PALAEOENVIRONMENTAL ASSESSMENT OF WYRE FOREST, WORCESTERSHIRE FOR THE *GROW WITH WYRE* PROJECT

Elizabeth Pearson and Nicholas Daffern

2nd February 2012

Worcestershire Archaeology
Worcestershire Archive and Archaeology Service,
Woodbury Building,
University of Worcester,
Henwick Grove,
Worcester WR2 6AJ

Project 3547
Report 1880

u:\u160 acs\u013 archaeology service\03 field section\projects\current\p3547 wyre forest environmental\08 integrated report\p3547 wyre forest environmental.docx

Contents

Figs:

Tables:

Palaeoenvironmental assessment of the Wyre Forest, Worcestershire: for the *Grow with Wyre* project

Elizabeth Pearson and Nicholas Daffern

Part 1 Project summary

A palaeoenvironmental assessment was undertaken as part of the *Grow with Wyre* project (centred on NGR SO 745 765), a Landscape Partnership Scheme. The lead organisation is the Forestry Commission, along with Natural England, Shropshire County Council, Bewdley Development Trust, Butterfly Conservation, Worcestershire County Council, Wyre Forest District Council and the National Trust. The project aims to ensure the long-term social, environmental and economic sustainability of the Wyre landscape. The work is funded by the Heritage Lottery Fund, SITA Trust, Natural Assets, Biffaward and GrantScape.

The assessment aimed to map small wetland sites (or areas where organic deposits could be expected to survive) in the form of a GIS and assess the potential for survival of organic deposits and their accessibility for fieldwork. These sites are of potential for providing valuable information on the past landscape and human activity over time. The information will enhance the Historic Environment Records for Worcestershire and Shropshire, providing a toolkit to help archaeological planners manage the wetland aspect of the historic environment, and may be of interest to various groups for research (for example university researchers and community groups).

A total of 474 sites were mapped. Of these eight were assessed as being of high potential, 53 of medium potential and the remainder as of low potential (mainly small features). The number of features identified overall was higher than expected for a landscape in which there is a high proportion of narrow streams in steep, wooded valleys. Ground-truthing of a selection of sites by walk-over survey (by volunteers) enabled the assessment of these features to be refined and the method to be tested. As a result of this work, recommendations were made which will help to improve the assessment process.

Auger sampling of three features at Snuffmill Dingle, Birchen Park and Lower Kingswood Farm revealed well preserved sequences of organic deposits which all showed a change from relatively open conditions to increasingly wooded, probably as the sites became abandoned, or as in the case of Birchen Park, plantations were introduced. Lower Kingswood Farm showed a more arable landscape. Interpretation of radiocarbon results placed the dates of all three between the mid 17th to late 19th century. However, as it was difficult to recover suitable material for radiocarbon dating from base of these sequences, it is thought that earlier dates may be recovered if funds became available to carry out further sampling on these sites.

Recommendations are also made for other aspects of palaeoenvironmental work which are of interest for the Wyre Forest area and could potentially be funded through legacy projects. These included, for example, stream-walking to prospect for burnt mounds (prehistoric features), sampling of features identified as charcoal burning platforms and further validation of mapped wetland features.

Part 2 Detailed report

1. Background

A palaeoenvironmental assessment of the Wyre Forest region in Worcestershire was undertaken as part of the *Grow with Wyre* project (centred on NGR SO 745 765). The project also conforms to a project proposal (including detailed specification; HEAS 2010).

This information will enhance the Historic Environment Record (HER) for Worcestershire and Shropshire. Archaeological projects frequently now include an analysis of organic remains from waterlogged deposits where they are encountered through excavation in order to recover information on the historic environment. These deposits typically comprise buried peat deposits which are relic marsh or palaeochannel deposits but also sometimes surviving surface features which include, for example, current areas of peat bog or marsh and fills of features such as oxbow lakes, ponds, moats, and artificial watercourses such as mill leats. Some of these deposits and features are visible on maps, aerial photographs and LiDAR images. GIS mapping of the widespread distribution of such features or deposits across large areas can, therefore, be used as an aid to designing palaeoenvironmental research projects and also as a tool to aid management of the archaeological resource, in addition to the more piecemeal recovery through field excavation. It will also complement work on LiDAR images to assess the archaeology and historic landscape potential of the *Grow with Wyre* project area (Mindykowski pers comm).

2. Aims

The aims of the assessment were to determine the potential of the Wyre Forest for palaeoenvironmental study which can provide evidence of historic land-use in the study area (Fig 1). The Assessment focussed on the presence and distribution of small wetland/waterlogged sites in which organic deposits (for example, peat and organic silts and clays) could be expected to survive along with organic remains such as pollen and plant macrofossil remains. This evidence can be used to reconstruct environmental change. The project included training of *Grow with Wyre* volunteers and assistance by the volunteers with fieldwork. Training of volunteers may be used in the future in legacy projects.

In particular the assessment has the following objectives:

- Mapping of the distribution of potentially organic deposits using map-based GIS survey
- Assessment of the potential of each deposit (potential for good preservation of organics and accessibility) identified through the GIS survey and to validate a sample of the deposits identified using volunteer help from the *Grow with Wyre* team
- Further validation of the mapping results by testing the preservation of organic remains from selected deposits using augering, and where possible, test-pit samples with volunteer help from the *Grow with Wyre* project being invited.

3. Methods

3.1 Documentary search

Prior to fieldwork commencing a search was made of the Worcestershire and Shropshire Historic Environment Record (HER). In addition the following were also consulted:

Cartographic sources

OS mapping 1:10,000 colour

OS 1:10,560 1st edition historical mapping for Worcestershire (not available for Shropshire)

Aerial photographs

2005 High resolution Aerial photographs

Other

Non-hill-shaded LiDAR images

Heritage Gateway on-line data for Shropshire

3.2 Mapping

Mapping of features of interest for palaeoenvironmental study was undertaken using GIS ArcMap (Version 9.3). Methodology was based upon map-based approaches developed by the WHEAS environmental team on two study areas within Worcestershire (Pearson 2010, Jackson *et al* 2011) and one in Gloucestershire (Pearson *et al* 2011).

The focus of this work lay in identifying features visible on 1st edition OS maps which may contain organic deposits and have potential for palaeoenvironmental reconstruction. Aerial photographs and LiDAR images were also considered to provide additional information. Historical mapping (1st edition OS), however, was not available for Shropshire so for this area features were identified on modern mapping, aerial photographs and LiDAR. As a result there is a greater chance that some mapped features for Shropshire may be modern.

The following were digitally mapped as a separate layer within the GIS:

- Fishponds
- Marsh
- Meander loop (pronounced stream/river meander)
- Meander movement (where a meander appears to have moved leaving behind relict marsh deposits
- Moat
- Osier bed
- Palaeochannel
- Pond
- Reed swamp
- Other

Subsequently an assessment was made of the potential of these deposits for organic survival based upon estimated size on the 1st edition OS map and any apparent change in the waterlogged state of the feature on modern OS maps, such as drying out or silting up. Secondly, accessibility was scored, based upon the extent to which the feature was presently covered by development such as buildings, surfaces or trees. Features were 'flagged' where there was archaeological or historical information available through the HER, which was of direct relevance. This did not, however, affect the scoring as this was intended to be a first stage of assessment, and irrespective of the likely date of the features. For further details see Appendix 1.

3.3 Validation by walk-over survey

Following completion of the mapping, a number of mapped features were selected for validation, which included a variety of different feature types and of low, medium and high

potential. A training session was held with a group of *Grow with Wyre* volunteers (on 18th January 2011) to demonstrate the process for validating the selected mapped features.

Features were validated using a recording sheet (AS47, see Appendix 2) and by photographing the features and surrounding context.

3.4 Validation by auger sampling

3.4.1 Fieldwork strategy

Fieldwork was undertaken in July and August 2011 with volunteers attending (Plates 1 and 2). Augering was undertaken at Snuffmill Dingle (Fig 2), Birchen Park (Fig 3) and Lower Kingswood Farm (Fig 3) using a gauge, or dutch auger depending on the nature of the deposits.

3.4.2 Sampling policy

The environmental sampling and recording strategy conformed to standard Service practice (CAS 1995; appendix 4). In addition, the sampling, geoarchaeology and environmental analysis conform to relevant sections of *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation* (English Heritage 2011), *Geoarchaeology: Using earth sciences to understand the archaeological record* (English Heritage 2007), and *The description and analysis of quaternary stratigraphic field sections* (Jones *et al* 1999)

Auger samples of approximately 250ml were taken from the core depths shown in Appendix 3.

3.4.3 Plant macrofossil remains

Samples were taken where organic matter appeared to contain sufficiently coarse plant matter to recover plant macrofossil remains (Table 1). This was possible only for sequences recovered from Snuffmill Dingle (Plate 1) and Birchen Park (Plate 2). For each of the samples a sub-sample approximately 2cm deep across the auger sample from approximately the top, middle and base was taken. The sample was processed by the wash-over technique as follows. The sub-sample was broken up in a bowl of water to separate the light organic remains from the mineral fraction and heavier reside. The water, with the light organic faction was decanted onto a 300μm sieve and the residue washed through a 1mm sieve.

The residues were scanned by eye and the abundance of each category of environmental remains estimated. The flots were scanned using a low power MEIJI stereo light microscope and plant remains identified using modern reference collections maintained by the Service, and a seed identification manual (Cappers *et al* 2006). Nomenclature for the plant remains follows the *New Flora of the British Isles*, 2nd edition (Stace 2010).

3.4.4 Palynological remains

Eight pollen sub-samples of $2cm^3$ were selected for palynological assessment; three from Birchen Park, two from Lower Kingswood Farm, and three from Snuffmill Dingle, the exact depths of which are given within the results section below. Samples were selected from approximately equally spaced depths from visibly organic deposits.

	Family	Common name	Habitat	1002	1002/1003	1005/1006	2009	2012
Site code				SMD011	SMD011	SMD011	BIR11	BIR11
Depth (bgs)				0.20 - 0.40m	0.40 - 0.60m	1.0 - 1.20m	1.49 – 1.75m	2.48 – 2.55m
Latin name								
Ranunculus acris/repens/bulbosus	Ranunculaceae	buttercup	CD				+	
Rubus sect *Glandulosus*	Rosaceae	bramble	CD				++	
Fagus sylvatica (nut)	Fagaceae	beech	C			+		
Fagus sylvatica (fruit)	Fagaceae	beech	C			+		
Betula pendula	Betulaceae	silver birch	C	+	+			
Alnus glutinosa (fruits)	Betulaceae	alder	CE		+	+		
Salix sp leaf	Salicaceae	willow	C	++	+++			
Rumex sp	Polygonaceae	dock	ABCD				+	
cf *Stellaria graminea*	Caryophyllaceae	lesser stitchwort	D				+	
Stachys sylvatica	Lamiaceae	hedge woundwort	CD				+	
Marrubium vulgare	Lamiaceae	white horehound	ABD				+	
Viburnum opulus	Caprifoliaceae	guelder rose	C			+		
cf *Viburnum opulus*	Caprifoliaceae	guelder rose	C	+				
Sagittaria sagittifolia (fruit)	Alismataceae	arrowhead	E			++		
Potamogeton sp	Potamogetonaceae	pondweed	E			+++		
Schoenoplectus lacustris	Cyperaceae	common club-rush	E				+	
Carex sp (3-sided) nutlets	Cyperaceae	sedge	CDE				+	
unidentified twig/bud fragments	unidentified					+	+++	
unidentified moss fragments	unidentified					+		
unidentified leaf fragments	unidentified					+++		
unidentified bark fragments	unidentified				++			
unidentified wood fragments	unidentified							+
unidentified herbaceous fragments	unidentified			+++		+++		

Table1 Plant macrofossil remains from auger samples

The sub-samples were submitted to the laboratories of the Department of Geography and Environment at the University of Aberdeen for chemical preparation following standard procedures as described by Barber (1976) and Moore *et al* (1991). The full methodology is described in Appendix 4.

Where preservation allowed, pollen grains were counted to a total of 150 land pollen grains (TLP) for assessment purposes using a GS binocular polarising microscope at x400 magnification. Identification was aided by using the pollen reference slide collection maintained by the Service, and the pollen reference manual by Moore *et al* (1991). Nomenclature for pollen follows Stace (2010) and Bennett (1994).

3.4.5 Radiocarbon dating

Three samples were submitted for Accelerated Mass Spectrometry (AMS) dating to the Scottish Universities Environmental Research Centre (SUERC) radiocarbon dating laboratory (Appendix 5).

The first sample (SUERC-36846 (GU25374)) came from Snuffmill Dingle and was a fragment of *Corylus avellana* (hazel) nut retrieved from 1.20-1.40m below ground surface (BGS).

The final two samples were taken from the Birchen Park auger hole. The first (SUERC-36850 (GU25375)) was a fragmentary but complete *Corylus avellana* nut from 1.37m below ground surface (BGS). The second sample (SUERC-36851 (GU25376)) comprised seeds of *Rubus fruticosus* (blackberry) retrieved from 1.49-1.75m BGS.

Unfortunately no datable material was retrieved from the Lower Kingswood auger hole and this site currently remains undated.

All calibrated date ranges cited in the text are those for 95% confidence.

4. Results

4.1 Stage 1 Desk-based survey and creation of GIS mapping

4.1.1 Desk-based survey

Very little palaeoenvironmental evidence has so far resulted from archaeological field interventions in the project area, and so little is known here about past landscape, agriculture and other human activities such as food production. This is probably because in a largely rural area the level of development is low and most archaeological field work currently results from commercial development, which, locally, is concentrated in the Bewdley area.

An assessment of potential for environmental archaeology (Pearson 1996), as part of an archaeological assessment of Bewdley (Central Marches Town Survey; Buteux 1996) noted the recovery of medieval timbers at Dog Lane Gate (WSM 10854), Welch Lane Gate (WSM 17763) and from a 15th century structure on the quayside. They also survive in a number of standing medieval buildings in the town. This type of evidence can provide information on the timber resources used in various structures, and potentially on local woodland management practices. Other evidence includes human remains of possible Iron Age date, and animal bone and horn core from tanning pits in the town (Table 2).

Location	County	HER number	Evidence type
Ribbesford	Worcestershire	WSM 41527	House platforms & fishponds
Lynall's Farm, Rock	Worcestershire	WSM 22970	Documentary
Trimpley	Worcestershire	WSM 15049	Documentary
Heightington, Rock	Worcestershire	WSM 15045	Documentary
Shatterford, Upper Arley	Worcestershire	WSM 15025	Documentary
Upper Arley	Worcestershire	WSM 15023	Documentary

DMV sites listed on Worcestershire HER

Location	County	HER number	Evidence type	Date
Tanner's Hill, Bewdley	Worcestershire	WSM 12779	Documentary	Post medieval 1540 to 1900s
Lax Lane, Bewdley	Worcestershire	WSM 17761	Excavation, animal bone & horn	17th or 18th century
Dog Lane, Bewdley	Worcestershire	WSM 31923	Excavation, animal bone & horn	18th/19th century

Tannery or horn working sites listed on HER

Location	County	HER number	Evidence type	Date
Kinlet Hall and park	Shropshire	7531	Documentary, landscape, buildings	18th century
Cleobury Mortimer park	Shropshire	7723	Documentary, landscape, buildings	Medieval

Historic garden sites listed on the HER

Location	County	HER number	Evidence type	Date
Pond Bay, Whiteleasowe Coppice	Shropshire	3997	Documentary, pond	16th century
Coal workings, Lodge Coppice	Shropshire	7133	Map	Post-medieval
Coal workings nr Kingswood	Shropshire	7136	Map	Post-medieval
Coal workings nr Beach Hay	Shropshire	7137	Map	Post-medieval
Pond Bay & mound of furnace on Baveney Brook	Shropshire	4634	Structural	16th century
Snuffmill Dingle, Bewdley	Worcestershire	WSM 11892	Documentary, ponds	Medieval to post-medieval
Quarry, St George's Farm, Bewdley	Worcestershire	WSM 35316	Landscape feature	post-med to modern
Fishery, Nr Uncllys Farm, Bewdley	Worcestershire	WSM 35313	Map	post-med to modern

Industrial sites listed on the HER

Table 2: Sites of interest for palaeoenvironmental evidence from HER sources

Types of site identified in the HER and documentary sources which have not been excavated but may be of interest for palaeoenvironmental work are historic gardens, deserted medieval villages, industrial workings and church burial grounds (Table 2). Documentary sources on historic gardens are of interest as they may indicate whether features or deposits could survive which have the potential to provide information on the garden environment and layout from palaeoenvironmental evidence (usually waterlogged organic remains). A number are identified from HER records for Worcestershire and Shropshire. In some cases ponds have been created to power furnaces which may still contain organic deposits (such as at a relatively large site at Snuffmill Dingle near Bewdley in Worcestershire), or there may be only documentary evidence of a furnace, such as at Whiteleasowe Coppice and on the Baveney Brook in Shropshire. In one case, ponds in an area of coal workings may relate to post-medieval coal extraction.

Charcoal burning is an industry in the forest with a long history, known from at least medieval times. In areas like this (for example, in the Forest of Dean and The Weald, Sussex), charcoal burning platforms are common. Sampling of these for charcoal remains may provide information on the types of tree used and possibly the management practices in use, such as the length of coppicing cycle. Features interpreted as charcoal burning platforms have been identified from LiDAR images (conjectural) in widespread locations across the Wyre Forest area (Fig 5). Careful radiocarbon dating of any samples taken from these structures is needed as the platforms may have been in use for several hundred years.

4.1.2 GIS mapping of results

A total of 474 features (Appendix 1, Table 2) of potential for palaeoenvironmental study were mapped based on criteria described in Appendix 1.

High potential features

Only eight features were considered to be of high potential at this stage. These included two large fish ponds (Features 442, 443 and 446) at Kinlet and Birchen Parks, two ponds at Ribbesford (#23), at Birchen Park (#445; Plate 4) and Trimpley Green (#8), an area of reed swamp (#404) at Sturt Coppice, a marsh adjacent to fishpond #446 at Birchen Park (Plate 3) and a 'meander movement' (#184) near The Fastings in Shropshire.

Medium potential features

A total of 53 features were assessed as being of medium potential. These were predominantly ponds, but other features included those classed as a 'meander movement' or palaeochannel, and occasional marsh and reed swamp deposits. Some of these features are large but not classed as of high potential because they are presently inaccessible, in that they are located under developments such as a housing estate, a road or have been created into a reservoir or pond. At present the scoring does not indicate the extent to which the developments are likely to be permanent (such as housing estates) or are likely to have caused considerable damage to the original feature, such as the creation of a pond over a feature classed as a meander movement. The notes in the GIS attributes table allow the researcher using the mapping to interpret these aspects.

Low potential features

The majority of the mapped features were classed as being of low potential, and these were mostly small features. Many of these were small ponds or features classed as 'meander loop' or 'meander movement'.

Results from LiDAR mapping

The above mapping focussed on features or deposits where there is the potential for survival of organic remains. However, a number of features identified by LiDAR mapping as part of the *Grow with Wyre* project are also of interest for palaeoenvironmental work but from another angle. These include charcoal burning platforms resulting from the charcoal industry which could be of medieval or later date. Clusters of these have been identified in the Baveney Brook area (Adam Mindykowski, *pers comm*). Charcoal which can provide evidence of the timber sources used, and possibly the woodland management practices, could be recovered by sampling these features.

4.2 Stage 2 Validation of mapped features

The validation data recorded on forms by volunteers has been transferred to a Microsoft Access database, the results of which are presented in Appendix 2 Table 1.

A total of 28 features were validated. The validation results, where overall potential was concerned, were in agreement with the GIS mapping for 18 out of the 28 features validated. Exceptions to this were as follows:

a) two small meander loops (Features 242 and 243) in Wimperhill/Longdon Wood, previously classed as being of low potential, appeared on validation to have been affected by recent disturbance according to the local knowledge of the assessor or validator, and are now accessed to have no potential;

b) a meander movement at Sturt Coppice seen on LiDAR appeared on validation to be the result of the collapse of the stream bank on one side;

c) a reed swamp known as Bayton Pool was mapped as being of high potential, principally on account of its large size, but on validation the marsh was relatively dried up and did not visibly look organic from photographs (Plate 5), so good survival of organic remains are uncertain. However, historic mapping (Worcestershire Historic Landscape Characterisation) shows this pond to have been formed as part of an 18th century landscape garden and it is, nevertheless, of historic interest;

d) two ponds at Catsley Farm (#436 and #437; Plates 6 and 7) are now thought to be relatively modern based on information from the farmer, but these were located in Shropshire where no historical mapping was available and identification of features was, by necessity, based on modern mapping, and;

e) two features (Features 446 and 447; Plates 1 and 3) in Birchen Park, a pond and marsh respectively, are not shown on modern mapping but validation shows they are both still present (also aerial photographs for #447) and are of much the same size as shown on 1st edition OS mapping.

Comments on ways of minimising inaccuracies in the scoring of potential are described in the synthesis (Section 6).

4.3 Stage 3 Assessment of auger samples, *by* Nicholas Daffern

The results of the auger survey are shown in Appendix 3.

The auger surveys at Birchen Park and Snuffmill Dingle indicated similar depositional environments in that a stream valley was dammed leading to a backlog of water flowing downstream and the creation of a fish or mill pond. Due to this change in the hydrology of the environment, an area of open water would have formed into which fine-grained sediment would have been carried and deposited, whilst upstream the ground would have become increasingly waterlogged and marshy.

Subsequently, as the features fell out of use and maintenance of these ceased, sedimentation of the ponds would have continued resulting in the features becoming clogged with sediment and vegetation forming a semi-natural marsh environment consisting of reeds, grasses and sedges with few areas of open water aside from the active stream channel, and it is this environment that can be seen today.

At Lower Kingswood, the moat does not appear to have had a permanent source of water feeding into the feature and would have probably have relied on rainfall and sub-surface groundwater flow to maintain water level which is likely to have resulted in seasonal wetting and drying.

The need to retain water is indicated by the presence of a possible lining (3010) at the base of the feature.

Similarly to the previously mentioned sites, it would appear that when the feature fell out of use, accumulation of sediment occurred, although in this instance probably seasonally rather than permanently when high rainfall events would result in temporary surface flow or surface runoff due to saturated ground, causing erosion and transportation of sediment into the feature.

4.3.1 Radiocarbon dating, *by* SUERC and Nicholas Daffern

4.3.1.1 Results

Three samples were submitted to SUERC for Accelerator Mass Spectrometry (AMS) radiocarbon dating. The results of which are contained in Table 3. The full radiocarbon report is shown in Appendix 3. All calibrated date ranges cited in the text are those for 95% confidence. All depths are recorded as below ground surface (BGS).

Laboratory code	Site name and depth (m BGS)	Material	13C/12C	Radiocarbon Age BP	OxCal calibrated age (95.4% probability or 2 sigma)
SUERC-36846 (GU25374)	Snuffmill Dingle (1.20m – 1.40m)	*Corylus avellana* (hazel) nut fragment	-24.5 ‰	230 ± 30	Cal AD 1530 - 1955
SUERC-36850 (GU25375)	Birchen Park (1.37m)	*Corylus avellana* (hazel) nut fragment	-28.2 ‰	170 ± 30	Cal AD 1659 - 1954
BIR2011/1.49-1.75m	Birchen Park (1.49m – 1.75m)	*Rubus fruticosus* (blackberry) seed	-30.6 ‰	125 ± 30	Cal AD 1677 - 1940

Table 3 ***Radiocarbon dating results***

4.3.1.2 Discussion

All three radiocarbon samples from the two sites produced post-medieval to modern dates. It should be noted that the Snuffmill Dingle lower date boundary is late medieval but the percentage probability of this is extremely low (0.8% probability – see Appendix 5).

From approximately AD 1600 onwards, the calibration of the BP (Before Present) date becomes problematic (see Appendix 5). In the author's view, based upon the percentage probabilities of each calibrated date, that the three dates lie between the mid 17th century and the late 19th century ie post-medieval to modern, rather than modern.

4.3.2 Palynological remains

4.3.2.1 Pollen analysis

The palynological evidence recovered is summarised in Table 4. The preservation and concentrations of palynological remains varied with depth and between sites but they were generally moderately to well preserved and in low to good concentrations with complete 150 TLP (total land pollen grains) counts achieved on all sub-samples with the exception of the upper sample (0.96m) from Birchen Park. All depths are recorded as below ground surface (BGS).

Birchen Park (0.96m, 1.37m and 2.40m)

In both of the samples for which complete counts were achieved, herbaceous species dominated with Poaceae undiff (grasses) being the main contributor although species including *Ranunculus acris*-type (meadow buttercup), *Rumex obtusifolius* (broad-leaved dock), Caryophyllaceae (pink family), *Plantago lanceolata* (ribwort plantain), *Cichorium intybus*-type (chicory/dandelion) and Cyperaceae (sedges) made lesser contributions.

Two grains of *Cerealia* indet (possible cereals) were identified in the middle sample (1.37m).

The two main contributors of arboreal pollen were *Alnus glutinosa* (alder) and *Corylus avellana*-type (hazel) although lesser or infrequent contributions were made by *Pinus sylvestris* (Scot's pine), *Quercus* (oak), *Betula* (birch) and *Salix* (willow).

Aquatics were represented by *Potamogeton natans*-type (broad-leaved pondweed) and *Sparganium erectum* (branched bur-reed) whilst spores were represented by *Pteridium aquilinum* (bracken), *Polypodium* (polypody) and *Pteropsida* (mono) indet (ferns).

Lower Kingswood Farm (0.67m, 0.92m)

Herbaceous species dominated (>85% TLP) the two samples from Lower Kingswood Farm with Poaceae undiff contributing the majority of this figure with lesser contributions by *Ranunculus acris*-type, Rosaceae (rose family), *Solidago virgaurea*-type (daisies/goldenrods), *Papaver argemone* (prickly poppy), *Rumex acetosella* (sheep's sorrel), *Plantago lanceolata*, *Cichorium intybus*-type, *Urtica dioica* (stinging nettle) and Cyperaceae.

Pollen grains of arable cultivars were present in both samples with grains of *Avena/Triticum*-type (oat/wheat), *Hordeum*-type (barley) and *Cerealia* indet being identified.

Tree and shrub species were represented by *Pinus sylvestris*, *Quercus*, *Betula*, *Alnus glutinosa*, *Corylus avellana*-type, *Salix*, *Ilex aquifolium* (holly) and *Hedera helix* (ivy), albeit all being present in low quantities (<5% TLP).

Aquatics were represented by *Hydrocharis morsus-ranae* (frogbit) *Potamogeton natans*-type whilst spores were represented by *Pteridium aquilinum*, *Polypodium* and *Pteropsida* (mono) indet.

Snuffmill Dingle (0.69m, 1.78m, 2.90m)

Herbaceous species dominate the samples from Snuffmill Dingle (>75% TLP) with Poaceae undiff the main contributor with lesser contributions by *Ranunculus acris*-type, *Filipendula* (meadowsweet), *Urtica dioica*, Caryophyllaceae, *Plantago lanceolata*, *Cichorium intybus*-type and Cyperaceae.

Alnus glutinosa was the main contributor of arboreal pollen from this site although species variety was moderate to high with grains of *Pinus sylvestris*, *Ulmus* (elm), *Fagus sylvatica* (beech), *Quercus*, *Betula*, *Corylus avellana*-type, *Salix* and *Tilia Cordata* (small-leaved lime) being identified. Heaths were solely represented by *Calluna vulgaris* (heather)

Aquatics were represented by *Menyanthes trifoliata* (bogbean), *Sparganium erectum* and *Sparganium emersum*-type (unbranched bur-reed) whilst spores were represented by *Pteridium aquilinum*, cf *Athyrium filix-femina* (lady fern) and *Pteropsida* (mono) indet.

			Birchen Park			Lower Kingswood		Snuffmill Dingle		
	Family	Common name(s)	0.96m	1.37m	2.40m	0.67m	0.92m	0.69m	1.78m	2.90m
Pinus sylvestris	Pinaceae	Scots pine		5			1	1		2
Ulmus	Ulmaceae	elm						6	1	
Fagus sylvatica	Fagaceae	beech						1		
Quercus	Fagaceae	oak			3	3	1	1	5	6
Betula	Betulaceae	birch		2	2	5		2	2	3
Alnus glutinosa	Betulaceae	alder	2	18	7	3	1	15	6	16
Corylus avellana-type	Betulaceae	hazel	1	9		7		3	5	3
Salix	Salicaceae	willow		4	4	2	1	3		5
Tilia cordata	Malvaceae	small-leaved lime								1
Ilex aquifolium	Aquifoliaceae	holly				2				
Hedera helix	Araliacae	ivy				1				
Calluna vulgaris	Ericaceae	heather						3	1	4
Papaver argemone	Papaveraceae	prickly poppy				4	2			
Helleborus viridis	Ranunculaceae	green hellebore		1						
Ranunculus acris-type	Ranunculaceae	meadow buttercup		8	14	13	3	7	8	12
Ranunculus arvensis	Ranunculaceae	corn buttercup				1				
Ranunculus cf flammula	Ranunculaceae	lesser spearwort								1
Thalictrum	Ranunculaceae	meadow-rue			2					
Saxifragaceae	Saxifragaceae	saxifrage family			3					
Vicia sylvatica-type	Fabaceae	vetches/ vetchlings/ peas		1						

			Birchen Park			Lower Kingswood		Snuffmill Dingle		
	Family	Common name(s)	0.96m	1.37m	2.40m	0.67m	0.92m	0.69m	1.78m	2.90m
Ononis	Fabaceae	restharrows					1			
Trifolium-type	Fabaceae	clovers				1	1			
Rosaceae	Rosaceae	rose family	1	3	1	6	5	2	1	
Filipendula	Rosaceae	meadowsweet	1	4	4	1	2	2	6	10
Potentilla-type	Rosaceae	cinquefoils						3		
Poterium sanguisorba	Rosaceae	salad burnet			1					
Rosa	Rosaceae	rose						1		
Urtica dioica	Urticaceae	stinging nettle		2	5	4	5	3	4	5
Urtica urens	Urticaceae	small nettle		2						
Circaea	Onagraceae	enchanter's-nightshade		1						
Brassicaceae	Brassicaceae	cabbage family							2	
Rumex acetosella	Polygonaceae	sheep's sorrel		1	2	8	3			
Rumex acetosa	Polygonaceae	common sorrel				3	4	2	1	1
Rumex obtusifolius	Polygonaceae	broad-leaved dock			8			3	4	1
Caryophyllaceae	Caryophyllaceae	pink family		6	9	1	3	5	2	2
Amaranthaceae	Amaranthaceae	goosefoot subfamily		2	5	3			1	2
Primula veris-type	Primulaceae	cowslip/ primrose								1
Rubiaceae	Rubiaceae	bedstraw family							1	
Cuscuta	Convolvulaceae	dodders						1		
Plantago indet	Plantaginaceae	plantain				2				
Plantago major	Plantaginaceae	indeterminable plantain		2	4	1	1	2	3	
Plantago lanceolata	Plantaginaceae	ribwort plantain	1	5	12	6	4	9	2	7

			Birchen Park			Lower Kingswood		Snuffmill Dingle		
	Family	Common name(s)	0.96m	1.37m	2.40m	0.67m	0.92m	0.69m	1.78m	2.90m
Stachys-type	Lamiaceae	woundworts/ dead-nettles								1
Centaurea nigra	Asteraceae	common knapweed		1		1	2			1
Centaurea cyanus	Asteraceae	cornflower		1						
Cichorium intybus-type	Asteraceae	chicory/ dandelion	1	12	4	9		3	9	4
Solidago virgaurea-type	Asteraceae	daisies/ goldenrods		7	4	10	2	3	3	3
Cirsium-type	Asteraceae	thistles					1		2	3
Artemisia-type	Asteraceae	mugworts			1				2	
Valerianella	Valerianaceae	cornsalads							1	
Valeriana dioica	Valerianaceae	marsh valerian			2					
Apiaceae	Apiaceae	carrot family		1	1	2	2			
Cyperaceae undiff	Cyperaceae	sedge	3	2	3	6	5	5	12	5
Poaceae undiff	Poaceae	grass	10	60	55	88	102	79	87	64
Cerealia indet	Poaceae	indeterminable cereal		2		4	6			
Avena/ *Triticum*-type	Poaceae	oat/wheat				4	2			
Hordeum-type	Poaceae	barley				1	2			
		TLP Grains counted	**20**	**162**	**156**	**202**	**162**	**165**	**171**	**164**
Menyanthes trifoliata	Menyanthaceae	bogbean						1		
Hydrocharis morsus-ranae	Hydrocharitaceae	frogbit				1				
Potamogeton natans-type	Potamogetonaceae	broad-leaved pondweed	1			1	1			
Sparganium erectum	Typhaceae	branched bur-reed		2				2		

			Birchen Park			Lower Kingswood		Snuffmill Dingle		
	Family	Common name(s)	0.96m	1.37m	2.40m	0.67m	0.92m	0.69m	1.78m	2.90m
Sparganium emersum-type	Typhaceae	unbranched bur-reed						2		
Pteridium aquilinum	Dennstaedtiaceae	bracken		10	16	7	4	4	11	6
cf Athyrium filix-femina	Woodsiaceae	lady fern								1
Polypodium	Polypodiaceae	polypody	2	2		1	3			
Pteropsida (mono) indet		ferns	33	25	29	5	5	14	21	23

Table 4 Results of pollen assessment

4.3.2.2 Discussion

All three sites show relatively open landscapes with arboreal pollen not exceeding 23% TLP, although there is the possibility that taphonomic factors have influenced this with local open, marsh/wet meadow vegetation being over-represented. Despite this, the richness of the herbaceous species in all of the samples indicates that the site environs have been relatively stable without large scale disturbances.

Lower Kingswood Farm has a more agricultural character than the other sites with the presence of cereals and the arable weed, prickly poppy, but this can be explained by the site being in close proximity to a farm.

The grains of Rosaceae pollen identified in the Lower Kingswood Farm samples may in fact represent orchard species such as *Malus* (apple) or *Pyrus* (pears), as extant trees of these species were seen on site but due to the constraints of the assessment and the difficulty of separating members of the Rosaceae family through palynological identification, this cannot be confirmed.

All of the sequences tend towards an increase in arboreal species through time. The reason for this is uncertain although it may be related either to the halting of woodland management or feature usage (the mill ponds at Snuffmill Dingle, the moat at Lower Kingswood Farm), or the commencement of woodland management and planting of tree species (Birchen Park). Only a detailed documentary or cartographic assessment would help confirm or refute this hypothesis.

4.3.3 Plant macrofossil remains

Only small quantities of material were available from auger samples for assessment of plant macrofossil remains and recovery of material for radiocarbon dating. Relatively coarse plant material was seen in the auger sequence from Snuffmill Dingle, from which three sub-samples were taken (Table 1). Two sub-samples were taken from the Birchen Park sequence, and none from the Lower Kingswood sequence, as only gauge auger samples were available which were not suitable for assessment of macrofossil remains.

The sequence from Snuffmill Dingle showed a transition from a predominantly herbaceous flora (including aquatic plants) at 1.0 to 1.20m to one dominated by remains of woodland flora (birch, alder and willow), although it should be borne in mind that only limited organic remains were recovered from the upper two samples (Table 1). A hazelnut fragment was also recovered from the auger sample at 1.20 to 1.40m which was submitted for radiocarbon dating.

Only unidentified wood was recovered from the lower sub-sample from the Birchen Park sequence at 2.48 to 2.55m. At 1.49 to 1.75m there was evidence of a mosaic of woody vegetation (unidentifiable twig fragments), wet bankside vegetation (sedge and club-rush) and weeds of grassy or overgrown areas, such as dock (*Rumex* sp), hedge woundwort (*stachys sylvatica*), white horehound (*Marrubium vulgare*) and bramble (*Rubus* sect *Glandulosus*). Seeds of bramble/blackberry from this sample were submitted for radiocarbon dating along with a fragment of hazelnut at 1.37m depth.

Identifiable material was not recovered from the base of either the Snuffmill Dingle or Birchen park sequences, so it was not possible to interpret the environment of the earliest phase of these features. Suitable material may be recovered through more intensive auger sampling using a 70 mm diameter dutch auger.

Occasional insect remain were noted in flots from both Snuffmill Dingle and Birchen Park.

5. Synthesis

Potential for palaeoenvironmental sturdy of the Wyre Forest has been assessed by mapping of (potentially) small wetland or waterlogged sites where organic deposits are likely to survive and by consulting documentary and Historic Environment Record sources. The former can be used to reconstruct the nature of the past landscape from waterlogged organic remains, while the latter can provide information on sites where on a variety of types of palaeoenvironmental evidence may survive.

Over 400 small wetland/waterlogged sites have been mapped on a GIS for the project area, despite the fact that in a largely wooded landscape with many narrow steep valleys, this did not seem a promising area for such features. This is not an area of the country associated with extensive wetland landscapes of the kind that are generally considered to produce large bodies of valuable archaeological and palaeoecological information, such as those recovered from the well known and well surveyed Cambridgeshire/Lincolnshire fenlands or Somerset Levels. Nevertheless, small wetland sites or deposits are widely dispersed across the Wyre Forest and could be of significance for palaeoenvironmental work.

Approximately 13% of the features mapped are of medium potential or higher with many of low potential, largely on account of their small size. However, some sites assessed as being of low potential at the mapping stage may prove to be more productive when fully investigated, as validation has shown tree cover/encroachment to be slightly over-estimated. Organic material within most of the feature types mapped (except palaeochannels) tends to derive from sediment influx small catchment areas. Where the catchment area is small, palaeoenvironmental data is invaluable because there is greater prospect of linking changes in environment seen in the data to specific events (for example, human activity on a known archaeological site in the vicinity).

Assessment of the GIS mapping

Validation has revealed some aspects which can limit the accuracy of assessment of potential at the mapping stage. These are: that tree cover can be over-estimated using aerial photographs, that there are some inaccuracies on modern OS mapping and that features identified as small palaeochannels can sometimes still be active watercourses. These problems can to some extent be minimised as follows:

- Coverage by trees– tree cover could be reflected in the scoring of potential only when the feature appears to be completely tree-covered on aerial photographs. This would limit the likelihood of over-estimating tree cover as the tree canopy can make the tree-cover appear more dense on aerial photographs than on the ground

- Modern mapping is sometimes not as accurate as the 1st edition OS mapping, but where the shape of features appears to have changed, or have disappeared completely, it is often possible to detect modern mapping inaccuracy by comparing with aerial photographs and LiDAR

- Small watercourses seen on 1st edition OS maps but not on modern OS maps (therefore identified as palaeochannels) can often still be active channels. Recording only those obvious on LiDAR but not on 1st edition or modern maps is recommended as the best way of limiting the number of active channels wrongly identified as palaeochannels

Other aspects that can affect the potential of the sites include modern ground disturbance which may have occurred in some locations, but this is difficult to predict or detect at the mapping stage. Many features assessed as being of low potential are small meander loops on brooks and streams where organic deposits could have built up, but because of their small size this is uncertain. Nevertheless, they are still seen as worth identifying as having some potential.

The date of many of the features is unknown, so it is not always possible to determine whether the features identified by the mapping are contemporary with any nearby known archaeological sites, monuments or historic landscapes. However, the data provides a starting point for any research into past historic environment using the types of features identified by this mapping.

Auger survey validation has shown good preservation of organic material, and particularly of pollen remains from three sites. At all three sites, sedimentation of the features appeared to have started in a relatively open landscape, becoming progressively more wooded over time, presumably as the features fell out of use, or (as in the case of Birchen Park), possibly because of tree planting. The association with a farm at Lower Kingswood was reflected in the sequence with a more arable-type flora. These are classic 'abandonment' sequences.

The radiocarbon dates for all three sites are of late medieval to modern date. In each case this is likely because the BP date corresponds with a point on the calibration curve where calibration of the date becomes more difficult. The most likely date in each case is interpreted to be 17th to 18th century (Section 4.3.2). This is likely to be a problem for a significant number of features mapped, so it should be borne in mind that other means of dating the features for research purposes may be needed; that is it may be necessary to recover artefactual material or use OSL dating).

For all three sites it was not possible to recover material for radiocarbon dating from the very base of the deposits from augering undertaken at this stage, but it is possible that with more intensive augering and use of a 70mm diameter dutch auger that sufficient material could be collected with further work. Either of these sequences may prove to have earlier (potentially medieval) origins.

Other evidence

Documentary and Historic Environment Record sources have shown a low level of archaeological fieldwork through which palaeoenvironmental data has been recovered; probably because the low level of commercial development in the area has resulted in few fieldwork interventions taking place overall. Table 2 summarises the sites listed on the Worcestershire and Shropshire HERs which have either produced palaeoenvironmental data or have the potential to do so. Much of the environmental data produced so far is concentrated in Bewdley where the Central Marches Towns Survey has identified the alluvial floodplain along the River Severn as having the greatest potential for environmental work, as archaeological deposits here are most likely to have remained waterlogged (Pearson 1996). Palaeoenvironmental evidence to date from Bewdley includes animal bone evidence from tanning or horn working sites at Lax Lane and Dog Lane (WSM 17761, WSM 31923) and dendrochronology data from timber-framed buildings (WSM 10854, 17763), from a 15th century structure on the quayside (HWCM 11173) and from tanning pits at Lax lane (WSM 17761). The types of site listed on the HERs which typically have potential to produce palaeoenvironmental data include deserted medieval villages (DMVs), ponds and water features related to industrial mills, and historic gardens.

Additionally features identified as charcoal burning platforms on LiDAR images (Fig 5) are of interest for analysis of charcoal to identify the sources of timber used and, potentially, some aspects of woodland management.

6. Research frameworks

A number of areas of research are also identified as being of importance to the Wyre Forest which relate to those discussed in local and regional research frameworks. These include assessments of potential for environmental archaeology for the *West Midlands Regional Research Framework for Archaeology* (Pearson forthcoming, Pearson 2003) and for aggregate levy funded assessments (Pearson 2007).

There is little evidence for prehistoric settlement in the Wyre Forest, apart from an Iron Age settlement at Blackstone (Hurst *et al* 2010), largely because there has been limited development and archaeological intervention in the project area. However, a feature which tends to be associated with late prehistoric activity is burnt mounds which can sometimes be seen in stream or river banks. These are mounds of burnt stone and charcoal which are thought to be either waste pot boilers from cooking activities or waste from the creation of sweat lodges. Both are activities which would have taken place near, or on the banks of watercourses, which is where burnt mounds are normally to be found (on present-day watercourses or palaeochannels), visible normally as a layer of burnt stone. Around 40 have been discovered in Birmingham, many of them in parks and open spaces (Hodder 2004, Hodder 2011, Pearson forthcoming), or are discovered through excavation, an example of which being found at Clifton Quarry (Worcestershire; Mann and Jackson forthcoming). As the River Severn and many small watercourses run through the Wyre Forest, prospecting for burnt mounds (by undertaking stream bank survey) may well be a productive way of finding evidence of prehistoric activity, as there has been so little opportunity to excavate.

Wyre Forest has historically been an area of dispersed small settlements within a largely wooded landscape – classed by landscape historians as a 'woodland' landscape as opposed to the 'champion' landscape of nucleated settlements and open arable fields. From medieval times until relatively recently the economy has been dominated by mixed farming, woodland industries (such as charcoal production) and other industries, but over time blocks of woodland have been 'assarted' or brought into arable use. Parcels of ridge and furrow within pastoral or wooded areas are visible on the LiDAR, potentially showing assarting but the date of these is unknown. Palaeoenvironmental evidence from nearby small wetland sites, if contemporary, may provide evidence of the assarting and the means to date the transition in land use.

Industries, rather than arable farming have been traditionally been important in the Wyre Forest, and environmental evidence for former existence of industry has been highlighted by Pearson (2003). Charcoal production is one such industry which can leave traces in the landscape. Features visible on LiDAR images in, for example the Baveney Brook area in Shropshire, have been interpreted as charcoal burning platforms. Sampling for recovery of charcoal may help to confirm whether the interpretation is correct, and provide information on the types of timber being used, and the management practices in use, such as the length of the coppicing cycle. Charcoal can also be used for radiocarbon dating of these features. Metal smelting is known from the medieval period and can be expected to have had a significant impact on the landscape, particularly, on the woodland. Timber (in the form of charcoal) would have been a prime source of fuel for smelting, so the impact on local woodland is of interest. If timber was mostly sourced from coppiced woodland rather than clear felling, it may be difficult to detect in contemporary pollen sequences. Nevertheless, it should be borne in mind when looking at pollen sequences contemporary with known nearby sites of metal smelting. Charcoal from smelting furnaces may have greater potential to provide information on timber sources and woodland management practices. This has been demonstrated by work in the Forest of Dean (Pearson *et al* 2011) where charcoal associated with Romano-British smelting waste has identified types of fire-wood in use.

Episodes of woodland clearance resulting from industrial or agricultural activity are likely to result in colluviation (soil slippage downslope as a result of de-stabilisation of the soils) in many steep-sided valleys. Geoarchaeological assessment as part of any fieldwork may be useful in identifying this process. This has been the case recently in the Forest of Dean (Pearson *et al* 2011) where the landscape and cultural history is similar to that of the Wyre Forest. Here colluviation was identified in association with Roman iron smelting (along with the charcoal evidence mentioned above).

Several historic gardens are known in the project area, and along with industrial sites have been highlighted as of interest (Pearson 2003). Integral features of these landscapes which may be of interest are fishponds, ornamental ponds, lakes and canalised watercourses, in which waterlogged organic deposits may survive. Pollen, other archaeobotanical and

geoarchaeological evidence from these features can provide information on the garden landscape which could be useful for garden reconstruction projects.

7. Recommendations

The following recommendations are made for any further work relating to the Wyre Forest should funds become available:

- As part of the GIS mapping, adjustment of the scores for 'coverage' to allow for tree coverage only where features are completely obscured by trees on aerial photographs (Section 5), then adjustment of overall score for potential where appropriate
- Further validation of GIS mapping by walk-over survey and augering
- To carry out stream walking surveys in collaboration with volunteers to look for evidence of burnt mounds in the banks of streams and rivers. To be carried out after initiation by an experienced professional (possible *Grow with Wyre* legacy project)
- To further validate possible charcoal burning platforms identified on LiDAR images and to sample promising features to recover charcoal for analysis.

8. Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

A palaeoenvironmental assessment was undertaken on behalf of the Grow with Wyre *project (centred on NGR SO 745 765), a Landscape Partnership Scheme. The project aimed to ensure the long-term social, environmental and economic sustainability of the Wyre landscape. The work was funded by the Heritage Lottery Fund, SITA Trust, Natural Assets, Biffaward and GrantScape.*

The assessment aimed to map small wetland sites (or areas where organic deposits could be expected to survive) in the form of a GIS, and assess the potential for survival of organic deposits and their accessibility for fieldwork. These sites are of potential for providing valuable information about the past landscape and human activity over time. The information was intended to enhance the Historic Environment Records for Worcestershire and Shropshire, help archaeological planners manage the wetland aspect of the historic environment, and may be of interest to various groups for research (for example university researchers and community groups).

A total of 474 sites were mapped. Of these eight were assessed as being of high potential, 53 of medium potential and the remainder as of low potential (mainly small features). The number of features identified overall was higher than expected for a landscape in which there is a high proportion of narrow streams in steep, wooded valleys. Ground-truthing of a selection of sites by walk-over survey (by volunteers) enabled the assessment of these features to be refined and the method to be tested. As a result of this work, recommendations have also been made which will help in future to improve the assessment process – see 'Recommendations'.

Auger sampling of three features at Snuffmill Dingle, Birchen Park and Lower Kingswood Farm revealed well preserved sequences of organic deposits which all showed a change from relatively open conditions to being increasingly wooded, probably as the sites became abandoned, or as in the case of Birchen Park, plantations were introduced. Lower

Kingswood Farm showed a more arable landscape. Interpretation of radiocarbon results placed the datable parts of all three sequences between the mid 17th to late 19th century. However, as it was difficult to recover suitable material for radiocarbon dating from base of these sequences, it is thought that earlier dates may be recovered, if funds became available to carry out further sampling on these sites.

Recommendations were also made for other palaeoenvironmental work relevant to the Wyre Forest area which could potentially be funded through legacy projects. These included, for example, stream-walking to prospect for burnt mounds (prehistoric features), sampling of features identified as charcoal burning platforms, and further validation of mapped wetland features.

9. Acknowledgements

The Service would like to thank the following for their kind assistance in the successful conclusion of this project, Adam Mindykowski of Worcestershire Historic Environment and Archaeology Service, and especially to the *Grow with Wyre* volunteers who put their time into validating the mapped features.

10. Personnel

The fieldwork and report preparation was led by Elizabeth Pearson. The project manager responsible for the quality of the project was Derek Hurst. GIS mapping was undertaken by Richard Bradley, fieldwork by Elizabeth Pearson, Nick Daffern and Alan Clapham, and environmental analysis by Elizabeth Pearson and Nick Daffern.

11. Bibliography

Barber, K E, 1976 History of vegetation, in S Chapman (ed) *Methods in plant ecology*, Oxford: Blackwell Scientific Publications, 49-52

Bennett, K D, 1994 *Annotated catalogue of pollen and pteridophyte spore types of the British Isles*, unpublished report, Department of Plant Sciences, University of Cambridge

Buteux, V, 1996 *Archaeological assessment of Bewdley and Wribbenhall*, Hereford and Worcester County Council, Archaeological Service report **298**

Cappers, T R J, Bekker, R M, and Jans, J E A, 2006 *Digitale Zadenatlas van Nederland: Digital seed atlas of the Netherlands*, Groningen Archaeological Studies, **4**, Barkhuis Publishing and Groningen University Library: Groningen

CAS, 1995 (as amended) *Manual of Service practice: fieldwork recording manual*, County Archaeological Service, Hereford and Worcester County Council, report, **399**

English Heritage 2007 *Geoarchaeology: Using earth sciences to understand the archaeological record*, Swindon: English Heritage Publishing

English Heritage 2011 *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Swindon: English Heritage Publishing

HEAS 2010 *Proposal for palaeoenvironmental assessment (Grow with Wyre project)*, Historic Environment and Archaeology Service, Worcestershire County Council, unpublished document dated 6th October 2010, **P3547**

Hodder, M, 2004 *Birmingham: the hidden history*, the History Press Ltd, Stroud

Hodder, M, 2011 Prehistoric Birmingham – 3000 years old burnt mounds, on-line reference available at http://www.birmingham.gov.uk/cs/Satellite?c=Page&childpagename=Planning-Management%2FPageLayout&cid=1223092741227&pagename=BCC%2FCommon%2FWrapper%2FInlineWrapper , accessed 21/12/2011

Hurst, D, Hunt, A, and Davenport, P, 2010 Iron Age settlement at Blackstone, Worcestershire: excavations 1972, 1973, and 1977, *Internet Archaeology* **28**. Online access, http://intarch.ac.uk/journal/issue28/hurst_index.html

Jackson, R, Mann, A, and Roberts, T, 2011 *Evaluating and enhancing the geoarchaeological resource of the lower Severn Valley*, Worcestershire Historic Environment and Archaeology Service report, **1819**

Jones, A P, Tucker, M E, and Hart, J K, 1999 Guidelines and recommendations, in A P Jones, M E, Tucker and J K, Hart (eds), *The description and analysis of Quaternary stratigraphic field sections*, London: Quaternary Research Association technical guide **7**, 27-76

Mann, A , and Jackson, R, forthcoming *Archaeological watching brief and contingency excavation at Clifton Quarry, Severn Stoke, Worcestershire*, Worcestershire Historic Environment and Archaeology Service internal report, **1612**

Moore, P D, Webb, J A, and Collinson, M E, 1991 *Pollen analysis*, (2nd edition), Oxford: Blackwell Scientific Publications

Pearson, E A, 1996 'Assessment of environmental evidence' and 'Potential for environmental remains', in Buteux 1996 *ibid*

Pearson, L, 2003 *Environmental archaeology in the West Midlands in the early post-medieval period: Do we really need environmental archaeology?*, West Midlands regional Research Framework for Archaeology, Seminar 6, available at http://www.iaa.bham.ac.uk/research/projects/wmrrfa/seminar6/index.shtml, accessed 22/12/2011

Pearson, E, 2007, Environment in R Jackson and H Dalwood, *Archaeology and aggregates in Worcestershire: a resource assessment and research agenda*, Worcestershire Historic Environment and Archaeology Service report, **1477**, available at http://www.worcestershire.gov.uk/cms/pdf/Archaeology%20and%20Aggregates1.pdf , accessed 22/12/2011

Pearson, E, 2010 *Peat Potential: mapping of organic deposits of potential for aiding management of the archaeological resource in Worcestershire*, Worcestershire Historic Environment and Archaeology Service report, **1797**

Pearson, E, forthcoming Cows, beans and the view: landscape and farming of the West Midlands in later prehistory, in D Hurst (Ed), *Westward on the High-hilled Plains: the later prehistory of the West Midlands*, Oxbow books, Oxford and Oakville

Pearson, E, Daffern, N, and Wilkinson, K, 2011 *Palaeoenvironmental assessment of Cannop Brook, Forest of Dean*, Worcestershire Historic Environment and Archaeology Service internal report, **1853**

Stace, C 2010 *New flora of the British Isles* (3rd edition), Cambridge: Cambridge University Press

Figures

Fig 1 Grow with Wyre project area

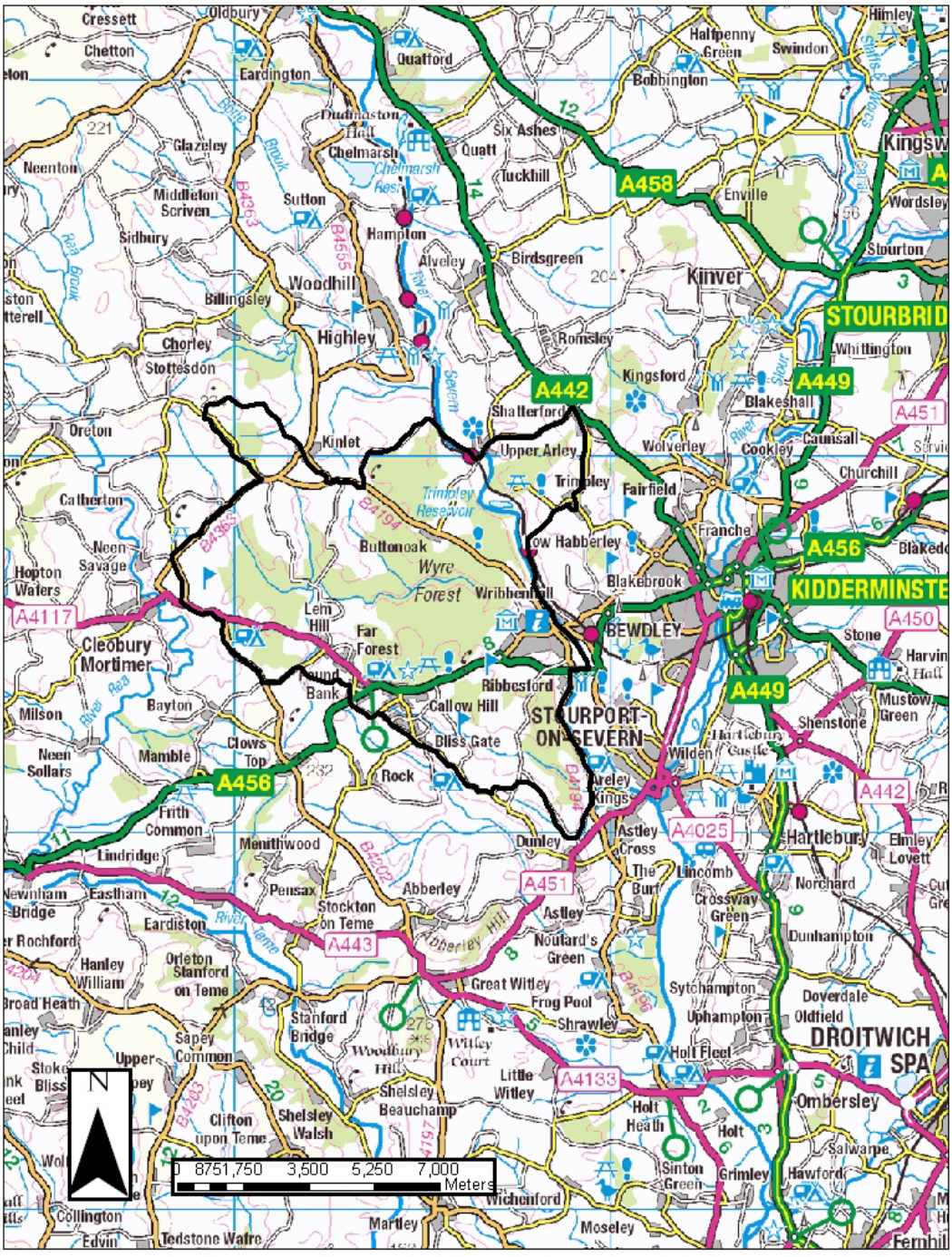


Fig 2: Auger site at Snuffmill Dingle #20

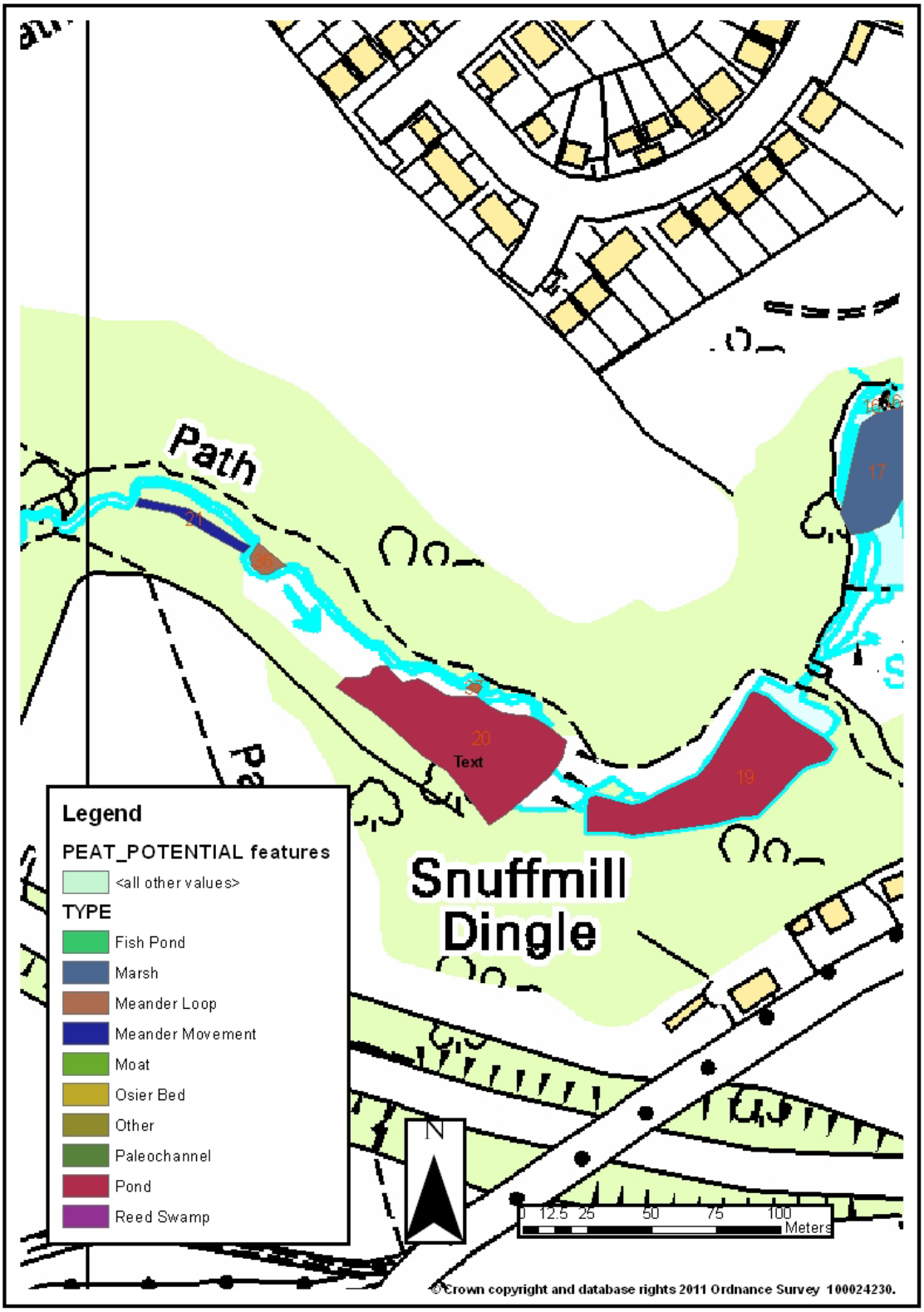


Fig 3 Auger site at Birchen Park #447

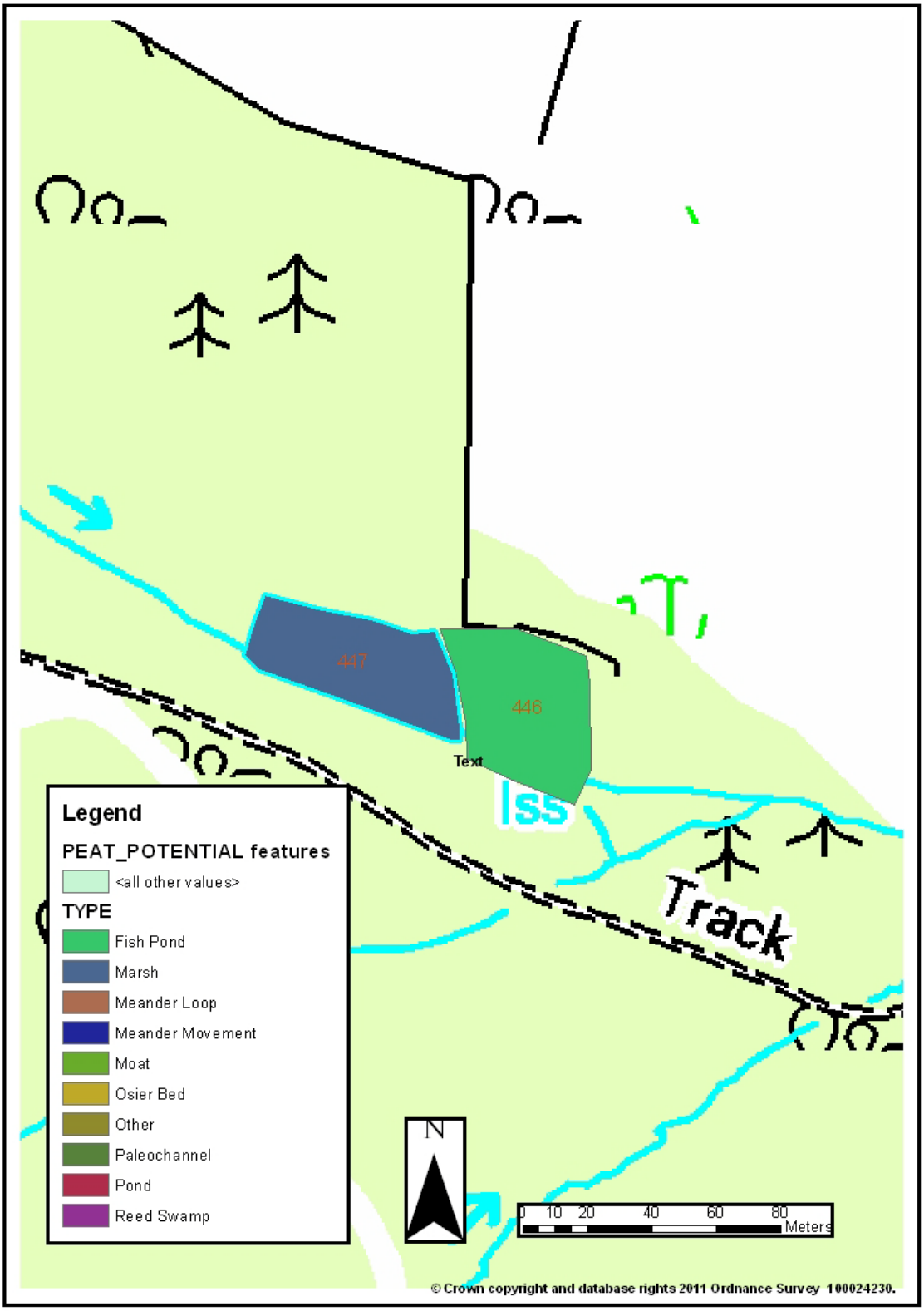


Fig 4 Auger site at Lower Kingswood Farm # 276

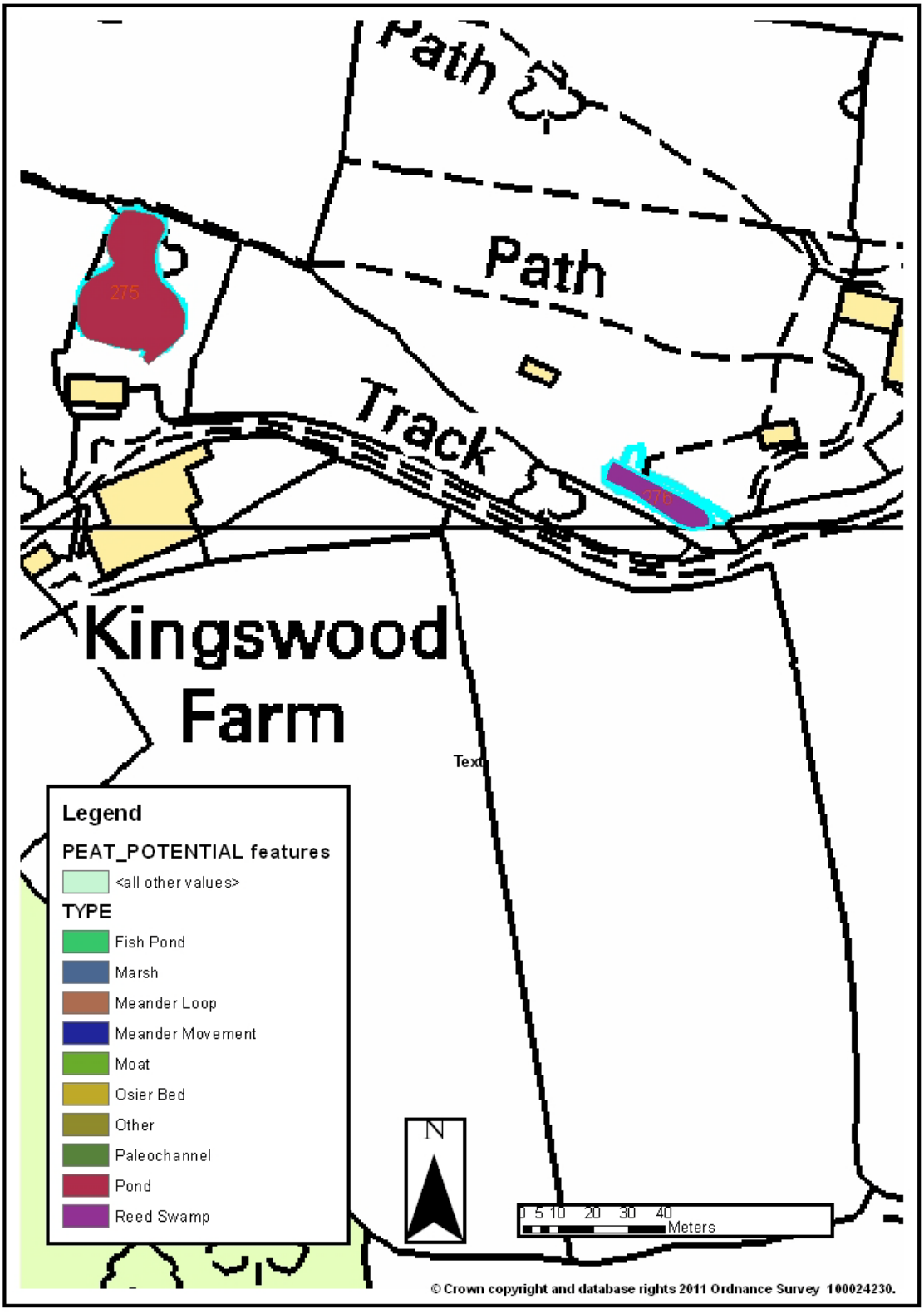
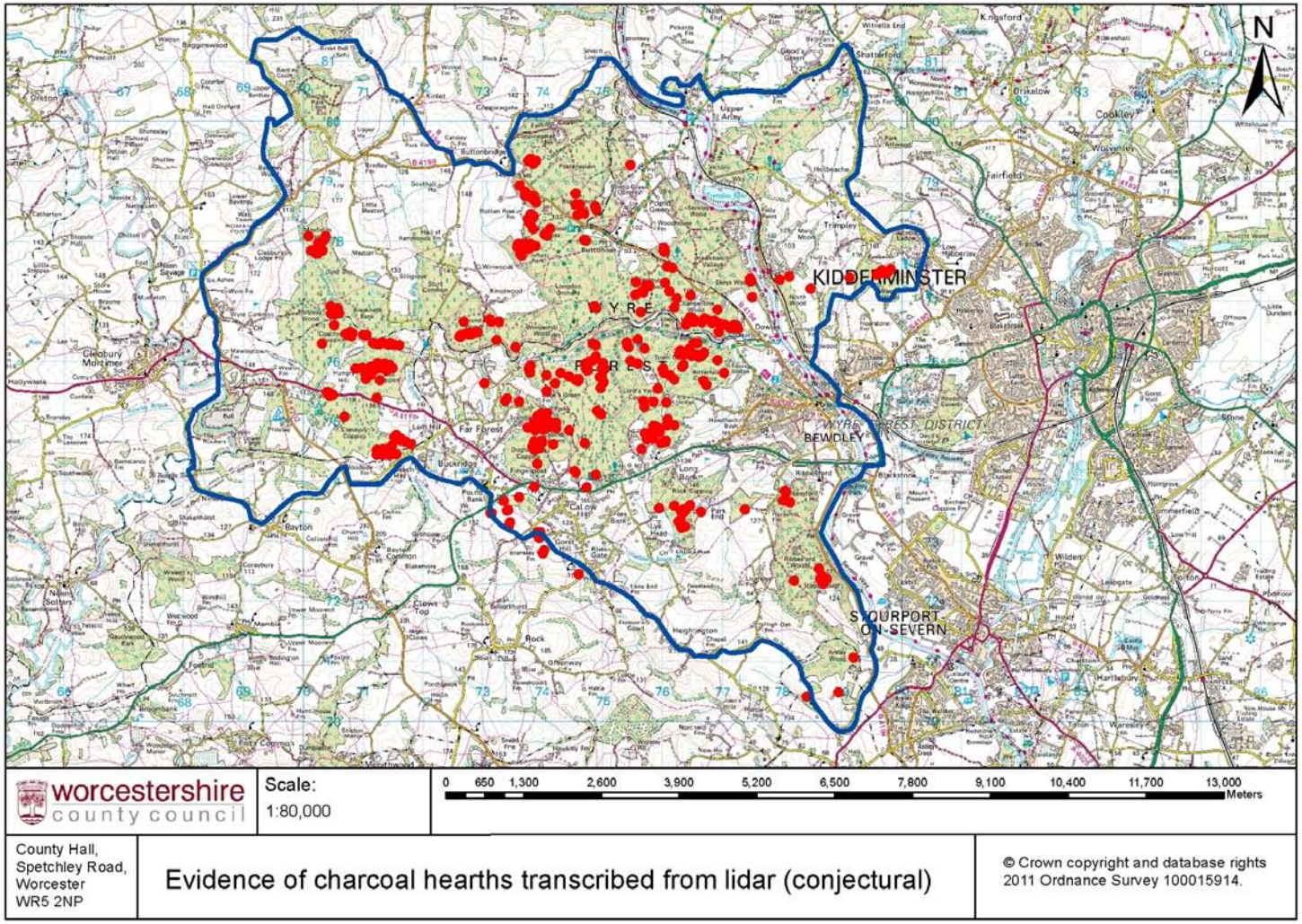


Fig 5: Features interpreted as charcoal burning platforms from LiDAR images



Plates

Plate 1 Snuffmill Dingle (cleaning an auger sample)

Plate 2 Augering at Birchen Park #447

Plate 3 Birchen park pond #446 facing south (photograph by Tony Leach)

Plate 4 Birchen Park pond #445 facing south (photograph by Tony Leach)

Plate 5 Stream through Bayton Pool #404 facing east (photograph by Tony Leach)

Plate 6 Catsley Farm pond #436 facing east (photgrapho by Pete Wolfe)

Plate 7 Catsley Farm pond #437 facing south (photograph by Pete Wolfe)

Appendix 1 Assessment of features with potential for organic survival

During the mapping phase features were scored according to their potential for organic deposits to survive and for their accessibility. This is a basic level of scoring intended to be used as a first stage of assessment of the mapped features (and is irrespective of the date of the feature). Table 1 shows the questions that were applied to each feature to facilitate the scoring of potential and the source referred to. The scores were weighted to take account of how important these aspects are in assessing the potential.

	Questions	**LOW**		**HIGH**
A	To what level is the feature accessible/covered? (Assessed from modern map)	Fully Covered **1**	Semi/Partially Covered **3**	Open **5**
B	What scale/size is the feature? (Info taken from attribute table)	Small (<500m^2) **1**	Medium (501-1999m^2) **3**	Large (2000> m^2) **6**
C	Has there been any change in the extent of waterlogging? (1st Ed OS, modern maps and AP's compared)	Major Change (No longer mapped) **1**	Minor Change (A decrease but still there) **2**	No Change or a 'Positive' Change **3**
	Is there any associated information with or related to the feature? (Take from HER layer)	No **Leave blank**		Yes **Add comment**

Table 1: Scoring potential and accessibility

The size of the feature is particularly important as the larger the feature the greater the potential for organic deposits to survive. Larger volumes of organic material are less prone to wetting and drying and consequently decay. The potential for recovering a sequence which represents a long time span and several phases of environmental change is also greater. For this work only surface area can be recorded as volume (the ideal measurement) is unknown.

The extent to which there have been changes in waterlogging of the features has also been used to assess the potential for organic deposits to survive. This was estimated by comparing the extent of waterlogging indicated on both 1st Edition OS and the modern OS maps (also by referring to any aerial photographs available). Any major drying out may have caused decay of organic deposits.

The accessibility of the mapped features was determined by categorising these as 'open' 'semi-open' or 'covered' according the modern OS map and any aerial photographs available. The extent to which cover will have damaged the deposits and the likelihood of this cover being removed may vary with the type of cover (trees, buildings or hard surfaces for example). For this reason the type of cover was noted in the GIS attributes table as an aid to assessing potential.

In addition, where information on the history or archaeology of a feature was available on the HER it was added to the attribute table and was flagged on the GIS map. This information was not used in scoring potential as, for instance, availability of documentary evidence on a medieval moat may improve the potential of this feature for projects focussing on medieval landscape but not for those focussing on prehistoric landscape: potential needs to be considered in a more general form.

The overall potential of the features was categorised as high, medium and low based on the scores detailed above as follows high (green) = 10–14, medium = 8–9 and low = up to 7.

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
0	SO7970	Pond	152	5	1	1	7	Low	
1	SO7881	Pond	139	3	1	3	7	Low	Woodland coverage
2	SO7981	Pond	307	3	1	2	6	Low	
3	SO7979	Pond	229	3	1	3	7	Low	
4	SO7979	Pond	140	3	1	3	7	Low	
5	SO7978	Pond	602	3	3	3	9	Medium	
6	SO7978	Pond	111	3	1	3	7	Low	In wooded area
7	SO7978	Pond	246	3	1	3	7	Low	In wooded area
8	SO7978	Pond	668	5	3	3	11	High	
9	SO7977	Pond	96	3	1	3	7	Low	In wooded area
10	SO7879	Pond	11	1	1	3	5	Low	
11	SO7879	Pond	381	1	1	2	4	Low	In wooded area
12	SO7878	Paleochannel	636	3	3	1	7	Low	
13	SO7877	Pond	257	3	1	3	7	Low	
14	SO7974	Meander Movement	677	1	3	2	6	Low	
15	SO7874	Pond	890	1	3	2	6	Low	
16	SO7874	Paleochannel	87	1	1	1	3	Low	Now under a pond
17	SO7874	Marsh	1277	1	3	1	5	Low	Now under a pond - probably disturbed
18	SO7879	Marsh	729	1	3	1	5	Low	Now under a pond - probably disturbed
19	SO7874	Pond	2264	1	6	2	9	Medium	In wooded area
20	SO7874	Pond	2325	1	6	1	8	Medium	In wooded area
21	SO7874	Meander Movement	181	1	1	2	4	Low	
22	SO7974	Meander Movement	1750	1	3	2	6	Low	
23	SO7874	Pond	2584	3	6	3	12	High	
24	SO7874	Marsh	355	1	1	1	3	Low	Now under a pond - probably disturbed
25	SO7874	Paleochannel	158	1	1	2	4	Low	Now under a road
26	SO7874	Paleochannel	179	1	1	2	4	Low	Now under a road
27	SO7873	Reed Swamp	461	1	1	1	3	Low	Now under a pond - probably disturbed

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
28	SO7873	Pond	177	1	1	3	5	Low	
29	SO7873	Pond	305	1	1	3	5	Low	
30	SO7873	Paleochannel	123	3	1	1	5	Low	
31	SO7873	Paleochannel	190	1	1	2	4	Low	Heavily wooded area
32	SO7873	Paleochannel	243	1	1	2	4	Low	Heavily wooded area
33	SO7971	Meander Loop	168	1	1	3	5	Low	Heavily wooded area
34	SO7971	Meander Loop	139	1	1	3	5	Low	Heavily wooded area
35	SO7971	Meander Loop	157	1	1	3	5	Low	Heavily wooded area
36	SO7874	Meander Loop	90	1	1	3	5	Low	Heavily wooded area
37	SO7874	Meander Loop	15	1	1	3	5	Low	Heavily wooded area
38	SO7877	Meander Loop	162	1	1	3	5	Low	Heavily wooded area
39	SO7871	Meander Loop	225	1	1	3	5	Low	Heavily wooded area
40	SO7871	Meander Loop	226	1	1	3	5	Low	Heavily wooded area
41	SO7871	Meander Loop	143	1	1	3	5	Low	Heavily wooded area
42	SO7871	Meander Loop	264	1	1	3	5	Low	Heavily wooded area
43	SO7871	Meander Loop	263	1	1	3	5	Low	Heavily wooded area
44	SO7871	Meander Loop	236	1	1	3	5	Low	Heavily wooded area
45	SO7871	Meander Loop	384	1	1	3	5	Low	Heavily wooded area
46	SO7871	Meander Loop	120	1	1	3	5	Low	Heavily wooded area
47	SO7871	Meander Loop	162	1	1	3	5	Low	Heavily wooded area
48	SO7871	Meander Movement	106	1	1	2	4	Low	Heavily wooded area
49	SO7871	Meander Movement	220	1	1	2	4	Low	Heavily wooded area
50	SO7871	Meander Movement	282	1	1	2	4	Low	Heavily wooded area
51	SO7871	Meander Movement	168	1	1	2	4	Low	Heavily wooded area
52	SO7871	Meander Loop	381	1	1	3	5	Low	Heavily wooded area
53	SO7871	Paleochannel	733	1	3	1	5	Low	Possible former watercourse
54	SO7871	Pond	278	3	1	1	5	Low	
55	SO7971	Meander Loop	37	1	1	1	3	Low	
56	SO7871	Paleochannel	6299	1	6	1	8	Medium	Possible former watercourse

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
57	SO7970	Pond	140	1	1	2	4	Low	
58	SO7970	Pond	156	1	1	3	5	Low	
59	SO7970	Meander Movement	41	1	1	2	4	Low	
60	SO7780	Pond	689	3	3	3	9	Medium	
61	SO7780	Marsh	450	5	1	1	7	Low	
62	SO7780	Marsh	47	5	1	1	7	Low	
63	SO7780	Pond	147	5	1	1	7	Low	
64	SO7779	Meander Loop	17	1	1	3	5	Low	Heavily wooded area
65	SO7778	Pond	668	3	3	3	9	Medium	
66	SO7776	Pond	77	1	1	3	5	Low	
67	SO7776	Meander Movement	472	1	1	2	4	Low	
68	SO7776	Meander Movement	236	3	1	2	6	Low	
69	SO7776	Meander Movement	519	3	3	2	8	Medium	
70	SO7776	Pond	81	1	1	1	3	Low	
71	SO7775	Pond	1446	1	3	3	7	Low	
72	SO7775	Pond	50	1	1	3	5	Low	
73	SO7775	Pond	217	1	1	1	3	Low	Now under a housing estate
74	SO7775	Marsh	102	1	1	1	3	Low	Now under a housing estate
75	SO7775	Marsh	246	1	1	1	3	Low	Now under a housing estate
76	SO7775	Pond	202	1	1	1	3	Low	Now under a housing estate
77	SO7775	Pond	81	1	1	1	3	Low	Now under a housing estate
78	SO7775	Pond	216	1	1	1	3	Low	Now under a housing estate
79	SO7774	Paleochannel	234	1	1	2	4	Low	Now under a main road
80	SO7774	Paleochannel	37	1	1	2	4	Low	Now under a main road
81	SO7774	Paleochannel	75	1	1	2	4	Low	Now under a main road
82	SO7774	Pond	676	1	3	1	5	Low	
83	SO7774	Pond	490	1	1	1	3	Low	Now under a reservoir
84	SO7774	Paleochannel	134	1	1	1	3	Low	Now under a reservoir
85	SO7774	Paleochannel	157	1	1	2	4	Low	Now under a main road

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
86	SO7774	Paleochannel	100	5	1	1	7	Low	Probably disturbed by main road
87	SO7774	Pond	176	3	1	3	7	Low	
88	SO7774	Meander Movement	70	1	1	2	4	Low	In wooded area
89	SO7774	Paleochannel	168	5	1	1	7	Low	
90	SO7774	Paleochannel	183	1	1	1	3	Low	Now mostly under a fishing pond
91	SO7773	Pond	244	3	1	3	7	Low	
92	SO7773	Pond	84	5	1	1	7	Low	
93	SO7773	Marsh	232	1	1	1	3	Low	Now partly under a pond
94	SO7774	Pond	260	3	1	1	5	Low	
95	SO7774	Pond	127	5	1	1	7	Low	
96	SO7774	Pond	95	1	1	1	3	Low	Now under a housing estate
97	SO7774	Pond	67	1	1	1	3	Low	Now under a housing estate
98	SO7775	Pond	32	1	1	1	3	Low	Now under a housing estate
99	SO7875	Pond	143	1	1	1	3	Low	Now under a housing estate
100	SO7875	Pond	168	1	1	1	3	Low	Now under a housing estate
101	SO7875	Pond	92	1	1	1	3	Low	Now under a housing estate
102	SO7875	Pond	44	1	1	1	3	Low	Now under a housing estate
103	SO7772	Pond	631	1	3	3	7	Low	
104	SO7772	Meander Loop	292	1	1	3	5	Low	In wooded area
105	SO7772	Meander Loop	1219	1	3	3	7	Low	In wooded area
106	SO7772	Meander Loop	167	1	1	3	5	Low	In wooded area
107	SO7772	Pond	133	5	1	1	7	Low	
108	SO7772	Meander Movement	76	1	1	2	4	Low	In wooded area - possible canalisation
109	SO7772	Meander Loop	93	1	1	3	5	Low	In wooded area
110	SO7771	Meander Loop	89	1	1	3	5	Low	In wooded area
111	SO7771	Meander Loop	157	1	1	3	5	Low	In wooded area
112	SO7771	Meander Loop	47	1	1	3	5	Low	In wooded area
113	SO7771	Meander Loop	98	1	1	3	5	Low	In wooded area
114	SO7771	Meander Loop	238	1	1	3	5	Low	In wooded area

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
115	SO7771	Pond	53	1	1	1	3	Low	Now under a driveway
116	SO7771	Pond	176	3	1	2	6	Low	
117	SO7771	Pond	156	3	1	1	5	Low	
118	SO7771	Pond	561	1	3	2	6	Low	
119	SO7771	Pond	110	1	1	3	5	Low	
120	SO7771	Pond	128	3	1	1	5	Low	Partly under access road
121	SO7771	Pond	357	3	1	3	7	Low	
122	SO7680	Meander Movement	134	3	1	2	6	Low	
123	SO7680	Marsh	280	3	1	1	5	Low	
124	SO7680	Pond	177	5	1	1	7	Low	
125	SO7679	Pond	158	1	1	3	5	Low	
126	SO7679	Meander Movement	4723	1	6	2	9	Medium	Validated - silted up & overgrown
127	SO7678	Moat	1306	5	3	1	9	Medium	No longer mapped.Visible on validation
128	SO7679	Paleochannel	42	1	1	1	3	Low	
129	SO7679	Pond	447	3	1	1	5	Low	
130	SO7678	Pond	1339	3	3	2	8	Medium	
131	SO7678	Paleochannel	160	3	1	1	5	Low	Disturbed by reservoir
132	SO7678	Pond	19	2	1	3	6	Low	
133	SO7676	Paleochannel	333	3	1	1	5	Low	
134	SO7676	Meander Movement	272	1	1	2	4	Low	Heavily wooded area
135	SO7676	Meander Movement	288	1	1	2	4	Low	Heavily wooded area
136	SO7676	Meander Movement	224	3	1	2	6	Low	Heavily wooded area
137	SO7676	Pond	1286	3	3	3	9	Medium	Heavily wooded area
138	SO7676	Pond	581	1	3	2	6	Low	Heavily wooded area
139	SO7676	Pond	1082	1	3	3	7	Low	Heavily wooded area
140	SO7676	Pond	340	3	1	1	5	Low	Heavily wooded area
141	SO7675	Pond	530	1	3	3	7	Low	Heavily wooded area
142	SO7675	Pond	143	1	1	2	4	Low	Heavily wooded area
143	SO7675	Pond	745	1	3	2	6	Low	Heavily wooded area

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
144	SO7675	Pond	204	1	1	3	5	Low	Heavily wooded area
145	SO7675	Pond	110	1	1	3	5	Low	Heavily wooded area
146	SO7675	Pond	211	1	1	3	5	Low	Heavily wooded area
147	SO7675	Pond	309	3	1	3	7	Low	Heavily wooded area
148	SO7675	Paleochannel	60	1	1	1	3	Low	Now under a large pond
149	SO7674	Pond	529	3	3	3	9	Medium	
150	SO7673	Pond	62	1	1	3	5	Low	In wooded area
151	SO7673	Pond	70	5	1	1	7	Low	
152	SO7673	Pond	74	3	1	3	7	Low	
153	SO7673	Pond	43	5	1	1	7	Low	
154	SO7673	Pond	228	5	1	1	7	Low	
155	SO7673	Paleochannel	110	1	1	1	3	Low	Now under pond
156	SO7672	Pond	149	3	1	1	5	Low	
157	SO7672	Pond	201	1	1	3	5	Low	
158	SO7672	Paleochannel	299	5	1	2	8	Medium	Disturbed/canalised by golf course
159	SO7672	Meander Loop	139	1	1	3	5	Low	In wooded area
160	SO7672	Meander Movement	102	1	1	2	4	Low	In wooded area
161	SO7672	Meander Loop	48	1	1	3	5	Low	In wooded area
162	SO7672	Meander Loop	361	1	1	3	5	Low	In wooded area
163	SO7672	Meander Loop	352	1	1	3	5	Low	In wooded area
164	SO7672	Meander Movement	137	5	1	2	8	Medium	Possibly canalised by golf course
165	SO7672	Meander Loop	118	1	1	3	5	Low	In wooded area
166	SO7672	Meander Loop	64	1	1	3	5	Low	In wooded area
167	SO7672	Meander Loop	407	3	1	3	7	Low	In wooded area
168	SO7672	Pond	363	3	1	2	6	Low	
169	SO7671	Pond	164	5	1	1	7	Low	
170	SO7671	Pond	184	5	1	1	7	Low	
171	SO7671	Pond	45	1	1	3	5	Low	
172	SO7671	Pond	16	3	1	3	7	Low	

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
173	SO7671	Pond	338	5	1	1	7	Low	
174	SO7671	Pond	76	3	1	1	5	Low	
175	SO7671	Pond	126	3	1	3	7	Low	
176	SO7671	Pond	343	3	1	3	7	Low	
177	SO7671	Pond	129	3	1	3	7	Low	
178	SO7671	Pond	182	3	1	1	5	Low	No longer mapped - visible on aerial photos
179	SO7580	Meander Loop	244	1	1	3	5	Low	In wooded area
180	SO7580	Meander Loop	210	1	1	3	5	Low	Partly under caravan park
181	SO7580	Meander Loop	92	1	1	3	5	Low	Partly under caravan park
182	SO7580	Meander Loop	51	1	1	3	5	Low	In wooded area
183	SO7580	Paleochannel	1264	3	3	2	8	Medium	Partly under caravan park
184	SO7580	Meander Movement	4216	3	6	2	11	High	Probably silted up
185	SO7580	Pond	61	3	1	3	7	Low	
186	SO7579	Pond	171	5	1	1	7	Low	
187	SO7579	Pond	231	5	1	3	9	Medium	
188	SO7579	Pond	215	3	1	1	5	Low	
189	SO7579	Meander Loop	91	1	1	3	5	Low	Heavily wooded area
190	SO7579	Meander Loop	157	1	1	3	5	Low	Heavily wooded area
191	SO7579	Meander Loop	64	1	1	3	5	Low	Heavily wooded area
192	SO7579	Meander Loop	21	1	1	3	5	Low	Heavily wooded area
193	SO7579	Meander Loop	28	1	1	3	5	Low	Heavily wooded area
194	SO7579	Pond	152	1	1	3	5	Low	
195	SO7578	Pond	230	3	1	3	7	Low	
196	SO7578	Pond	91	3	1	1	5	Low	
197	SO7578	Pond	176	3	1	2	6	Low	
198	SO7578	Pond	134	5	1	3	9	Medium	
199	SO7577	Pond	169	3	1	2	6	Low	
200	SO7577	Marsh	72	1	1	1	3	Low	Now under a pond - probably disturbed
201	SO7577	Reed Swamp	1832	1	3	1	5	Low	

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
202	SO7576	Meander Movement	414	1	1	2	4	Low	Complex of channels left after dam built
203	SO7576	Pond	792	3	3	3	9	Medium	Heavily wooded area
204	SO7575	Meander Movement	82	1	1	2	4	Low	Heavily wooded area
205	SO7575	Meander Movement	85	3	1	2	6	Low	Heavily wooded area
206	SO7575	Meander Loop	58	1	1	3	5	Low	Heavily wooded area
207	SO7575	Meander Loop	23	1	1	3	5	Low	Heavily wooded area
208	SO7575	Meander Loop	21	1	1	3	5	Low	Heavily wooded area
209	SO7575	Meander Loop	15	1	1	3	5	Low	Heavily wooded area
210	SO7575	Meander Loop	24	1	1	3	5	Low	Heavily wooded area
211	SO7575	Meander Loop	23	1	1	3	5	Low	Heavily wooded area
212	SO7575	Meander Loop	16	1	1	3	5	Low	Heavily wooded area
213	SO7774	Pond	73	1	1	1	3	Low	Now under a fish pond - probably disturbed
214	SO7774	Paleochannel	87	3	1	1	5	Low	Now under a fish pond - probably disturbed
215	SO7675	Pond	155	1	1	3	5	Low	
216	SO7674	Paleochannel	82	3	1	1	5	Low	Now under golf course water features
217	SO7671	Pond	230	1	1	1	3	Low	
218	SO7574	Meander Movement	59	3	1	2	6	Low	Probably moved/disturbed by road
219	SO7574	Pond	48	3	1	3	7	Low	
220	SO7574	Pond	189	3	1	3	7	Low	
221	SO7574	Pond	442	1	1	3	5	Low	
222	SO7573	Pond	72	1	1	1	3	Low	
223	SO7573	Pond	48	1	1	1	3	Low	Under an access track
224	SO7573	Pond	104	1	1	1	3	Low	
225	SO7573	Pond	30	1	1	3	5	Low	
226	SO7573	Pond	36	1	1	1	3	Low	
227	SO7573	Pond	41	5	1	1	7	Low	
228	SO7573	Pond	20	5	1	1	7	Low	
229	SO7573	Pond	18	5	1	1	7	Low	
230	SO7573	Pond	25	1	1	1	3	Low	

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
231	SO7573	Pond	28	3	1	1	5	Low	
232	SO7572	Pond	19	1	1	3	5	Low	
233	SO7572	Pond	36	1	1	1	3	Low	
234	SO7572	Meander Loop	23	1	1	3	5	Low	Heavily wooded area
235	SO7572	Pond	284	3	1	3	7	Low	
236	SO7572	Pond	699	1	3	2	6	Low	
237	SO7572	Pond	39	2	1	1	4	Low	Partly under access track
238	SO7571	Pond	227	3	1	3	7	Low	
239	SO7476	Meander Movement	48	1	1	2	4	Low	Disturbed by road/track
240	SO7476	Meander Loop	34	1	1	3	5	Low	
241	SO7476	Meander Movement	140	1	1	2	4	Low	Disturbed by road
242	SO7476	Meander Loop	137	3	1	3	7	None	Stream bed, result of modern road build-up
243	SO7476	Meander Loop	887	3	3	3	9	None	Recent disturbance, new bridge built - validated
244	SO7474	Paleochannel	460	1	1	2	4	Low	Possible former watercourse
245	SO7474	Pond	61	3	1	2	6	Low	
246	SO7474	Meander Movement	29	1	1	2	4	Low	Disturbed by road/track
247	SO7474	Paleochannel	1259	1	3	1	5	Low	In wooded area
248	SO7473	Pond	224	3	1	1	5	Low	
249	SO7473	Pond	41	3	1	3	7	Low	
250	SO7473	Pond	26	3	1	1	5	Low	
251	SO7473	Pond	109	1	1	3	5	Low	
252	SO7473	Pond	208	3	1	1	5	Low	
253	SO7473	Pond	54	3	1	1	5	Low	
254	SO7473	Pond	36	1	1	1	3	Low	
255	SO7473	Pond	30	1	1	3	5	Low	
256	SO7472	Pond	12	1	1	1	3	Low	
257	SO7472	Pond	27	1	1	1	3	Low	Now under a garden patio
258	SO7472	Pond	19	3	1	1	5	Low	Now under a back garden
259	SO7479	Paleochannel	3650	1	6	1	8	Medium	Heavily wooded area

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
260	SO7478	Paleochannel	1531	1	3	1	5	Low	Heavily wooded area
261	SO7379	Meander Movement	74	3	1	2	6	Low	
262	SO7379	Osier Bed	575	5	3	1	9	Medium	
263	SO7378	Osier Bed	220	3	1	1	5	Low	
264	SO7378	Pond	49	5	1	1	7	Low	
265	SO7378	Pond	183	3	1	3	7	Low	
266	SO7378	Pond	37	3	1	3	7	Low	
267	SO7377	Marsh	953	1	3	1	5	Low	Now under a pond - probably disturbed
268	SO7377	Pond	603	3	3	3	9	Medium	
269	SO7377	Meander Loop	35	3	1	3	7	Low	In wooded area, only alluvium visible- validated
270	SO7377	Meander Loop	48	3	1	3	7	Low	In wooded area, only alluvium visible - validated
271	SO7377	Meander Loop	62	3	1	3	7	Low	In wooded area, only alluvium visible - validated
272	SO7377	Meander Loop	39	3	1	3	7	Low	In wooded area, recent damming to make pond
273	SO7377	Meander Loop	106	1	1	3	5	Low	In wooded area
274	SO7377	Meander Loop	41	1	1	3	5	Low	In wooded area
275	SO7377	Pond	791	3	3	3	9	Medium	
276	SO7377	Reed Swamp	209	3	1	2	6	Low	Overgrown on edges - validated
277	SO7376	Meander Movement	572	1	3	2	6	Low	Heavily wooded area
278	SO7376	Meander Movement	64	1	1	2	4	Low	In wooded area
279	SO7376	Osier Bed	76	5	1	1	7	Low	
280	SO7376	Meander Loop	73	1	1	3	5	Low	In wooded area
281	SO7376	Meander Loop	98	1	1	3	5	Low	In wooded area
282	SO7376	Meander Loop	115	1	1	3	5	Low	In wooded area
283	SO7376	Meander Loop	158	1	1	3	5	Low	In wooded area
284	SO7375	Paleochannel	92	1	1	1	3	Low	Now under a pond - probably disturbed
285	SO7375	Pond	65	1	1	3	5	Low	In wooded area
286	SO7375	Pond	33	1	1	1	3	Low	Now under a farmyard
287	SO7375	Paleochannel	114	1	1	2	4	Low	In wooded area
288	SO7374	Pond	29	3	1	1	5	Low	

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
289	SO7374	Pond	34	3	1	1	5	Low	Now partly under a driveway
290	SO7374	Pond	53	5	1	3	9	Medium	
291	SO7373	Pond	156	1	1	1	3	Low	
292	SO7373	Pond	20	3	1	1	5	Low	Now partly under a building
293	SO7373	Pond	31	1	1	1	3	Low	Now under a farmyard
294	SO7373	Pond	24	1	1	1	3	Low	Now under a driveway
295	SO7373	Pond	14	1	1	1	3	Low	
296	SO7373	Marsh	564	1	3	1	5	Low	In wooded area
297	SO7373	Pond	35	5	1	1	7	Low	
298	SO7373	Pond	50	3	1	1	5	Low	
299	SO7373	Pond	13	5	1	1	7	Low	
300	SO7373	Pond	17	3	1	1	5	Low	
301	SO7278	Pond	189	5	1	1	7	Low	
302	SO7278	Pond	525	3	3	3	9	Medium	
303	SO7277	Pond	503	3	3	3	9	Medium	
304	SO7277	Pond	317	3	1	3	7	Low	
305	SO7277	Pond	149	5	1	1	7	Low	
306	SO7276	Meander Loop	926	1	3	3	7	Low	In wooded area
307	SO7276	Pond	449	3	1	3	7	Low	In wooded area
308	SO7276	Pond	72	3	1	3	7	Low	
309	SO7276	Meander Loop	546	1	3	3	7	Low	In wooded area
310	SO7276	Meander Loop	249	3	1	3	7	Low	In wooded area
311	SO7275	Pond	203	1	1	3	5	Low	
312	SO7275	Meander Movement	63	1	1	3	5	Low	In wooded area
313	SO7275	Pond	112	1	1	3	5	Low	In wooded area
314	SO7275	Pond	297	3	1	3	7	Low	In wooded area
315	SO7274	Meander Loop	305	1	1	3	5	Low	In wooded area
316	SO7274	Pond	40	5	1	1	7	Low	
317	SO7274	Pond	27	5	1	1	7	Low	

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
318	SO7274	Pond	21	3	1	1	5	Low	
319	SO7274	Meander Loop	281	3	1	3	7	Low	Partly under caravan park
320	SO7274	Meander Loop	326	3	1	3	7	Low	Partly under caravan park
321	SO7274	Pond	22	1	1	1	3	Low	In wooded area
322	SO7178	Paleochannel	332	1	1	2	4	Low	Now under a pond - probably disturbed
323	SO7178	Paleochannel	141	1	1	2	4	Low	Now under a pond - probably disturbed
324	SO7177	Pond	108	5	1	1	7	Low	
325	SO7177	Pond	102	5	1	3	9	Medium	
326	SO7177	Pond	63	3	1	3	7	Low	
327	SO7177	Meander Loop	96	1	1	3	5	Low	In wooded area
328	SO7178	Meander Loop	26	1	1	3	5	Low	
329	SO7177	Paleochannel	523	1	3	2	6	Low	Now under a pond - probably disturbed
330	SO7177	Pond	86	5	1	1	7	Low	
331	SO7177	Pond	272	3	1	2	6	Low	
332	SO7177	Paleochannel	630	1	3	2	6	Low	Now under a pond - probably disturbed
333	SO7177	Meander Loop	118	1	1	3	5	Low	In wooded area
334	SO7176	Reed Swamp	1192	1	3	1	5	Low	Heavily wooded area
335	SO7176	Meander Movement	337	1	1	2	4	Low	Heavily wooded area
336	SO7176	Meander Loop	151	1	1	3	5	Low	Heavily wooded area
337	SO7176	Meander Loop	286	1	1	3	5	Low	Heavily wooded area
338	SO7176	Paleochannel	42	3	1	2	6	Low	Now under a pond - probably disturbed
339	SO7176	Meander Movement	114	5	1	2	8	Medium	
340	SO7176	Meander Loop	489	1	1	3	5	Low	
341	SO7176	Meander Loop	261	1	1	3	5	Low	Heavily wooded area
342	SO7176	Paleochannel	78	1	1	2	4	Low	Now under a pond - probably disturbed
342	SO7176	Meander Movement	80	1	1	2	4	Low	
344	SO7175	Meander Loop	414	3	1	3	7	Low	
345	SO7175	Meander Loop	250	1	1	3	5	Low	In wooded area
346	SO7175	Meander Loop	141	1	1	3	5	Low	In wooded area

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
347	SO7175	Meander Loop	88	1	1	3	5	Low	In wooded area
348	SO7175	Reed Swamp	103	3	1	1	5	Low	In wooded area
349	SO7175	Meander Loop	136	1	1	3	5	Low	In wooded area
350	SO7175	Meander Loop	242	1	1	3	5	Low	In wooded area
351	SO7175	Meander Loop	198	1	1	3	5	Low	In wooded area
352	SO7175	Meander Loop	60	1	1	3	5	Low	In wooded area
353	SO7175	Marsh	83	3	1	1	5	Low	
354	SO7175	Pond	59	3	1	3	7	Low	
355	SO7174	Pond	36	5	1	3	9	Medium	
356	SO7174	Meander Movement	253	5	1	2	8	Medium	
357	SO7174	Meander Movement	50	5	1	2	8	Medium	
358	SO7174	Paleochannel	35	3	1	2	6	Low	
359	SO7174	Meander Movement	28	1	1	2	4	Low	Heavily wooded area
360	SO7174	Meander Loop	107	3	1	3	7	Low	
361	SO7074	Pond	10	5	1	1	7	Low	
362	SO7074	Pond	79	5	1	1	7	Low	
363	SO7074	Pond	49	5	1	1	7	Low	
364	SO7074	Pond	108	5	1	1	7	Low	
365	SO7074	Paleochannel	46	3	1	2	6	Low	Now under a pond - probably disturbed
366	SO7074	Paleochannel	108	1	1	2	4	Low	Now under a pond - probably disturbed
367	SO7075	Meander Movement	215	1	1	2	4	Low	Heavily wooded area
368	SO7075	Pond	29	5	1	3	9	Medium	
369	SO7075	Pond	83	3	1	3	7	Low	
370	SO6975	Pond	53	3	1	3	7	Low	
371	SO6975	Pond	51	3	1	3	7	Low	
372	SO7076	Pond	40	3	1	3	7	Low	
373	SO7076	Paleochannel	17	1	1	2	4	Low	Now partly under a pond - probably disturbed
374	SO7076	Meander Movement	87	1	1	2	4	Low	Heavily wooded area
375	SO7076	Paleochannel	162	1	1	2	4	Low	Now partly under a pond - probably disturbed

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
376	SO7076	Meander Loop	62	1	1	3	5	Low	Heavily wooded area
377	SO7076	Meander Loop	162	1	1	3	5	Low	Heavily wooded area
378	SO7076	Meander Loop	52	1	1	3	5	Low	Heavily wooded area
379	SO7077	Meander Loop	63	1	1	3	5	Low	Heavily wooded area
380	SO7077	Meander Loop	98	1	1	3	5	Low	Heavily wooded area
381	SO7077	Meander Loop	337	1	1	3	5	Low	Heavily wooded area
382	SO7077	Meander Loop	173	3	1	3	7	Low	Heavily wooded area
383	SO7077	Meander Loop	222	3	1	3	7	Low	Heavily wooded area
384	SO7077	Meander Loop	542	1	3	3	7	Low	Heavily wooded area
385	SO7078	Meander Loop	332	1	1	3	5	Low	Heavily wooded area
386	SO7077	Meander Loop	293	1	1	3	5	Low	Heavily wooded area
387	SO7077	Meander Loop	139	1	1	3	5	Low	Heavily wooded area
388	SO6977	Pond	110	3	1	3	7	Low	
389	SO6976	Paleochannel	33	3	1	2	6	Low	Now under a pond - probably disturbed
390	SO6976	Paleochannel	75	3	1	2	6	Low	Now partly under a pond - probably disturbed
391	SO6976	Pond	167	1	1	1	3	Low	
392	SO6976	Paleochannel	46	1	1	2	4	Low	Disturbed by railway line (now dismantled)
393	SO6976	Paleochannel	152	3	1	2	6	Low	Disturbed by railway line (now dismantled)
394	SO6975	Pond	282	1	1	2	4	Low	
395	SO6975	Paleochannel	33	1	1	2	4	Low	Disturbed by railway line (now dismantled)
396	SO6975	Pond	424	3	1	2	6	Low	
397	SO6975	Pond	265	1	1	3	5	Low	
398	SO6975	Pond	216	1	1	1	3	Low	In wooded area
399	SO6975	Pond	860	3	3	3	9	Medium	
400	SO6975	Pond	981	5	3	3	11	High	Area of marshy ground - validated
401	SO6974	Pond	244	5	1	3	9	Medium	
402	SO6974	Pond	1443	3	3	3	9	Medium	In wooded area, fish pond
403	SO6974	Paleochannel	127	3	1	1	5	Low	In wooded area, validated - described as culvert
404	SO6974	Reed Swamp	8470	1	6	2	9	Medium	Created as part of landscaped garden. Validated

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
405	SO6974	Pond	236	5	1	3	9	Medium	
406	SO6974	Reed Swamp	295	3	1	1	5	Low	
407	SO6974	Meander Loop	279	1	1	3	5	Low	In wooded area
408	SO6974	Meander Loop	211	1	1	3	5	Low	In wooded area
409	SO6974	Pond	168	5	1	1	7	Low	No longer mapped - but visible on aerial photos
410	SO6974	Pond	243	3	1	3	7	Low	
411	SO6973	Pond	203	5	1	1	7	Low	No longer mapped - but visible on aerial photos
412	SO6973	Reed Swamp	2701	1	6	1	8	Medium	Wooded area follows extent of former reed swamp
413	SO6874	Meander Movement	815	3	3	2	8	Medium	
414	SO6874	Meander Movement	565	3	3	2	8	Medium	
415	SO6874	Paleochannel	125	5	1	2	8	Medium	
416	SO6874	Pond	132	1	1	1	3	Low	
417	SO6874	Pond	441	3	1	3	7	Low	No longer mapped - now part of river channel
418	SO6874	Meander Movement	914	5	3	1	3	None	Not visible on validation - collapsed bank?
419	SO6874	Paleochannel	120	5	1	2	8	Medium	
420	SO6875	Pond	30	5	1	1	7	Low	
421	SO6875	Meander Movement	403	1	1	2	4	Low	In wooded area
422	SO6875	Marsh	541	3	3	1	7	Low	Extends beyond project area
423	SO6875	Pond	177	5	1	1	7	Low	
424	SO6876	Pond	271	1	1	1	3	Low	Now under modern farm buildings
425	SO6877	Pond	332	5	1	1	7	Low	
426	SO6877	Pond	452	3	1	1	5	Low	
427	SO6877	Pond	726	5	3	1	9	Medium	
428	SO6877	Pond	411	3	1	1	5	Low	Now partly under modern farm building
429	SO6877	Pond	785	3	3	2	8	Medium	
430	SO6877	Pond	288	1	1	3	5	Low	
431	SO6877	Paleochannel	1007	3	3	1	7	Low	
432	SO6978	Paleochannel	342	3	1	2	6	Low	Now under a pond - probably disturbed
433	SO6978	Paleochannel	257	3	1	2	6	Low	Now under a pond - probably disturbed

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
434	SO6978	Paleochannel	1552	3	3	2	8	Medium	Now under a pond - probably disturbed
435	SO7178	Pond	159	1	1	3	5	Low	
436	SO7279	Pond	511	5	3	2	1	Low	Possibly modern (from validation visit)
437	SO7279	Pond	657	5	3	3	1	Low	Possibly modern (from validation visit)
438	SO7179	Pond	81	1	1	3	5	Low	
439	SO7179	Pond	218	1	1	3	5	Low	
440	SO7179	Pond	294	3	1	3	7	Low	
441	SO7180	Pond	1723	3	3	2	8	Medium	
442	SO7180	Fish Pond	3993	1	6	3	10	High	Not visible on aerial photos but still mapped
443	SO7080	Fish Pond	2206	1	6	3	10	High	Not visible on aerial photos but still mapped
444	SO7079	Pond	633	5	3	1	9	Medium	
445	SO7080	Pond	542	5	3	3	11	High	In wooded area, validated
446	SO7080	Fish Pond	1829	5	3	3	11	High	No longer mapped but pond still present, validated
447	SO7080	Marsh	1731	5	3	3	11	High	No longer mapped but marsh still present,validated
448	SO6979	Meander Loop	197	1	1	3	5	Low	In wooded area
449	SO7080	Paleochannel	559	1	3	1	5	Low	Heavily wooded area - possible former watercourse
450	SO7180	Pond	1431	3	3	1	7	Low	Possible former pond - visible on LiDAR
451	SO7378	Paleochannel	832	3	3	1	7	Low	Active watercourse in wood, validated
452	SO7278	Paleochannel	674	1	3	1	5	Low	Heavily wooded area - possible former watercourse
454	SO7077	Paleochannel	611	1	3	1	5	Low	Heavily wooded area - possible former watercourse
454	SO7176	Paleochannel	363	1	1	1	3	Low	Heavily wooded area - possible former watercourse
455	SO7376	Paleochannel	1125	3	3	1	7	Low	Heavily wooded area - possible former watercourse
456	SO7175	Paleochannel	898	1	3	1	5	Low	Heavily wooded area - possible former watercourse
457	SO7175	Paleochannel	969	1	3	1	5	Low	Heavily wooded area - possible former watercourse
458	SO7374	Paleochannel	2513	1	6	1	8	Medium	Heavily wooded area - possible former watercourse
459	SO7879	Paleochannel	507	1	3	1	5	Low	Heavily wooded area - possible former watercourse
460	SO7579	Paleochannel	414	3	1	1	5	Low	Heavily wooded area - possible former watercourse
461	SO7677	Paleochannel	878	1	3	1	5	Low	Heavily wooded area - possible former watercourse
462	SO7677	Paleochannel	807	1	3	1	5	Low	Heavily wooded area - possible former watercourse

FEATURE	GRID SQUARE	TYPE	AREA m^2	COVERAGE	AREA SCORE	WATERLOGGING SCORE	POTENTIAL SCORE	POTENTIAL	COMMENTS
463	SO7677	Paleochannel	342	1	1	1	3	Low	Heavily wooded area - possible former watercourse
464	SO7577	Paleochannel	475	1	1	1	3	Low	Heavily wooded area - possible former watercourse
465	SO7476	Paleochannel	667	1	3	1	5	Low	Heavily wooded area - possible former watercourse
466	SO7675	Paleochannel	2067	1	6	1	8	Medium	Heavily wooded area - possible former watercourse
467	SO7475	Paleochannel	883	1	3	1	5	Low	Heavily wooded area - possible former watercourse
468	SO7475	Paleochannel	758	1	3	1	5	Low	Heavily wooded area - possible former watercourse
469	SO7474	Paleochannel	1098	1	3	1	5	Low	Heavily wooded area - possible former watercourse
470	SO7673	Paleochannel	401	1	1	1	3	Low	In wooded area - possible former watercourse
471	SO7772	Meander Loop	362	1	1	3	5	Low	In wooded area
472	SO7775	Pond	97	1	1	1	3	Low	
473	SO7776	Pond	191	3	1	1	5	Low	
474	SO7775	Pond	63	1	1	1	3	Low	

Appendix 1 Table 2: Features mapped (validated sites indicated by highlighting)

Appendix 2 Validation recording sheet (AS47)

VALIDATION MAPPED ORGANIC FEATURES

SITE NAME	Name	Date

Weather if relevant (eg has it been very wet?)

Site conditions ✓

- Overgrown vegetation		Comments
- Marshy ground		
- Steep slopes		
- Stock grazing		
- Fences / obstructions		
- Other		

Conditions for augering (eg amount of standing watering)

Boots / Wellies / Waders / Boat Job?

Area of water

Is the area of the water the same as mapped?

Same **Smaller** **Larger**

Photographs

Photo Number	Looking N / S/ E/ W?	Description

worcestershire county council

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
23	Ribbesford	Dry, sunny. No rain for 4 to 5 weeks	Yes	No	Yes	No	Yes	No	Pond in fenced garden	Boat job	Same		Unable to get photographs as access & viewpoints v limited	High	High
24	Ribbesford	Dry, sunny. No significant rain for 4 to 5 weeks	Yes	No	Yes	No	Yes	No	Evidence for dredging. Piles of ?mud on banks	Wellies or waders	Same	Hard to check depth due to foliage, but no access for boat		Low	Low
27	Ribbesford	Dry, sunny. No rain for 4 to 5 weeks	Yes	Yes	Yes	No	No	No	Dense, mixed broadleaf trees or ground cover	Wellies	Smaller			Low	Low
66	Dowles Brook	fine, dry, bright. No rain for 4 to 5 weeks	No	No	No	No	No	No	Unable to gain access - in private garden & owner/occupier unavailable. Could not see any evidence of pond from roadway					Low	Low
67	Dowles Brook	Fine, dry, bright. No	Yes	No	Yes	No	Yes	Yes	Himalayan Balsam on	Wellies/waders	Smaller			Low	Low

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
		significant rain for 4 to 5 weeks.							both banks. Eroded banks on N side of bend. 6' fence from bend to E. Occasional debris accumulations						
68	Dowles Brook	Fine, dry, bright. No significant rain for 4 to 5 weeks	No	No	Yes	No	No	No	bank erosion to N. 6' fence at top of bank could become unstable	Wellies/Waders	Smaller			Low	Low
126	Trimpley Reservoir	Hot & sunny following rain	Yes	Yes	No	No	No	No	V overgrown with nettles & Himalayan balsam, marshy channel to cross	Boots/wellies	Same	Channel fills with water at high river levels	Feature difficult to see because of overgrown vegetation	Medium	Medium
127	Trimpley Reservoir	Hot & sunny following rain	Yes	No	Yes	No	No	No	Nettles on N side, slightly steep slope from N-W	Boots	Same	No standing water in June		Medium	Medium
130	Trimpley Reservoir	Hot & sunny following rain	Yes	No	Yes	No	Yes	No	Brambles, bushes & mature trees, steep banks in places, fencing	Waders/boat job	Same	Depth of water unknown	Pond to N is a cess pit, larger pond to south is pond fed by stream	Medium	Medium

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
									on W side						
202	Wimperhill/Longdon Wood	Long dry period. Stream levels low	Yes	Yes	No	No	No	No	Some woodland	Boots	Never seen water there	A complex of channels left after dam for Cooper's Mill built. Stonework remains visible & leat.		Low	Low
242	Wimperhill/Longdon Wood	Long dry period. Stream levels low	Yes	Yes	No	No	No	No	Trees, brambles. Small wet patch in dip (waterhole area)	N/A	Same	No standing water	Left-over bit of stream bed after forest road built up with creation of ?ornamental pool (*c* 1980) & culvert. Not long-standing meander loop	Low	None
243	Wimperhill/Longdon Wood	Long dry period. Stream levels low	No	No	No	No	No	Yes	Bare ground and wide stream	Not needed	Same	No water	Very disturbed area. An old ford replaced	Low	None

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
													by a bridge (washed away in 2007 floods) now replaced with much earth moving.		
269	Corbets Park	Long dry period	No	No	Yes	No	No	Yes	Woodland - old coppice	Boots	Smaller	No standing water	Small areas of mineral alluvium, stony base	Low	Low
270	Corbets Park	Long dry period	No	No	Yes	No	No	No	Woodland - old coppice	N/A	Smaller	No standing water	Small areas of mineral alluvium, stony base	Low	Low
271	Corbets Park	Long dry period	No	No	Yes	No	No	No	Woodland - old coppice	N/A	Smaller	No standing water	Small areas of mineral alluvium, stony base	Low	Low
272	Corbets Park	Long dry period	No	No	Yes	No	No	No	Woodland - old coppice	N/A	Larger	Recently made into pond		Low	Low
276	Lower Kingswood Farm	Long dry period	No	Yes	No	Yes	No	No	Surrounding small trees & rushes. Not like a reed bed.	Boots, wellies, ?waders	Smaller	Standing water, rest wet ground. This is one edn of enclosure	Validation by augering showed a short sequence of well preserved	Low	Medium

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
												ditch. Was a pond until a few years ag	organic deposits		
400	Sturt Coppice	Little rain for 2/3 weeks	No	Yes	No	No	No	No		Boots	Same	marked as a pond but is now an area of marshy ground		High	High
402	Sturt Coppice	Little rain for 2/3 weeks	No	No	No	No	No	No		Boat job	Same		man made fish pond	Medium	Medium
403	Sturt Coppice	Little rain for 2/3 weeks	No	No	No	No	No	No					marked as palaeochannel but appears to be a culvert draining the man-made fish pond #402	Low	Low
404	Bayton Pool, Sturt Coppice	Little rain for 2/3 weeks	No	Yes	No	No	No	No	Marked as Bayton Pool but is fairly dry	Boots	Same		Stream flows out feature through an earth dam. Dried out - farmer has no memory of pool in last	High	Medium

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
													25/30 years		
418	Sturt Coppice		No	No	No	No	No	No		Boots			There is a large stream/small river flowing towards a weir. Meander movement probably bank of river subsiding into stream	Medium	None
436	Catsley Farm	Fine, dry, bright	Yes	Yes	No	Yes	Yes	Yes	Willows & thorns on edges; recent stock grazing; thick hedges on roadsides; very clayey movement (could be difficult)	Wellies or waders	Same		Pond created for removal of clay and stone for building purposes around farm as well as providing water for stock ie Modern?	Medium	Low
437	Catsely Farm	Fine, dry. Bright	Yes	Yes	No	Yes	Yes	No	Willows & thorns on edges; recent stock grazing;		Larger	Slightly larger water area	Pond created for removal of clay and stone for	Medium	Low

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
									thick hedges on roadsides; very clayey movement (could be difficult)				building purposes around farm as well as providing water for stock ie Modern?		
445	Birchen Park	Very little rain for 2 weeks	No	No	No	No	No	No		Boat job	Same		Appears to be natural pond. Stream flows alongside pond - presumably fed by spring	Medium	High
446	Birchen Park	Very little rain for 2 weeks	No	No	No	No	No	No		Boat job	Same		Appears to be man-made fish pond linked to #447	Medium	High
447	Birchen Park	Very little rain for 2 weeks	No	Yes	No	No	No	No	Very little standing water	Boots	Larger	Map shows 75 x 25m. More like 120 x 25m but difficult to define exact area	Marshy area - appears to be result of fish pond #446 immediately to east	Medium	High

Feature number	Site name	Weather	Overgrown vegetation	Marshy ground	Steep slopes	Stock grazing	Fences/obstructions	Other	Site condition	Augering conditions	Area of water	Notes on water	Notes (other)	Pre-validation potential	Updated potential
451	Lawley Coppice	Overcast following overnight rain	Yes	Yes	Yes	No	Yes	Yes	Vegetation in channel, forest ops on N side palaeochannel, access to ponds maybe impeded by trees in leaf	Wellies & waders	Larger	Active channel running into ?separate pools		Low	Low

Appendix 2 Table 2: Summary of validation results by walk-over survey

Appendix 3 Augerhole descriptions

Snuffmill Dingle

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
1001	Leaf litter layer	Friable, mid brown silty clay. Leaf litter layer with abundant leaves, root fragments and modern organic material	0.00m – 0.10m
1002	Layer	Slightly pliable, dark greyish brown silty clay. Occasional fine organic matter and thin, lighter coloured clay lenses	0.10m – 0.57m
1003	Layer	Slightly pliable, light – mid greyish brown silty clay. Occasional fine organic matter and thin, lighter coloured clay lenses	0.57m – 0.76m
1004	Layer	Slightly pliable, light grey silty clay. Occasional fine organic matter. Context is clayier than previous contexts	0.76m – 0.87m.
1005	Layer	Pliable, dark bluish grey silty clay. Abundant organic matter - buried leaf litter layer?	0.87m – 1.07m
1006	Layer	Pliable, greyish brown silty clay. Occasional fine organic matter in thin dark organic bands	1.07m – 1.14m
1007	Layer	Pliable, soft, pale yellowish brown clay. Rare occasional organic matter	1.14m – 1.40m
1008	Layer	Pliable, soft, pale yellowish brown sandy clay, Becomes sandier towards base of deposit, rare small angular stones and occasional organic matter	1.40m – 2.18m
1009	Layer	Pliable, soft, pale yellowish brown clay. Rare fine organic matter	2.18m – 2.23m
1010	Layer	Friable, yellowish brown slightly silty sand. Rare fine organic matter	2.23m – 2.93m
1011	Layer	Pliable, greyish yellow brown clay. Rare fine organic matter	2.93m – 3.02m
REFUSAL			3.02m

Birchen Park

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
2001	Topsoil	Pliable, mid orangish brown clayey silt. Frequent modern organic fragments and rootlets	0.00 – 0.05m
2002	Subsoil	Pliable/mouldable, light yellowish brown clayey silt. Rare rootlets	0.05m – 0.14m
2003	Layer	Pliable, light brownish grey clayey silt. Occasional rootlets	0.14m – 0.42m
2004	Layer	Pliable, light grey clayey silt. Rare rootlets and manganese flecks	0.42m – 0.57m
2005	Layer	Pliable, light grey clayey silt. Occasional – frequent rootlets and manganese flecks	0.57m – 0.60m
2006	Layer	Pliable – sticky, mid brownish grey silt. Rare to occasional woody fragments	0.60m – 0.74m

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
2007	Layer	Pliable – sticky, light brownish grey silt. Occasional organic lenses	0.74m – 1.20m
2008	Layer	Pliable, very light brownish grey fine sandy silt. Rare rootlets and occasional organic matter	1.20m – 1.49m
2009	Layer	Pliable, light brownish grey fine sandy silt. Frequent organic matter and mottling	1.49m – 1.75m
2010	Layer	Wet, pliable light brownish grey fine to mid sandy silt. Single root fragment and a single lense of very coarse sand at 1.98m	1.75m – 2.19m
2011	Layer	Pliable, reddish brown silty clay, Occasional organic fragments	2.19m – 2.48m
2012	Layer	Pliable, light blue grey silty clay. Rare possible charcoal. Became much firmer in base of deposit	2.48m – 2.55m
REFUSAL			2.55m

Lower Kingswood Farm

Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
3001	Topsoil	Pliable, light orangish brown. Frequent bioturbation and rootlets	0.00m – 0.10m
VOID			0.10m – 0.30m
3002	Layer	Pliable light grey silt. Occasional orange mottling caused by bioturbation	0.30m – 0.41m
3003	Layer	Pliable light grey silt.	0.41m – 0.59m
3004	Layer	Pliable, dark grey silty clay	0.59m – 0.68m
3005	Layer	Pliable, dark blackish grey woody silt. Frequent wood and macro fragments	0.68m – 0.77m
3006	Layer	Pliable, mid to dark grey silt	0.77m – 0.79m
3007	Layer	Pliable, light creamish grey silt	0.79m – 0.81m
3008	Layer	Pliable, dark grey silt. Rare woody inclusions	0.81m – 0.95m
3009	Layer	Pliable to mouldable light yellowish white silty clay with occasional grey mottling	0.95m – 1.10m
3010	Lining?	Very hard, greyish black clay. Occasional angular to sub angular stone fragments	1.10 – 1.18m
REFUSAL			1.18m

Appendix 4 Pollen processing methodology (Tim Mighall, Department of Geography and Environment, University of Aberdeen)

ABSOLUTE POLLEN ANALYSIS: PREPARATION SCHEDULE

PRECAUTIONARY NOTES: All procedures, up to stage 25, should take place in the fume cupboard. Read precautionary notices on fume cupboard before starting. Ascertain whereabouts of First Aid equipment NOW. Please wear laboratory coat, gloves and goggles when dealing with all chemicals. Please organize fume cupboard carefully to maximize workspace. Use the containment trays provided. Always keep the fume cupboard door down as far as practically possible. Make sure the fume cupboard is switched on and functioning correctly.

A) SOLUTION OF HUMIC COMPOUNDS

1) Switch on hotplate to heat water bath. Prepare 12 to 16 samples concurrently.

HCl. is an irritant and can cause burns. Wear gloves. Wash with water if spilt on your skin.

Using a clean spatula, place a known volume or weight of sediment (c. 2cm^3) and one spore tablet in each 50ml centrifuge tube. Add a few cm^3 of distilled water (enough to cover the pellet and tablets) and a few drops of 2M HCl. Wait until effervescence ceases, then half fill tubes with 10% KOH; place in a boiling water bath for 15 minutes. Stir to break up sediment with clean glass rod. Return HCl and KOH bottles to the chemical cabinet.

2) Centrifuge at 3,000 rpm for 5-6 minutes, ensuring first that tubes are filled to the same level. This applies throughout the schedule (Mark 7 on centrifuge).

3) Carefully decant, i.e. pour away liquid from tube, retaining residue. Do it in one smooth action.

4) Disturb pellet using vortex mixer; add distilled water, centrifuge and decant.

5) Using a little distilled water, wash residue through a fine (180 micron) sieve sitting in filter funnel over a beaker. NB Be especially careful in keeping sieves, beakers and all tubes in correct number order. Wash residue on sieve mesh into petri dish and label the lid. If beaker contains mineral material, stir contents, wait four seconds, then decant into clean beaker, leaving larger mineral particles behind. Repeat if necessary. Clean centrifuge tube and refill with contents of beaker.

6) Centrifuge the tubes and decant.

B) HYDROFLUORIC ACID DIGESTION

***(Only required** if mineral material clearly still present. Otherwise, go to stage 13)*

NB Hydrofluoric acid is extremely corrosive and toxic; it can cause serious harm on contact with eyes and skin. Rubber gloves and mask/ goggles MUST be worn up to and including stage 11. Please fill sink with H_20; have $CaCo_3$ gel tablets ready. Place pollen tube rack into tray filled with sodium bicarbonate.

7) Disturb pellet with vortex mixer. Add one cm^3 of 2M HCl.

8) With the fume cupboard sash lowered between face and sample tubes, very carefully one-third fill tubes with concentrated HF (40%). Place tubes in water bath and simmer for 20 minutes.

9) Remove tubes from water bath, centrifuge and decant down fume cupboard sink, flushing copiously with water.

10) Add 8cm^3 2H HCl to each tube. Place in water bath for 5 minutes. Do not boil HCl.

11) Remove tubes, centrifuge while still hot, and decant.

12) Disturb pellet, add distilled water, centrifuge and decant.

C) ACETYLATION

NB Acetic acid is highly corrosive and harmful on contact with skin. Wash with H_20 if spilt on skin.

13) Disturb pellet, add 10cm^3 glacial acetic acid, and centrifuge. Decant into fume cupboard sink with water running during and after.

14) Acetic Anhydride is anhydrous. Avoid contact with water. The acetylation mixture can cause severe burns if spilt on skin. Wash with water.

15) Make up 60cm^3 of acetylation mixture, just before it is required. Using a measuring cylinder; mix acetic anhydride and concentrated sulphuric acid in proportions 9:1 by volume. Measure out 54cm^3 acetic anhydride first, then add (dropwise) 6cm^3 concentrated H_2S0_4 carefully, stirring to prevent heat build—up. Stir again just before adding mixture to each tube.

Disturb pellet; then add 7cm^3 of the mixture to each sample.

16) Put in boiling water bath for 1-2 minutes. (Stirring is unnecessary—never leave glass rods in tubes as steam condenses on the rods and runs down into the mixture reacting violently). One minute is usually adequate; longer acetylation makes grains opaque. Switch off hot plate.

17) Centrifuge and decant all tubes into large (1,000ml) beaker of water in fume cupboard. Decant contents of beaker down fume cupboard sink.

18) Disturb pellet, add 10cm^3 glacial acetic acid, centrifuge and decant.

19) Disturb pellet, add distilled water and a few drops of 95% ethanol centrifuge and decant carefully.

D) DEHYDRATION, EXTRACTION AND MOUNTING IN SILICONE FLUID

20) Disturb pellet; add 10cm^3 95% ethanol, centrifuge and decant.

21) Disturb pellet; add 10cm^3 ethanol (Absolute alcohol), centrifuge and decant. Repeat.

22) Toluene is an irritant. Avoid fumes.

Disturb pellet; add about 8cm^3 toluene, centrifuge and decant carefully into 'WASTE TOLUENE' beaker in fume cupboard (leave beaker contents to evaporate overnight).

23) Disturb pellet; then using as little toluene as possible, pour into labelled specimen tube.

24) Add a few drops of silicone fluid - enough to cover sediment.

25) Leave in fume cupboard overnight, uncorked, with fan switched on. Write a note on the fume cupboard *'Leave fan on overnight - toluene evaporation'*, and date it. Collect specimen tubes next morning and cork them. Turn off fan.

26) Using a cocktail stick, stir Contents and transfer one drop of material onto a clean glass slide and cover with a cover slip (22mm x 22mm). Label the slide.

27) Wash and clean everything you have used. Wipe down the fume cupboard worktop. Remove water bath from fume cupboard if not needed by the next user. Refill bottles and replace them in chemical cabinets.

Appendix 5 SUERC Radiocarbon dating results

Scottish Universities Environmental Research Centre

Director: Professor A B MacKenzie Director of Research: Professor R M Ellam

Rankine Avenue, Scottish Enterprise Technology Park,
East Kilbride, Glasgow G75 0QF, Scotland, UK
Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

15 November 2011

Laboratory Code	SUERC-36846 (GU25374)
Submitter	Nick Daffern Worcestershire Historic Environment & Archaeology Service c\o University of Worcester Henwick Grove Worcester. WR2 6AJ
Site Reference	Grow With Wyre - Snuffmill Dingle
Context Reference	not available
Sample Reference	SMD2011/120-140cm
Material	Nutshell : Corylus avellana (hazel)
$\delta^{13}C$ relative to VPDB	-24.5 ‰
Radiocarbon Age BP	230 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

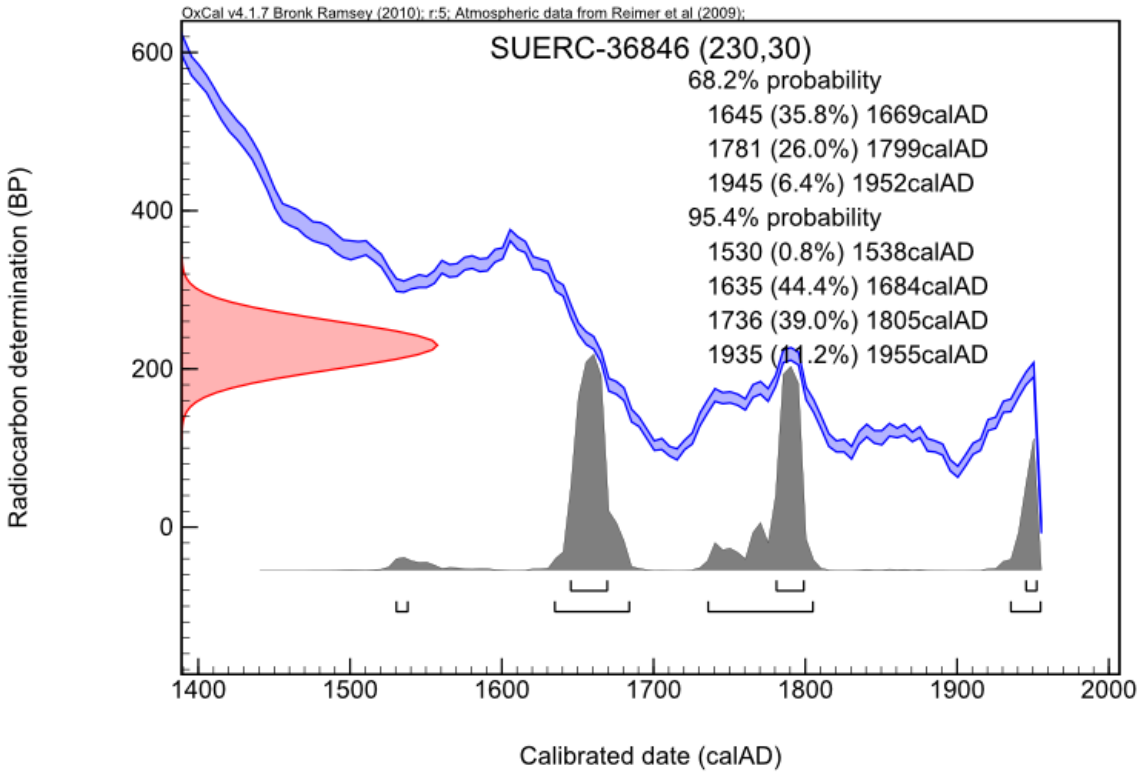
The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- Date :-

Checked and signed off by :- Date :-

Calibration Plot



Scottish Universities Environmental Research Centre

Director: Professor A B MacKenzie Director of Research: Professor R M Ellam

Rankine Avenue, Scottish Enterprise Technology Park,
East Kilbride, Glasgow G75 0QF, Scotland, UK
Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

15 November 2011

Laboratory Code	SUERC-36850 (GU25375)
Submitter	Nick Daffern Worcestershire Historic Environment & Archaeology Service c\o University of Worcester Henwick Grove Worcester. WR2 6AJ
Site Reference	Grow With Wyre - Birchen Park
Context Reference	not available
Sample Reference	BIR2011/1.37m
Material	Nutshell : Corylus avellana (hazel)
$\delta^{13}C$ relative to VPDB	-28.2 ‰
Radiocarbon Age BP	170 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

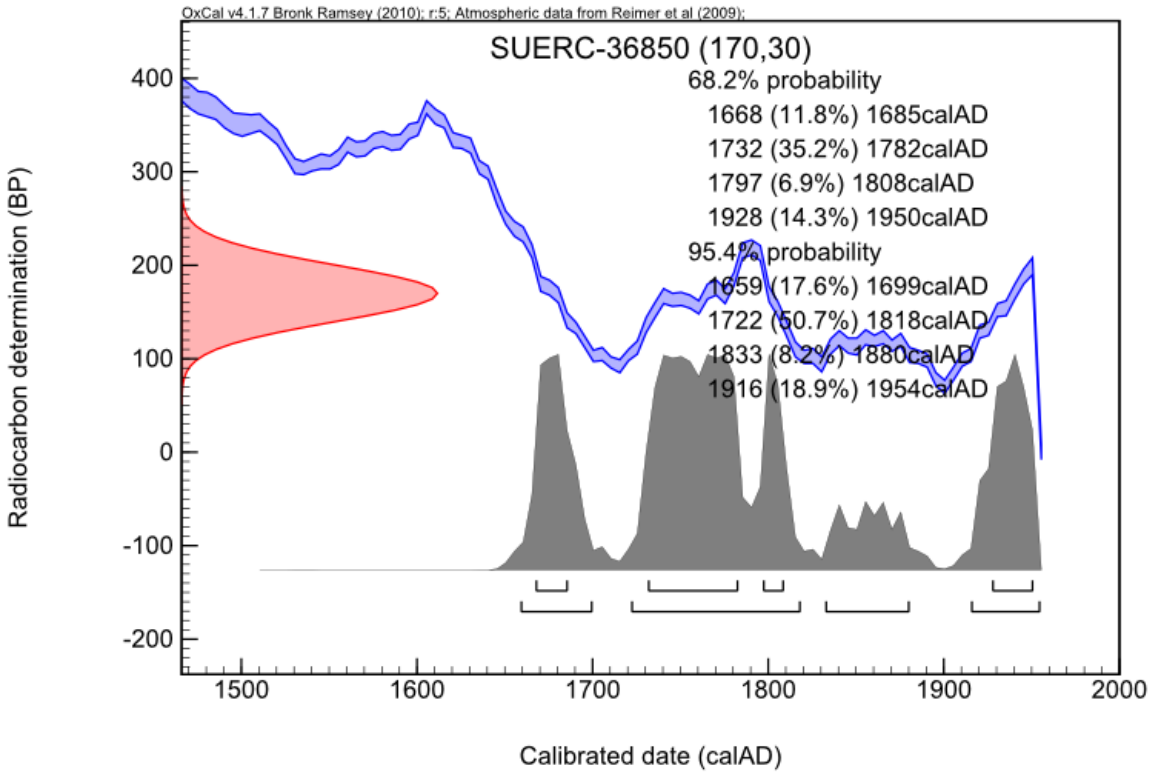
The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- Date :-

Checked and signed off by :- Date :-

Calibration Plot



Scottish Universities Environmental Research Centre

Director: Professor A B MacKenzie Director of Research: Professor R M Ellam

Rankine Avenue, Scottish Enterprise Technology Park,
East Kilbride, Glasgow G75 0QF, Scotland, UK
Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

15 November 2011

Laboratory Code	SUERC-36851 (GU25376)
Submitter	Nick Daffern Worcestershire Historic Environment & Archaeology Service c\o University of Worcester Henwick Grove Worcester. WR2 6AJ
Site Reference	Grow With Wyre - Birchen Park
Context Reference	not available
Sample Reference	BIR2011/1.49-1.75m
Material	Seeds : Rubus fruticosus (blackberry)
$\delta^{13}C$ relative to VPDB	-30.6 ‰
Radiocarbon Age BP	125 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

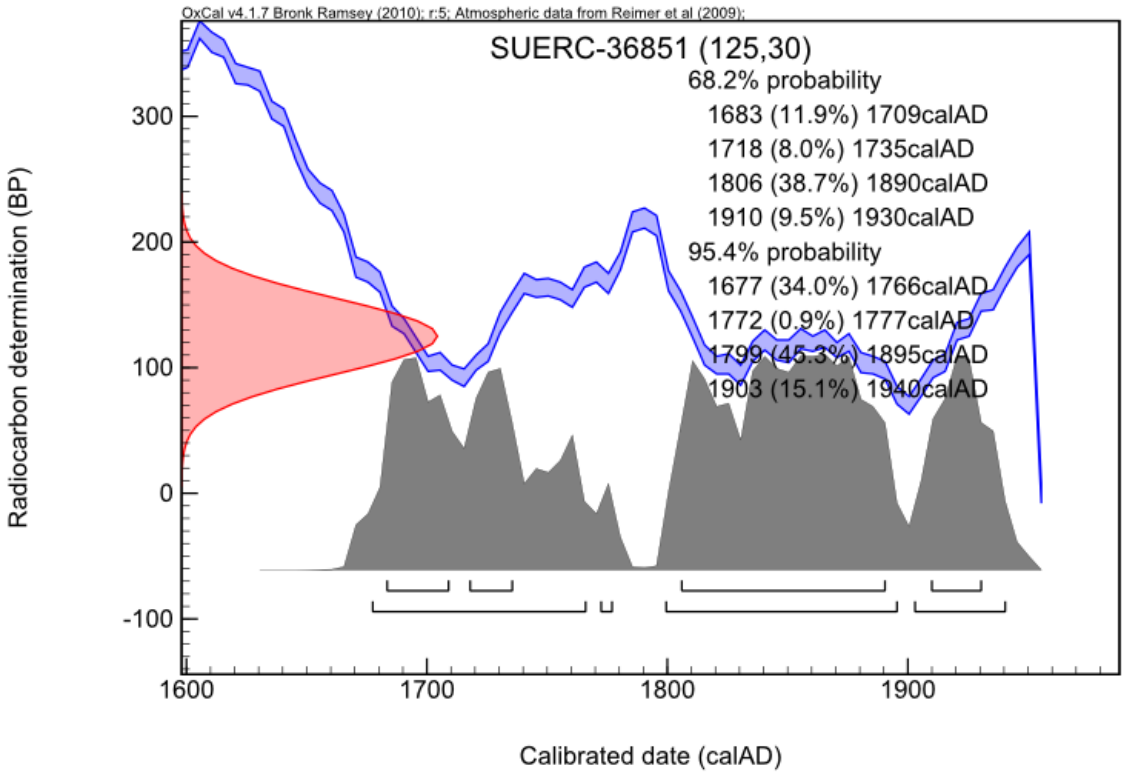
The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- Date :-

Checked and signed off by :- Date :-

Calibration Plot



Appendix 6 Technical information

The archive

The archive consists of:

55	Digital photographs
28	Validation record sheet AS 47
6	Auger records AS 26
5	Flot records AS21
8	Pollen score sheet AS35
1	Copy of this report (bound hard copy)

The project archive is intended to be placed at:

Worcestershire County Museum
Hartlebury Castle
Hartlebury
Near Kidderminster
Worcestershire DY11 7XZ
Tel Hartlebury (01299) 250416

Summary of data for Worcestershire HER

WSM number not yet assigned

P3547

Methods of retrieval	Yes/No
Hand retrieval	
Bulk sample	
Spot sample	
Auger	Y
Monolith	
Observed	Y

Type	Preservation	Date (note 1)	Specialist report? Y/N (note 2)	Key assemblage? Y/N (note 3)
Environmental deposit – peat	Waterlogged	Undated	N	N
Environmental deposit -peat	Waterlogged	Post-medieval Mid 17th – late 19th C	Y	N
Plant remains – macrofossils	Waterlogged	Post-medieval Mid 17th – late 19th C	Y	N
Plant remains – pollen	Waterlogged	Post-medieval Mid 17th – late 19th C	Y	N
Plant remains – wood	Waterlogged	Post-medieval Mid 17th – late 19th C	N	N

Period	From	To
Palaeolithic	500000 BC	10001 BC
Mesolithic	10000 BC	4001 BC
Neolithic	4000 BC	2351 BC
Bronze Age	2350 BC	801 BC
Iron Age	800 BC	42 AD
Roman	43	409
Post-Roman	410	1065

Medieval	1066	1539
Post-medieval	1540	1900
Modern	1901	2050

Period Specific	**From**	**To**
Lower Paleolithic	500000 BC	150001
Middle Palaeolithic	150000	40001
Upper Palaeolithic	40000	10001
Early Mesolithic	10000	7001
Late Mesolithic	7000	4001
Early Neolithic	4000	3501
Middle Neolithic	3500	2701
Late Neolithic	2700	2351
Early Bronze Age	2350	1601
Middle Bronze Age	1600	1001
Late Bronze Age	1000	801
Early Iron Age	800	401
Middle Iron Age	400	101
Late Iron Age	100 BC	42 AD
Roman 1st century AD	43	100
2nd century	101	200
3rd century	201	300
4th century	301	400
Roman 5th century	401	410
Post roman	411	849
Pre conquest	850	1065
Late 11th century	1066	1100
12th century	1101	1200
13th century	1201	1300
14th century	1301	1400
15th century	1401	1500
16th century	1501	1600
17th century	1601	1700
18th century	1701	1800
19th century	1801	1900
20th century	1901	2000
21st century	2001	

Notes

1. In some cases the date will be "Undated". In most cases, especially if there is not a specialist report, the information entered in the *Date* field will be a general period such as Neolithic, Roman, medieval etc (see below for a list of periods used in the Worcestershire HER). Very broad date ranges such as *late Medieval to Post-medieval* are acceptable for artefacts which can be hard to date for example roof tiles. If you have more specific dates, such as *13th to 14th century*, please use these instead. Specific date ranges which cross general period boundaries can also be used, for example *15th to 17th century*.

2. Not all evaluations of small excavation assemblages have specialist reports on all classes of objects. An identification (eg clay pipe) and a quantification is not a specialist report. A short discussion or a more detailed record identifying types and dates is a specialist report. This field is designed to point researchers to reports where they will find out more than merely the presence or absence of material of a particular type and date.

3. This field should be used with care. It is designed to point researchers to reports where they will be able to locate the most important assemblages for any given material for any given period. Most assemblages will not, on their own, be key assemblages.