Samian Ware, two body sherds of Severn Valley Ware, one rim sherd of a Severn Valley Ware jar, one rim sherd of a Severn Valley Ware dish/bowl. See Webster (1976) for details .	Roman	pottery/ceramic
95		SH30	Roman	SEVERN VALLEY WARE	SJ69471793	Jar base sherd of Severn valley Ware. See Webster (1976) for details .	Roman	pottery/ceramic
96		SH38	Roman	SEVERN VALLEY WARE	SJ70341856	Very abraded Severn Valley Ware body sherd .	Roman	pottery/ceramic
97	2007	MSA1471	Unknown	DITCH	SJ 6359 1373	Linear Cropmarks at Bratton	Unknown	ditch
98	2358	MSA1568	Unknown	ENCLOSURE/PIT ALIGNMENT	SJ 6296 1995	Cropmark of a sub-rectangular enclosure and pit alignments E of The Mount	Unknown	enclosure
99	4522	MSA2981	Unknown	ENCLOSURE?, TRACKWAY	SJ 6276 1743	Trackway and possible enclosure SW of Crudgington	Unknown	enclosure /trackway
100		SH57	Unknown	BONE/ANTLER	SJ66591662	Fragment of worked bone or possibly antler.	Unknown	bone
101	4937	MSA16681	Prehistoric	RECTILINEAR ENCLOSURE, PIT ALIGNM	SJ 6258 1831	Enclosure and Pit Alignment c350m NNW of Crudgington Bridge	Unknown	enclosure
102	1381	MSA1069	Unknown	SPRING	SJ 6521 1795	Rodway Spring	Unknown	spring
103	1369		Post Medieval	BRINE WORKS	SJ67221491	Kingley Wich brine well and salt works	Post Medieval	spring/salt works

NB

This attribute table combines the Shropshire HER (as at June 2012) with additional sites recorded by the NWWS in 1997. Those from the NWWS are prefixed SH and shown in Leah et al 1998: Figure 26.

Period

Unless stated otherwise, all Mesolithic and Early Neolithic lithics are classified as Early Prehistoric; all Neolithic and Bronze Age sites, plus all burnt mounds and burnt stone, are classified as Middle Prehistoric; all Early Iron Age to Roman and Iron Age sites are classified as Late Prehistoric; Roman sites are classified as Roman; Undated/unknown are classified as such.

THE WEALD MOORS AND WALL CAMP - APPENDIX 2

Selected Iron Age hillforts and enclosures – Comparison Table

Name	Location/ terrain	Height OD	Construction	Entrances / Size	Date	Findings
Wall Camp	Low ridge overlooking marshland	61m	Multiphase Multivallate Stone revetments	S and NE 12ha	Iron Age	• Briquetage (Stony VCP) • Group D Vesicular Mudstone Fabric Pottery (Severn-Avon valley) + local pottery and fired clays • Animal bone? • Iron Age glass bead • Prehistoric flint • (Iron Age cauldron at Shray Hill)
Bury Walls	Ridge overlooking marshland	152m	Multiple ramparts Multivallate Stone revetments and defences	NE (+ NW-subsidiary) Around 8ha	Iron Age /Roman	• Roman bricks/ masonry/ structures/ coins/ pottery/ temple? • Iron Age pottery (1) • Wheel ruts • Hearth? • Metal implements
The Burgs	Hilltop overlooking Bomere Pools	80m	Stone revetment with timber lacing Bivallate 'Permanently occupied high status IA settlement'	2.1ha E entrance	Iron Age	• Plano convex knife • Pottery sherds (Medieval?) • Burnt timbers (oak)
The Berth	Glacial mounds in marsh	95m	Univallate 2 enclosures Causeway (acted as a dam to enclose a lake?)	3.1ha & .7ha Entrance to both enclosures from S along causeway	Iron Age	• Bronze Age cemetery nearby • Iron Age cauldron • 'Slave chains' • Bead • Iron Age brooch (La Tene III) • Briquetage (Stony VCP) • Roman pottery – possibly a high status Roman site
Castle Farm		120m	Double ditch enclosure Palisaded	1.02ha Poss E entrance	Iron Age Roman?	• Briquetage (Stony VCP) • Roman pottery • Pits, hearth, posthole

Selected Iron Age hillforts and enclosures – Comparison Table

Name	Location/ terrain	Height OD	Construction	Entrances / Size	Date	Findings
Pave Lane	Undulating land near gully	100m	Multiditched enclosed farmstead. Bank & ditch defences, multiple in north. Natural gully incorporated into defensive circuit	3.6ha. SW entrance. Possible NE entrance. Causeway connecting with ditches	Iron Age	• Pollen samples = open grassland during Iron Age • Cobbled surface at SW entrance • Possible roundhouses in interior
Breiddin	Volcanic ridges overlooking the Severn valley	365m	Multivallate; Palisades Split site (Buckbean Pond on lower circuit)	28ha SE entrance	8th C BC onwards	• Briquetage (Stony VCP) • Habitation • A wide range of Bronze Age, Iron Age and Roman artefacts
Collfryn (Powys)	Not a defensive position. High status settlement equidistant from Llanymynech and Breiddin		Enclosed settlement 3 ditches and banks/reduced later Surmounted by hedges or fences	.56ha W entrance	3rd C BC onwards	• Briquetage (2800 sherds - Stony VCP) • Habitation • Small scale industry • Glass beads • Bronze linchpin • Whorls • Utilised stone • Artefacts - cf Breiddin
Sutton Common (South Yorks)	Low lying fen	6m max	2 enclosures A and B Causeway Rampart Palisade Ditch	A - 3ha + N, E & SW entrance B - 1ha + W entrance	EBA mortuary enclosure. Thereafter utilised from 4th C BC	• Wooden well(?) without artefacts. • Brushwood floor. • Four-post structures (granaries) with charred grain in post holes. • Mortuary rings. • Metalwork. • Glass beads. • Lack of domestic waste? • Roman sherds • Kept ceremonially clean?

THE WEALD MOORS AND WALL CAMP - APPENDIX 2

Selected Iron Age hillforts and enclosures – Comparison Table

Name	Location/ terrain	Height OD	Construction	Entrances / Size	Date	Findings
Stonea Camp (Cambs)	Gravel island above fen	2m	Multiphase Multivallate Romano/British enclosure/ settlement Ring ditch	9.1ha	1st C BC AD40-60	• Human remains • Mesolithic flints • Neolithic flakes, axes • Cursus? • Bronze Age axes • Roman pottery (site close by?) • Use unknown

THE WEALD MOORS AND WALL CAMP - APPENDIX 2

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The Berth	Glacial mounds in marsh	95m	Univallate 2 enclosures Causeway (acted as a dam to enclose a lake?)	3.1ha & .7ha Entrance to both enclosures from S along causeway	Iron Age	• Bronze Age cemetery nearby • Iron Age cauldron • 'Slave chains' • Bead • Iron Age brooch (La Tene III) • Briquetage (Stony VCP) • Roman pottery – possibly a high status Roman site
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Sutton Common (South Yorks)	Low lying fen	6m max	2 enclosures A and B Causeway Rampart Palisade Ditch	A - 3ha + N, E & SW entrance B - 1ha + W entrance	EBA mortuary enclosure. Thereafter utilised from 4th C BC	• Wooden well(?) without artefacts. • Brushwood floor. • Four-post structures (granaries) with charred grain in post holes. • Mortuary rings. • Metalwork. • Glass beads. • Lack of domestic waste? • Roman sherds • Kept ceremonially clean?

Selected Iron Age hillforts and enclosures – Comparison Table

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Stonea Camp (Cambs)	Gravel island above fen	2m	Multiphase Multivallate Romano/British enclosure/ settlement Ring ditch	9.1ha	1st C BC AD40-60	• Human remains • Mesolithic flints • Neolithic flakes, axes • Cursus? • Bronze Age axes • Roman pottery (site close by?) • Use unknown

HOLOCENE PALAEOENVIRONMENTAL SEQUENCE (plus Wall Camp)- NORTH SHROPSHIRE/ STAFFORDSHIRE

Date	Re-calibrated dates (OxCal Version 4.2.2; 95.4% confidence; June 2013)	Shropshire and Staffordshire Wetlands Site	West Midlands Region	Environmental indicators	Source	Period
9210±40BP; Beta 341619	8550-8300 cal BC	Wall Camp Sample 3		*Phragmytes sp.* dominated fen Alder carr Microscopic charcoal Organic peaty soils	This text	**EARLY PREHISTORIC** **[Mesolithic / Early Neolithic]**
7400±30BP; Beta 341165	6370-6220 cal BC	Wall Camp Sample 1		*Phragmytes sp.* dominated fen Organic peaty soils	This text	
7480±60BP SRR-2798 - 6820±50BP SRR- 2901	6437-6228 cal BC – 5805 –5629 cal BC	River Perry Tetchill Brook		Vegetation change; alder increases	Brown 1990:46	
6890±50BP SRR-2797	5887 – 5673 cal BC	River Perry Baggy Moor		Floodplain mire initiation Commencement of peat accumulation	Brown 1990:46	
	ca6000-5000 cal BC*	King's Pool Staffs		Microscopic charcoal Pine maximum, followed by increase in alder	Leah *et al.* 1998:98 Bartley and Morgan 1990:184/189	
	Ca 5000BC	Shropshire		Increase in alder	Twigger and Haslam 1991:744	
5296±150BP Q-1235	4448-3791 cal BC	Crose Mere		Elm decline (also alder & lime) Opening of forest canopy Possible pollarding for fodder	Beales 1980:151-156	

*** Date ambiguous**

HOLOCENE PALAEOENVIRONMENTAL SEQUENCE (plus Wall Camp)- NORTH SHROPSHIRE/ STAFFORDSHIRE

Date	Re-calibrated dates (OxCal Version 4.2.2; 95.4% confidence; June 2013)	Shropshire and Staffordshire Wetlands Site	West Midlands Region	Environmental indicators	Source	Period
3800±55BP OxA-6746	2458-2047 cal BC	Top Moss		Sharp decline in tree pollen (clearance of birch scrub); expansion in heathland; low charcoal peak. Woodland then regenerates (not lime)	Leah *et al.* 1998:67	
     3660±50 BP SRR-2831	2300-2000 cal BC 2196-1903 cal BC	Boreatton Moss		Increased human disturbance Some agriculture Hydrology affected by forest clearance to wetter conditions Peat development assc. with clearance. Lime decline (1st lime clearance phase).	Twigger 1988: 149 (cited in Leah *et al.* 1998:53) Twigger 1988:131 (cited in Leah *et al.* 1998:53)	
3550±50 BP SRR-3833	2040-1750 cal BC	New Pool		Lime decline (1st lime clearance phase)	Twigger 1988:131 (cited in Leah *et al.* 1998:53)	
	ca2000-1700 cal BC	Top Moss		Burning of mire vegetation	Leah *et al.* 1998:179	
	ca 2000calBC	Berth Pool; Birchgrove Pool		Lime decline (1st lime clearance phase)	Twigger 1988:131 (cited in Leah *et al.* 1998:53)	
3238±115 BP Q-467	1873-1220 cal BC	Whixall Moss		Lime decline (1st lime clearance phase)	Turner 1964:85 (cited in Leah *et al.* 1998:17)	

*** Date ambiguous**

THE WEALD MOORS AND WALL CAMP - APPENDIX 3

HOLOCENE PALAEOENVIRONMENTAL SEQUENCE (plus Wall Camp)- NORTH SHROPSHIRE/ STAFFORDSHIRE

Date	**Re-calibrated dates (OxCal Version 4.2.2; 95.4% confidence; June 2013)**	**Shropshire and Staffordshire Wetlands Site**	**West Midlands Region**	**Environmental indicators**	**Source**	**Period**
ca 3700BP		Bomere and Shomere Pools		Lowland clearance	Gaffney, White and Buteux 2001:376	
	from 1620 cal BC onwards	Baschurch Pools		Higher levels of woodland exploitation (2nd lime clearance phase) Lime and elm decline Cereal cultivation inc. basic land rotation	Twigger 1988 (cited in Leah *et al.* 1998:54) Twigger and Haslam 1991:748	
3220±50BP OxA-6639	1615-1411 cal BC	Top Moss		Lime Decline (2nd lime clearance phase)	Leah *et al.* 1998:67	
3190±60BP SRR-2923	1617-131 7cal BC	Fenemere Pool		Lime decline (2nd lime clearance phase) Creation of small woodland clearings	Twigger 1988 (cited in Leah *et al.* 1998:53) Twigger and Haslam 1991:747	
	800-400 cal BC	King's Pool		Large scale Iron Age deforestation Inwash of nutrient rich sediment	Bartley and Morgan 1990	**LATER PREHISTORIC** **[Iron Age]**

*** Date ambiguous**

HOLOCENE PALAEOENVIRONMENTAL SEQUENCE (plus Wall Camp)- NORTH SHROPSHIRE/ STAFFORDSHIRE

Date	Re-calibrated dates (OxCal Version 4.2.2; 95.4% confidence; June 2013)	Shropshire and Staffordshire Wetlands Site	West Midlands Region	Environmental indicators	Source	Period
2307±110BP Q-383*	765-110 calBC ('ca 360BC')	Whixall Moss		Pine Stump Layer (some correspondence with pine peak at Crose Mere)	Hardy 1939/ Turner 1964/Haslam 1988 /Chambers *et al.* 1996 Beales 1980:156	
2310±85BP Q-1233*	753-172 cal BC	Crose Mere		Rapid sedimentation (but dating is suspect) Regeneration of woodland Pine peak	Beales 1980:153-156	
	650bc		Pilgrim Lock	Increased sedimentation - 'buff red silty clay'	Shotton 1978	
640±50 - 2360±50BP	917-601 cal BC – 750-258 cal BC		Wilden Moss	Increased sedimentation	Brown 1988	
2195±50BP OxA-6640	390-114 cal BC	Top Moss		Woodland but some pastoral and agriculture Mire became wetter Woodland clearance less pronounced	Leah *et al.* 1998:67	
2110±90 *Har-6392*	*371 cal BC- cal AD 53*	*Wall Camp interior*		-	*Bond 1991*	
2180±50BP SRR-3074	384-102 cal BC	Whixall Moss		Renewed mire growth	Haslam 1988 (cited in Leah *et al.* 1998:16)	

*** Date ambiguous**

THE WEALD MOORS AND WALL CAMP - APPENDIX 3

HOLOCENE PALAEOENVIRONMENTAL SEQUENCE (plus Wall Camp)- NORTH SHROPSHIRE/ STAFFORDSHIRE

Date	Re-calibrated dates (OxCal Version 4.2.2; 95.4% confidence; June 2013)	Shropshire and Staffordshire Wetlands Site	West Midlands Region	Environmental indicators	Source	Period
2086±75 BP Q-1232 *	359 cal BC- cal AD63	Crose Mere		Clearance of regenerated woodland Homestead agriculture	Beales 1980:156 (cited in Leah *et al.* 1998:27)	
2000+BP (Roman)		Bomere & Shomere Pools (SE of Shrewsbury) Hencott Pool (N of Shrewsbury)		Late clearance Marsh and some woodland	Gaffney White & Buteux 1991:376	**ROMAN**
	ca100BC	Fenemere/ Baschurch Pools		Maximum woodland clearance	Twigger and Haslam 1991:751-752	
1890±50BP SRR-2920	Cal AD 5-240	Fenemere/ Baschurch Pools		Woodland regeneration	Twigger and Haslam 1991:752 Leah *et al.* 1998:55	
1375±40BP SRR-3095 1190±50BP SRR-2796 (ca1400-1200BP)	between cal AD 595-766 and cal AD 690-970	River Perry		Floodplain clearance probably through human agency	Brown 1990:47; cited in Leah *et al.* 1998:37	**POST ROMAN**

*** Date ambiguous**

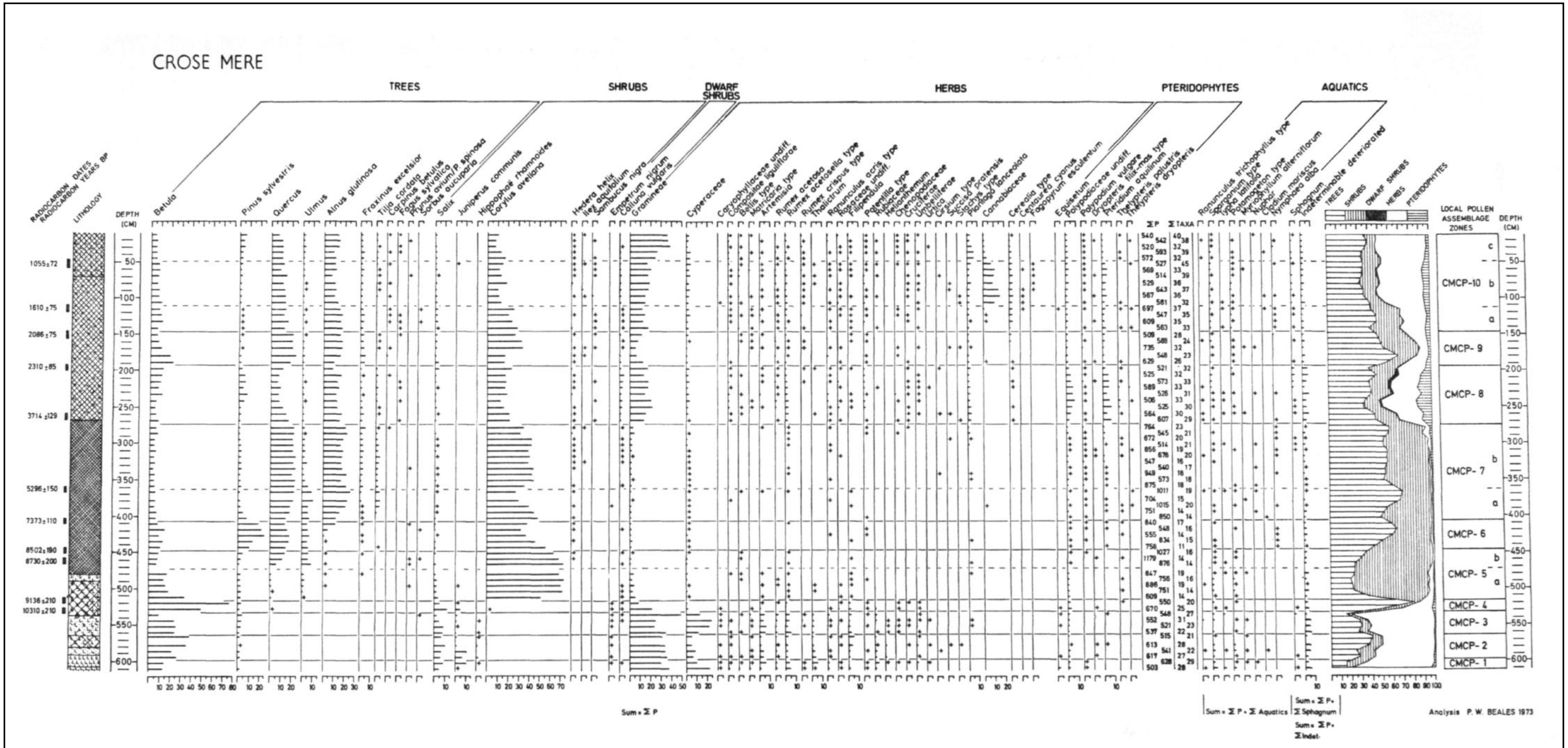


Fig. 4. Percentage pollen and spore diagram from Crose Mere (includes all taxa occurring at five or more levels).

(*Facing p.* 142)

CROSE MERE (Beales 1980:Fig.4)

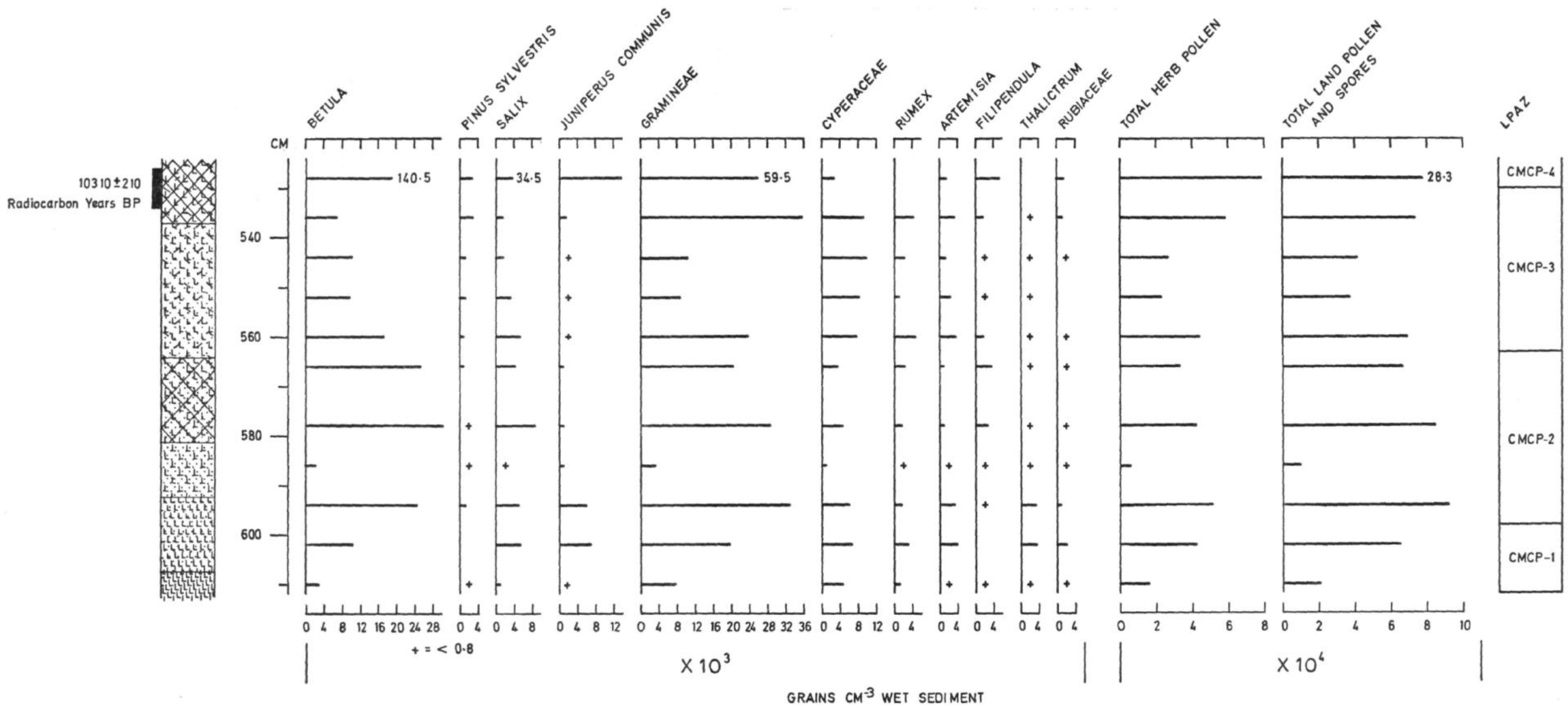


Fig. 5. Late Devensian pollen and spore concentrations of the most abundant taxa from Crose Mere.

CROSE MERE (Beales 1980:Fig 5)

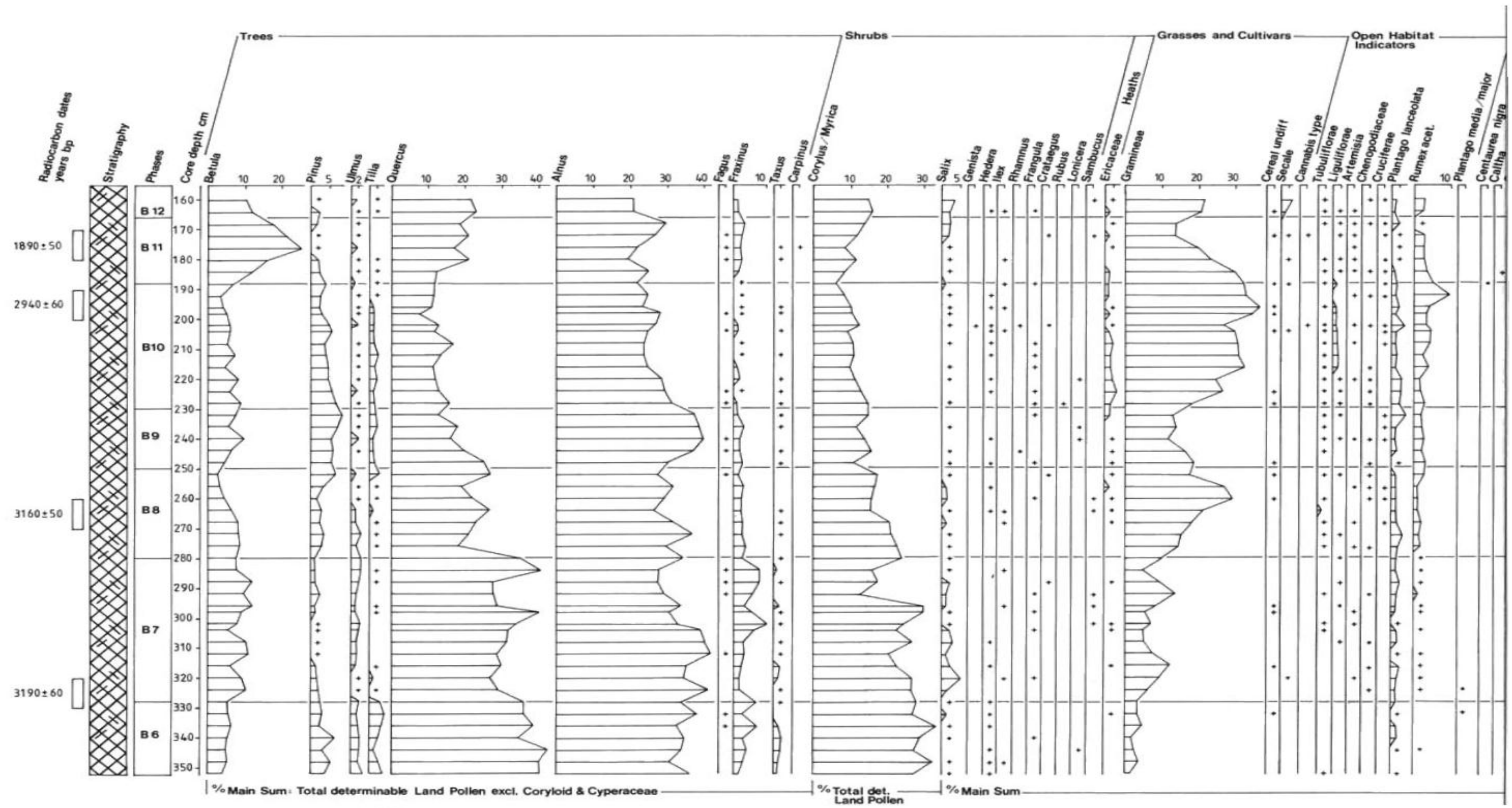
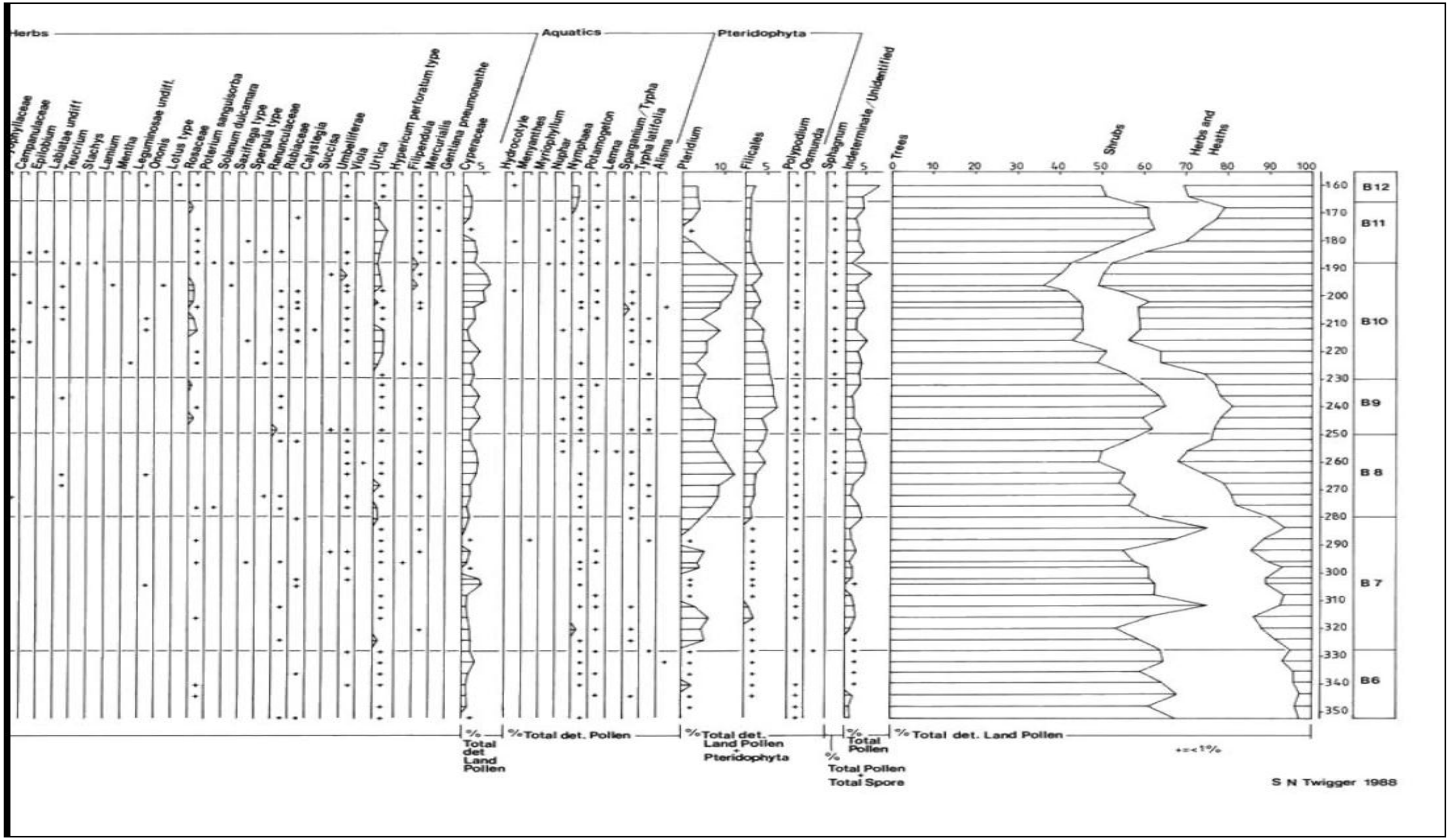


FIG. 3.
Percentage pollen frequency diagram from Fenemere, Shropshire.

MID-SHROPSHIRE WETLANDS – FENEMERE (Twigger and Haslam 1991:Fig.3) **(cont)**



(cont) MID-SHROPSHIRE WETLANDS – FENEMERE (Twigger and Haslam 1991:Fig.3.)

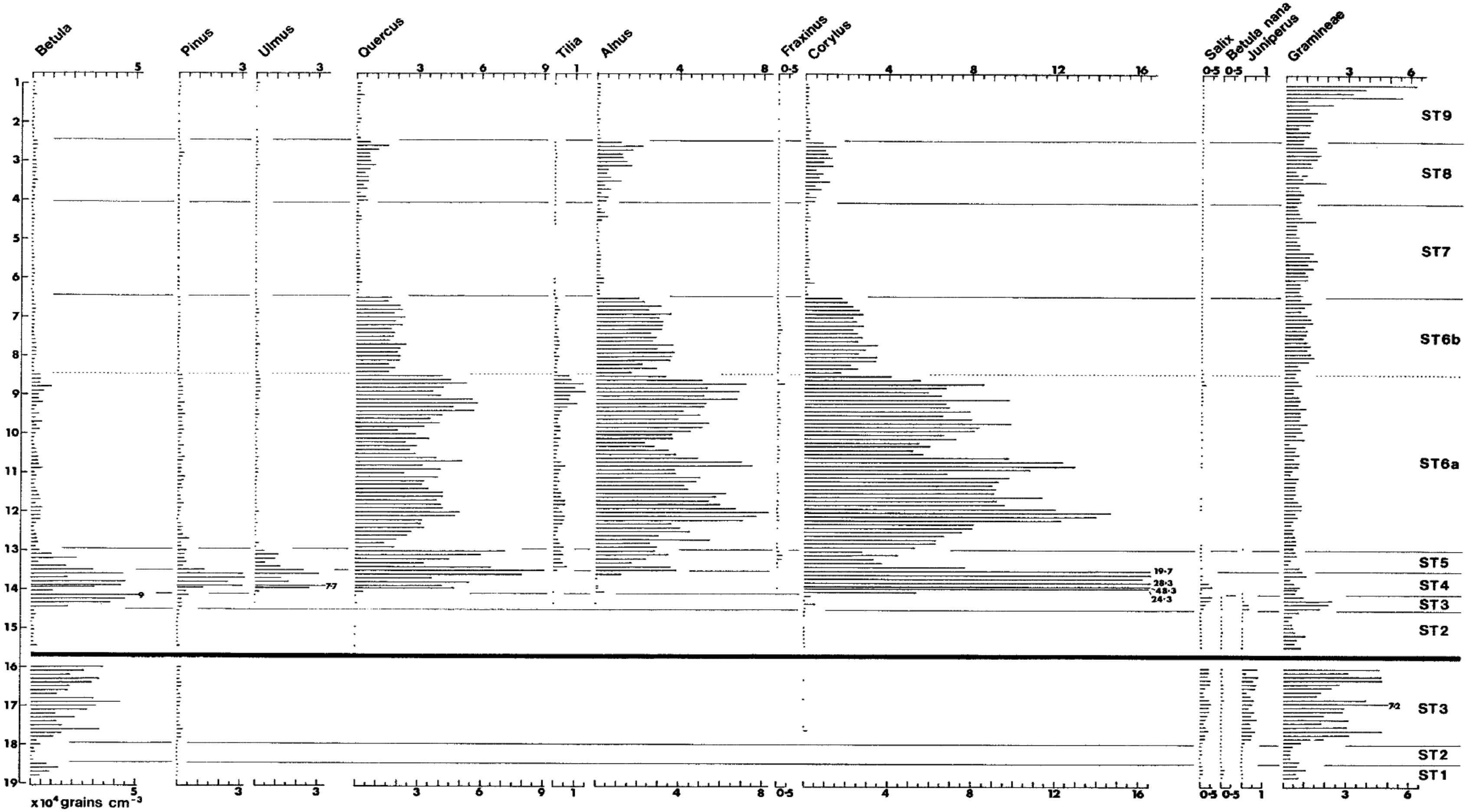


Figure 5. Concentration pollen diagram from the King's Pool.

KING'S POOL STAFFORDSHIRE (Bartley and Morgan 1990:Fig.5) **(cont)**

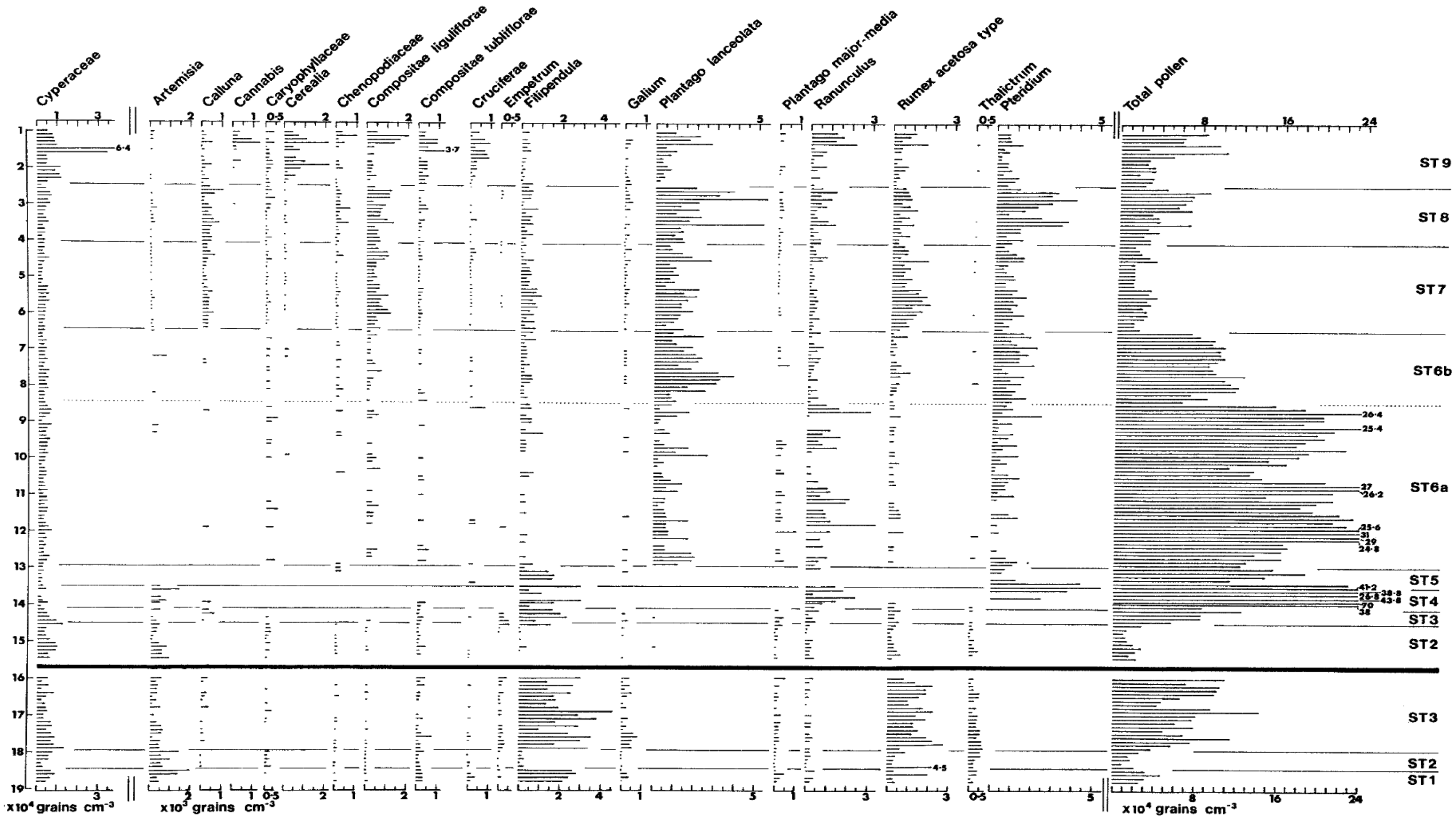


Figure 5.—*Continued.*

(cont) KING'S POOL STAFFORDSHIRE (Bartley and Morgan 1990:Fig.5)

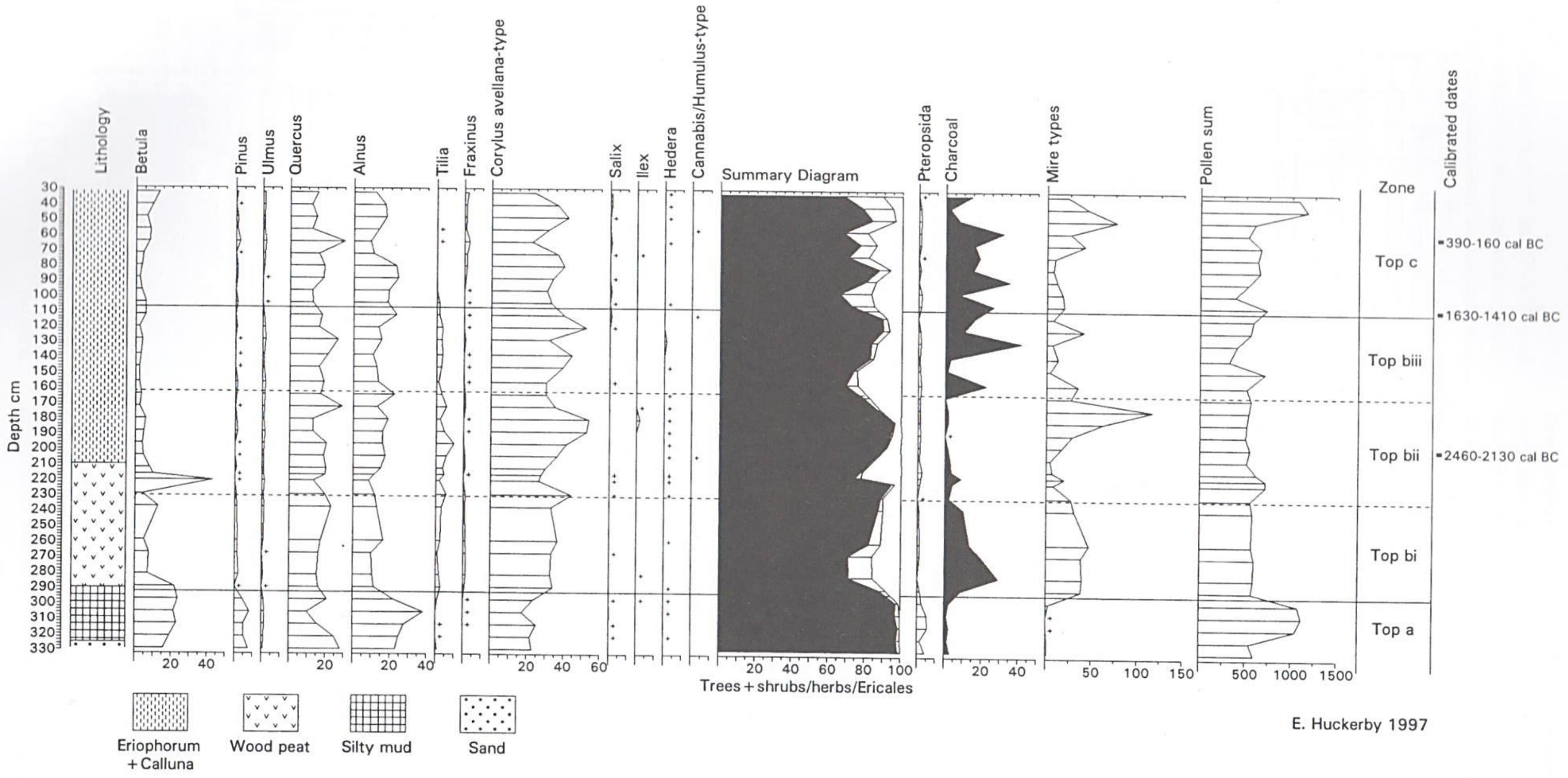


Fig 48 Top Moss percentage pollen diagram — trees (for details of radiocarbon dates see Appendix 11)

TOP MOSS – tree pollen (Leah *et al.* 1998:175)

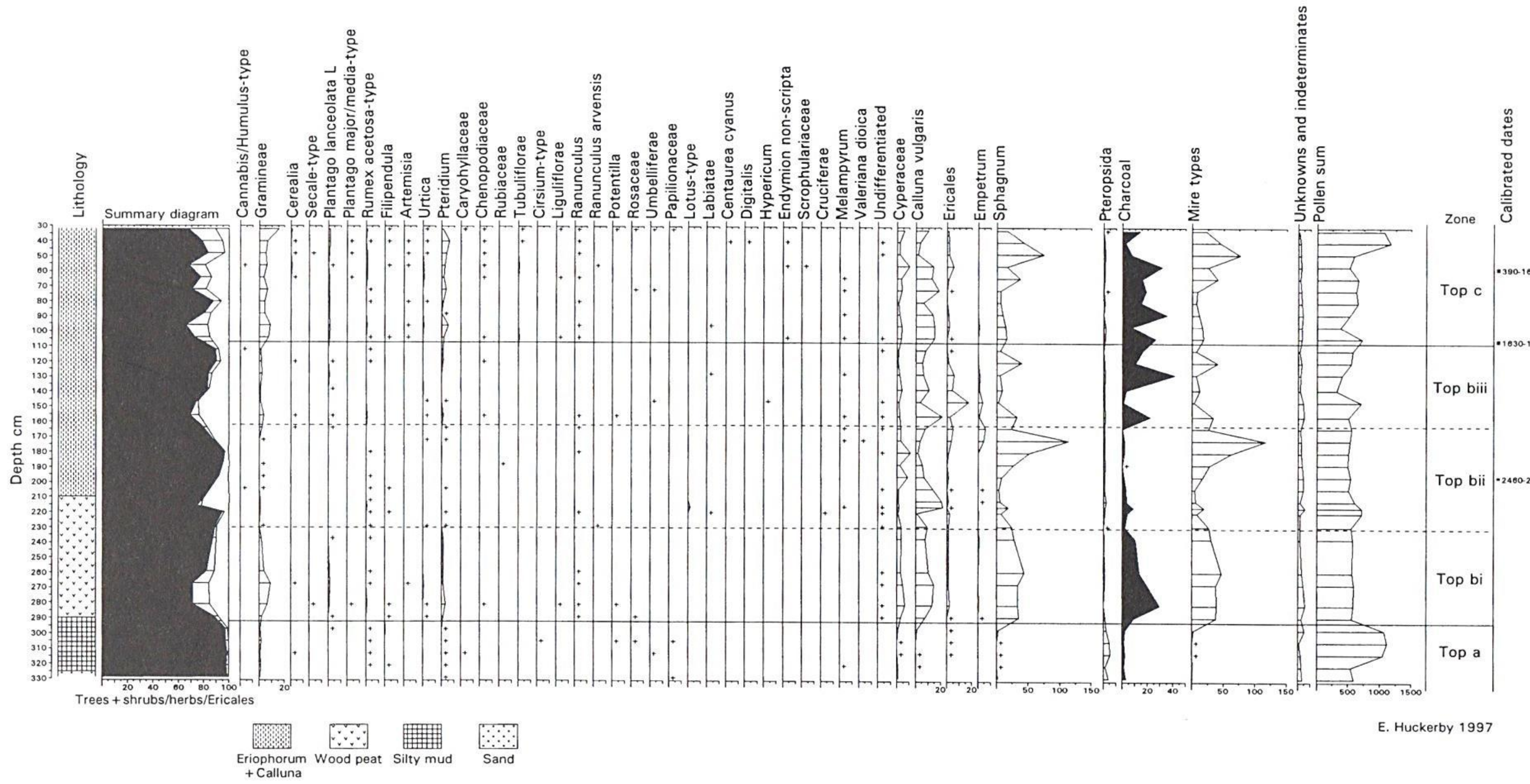


Fig 49 Top Moss percentage pollen diagram — selected herbs (for details of radiocarbon dates see Appendix 11)

TOP MOSS – herb pollen (Leah *et al.* 1998:176)

THE WEALD MOORS AND WALL CAMP

Appendix 5 – Methodology – Sample Selection and Insect Processing

- ### Sample Selection

A desk-top review was undertaken to establish prospective sites for environmental sampling. This included a review of the existing literature (Chapter 1), the geomorphology and field conditions (Chapter 2:Fig.14 *et seq.*; Leah *et al.* 1998: Fig.26), and the archaeological records (Appx. 1). NWWS's conclusion, that there were areas adjacent to Wall Camp which may hold a palaeoenvironmental archive, was also noted (Leah *et al.* 1998:123).

Two areas were selected for auguring – fields close to Wall Camp (but outside the Scheduled Area) and Crudgington Moor. The area of peat Crudgington Moor (SJ655183) only achieved 20 cm of degraded peat. However, initial auguring across several fields close to Wall Camp, followed by a transect of 10 augurs in the field between Wall Camp and Pipe Strine, showed consistent results of *Phragmites sp.* peat banded with gravel and clay, to a maximum depth of 1.2-1.8m. This area was considered likely to yield successful samples for palaeoentomological analysis, and was subsequently identified as the palaeochannel which encircles Wall Camp (Fig. 1).

Three test pits were excavated in this area between October and December 2012. These provided a total of 10 samples as a continuous section for analysis and dating; a monolith core was also taken for possible future pollen analysis. Auguring and test pitting was completed under the supervision of Drs. A. J. Howard and D. N. Smith, University of Birmingham, with assistance from Geoff Hill, Queen's University, Belfast.

The test pits spanned an area of approx. 60m^2, and achieved a depth of 70cm max. Augur samples had indicated that further peat was present beneath the clay layer at 60-70cm, however, adverse weather conditions and a high level of ground water during autumn/winter 2012 prevented this from being accessed. The stratigraphy and soil profile, shown in Chapter 5, **Error! Reference source not found.**, are characterised by highly compacted, sometimes desiccated, organically rich peaty soils interspersed in one instance with a band of clay and gravel.

THE WEALD MOORS AND WALL CAMP

Appendix 5 – Methodology – Sample Selection and Insect Processing

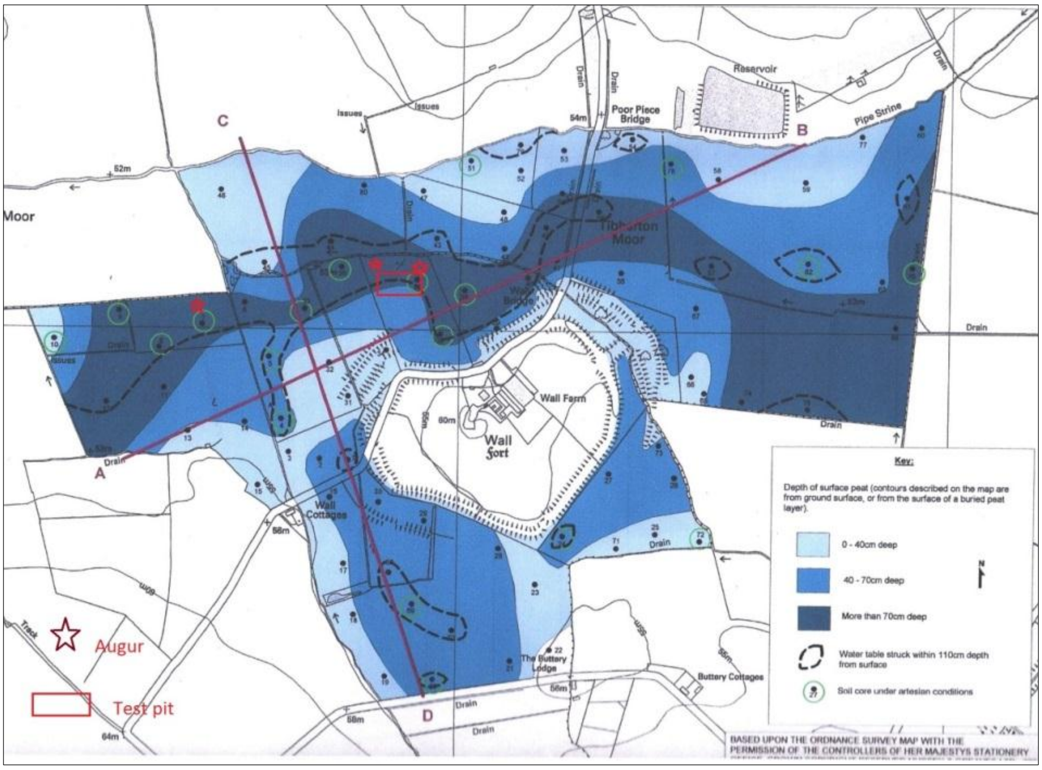


Fig. 1 Position of augur holes and test pits at Wall Camp.

Fig. 2 Excavation of Test Pit 3 near Wall Camp; December 2012

THE WEALD MOORS AND WALL CAMP

Appendix 5 – Methodology – Sample Selection and Insect Processing

- ### Insect Processing - Table 1

The processing of each sample was by paraffin-floatation, following Kenward (1980:4). All utensils were washed; each bulk sample was weighed and its volume calculated. The samples appeared to be desiccated and highly compacted and in order to facilitate processing, some were treated with Sodium hexametaphosphate and allowed to soak for up to 6 days (in the case of TP2<2>). Each sample was washed over onto a 300mm sieve to separate organic material from inorganic fraction. The organic material was then subjected to paraffin flotation to separate the insect remains from plant debris; the paraffin flotation process was repeated 3 times for each sample. Each flot was then retained in a 300 micron sieve and washed in household detergent to remove the paraffin residue, and the results preserved in ethanol solution before scanning through a binocular Meiji microscope. The insect fragments were extracted for identification, which was achieved by comparison with the Gorham and Girling Coleoptera Collections held by University of Birmingham, with expert assistance from Dr. D. N. Smith, together with the following resources:-

- http://www.bugscep.com/intro.html
- Harde K.W. 1984. *A Field Guide in Colour to Beetles* London
- Luff M.L. 2007. *The Carbidae (ground beetles) of Britain and Ireland, Vol 2* (Handbooks for the Identification of British Insects) Royal Entomological Society London
- Morris M.G. 2002. True Weevils: Coleoptera, Curculionidae, Ceutorhynchinae Pt. 2
- Duff A.G. (Ed.) 2012 Checklist of Beetles of the British Isles. 2nd edition. Pemberley Books. http://www.coleopterist.org.uk/checklist2012.pdf Accessed November 2012
- Buckland, P.I. (2007). "The Development and Implementation of Software for Palaeoenvironmental and Palaeoclimatological Research: The Bugs Coleopteran Ecology Package (BugsCEP)". PhD thesis, Environmental Archaeology Lab., Department of Archaeology & Sámi Studies. University of Umeå, Sweden. Archaeology and Environment 23, 236 pp + CD. Available online: http://www.diva-portal.org/umu/abstract.xsql?dbid=1105 Accessed throughout November/December 2012; January/February 2013

A I ltr sample was retained from TP2 and TP3 samples for possible pollen and plant macrofossil analysis, together with the contents of the monolith tin; this was taken before treatment with Sodium hexametaphosphate. The residual organic matter was bagged and is held at University of Birmingham if required.

THE WEALD MOORS AND WALL CAMP

Appendix 5 – Methodology – Sample Selection and Insect Processing

Level cms	Test Pit 1	Weight	Volume	Process weight	Insects /MNI	Test Pit 2	Weight	Volume	Process weight	Insects /MNI	Test Pit 3	Weight	Volume	Processed weight	Insects /MNI
0-10		Turf													
10-20						TP2 <1>	5.2kg	6ltrs	4.2kg	Few (4)	TP3 <1>	5kg **	7ltrs	4kg	N
20-30						TP2 <2>	5.2kg	5.5ltrs	4.2kg	Few (3)	TP3 <2>	6kg **	8ltrs	5kg	Y (16)
30-40						TP2 <3>	4.7kg	6ltrs	3.7kg	Y (24)	TP3 <3>	8kg **	10ltrs	7kg	Y (20)
40-50						TP2 <4>	5kg	6ltrs	4kg	Y (60)	TP3 <4>	8.5kg **	9.5ltrs	7.5kg	Y (31)
50-60	TP1 <1>	2.7kg	3ltrs	2.7kg - Grab sample	Y (26)						TP3 <5>	9kg **	7ltrs	8kg	Y (15)

Table 1 Wall Camp - sample dimensions;Insect MNI

** Addition of Sodium hexametaphosphate

THE WEALD MOORS AND WALL CAMP															
Table 1															
Site: Weald Moors, Wall Farm		**Sample : TP1 <1>**			**Depth: 50-60CM**			**Date: October 19 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Clivina fossor (L.)		1	~	~	~	1									Associated with disturbed ground
Dyschirius salinus Schaum		1	~	~	1	~			1					1	
Dyschirius globosus (Hbst.)		1	~	~	1	1									Associated with disturbed ground
Trechus micros (Hbst.)		1	~	~	1	1									
Trechus quadristriatus (Schrank)		3	~	1	3	1									
Pterostichus strenuus (Panz.)		3	~	2 + 1 frag	~	1									Associated with disturbed ground
HYDRAENIDAE															
Ochthebius minimus (F.)		2	~	1	2 frag	1		2							
HYDROPHILIDAE															
Coelostoma orbiculare (F.)		2	~	~	2	~		2							
Cercyon sp. (aquatic)		2	~	~	2	1		2							
Megasternum boletophagum (Marsham)		1	~	~	~	1									
Chaeltarthria seminulum (Hbst.)		1	~	~	1	~		1							
STAPHYLINIDAE															
Stenus sp.		2	~	~	2 frag	1									
Lathrobium sp.		1	~	1	~	~			1						
CHRYSOMELIDAE															
Donacia impressa Payk.		2	~	~	2 frag	2 frag			2						Associated with *Schoenoplectus lactustris* (L.) Palla (Common Club Rush)
Plateumaris discolor (Panz.)		2	~	~	2 frag	~							2		Associated with cotton grass Eriophorum spp. and Carex spp.
CURCULIONIDAE															
Limnobaris sp.		1	~	~	1 frag	1 frag			1						
TOTAL MNI		26						7	5				2	1	

THE WEALD MOORS AND WALL CAMP

Table 2a

Site: Weald Moors, Wall Farm		**Sample : TP2 <1>**			**Depth 10-20cm**			**Date: October 19 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Nebria brevicollis/salina (F.)/Fairm. & Lab.		2	~	1 + 1frag	~	~									
STAPHYLINIDAE															
Aleocharinae indet.		2	~	~	2	~									Associated with disturbed ground
TOTAL MNI		4													

Table 2b

Site: Weald Moors, Wall Farm		**Sample : TP2 <2>**			**Depth 20-30cm**			**Date: October 19 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
HYDROPHILIDAE															
Cercyon sp. (aquatic)		1	~	~	1	~		1							
STAPHYLINIDAE															
Lathrobium sp.		2	~	2	~	~									
TOTAL MNI		3						1							

THE WEALD MOORS AND WALL CAMP

Table 3

Site: Weald Moors, Wall Farm	Sample : TP2 <3>	Depth: 30-40CM				Date: October 19 2012							
Insect Assemblage	**MNI**	**Fossilised Coleoptera Remains**				**Habitat after Robinson 1981;1983**							
		Head	**Thorax**	**Elytra - L**	**Elytra - R**	**Aquatic**		**Terrestrial**					
						Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera													
CARABIDAE													
Notiophilus biguttatus (F.)	1	~	~	~	1frag		1						
Clivina fossor (L.)	2	~	~	1+1frag	~								Associated with disturbed ground
Bembidion sp.	2	~	~	1	2								
DYTISCIDAE													
Agabus sp.	2	~	2 frag	~	~	2							
GYRINIDAE													
Gyrinus spp.	1	~	~	1frag	~	1							
STAPHYLINIDAE													
Olophrum piceum (Gyll.)	2	~	~	1+1frag	~		2						
Lathrobium sp.	1	~	1	1	1		1						
Xantholinus sp.	1	~	1	~	~								
CHRYSOMELIDAE													
Donacia/Plateumaris sp. indet.	1	~	~	~	1 frag		1						
ELATERIDAE													
Elateridae indet.	1	~	~	1frag	~								
CURCULIONIDAE													
Notaris aethiops (F.)	4	~	2 + 3 frag	2	3+4frag		4						Associated with branched bur-reed, *Sparganium erectum* .
Limnobaris sp.	3	~	3	1frag	~		3						
TOTAL MNI	21					3	12	0	0	0	0		

THE WEALD MOORS AND WALL CAMP															
Table 4															
Site: Weald Moors, Wall Farm		**Sample : TP2 <4>**			**Depth: 40-50CM**			**Date: October 19 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Dyschirius salinus (Hbst.)		1	~	~	1	~			1					1	
Dyschirius globosus (Hbst.)		1	~	~	1 frag	~									Associated with disturbed ground
Trechus micros (Hbst.)		1	~	1	~	1									
Bembidion clarkii (Dawson)		1	~	1	~	1			1						
Patrobus spp.		1	~	~	~	1									
Pterostichus strenuus (Panz.)		1	~	~	1	1									
Pterostichus nigrita (Payk.)		1	~	1	~	~			1						
Panagaeus cruxmajor (L.)		3	~	2 + 1frag	~	~			3						
DYTISCIDAE															
Hydroporus spp.		1	~	1	~	~		1							
Agabus spp.		1	~	1	1frag	~		1							
HYDROPHILIDAE															
Cercyon spp. (aquatic)		1	~	1	~	~		1							
HISTERIDAE															
Hister carbonarious (L.)		1	~	~	1frag	~				1					
STAPHYLINIDAE															
Olophrum piceum (Gyll.)		5	~	5	~	~			5						
Olophrum spp.		2	~	2	~	~			2						
Acidota cruentata Mann.		1	~	1	~	~									
Lesteva longoelytrata (Goeze)		4	~	~	4	3			4						
Lesteva heeri Fauv.		16	~	10	16	14			16						
Stenus sp.		1	1	~	~	~									
Lathrobium sp.		1	1	~	~	~			1						
Cryptobium sp.		1	1	~	~	~			1						
Aleocharinae indet.		3	~	1	2	3									Associated with disturbed ground
CURCULIONIDAE															
Apion sp.		2	~	~	1frag	2frag					2				Associated with disturbed ground
Bagous sp.		1	~	~	1frag	1frag			1						
Notaris sp.		1	~	~	1frag	~			1						
Notaris aethiops (F.)		4	~	3 + 1 frag	~	~			4						
Limnobaris sp.		3	1	~	3	2			3						
Rhamphus sp.		1	~	~	~	1frag						1			Associated with willow
TOTAL MNI		60						3	44	1	2	1	0	1	

THE WEALD MOORS AND WALL CAMP
Table 5

Site: Weald Moors Wall Farm		**Consolidated data TP2**					**Date: October 19 2012**						
Concolidated Insect Assemblage	**MNI**					**Habitat after Robinson 1981;1983**							
		TP2<1>	**TP2<2>**	**TP2<3>**	**TP2<4>**	**Aquatic**		**Terrestrial**					
						Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera													
CARABIDAE													
Nebria brevicollis/salina (F.)/Fairm. & Lab.	2		2										
Notiophilus biguttatus (F.)	1			1									
Clivina fossor (L.)	2			2									Associated with disturbed ground
Dyschirius salinus Schaum	1				1		1					1	
Dyschirius globosus (Hbst.)	1				1								Associated with disturbed ground
Trechus micros (Hbst.)	1				1								
Bembidion sp.	2			2									
Bembidion clarkii (Dawson)	1				1		1						
Patrobus sp.	1				1								
Pterostichus strenuus (Panz.)	1				1								
Pterostichus nigrita (Payk.)	1				1		1						
Panagaeus cruxmajor (L.)	3				3		3						
DYTISCIDAE													
Hydroporus sp.	1				1	1							
Agabus sp.	3			2	1	3							
GYRINIDAE													
Gyrinus sp.	1			1		1							
HYDROPHILIDAE													
Cercyon spp. (aquatic)	2	1			1	2							
HISTERIDAE													
Hister carbonarious (L.)	1				1			1					
STAPHYLINIDAE													
Olophrum piceum (Gyll.)	7			2	5		7						
Olophrum sp.	2				2		2						
Acidota cruentata Mann.	1				1								
Lesteva longoelytrata (Goeze)	4				4		4						
Lesteva heeri Fauv.	16				16		16						
Stenus sp.	1				1								
Lathrobium sp.	4	2		1	1		4						
Cryptobium sp.	1				1		1						
Xantholinus sp.	1			1									
Aleocharinae indet.	5		2		3								Associated with disturbed ground
CHRYSOMELIDAE													
Donacia/Plateumaris spp. indet.	1			1			1						
ELATERIDAE													
Elateridae indet.	1			1									
CURCULIONIDAE													
Apion sp.	2				2				2				Associated with disturbed ground
Bagous sp.	1				1		1						
Notaris sp.	1				1		1						
Notaris aethiops (F.)	8			4	4		8						Associated with branched bur-reed, *Sparganium erectum* .
Limnobaris sp.	6			3	3		6						
Rhamphus sp.	1				1					1			Associated with willow
TOTAL MNI	88					7	57	1	2	1		1	

THE WEALD MOORS AND WALL CAMP
Table 6

Site: Weald Moors Wall Farm | **Consolidated data TP1 & 2** | **Date: October 19 2012**

Concolidated Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			TP1<1>	**TP2<1>**	**TP2<2>**	**TP2<3>**	**TP2<4>**	**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Nebria brevicollis/salina (F.)/Fairm. & Lab.		2			2										
Notiophilus biguttatus (F.)		1				1									
Clivina fossor (L.)		3	1			2									Associated with disturbed ground
Dyschirius salinus Schaum		2	1				1		2					2	
Dyschirius globosus (Hbst.)		2	1				1								Associated with disturbed ground
Trechus micros (Hbst.)		2	1				1								
Trechus quadristriatus (Schrank)		3	3												
Bembidion sp.		2				2									
Bembidion clarkii (Dawson)		1					1		1						
Patrobus sp.		1					1								
Pterostichus strenuus (Panz.)		4	3				1								
Pterostichus nigrita (Payk.)		1					1								Associated with disturbed ground
Panagaeus cruxmajor (L.)		3					3		3						
DYTISCIDAE															
Hydroporus sp.		1					1	1							
Agabus sp.		3				2	1	3							
GYRINIDAE															
Gyrinus sp.		1				1		1							
HYDRAENIDAE															
Ochthebius minimus (F.)		2	2					2							
HYDROPHILIDAE															
Coelostoma orbiculare (F.)		2	2					2							
Cercyon spp. (aquatic)		4	2	1			1	4							
Megasternum boletophagum (Marsham)		1	1												
Chaeltarthria seminulum (Hbst.)		1	1					1							
HISTERIDAE															
Hister carbonarious (L.)		1					1			1					
STAPHYLINIDAE															
Olophrum piceum (Gyll.)		7				2	5		7						
Olophrum sp.		2					2		2						
Acidota cruentata Mann.		1					1								
Lesteva longoelytrata (Goeze)		4					4		4						
Lesteva heeri Fauv.		16					16		16						
Stenus sp.		3	2				1								
Lathrobium sp.		5	1	2		1	1		5						
Cryptobium sp.		1					1		1						
Xantholinus sp.		1				1									
Aleocharinae indet.		5			2		3								Associated with disturbed ground
CHRYSOMELIDAE															
Donacia impressa Payk.		2	2						2						Associated with *Schoenoplectus lactustris* (L.) Palla (Common Club Rush)
Plateumaris discolor (Panz.)		2	2										2		Associated with cotton grass Eriophorum spp. and Carex spp.
Donacia/Plateumaris spp. indet.		1				1									
ELATERIDAE															
Elateridae indet.		1				1									
CURCULIONIDAE															
Apion sp.		2					2				2				Associated with disturbed ground
Bagous sp.		1					1		1						
Notaris aethiops (F.)		11				7	4		11						Associated with branched bur-reed, *Sparganium erectum* .
Notaris sp.		1					1		1						
Limnobaris sp.		7	1			3	3		7						
Rhamphus sp.		1					1					1			Associated with willow
TOTAL MNI		117						14	63	1	2	1	2	2	

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Table 7		**NB TP3 <1> - the sample produced no identifiable sclerites**													
Site: Weald Moors, Wall Farm		**Sample : TP3 <2>**			**Depth: 20-30CM**			**Date: December 7th 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Carabidae indet.		1	1	~	~	~									
Trechus micros (Hbst.)		1	~	~	~	1									
Bembidion clarkii (Dawson)		3	~	2 + 1 frag	~	~			3						
Bembidion sp.		2	~	~	1	1 + 1 frag									
STAPHYLINIDAE															
Carpelimus/Thinobius sp.		1	~	~	1	~			1						
Anotylus sp.		1	~	~	~	1									
Stenus spp.		2	~	~	1 + 1 frag	1									
Xantholinus linearis (Ol.)		2	1	2	~	1									
CURCULIONIDAE															
Polydrusus mollis (Ström)		1	1	~	~	~						1			
Sitona suturalis Steph		1	~	~	1	~			1						
Notaris sp.		1	1	~	~	~			1						
TOTAL MNI		16							6			1			

THE WEALD MOORS AND WALL CAMP															
Table 8															
Site: Weald Moors, Wall Farm		**Sample : TP3 <3>**			**Depth: 30-40CM**			**Date: December 7th 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Clivina fosser (L.)		1	~	~	~	1									Associated with disturbed ground
Bembidion sp.		1	~	~	1	~									
Pterostichus nigrata (Payk.)		2	~	1+1frag	2	1			2						
GYRINIDAE															
Gyrinus sp.		1	~	~	~	1		1							
HYDROPHILIDAE															
Cercyon ustulatus (Preys.)		1	~	~	1	~		1							
Hydrobius fuscipes (L.)		1	~	~	1	~		1							
STAPHYLINIDAE															
Stenus sp.		1	~	~	~	1									
Lathrobium sp.		1	~	~	~	1			1						
Xantholinus sp.		1	1	~	~	~									
Philonthus sp.		1	~	1frag	~	~									
PHALACRIDAE															
Phalacrus corruscus (Panz.)		2	~	~	2	1			2						
CHRYSOMELIDAE															
Donacia/Plateumaris sp. indet.		1	~	~	1	~			1						
Plateumaris bracatta (Scop.)		3	~	~	3	~			3						Associated with *Phragmites australis* (Cav.) Trin. ex Steud. (water reed)
CURCULIONIDAE															
Notaris acridulus (L.)		1	~	~	1	~			1						Often on *Glyceria maxima* (Hartm.) Holmb. (reed sweet-grass) and other *Glyceria* species (sweet-grasses)
Limnobaris sp.		2	~	~	2frag	1frag			2						
TOTAL MNI		20						3	12						

THE WEALD MOORS AND WALL CAMP

Table 9

Site: Weald Moors, Wall Farm	**Sample : TP3 <4>**		**Depth: 40-50CM**			**Date: December 7th 2012**							
Insect Assemblage	**MNI**	**Fossilised Coleoptera Remains**				**Habitat after Robinson 1981;1983**							
		Head	**Thorax**	**Elytra - L**	**Elytra - R**	**Aquatic**		**Terrestrial**					
						Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera													
CARABIDAE													
Clivina fossor (L.)	1	~	1	1	1								Associated with disturbed ground
Bembidion clarkii (Dawson)	3	~	2 + 1 frag	~	~		3						
Pterostichus strenuus (Panz.)	2	~	~	~	1+ 1 frag								Associated with disturbed ground
Dromius agilis (F.)	1	1	~	~	~					1			under bark of deciduous trees
GYRINIDAE													
Gyrinus sp.	1	~	~	1frag	~	1							
ORTHOPERIDAE													
Sericoderus lateralis (Gyll.)	1	~	1	~	~		1						
STAPHYLINIDAE													
Anotylus rugosus (F.)	1	~	1	~	~			1					
Stenus sp.	2	~	~	2	~								
Lathrobium sp.	1	1	~	~	~		1						
Xantholinus sp.	1	~	1	~	~								
PHALACRIDAE													
Phalacrus corruscus (Panz.)	4	~	~	3	3+1frag		4						
CHRYSOMELIDAE													
Donacia/Plateumaris sp. indet.	1	1	~	~	~		1						
Plateumaris bracatta (Scop.)	4	~	~	4frag	3 + 1 frag		4						*Phragmites australis* (Cav.) Trin. ex Steud. (water reed)
CURCULIONIDAE													
Tanysphyrus lemnae (Payk.)	1	~	~	1	1	1							*Lemnae sp* . (Duckweed)
Notaris sp.	2	~	2	~	~		2						
Limnobaris pilistriata (Steph.)	5	~	1	4	4 +1 frag		5						*Juncaceae and Cyperaceae* (rushes)
TOTAL MNI	31					2	21	1		1			

THE WEALD MOORS AND WALL CAMP															
Table 10															
Site: Weald Moors, Wall Farm		**Sample : TP3 <5>**			**Depth: 50-60CM**			**Date: December 7th 2012**							
Insect Assemblage		**MNI**	**Fossilised Coleoptera Remains**					**Habitat after Robinson 1981;1983**							
			Head	**Thorax**	**Elytra - L**	**Elytra - R**		**Aquatic**		**Terrestrial**					
								Aquatic	**Waterside**	**Dung + foul**	**Grassland**	**Woodland**	**Moorland**	**Halotolerant**	**Notes**
Coleoptera															
CARABIDAE															
Pterostichus strenuus (Panz.)		1	~	~	1	~									Associated with disturbed ground
STAPHYLINIDAE															
Omalium rivulare (Payk.)		1	~	1	~	~									
Stenus sp.		2	1	2	~	2									
Philonthus sp.		1	~	1 frag	~	~									
CURCULIONIDAE															
Tanysphyrus lemnae		1	~	~	1	1		1							*Lemnae spp.* (Duckweed)
Notaris acridulus (L.)		1	~	~	1	1			1						Often on *Glyceria maxima* (Hartm.) Holmb. (reed sweet-grass) and other *Glyceria* species (sweet-grasses)
Limnobaris pilistriata (Steph.)		8	8	~	7	3			8						*Juncaceae and Cyperaceae* (rushes)
TOTAL MNI		15						1	9						

THE WEALD MOORS AND WALL CAMP

Table 11

Site: Weald Moors Wall Farm | **TP3 Consolidated Species List** | **Date: December 7th 2012**

Insect Assemblage	MNI	Fossilised Coleoptera Remains				Habitat after Robinson 1981;1983							
		TP3 <2>	TP3<3>	TP3<4>	TP3<5>	Aquatic		Terrestrial					
						Aquatic	Waterside	Dung + foul	Grassland	Woodland	Moorland	Halotolerant	Notes
Coleoptera													
CARABIDAE													
Carabidae indet.	1	1											
Clivina fossor (L.)	2		1	1									Associated with disturbed ground
Trechus micros (Hbst.)	1	1											
Bembidion clarkii (Dawson)	6	3		3			6						
Bembidion sp.	3	2	1										
Pterostichus strenuus (Panz.)	3			2	1								Associated with disturbed ground
Pterostichus nigrata (Payk.)	2		2				2						
Dromius agilis (F.)	1			1						1			under bark of deciduous trees
GYRINIDAE													
Gyrinus sp.	2		1	1		2							
HYDROPHILIDAE													
Cercyon ustulatus (Preys.)	1		1			1							
Hydrobius fuscipes (L.)	1		1			1							
ORTHOPERIDAE													
Sericoderus lateralis (Gyll.)	1			1			1						
STAPHYLINIDAE													
Omalium rivulare (Payk.)	1				1								
Carpelimus/Thinobius sp.	1	1					1						
Anotylus rugosus (F.)	1			1				1					
Anotylus sp.	1	1											
Stenus sp.	7	2	1	2	2								
Lathrobium sp.	2		1	1			2						
Xantholinus linearis (Ol.)	2	2											
Xantholinus sp.	2		1	1									
Philonthus sp.	2		1		1								
PHALACRIDAE													
Phalacrus corruscus (Panz.)	6		2	4			6						
CHRYSOMELIDAE													
Donacia/Plateumaris sp. indet.	2		1	1			2						
Plateumaris bracatta (Scop.)	7		3	4			7						*Phragmites australis* (Cav.) Trin. ex Steud. (water reed)
CURCULIONIDAE													
Polydrusus mollis (Ström)	1	1								1			
Sitona suturalis Steph	1	1					1						
Tanysphyrus lemnae (Payk.)	2			1	1	2							*Lemnae sp*. (Duckweed)
Notaris acridulus (L.)	2		1		1		2						Often on *Glyceria maxima* (Hartm.) Holmb. (reed sweet-grass) and other *Glyceria* species (sweet-grasses)
Notaris sp.	3	1		2			3						
Limnobaris pilistriata (Steph.)	13			5	8		13						*Juncaceae and Cyperaceae* (rushes)
Limnobaris sp.	2		2				2						
TOTAL MNI	82					6	48	1		2			

WEALD MOORS WALL FARM CONSOLIDATED SPECIES LIST

Coleoptera	TOTAL MNI
CARABIDAE	
Carabidae indet.	1
Nebria brevicollis/salina (F.)/Fairm. & Lab.	2
Notiophilus biguttatus (F.)	1
Clivina fossor (L.)	5
Dyschirius salinus Schaum	2
Dyschirius globosus (Hbst.)	2
Trechus micros (Hbst.)	3
Trechus quadristriatus (Schrank)	3
Bembidion clarkii (Dawson)	7
Bembidion sp.	5
Patrobus sp.	1
Pterostichus strenuus (Panz.)	7
Pterostichus nigrata (Payk.)	3
Dromius agilis (F.)	1
Panagaeus cruxmajor (L.)	3
DYTISCIDAE	
Hydroporus sp.	1
Agabus sp.	3
GYRINIDAE	
Gyrinus sp.	3
HYDRAENIDAE	
Ochthebius minimus (F.)	2
HYDROPHILIDAE	
Coelostoma orbiculare (F.)	2
Cercyon ustulatus (Preys.)	1
Cercyon spp. (aquatic)	4
Megasternum boletophagum (Marsham)	1
Hydrobius fuscipes (L.)	1
Chaeltarthria seminulum (Hbst.)	1
HISTERIDAE	
Hister carbonarious (L.)	1
ORTHOPERIDAE	
Sericoderus lateralis (Gyll.)	1
STAPHYLINIDAE	
Omalium rivulare (Payk.)	1
Olophrum piceum (Gyll.)	7
Olophrum sp.	2
Acidota cruentata Mann.	1
Lesteva longoelytrata (Goeze)	4
Lesteva heeri Fauv.	16
Carpelimus/Thinobius sp.	1
Anotylus rugosus (F.)	1
Anotylus sp.	1
Stenus sp.	10
Lathrobium sp.	7
Cryptobium sp.	1
Xantholinus linearis (Ol.)	2
Xantholinus sp.	3
Philonthus sp.	2
Aleocharinae indet.	5
PHALACRIDAE	
Phalacrus corruscus (Panz.)	6
CHRYSOMELIDAE	
Donacia impressa Payk.	2
Donacia/Plateumaris sp. indet.	3
Plateumaris discolor (Panz.)	2
Plateumaris bracatta (Scop.)	7
ELATERIDAE	
Elateridae indet.	1
CURCULIONIDAE	
Apion sp.	2
Polydrusus mollis (Ström)	1
Sitona suturalis Steph	1
Bagous sp.	1
Tanysphyrus lemnae (Payk.)	2
Notaris acridulus (L.)	2
Notaris aethiops (F.)	11
Notaris sp.	4
Limnobaris pilistriata (Steph.)	13
Limnobaris sp.	9
Rhamphus sp.	1
TOTAL	**199**

RANK ORDER	
Lesteva heeri Fauv.	16
Limnobaris pilistriata (Steph.)	13
Notaris aethiops (F.)	11
Stenus sp.	10
Limnobaris sp.	9
Bembidion clarkii (Dawson)	7
Pterostichus strenuus (Panz.)	7
Olophrum piceum (Gyll.)	7
Lathrobium sp.	7
Plateumaris bracatta (Scop.)	7
Phalacrus corruscus (Panz.)	6
Clivina fossor (L.)	5
Bembidion sp.	5
Aleocharinae indet.	5
Cercyon spp. (aquatic)	4
Lesteva longoelytrata (Goeze)	4
Notaris sp.	4
Trechus micros (Hbst.)	3
Trechus quadristriatus (Schrank)	3
Pterostichus nigrata (Payk.)	3
Panagaeus cruxmajor (L.)	3
Agabus sp.	3
Gyrinus sp.	3
Xantholinus sp.	3
Donacia/Plateumaris sp. indet.	3
Nebria brevicollis/salina (F.)/Fairm. & Lab.	2
Dyschirius salinus Schaum	2
Dyschirius globosus (Hbst.)	2
Ochthebius minimus (F.)	2
Coelostoma orbiculare (F.)	2
Olophrum sp.	2
Xantholinus linearis (Ol.)	2
Philonthus sp.	2
Donacia impressa Payk.	2
Plateumaris discolor (Panz.)	2
Apion sp.	2
Tanysphyrus lemnae (Payk.)	2
Notaris acridulus (L.)	2
Carabidae indet.	1
Notiophilus biguttatus (F.)	1
Patrobus sp.	1
Dromius agilis (F.)	1
Hydroporus sp.	1
Cercyon ustulatus (Preys.)	1
Megasternum boletophagum (Marsham)	1
Hydrobius fuscipes (L.)	1
Chaeltarthria seminulum (Hbst.)	1
Hister carbonarious (L.)	1
Sericoderus lateralis (Gyll.)	1
Omalium rivulare (Payk.)	1
Acidota cruentata Mann.	1
Carpelimus/Thinobius sp.	1
Anotylus rugosus (F.)	1
Anotylus sp.	1
Cryptobium sp.	1
Elateridae indet.	1
Polydrusus mollis (Ström)	1
Sitona suturalis Steph	1
Bagous sp.	1
Rhamphus sp.	1

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27:lab. mult=1)

Laboratory number: **Beta-341165**

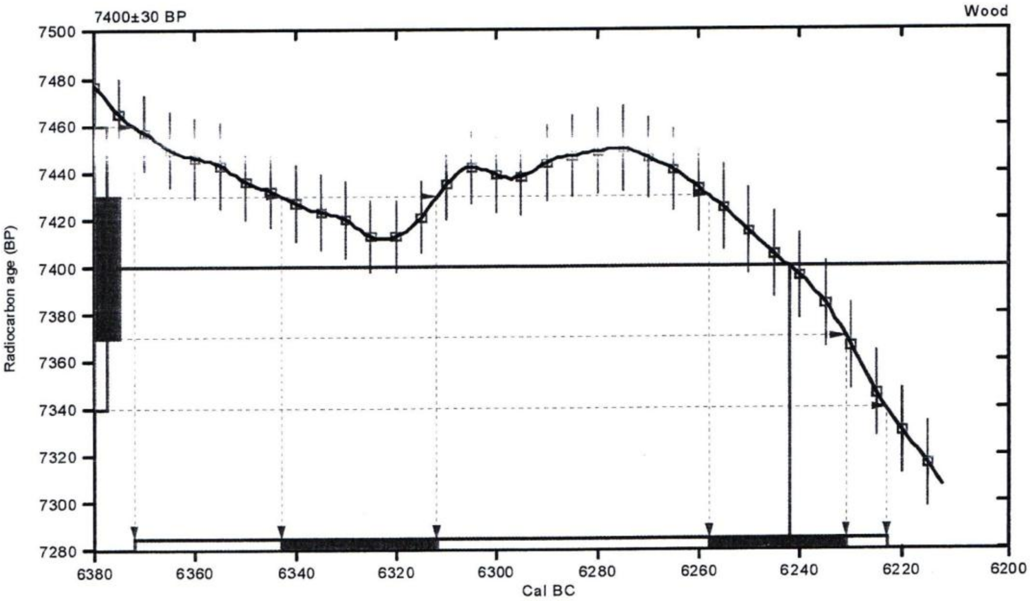
Conventional radiocarbon age: **7400±30 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 6370 to 6220 (Cal BP 8320 to 8170)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 6240 (Cal BP 8190)

1 Sigma calibrated results: (68% probability) Cal BC 6340 to 6310 (Cal BP 8290 to 8260) and Cal BC 6260 to 6230 (Cal BP 8210 to 8180)



References:
Database used
INTCAL09
References to INTCAL09 database
Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192
Mathematics used for calibration scenario
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.1:lab. mult=1)

Laboratory number: **Beta-341619**

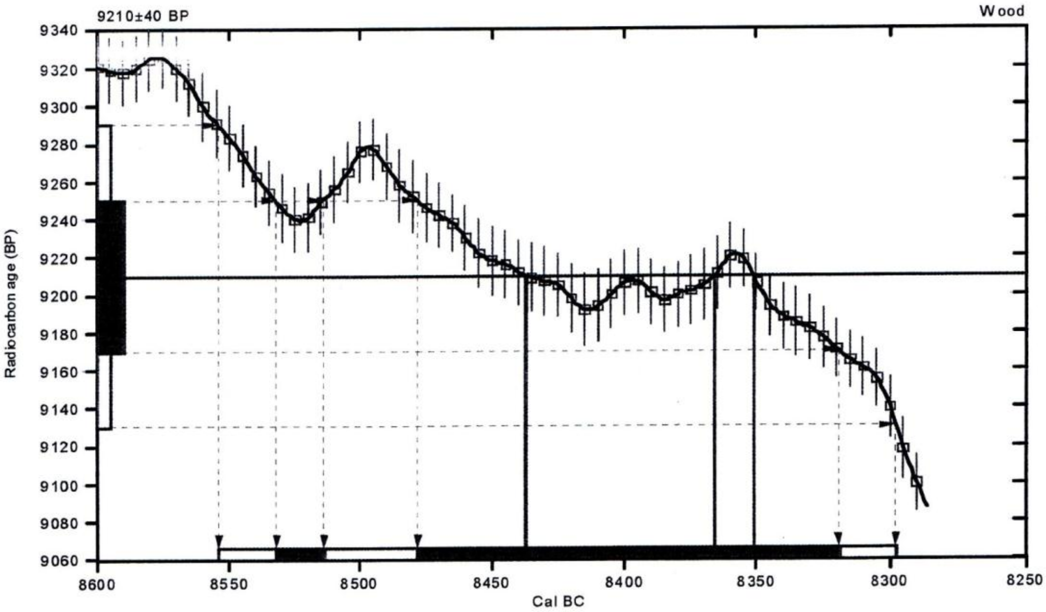
Conventional radiocarbon age: **9210±40 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 8550 to 8300 (Cal BP 10500 to 10250)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal BC 8440 (Cal BP 10390) and
Cal BC 8370 (Cal BP 10320) and
Cal BC 8350 (Cal BP 10300)

1 Sigma calibrated results: (68% probability) Cal BC 8530 to 8510 (Cal BP 10480 to 10460) and
Cal BC 8480 to 8320 (Cal BP 10430 to 10270)



References:
Database used
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Mathematics used for calibration scenario
A Simplified Approach to Calibrating C14 Dates
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