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Walton Basin Project 2012-13

Archaeological Conservation in Rural Environments (ACRE)

THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

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cover: fields of ripening cereals at Walton within which the cropmarks of several Neolthic monuments and Roman marching camps are visible. Photo CPAT 84-c-0335

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1 INTRODUCTION

1.1 Recent Cadw-funded project work in the Walton Basin under the aegis of the Prehistoric Funerary and Ritual Sites and the Roman Military Vici initiatives, combined with the results of earlier assessment work by the Trust under the direction of Dr Alex Gibson and also funded by Cadw, continues to highlight the importance and complexity of this area of eastern Radnorshire, which is virtually unparalleled elsewhere within the British Isles. The area encapsulates the archaeology of the Welsh borderland and is so far known to contain evidence for multiperiod activity from the early post-glacial period onwards. Recent studies have focused on the complex of prehistoric monuments around Hindwell and Walton, most of which date from the Neolithic, and include some of the largest sites of their type in Britain, such as the Hindwell cursus and the Hindwell palisaded enclosure. The importance of the area as a base for Roman military campaigns is also becoming more apparent and the strategic significance of the routeway which passes through the basin into mid Wales remained influential well into the medieval period.

Fig. 1 The Walton Basin viewed from the east. Photo CPAT 04-c-0195

1.2 It has been apparent for some time that the archaeology of the Walton Basin is under varying degrees of threat from continued ploughing in this highly productive agricultural area, as well as from piecemeal development, both of which are having a very real impact upon the archaeological resource. Few archaeological sites retain any upstanding element and are generally known only from cropmark evidence, which has raised a number of issues regarding the future management of the resource as well as the desirability and practicality of scheduling what are in some cases very large sites with no visible component. Even scheduling fails to provide effective protection from continued plough erosion, however, and with the discovery of more and more sites in the basin the fear of scheduling and worries about the potential impact this might have on land values, agricultural incomes and constraints upon future development have become very real issues for which there are no easy answers.

1.3 The present study has therefore been developed in order to address some of the known issues relating to the management of this extensive and complex archaeological landscape. This report presents the results from an initial phase of assessment, which includes recommendations for further stages of investigation, some of which will hopefully come to fruition in future years.

2 METHODOLOGY

2.1 The initial stage was to define the study area. It adopted the Ordnance Survey 1km grid to provide a ready framework, covering an area of 33km^2, which extended for up to 9km from west to east and 5km north to south (Fig. 2). The area focuses principally on the valley floor, although necessarily includes sections of the upland edge where these fall within the grid squares.

2.2 An extract was obtained from the regional Historic Environment Record (HER), initially containing records for monuments of all periods, although this was subsequently refined to exclude all post-medieval and later sites. The resulting dataset was enhanced through updating the description and location of sites where appropriate, as well as adding new records for previously unrecorded sites identified through an examination of available aerial photographs and LiDAR data, both of which allowed the plotting of cropmarks and earthwork sites into a Geographical Information System (GIS) that could be linked to the HER by use of the unique Primary Record Number (PRN) afforded to each monument. The development of site-specific mapping was critical to the study since point data alone would have been insufficient to assess potential impacts on the archaeology with many of the sites extending over a considerable area and often over more than a single field.

2.3 Aerial photography and LiDAR were also employed to map palaeochannels, visible both as cropmarks and earthworks, in an attempt to understand the historic hydrology within the basin. Available datasets were also used to produce a ditigal terrain model (DTM) of the study area, allowing the production of close-interval contour data to facilitate the study of the micro-topography and its relationship with the siting of monuments and also the vulnerability of those sites to agricultural practices.

2.4 A preliminary study of the field patterns in the Walton Basin was conducted in an attempt to shed some light on the otherwise relatively poorly understood history of settlement and land-use during the early medieval, medieval and early post-medieval periods. This utilized readily available sources, including 18th-century estate maps and the later 19th-century Ordnance Survey mapping.

2.5 A land-use study for the basin had previously been conducted as part of the Walton Basin Project during August 1992 (Gibson 1999, 1), which was based on field visits. The resulting mapping was digitised as part of the present project to provide baseline data for a new study which was undertaken remotely, using available vertical aerial photography from 2006 (Getmapping) and 2009 (Next Perspectives). The combined data from all three years was then used to develop a predictive model for the potential risks to archaeology posed by the apparent agricultural regimes (see section 8). Historic landuse was also recorded, using information from the tithe surveys of the 1840s.

2.6 The final assessment phase of the project comprised an examination of how farming and cultivation methods can affect archaeology in general, followed by an assessment of the potential impacts on sites within the study area. This was in part based on a series of studies conducted in England, including the Conservation of Scheduled Monuments in Cultivation, or COSMIC study and the more detailed Trials project, although the approach adopted for the Walton Basin was necessarily less detailed. The assessment involved analysing the extent, form and vulnerability of each monument and comparing this with the landuse data to provide a predictive model for the potential risks to sites from agricultural practices.

2.7 Based on the results from the assessment of landuse and monuments at risk, proposals were developed to test the predictive model in the field through a series of small-scale trial interventions, which it is hoped will be undertaken during a subsequent year.

2.8 Through the Trust's work in this area over the past twenty years the level of public awareness of the archaeology has seen a significant increase. It has been recognised for some time that the involvement of the community in the heritage of their area is of critical importance in promoting both a sense of belonging and a wider awareness and responsibility for the archaeology and the current project has continued this theme, concluding with a number of proposals that address this issue.

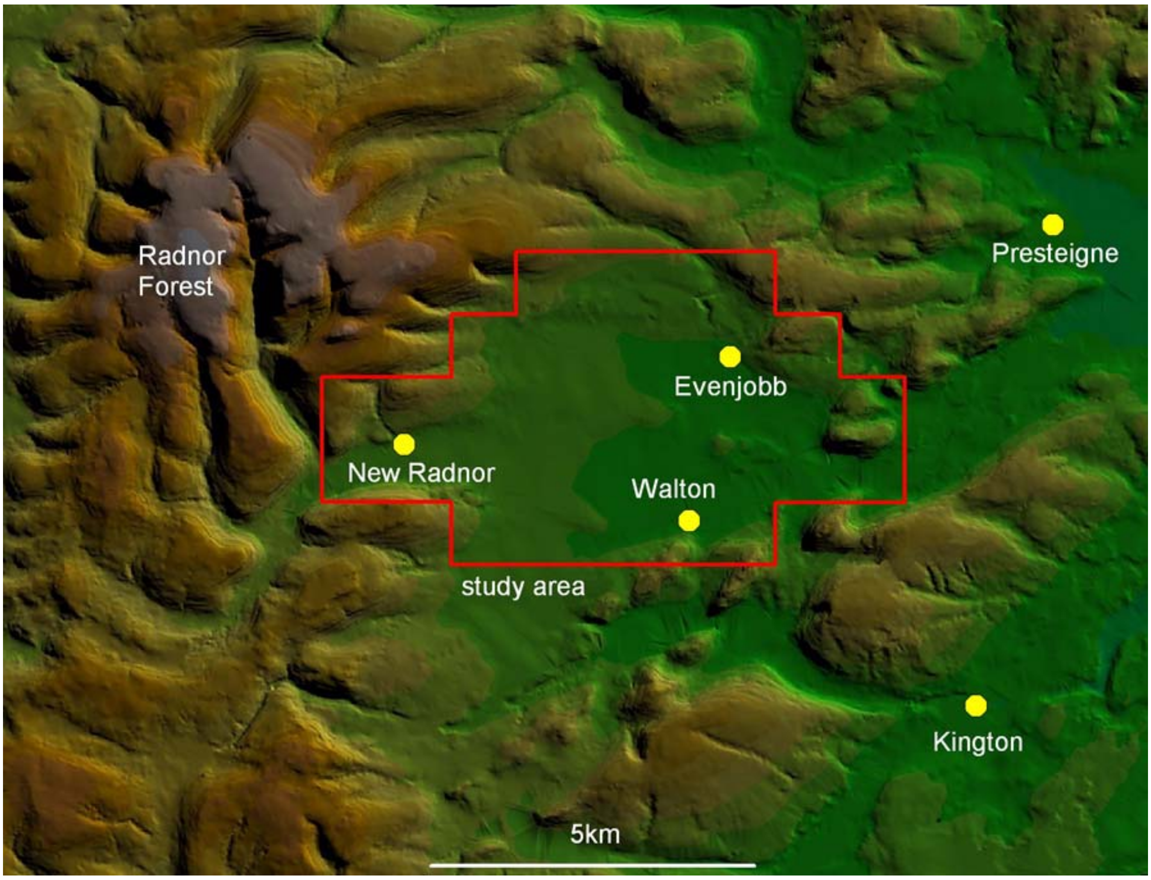

Fig. 2 Study area location

3 TOPOGRAPHY, SOILS AND DRAINAGE

Location and topography

3.1 The Walton Basin lies in south-eastern Radnorshire (part of modern Powys), on the border with Herefordshire, and is surrounded by hills which rise dramatically to heights of between 300-600m OD, creating a natural amphitheatre between 4km and 6km across. To the north and north-west are the uplands of the Radnor Forest, including Whimble and Bache Hill, while to the west lies Smatcher, with the narrowing valley of the Summergil Brook in between, forming an obvious communications route into mid Wales. The southern extent is marked by Old Radnor Hill, separating the basin from the valley of the Cynon Brook, with Hergest Ridge beyond. The south-eastern side of the basin is marked by Herrock Hill, to the north of which the Hindwell Brook flows through a narrow gap overlooked from the north by the Iron Age hillfort of Burfa Camp, which crowns a prominent hill at the southern end of a range of hills defining the north-western side of the basin.

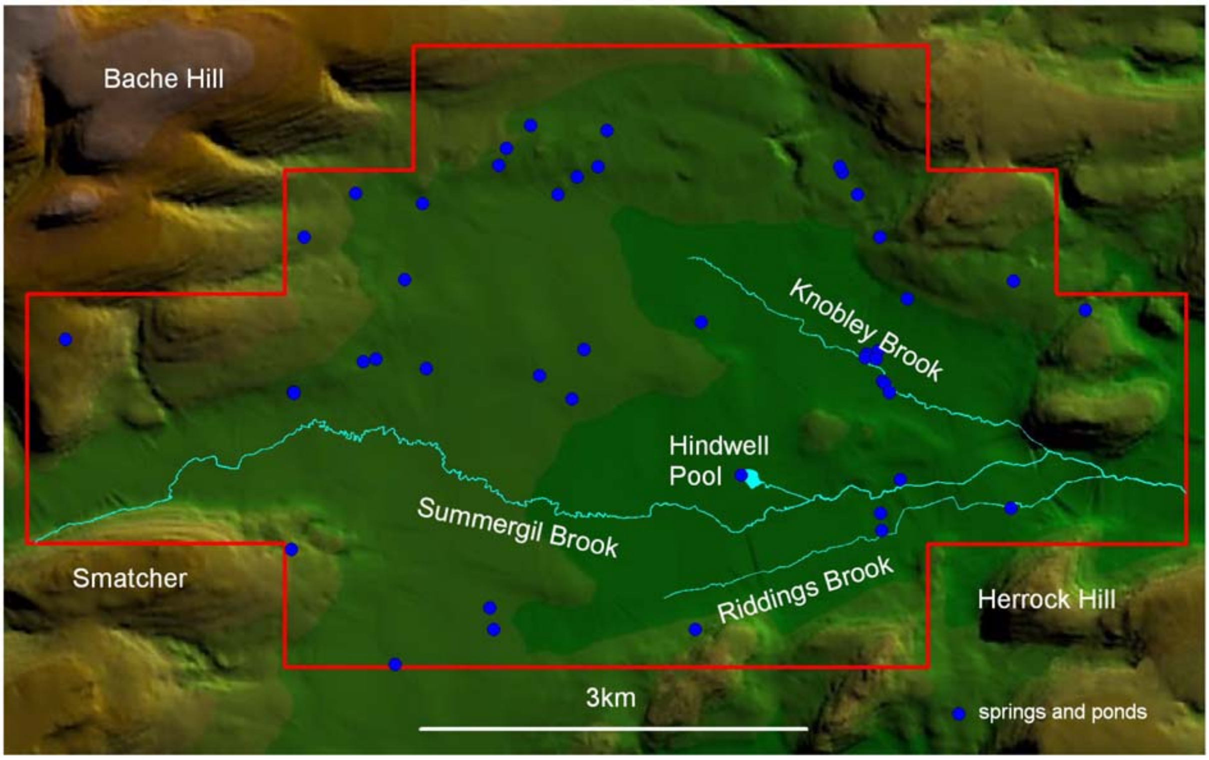

Fig. 3 The topography and main drainage of the Walton Basin

3.2 The floor of the basin rises gently from 180m OD in the east to around 230m in the west and is punctuated by fluvioglacial landforms such as drumlins, gravel ridges and meltwater channels (Dwerryhouse and Miller 1930, 96). In the southern part of the basin the main drainage is formed by the Summergil Brook and to a lesser extent the Riddings Brook, while to the north the Knobley Brook is the main watercourse. Between the two is a low, broad ridge rising to a maximum of *c*.25m above the surrounding countryside which, on the basis of the numerous flint scatters that it has produced, appears to have been favoured by early settlers. Towards the eastern end of the basin, at Womaston, is a low but prominent hill, perhaps a glacial drumlin, which is visible from the entire basin and also provides unparalleled views of the surrounding area, no doubt influencing the siting of the Neolithic causewayed enclosure on its summit.

Soils and geology by Richard Hankinson

3.3 The geology underlying much of the study area comprises mudstones and siltstones belonging to the Wenlock series of Silurian rocks, flanked on the north and west by similar rocks belonging to the Ludlow series, a later division of the Silurian. The south-eastern part of the area is rather different in character, being heavily faulted and containing both limestones of early Wenlock date and grits belonging to the Pre-Cambrian (BGS map of Wales, 1994). In more recent geological time the rocks have evidently been subject to glacial action, forming steep-sided valleys with flat floors, something which is particularly noticeable in the area west of New Radnor. The streams that currently flow generally from west to east across the study area are too small to create more than minor changes to the existing topography and have limited themselves to eroding the glacial ablation deposits which mask the underlying rocks on the lower ground of the study area.

3.4 Information on the soils of the locality was provided by the National Soil Resources Institute at Cranfield University as two *Soils site reports* (via https://www.landis.org.uk/sitereporter/). These contained a range of data regarding the soils of the study area, including their nature, permeability and source of origin (Fig. 4).

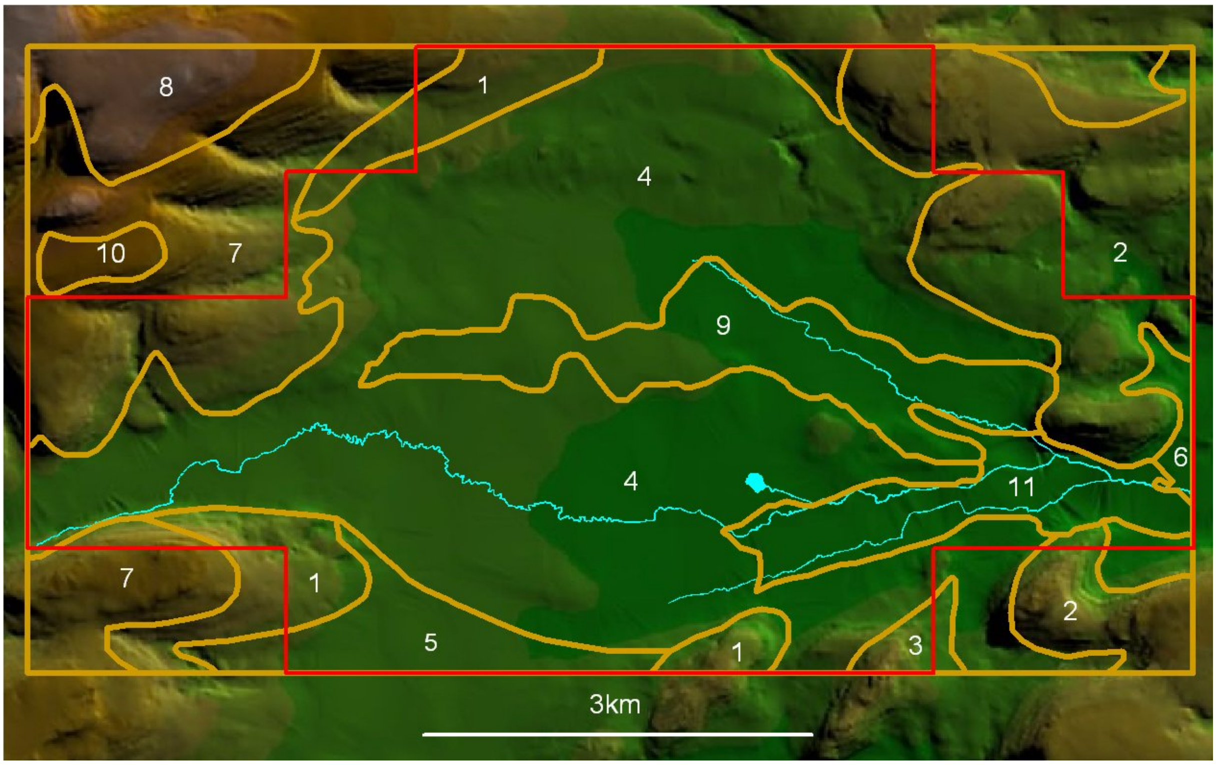

Fig. 4 The principal soil types within the study area: 1 – Denbigh 1, 2 – Barton, 3 – Trusham, 4 – East Keswick, 5 – Nercwys, 6 – Rowton, 7 – Manod, 8 – Hafren, 9 – Brickfield 2, 10 – Wilcocks 2, 11 – Conway.

3.5 The most widespread soils occur on the lower ground of the Walton Basin and comprise deep, well-drained, fine loamy soils of the East Keswick 1 soil association, although a narrow strip of land occupied by slowly permeable, seasonally waterlogged, fine loamy soils of the Brickfield 2 association crosses this area in an east/west direction. Both of these soil types are derived from glacial drift, although the latter is more prone to seasonal waterlogging and is therefore perhaps more clayey in nature. At the eastern end of the basin the lower ground is occupied by deep stoneless fine silty and clayey soils of the Conway association, derived from river alluvium, where groundwater is present near the surface; this is flanked by well-drained fine silty and loamy soils over gravel belonging to the Rowton association at the extreme east end of the study area. With the exception of a section of relatively low ground extending beyond the southern margin of the study area, where deep fine loamy soils of the Nercwys association are recorded, most of the northern, eastern and southern margins of the study area comprise higher ground occupied by fine loamy and silty soils over rock, belonging to the Denbigh 1, Barton, and Trusham associations. On the west, the higher ground flanking the basin is occupied by well-drained fine loamy or silty soils over rock, belonging to the Manod association.

3.6 George (1970, 126) describes the main movement of ice from the Radnor Forest in the last glaciation as being directly into the plain occupied by Hereford, meaning that it would have been flowing from west to east or south-east across the study area, and this seems to be borne out by the soils. It is certainly tempting to suggest that the strip of soils belonging to the Brickfield 2 association might be indicative of a late glacial outwash channel infilled with material from glaciers which by then had retreated further west, resulting in only the finer, more clayey, material suspended in the glacial meltwater reaching the study area. The gravels to the east, if glacial in origin, indicate a more active environment in which the leading edge of glaciation was nearer, although they could also be related to powerful erosive forces linked to the constricted outlet at the eastern end of the Walton basin, where the Hindwell Brook now flows between Burfa Bank and Herrock Hill. The more recent river alluvium which appears in the lower courses of the Summergil/Hindwell and Knobley brooks has presumably masked these glacial ablation deposits, and is significant as it provides one of the few areas on the floor of the Walton Basin where groundwater can be reliably found close to the surface, as the Summergil often dries up in the summer, hence its name. The periodically dry section of the Summergil seems to be linked to the East Keswick soils, implying that they are sufficiently permeable to permit the sub-surface transportation of water coming from the relatively free-draining soils of the surrounding hills.

3.7 Overall, the effect of the subsoils on the suitability of the Walton Basin for permanent settlement is clear; the periodic summer drought conditions highlighted by the Summergil Brook over much of the western part of the basin would presumably have meant that settlement was more likely to concentrate on the margins of the river alluvium at its eastern end, where water was more reliably available. Otherwise, the main water supplies would have been around the margins of the basin or perhaps at one of the few springs where sub-surface water could find its way to the surface. The access to a reliable water source may have been one of the main reasons for the siting of the Roman fort and marching camps at Hindwell, rather than further to the west in the basin. The implications of water availability on the siting of any prehistoric settlements remain to be understood, although the line adopted by the Hindwell cursus does roughly coincide with the divide between the drier northern and western parts of the basin from the wetter south-east.

Fig. 5 Cropmarks visible in 1984 show part of the complex of palaeochannels along the course of the Summergil Brook. Photo CPAT 84-c-0336

Palaeochannels

3.8 Topographical and cropmark evidence has revealed parts of a complex hydrological system (Fig. 6), most of which is likely to date to the late glacial period. As noted above, the floor of the basin would at one time have been a large glacial outwash fan which might also have included a glacial lake. It is likely that the principal drainage system within the basin, namely the Summergil, Riddings and Knobley Brooks, has itse their origins in the late glacial period, with outwash from ice sheets to the west cutting through earlier glacial gravels to create broad, but shallow valleys. Within the basin these streams may have been braided and cropmark evidence provides hints of a palimpsest of small, meandering channels which are particularly evident along the course of the Summergil Brook (Fig. 4). Indeed, one of the more prominent present-day landforms is the pronounced scarp along the northern, and to a lesser extent the southern side of the Summergil Brook, which presumably mark the extents of channel movement. A mapping exercise of similar palaeochannels in the area around the Thornborough Henges in North Yorkshire also concluded that they were probably associated with aggradation of a glacial outwash fan during the late glacial period and, more importantly, suggested that it was unlikely that such channels would have been visible to the earliest settlers (Oakley *et al*. 2005) since by that stage the main drainage, in this case the River Ure, had become established close to its current position.

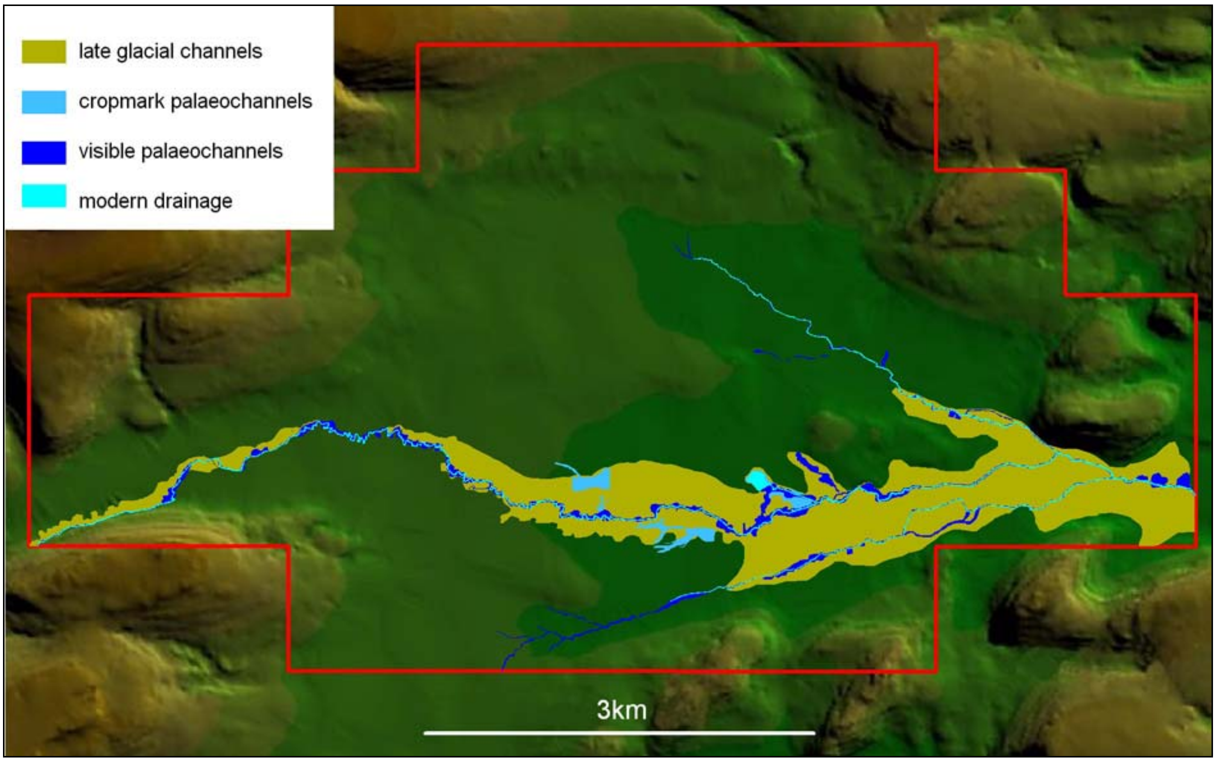

Fig. 6 Mapping of the late glacial channels and palaeochannels

3.9 There is no evidence that reveals at what period the streams became more formalised into single, more stable channels, but it seems likely that even once this had occurred the hydrology was far from static. Evidence from ground observations and LiDAR data suggests that there may have been a period of rejuvenation which is particularly evident in the area south of Hindwell where a substantial palaeochannel can be identified between the present courses of the Summergil and Hindwell Brooks (Fig. 7). Whether the feature represents an earlier, more northerly course of the Summergil is uncertain, as is the date at which it is likely to have been active. It is tempting to suggest that rejuvenation could be related to woodland clearance and early agriculture during the Neolithic period, and evidence from elsewhere in

Britain suggests that this may well be the case (Brown 1997). Regardless of its period of active use, the channel clearly had a significant impact on the siting of the large Neolithic palisaded enclosure at Hindwell, which appears to terminate at the western edge of the channel. By contrast, however, the double palisaded enclosure further to the east may well have straddled the channel, as it is now cut by the Hindwell Brook.

Fig. 7 The large palaeochannel south of Hindwell viewed from the south. The Hindwell palisaded enclosure appears to terminate on the western edge of the channel.
Photo CPAT 3241-0020

3.10 As might be expected, a comparison between the modern drainage and that mapped by the Ordnance Survey in the later 19th century shows that the main watercourses continue to evolve, meandering within zones that are up to 60m across. This more recent stream movement will generally have removed any traces of earlier archaeology that lay within these fluvial corridors.

3.11 The presence of water within the basin appears to have influenced settlement from an early period. The underlying soils are responsible for a pattern of drainage which sees the Summergil Brook running dry during the summer months, as its name suggests, while springs persist around the margins of the basin, and particularly in the east, around Hindwell, where the subterranean passage of water through the gravels is interrupted by a bed of clay (Lewis 1849).

4 THE ARCAHEOLOGY OF THE WALTON BASIN

4.1 The archaeology of the Walton Basin was originally summarised by Gibson (1999) and some of the following text is drawn from that source, although a number of major discoveries in the intervening period have added considerably to our understanding of the area, particularly during earlier prehistory.

Earlier prehistory

4.2 The earliest signs of human activity are represented by a single flint artefact, a shouldered point of upper palaeolithic date (13,000-11,800 BP), from excavations in the medieval town of New Radnor (Jones 1998, 158-161). The majority of evidence for earlier prehistoric occupation, however, is provided by the numerous lithic scatters which have been found after ploughing. At least 7900 flints are recorded within the basin (Gibson 1999, 48), of which 175 are thought to be Mesolithic forms, while the majority perhaps date from the Neolithic and Early Bronze Age, though many remain undated. It is likely that these scatters represent plough-truncated settlement sites though it is not known whether the settlement was permanent, temporary, continuous or intermittent.

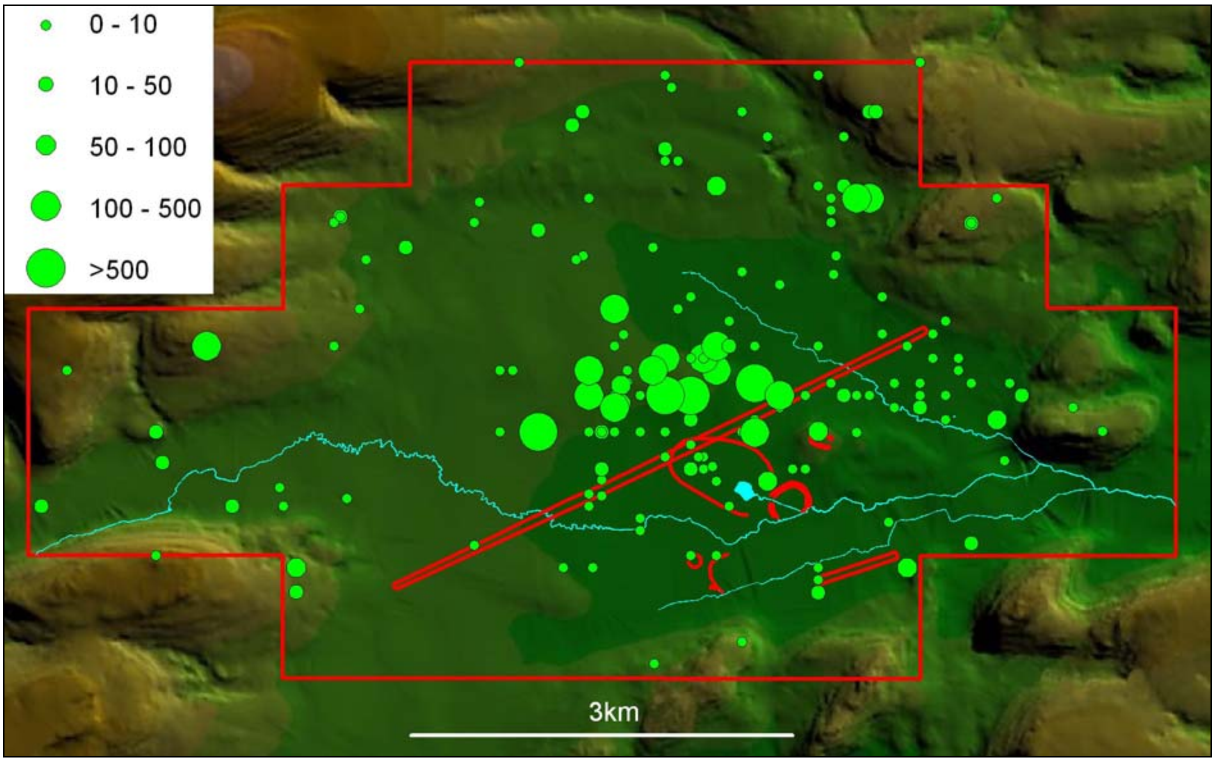

Fig. 8 Distribution and relative size of flint scatters in relation to the major Neolithic monuments

Neolithic

4.3 The complex of Neolithic monuments on the eastern side of the basin is one which is virtually unparalleled in an area of comparable size anywhere else in the British Isles. On the basis of current evidence the earliest monument appears to be the Hindwell cursus, which was constructed sometime after 3950-3520 BC and before 2870-247 BC. This extends for 4.6km, making it perhaps the second longest cursus in Britain, comprising parallel ditches around 3.9m wide and 1.8m deep, set between 54m and 74m apart. A second cursus at Walton Green is considerably smaller at 673m in length and 55-58m wide and, despite trial excavation, this remains undated. The two cursuses are on a similar alignment but their landscape setting is quite different. The Walton Green cursus lies parallel to the valley side and seems to be aligned on the eastern entrance to the valley, while the Hindwell cursus has more the appearance of a vast barrier, dividing the basin into two.

4.4 Apparently contemporary with the Hindwell cursus, and sited on a low but prominent hill overlooking it, is the Womaston causewayed enclosure, dated to around 3660-3340 BC. The enclosure was discovered as recently as 2006 through aerial reconnaissance and comprises a double circuit of interrupted ditches extending over an area measuring 180m by 130m, with an internal area of 1.8ha. Trial excavations in 2008 revealed that the ditches were U-shaped, around 2.5m across and 1.8m deep, with evidence for recutting suggesting several periods of activity.

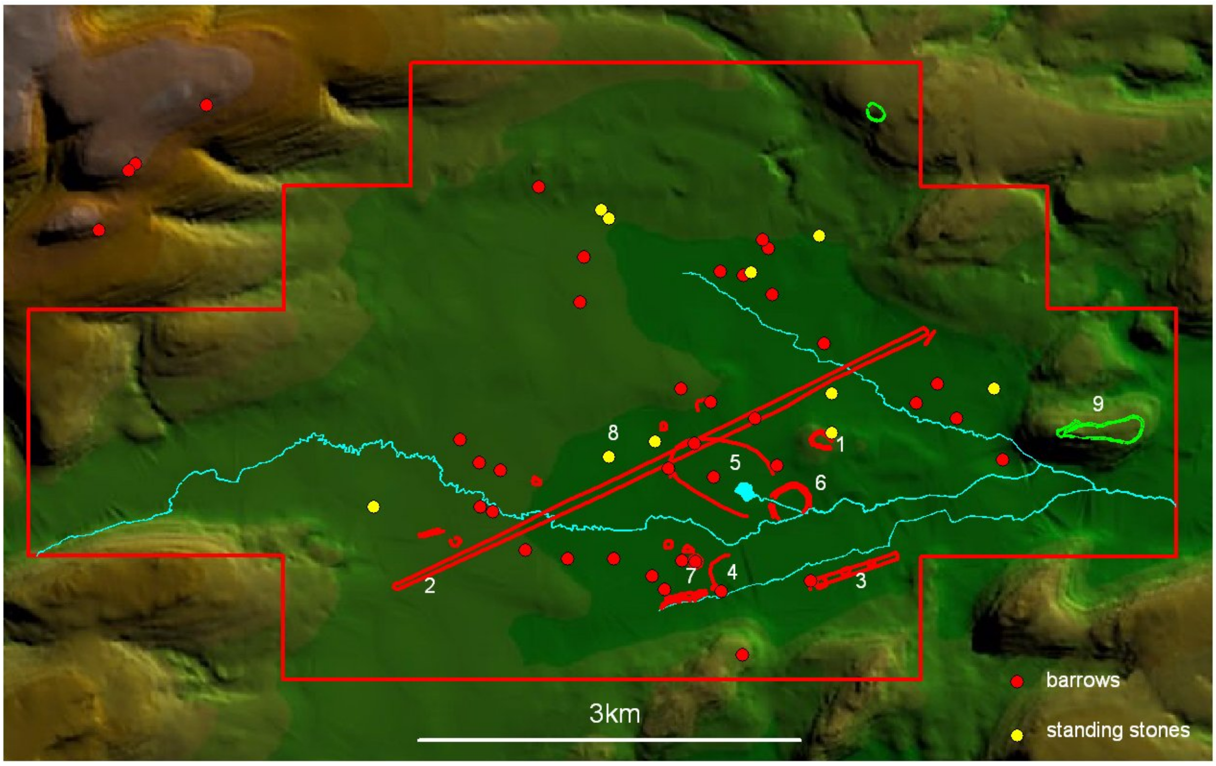

Fig. 9 The prehistoric sites of the Walton Basin. 1 – Womaston causewayed enclosure, 2 – Hindwell cursus, 3 – Walton Green cursus, 4 – Walton palisaded enclosure, 5 – Hindwell palisaded enclosure, 6 – Hindwell double-palisaded enclosure, 7 – Walton Court Farm ring-ditch, 8 – Four Stones stone circle

4.5 At a later date, and after the Hindwell cursus fell out of use, three large, palisaded enclosures were built, two at Hindwell and one at Walton. They were each constructed of large upright oak posts which may have stood to 4m above ground, but they had been built in subtly different ways. The evidence suggests that the three enclosures were built in the period between about 2800–2400 BC, possibly in sequence. Changes in construction technique perhaps reflect a change in custom, or technology, or available resources. The earliest to be dated securely, and by far the largest, is the 34-hectare Hindwell enclosure, which had individual posts set in intercutting pits with post-ramps. This was superseded by the 7-hectare Hindwell double-palisaded enclosure, which was built of smaller, close-set posts placed in continuous, steep-sided foundation trenches. This perhaps suggests that the earlier enclosure was built of trees hewn from the wildwood (most likely on the valley sides) whereas the later enclosure was built from timber taken from regenerating woodland. The enclosure at Walton is not closely dated but was built of widely spaced posts set in separate pits with post-ramps, a form which might suggest that it should be the earliest of the palisades. A review of cropmark evidence has also suggested a possible third, triple-ditched palisaded enclosure immediately west of the site at Walton, the position of which suggests it may straddle the Riddings Brook.

4.6 The giant Walton Court Farm ring-ditch is just under 100 metres in diameter, a similar size to the earliest phase at Stonehenge, and is dated to the period 2570–2300 BC, suggesting that it is amongst the latest of the large monuments in the Walton Basin.

4.7 Direct evidence for Neolithic settlement, other than that provided by flint scatters, is scarce, being limited to the results from two excavations at Upper Ninepence during the 1990s. The excavation of a barrow uncovered a series of pits containing Peterborough Ware, flints and charred materials, and dating from around 3000 BC. Evidence suggests that at this time the surrounding landscape would have contained cultivated crops, including emmer and bread wheat, as well as grassland and hazel scrub. Later Neolithic activity, around 2700 BC, was associated with Grooved Ware and included two circular, stake-built structures, several hearths and a number of pits. Cropmark evidence has also revealed a nearby enclosure around 130m across which does not appear to be defensive and, although not closely dated, may belong to the later Neolithic or Early Bronze Age (Gibson 1999).

4.8 Although as yet unconfirmed, it has also been suggested (Gibson 1999, 9) that the large mound at Knapp Farm may be a large prehistoric barrow, rather than a small motte, similar to well-attested sites such as Silbury Hill, Marlborough, and Hatfield Barrow, in Wiltshire and Duggleby Howe, in Yorkshie.

Bronze Age

4.9 There are six surviving standing stones in the basin, only three of which are thought to be *in situ*, although place-names hint at the former existence of several more. The only stone circle within the basin, at Four Stones, is not actually a circle at all but, as the name suggests, is an arrange of four large boulders forming a type of monument generally referred to as a 'four-poster'.

4.10 The principal indicators of Bronze Age activity are the numerous burial monuments within and surrounding the basin. Seven barrows survive as prominent earthworks on Bache Hill, Whinyard Rocks and Whimble, overlooking the basin from the north, and were obviously sited so as to be visible from the floor of the basin. Within the basin itself 17 barrows survive as upstanding earthworks, including one complex site within the Hindwell palisaded enclosure which may also have incorporated a stone circle, now buried beneath the mound. Two others have been destroyed by quarrying. A further 18 sites have only been recognised as cropmark ring-ditches, having been levelled by centuries of ploughing.

4.11 With the exception of a number of flints, artefacts of Bronze Age date are rare, which makes the chance discovery in 1981 of two spectacular finds at Maesmelan Farm, near New Radnor, all the more remarkable. They were found during ploughing and comprise two gold Capel Isaf type hook-fastened bracelets of Middle to Late Bronze Age date (Green *et al.* 1983).

Iron Age

4.12 There are two hillforts within the study area, Burfa Bank and Pen Offa, both of which are univallate, though Burfa has an additional line of defence in the area of the entrance. On a smaller scale there are eight enclosures within the basin which are known only from cropmark evidence and are generally assumed to date from this period. Two of the enclosures have been subject to trial excavations which were generally uninformative, though the site known as Hindwell I was dated to the 4th-2nd centuries BC. Perhaps associated with the enclosures are a further set of cropmark features comprising linear ditches which are likely to respresent elements of field systems. There is also evidence for the reoccupation of the causewayed enclosure at Womaston during this period (Jones 2010, 28).

Roman

4.13 There is a growing body of evidence for Roman activity in the basin which focuses on the area around Hindwell and Walton. Cropmark evidence has so far identified five, or perhaps six, marching camps which vary in size from 1.9ha to 17.4ha, all of which were presumably associated with successive Roman campaigns into mid Wales, initially during the pre-Flavian campaigns of the AD 50s and early 60s, and later during the Flavian operations in Wales in AD 73/4-77 (Burnham and Davies 2010, 37-43).

4.14 The auxiliary fort at Hindwell may well have its origins in the Neronian period, between AD 55-65, with occupation probably extending into the Flavian period, beyond AD 80 (Silvester 2010), although there has been no major excavation on the site. The outline of the fort can still be traced as slight earthworks measuring around 155m by 148m, enclosing an area of *c.* 2.29 ha. Details of the fort interior are known only from cropmark evidence and a detailed geophysical survey, conducted in 1998, which suggest a regular layout of timber buildings, many of which may have been destroyed by fire, together with the headquarters building (*principia)* with its courtyard. The defences are complex, with three ditches, the alignment of the outermost suggesting an earlier phase of fort construction.

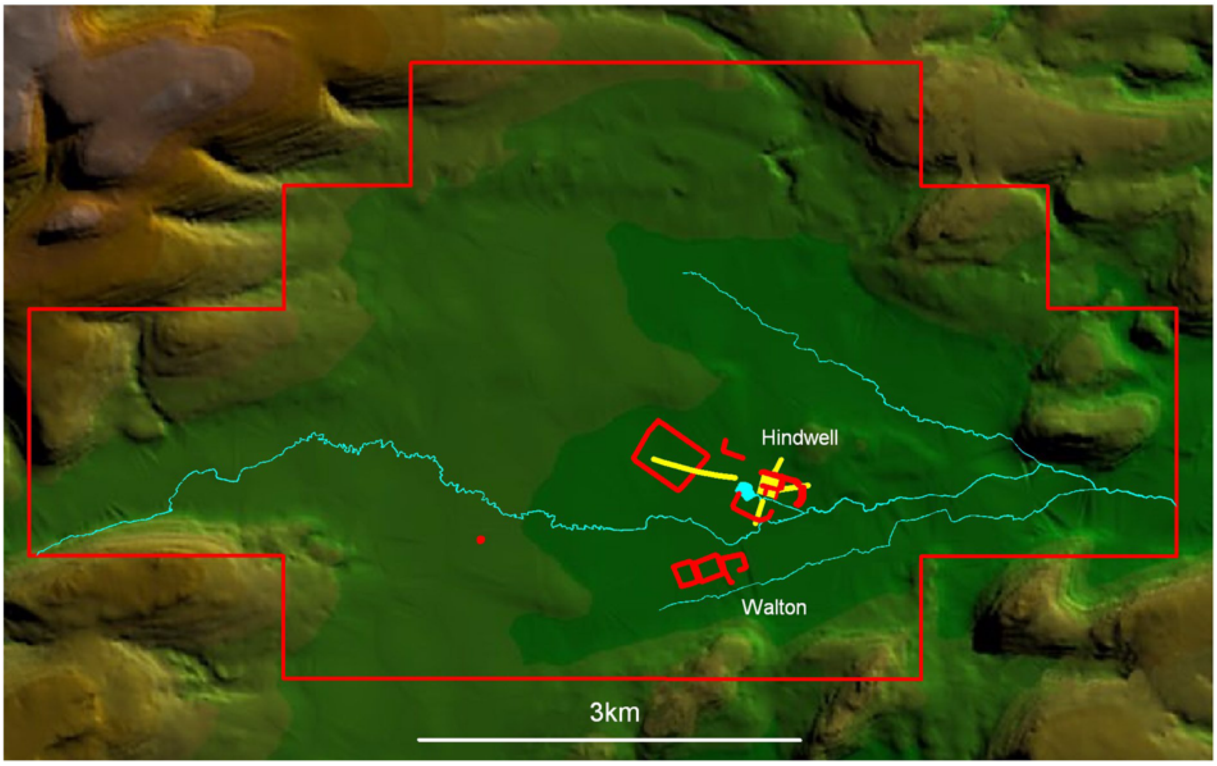

Fig. 10 The Roman sites and roads (in yellow) of the Walton Basin

4.15 Roads have been identified leading from all four gates and that to the east was flanked by a civilian settlement, or *vicus*, with indications of buildings and ancillary activity spreading out for about 30m on either side of the road and defined, at least on the south side, by a narrow, V-shaped ditch. The *vicus* continues for about 160m beyond the fort defences, occupying an area of around 0.7ha. Recent excavations have confirmed that the eastward extent of the *vicus* is bounded by a system of triple ditches, the innermost being around 2.65m wide and 1.2m deep, together with a four- or six-posted gateway across the road (Jones 2012b).

4.16 Finds made in the 1950s about 120m to the south of the fort included tile and hypocaust bricks, suggesting the presence of a bath-house close to the stream. Recent geophysical surveys and trial excavations have confirmed the line of the road in this area, as well as a large defensive ditch defining a probable annex, but the precise position of the bath-house has yet to be established.

4.17 Other Roman sites include a possible signal station near Harpton, defined by double ditches, and evidence for late Roman activity near Four Stones, which came to light during excavations focusing the Hindwell cursus and included several small ditches, the pottery indicating activity dating to the late 3rd to 4th century, with other finds including part of a rotary quern.

Early Medieval

4.18 As elsewhere in Wales and the Marches little is known of the area during the centuries immediately after the Roman withdrawal. The only monuments which are known to date to this period are Offa's Dyke, which crosses the eastern end of the basin, and a short linear earthwork cutting off the western entrance to the basin some 1.5km beyond New Radnor. The Domesday Book of 1086 records manors at Radnor, presumably Old Radnor, along with Harpton and Knill (Thorn and Thorn 1983). There is evidence to suggest that Old Radnor in particular has early origins as lands belonging to church were supposedly acquired by the See of Worcester in 887, while the configuration of the churchyard and the remarkable font within the building both point to beginnings in the early medieval era (Silvester 1994b).

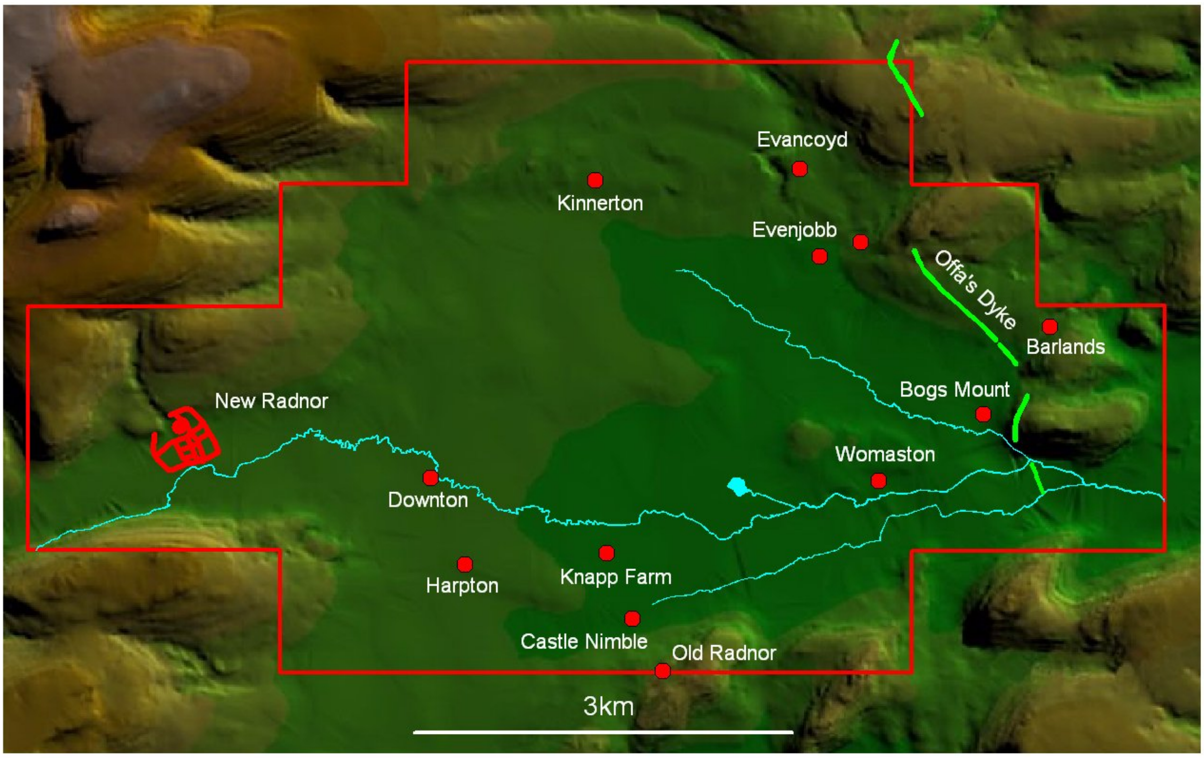

Fig. 11 The Medieval sites of the Walton Basin

Medieval

4.19 The often turbulent history of the area is evidenced by the number of defensive earthworks, the most prominent being the castle at New Radnor, although there are also eight, or perhaps nine mottes, three with attendant baileys, and an unusual ringwork at Old Radnor which is referred to as moated parsonage in 1607 (Silvester 1994b, 134).

4.20 Medieval settlement is dominated by the planned town of New Radnor which was laid out in the mid- to late-12th century, occupying more level ground below the castle. The town defences enclosed around 12ha and these, together with the regular gridded street plan, are largely still evident today. Although the town expanded rapidly during the 14th century it appears to have declined in the later Middle Ages, possibly as a result of being sacked by Glyndŵr in 1401. By 1544 it was described as a 'decayed town' and its decline is thought to have continued throughout the 16th and 17th centuries (Jones 1998, 134-5; Silvester 1994a). It is notable that medieval settlement appears to be situated around the edges of the basin, perhaps reflecting the availability of reliable water sources.

4.21 The modern villages of Old Radnor and Kinnerton are both shrunken medieval villages with earthwork traces of the former settlements located in the surrounding fields (Jones and Owen 1996). Traces of medieval field systems associated with these and other settlements are also apparent, surviving mostly as areas of ridge and furrow, but also including an area of fairly regular fields between New Radnor and Kinnerton which has only recently been recognised during the present study, surviving as low banks and lynchets underlying the present field pattern.

5 FIELD PATTERNS by Bill Britnell

Introduction

5.1 A preliminary study of the field patterns in the Walton Basin was undertaken to see what light this might shed on the otherwise relatively poorly understood history of settlement and land use in the area during the early medieval, medieval and early post-medieval periods.

5.2 Early medieval settlement in at least the southern and eastern area of the area is suggested by the possible 9th-century or earlier origins of the church at Old Radnor (Silvester and Martin 2011), and by documentary evidence for the existence of 11th-century manorial centres involved with farming at Harpton, Old Radnor and Barland recorded in the Herefordshire Domesday hundred of Hazetre (Thorn and Thorn 1983; Rodd 1958; 1962).

5.3 Small manorial centres were also in existence at Evenjobb and Kinnerton by the beginning of the 14th century and possibly much earlier. The early manorial centres at Old Radnor, Barland/Burfa, Evenjobb and Kinnerton are each associated with one or more earthwork castles of 11th- to late 13th-century date. A further medieval manorial centre of 11th- to 13th-century date is also implied by the earthwork castle at Womaston, though the interpretation of the mound at Knapp Farm (**359**) as yet another castle mound is more equivocal (Gibson 1997).

5.4 The medieval planted town at New Radnor is documented as being in existence by the late 12th or early 13th century, sited below the earthwork castle probably established here by the end of the 11th century as the *caput* of the Radnor lordship (Silvester and Martin 2011). The inhabitants of the medieval and later town would have been actively involved in farming and by at least the 18th century a number of farms, such as The Porth and Newgate Farm, had become established within the town. Crop-processing of cereals cultivated in arable fields by the inhabitants is indicated by medieval and later corn-drying kilns recorded within the town (Jones 1998).

5.5 Little study has yet been undertaken of the origin of isolated farms and smallholdings in the Walton Basin and the evidence this might provide for the history of land-use. Some of these farms were in existence by the 15th century, as represented by cruck-built halls at Burfa Farm (**32098**) and Lower Farm (**16067**), though others, such as Hindwell Farm (**32135**) may only have come into existence as part of the enclosure movement and rise in estate farming during the course of the 16th to 18th centuries.

5.6 Surviving traces of ridge-and-furrow cultivation have been recorded near New Radnor (**19128**, **19132**, **19137, 19138, 33103, 33104**), Old Radnor (**16267, 33132**), Kinnerton (**15831**, **19009**, **19350**), Evenjobb (**16268**, **16269**, **16271, 33145**) and Downton Farm (**33107**, **33142**, **33143**), some but not necessarily all of which might represent medieval open-field cultivation.

Field pattern study

5.7 The earliest surviving mapping of the Walton basin that has been identified showing field boundaries is a later 18th-century estate map, perhaps dating from the 1790s, showing the properties belonging to Percival Lewis (Powys Archives, R X 58). This shows field names and is largely limited to part of the area between New Radnor and Downton Farm. No indication of land use is given but field names on the map such as 'Dole Piece' (Welsh *dol* = 'meadow), 'Calves Plock' ('plock' being a common Herefordshire term for a small plot of land), 'Lower Meadow', and 'Cow Pasture' suggest a predominantly pastoral economy in this part of the basin by that date. Names indicating arable are less common but may include Mass Downton (? Welsh *maes* = 'open field'). The earliest consistent mapping for the whole of the basin is given by the tithe maps for the ecclesiastical parishes of Old Radnor and New Radnor, dated respectively to 1841 and 1845. These are accompanied by apportionments which indicate land use as well as field names, which show that the extent of arable agriculture was more extensive within the basin in the mid 19th century than at the present day (see section 6).

5.8 The methodology adopted for the study followed that employed for historic landscape characterisation of a number of areas within the Clwyd-Powys region (eg Britnell 2003; 2005). In the present study this involved the plotting of polygons within the project study area according to shape, size and relationships of parcels of land represented on modern mapping. For convenience this was undertaken within the project GIS using the Ordnance Survey Mastermap vector mapping, on the basis of the following subjective classification.

Mountain land

Two types are distinguished, 'open mountain land' and 'enclosed mountain land', the latter probably enclosed in the 19th century, representing former upland commons. Some areas of mountain land were evidently planted as conifer woodland in the 19th and 20th centuries.

Stream fields

These are irregularly shaped fields whose boundaries are largely dictated by meandering watercourses. These generally appear to represent relatively late enclosure of common meadows.

Irregular fields

Irregularly shaped fields adopting no clear overall pattern, subdivided into those below and those above 3 hectares and generally having the appearance of piecemeal enclosure. Some fields of this kind appear to represent more anciently enclosed land in the ownership of individual farms.

Regular fields

Blocks of roughly rectangular fields, though often without precisely straight boundaries, having more the appearance of large-scale enclosure or landscape reorganisation probably from late medieval times onwards within individual landholdings or estates, subdivided into those below and those above 3 hectares.

Strip fields

Two different categories of strip fields are distinguished: firstly, 'strip fields' which are long, narrow fields with a length to breadth ration of >2:1, often in groups with other similarly shaped fields; secondly 'reorganised strip fields' whose shape and outline, sometimes with dogleg boundaries, which have the appearance of amalgamated groups of former strip fields. Both field types have the appearance of being enclosed former medieval open fields.

Straight-sided fields
Fields with more precise boundaries, generally on marginal hill slopes and having the appearance of late, probably 19th-century, enclosure, subdivided into those below and those above 3 hectares.

Woodland
Different kinds of woodland represented on modern mapping, including sinuous tracts of ancient broadleaved woodland or scrub often along steep slopes or along watercourses, managed broadleaved or coniferous or mixed plantations often on steeper slopes or in areas of impeded drainage or on areas of former open hill land, and ornamental woodland or orchards generally associated with larger houses and estates. These different kinds of woodland clearly each have a different historical significance but have been grouped together at this stage.

Preliminary conclusions

5.9 The results of this preliminary and subjective study of field shapes are conjectural but suggest some of the processes involved in the development of the agricultural landscape of the Walton Basin since medieval times. The history of enclosure is probably obscured by the fact that much of the intensively farmed land in and around the basin was enclosed at a relatively early date, perhaps from the 15th and 16th centuries onwards, and by evidence for extensive boundary changes within the modern period.

Medieval open fields
There are hints of the survival in the modern landscape of the former existence of medieval open arable fields associated with the medieval town of New Radnor and the manors at Old Radnor, Kinnerton, Evenjobb and Womaston which were later enclosed and underwent boundary reorganisation. Some of the possible areas of enclosed open field appear to be associated with recorded evidence of ridge-and-furrow cultivation of possible medieval date.

Upland commons
The uplands encircling the Walton Basin probably survived as unpartitioned upland commons until the 19th century when some land was enclosed or encroached upon by smallholdings. Parts of the upland edge were planted with conifer plantations in the later 19th and 20th centuries.

Lowland commons
The often large and irregularly shaped fields along the principal streams probably owe their origin to once more extensive lowland commons held as winter grazing land and summer meadow. The predominantly large and generally irregular fields in the central, eastern and southern parts of the study area suggest a gradual and piecemeal process of enclosure of extensive lowland commons probably from the 16th and 17th centuries onwards, perhaps to be associated with the rise of estate farms such as those at Harpton Court and Hindwell Farm. Patterns of more regularly shaped fields in the vicinity of Walton Court and Lower Farm, Bestbrook Farm and Bache Farm suggest a more integrated process of enclosure or landscape reorganisation again probably associated with the management of landed estates.

Relict ancient woodland
There are hints of relict ancient broadleaved woodland on some of the steeper slopes around the basin and along some watercourses.

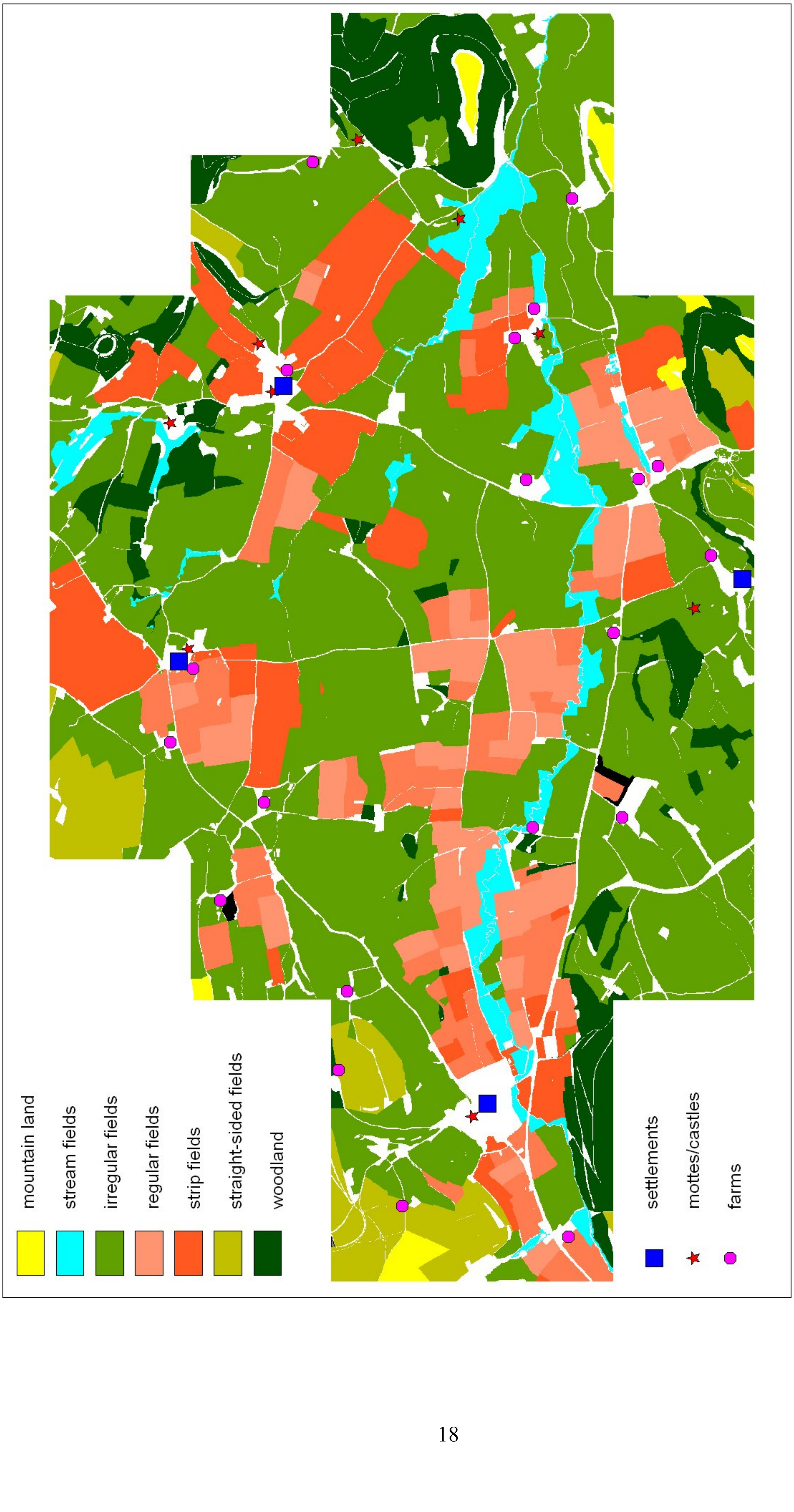

Fig. 12 An analysis of field patterns in the Walton Basin

Future work

5.10 Further work summarized below is needed to check the preliminary conclusions that have been reached.

Map regression analysis

It would be helpful to compare the field types identified here with those apparent on earlier mapping, including the later 18th-century estate map and the tithe map mentioned above, and to record the extent of boundary changes.

Field name research

More extensive analysis of field names, especially those give in the tithe apportionments, may provide useful information on earlier land use history.

Fieldwork

Fieldwork is needed to check the preliminary map-based study, looking at boundary types, lynchets and the association of field types with relict ridge-and-furrow, and woodland types. This would complement the work Lord Rennel in his *Valley on the March* (1958) which went some way in trying to identify surviving traces of early field patterns in the Hindwell valley.

6 LANDUSE WITHIN THE BASIN

6.1 At the outset of the project the only statistics available for landuse within the study area was provided by survey data produced in August 1992, derived from a series of field visits (Gibson 1999, 1-4). This was augmented by an assessment of available vertical aerial photography from 2006 (Getmapping) and 2009 (Next Perspectives); the resulting data, together with a digitization of the 1992 data, was incorporated in GIS mapping which could then be interrogated. A further data set was later added to incorporate details from the tithe surveys for Old Radnor in 1841 and New Radnor four years later. The result has been to provide four snapshots of landuse within the basin, which are depicted in Fig. 14 and summarised in Table 1.

Table 1: Comparative landuse statistics

Landuse	**1840s**		**1992**		**2006**		**2009**	
	ha	*%*	ha	*%*	ha	*%*	ha	*%*
Arable	1090	*33*	698	*21*	725	*22*	829	*25*
Fallow	-	-	290	*9*	269	*8*	198	*6*
Pasture	1556	*47*	1590	*48*	1712	*52*	1676	*51*
Woodland	263	*8*	156	*5*	143	*4*	139	*4*
Forestry	-	-	200	*6*	200	*6*	196	*6*
Moorland	73	*2*	40	*1*	25	*1*	25	*1*
Other/not recorded	318	*10*	326	*10*	237	*7*	237	*7*

6.2 The results provide a useful indication of general trends and, as outlined below, form the basis for a further stage of analysis relating to the potential impact of agriculture on archaeology. However, a caveat must be introduced at this point regarding the reliability of the data. It is not possible to determine how much land might have been within a crop rotation at the time of the tithe surveys, since agricultural land was only divided into arable and pasture (or meadow), rather than specifically including fallow. The 1992 study perhaps presents the most reliable statistics, since this was undertaken through field visits, whereas the data for 2006 and 2009 were gathered remotely, from aerial photography, introducing difficulties in differentiating between permanent pasture, fallow, and pasture within a rotation. There is also no data available regarding the nature of the crops grown or, in general, the methods of cultivation which can have significantly different impacts on buried archaeology.

6.3 An examination of landuse during the 1840s shows a relatively even geographical distribution of agricultural land between pasture and arable Topography and soils do not appear to have exerted a significant influence over the choice of farming practice. By area, pasture occupied 47% of the basin and arable 33%, although as noted above it is likely that more than a third of the land was included within a rotation, with any fields under fallow having been counted as pasture. The likelihood is that most, if not all farms were mixed, neither specialising in arable, dairy nor sheep production. Woodland at this time accounted for only 8% of the area, concentrated mostly around the edges of the basin, while the moors which dominated the surrounding uplands only impinged slightly into the north-western and north-eastern margins of the study area.

6.4 One hundred and fifty years later, in 1992, the situation was subtly different, indicating a number of general trends. Firstly, the area under arable crops had reduced significantly from 33% to 21%, but with a further 9% of fields under fallow. What is apparent is not just the overall reduction in arable, but also the change in its geographical distribution. Significantly, the western, northern and southern margins of the area had been turned over almost exclusively to pasture, suggesting a degree of specialisation on a number of farms where pastoral farming was now dominant. Elsewhere within the basin mixed farming was still the norm, although pasture as a whole accounted for 48% of the area. The area of native woodland had dropped from 8% to 5%, having been partly turned over to agriculture and also in part replaced by coniferous plantations, which now accounted for 6% of the area. The area of moorland is also noticeably smaller, with 30ha having changed to improved pasture.

Fig. 13 The concentration of arable cultivation in the centre and east of the basin is most apparent around harvest time. Photo CPAT 2627-0068

6.5 Data from both 2006 and 2009 show little overall change and although a slight increase in arable land is indicated in the most recent figures there is also a slight reduction in fallow and pasture, perhaps suggesting that this is in part the result of expected variations within rotations. The slight but steady decline in native woodland is also an apparently also a trend.

6.6 Taking the three recent data sets together it appears that there is no obvious relationship between soils and agricultural regimes. For example, the central ridge which bisects the basin from west to east has soils of the Brickfields 2 association, which are slowly permeable with seasonal waterlogging and should, in theory, be areas where dairy farming is more prevalent, whereas in fact arable farming predominates. That said, the area between the Summergil and Riddings Brooks has soils of the Conway association which are prone to seasonal waterlogging and in this area permanent pasture is more common, as would be expected, although there has been a clear trend to convert some of this to arable. The overall conclusion is that the Walton Basin is an area which is particularly favourable to agriculture and that, although some areas may be more prone to summer drought, the overall conditions have enabled mixed farming to be practiced over most of the area for many centuries. This has, of course, had a predictable impact on the archaeology of the basin, much of which has been gradually levelled by the plough, and in some cases this situation continues.

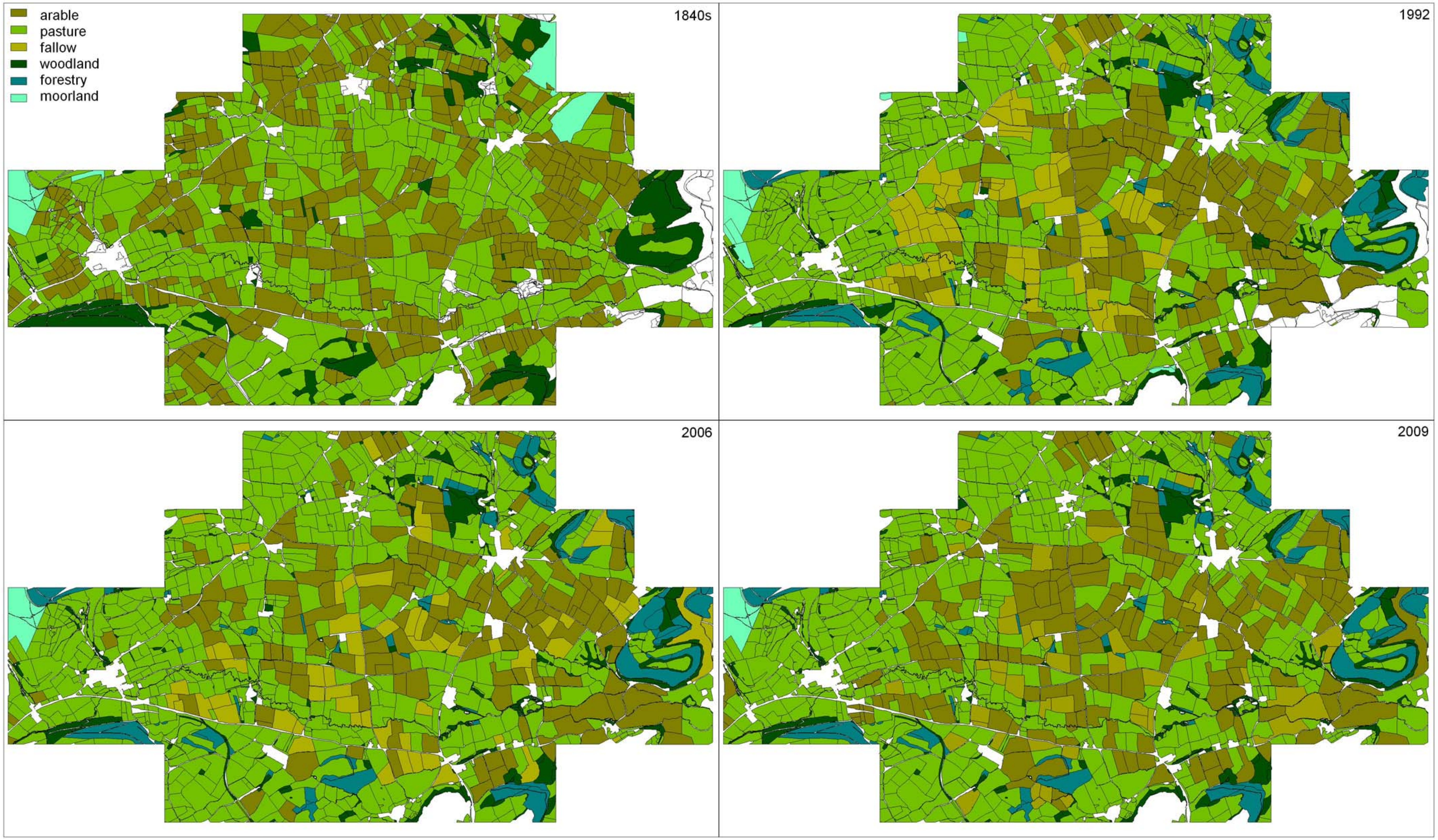

Fig. 14 Comparative landuse mapping

7 ARCHAEOLOGY, FARMING AND CULTIVATION METHODS

7.1 A series of studies conducted in England have examined the impact of agriculture on upstanding and buried archaeological remains. These include, amongst others, the *Monuments at Risk Survey* (MARS) (Darvill and Fulton 1998), the *Management of Archaeological Sites in Arable Landscapes Project* (OA 2002), and the more recent *Conservation of Scheduled Monuments in Cultivation* (COSMIC) (OA 2006) and especially the Trials project (Booth and Spandl 2010), complemented in Scotland by a study of cropmark archaeology in the Lunan Valley, Angus (Dunwell and Ralston 2008). Intensive, predominantly arable agriculture, was recognized by the COSMIC study as the principal unmitigated threat to the buried archaeological resource, identifying the processes that cause damage as being:

- the conversion to arable of previously uncultivated grassland which includes archaeological sites
- the encroachment of cultivation on sites surviving as ‘islands’ in arable fields
- the erosive effect of repetitive cultivation nominally ‘to the same depth’, and
- deeper than previous cultivation practices for the introduction of certain crops and to address problems with soil fertility and drainage

7.2 The original COSMIC study, conducted in 2003-6 and known as COSMIC 1, developed and tested an integrated risk assessment and mitigation model for archaeological sites in arable cultivation. The project also quantified the actual threat from arable cultivation for the monuments assessed in the East Midlands. Using the results of the study a risk assessment methodology was developed which could be implemented in a wider context and certain factors were identified which most often resulted in sites being at serious risk, including the following:

- the presence of earthworks or vulnerable archaeological deposits (eg burials/mosaics)
- root and tuber crop cultivation
- particular vulnerability to erosion – eg locations on moderate to steep slopes with lighter soils
- any combination of the above variables

7.3 Soil tillage is performed in order to optimise productivity by alleviating the physical, chemical and biological constraints of soil. The effects of arable cultivation on archaeological deposits are mostly related to the impacts of ploughing, whereby continuous cultivation will gradually erode upstanding monuments while potential increases in the depth of cultivation (the plough-zone) can plane off buried features and deposits. The effect of plough erosion on buried archaeological remains is generally of a cumulative nature and erosion is most significant on slopes where material from the upper part of the slope is often deposited at the lower part of the slope, resulting in differential preservation.

7.4 The growing of root crops in particular has long been recognized as presenting a significant threat to archaeological deposits, owing to the requirements for deeper cultivation. Potatoes require good seedbeds which are constructed by a bed-former, which is drawn through the soil to construct cultivation ridges. Further soil disturbance can occur at harvesting when a flat share passes under the seedbed and lifts the potatoes (White 2001).

7.5 In recent years, under economic and environmental pressure, much has been done to develop alternatives to conventional inversion tillage (ploughing) in order to reduce costs and also help to alleviate environmental concerns. Systems of non-inversion, or conservation tillage, have been developed with the objective of limiting the mechanical disturbance of the soil to that required for seed placement, and to develop a soil structure which does not restrict root growth and function, and therefore crop yield. This involves the cultivation of the soil by techniques in which straw and plant residues are maintained on or near the soil surface and non-inversion tillage systems can now operate at shallower working depths than the plough and at higher speeds, increasing the work rate, reducing fuel use and restricting the risk of soil erosion because crop residues remain on the soil surface (Morris 2009). A study in 2006 estimated that approximately 46% of arable land was then under some form of conservation tillage (Jones *et al.*, 2006).

Fig. 15 Potato ridging adjacent to the Four Stones stone circle in 1996.
Photo CPAT cs96-29-0033

7.6 Table 2 presents a summary of current tillage systems where the intensity of tillage decreases from the top to the bottom of the table.

Table 2: Summary of tillage systems (after Morris 2009)

System	System category	Typical field operations
Conventional tillage	Inversion	Primary cultivation with mouldboard plough Secondary cultivation with power harrow discs or one or two passes of a heavy press Cultivator drill Roller
Minimum tillage	Non-inversion	Cultivation to create a stale seedbed Spray off weeds in stale seedbed Shallow tine or disc, press Cultivator drill Roller
Strip tillage	Non-inversion	Autumn or spring cultivation to create strips Drill into strips Post emergence spray as needed
Direct drilling	Non-inversion	Spray off weeds in stubble Drill into undisturbed surface Post-emergence spray as needed

Fig. 16 An example of non-inversion tillage using the Väderstad Carrier Drill 300 (photo Väderstad)

7.7 Although numerous systems have been developed for non-inversion tillage, most designs are based on tine and disc combinations, such as the Väderstad Carrier Drill 300 (Fig. 16), which can undertake all the soil preparation and seed drilling required to establish a new crop. Directly after harvest, one or two cultivation passes are carried out to initiate straw decomposition and to create a false seedbed, while weed seeds can be destroyed later, either mechanically or chemically. The equipment has two rows of conical and serrated 450mm discs which gives very intensive cultivation and mixes the soil together with harvest trash. In a final pass with the machine the seed is broadcast in a band behind each disc and is covered by soil from the neighbouring discs, while a steel or rubber roller reconsolidates the ground.

7.8 At present, Hindwell is the only farm in the Walton Basin to use non-inversion tillage but the practice is gaining interest in the area and at least two of the neighbouring farms are likely to change to this method in the near future (John Goodwin *pers comm*.). The restricted depth of general cultivation is clearly of significant benefit to archaeology, although the method is not without its limitations. Occasional ploughing will still be required, either in order to take land back into cultivation after a period as pasture within a rotation, or when the ground is too wet, when non-inversion tillage can lead to poor germination. Some concern has also been expressed regarding soil compaction owing to a reduction in cultivation depth, although this can also be a feature of traditional cultivation. Compaction may be a particular issue on headlands and around the entrance to a field. The solution is the use of equipment which does not turn the soil over, but is designed to break up mineral pans and compacted soil, sometimes known as a subsoiler (Fig. 17). The depth to which this technique penetrates is critical and with most designs it is likely that the depth of penetration can be varied. There is, however, no benefit in disturbing the subsoil as this introduces unsuitable material into the tilled soil.

Fig. 17 An example of equipment designed to alleviate soil compaction, but which can also be used to loosen the subsoil

7.9 Detailed field trials into the impact of varying cultivation methods on buried archaeological features were conducted by Oxford Archaeology and Cranfield University in what has become known as the Trials project (Booth and Spandl 2010). The study concluded that conventional mouldboard ploughing to a depth of 0.20-0.25m was the most destructive form of primary cultivation. The results also demonstrated that over time the depth to which the plough penetrated was gradually increasing, eventually reaching 0.4m, which probably was due to a combination of soil shift from primary cultivation, difficulties in maintaining plough depth over time and more rapid truncation caused by a loss of soil structure in wetter years, leading both the tractor wheels and the implement to sink deeper into the ground. The truncation of archaeological deposits by mouldboard ploughing was recorded as being between 3mm and 10mm a year, indicating a process of gradual loss but with significantly enhanced damage as a result of working wet soil.

7.10 Shallow ploughing to a depth of 0.125m within an existing plough-zone of 0.25-0.30m did not cause damage to the underlying archaeological deposits during the period of the study, although once again a gradual increase in the depth of plough activity was recorded over time, particularly in the wetter years, and thus damage to underlying archaeological deposits is likely to occur. Consequently, although traditionally restricting plough depth has often been seen as an effective way to protect archaeological sites the results show that this is not sustainable over time.

7.11 Significantly, the study showed that neither non-inversion tillage nor direct drilling were likely to result in the truncation of archaeological deposits, although the use of subsoiling was seen as a key issue. In fact, the results suggest that in general non-inversion cultivation will maintain a stronger soil structure than ploughing, at least with regard to its ability to withstand loading. The study also recognized that localized compaction might occur, as at field entrances and along headlands (wheelings or turning areas on the field margins), and suggested that this could be easily remedied by the use of a subsoiler operating at a restricted depth. Indeed, the conclusion was that direct drilling and shallow, non-inversion tillage, will offer long-term protection to buried archaeological features if they are sustainable without the need for subsoiling below the primary cultivation depth.

7.12 The Trials project also examined the effects of cultivation on earthwork monuments, drawing the following conclusions:

- ploughing does not allow the preservation of earthworks
- non-inversion tillage does not offer significant advantages in the protection to earthworks over conventional ploughing
- non-tillage (direct drilling) offers the only long-term sustainable protection for most earthworks if they remain in cultivation
- managed pasture forms the only other sustainable protection for earthworks, although increased bioturbation may be an issue
- the average height loss of earthworks tilled by non-inversion is *c* 10-30mm per year, the variation correlating significantly with earthwork type
- the average height loss of a ploughed earthwork is *c* 10mm per year
- truncation of the earthwork and the redistribution of the soil may lead to misinterpretation
- buried soils and features below earthworks are likely to be affected at the edges of the earthwork first
- once earthworks have been ploughed/cultivated flat then any features beneath them will survive better under non-inversion tillage regimes than under ploughing
- even severely plough-damaged earthworks can preserve buried soils, artefacts, burials and other features beneath

7.13 In general the present study has not investigated the range of crops or the cropping regimes which are prevalent within the area, although discussions with John Goodwin at Hindwell have shed some light in the issue, though this situation cannot necessarily be extrapolated across the basin. The cropping regime at Hindwell is a 12-year rotation, with six years in grass followed by wheat, oil seed rape, oats and potatoes. At present the ground is normally ploughed twice every 12 years, once to come out of grass and once for potatoes. Compared with many of the surrounding farms which, as noted above, do not currently employ non-inversion tillage and may plough annually, the intensity of cultivation is considerably reduced. Indeed, traditional ploughing could be reduced to just once every 12 years if fodder beet were to replace potatoes within the rotation.

7.14 It is worth noting that in 2014 regulations will come into force as part of a revision to the European Union’s Common Agricultural Policy which prevent the ploughing of permanent pasture which has not been ploughed in the past five years. It is already apparent that a number of farmers have pre-empted this by ploughing permanent pasture, even where there is no intention of taking the land back into regular cultivation. Although no reliable data are currently available, the impact on archaeology could in some cases be significant.

8 ASSESSMENT OF POTENTIAL RISKS

8.1 The present study has taken a lead from the approach adopted by COSMIC, although in developing an independent methodology for the Walton Basin it was clear that within the parameters of the project there was not the scope for such a detailed study. In part this was due to restrictions in time and funding, but there is also a lack of comparable data for the study area. It was also recognised at the outset that the study relied on a number of assumptions imposed by the available data, particularly with regard to landuse and crop rotations. Although this may have influenced the results, the overall conclusions are considered to be valid. The methodology was developed in a form which could be applied to any area, rather than being specific to the present study.

8.2 The study has utilised as its primary evidence the results from the landuse surveys for 1992, 2006 and 2009, using the combined data to determine the potential risk to archaeology posed by varying agricultural regimes, and this is summarised in Table 3. As noted above, a note of caution must be introduced since only the earlier study was based on field assessment, the others relying entirely on evidence from aerial photography from which is can be difficult to differentiate between permanent pasture, fallow, or pasture within a rotation.

Table 3: Factors in assessing the potential risk to archaeology from varying agricultural regimes

Risk Level	Factors in assessing the potential risk to archaeology from cultivation
Very high – level 4	Regular arable cultivation; new cultivation of permanent pasture or land which has remained uncultivated for a significant period; forestry
High – level 3	Regular cultivation in a rotation which includes pasture or fallow
Medium – level 2	Occasional ploughing; direct drilling; woodland
Low – level 1	Permanent pasture

8.3 The potential magnitude of impacts on the archaeology is summarised in Table 4, which is based on principles originally set out as part of a framework for assessing impacts to the cultural heritage within the *Design Manual for Roads and Bridges* (HA 208/07; Volume 11, Section 3, Part 2), revised in August 2007.

Table 4: Factors in assessing the magnitude of impact to archaeological sites

Threat level	Factors in assessing the magnitude of impacts
A	Change to most or all key elements of a monument, such that the resource is totally altered
B	Changes to many key elements of a monument, such that the resource is clearly modified
C	Changes to key elements of a monument, such that the resource is slightly altered or different
D	Very minor changes to some elements of a monument, the majority of which may be unchanged
E	No change

8.4 The potential significance of the impact of agriculture on a particular archaeological site is then established from the matrix in Table 5, which takes into account the agricultural regime, the form of the site, and the slope. Each site within the study was assessed in this manner, with its extents being mapped to take into account potential differences in the agricultural regime where a site extended across two or more fields so that in some instances multiple records were created for an individual site.

Table 5: Matrix for assessing the potential significance of impacts (level of threat) on various types of archaeology

		Very high	High	Medium	Low
Prominent earthwork	*Slope*	A	A	C	D
	No slope	A	B	C / D	D
Slight earthwork	*Slope*	A	A	C	D
	No slope	A / B	B	C / D	D / E
Shallow stratigraphy	*Slope*	A	B	C	E
	No slope	A / B	B / C	D / E	E
Negative features/ Cropmarks	*Slope*	A	B	D / E	E
	No slope	A / B	B / C	D / E	E
Finds only	*Slope*	A	B	D / E	E
	No slope	A / B	B / C	D / E	E
Environmental deposits	*Slope*	A	B	D / E	E
	No slope	A / B	C	D / E	E

Potential agricultural risks

8.5 The results of the assessment are depicted in Fig. 18 and summarised in Table 6, with further details in Appendix 1. Earthwork and cropmark sites have been considered separately from flint and finds scatters since the approach for the latter has been to map the entire field as the precise location of and extent of recorded finds scatter is generally unknown.

8.6 An important caveat must be raised at this point, however, since it is clear from discussions with local farmers (see below) that inversion tillage (ie ploughing) is not the only form of cultivation in use and cultivation tillage and extended crop rotations have the potential to produce a lower potential risk than the results may indicate.

Table 6: Summary of the potential agricultural risks to archaeology

Risk (derived from table 3)	**Area (ha)**	**%**
Low – level 1	1384	*42*
Medium – level 2	124	*4*
High – level 3	1020	*31*
Very high – level 4	535	*16*
Built over/ not recorded	237	*7*

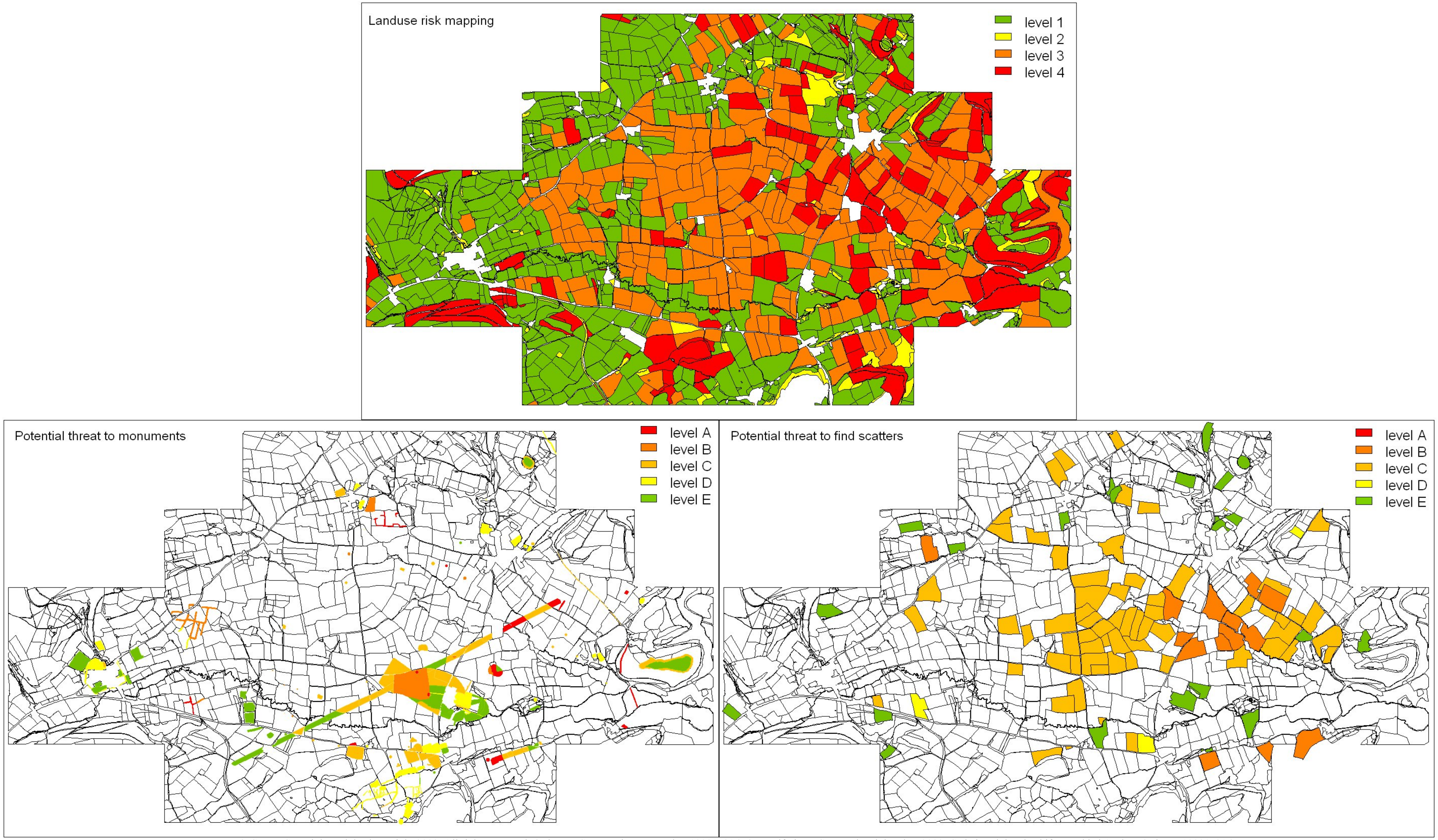

Fig. 18 An assessment of the potential risks to monuments

8.7 An analysis of the results indicates that 16% of the area appears to present a very high potential risk to buried archaeology, resulting from the ploughing of fields which were previously permanent pasture (2%), intensive arable farming (8%) and coniferous plantations (6%). Areas presenting a very high arable risk are generally located in the eastern half of the basin, including a number of areas known to contain significant buried archaeology. The statistics suggest that almost a third of the area is under a crop rotation which includes fallow or pasture, occupying most of the central and eastern parts of the basin, while the majority of the area (46%) presents a low or medium risk, being either permanent pasture, woodland, or subject only to occasional cultivation.

Potential impacts on monuments and finds scatters

8.8 The monuments within the study area have been assessed using the matrix in Table 5 to determine the potential levels of threat posed by agriculture. The results are depicted in Fig. 18 and presented in full in Appendix 1.

8.9 Fourteen monuments have been identified as being under a potentially significant threat (level A) and these are listed in Table 7, while for a further 24 sites the level of threat has been categorised as level B. The potential impact on artefact scatters has been assessed separately (Appendix 2), identifying 14 sites where the potential threat is at level B, including one major flint scatter (**50179**), and 64 sites where the potential threat is at level C, including 12 sites where between 100-500 flints have been recorded and one where over 1200 flints are known (**19065**).

Table 7: Monuments under potential significant threat

PRN	Name	Period	Form
300	Court Farm barrow I	Bronze Age	Earthwork
314	Hindwell Farm barrow I	Bronze Age	Earthwork
369	Walton Green barrow	Bronze Age	Earthwork
3664	Knapp Farm enclosure	Iron Age	Cropmark
5134	Walton Green cursus	Neolithic	Cropmark
6121	Walton Green enclosure II	Neolithic	Cropmark
26720/26722	Offa’s Dyke	Early Medieval	Cropmark
19376	Hindwell palisaded enclosure	Neolithic	Cropmark
33109	Hindwell cursus	Neolithic	Cropmark
33117	Barland enclosure	Iron Age	Cropmark
33120	Lower Harpton enclosure	Prehistoric	Cropmark
53996	Womaston causewayed enclosure	Neolithic	Cropmark
122779	Evenjobb cursus?	Neolithic	Cropmark
122818	New Radnor strip field system	Medieval	Earthwork
122823	Kinnerton Court field system II	Medieval	Earthwork

The threat to earthworks

8.10 Three upstanding Bronze Age barrows have been identified as being under a major threat from cultivation, the slight earthworks and shallow stratigraphy rendering them particularly vulnerable to plough damage. The effect of differing agricultural regimes on an earthwork is dramatically illustrated by Hindwell Ash barrow (**307**), which is bisected by a field boundary. In the 1990s this site was identified as being under significant plough threat and the decision was taken to excavate the already denuded northern half of the site. The excavation confirmed that the mound material had been significantly truncated, reducing not only the overall height, but also removing the periphery of the mound, which in places had been reduced by up to 4m (Gibson 1999, 20-25). Significant threats have also been identified for two medieval field systems, where the low earthen banks are being gradually levelled by the action of the plough.

The threat to cropmarks and find scatters

8.11 Intensive cultivation is also seen as a significant threat to nine sites which have already been plough-levelled and are now known only from cropmark evidence and, in some cases, limited excavations. These include several of the major Neolithic enclosures such as the Womaston causewayed enclosure, Hindwell cursus, Hindwell palisaded enclosure and the Walton Green cursus.

8.12 On level sites the depth of ploughing is critical, as is the depth of the plough-zone within which previous cultivation has taken place. Evidence from the COSMIC study suggested that even where the depth of ploughing was relatively consistent the overall effect was a gradual truncation of deposits, although this was considerably greater where root or tuber crops were cultivated. Excavated evidence in the Walton Basin has shown that the plough-zone can be remarkably thin in some instances, notably at the eastern end of the Hindwell palisaded enclosure where an investigation of its coincidence with the Hindwell cursus showed only 0.15-0.25m of ploughsoil above the natural gravels (Fig. 19; Jones 2012a). Potatoes form part of the normal rotation here and at other sites in the area and this cropping pattern is likely to have a negative impact on buried deposits.

Fig. 19 The intersection of the Hindwell cursus and palisaded enclosure in 2011, showing the shallow depth of ploughsoil in a field where a potato crop had recently been lifted. Photo CPAT 3335-0021

8.13 The potential impact of ploughing can also be exacerbated where the monument lies on a slope, a situation which pertains at Womaston, where part of the causewayed enclosure is subject to intensive cultivation, resulting in the formation of a 0.5m-high negative lynchet along the field boundaries separating this from the two pasture fields (Fig. 20). Excavations in 2008, within a field of permanent pasture, demonstrated that even here past ploughing had removed any contemporary ground surface and truncated the upper levels of the ditches, which lay on or below the crest of the hill (Jones 2010).

Fig. 20 A 0.5m-high negative lynchet has been formed as a result of intensive ploughing within the Womaston causewayed enclosure. Photo CPAT 3590-0012

9 MANAGING THE ARCHAEOLOGICAL RESOURCE

9.1 The primary legislation for the protection of monuments in Wales is the 1979 Ancient Monuments and Archaeological Areas Act, affording protection to sites deemed to be of national importance. Once scheduled most ground disturbance, as well as other works, is likely to be controlled by a process known as Scheduled Monument Consent, although existing agricultural practices are generally exempted through a system known as Class Consent. It is possible, however, that this situation may change in the future as proposed reforms under the Heritage Bill could include the removal of Class Consent.

9.2 Unscheduled sites may also be protected from development through the system of Planning Permission under established Welsh Government guidelines (Planning Policy Wales and Welsh Office Circulars 60/96 and 61/96).

9.3 Since 1999 the management of archaeological sites has to some extent been influenced by Welsh Government agri-environment schemes, initially through Tir Gofal and more recently through Glastir. Under Glastir farmers within the scheme are obliged to maintain in their present state those archaeological monuments which have been identified and defined. In addition, under an advanced level of the scheme there may be some assistance for capital works relating to monuments, such as clearing scrub from earthwork sites or taking a site out of arable cultivation.

9.4 Statistics made available by the Welsh Government Department for Rural Affairs indicate that at present only nine farms within the Walton Basin are within Glastir, accounting for 18.35% of the study area as a whole. The available information was not sufficiently detailed to allow the identification of individual farms or map those areas within a scheme. These figures indicate that although agri-environment schemes may have the potential to influence the management of the archaeological resource, in the Walton Basin at least the numbers involved in the schemes would need to be considerably higher in order to have a significant impact.

Table 8: The influence of agri-environment schemes within the Walton Basin (source: Welsh Government Department for Rural Affairs)

Scheme	Area (ha)	No. of cases	% of study area
Tir Gofal	60.61	3	1.83%
Tir Cynnal	295.13	11	8.93%
Organic Farm Subsidies	35.31	3	1.07%
Glastir	606.85	9	18.35%

9.5 The detailed studies conducted in England have identified the principal sources of impact on both earthwork sites and buried archaeology which may result from agricultural practices, and the Trials project in particular concluded with a series of recommendations designed to reduce the potential impact of cultivation on buried archaeological features. These are outlined below with the addition of two final recommendations which result from the present study:

- Avoid mouldboard ploughing - i.e tillage operations which invert the soil
- Use shallow tillage and direct drilling (no/zero tillage) operations with tractors equipped with wide section tyres, low ground pressure or dual tyres or rubber tracks.
- Where possible use harvesters, tractors and trailers equipped with rubber-belted tracks or the largest possible tyre diameters and section widths and/or dual tyres or tandem/triple axles to reduce the load per tyre.
- Operate all field-going equipment with the safest low inflation pressure for the required load and field/road speed duty cycle.
- Where practicable concentrate as many wheelings as possible in one place and apply the principles of controlled traffic farming.
- Prevent road-going trucks with high inflation pressures from traversing the field; permit them to park on the headland by the gateway.
- Discharge crop harvesters to trucks and trailers located on the headlands or alternatively reduce the load in harvesting trailers and ‘chaser wagons’.
- Where possible avoid field operations in high moisture content conditions with weak soils at or above field capacity.
- Only undertake subsoiling operations to depths no greater than 0.3m, or within the current depth of ploughsoil - whichever is least - as they will damage buried archaeological deposits and objects by direct impact.
- Place all earthwork sites under permanent pasture or use direct drilling as the only method of cultivation.
- On slopes neither mould board ploughing nor shallow ploughing should be undertaken.
- Whilst non-inversion tillage is damaging to earthworks due to its capacity to move and level irregularities, it can be used on slopes with the following caveats:

  a) Non-inversion tillage or indeed any tillage should not be undertaken on the upper and middle slopes where the slope is more than 5 or 6 degrees (direct drilling may be possible but should be assessed on a case by case basis). This is especially relevant on predominately fine sand and silty soils where the risk of soil erosion is greatest. Soils with higher clay content may be cultivated but they would need to be assessed on a case by case basis depending on the history of erosion and soil depth etc.

  b) Non-inversion tillage must be undertaken either along the contours of the slope or approximately perpendicular to the main field slope, and not up/down slope.

  c) Good slope tillage management should be adhered to, i.e. tillage should be practised in one direction one year and the other direction the year after. This will compensate for any small movements of the soil

- replace the use of potatoes with fodder beet in a rotation
- archaeological excavation of sites as a last resort

9.6 It is clear that a change to non-inversion tillage could have the potential to reduce the risks to buried archaeology, although in practice any benefits will be related to a number of variables, including:

- the nature and vulnerability of the archaeology
- the depth of the existing plough-zone
- the frequency and depth of traditional ploughing within the rotation
- the type of soil
- the moisture content of the soil
- the potential for compaction at headlands and field entrances
- the use of machinery to combat compaction and in particular its depth of penetration

9.7 Although there is no detailed information currently available for the Walton Basin to indicate cropping regimes it appears that most cultivated land is farmed as part of a rotation which includes a number of years as fallow or pasture. As such the implementation of non-inversion tillage on a wider basis could have a beneficial effect, although it would not alleviate the need for ploughing, both to return the land to cultivation after a period of ploughing, or during periods where the soil was too wet to permit other forms of tillage. The use of a subsoiler as part of this regime is potentially its main limitation for were the depth of penetration to exceed that of the plough-zone then the overall impact on buried archaeology could be greater than with traditional ploughing.

9.8 As we have seen there is now a growing body of evidence to indicate the potential impacts of cultivation on the archaeological resource, as well as a range of acknowledged options for its sustainable management. However, the implementation of any such measures is inevitably likely to be met with resistance from the farming community. What must be appreciated is that farming is a business which must remain economically viable in order to continue and any restrictions on farming practice are likely to have an economic impact. An additional consideration in the management of monuments under cultivation is that many farmers now employ contractors, particularly during harvest. The agricultural contracting business is based around time and cost efficiency and it is likely to be difficult to influence the manner in which their work is conducted.

9.9 In the Walton Basin most farms are relatively small; Hindwell, for example, is around 350ha, of which around 11% is already scheduled. In fact, even within the area of a scheduled ancient monument it is not possible to regulate existing farming practices, and management of the archaeology is often reliant on the goodwill of the landowner since established agricultural regimes and cultivation are currently permitted under the terms of the Act and are exempt from the Scheduled Monument Consent process.

9.10 Regardless of any statutory protection the most effective management of the archaeological resource as a whole is the stewardship of the landowners themselves. As noted above, improved management of the archaeology is already a feature of agri-environment schemes, but this on its own will not provide a satisfactory solution. It is also necessary to raise the general awareness and appreciation of the public, and farmers in particular, with regard to the heritage and the archaeological remains which surround them.

10 FUTURE RESEARCH OBJECTIVES

10.1 The Neolithic enclosures in the Walton Basin are of a scale and concentration which are unique in Wales and are of national and international significance. Whilst previous work has provided some information regarding their form and dating much still remains to be discovered about how they were built, what they were built for, and where the people that built them lived. Superimposed upon these Neolithic monuments is a palimpsest of Bronze Age, Iron Age, Roman, early medieval and medieval sites about which little is known. The sites exist within an actively farmed landscape, subject to periodic development pressure, yet few of the sites are visible within the landscape. Future research should therefore be directed towards assessing the vulnerability of these sites and considering how they can be best managed for the future, as well as creating greater awareness and appreciation of their significance. The present assessment has identified a number of monuments where further investigation should be considered, both to assist with the future management of the site and to test the project methodology and conclusions, and these are detailed below.

EARLIER NEOLITHIC

Womaston causewayed enclosure (53996)

10.2 Parts of site, which remains unscheduled, are affected by intensive cultivation, the long-term impact of which could be assessed through field evaluation conducted to either side of a negative lynchet on the south-eastern side of the monument.

Hindwell cursus, north-east terminal (33109)

10.3 The cursus terminal, which is currently unscheduled, is considered to be under a high risk from ploughing, the impact of which may not be uniform owing to the slope. The objective of fieldwork would be to assess the long-term severity of the plough threat on the monument at the uphill and downhill ends within the same field.

Evenjobb cursus (122779)

10.4 The nature of this unscheduled cropmark site remains untested through excavation, though it is recorded as a possible cursus. An evaluation could assess its form, dating, condition and vulnerablitilty to ploughing.

Hindwell cursus, south-west terminal (33109)

10.5 The possible terminal has been tentatively suggested by geophysical survey results, although remains unconfirmed and unscheduled. Demonstrating that the terminal exists here would confirm that the Hindwell cursus is the second longest cursus monument known in the British Isles.

Garden House cursus (122779)

10.6 Cropmarks have revealed a possible cursus, which remains unexcavated and unscheduled and is periodically affected by ploughing. Field evaluation would assess its form, dating condition and vulnerablitilty to ploughing.

Walton Green cursus (5134)

10.7 The confirmed cursus, which is not currently scheduled, is affected by intensive cultivation which also affects a large, upstanding barrow (369), as well as a number of cropmark enclosures, the relationships of which to the cursus are unknown. An evaluation should seek to assess the form and condition of the enclosure sites, assess the condition and vulnerability to ploughing of an additional part of the monument (trial excavations have previously only been carried out on the eastern terminal which is in Herefordshire), and obtain radiocarbon samples for dating the cursus, which is currently undated.

LATER NEOLITHIC

Hindwell palisaded enclosure (19376)

10.8 The 34ha enclosure appears to abut an adjacent palaeochannel on its south-east side. This relationship could be examined through small-scale excavation and augering with the objective of establishing whether this end of the monument is open-sided or closed. It is also important to determine what the relationship of the Walton palisaded enclosures was to stream courses.

Hindwell double-palisaded enclosure (114489)

10.9 As with the neighbouring and larger palisaded enclosure there is an apparent relationship between the monument and another palaeochannel, which could be similarly investigated with the same objectives.

Walton triple-palisaded enclosure (33130)

10.10 Cropmarks have revealed a system of triple, curving ditches on the north side of the Riddings Brook which are suggestive of another palisaded enclosure, perhaps straddling the brook. The site is subject to regular ploughing and a field assessment would seek to determine the nature and dating of the site, the degree of preservation and impact of continued cultivation.

Hindwell small enclosures (19358 and 114421)

10.11 Two small unscheduled enclosures outside the eastern end of the Hindwell palisaded enclosure are currently unexcavated and are affected by intensive cultivation. Both enclosures are sited on slight rises which makes them more vulnerable to plough erosion. Objectives of field assessment would therefore be to assess the degree of preservation and impact of continued ploughing, and establish their relationship with the palisaded enclosure.

Walton double pit alignment (5295)

10.12 The form of the monument, a double pit alignment, is probably unique in Wales and remains unexcavated and unscheduled. Its relationship with the adjacent Walton palisaded enclosure is unknown and an evaluation would seek to investigate this as well as the form and dating of the monument, while also providing an opportunity to test the project methodology, assess the degree of preservation and the impact of continued ploughing.

LATE NEOLITHIC/EARLY BRONZE AGE

Knapp Farm barrow/motte (359)

10.13 The large mound, which is scheduled as a medieval motte, has also been considered as a large barrow of Late Neolthic or Early Bronze Age date. A programme of test pitting and augering could help to establish the form and dating of this site.

Hindwell barrow (309)

10.14 The low earthwork barrow is set within both the Hindwell cursus and the Hindwell palisaded enclosure, and falls within the scheduled area of the latter. Evidence from geophysical survey and cropmarks suggest that the barrow may contains a ring of pits, posts or buried stones. The site remains unexcavated and the objectives of a field assessment would be to assess by non-destructive means the nature of the site, the degree of preservation and the impact of continued ploughing.

Knobley Brook barrow (310)

10.15 The unexcavated barrow, which is not currently scheduled, lies to the west of the Burfa Bog Motte and is bisected by a field boundary, the western side being subject to intensive ploughing. The objective would be to assess the degree of preservation and the impact of continued ploughing.

Walton barrow (365)

10.16 The unscheduled cropmark site lies on a possible drumlin in the valley bottom, with the topography likely to have exacerbated the effects of regular ploughing. The objective of field evaluation would be to assess the degree of preservation and the impact of continued ploughing.

Four Stones stone circle (1072)

10.17 It is uncertain whether the site might be part of a larger ceremonial complex and while the visible stones are scheduled the surrounding area is subject to regular ploughing. By examining an area outside the scheduled area the objective would be to assess whether the stones once formed part of a larger complex, the degree of preservation and also the impact of continued ploughing.

Hindwell standing stone (1073)

10.18 The isolated standing stone lies on sloping ground. The objective would be to test the project methodology, to assess the degree of preservation and impact of continued ploughing, and determine whether the visible stones once formed part of a larger complex.

ROMAN

Hindwell Roman marching camp I (313)

10.19 A large marching camp has been identified through cropmark evidence and geophysical survey and lies partly within the scheduled area of the Hindwell palisaded enclosure. The objective of an evaluation, to be conducted outside the scheduled area, would be to assess the degree of preservation and the impact of continued ploughing.

Hindwell Roman marching camp II (122794)

10.20 A possible marching camp has been identified through geophysical survey and lies partly within the scheduled area of the Hindwell palisaded enclosure. The objective of an evaluation would be to determine the nature of the site and assess the degree of preservation and the impact of continued ploughing.

Walton Roman marching camp IV (122826)

10.21 Part of a probable marching camp, or possibly an annex to one of those recorded previously, has been identified from cropmark evidence to the south of the three scheduled marching camps at Walton. The objective of an evaluation would be to confirm the form and dating of the site and assess the degree of preservation and its vulnerability to continued ploughing.

EDUCATION AND OUTREACH

10.22 As has already been noted, the support of the farmers and the wider community is a vital part of managing the archaeological resource. Without their cooperation and understanding the implementation of any changes is likely to be difficult, if not impossible. Archaeologists from CPAT have been conducting work in the area for the last 20 years, affording many opportunities to engage with the farming community and it has been thanks to their support that the various excavations and surveys have been possible. Whilst the profile of archaeology has undoubtedly been elevated as a result there is clearly more which could be done.

10.23 Further outreach initiatives would assist in raising the awareness of the public with regard to what is after all a fascinating complex of archaeology that is undoubtedly of national importance, and in some cases has a significance on an international scale. One of the main limitations in this respect has always been the scarcity of obvious visual monuments to attract the public attention. The use of computer graphics can to some extent compensate for this, and the existing virtual reality model of the basin has certainly been a useful tool, although this is now somewhat outdated. Talks to local societies and attendance at events has always been a part of the Trust's work in this area and these platforms present the opportunity to inject a realism into archaeology in a manner which is otherwise difficult to attain. Publications, both academic and otherwise, have already played their part in reaching a wider audience, although with the scale of more recent discoveries the time is now right to consider the means of presenting this to the public at large.

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18th-century Powys Archives, R X 58, undated: 'A plan of the several farms and tenements in the parishes of Old and New Radnor belonging to Percival Lewis Esq.'

1841 Tithe survey for Old Radnor parish

1845 Tithe survey for New Radnor parish

APPENDIX 1
An assessment of the potential agricultural threats to monuments

It should be noted that for the purpose of the study a number of monuments were divided into several polygons to reflect differences in the potential level of threat and will therefore appear more than once in the tables below.

Monuments under threat level A

PRN	Type	Period	Form	NGR
300	Round barrow	Bronze Age	Earthwork	SO25616228
314	Round barrow	Bronze Age	Earthwork	SO2537460639
369	Round barrow	Bronze Age	Earthwork	SO2613259802
3664	Enclosure	Iron Age	Cropmark	SO2440859977
5134	Cursus	Neolithic	Cropmark	SO2646359886
6121	Enclosure	Neolithic	Cropmark	SO2621959792
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
26720	Offa's Dyke	Early Medieval	Cropmark	SO2799760586
26720	Offa's Dyke	Early Medieval	Cropmark	SO2783861103
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33117	Defended enclosure	Iron Age	Cropmark	SO2790661944
33120	Enclosure	Prehistoric	Cropmark	SO2787360228
53996	Causewayed enclosure	Neolithic	Cropmark	SO2623060950
122779	Cursus	Neolithic	Cropmark	SO27076177
122818	Strip field system	Medieval	Earthwork	SO22356050
122823	Field system	Medieval	Earthwork	SO24826287

Monuments under threat level B

PRN	Type	Period	Form	NGR
299	Standing stone	Bronze Age	Structure	SO25676230
303	Round barrow	Bronze Age	Earthwork	SO2583762122
306	Standing stone	Bronze Age	Structure	SO26306132
307	Round barrow	Bronze Age	Earthwork	SO25706112
310	Round barrow	Bronze Age	Earthwork	SO2728061120

PRN	Type	Period	Form	NGR
313	Marching camp	Roman	Cropmark	SO2502060810
314	Round barrow	Bronze Age	Earthwork	SO2537460639
370	Marching camp	Roman	Cropmark	SO2552759938
1078	Round barrow	Bronze Age	Earthwork	SO2435562430
1081	Round barrow	Bronze Age	Earthwork	SO2389860052
3651	Round barrow	Bronze Age	Earthwork	SO237607
19358	Defended enclosure	Roman	Cropmark	SO2501360719
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
33023	Shrunken settlement	Medieval	Earthwork	SO24606300
33109	Cursus	Neolithic	Cropmark	SO2471460627
33125	Road	Roman	Cropmark	SO2537760656
33126	Ring ditch	Bronze Age	Cropmark	SO2501860716
53996	Causewayed enclosure	Neolithic	Cropmark	SO2623060950
114421	enclosure	Prehistoric	Buried feature	SO25056065
122810	Round barrow	Bronze Age	Earthwork	SO2353260759
122811	Round barrow	Bronze Age	Earthwork	SO2338160942
122811	Round barrow	Bronze Age	Earthwork	SO2338160942
122817	Field system	Medieval	Earthwork	SO22376153
122818	Strip field system	Medieval	Earthwork	SO22356050

Monuments under threat level C

PRN	Type	Period	Form	NGR
297	Hillfort	Iron Age	Earthwork	SO26656360
307	Round barrow	Bronze Age	Earthwork	SO25706112
312	Hillfort	Iron Age	Earthwork	SO2843061010
313	Marching camp	Roman	Cropmark	SO2502060810
313	Marching camp	Roman	Cropmark	SO2502060810
315	Fort	Roman	Earthwork	SO2579660582
358	Round barrow	Bronze Age	Earthwork	SO2422559979
365	Ring ditch	Bronze Age	Cropmark	SO2498859731
371	Marching camp	Roman	Cropmark	SO2533559901

PRN	Type	Period	Form	NGR
371	Marching camp	Roman	Cropmark	SO2533559901
372	Marching camp	Roman	Cropmark	SO2515059860
372	Marching camp	Roman	Cropmark	SO2515059860
373	Ring ditch	Bronze Age	Cropmark	SO2512459963
375	Ring ditch	Neolithic	Cropmark	SO2523259959
1072	Stone circle	Bronze Age	Structure	SO24576080
1075	Masonry castle	Medieval	Structure	SO2111661018
1081	Round barrow	Bronze Age	Earthwork	SO2389860052
2275	Defended enclosure	Iron Age	Earthwork	SO2670662562
3664	Enclosure	Iron Age	Cropmark	SO2440859977
4222	Defended enclosure	Iron Age	Cropmark	SO2398260607
4224	Ring ditch	Bronze Age	Cropmark	SO2354360398
4228	Occupation site	Neolithic	Buried feature	SO2561
4254	Ring ditch	Bronze Age	Cropmark	SO2489459837
4255	Palisaded enclosure	Neolithic	Cropmark	SO2535359863
5134	Cursus	Neolithic	Cropmark	SO2646359886
5134	Cursus	Neolithic	Cropmark	SO2646359886
5295	Pit avenue	Neolithic	Cropmark	SO2538859742
7022	Ring ditch	Bronze Age	Cropmark	SO2696261242
7945	Cursus	Neolithic	Cropmark	SO244605
10000	Offa's Dyke	Early Medieval	Earthwork	SO27046242
10000	Offa's Dyke	Early Medieval	Earthwork	SO27376201
10000	Offa's Dyke	Early Medieval	Earthwork	SO27766162
19009	Ridge and furrow	Medieval	Earthwork	SO24236320
19374	Enclosure	Prehistoric	Cropmark	SO2503362242
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
19427	Enclosure	Neolithic	Cropmark	SO2641659877
19428	Enclosure	Neolithic	Cropmark	SO2661359941
33100	Ring ditch	Bronze Age	Cropmark	SO2432462060
33101	Defended enclosure	Iron Age	Cropmark	SO2353061502
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO26126136
33109	Cursus	Neolithic	Cropmark	SO24886072
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627

PRN	Type	Period	Form	NGR
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO24766066
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33112	Ring ditch	Bronze Age	Cropmark	SO2543062308
33118	Ring ditch	Bronze Age	Cropmark	SO2764760781
33123	Ditch	Neolithic	Cropmark	SO2579760769
33127	Enclosure	Prehistoric	Cropmark	SO2517160055
33128	Ring ditch	Bronze Age	Cropmark	SO2543359711
33140	Ditch	Roman	Cropmark	SO2499059717
33148	Ring ditch	Bronze Age	Cropmark	SO2587560737
33156	Defended enclosure	Iron Age	Cropmark	SO2591261252
34059	Ring ditch	Bronze Age	Cropmark	SO27136140
50188	Ring ditch	Bronze Age	Cropmark	SO2535361250
50188	Ring ditch	Bronze Age	Cropmark	SO2535361250
122793	Road	Roman	Buried feature	SO2587160717
122794	Marching camp	Roman	buried feature	SO2543760940
122806	Bank	Unknown	Earthwork	SO2485559528
122826	Marching camp	Roman	cropmark	SO25495982

Monuments under threat level D

PRN	Type	Period	Form	NGR
298	Motte	Medieval	Earthwork	SO26126313
301	Motte	Medieval	Earthwork	SO2661162534
304	Motte and bailey	Medieval	Earthwork	SO2810261834
310	Round barrow	Bronze Age	Earthwork	SO2728061120
311	Motte	Medieval	Earthwork	SO2756561116
311	Motte	Medieval	Earthwork	SO2756561116
315	Fort	Roman	Earthwork	SO2579660582
317	Motte and bailey	Medieval	Earthwork	SO2673760565
359	Motte/ Round barrow	Medieval/ Neolithic	Earthwork	SO2458659975
360	Motte and bailey	Medieval	Earthwork	SO2478759440
370	Marching camp	Roman	Cropmark	SO2552759938
371	Marching camp	Roman	Cropmark	SO2533559901
374	Ringwork	Medieval	Earthwork	SO2502059010
1070	Standing stone	Bronze Age	Structure	SO24556274

PRN	Type	Period	Form	NGR
1071	Motte	Medieval	Earthwork	SO24506303
1075	Masonry castle	Medieval	Earthwork	SO2111661018
4255	Palisaded enclosure	Neolithic	Cropmark	SO2535359863
5133	Enclosed settlement	Roman	Cropmark	SO2528259705
5133	Enclosed settlement	Roman	Cropmark	SO2528259705
5294	Marching camp	Roman	Cropmark	SO25075968
10000	Offa's Dyke	Early Medieval	Earthwork	SO26926286
16267	Ridge and furrow	Medieval	Earthwork	SO2512359210
16268	Ridge and furrow	Medieval	Earthwork	SO2665562505
16269	Ridge and furrow	Medieval	Earthwork	SO2649762600
16271	Ridge and furrow	Medieval	Earthwork	SO2610062750
19116	Town gate	Medieval	Earthwork	SO21016077
19350	Ridge and furrow	Medieval	Earthwork	SO24456329
33000	Field boundary	Medieval	Earthwork	SO2511759451
33003	Platform	Medieval	Earthwork	SO2522459328
33004	Platform	Medieval	Earthwork	SO2524159335
33005	Platform	Medieval	Earthwork	SO2522259354
33006	Platform	Medieval	Earthwork	SO2524659355
33007	Trackway	Medieval	Earthwork	SO2522359371
33008	Boundary bank	Medieval	Earthwork	SO2522759453
33009	Boundary bank	Medieval	Earthwork	SO2526259497
33010	Platform	Medieval	Earthwork	SO25225940
33011	Platform	Medieval	Earthwork	SO25255938
33011	Platform	Medieval	Earthwork	SO25255938
33013	Bank	Medieval	Earthwork	SO2521159329
33014	Holloway	Medieval	Earthwork	SO25105930
33023	Shrunken settlement	Medieval	Earthwork	SO24606300
33060	Boundary bank	Medieval	Earthwork	SO2522059431
33103	Ridge and furrow	Medieval	Earthwork	SO2117361259
33124	Road	Roman	Earthwork	SO2553260644
33129	Enclosure	Prehistoric	Cropmark	SO2527159710
33131	Enclosed settlement	Prehistoric	Cropmark	SO2513559683
33132	Ridge and furrow	Medieval	Earthwork	SO2511559112

PRN	Type	Period	Form	NGR
33146	Ridge and furrow	Medieval	Earthwork	SO2749161132
33151	Ridge and furrow	Medieval	Earthwork	SO2468959482
47700	Road	Roman	Cropmark	SO2590860535
50634	Town defences	Medieval	Earthwork	SO21126065
50636	Town defences	Medieval	Earthwork	SO21516080
50636	Town defences	Medieval	Earthwork	SO21516080
50637	Town defences	Medieval	Earthwork	SO21416105
114489	palisaded enclosure	Neolithic	cropmark	SO25976044
122800	Gully	Medieval	Earthwork	SO2472059370
122801			Earthwork	SO2467659091
122803	Bank	Unknown	Earthwork	SO2466859307
122804	Gully	Medieval	Earthwork	SO2452259209
122805	Bank	Unknown	Earthwork	SO2496659372
122807	Bank	Unknown	Earthwork	SO2483259224
122817	Field system	Medieval	earthwork	SO22376153

Monuments under threat level E

PRN	Type	Period	Form	NGR
297	Hillfort	Iron Age	Earthwork	SO26656360
312	Hillfort	Iron Age	Earthwork	SO2843061010
316	Bath house	Roman	cropmark	SO25656041
370	Marching camp	Roman	Cropmark	SO2552759938
4225	Defended enclosure	Roman	Cropmark	SO2334660116
4225	Defended enclosure	Roman	Cropmark	SO2334660116
5134	Cursus	Neolithic	Cropmark	SO2646359886
5134	Cursus	Neolithic	Cropmark	SO2646359886
19128	Ridge and furrow	Medieval	Earthwork	SO2114760764
19132	Ridge and furrow	Medieval	Earthwork	SO2143060909
19138	Ridge and furrow	Medieval	Earthwork	SO2092161051
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
19376	Palisaded enclosure	Neolithic	Cropmark	SO2504160792
29183	Urban area	Medieval	Buried feature	SO21256075
33009	Boundary bank	Medieval	Earthwork	SO2526259497
33104	Ridge and	Medieval	Earthwork	SO2153760820

PRN	Type	Period	Form	NGR
	furrow			
33107	Ridge and furrow	Medieval	Earthwork	SO2300860630
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO2471460627
33109	Cursus	Neolithic	Cropmark	SO23546007
33109	Cursus	Neolithic	Cropmark	SO2471460627
33111	Ring ditch	Bronze Age	Cropmark	SO2578162570
33118	Ring ditch	Bronze Age	Cropmark	SO2764760781
33122	Ditch	Roman	Cropmark	SO2607260476
33142	Ridge and furrow	Medieval	Cropmark	SO2308060477
33143	Ridge and furrow	Medieval	Cropmark	SO2308360337
33150	Ridge and furrow	Medieval	Earthwork	SO2673660469
34055	Signal station	Roman	Cropmark	SO2354460129
47700	Road	Roman	Cropmark	SO2590860535
53996	Causewayed enclosure	Neolithic	Cropmark	SO2623060950
80117	Vicus	Roman	Buried feature	SO25856050
114489	palisaded enclosure	Neolithic	Cropmark	SO25976044
114489	palisaded enclosure	Neolithic	Cropmark	SO25976044
122798	ring ditch	Bronze Age	Cropmark	SO2544359641
123541	Annexe	Roman	Buried feature	SO25776034
123541	Annexe	Roman	Buried feature	SO25776034
123542	Road	Roman	Buried feature	SO2573160352

APPENDIX 2
An assessment of the potential agricultural threats to finds scatters

PRN	Risk	Period	NGR	Quantity of finds
2203	B	Prehistoric	SO25906127	
2211	B	Neolithic	SO265613	3
19035	B	Prehistoric	SO262617	1
19043	B	Prehistoric	SO264613	25
19049	B	Mesolithic	SO274601	36
19050	B	Prehistoric	SO269599	65
19054	B	Prehistoric	SO257617	7
23329	B	Prehistoric	SO226624	5
23348	B	Prehistoric	SO262597	19
23353	B	Prehistoric	SO268614	1
23355	B	Prehistoric	SO267621	5
23359	B	Prehistoric	SO271618	7
50179	B	Prehistoric	SO259613	242
1074	C	Neolithic	SO23706100	4
2200	C	Prehistoric	SO250616	306
2208	C	Prehistoric	SO251620	
3531	C	Mesolithic	SO272619	1
3533	C	Prehistoric	SO250613	531
3656	C	Neolithic	SO244610	1
3661	C	Neolithic	SO244605	6
4228	C	Neolithic	SO2561	
6346	C	Neolithic	SO253616	356
16614	C	Medieval	SO276612	
19025	C	Prehistoric	SO252611	16
19026	C	Prehistoric	SO245607	14
19029	C	Prehistoric	SO251632	1
19033	C	Prehistoric	SO265610	1
19034	C	Prehistoric	SO267618	1
19036	C	Prehistoric	SO252621	1
19040	C	Prehistoric	SO276629	1
19041	C	Prehistoric	SO237615	4
19042	C	Prehistoric	SO226620	5
19046	C	Prehistoric	SO259622	3
19047	C	Prehistoric	SO243624	2
19048	C	Prehistoric	SO250639	3
19055	C	Prehistoric	SO252616	1
19056	C	Prehistoric	SO255619	7
19059	C	Prehistoric	SO245610	39
19060	C	Prehistoric	SO224617	1
19065	C	Prehistoric	SO252613	1267
19385	C	Prehistoric	SO248603	1
23328	C	Prehistoric	SO273616	2
23330	C	Prehistoric	SO238615	2
23332	C	Neolithic	SO246610	9
23333	C	Neolithic	SO246617	1
23334	C	Neolithic	SO244613	114

PRN	Risk	Period	NGR	Quantity of finds
23335	C	Neolithic	SO247615	
23336	C	Neolithic	SO248610	66
23337	C	Neolithic	SO249613	5
23338	C	Neolithic	SO249625	19
23343	C	Prehistoric	SO252600	1
23346	C	Prehistoric	SO254630	66
23354	C	Prehistoric	SO269617	1
23357	C	Prehistoric	SO270612	17
23358	C	Prehistoric	SO271616	3
23360	C	Prehistoric	SO272611	1
23361	C	Prehistoric		3
26310	C	Bronze Age	SO24356360	16
26316	C	Prehistoric	SO21976055	2
26318	C	Prehistoric	SO24006264	13
26319	C	Prehistoric	SO24676179	1
34390	C	Prehistoric	SO23506270	9
34391	C	Prehistoric	SO23546287	2
50174	C	Prehistoric	SO254615	110
50175	C	Prehistoric	SO254617	230
50177	C	Prehistoric	SO257614	519
50178	C	Prehistoric	SO257610	144
50220	C	Prehistoric	SO24656138	93
50222	C	Prehistoric	SO244615	299
50223	C	Prehistoric	SO249615	398
50224	C	Prehistoric	SO246620	110
50625	C	Prehistoric	SO246612	338
58429	C	Prehistoric	SO24435990	2
70223	C	Prehistoric	SO24276349	27
77814	C	Bronze Age	SO242599	1
114317	C	Roman	SO277611	
119506	C	Roman	SO27466160	
2206	D	Bronze Age	SO274627	13
19030	D	Prehistoric	SO264630	31
23344	D	Prehistoric	SO254600	3
26303	D	Prehistoric	SO22506046	4
3532	E	Prehistoric	SO265629	154
4221	E	Bronze Age	SO244629	1
5239	E	Prehistoric	SO214617	106
16476	E	Neolithic	SO22456275	44
19027	E	Prehistoric	SO250633	12
19028	E	Prehistoric	SO250632	3
19039	E	Prehistoric	SO263628	2
19044	E	Prehistoric	SO264634	5
19062	E	Prehistoric	SO262639	2
19063	E	Prehistoric	SO258634	3
19078	E	Prehistoric	SO25806060	80
19384	E	Prehistoric	SO248602	1
23028	E	Prehistoric	SO221599	56
23347	E	Prehistoric	SO263629	5
23349	E	Prehistoric	SO260607	2
23356	E	Prehistoric	SO26656360	

PRN	Risk	Period	NGR	Quantity of finds
23363	E	Prehistoric	SO274614	1
26305	E	Neolithic	SO22006040	9
26307	E	Prehistoric	SO2820061200	2
26311	E	Prehistoric	SO26756027	8
26313	E	Prehistoric	SO20106040	14
26325	E	Prehistoric	SO22966250	16
118971	E	Prehistoric	SO262599	3
120069	E	Roman	SO25986075	