Wessex Archaeology

Blackfan Fen, Welwyn Garden City Hertfordshire

Post-Excavation Assessment Report

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Blackfan Fen, Welwyn Garden City, Hertfordshire

Post-Excavation Assessment Report

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Summary

Wessex Archaeology was commissioned by Commonswood Nature Watch to investigate peat deposits observed during service trenching within Blackfan Fen, Welwyn Garden City (centred on OS NGR 525957 211255). Whilst on Site, the opportunity was also taken to visually assess a spread of burnt flint previously identified by the client.

The peat sequence was recorded geoarchaeologically and appropriate samples taken for radiocarbon dating and assessment. The results of radiocarbon dating indicate that the peat began to form in the very late Roman to Early Anglo-Saxon period, and was sealed by probable alluvial fan deposition in the late medieval to early post-medieval period.

Assessment of the sediments, pollen and plant macrofossils indicate that whilst the site has essentially remained a fen-type environment throughout the period of peat formation, there are notable changes in the vegetational environment through time. It could be summarised as a fen dominated by reeds and sedges, in an open wooded environment (with oak, hazel and ash) in the earlier stages, becoming still more open over time. The pollen record also suggests indications of the onset or increase of hazel coppice management.

This report summarises the potential of the sequences on Site and includes recommendations for analysis and publication.

The burnt flint spread was interpreted as a possible burnt mound, and suggestions are made for investigation.

Acknowledgements

Wessex Archaeology is particularly grateful to Peter Oakenfull of Commonswood Nature Watch, who commissioned the project. His support and enthusiasm throughout the project was very greatly appreciated.

The report was researched and compiled by David Norcott, who also carried out the fieldwork and geoarchaeological recording, interpretation and subsampling. The environmental samples were processed by Nicki Mulhall, and assessed by Dr Chris J Stevens. Pollen assessment was carried out by Dr Michael J Grant, with pollen sample preparation undertaken at the Centre for Earth and Environmental Sciences Research (CEESR), Kingston University. Radiocarbon sampling and liaison was provided by Dr Chris J Stevens, and radiocarbon dating by the Scottish Universities Environmental Research Centre (SUERC) Radiocarbon Laboratory, University of Glasgow. Flint expertise was provided by Phil Harding.

The illustrations were drawn by Ken Lymer, and the project managed for Wessex Archaeology by Andy Crockett. Wessex Archaeology is also grateful to Pippa Bradley, Senior Project Manager, for her comments on the final draft of this report.

Blackfan Fen, Welwyn Garden City, Hertfordshire

Post-Excavation Assessment Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Peter Oakenfull of Commonswood Nature Watch in late Spring 2011, to assess and where necessary investigate potential archaeological sites and a peat sequence within the bounds of the Commons Local Nature Reserve, Welwyn Garden City (centred on OS NGR 525957 211255; **Figure 1**).

1.1.2 The peat sequence was identified during repairs to a service pipe within Blackfan Fen. In addition, prehistoric flint artefacts were recovered from a ridge adjacent to the Fen, and a probable burnt mound-type feature identified on the edge of the Fen itself.

1.2 Location, topography and geology

1.2.1 Blackfan Fen comprises approximately 5.5ha of open fen, scrub and a narrow band of secondary woodland, located at Hall Grove on the south-east fringes of Welwyn Garden City. There are two distinct areas of calcareous fen, known as North and South Fen, which are separated at present by a broad band of scrub. The fen is on the west-facing gently sloping side of a shallow valley at approximately 70m above Ordnance Datum (aOD), overlooking a south-flowing stream forming the western boundary, which discharges into the River Lea approximately 1km to the south.

1.3 Scope of report

1.3.1 This report details the results of the excavation of a geoarchaeological sondage through peat deposits at Blackfan Fen, and the palaeoenvironmental assessment of samples obtained during that excavation.

1.3.2 In addition the possible burnt mound was visually assessed and is discussed below.

1.4 Aims and objectives

1.4.1 The aim of the project was to determine the archaeological potential and significance of the area to be investigated.

1.4.2 All works were undertaken in accordance with the relevant Institute for Archaeologists' (IFA) Standard and Guidance, the IfA Code of Conduct, and other current and relevant best practice and standards and guidance.

1.4.3 To achieve the project aim as outlined, the following generic objectives were defined:

- *Excavate a sondage through the peat sequence, in order to record and sample as appropriate;*

- *Undertake scientific dating and assess the palaeoenvironmental potential of the peat deposit, and where appropriate, make recommendations for further work; and*
- *Inspect and assess a possible burnt mound, in order to inform appropriate mitigation measures to offset potential construction impact.*

2 METHODOLOGY

2.1 Sondage

2.1.1 In summary, all machine-excavation was carried out under constant archaeological supervision, using a tracked hydraulic excavator. The sondage was excavated to a depth of 1.75m, and stepped to allow safe access for site staff.

2.1.2 The exposed section face was cleaned by hand, photographed, drawn and recorded using Wessex Archaeology *pro forma* record sheets. Soil descriptions were based upon Hodgson (1997), including:

- *Depth*
- *Texture*
- *Composition*
- *Colour*
- *Inclusions*
- *Structure (bedding, ped characteristics etc)*
- *Contacts between deposits*

2.1.3 The section was sampled using a one metre monolith to capture the full thickness of the peat, including top and bottom interfaces. A series of near-contiguous 10 litre bulk samples were taken immediately adjacent to the monolith sample in order to provide larger quantities of material for assessment of macrofossils and other remains.

2.1.4 The deposits were noted to be waterlogged, or partially waterlogged, in the field. During post-excavation processing subsamples of 2 litres were therefore taken from all bulk samples and processed for the recovery of waterlogged remains. Laboratory flotation was undertaken with flots retained on a 0.25mm mesh and residues on a 0.5mm mesh. Residues and flots were stored in sealed containers with Industrial Methylated Spirits (IMS). The larger fraction (>5.6mm) was sorted, weighed and discarded. The flots were visually inspected under a x10 to x40 stereo-binocular microscope to determine if waterlogged material occurred. Where waterlogged material was present, preliminary identifications of dominant taxa, were conducted and are presented below.

2.1.5 For the pollen assessment, standard preparation procedures were used (Moore *et al*. 1991); 4cm^3 of sediment was processed per sample, with a Lycopodium spike added to allow the calculation of pollen concentrations (Stockmarr 1971). All samples received the following treatment:

- *20ml of 10% KOH (80°C for 30 minutes);*
- *20ml of 60% HF (80°C for 120 minutes);*

- *15ml of acetolysis mix (80°C for 3 minutes);*
- *Stained in 0.2% aqueous solution of safranin; and*
- *Mounted in silicone oil following dehydration with tert-butyl alcohol.*

2.1.6 Pollen counting was undertaken at a magnification of x400 using a Nikon Eclipse E400 transmitted light microscope. Determinable pollen and spore types were identified to the lowest possible taxonomic level with the aid of a reference collection kept at Wessex Archaeology. The pollen and spore types used are those defined by Bennett (1994; Bennett *et al*., 1994) except Poaceae which follow Küster (1988). Plant nomenclature follows Stace (1997). A total land pollen (TLP) sum of a minimum of 100 grains, excluding obligate aquatics and pteridophytes, was used for assessment.

2.1.7 The environmental sampling, processing and assessment strategy followed *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (2nd edition)* (EH 2011a) and incorporated relevant recommendations contained in *Environmental Archaeology and Archaeological Excavations* (AEA 1995). The post-excavation assessment programme was carried out in accordance with *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (EH 2006).

2.2 Burnt flint spread

2.2.1 The burnt flint spread was subjected to brief visual assessment.

3 RESULTS

3.1 Introduction

3.1.1 The machine excavated sondage revealed a 1.75m deep sequence, with sandy gravel at the base overlain by 0.63m of peat, which was in turn overlain by a coarse silt to clay deposit of c.1.05m thickness (**Table 1**).

Table 1: Sediment descriptions and subsamples

Monolith <1> NGR 525965 211389 (±6m)			**Comments:** Monolith starts 0.80 m below ground level, in order to sample full thickness of peat and top & bottom interfaces.	
Depth (m from monolith top)	**Pollen samples @ (m)**	**Bulk samples @ (m) <sample nos>**	**Sediment description**	**Interpretation**
0-0.22			10YR 6/ 6 brownish yellow, clay loam at top grading gradually down to sand loam (very fine to fine sand) at interface.	Alluvium – ?alluvial fan
0.22-0.70	0.25 0.45 0.65	0.22-0.32 <2> 0.32-0.42 <3> 0.42-0.52 <4> 0.52-0.62 <5> 0.62-0.70 <6>	Peat – reddish brown oxidising rapidly to black on exposure to air. Extremely well preserved, waterlogged, abundant recognisable plant remains (inc. hazelnuts). Clear boundary.	Peat – highly vegetated wetland
0.70-0.85	0.80	0.72-0.83 <7>	Very dark greyish brown to black, more humified peat speckled with sand and fine gravel increasing with depth.	Peaty soil / peat initiation
0.85-0.94			Light greyish brown sand and gravel, 3-25mm diameter.	River/ valley gravels

3.2 Sediments

Gravels

3.2.1 The basal sandy gravels are fluvial – i.e. river lain – and though could be Pleistocene in date, were more likely deposited during the Holocene. In the field they were noted to contain roots. The upper part of this context was rooty and humic as a result of vegetation/ peat development.

Peat

3.2.2 The peat was fine, very well preserved and had the characteristic smell and colour-change on exposure of a well preserved, waterlogged peat in a reducing environment. Recognisable plant remains were readily visible in the peat, including intact acorns and Phragmites reed stems. The upper boundary of the peat was extremely sharp, with flattened Phragmites well preserved and layered at the upper boundary.

Overlying ?alluvial fan deposit

3.2.3 The peat was overlain very sharply by a well-sorted coarse silt to fine sand deposit, which became much clayier up profile. This was initially interpreted as a wind-blown loessic deposit (which would by definition be of Pleistocene date), but this was ruled out by the discovery of a piece of ceramic building material of Roman or later date within the peat. The best interpretation of this layer would be alluvium – none of it had the characteristics of made ground, and the lower portion is well sorted which indicates transport by a fluid medium.

Summary

3.2.4 The basal sequence shows an active channel environment, as evidenced by the river gravels. This is overlain by peat indicative of a heavily vegetated wetland environment, the character of which will be elucidated by the plant macrofossil and pollen results and discussed below.

3.2.5 The sealing layer at the top of the peat sequence is difficult to interpret with certainty. During excavation and description on site, the most fitting interpretation seemed to be that the upper layer was a wind-deposited loessic silts/ coversand of late Pleistocene date; the boundary was razor-sharp, with flattened reeds at the peat surface well preserved at the very top, and the coarse silt to fine sand at the base of that layer is well to quite well sorted too. However, the discovery of a sizeable fragment of undiagnostic (i.e. of Romano-British or later date) ceramic building material within the peat layer ruled this out.

3.2.6 The most likely explanation is alluvium, specifically alluvial fan material. There is no obvious source for this, as no present channels appear to be present nearby, and the material is higher than the surrounding wetlands. However the topography suggests that an alluvial fan deposit would be possible – the deposit extends into and over the peat fen, forming a wide and low ridge which runs from the drier and higher ground.

3.3 Radiocarbon dating

Introduction

3.3.1 The top and bottom of peat sequence was sampled for radiocarbon dating, in order to establish a chronological framework for the peat formation. The uppermost sample came from a large number of flattened stems of common reed (*Phragmites australis*) from the upper boundary of the peat, an excellent source for dating the sedimentary event which sealed the peat and effectively halted its formation. The second sample dated was a whole hazelnut (*Corylus avellana*) from near the base of the peat. The samples were

identified at Wessex Archaeology environmental laboratory, and submitted to the Scottish Universities Environmental Research Centre, East Kilbride (SUERC) for radiocarbon dating.

Results

3.3.2 The radiocarbon determinations were calibrated using OxCal 4.1.7 (Bronk Ramsey 2001; 2009) and the IntCal09 calibration curve (Reimer *et al.* 2009) and are quoted in the form recommended by Mook (1986) with the end points rounded outward to 10 years. (**Table 2**).

Table 2: Radiocarbon determinations

Provenance	Identification	Laboratory Code	$\delta^{13}C$	Date BP	Calibration (2 sig. 95.4%)
Monolith <1> Spot sample at 0.22m	*Phragmites australis* stems	SUERC-38416	-29‰	355±30	cal. AD 1450-1640
Bulk sample <6> Base of peat at 0.62-0.70m	*Corylus avellana* (nut) x1	SUERC-38417	-26.3‰	1615±30	cal. AD 380-540

3.3.3 The radiocarbon determinations indicate that the peat began to form in the very late Roman to Early Anglo-Saxon period at some point within cal. AD 380-540 (1615±30 BP, SUERC-38417). The uppermost sample indicates that the peat was sealed in the late medieval to early post-medieval period, sometime during cal. AD 1450-1640 (355±30 BP, SUERC-38416) (**Figure 2**).

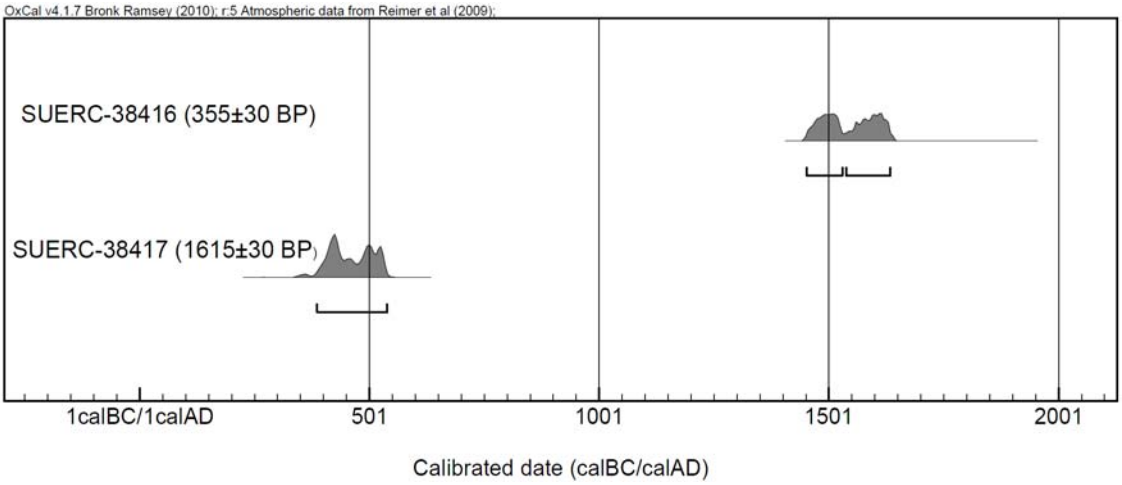

Figure 2: Probability distributions for calibrated radiocarbon dates

3.3.4 The sequence potentially covers a period of around 1,000 to 1,200 years, although a combination of pollen analysis and further dating would be required to understand if such a sequence was uninterrupted, or indeed if there were periods in which peat formation stopped or slowed to a near halt.

3.4 Waterlogged plant remains

Introduction

3.4.1 A series of six bulk environmental samples of 10 litres volume were taken in a contiguous column from the peat and also from the underlying gravel. The samples were taken at *c.* 0.10m intervals, with sample <2> located at the top of the column from the uppermost peat, and sample <7> being from the basal peaty interface sealing gravel.

Results

SAMPLE <2>

3.4.2 As noted above this sample was dated on stems of common reed (*Phragmites australis*), although few waterlogged stems were actually noted within the sample itself. The sample contained many fine rootlets, but relatively few seeds. Those present included several of bugle (*Ajuga reptans*) and wild celery (*Apium graveolens*).

3.4.3 The former is characteristic of damp woodlands, but also in meadows and pastures, whilst the latter, though also found in woodlands, is commoner in overgrown, often shaded areas of riversides and marshlands.

3.4.4 The fairly frequent presence of worm cocoons within this sample indicates that it probably has been subjected to drying, and some potential pedogenesis which may account for the lack of waterlogged material.

SAMPLE <3>

3.4.5 This sample was generally similar to the uppermost peat sample, though with the absence of bugle and addition of nightshade (*Solanum nigrum*) and hemp-agrimony (*Eupatorium cannabinum*). Hemp-agrimony and nightshade can also be found in shadier areas, although it is more common in open wasteland.

SAMPLE <4>

3.4.6 Seeds of hemp-agrimony (*Eupatorium cannabinum*) were relatively frequent within this sample along with those of sedges (*Carex* sp.).

SAMPLE <5>

3.4.7 Seeds of hemp-agrimony (*Eupatorium cannabinum*) again dominated the sample, but the sample also had seeds of gypsywort (*Lycopus europaeus*), another riverbank/ fen marsh species. On the basis of their cell pattern a few seeds were identified tentatively as those of sharp-flowered rush (*Juncus acutiflorus*) a common species of meadows, marshes and sometimes wet woodlands. Seeds of buttercup (*Ranunculus* sp.) noted can also be considered as representing a similar environment. The sample also had an oak (*Quercus* sp.) acorn cup.

SAMPLE <6>

3.4.8 This sample was notably richer than the samples above with a good diversity of species represented. Most notable were a number of species of woodland and scrub, including oak (*Quercus* sp., represented by acorn cups), hazelnut (*Corylus avellana*, hazelnuts), and dogwood (*Cornus sanguinea*), hawthorn (*Crataegus monogyna*) and sloe (*Prunus spinosa*, fruit stones). Other woodland species represented included field maple (*Acer campestre*, a single seed), buds of willow (*Salix* sp.) and probably also aspen (*Populus tremula*).

3.4.9 Other woodland indicators in this sample included seeds of early dog-violet (*Viola reichenbachiana*) or common dog violet (*Viola riviniana*), identified by their large size. Both species are found on woodland edges and hedgebanks, Some fairly distinctive stones of rose were also identified as most probably of soft downy rose (*Rosa mollis*), again most commonly found in open woodlands, woodland edge, scrub and hedges. While seeds of thistle (*Carduus/ Cirsium* sp.) and sedge (*Carex* sp.) are not necessarily indicative of a more woodland environment both may be recovered from the edge of such environments. Similarly, marsh-marigold (*Caltha palustris*) is commonly found in wet woodland and streamsides, but also in meadows and pastures.

3.4.10 Unlike the overlying samples there was more definitive evidence for larger areas of open standing water in the presence of common club-rush (*Schoenoplectus lacustris*, along with probably water-crowfoot (*Ranunculus* subgenus Batrachium).

SAMPLE <7>

3.4.11 The basal sample was less organic than the overlying deposits, but provided a very similar range of species to those seen from the overlying sediment dated to the late Romano-British/ Early Anglo-Saxon period. There are however several indicators of a more open environment than seen in the overlying samples. Seeds of sedge (*Carex* sp.) were relatively common as were those of buttercup (*Ranunculus* sp.). These were accompanied by seeds of dock (*Rumex* sp.), knotgrass (*Polygonum aviculare*) and mint (*Mentha* sp.). As with Sample <6>, seeds of common club-rush (*Schoenoplectus lacustris*) were also present in the sample.

Discussion

3.4.12 The samples provide a good picture of localised changes in the history of the site from probably the late Romano-British/ Early Anglo-Saxon period at the base to the 15th to 17th century AD at the top of the sequence. The initial peat formation appears to have taken place in a fairly wooded environment. The initial event sees such peat formation under a potentially open environment, although this could be further elucidated through detailed pollen analysis. Around the Early Anglo-Saxon period the local landscape appears to be quite wooded, although such woodland may have been relatively open or been part of a small woody scrub.

Table 3: Plant macrofossils

	Sample	**<2>**	**<3>**	**<4>**	**<5>**	**<6>**	**<7>**
	Sample vol. (litres)	**2**	**2**	**2**	**2**	**2**	**2**
	Flot vol. (ml)	**250**	**250**	**250**	**250**	**250**	**120**
Species	**Common Name**						
Caltha palustris	marsh marigold	-	-	-	-	+	-
Ranunculus subg. *Ranunculus* (arb)	buttercup	-	-	-	+	-	++
Ranunculus subg. Batrachium	water-crowfoots	-	-	-	-	+	-
Quercus sp. (acorn cups)	oak	-	-	-	+	+	-
Corylus avellana	hazelnut	-	-	-	-	+	-
Persicaria minor	small water-pepper	-	-	-	-	+	-
Polygonum aviculare	knotgrass	-	-	-	-	-	+
Rumex sp.	dock	-	-	-	-	-	+
Viola reichenbachiana/ riviniana	dog-violet	-	-	-	-	+	-
Populus tremula	aspen	-	-	-	-	+	-
Salix catkin bud scale	willow bud scale	-	-	-	-	+	-
Rorippa cf. nasturtium-aquaticum	narrow-fruited watercress	-	-	-	-	-	+
Rubus sp.	bramble	-	-	-	-	-	+
Rosa cf. mollis)	Soft-downy rose	-	-	-	-	+	-
Prunus spinosa	sloe	-	-	-	-	+	-
Crataegus monogyna (fruit stones)	hawthorn berries	-	-	-	-	+	+
Cornus sanguinea	dogwood	-	-	-	-	+	-
Acer campestre	field maple	-	-	-	-	+	-
Apium graveolens	wild celery	+	+	-	+	+	+
Apium nodiflorum	fool's watercress	-	-	-	-	-	+
Ajuga reptans	bugle	+	-	-	-	-	-
Solanum nigrum	nightshade	-	+	-	-	-	-
Lycopus europaeus	gypsywort	-	-	-	+	-	-

	Sample	**<2>**	**<3>**	**<4>**	**<5>**	**<6>**	**<7>**
	Sample vol. (litres)	**2**	**2**	**2**	**2**	**2**	**2**
	Flot vol. (ml)	**250**	**250**	**250**	**250**	**250**	**120**
Species	**Common Name**						
Mentha sp.	mint	-	-	-	-	-	+
Carduus/ Cirsium sp.	thistle	-	-	-	-	+	-
Eupatorium cannabinum	hemp agrimony	-	+	++	++	-	-
Juncus cf. *acutiflorus* type	sharp-flowered rush	-	-	-	+	-	-
Schoenoplectus lacustris	common club-rush	-	-	-	-	+	+
Carex sp.	sedge	-	-	++	-	+	++
Insects		+	+	+	+	-	-
Acari sp.	mites	-	-	-	+	-	-
Fine roots		-	+	-	-	-	-
leaf fragments		-	-	-	-	+	-
Worms cocoons		+	-	-	-	-	-

3.5 Land and fresh/ brackish water molluscs

3.5.1 No molluscan remains were preserved within the peat deposit. Despite the calcareous nature of the Fen, it seems probable that the conditions within the peat itself have been too acidic for their survival.

3.6 Pollen

3.6.1 Four pollen samples were extracted for assessment from Monolith <1> (**Table 1**). Radiocarbon dates obtained from the top and towards the bottom of the sequence (see **Table 2**) indicate peat accumulation occurred between the late Romano-British/ Early Anglo-Saxon and late medieval/ early post-medieval periods. High amounts of pollen were encountered in all four samples, providing sufficient counts for assessment. These were derived from the main peat and underlying peaty silt deposits.

3.6.2 The pollen shows initially an open wooded environment with *Quercus* (oak), *Corylus avellana*-type (hazel) and *Fraxinus excelsior* (ash), situated within a largely open environment containing high amounts of Poaceae (grasses) and Cyperaceae (sedges), though these may largely be derived from the local fen vegetation. Towards the top of the sequence the amount of woodland pollen is reduced, indicating an opening up of the local environment with increases in open ground. The reductions in hazel may in part be related to coppice management in the local area, as there are approximately 300 mature hazel stools surrounding the site that have recently been brought back into active management. The presence of *Primula veris*-type (primrose) may be associated with this type of coppiced woodland. The changes in the pollen sequence may therefore also be related to coppice management occurring in the local area.

3.6.3 Increases in *Plantago lanceolata* (ribwort plantain) occur towards the top of the sequence, along with the occurrence of *Pteridium aquilinum* (bracken), which are likely to indicate ground disturbance, such as from grazing activities. No cereal pollen was identified, but instead similar pollen from wild grasses that were likely to be associated with the fen vegetation (eg, *Glyceria*-type, sweet-grass). High amounts of Apiaceae undiff. pollen at the base of the sequence is likely to reflect the on-site ground flora present during the early stages of organic sedimentation.

3.6.4 In summary, the peat forms a dateable record of the local palaeoenvironment, over much of the historic period from the late Romano-British to early post-medieval periods. Although there are changes in vegetation indicated throughout the peat formation, the site

has essentially remained a fen-type environment throughout. It could be summarised as a fen dominated by reeds and sedges, in an open wooded environment (with oak, hazel and ash) in the earlier stages, becoming still more open over time. The pollen record may also show indications of the onset or increase of hazel coppice management.

3.7 Burnt flint spread

3.7.1 Separately to the peat sondage, at the client's request a spread of burnt flint previously observed nearby during the machine enlargement of a pond was examined.

3.7.2 Part of a laterally extensive spread of burnt flint in a dark silty matrix was observed exposed in a depression through the overlying ?alluvial deposits (possibly caused by later erosion from a spring). It would need further investigation to be more certain, but a burnt mound would certainly appear to be a likely explanation for this spread of material.

3.7.3 Burnt mounds are usually of Bronze Age date; a classic example would comprise a kidney-shaped mound of burnt stones lying near to a watercourse. The mound often lies slumped over or next to a pit or trough which has been made water-tight; a hearth for heating stones is often found close to the trough. The accumulated mound of burnt stones will comprise heat-shattered burnt stones, fractured into irregular shapes, interspersed with deposits of charcoal-rich soils from the hearths. Occasionally, as in the West Midlands or at Titlington Mount in Northumberland, stake-built structures have been discovered near the hearth or pit, possibly representing wind-breaks or some form of temporary shelter (English Heritage 2011b).

3.7.4 Possible methods of investigation (if required) would be to dig a test-pit (a 1x1m sondage through the layer and into the underlying deposits) to examine the stratigraphy of the layer(s), and obtain secure samples for radiocarbon dating if appropriate. In addition, hand augering could also be used as a rapid method of mapping the extent of the spread. Should the deposits in the test pit be typical of a burnt mound, and the samples return a Bronze Age date, then it would be reasonable to assume that the feature is a burnt mound without further disturbance.

3.8 Worked flint assemblage

3.8.1 An assemblage of worked flint (examples shown opposite) retrieved from surface scatters on land adjacent to the fen was inspected and reported on verbally by Dr Phil Harding, during a visit to the Wessex Archaeology office in Salisbury by the client.

3.8.2 In summary, although the assemblage was predominantly specifically undiagnostic (i.e. of indeterminate prehistoric date), elements within the assemblage were thought to be broadly Neolithic in date.

4 POTENTIAL

4.1 Sediments

4.1.1 The sediments have no further potential *per se*.

4.2 Pollen

4.2.1 The results of the pollen assessment indicate changes in the localised vegetation openness from the late Romano-British/ Early Anglo-Saxon periods through to the early post-medieval, when the top of the peat is capped by inorganic sediments.

4.2.2 Although sampled at a coarse interval at this stage, the pollen assessment shows clear changes through the sequence that define different land-uses and vegetational changes during the historic period.

4.2.3 There is a general paucity of stratified pollen sequences from central England and therefore the presence of such a sequence at this Site (spanning *c.* 1000 years) is of particular interest. This is further emphasised by the fact that the sequence covers the late Romano-British and Early Anglo-Saxon periods which are poorly represented by pollen sequences across the whole of lowland Britain (see Dark 2000, 134-143). Of particular interest in the Early Anglo-Saxon period is the question of whether there was continuity of land-use after the end of the Romano-British period, or general collapse of agricultural systems and widespread abandonment of land.

4.2.4 It is assumed that due to declining pressure on the landscape that scrub and woodland may have overgrown much of the abandoned agricultural land (eg. Drewett *et al*. 1988; Gardiner 2003). Dark, (1996; 2000) and Dark and Dark (1997) reviewed the evidence from radiocarbon dated palynological records across Britain and found that in central southern England only two pollen sequence covered this period: Snelsmore, Berkshire (Waton 1983) and Sidlings Copse, Oxfordshire (Day 1991). At the former major woodland regeneration at the end of the Romano-British period suggested a reduction in land use intensity, whereas at the later there was no evidence of major late Roman woodland regeneration. However, Dark and Dark (1997) cautioned that too few suitable sequences are available from southern and central England to make more than very tentative conclusions.

4.2.5 The presence of the deposits at Blackfan Fen dating to this period is therefore potentially of national significance, which is further enhanced by the excellent preservation of the pollen and availability of sufficient material to allow further radiocarbon dating.

4.3 Plant macrofossils

4.3.1 The initial assessment of the plant macrofossils from this sequence have provided a good overview of the changes in local vegetation through the course of the fen development and changes in local woodland cover. It is therefore suggested that any further work on the plant macrofossils from this site would yield little in the way of new information. Therefore no further work is proposed.

4.4 Radiocarbon dating

4.4.1 The sequence as currently dated spans approximately 1,000-1,200 years. With ample suitable material available, there is therefore considerable potential to obtain additional determinations in order to better constrain dating for key phases throughout the sequence.

5 RECOMMENDATIONS

5.1 Introduction

5.1.1 On the basis of the archaeological potential as defined above, further analysis and publication is recommended, for which an outline task list has been prepared (**Table 4**). In

addition to the tasks defined, it should be noted that there will be additional fees to cover publication (per printed page) and archive storage (per box/file).

5.2 Pollen

5.2.1 Given the very high potential of this site, it is recommended that additional pollen samples be examined during a phase of full analysis (extended counts of 400 TLP). It is proposed that an additional 20 samples would improve the resolution of the diagram to identify changes in vegetation cover throughout the sequence, with particular focus upon the sequence with is dated to the late Romano-British and Early Anglo-Saxon periods.

5.3 Radiocarbon dating

5.3.1 It is recommended that three further radiocarbon dates be obtained to fully constrain the timing of the depositional history (samples are suggested from *c.* 0.80, 0.55 and 0.40m, though precise sample locations would be informed by the results of the detailed pollen analysis).

Table 4: Proposed task list

Description	Grade	No.	Unit
Pollen sub-sampling	ES	0.125	Days
Pollen slide sample preparation	-	20.000	Slides
Pollen analysis and reporting	SPO	20.000	Days
Radiocarbon date sample selection	SPO	0.500	Days
Radiocarbon dates	-	3.000	Samples
Environmental overview	SPO	2.000	Days
Drawing office	DO	2.000	Days
Proof reading and QA	PM	0.500	Days
Project management, including journal liaison	PM	2.000	Days
Archive preparation and deposition	PS	1.000	Day

5.4 Publication

5.4.1 It is recommended that the results of the proposed detailed analysis be published in an appropriate regional and/or period-specific journal, such as *Hertfordshire Archaeology*.

5.4.2 Details of the Site will also be submitted online to the OASIS (**O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S**) database.

5.4.3 Wessex Archaeology Ltd shall retain full copyright of any reports under the *Copyright, Designs and Patents Act* 1988 with all rights reserved. Wessex Archaeology will provide an exclusive licence to the client for the use of the report by the client in all matters directly relating to the project.

5.5 Archive

5.5.1 The project archive will be prepared to the standards set out in *Management of Research Projects in the Historic Environment* (EH 2006) and in accordance with procedures outlined in *Standards in the Museum Care of Archaeological Collections* (MGC 1992), *Selection, Retention and Dispersal of Archaeological Collections: Guidelines for use in England, Wales and Northern Ireland* (SMA 1993), and the requirements of the recipient museum, who will be consulted by Wessex Archaeology prior to commencement of the investigation. The written archive will be on clean, stable materials, and will be suitable for

photocopying. The materials used will be of the standard recommended in *Guidelines for the Preparation of Excavation Archives for Long-term Storage* (Walker 1990).

5.5.2 The basic computerised data will form part of the site archive.

5.5.3 With the agreement of the landowner(s), the project archive, including written, drawn, photographic and material elements (together with a summary of the contents of the archive) will be deposited upon completion of the post-fieldwork programme.

5.5.4 Wessex Archaeology will finalise an agreement with the recipient museum (to be confirmed) regarding deposition of the archive; this agreement will also address retention and discard policy for the project.

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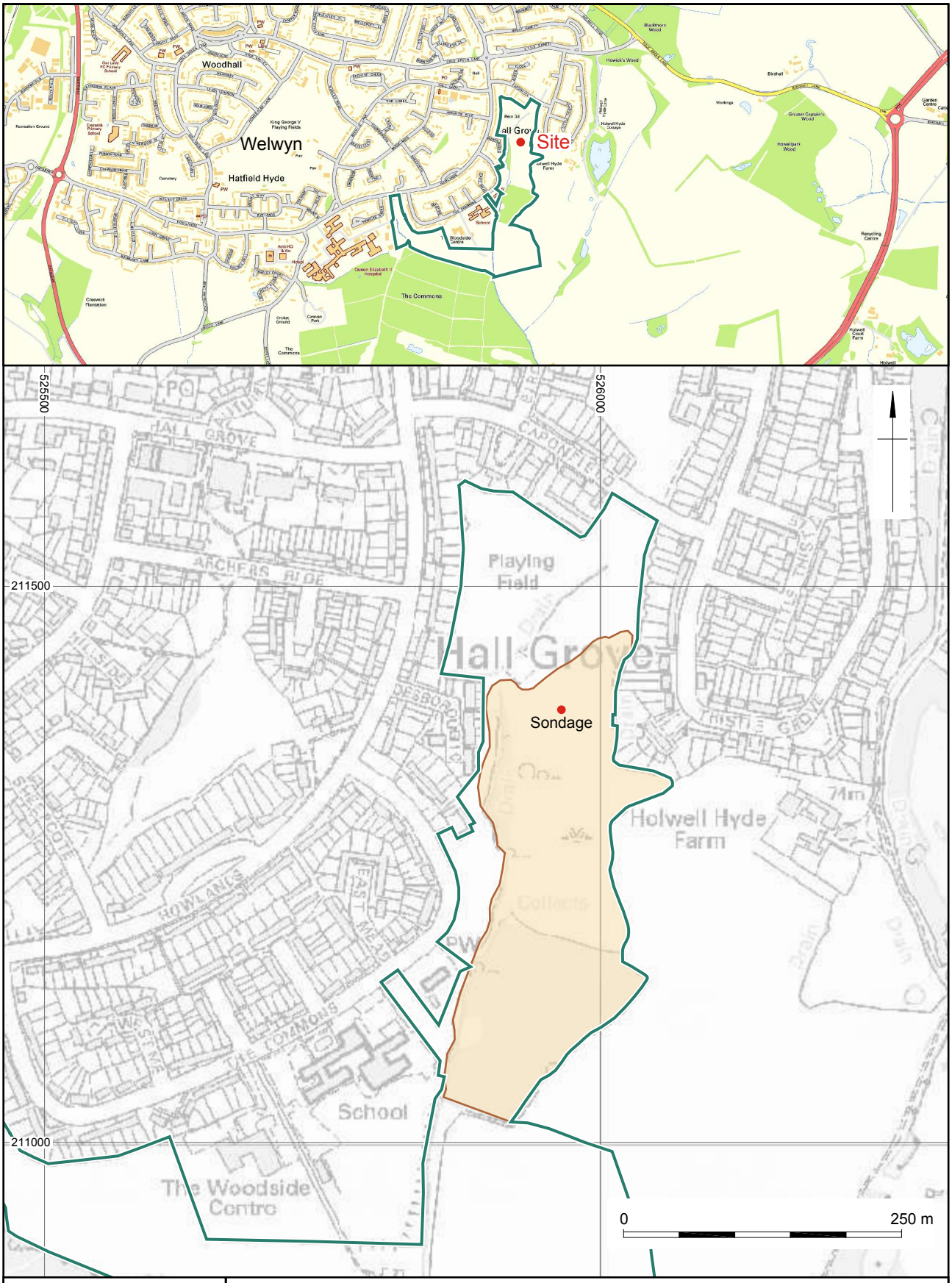

Local Nature Reserve

Blackfan Fen area

Wessex Archaeology

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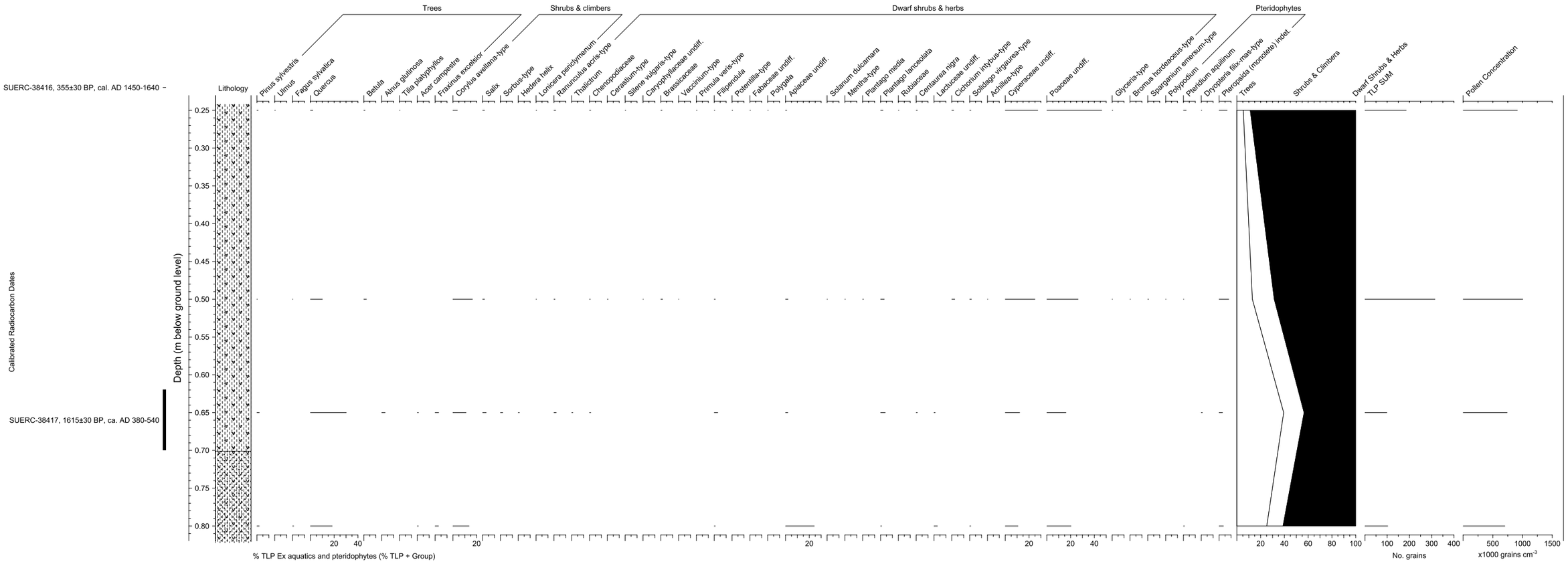
Site location plan

Figure 1



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Pollen diagram

Figure 3

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