Fuelling the fires: the contribution of wood charcoal analysis to a landscape scale project at and around Pre-Conquest Iron Age Silchester and a reflection on its wider implications

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Abstract

This paper seeks to examine the contribution of targeted wood charcoal analysis (anthracology) to our understanding of the 1st millennium BC Late Iron Age *oppidum* and transition to the Early Roman town at Silchester and a series of nearby late prehistoric satellite sites investigated by the ongoing Silchester Environs project. Consideration is given to whether clear differences in charcoal assemblages of varying size and origin are discernible through time and space across the landscape, and whether these are of significant value in consideration of taphonomy, interpretation of the sites and of lifestyles on a site level and beyond. Data for the sites are presented but discussed in summary only at a site level, more detailed context level interpretation is published elsewhere (Barnett 2018, in prep. a and c). Instead, this paper aims to stand back and take stock of the work so far and what lessons can be learned within and outside the project.

Keywords

Wood charcoal, anthracology, landscape, Iron Age, palaeoecology, environmental archaeology, Silchester, woodland archaeology

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Introduction

Wood charcoal analysis/ anthracology has the potential to provide valuable data on past landscapes, vegetation structure and enable examination of human activity and resource exploitation, yet is often overlooked or underestimated as a tool in archaeological studies. Reflection is made here on whether systematic, sometimes large-scale, analysis of wood charcoal is of significant value in understanding landscape, resource use and lifestyles at and around Middle-Late Iron Age Silchester. Analysis of the Pre-Conquest Iron Age layers at Silchester (Roman settlement name *Calleva atrebatum*) is published (Barnett 2018a) and the Early Roman transitional material analysed (Barnett in prep. a). Post-excavation analysis of a series of rural sites in the hinterland is ongoing under the Silchester Environs project. It is therefore timely to review the approaches and consider whether any methodological adjustments are needed or whether analysis of charcoal is always warranted. Inter- and intra-site variability in charcoal deposition, preservation and inferred changes in wood use and availability is considered for the transitional period of occupation during the Middle to Late Iron Age, leading up to the Roman Conquest in AD43, and a critical review made of the potential contribution of the discipline to wider landscape studies.

Introduction to the Silchester Projects

The Silchester Environs Iron Age project 2014-2019, led by Professor Mike Fulford and co-directed by this author, examines 143km^2 of the modern North Hampshire-West Berkshire border landscape around Silchester. Prospective and ground investigations focus on Iron Age activity, including settlement, movement and agriculture in the hinterland, contextualising the origins of the central *oppidum* and the transition to Roman urbanised living. For project design, aims, approaches and findings to date see Barnett and Fulford (2015); Linford, Linford and Payne (2016), 2017; Bayer (2017); Field et al. (2015, 2016, 2017); Fulford et al. (2016, 2017, 2018); Truscoe (in prep).

Targeted analysis of ecofacts and artefact, supported by a substantial radiocarbon dating programme (103 new dates, Barnett 2018b, in prep. b), includes considerable archaeobotanical work including analysis of pollen, plant macrofossils, phytoliths, waterlogged wood and macro-charcoal where preservation and context allows.

Charcoal analysis has been used to investigate site activities and landscape variation in time and space, notably woodland structure, location of different habitats, their exploitation and management.

[Insert Figure 1 near here]

Methods

Charcoal assemblages from bulk sediment samples of 5-120L processed by flotation, were selected in assessment on the basis of abundance, stratigraphic integrity, and relationship to archaeological events. Assemblages were predominantly from secondary contexts, the charcoal having been removed from the point of burning and dumped in pits, ditches and wells. Wood charcoal >2 mm was separated from the processed flots and the residue scanned or sorted. A grab sub-sample of c.100 fragments was taken for large assemblages, those <100 fragments >2mm were identified in their entirety. Fragments were prepared according to standard methodology (Leney and Casteel 1975; Gale and Cutler 2000), each fractured to show transverse section (TS), radial longitudinal section (RLS) and tangential longitudinal section (TLS), and examined under bi-focal epi-illuminated microscopy at magnifications up to x400 using an Olympus BHM microscope.

Identification followed the anatomical characteristics described by Richter *et al.* (2004), Schweingruber (1990) and Butterfield and Meylan (1980). Access to modern reference material was limited. Identification was to the lowest taxonomic level possible, usually genus, but sometimes species where anatomical or external morphological features were highly diagnostic. Juvenile twigwood and roundwood were separated from mature where the whole radius was visible, or where apparent from ring curvature and ray divergence. Reflectance analysis of charcoal can provide evidence of original burn temperature (Ascough et al. 2010; McParland et al. 2009) but is time-consuming, in order to maximise sample identification time, a rough estimate of the proportion of more reflective pieces were noted during analysis by eye.

Quantification was by fragment number of each taxon per sample (**Appendix 1**) and species ubiquity across the site (i.e. number of single-sample contexts in which each species appears). Concentration on ubiquity, a qualitative measure, arguably overcomes issues of differential fragmentation (due to taphonomic process, post-depositional process, sampling and processing), and overrepresentation of targeted types for particular activities at the site, so allowing consideration of woodland structure. Studies on quantitative measures indicate that fragmentation rate is similar for all taxa (Chabal 1992) and that recording volume, fragment number or weight as indices lead to similar results in terms of relative taxonomic representation, suggesting fragment counts and the resultant percentage data is meaningful (cf. Chabal 1997; Keepax 1988 p70-79). It provides a non-homogenised dataset, allowing patterns of relative input/ differential exploitation to be considered (Asouti and Austen 2013), the two indices are both used here to maximise the findings. Interpretation of individual taxon preference and habitat is with reference to modern plant ecology (Ellenberg 1988; Peterken 1993; Stace 2010). Latin binomials are given once at first appearance, common names throughout, nomenclature is according to Stace (2010). Full data interpretation on a context level for the Iron Age and the Early Roman levels at Insula IX is made in Barnett (2018a; in prep. c). The same full Iron Age data tables are included here for transparency, but discussed in summary form and on a site level only.

Results

A summary of the charcoal findings to date are listed in **Table 1.** It has been argued (eg Théry-Parisot et al. 2010; Asouti and Austen 2005, Chabal 1997), that while wood gathered for fuel tends to be of low species diversity, collection takes place repeatedly and randomly around and close to its point of use, using the least effort required (Shackleton and Prins 1992). It follows that relative proportions of individual taxa in long-term accumulations of material and in the total site assemblage is a reflection of abundance in the local environment, despite some over-representation of types that create more deadwood. However, functional and socio-cultural factors or filters (Théry-Parisot et al. 2010; Smart and Hoffman 1988) dictate that taxa may be targeted for particular purposes, and their presence represent those activities, but across a whole site, types common in the local woodlands will usually occur, these assumptions, while not absolute, underpin the following interpretations.

[Insert Table 1 near here from end]

Pre-Conquest Insula IX

The Site

Silchester Insula IX lies on a cap of Silchester gravels overlying London Clay bedrock at SU64006244. The soils and sediments are well-drained and their contents prone to mechanical damage within sticky clays and abundant gravel. Research-led excavation within the scheduled area (SAM 241057) includes 20 years of investigation by Fulford, Clarke and team. An unusually high-resolution chronological framework exists from the pottery typology especially the Arratine finewear stamp assemblage. The *oppidum* was constructed and in use for, at most, 65 years during the Late Iron Age at 20 BC-43AD, (Period 0) before the Roman Conquest took place and the town layout was fundamentally changed (Period 1 onwards). A suite of radiocarbon dates (Barnett in prep. b) proved uniform at 100 BC-60 cal AD, with a clear overlap with the artefact typology, albeit with wider error terms for this part of the radiocarbon curve.

The Charcoal

Analysis of 1896 fragments was undertaken on 32 Pre-Conquest contexts (Barnett 2018a, Veal 2013 well 8328) **Table 2 Appendix 1**. Presence and exploitation of a minimum of 18 taxa was demonstrated. Hazel (*Corylus avellana*), alder (*Alnus glutinosa*), birch (*Betula* sp.) and Maloideae (including *Crataegus* and *Sorbus* types) were common at 2-6% of the overall assemblage, present in 14-17 contexts of 32, **Figure 3**) . Other tree types include elm (*Ulmus* sp.), beech (*Fagus sylvatica*) and ash (*Fraxinus excelsior*), holly (*Ilex aquiolium*), hornbeam (*Cornus* sp.), elder (*Sambucus nigra*), field maple (*Acer campestre*) (**Figures 2 & 3)**. A focus on oak (*Quercus* sp.) for domestic, metalworking and craft use was clear, being ubiquitous and forming 76% of the site assemblage. Management by short-rotation oak coppicing or pollarding to maintain supply is indicated by the high proportion of roundwood cut at 3–5 years (contexts 11111, 10329, 11680) (**Table 2, Appendix 1**; Barnett 2018a). Of particular note is that the Period 1 (Early Roman transition.43-80 AD) charcoal data from analysis of 1788 fragments, 21 contexts, minimum 20 taxa, are near-identical, providing a story of continuity in landscape, management regime, exploitation and impact despite the profound societal changes taking place.

Insert Figures 2 and 3 % and ubiquity P0 Insula IX near here

Smaller shrubs (heather/lings (*Erica/ Calluna* sp.), gorse/ broom (cf. *Cytisus/ Ulex* sp.), hawthorn type (*Crataegus* type including pieces with homogenous rays and thorns cf. *monogyna*)) occurred in contexts related to animal bedding or foddering, as suggested by location (open-area pit dumps), geochemistry (raised strontium-calcium-phosphorous levels in the vicinity, Cook 2018) and increased weed seeds (Lodwick 2018 in press). These scrubby types are found infrequently in charcoal analyses, reflecting their small size and vulnerability to complete combustion in fires, to pedogenic process after deposition and to loss during processing and analysis, particularly if only >4mm fragments are retained (see Gale 2008a, 2008b).

A mosaic of vegetation, with heath, scrub, wetland and open mixed deciduous woodland is proposed for the source area(s). Targeting or expansion of scrub/ secondary woodland areas is inferred for the late-phase Iron Age contexts (birch, Maloideae cf. *Crataegus* type, Barnett 2018a). Changes in pattern or intensity of arable or pastoral activity, enabling recolonisation of trees in previously open areas, is proposed. A variety of activities, including site clearance, domestic use (heating, cooking), and provision of animal fodder/bedding are represented. Smithing and/or possible smelting related waste is suggested for assemblages dominated by highly reflective pieces in the presence of artefactual evidence for metalworking and geochemical evidence (Barnett 2018a; Cook 2018). The charcoal data generated for Periods 0 (and 1) are highly detailed and add substantially to understanding of landscape, exploitation and activity at and near Insula IX but builds on a context provided by the excavated archaeology, analysis of geochemistry, insects, pollen and an exceptional macrofossil dataset (Lodwick 2018 in press; 2013).

Pond Farm Hillfort

The Site

Pond Farm Hillfort, Scheduled Ancient Monument 241076, lies 1.2km northwest of the *oppidum* and Roman town at Silchester, SU62686308 on a low hilltop of Silchester Gravel over London Clay and comprises a large bank and ditch encircling 2.1ha. Excavations of 10% of the hillfort by the Environs team in 2015 were the first undertaken, and establised that the monument was constructed in the

Late Iron Age at 200-30 calBC (2083±29 BP, SUERC-65355). It was placed in a landscape already cleared for agriculture from the Beaker period into the Middle Iron Age (Fulford, Barnett and Clarke 2016; Barnett and Fulford in prep.). The multi-phase site underwent maintenance and re-use in the Middle to Late Roman periods at 230-430 calAD, the Early Medieval period at 560-680 calAD and again in the medieval and post-medieval periods. Despite the substantial investment in establishing the earthworks, initial use was short-lived and small-scale, with no evidence of significant settlement in the Late Iron Age, its use potentially focussed on livestock management or community gatherings, and perhaps curtailed by the arrival of the Romans at Silchester.

The Charcoal

Wood charcoal was the most common remain onsite, well-preserved and moderately plentiful for some archaeological periods identified e.g. **Figure 4** Saxon dump. However, a lack of substantial or numerous Iron Age features limited the potential contribution of charcoal and other palaeoenvironmental remains. Only 5/24 contexts analysed and 199/1004 identified fragments were of Middle or Late Iron Age date (**Table 3 Appendix 1**). Only five taxa have been identified for the Iron Age but the knowledge that oak-hazel-ash woodland existed nearby, with alder carr (12% total assemblage), and Maloideae nearby (**Figures 5a and 6a**) adds a little to our picture of the wider landscape. The (Mid-Late) Roman levels (**Figures 5b and 6b**) indicate continuation of oak-hazel-ash but with the addition of holly and 8% birch and a decrease in alder to 2%. Analysis has enabled the radiocarbon dating programme, and so our improved understanding of the chronology of clearance, construction, re-use and relationship in time with the nearby *oppidum* and Roman town.

[Insert Figures 4 (Photo monument ditch), 5a and b & 6a and b (% and ubiquity Pond Farm) near here]

A lack of charred plant macrofossils heightens the significance of the charcoal, while limited pollen –bearing strata on and off-site, indicate establishment of heathland (with *Erica* and *Calluna*) by the Early Roman period, (Dark and Batchelor in prep) and mixed oak-hazel-holly (*Ilex aquifolium*) woodland with alder (*Alnus glutinosa*) on the wetland fringes.

The Little London Linear and linear at Brocas Lands

The Site

A series of substantial, now discontinuous, linear bank and ditch monuments named the Silchester Dykes or Linears cut across the landscape of the *oppidum* in a pattern that makes little sense in terms of its contemporary land division (marked on **Figure 1**) but previously assumed contemporary. Most extant sections are scheduled but poorly understood and dated. By their very nature and scale, such monuments, around Silchester and other *oppida* such as Chichester (McOmish and Hayden 2015), tend to be archaeologically sparse, with little associated settlement activity. Coring and excavation at Brocas Lands north-east of Silchester SU465312163357 and at one of three converging linears at Bridle's Copse, Little London (the LL Linear, SAM 1008728, SU6251260497) proved these follow the norm. Artefactual material was scant, comprising only burnt flint. Dating of the bank at the LL Linear to 365-170 calBC and primary ditch fill at Brocas Lands dated to 400-205 calBC (Barnett in prep. b) indicate they predate the *oppidum*, the pattern of the linears making more sense as territorial boundaries outside the context of an established central town.

The Charcoal

Wood charcoal occurred in small quantities in the Brocas Lands trench and in the cores from both sites. It was highly fragmented, although, where present, well stratified and sealed. Charcoal did not contribute to our understanding of the wider landscape or activity at the sites, however, it played a part in our improved understanding of the relative chronology of the sites, since identifiable short lived oak, birch and hazel fragments enabled the radiocarbon dating of key contexts. Plant macrofossils were virtually absent onsite while pollen was well-preserved for the ditch sequence only at Little London and gives an indication of major shifts in land-use over the Middle Iron Age-Roman period, and supports the charcoal data described for Pamber Forest below.

Wood Farm

[Insert Figure 7. near here]

The Site

Excavations of a stream-side low-lying section of linear monument took place at Wood Farm (SAM 1011956), Little London, SU6319060945 in 2017. It traverses the London Clay outcrop **[Figure 7]** and was built in the context of an existing Middle and Late Iron Age settlement (see Fulford, Barnett and Clarke 2017). Downslope movement of domestic debris, including pottery and charcoal, occurred in a wedge of localised colluvium that directly underlay the monument bank, with final occupation dated to 170 calBC-5 calAD (2063±28 BP, SUERC-69371). The linear monument was constructed still in the Late Iron Age, with the initial de-turfing event dated to 115 calBC-55 calAD (2026±29 BP, SUERC-69372), contemporary with initial construction of the *oppidum*.

The Charcoal

The charcoal assemblages proved small but well-stratified. Their dating has established the chronology of occupation, monument construction and use, and their analysis provides useful, limited, data. Of the nine contexts analysed, six are Middle-Late Iron Age, (**Table 4 Appendix 1**, **Figures 8 & 9**). Two discontinuous Late Iron Age layers with occupation debris immediately under the bank (contexts 107, 119,) demonstrate use of oak (5 of 6 contexts, 85% total assemblage), hazel, Maloideae and cherry-type (*Prunus* sp.), in common with contemporary layers at the *oppidum* and Windabout and, like Pond Farm, indicates local growth and use of holly and availability of wetland taxa (willow/ poplar, 3 of 6 contexts, 6% total assemblage). No heath and scrub taxa were found but may be due to the limited material rather than true absence. There were scant plant macrofossils and no contemporary coleopteran or molluscan remains onsite (with off-site sequences post-dating monument construction). Pollen has preserved well in the lower portion of the monument ditch sequence only, but indicates defined phases of open arable cultivation then oak-hazel-holly woodland regeneration during the Middle-Late Iron Age (Dark in prep 2019), supporting the charcoal findings.

[Insert Figures 8 & 9 (% and ubiquity Wood Farm) near here]

Windabout Copse

The Site

Windabout Copse near Mortimer, SU65386374 lies in rolling arable land on sandy Silchester Gravels over London Clay. Evaluation by geophysical survey (Linford, Linford and Payne 2017), then excavation over cropmarks (Truscoe in prep.) led to the discovery of an Iron Age complex. A mortuary enclosure on the hilltop in the northern portion of the site overlooks an Early and Late Iron Age settlement complex to the south (**Figure 10**). The remains of a cremated adult male (Carroll in prep.), were interred at the Late Iron Age-Early Roman transition at c. 60 calBC-80 calAD (Barnett in prep.b; Fulford, Barnett and Clarke 2017), in a chambered grave with vessels imported from Northern France **[Figure 11]**, and smashed Spanish amphorae. This is the first Stanway type burial recorded south of the Thames, and is in the tradition of those associated with the *oppida* of Verulamium (St Albans) e.g. Folly Lane (Niblett 1999), Camulodunum (Colchester) (Crummy 2007), and beyond, to origins in Northern France.

[Insert Figures 10 & 11 site photos. near here]

The Charcoal

The charcoal is numerous, well-preserved and closely related to the archaeology. Of the 16 analysed, 13 are from Late Iron Age and LIA-Early Roman transitional domestic and funerary contexts *c.*170 calBC-80 calAD. A minimum of 12 taxa occur in the 1220 identified fragment assemblage >2mm (**Table 1, Table 5 Appendix 1)**. Considerable overlap in types represented at Insula IX were noted; oak again ubiquitous, forming 92% of the Late Iron Age assemblage (**Figure 12)** and 83% of the Early Iron Age. Hazel and cherry-type are common, (5/13 IA contexts, 3/9 excluding EIA contexts) **Figure 13a and b**. Yew (*Taxus baccata*) and lime/ linden (cf. *Tilia* sp.) are notable additions. Small twiggy types e.g. heather and gorse/ broom are missing, in contrast to the *oppidum* and nearby Pond Farm hillfort. Some exploitation of wetland habitats is indicated by low presence of willow/ poplar and alder.

The charcoal from the cremation burial (context 949) is secondary, with bone and fuel removed from the pyre (not found) and placed within the chambered grave. The restricted spread of material within the grave and presence of four copper alloy rings around the periphery of the remains indicate they were encased in a wooden box or leather bag. The grave charcoal was *c.*95% mature oak, with occasional oak twig and hazel, reflecting dominance of large oak stem wood in pyre construction, in order to sustain a high-temperature steady burn, also attested to by high reflectivity (Mcparland et al. 2009; Ascough et al. 2010) noted for c.40% of this assemblage. However, large charcoal dump (context 117) in a contemporary ditch contained 37% oak roundwood, some cut at 15 and 20 years, **(Table 5 Appendix 1)** and a mix of fast and slow grown mature oak pieces with ash (*Fraxinus excelsior*) and ash roundwood. A managed woodland source is possible. Settlement dump 144 contained a broader mix of taxa, including field maple, Maloideae, blackthorn, hazel, and lime/ linden. Many were juvenile, and two oak fragments showed rips/ heels where remove, the dump is interpreted as localised clearance of secondary growth or hedgerow from Late Iron Age re-occupation.

Ten samples suitable for macrofossil analysis included spelt wheat (*Triticum spelta*) grains and glume bases, and barley (*Hordeum* sp.) grains and rachis fragments, indicating small-scale domestic cereal processing and consumption at the site (Lodwick in prep.). Context 144 contained cereal remains, and wild and weed types e.g. sheep's sorrel (*Rumex acetosella*), fat-hen (*Chenopodium album*), elder (*Sambucus nigra*, not represented in the charcoal assemblage), grasses (Poaceae) and bromes/oat (cf. *Bromus/Avena*) plus limited wetland types including sedge and rush (*Carex, Juncus* sp.) (Lodwick in prep). The number of Late Iron Age features, charcoal and plant macrofossil assemblages, together provide a more complete archaeobotanical dataset for Windabout than the other hinterland sites. Wood charcoal here makes a substantial contribution to site and landscape interpretation, drawing out aspects of vegetation structure and fuel choice in the site environs that differ from that at the *oppidum*.

[Insert Figures 12 & 13a and b (% and ubiquity Windabout Copse) near here]

Pamber Forest

[Insert Figure 14. site photo Enclosure 2]

The Site

Six putative late prehistoric monuments identified during aerial interpretation and walkover survey lie on the London Clay and colluvial deposits at Pamber Forest, near Tadley, SU61976018, within a Site of Special Scientific Interest (SSSI), managed sensitively for wildlife and designated due to presence of "ancient" coppice and a diverse fauna. Within the buffer area, beyond the strictly protected zone, it is under active forestry management with a regular wood cropping regime. Three large circular and D-shaped enclosures were excavated in 2017. All were constructed in the Middle Iron Age at 400-200 calBC (Barnett in prep. c), with Enclosure 3 containing closely packed structures, indicating concentrated settlement at this time, indeed all pottery belongs to this phase. However, all were set on the sites of earlier activity including Mesolithic and Neolithic. Enclosure 3 was placed around substantial and presumably still visible Middle Bronze Age (1750-1450 calBC) activity, including use of hot stones to heat water in features by a natural springline that runs across the site (Fulford et al. 2018). No Late Iron Age activity was identified but later reuse includes creation of a probable charcoal preparation structure (pit 3020) at 125-325 calAD (Mid-Late Roman).

The Charcoal

2011 charcoal fragments were identified from 24 contexts (**Table 6 Appendix 1**), with substantial charcoal assemblages of Middle Bronze Age, Middle Iron Age and Mid-Late Roman phases recovered. These are described in detail in Barnett (in prep. c), and the findings for seven Middle Iron Age settlement contexts (457 fragments) and five Mid-Late Roman contexts (pit 3020 and associated posthole, 550 fragments) are summarised here. Mixed deciduous woodland of oak (65% total MIA assemblage, 7/7 contexts) and hazel (5%, 4/7 contexts) with ash, holly and field maple (1-2%, 2-3/7 contexts, **Figures 15 & 16**) had established by the time of enclosure, with wetland trees e.g. alder and willow/ poplar growing nearby (4%). Open secondary woodland and/or scrub sources of fuel wood are inferred from a greater proportion of birch (11%) than seen for the Middle Bronze Age contexts (<1%) with occurrence of hawthorn (Maloideae cf. *Crataegus* type, 2%).

Four substantial layers of charred oak filled Mid-Late Roman pit 3020. The basal fill comprised a large plank-like piece >30 years when cut but the three overlying layers contained pieces cut at 15-20 years (where discernible) (**Table 6 Appendix 1**). A managed oak source is proposed. Pollen analysis of the ditch sequence shows periods of abnormally high oak flowering (Dark 2019 in prep), coppiced or pollarded oak stands were likely established during the Iron Age, and the charcoal data demonstrates their continuation into the Roman period. The preservation of *in situ* layers of managed-source oak by charring without ashing indicate moderate, controlled temperatures), the form of the feature, presence of rubified soil, and associated encircling postholes all lend to an interpretation of this being the remains of a charcoal preparation stack. It compares well with 19th-20th century woodland charcoal-making features described by Edlin (1949, 160-165). Examples have been described for Medieval bloomeries e.g. Holwick Fell (SAM 1017121), while proposed Iron Age-Roman charcoal production pits of similar form include those excavated along the N6, central Ireland (OCarroll and Mitchell 2017; Egan 2007).

Over the millennia, Pamber was partly deforested, repeatedly exploited for fuel, and, by the Roman period, deliberately managed for a crop of oak seemingly used for charcoal-making. What would appear a relatively stable ancient coppiced woodland in modern ecological terms therefore had a mixed and dynamic past. Charcoal analysis has provided insights into human-environment relationships and the long-term history of these woodlands that enable comparison with the modern day ecosystem. The ability of the woodland to recover repeatedly from clearance episodes in the absence of modern day farming techniques and agri-chemicals is demonstrated. The Environs team have worked with the landowners, land managers (Wildlife Trust) and designatory body (Natural England) to minimise impact of the archaeological investigations on ecology, to inform and support their management framework for the area, to ensure appropriate continued woodland management armed with this new information and to highlight the need to mitigate future impact on this newly found archaeological resource.

[Insert Figures 15 & 16 (% and ubiquity Pamber Forest) near here]

Interpretation and Conclusions

Given the varying contribution of charcoal analysis to our understanding the sites already analysed, it seems timely to take stock and review the value of the approach, methods and findings before completing the remaining Environs sites. Inter-site variability in assemblage size, number and species representation has been outlined. On a crude level, the larger and more numerous the charcoal assemblages, the more informative they have been. Intra-site complexity has been apparent for the multi-faceted sites of Insula IX and Windabout Copse, attributable to differing activities (including crafts and animal husbandry at the former, funerary vs domestic at the latter). The relationship between number of fragments identified and number of taxa found is strong, scatter plot **Figure 17** shows an increase in types found with one in fragment number (total site values used) up to c.1500 fragments, at which point the recovery rates plateau. There is a correlation with the appearance of taxa that form a smaller proportion of the charcoal assemblage and by inference, the local vegetation. Since all viable sampled contexts were analysed for the hinterland sites (with greater selectivity only necessary at Insula IV), assemblages were essentially self-selecting, and quantity a direct result of taphonomic issues, including original activity and deposition and post depositional factors rather than any skew introduced by any parameters set for analysis. At Insula IX however, judgment on what to subsample has been necessary.

There has been cumulative value from the data generated for less charcoal-rich sites e.g. Pond Farm and the Silchester Dykes, with contrasting presence/ absence of taxa of particular habit (such as wetland, heath and closed woodland) providing information on activity and the setting of each site, building together into a bigger and more complex landscape picture than we had prior to the analyses mapped in **Figure 18 and** summarised in **Table 1** and as follows:

At Pond Farm, the Middle-Late Iron Age charcoal assemblage (5 contexts) showed only that oak-hazel-ash woodland, alder carr and one or more members of the Maloideae grew nearby but Bronze Age, Roman and Saxon age assemblages have been analysed too, providing a longer term view of the environs. Pollen analysis adds the identification of heathland types to the Late Iron Age-Early Roman findings. Charcoal from 32 contexts representing the <65 years, c.20BC-43AD phase of intense Late Iron Age activity at Insula IX has provided more nuanced data, with use of a broad range of taxa (≥18) from contrasting local habitats (wetland, scrub/ heath and open woodland) demonstrated, along with targeting of types for particular purposes e.g. use of small twiggy shrubs related to animal husbandry. The likelihood of long-rotation coppice or pollard management of oak stands in the Late Iron Age to Roman period has been proposed from similar-age roundwood in particular contexts at Insula IX and Pamber Forest and supporting pollen evidence from Pamber.

Analysis of material from the archaeologically sparse Silchester Dykes at Little London and Brocas Lands showed oak, hazel and birch presence during the Middle-Late Iron Age. That of six contemporary contexts at Wood Farm, demonstrated growth of hazel, *Prunus* sp., Maloideae and holly as well as dominant oak, and that wetland habitats were used, , but no scrub or heath types were identified. Examination of 13 Late Iron Age and LIA-Early Roman transitional domestic and funerary contexts (c.170 calBC-80 calAD) at Windabout Copse showed dominance of oak but also local availability of ≥ 11 other taxa such as field maple, lime/ linden and holly. Wetland types occurred in small numbers but not scrub or heath types. Useful here was the occurrence of a large diverse assemblage (context 117, field maple, Maloideae, blackthorn, hazel and lime/ linden plus elder in the plant macrofossils), often in juvenile form, interpreted as the locally cleared vegetation, perhaps hedging given the taxa represented.

Of the 24 contexts analysed for Pamber Forest, the seven of Middle Iron Age date showed a smaller proportion of oak (though still 65% of the total site assemblage), with ash, hazel, holly and a greater proportion of open secondary woodland and/ or scrub types, notably high (11%) birch and probable hawthorn, plus wetland trees. Differing patterns of woodland, scrub, heath and wooded wetlands have been identified at and around these late prehistoric sites and areas of increased human intervention and management. As more sites are analysed under the Environs project, it is hoped an increasingly detailed mapping of the Middle-Late Iron Age mosaic landscape will be achieved, building on that depicted in **Figure 18**.

The picture so far is of exploitation of several different habitats for fuel across the landscape, including wetland, mixed deciduous woodland, secondary woodland/ scrub for fuel for use in domestic and craft use, with a relatively diverse range of taxa taken. The single cremation context analysed showed clear oak dominance. Managed cropped stands appear to have been dominated by oak too although one context at Windabout indicates possible management of ash. So far, heath type charcoals have only been identified from what have been interpreted as contexts related to animal husbandry and only within Insula IX. The Iron Age assemblages suggest a somewhat rural way of life, with small-scale, perhaps individual family-led, collection of fuel but with hints of the establishment of formal woodland management systems during this time.

[Insert Figure 18 Eco zone map near here]

Charcoal preservation has been good at most sites and the contrast with scarce charred plant macrofossil assemblages is stark, particularly at the non-settlement sites. Their lack is not believed related to preservation, after all charred wood has been preserved ubiquitously for the contexts excavated, charred plant macrofossils are considered similarly robust and were present in copious amounts (cereal and non-cereal) within the *oppidum* (Lodwick 2018 in press; Lodwick 2017; Lodwick 2013). The reasons for absence may be manifold e.g. low-level domestic activity at some of these sites, a concentration on non-cereal plant foods prepared without exposure to fire and on meat, poor cereal yields due to poor soils on the London Clay or perhaps high demand from the *oppidum* depleting available plant crops to the outlying rural communities, although that doesn't fully explain the accompanying lack of weeds and wild types at all sites except Windabout Copse. Heavy reliance has therefore been placed on charcoal analysis as the most reliably present and informative technique.

Opportunities to work on a landscape scale are usually limited due to the site-based nature of both research funding and development control-led work. Sometimes several sites are examined together, but due to the linear nature of major development projects such as HS1 and the M6 toll, those studied do not form one coherent, contemporary lived-in landscape, though useful site data has been generated (e.g. Gale 2008a, b; Barnett 2013). Charcoal studies of Iron Age sites, (including *oppida*) are uncommon (cf. Huntley 2010, 19) and comparators for this study few. Less systematic bulk sampling in older excavations and a continuing focus on plant macrofossils and pollen in preference to wood charcoal in the context of limited post-excavation resources (financial and capacity) have contributed. There is a perception that these techniques are more informative rather than complementary.

Onsite wood charcoal and charred plant macrofossils give direct evidence of human activity and alteration by fire and are more reflective of the site environment and activity at a particular point in time than pollen (cf. Asouti and Austen 2005, 6). Conversely the value of “offsite” pollen and that from particular onsite contexts in providing a picture of longer term trends and change is high. Care is needed to interpret plant macrofossil remains due to trade in the Late Iron Age, particularly in cereal crops (Dark 2000, 39), they may therefore relate to a more distant landscape. Wood collected for domestic fuel use will tend not to have travelled far (Théry-Parisot et al. 2010; Chabal 1992), although that from a managed source may. Where projects have been ambitious and looked at the wider setting or environs of a major site e.g. the Danebury Environs project, opportunities to study the wood charcoal assemblages are not always taken up (but see Poole 1984 for the hillfort and Campbell 2000 for the environs macrofossils). This may again be due to financial constraints, limited capacity/ number of charcoal specialists available or a view that charcoal analysis has a limited contribution to make.

Overall, there is a scarcity of detailed published charcoal and also pollen data for southern England for the first millennium BC (for a review see Dark 2000), which both heightens the usefulness of the Silchester work but also makes the data harder to interpret. Those pollen analyses that have been undertaken indicate extensive clearance of woodland during the late Bronze Age to early Iron Age (later moving northwards), with a substantial drop seen in arboreal taxa (Dark 2000, 42–4). The degree of tree cover in the Late Iron Age seems to have been highly variable by region but parts of southern England may have been as open as they are today (ibid., 79). Certainly, in this study, even local variation can be seen to be substantial, and that can only be picked out where there are analyses at a number of sites within one area. A single site in isolation will always provide a skewed story.

Lessons learned and implications beyond the project

Looking back, the larger, more species diverse assemblages recovered from the hinterland sites and those from Insula IX were however perhaps capable of telling us more had the number of fragments identified been greater. In the next phase of work on sites e.g. the Simm’s Copse enclosures, Little London Tilery (Sites 8 & 9 **Figure 1**) and Insula IX Periods 1 and 2, consideration is being given to increasing counts from *c.*100 fragments (the minimum viable number suggested by Keepax 1988, 120-4) to 2-300 for a select few contexts, to add precision and potentially recover a greater diversity of taxa (cf. Chabal et al. 1999, 66). This will necessarily reduce the number of samples examined, a careful balance will have to be found. A strategy of routine extensive and intensive bulk sampling focussed on interesting archaeological questions will continue to be employed in future excavations.

More nuanced data related to specific human activity has come from the sites with large and numerous same-age assemblages, as identified through the substantial dating programme(Insula IX, Windabout and Pamber) but smaller analyses have had a part to play in building a picture. Analysis has a significant contribution to make within and without the context of other artefactual and palaeoenvironmental datasets. Factoring-in thorough assessment of well-planned bulk sediment samples using standardised methods and quantification (see Huntley 2010 53-61; Asouti and Austen 2005; Chabal 1992), in consultation with the charcoal specialist sets the scene. Encouragement by environmental archaeologists of colleagues managing post-excavation programmes to view anthracology, not as another chore to get through, but a potential mine of information on archaeological activity and on responses to change in climate and environment, of direct relevance to modern day and future landscape management policy and planning would move us forward. The successes of larger research-led projects such as this should help provide evidence of why it has weight. Lack of capacity is an ongoing issue. There are currently few institutions teaching anthracology, the annual Kew course being a notable exception. There is also a trend of decline in undergraduates taking botany or science-based archaeology. Yet, a critical mass of trained analysts is required to cope with ongoing demands of development-led archaeology, the same issues extending to plant macrofossil analysis and geoarchaeology, and our experience in organising the Integrated Microscopy Approaches in Archaeobotany workshops at the University of Reading is that there is an appetite for this training and sharing of knowledge both in the UK and internationally.

Collectively, wood charcoal has been invaluable to the Silchester Environs project. For the hinterland sites, it is the dominant source of palaeoenvironmental/ landscape data. Individual site interpretations would have been diminished without it, from one end of the scale in having a less robust radiocarbon chronology for each site through to its direct input to our understanding of wood and charcoal sourcing and woodland management, of considerable importance in daily life within both the rural and town contexts. The benefits of pursuing substantial analysis in question-led research has become apparent and the intention is to continue to build on this through the remainder of the project and allied work within and around the Roman town.

Geolocation information

The Silchester Environs study area is of 143km^2, lying between the River Kennet to the North and the city of Basingstoke to the south, grid southwest SU 610550 to northeast SU 690700.

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LIST OF FIGURES (ATTACHED SEPARATE EDITABLE FILES)

SUPPLEMENTARY INFORMATION (SINGLE SEPARATE FILE OF LARGE WORD TABLES)

Table 1. Summary of the Silchester Wood Charcoal Analyses

Site name	Assemblages large/ small? (majority > or <100 fragments	No. assemblages analysed Middle and Late Iron Age only	Total no. frags identified	Minimum no. taxa	Taxa represented in the IA charcoal assemblages (see Tables 2-6 Appendix 1)	Key findings	Notes on availability and contribution of other bioarchaeological remains
1. Insula IX P0 Excavation	large	32 LIA (35 samples)	1896	18	*Acer campestre, Alnus glutinosa, Betula pendula/ pubescens, Cornus sanguinea/ mas, Corylus avellana, Erica/Calluna, Euonymous europeus,* Fabaceae *eg Cytisus/ Ulex, Fagus sylvatica, Fraxinus excelsior, Ilex aquifolium,* Maloideae*,* Maloideae *(Crataegus type),* Maloideae (cf. *Sorbus,* Veal) *Prunus spinosa, Prunus* sp.*, Quercus* sp*, Quercus/ Castanea*, *Salix/ Populus* sp.*, Sambucus nigra, Ulmus* sp.	Small plants including cf. gorse, cf. hawthorn, cf. heather found as well as tree and shrub taxa. Also, roundwood well-represented in a few particular contexts. A focus on oak wood but also exploitation of a large number of available taxa and juvenile pieces. Numerous samples within a restricted (<65 year) period of deposition, highly detailed data.	Waterlogged wood, good, restricted to well contexts (offcuts and structural) (Barnett 2018). Macros, exceptional info on diet and agriculture (see Lodwick 2018). Phytoliths, information on bedding, thatching from specific well layers (see Elliot 2018). Pollen, highly variable but available for a few specific features, notably Well 8328 (see Brown 2017) Molluscs poor Insects (Robinson 2018) wells and cess only Animal bones (Ingrem 2018) prolific, detailed data on livestock and husbandry, butchery, introductions, pets
2. Pond Farm Excavation	IA small (later large)	5 M-LIA (24 BA, M-LIA, ERB, LRB, Sax, Med)	199 (1004 all)	5	*Alnus glutinosa, Corylus avellana, Fraxinus excelsior, Maloideae, Quercus* sp.	Few (Middle and) Late Iron Age contexts, low-level use and no settlement despite large scale of earthworks and palisade. Oak-hazel- ash woodland and alder carr nearby. Presence of heath and scrub types by Early Roman, may also relate to LIA	Macros, very poor. Pollen only very specific contexts, most Roman or later. Phytoliths, none preserved for Iron Age levels (new methodology for extraction now being attempted) Molluscs, insects, animal bones, none preserved
3. Brocas Lands Excavation	Very small	2 M-LIA	6	2	*Corylus avellana, Quercus* sp.	The linear monument shows minimal burning and archaeological activity. The few well-sealed pieces of charcoal found have enabled 14C dating of the site	No other bioarchaeological remains are preserved for Iron Age levels on or off-site. (but waterlogged plant remains Roman-Early Medieval recovered from floodplain sequence)
4. Little London Linear coring only	n/a from cores	3 M-LIA	5	2	*Betula pendula/ pubescens, Corylus avellana*	Localised burning represented by burnt flint and charcoal in the cores. Site has potential but its scale and type prevented excavation. The few well-sealed pieces of charcoal found during coring have enabled 14C dating of the site	Pollen, good for the ditch sequence, preliminary results described here (Dark in prep). No other remains recovered during coring
5. Wood Farm excavation	small	6 M-LIA (9)	155	7	*Alnus glutinosa, Carpinus betulus, Corylus avellana, Ilex aquifolium, Maloideae, Prunus sp., Salix/ Populus*	LIA settlement debris found as well as material related to superimposition of the linear monument Dominated by oak but domestic exploitation of several other types of both dry and wetland habit.	Plant macros, very few charred found on site despite excellent charcoal preservation, offsite waterlogged macros postdate the monument. Pollen preservation good for the monument ditch, described here (Dark in prep). No animal bone, molluscs, insects preserved
6.Windabout excavation	large	13 LIA/ LIA_ER transition (16 incl EIA)	1016 (1220)	12	*Acer campestre, Alnus glutinosa, Betula pendula/ pubescens, Corylus avellana*, (EIA *Fraxinus excelsior*)*, Ilex aquifolium, Maloideae, Prunus sp., Prunus cf. spinosa, Quercus* sp. *Salix/ Populus* sp., *(*?RB *Taxus baccata),* cf. *Tilia* sp.	Well-preserved large assemblages related to LIA-Early Roman transition mortuary and settlement activities. Range of taxa represented. Cremation/ pyre dominated by mature oak, incl large planks. Context 144 very substantial dump of local, especially twig wood, large number of taxa shown by wood charcoal and plant macro analysis, useful detailed local picture.	Plant macros, good preservation of charred but only present in a limited number of contexts, low-level domestic cereal processing and cooking. Wild and weed in context 144 (Lodwick in prep). Pollen, present for a very few contexts, grave and LIA ditch dump 612 only, under analysis (Dark in prep). Phytoliths, none preserved. No animal bone, molluscs, insects preserved
7. Pamber Forest excavation	large	7 MIA (24 total Early Neo, BA, MIA, M-LRB, Med)	2011	12	*Acer campestre, Alnus glutinosa, Betula pendula/ pubescens, Cornus sanguinea/ mas, Corylus avellana, Fraxinus excelsior, Ilex aquifolium,* Maloideae, *Prunus* sp., *Prunus spinose, Quercus* sp., *Salix/ Populus* sp.	Onsite preparation of oak charcoal proposed (dominated by pieces cut at 15-20 years +). Large number of high quality assemblages under analysis. High potential for input to modern woodland/ SSSI management practices	Plant macros, good preservation of charred but only present in a limited number of contexts. *T.spelta, Hordeum* in Encl.2 & 3, plus disturbed and wet-loving taxa e.g.*Plantago, Rubus, Rumex,* Chenopodiaceae*, Juncus, Carex.* Pollen under analysis.

Appendix 1 Wood Charcoal Data Tables

Table 2 P0 Insula IX

Site Code	Feature	Context	Sample	Context desc.	Comments	*Acer campestre*	*Alnus glutinosa*	*Alnus / Corylus type*	*Betula pendula/ pubescens*	*Cornus*	*Corylus avellana*	*Euonymous europeus*	*Erica/Calluna*	*Fagus sylvatica*	*Fraxinus excelsior*	*Ilex aquifolium*	*Maloideae*	*Maloideae (Crataegus type)*	*Fabaceae eg Cytisus/ Ulex*	*Prunus spinosa*	*Prunus sp.*	*Quercus sp.*	*Quercus/ Castanea*	*Salix/ Populus sp.*	*Sambucus nigra*	*Ulmus sp.*	Unidentifiable	Unidentifiable twigwood	Total identified	other
A.2009.20	well 10421	10434	4015	charcoal rich dump in well overlies:	Small no. of large mature pieces	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	14	0	0	0	3	0	0	21	0
A.2009.20	well 10421	10436	4029	charcoal rich dump in well overlies:	Some pieces vitrified, fragmented, others highly reflective	0	4	4	0	0	0	0	0	0	0	0	1	0	0	0	0	90 1s	0	0	0	0	3	0	100	Bark 1, hazel shell 1
A.2009.20	well 10421	10438	4068	charcoal rich dump in well overlies:	Small (residue only?) sample	0	3	3	0	0	4	0	0	0	0	0	1	0	0	0	0	54 1s	0	0	0	0	4	0	70	0
A.2009.20	well 10421	10439	4085	charcoal rich dump in well overlies:	Rich fragmented sample	0	4	0	1 cf.	0	3	0	0	0	0	0	0	0	0	0	0	89 1s	0	0	0	0	2	0	100	0
A.2009.20	well 10421	10441	4141	charcoal rich dump in well, first 2^0 fill (1^0 is 10442)	Highly fragmented, few useable pieces, included as part of a sequence	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	2	0	9	0
A.2008.31	well 8328 by Veal	9309	3235	well fill		0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	24	0	1	0	0	10	0	40	
A.2008.31	well 8328 by Veal	9258	3195	well fill		0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	2	0	0	10	0	40	
A.2008.31	well 8328 by Veal	9257	3216	well fill		0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	7	0	14	
A.2008.31	well 8328 by Veal	9152	3162	well fill		0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	3	0	0	13	0	50	
A.2008.31	well 8328 by Veal	9170	2979	well fill		1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	4	0	0	11	0	35	
A.2008.31	well 8328 by Veal	9183	3025	well fill		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	5	0	15	
A.2008.31	well 8328 by Veal	8486	2943	well fill		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
A.2008.31	well 8328 by Veal	8452	3024	well fill	Maloideae=cf. *Sorbus*	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	18	0	0	0	0	4	0	25	
A.2008.31	well 8328 by Veal	8428	2722	well fill		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
A.2011.14	Ditch 11631	11111	7232	Upper ditch fill	Upper/ levelling deposit* Oak rwd 3-5yr, dom by 3yr.	0	0	0	2 2t	0	2r <5yr	0	0	0	0	2	2 3t	0	0	0	0	57, 26r, 2t	0	2	0	0	0	0	100	0
A.2011.14	Ditch 11631	11650	6445/ 5956	Upper ditch fill	Upper/ levelling deposit* above (12847) oak rwd 6mm 3yr	0	0	0	8	0	0	0	1 cf.	0	1	2	8	0	0	0	1	31, 3r	0	0	1 cf.	2	0	0	58	0
A.2011.14	Ditch 11631	12847	7621	charcoal dump in ditch	Discrete dump in upper levels of ditch, immediately below (11650), with pierced pot. V large no. tiny 1-2 yr twigs. Maloideae rwd (5 yr 3-6mm d)	0	3	0	4	0	1 cf.t	0	0	0	2	0	0	7r 40 cf. t	0	0	2	17, 16r	0	0	0	0	0	0	92	0
A.2010.48	pit group 2	11117	5425	pit fill of pit 11131	Charcoal volume good but analysis limited by fragmentation	0	0	0	6	0	1	0	1	0	0	0	1	0	0	0	0	19, 2r	0	0	0	0	0	0	30	0
A.2011.14	pit group 2	12117	7140	pit fill of pit 12179	Large volume but v fragmented, several pieces vitrified	0	4	10	2	0	12	0	0	0	0	0	0	0	0	0	0	52, 5t	0	2	0	0	12	1	100	0
A.2011.14	pit group 2	12714	6530	Basal fill pit 12696	Good condition, some large pieces	0	0	0	0	0	4	0	0	0	2	0	16 2 cf.t	0	0	0	0	74	0	2	0	0	0	0	100	Bark 1
A.2013.09	pit group 3	15685	10897	tree throw 16630 fill assoc with scorched earth	Single species incl mature and poss. Juvenile (first few rings but too fragmented). 100 frags=<10% of sample, scan of rest shows also oak. Sapwood dated to 2566-2341 cal BC (3943+/-29, SUERC-65375)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98, 2s	0	0	0	0	0	0	100	0
A.2013.09	pit group 4	15138	10557	Fill of pit 15142	Good condition but small sample of small frags. Oak rwd 20mm, 7 yr	0	1	0	3	0	6	0	0	0	0	0	1	0	0	0	2 cf.	16, 3 r	0	1	0	1 cf.	0	0	34	0
A.2013.09	pit group 4	15140	10441	Fill of pit 15142	Large rich sample, several soft and friable, some fissured (burnt damp?), others have features obscured by mineral dep.	0	0	7	10	1	8, 3 r (3-7yr) 1 t	1	0	1	5	0	1	0	2	0	0	48, 6 r	0	4	0	0	0	2	100	Large parenchyma eg tuber 2 Bark 1 Thorn eg *Crataegus/ Prunus spinosa*
A.2013.09	pit group 4	15693	11012	pit 15684 1^0 fill	Fragmentary. NB macros incl Ericaceae bud	0	1	0	8, 7 r/t	0	1 1t	0	3 cf.	0	0	0	0	0	0	0	0	5	3 3yr	2	0	0	1	0	32	0

Site Code	Feature	Context	Sample	Context desc.	Comments	*Acer campestre*	*Alnus glutinosa*	*Alnus / Corylus type*	*Betula pendula/ pubescens*	*Cornus*	*Corylus avellana*	*Euonymous europeus*	*Erica/Calluna*	*Fagus sylvatica*	*Fraxinus excelsior*	*Ilex aquifolium*	*Maloideae*	*Maloideae (Crataegus type)*	*Fabaceae eg Cytisus/ Ulex*	*Prunus spinosa*	*Prunus* sp.	*Quercus* sp.	*Quercus/ Castanea*	*Salix/ Populus* sp.	*Sambucus nigra*	*Ulmus* sp.	Unidentifiable	Unidentifiable twigwood	Total identified	other
A.2013.09	pit group 5	16484	11033	Fill of pit 16488	8 oak rwd frags=18mm d, 5 yrs, pieces appear straight, rod-like, rest fragmentary	0	0	0	4	0	12	0	0	0	4	0	0	0	0	0	0	30, 46r, 2s	0	2	0	0	0	0	100	Bark 1
A.2013.09	pit group 7	15265	10329	pit 15266 1^0 fill	Oak rwd 3-6yr+, twigwood 2-3 yr. Some of the rest could also be rwd but too fragmented to tell.	0	1	0	8	0	0	0	0	0	0	0	0	0	0	1	1 cf.t	58, 23r, 8t	0	0	0	0	0	0	100	Bark 8
A.2011.14	pit group 8	12461	6767	1^0 fill of pit 12462 ?cess	Small sample but used as poss cess and with metal objects and pot	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	4, 1r	0	0	0	0	2	0	10	0
A.2011.14	pit group 8	12461	7616	Also 1^0 fill of pit 12462 ?cess	Repeat (adjacent) sample	1cf.	2 1 cf.	1 cf. t	2	0	3	1 cf.	1	0	3	0	0	0	0	0	0	83, 1s, 1t	0	0	0	0	0	0	100	Paren-chyma 5
A.2010.48	pit group 12	11687	5622	1^0 fill of pit 11721	As below	0	1t	0	0	0	3	0	0	0	0	1	3	0	0	0	0	9, 2r	0	0	0	0	4	0	23	0
A.2010.48	pit group 12	11680	5542/ 5543	2^0 fill of pit 11721	All oak rwd is small ≤5 yrs, 4 pieces 4 yrs 16mm d. Rest of oak also likely juvenile	0	0	0	0	0	1, 1r 4yr	0	0	0	0	0	0	3	0	0	0	12, 24r	0	0	0	0	0	0	41	0
A.2010.48	Pit group 13	11602	5594	9^{th} Fill of well/ pit 11026 over:	C14 charcoal Small no. large pieces (100% IDd)	0	0	0	0	0	1 cf.	0	0	0	0	1	1	0	0	0	1	100	0	0	0	0	0	0	104	0
A.2010.48	Pit group 13	11603	5595	8^{th} Fill of well/ pit 11026	C14 hazelnut shell/ spelt grains	0	0	0	7, 1r, 2t	0	2	0	0	0	0	0	1	0	0	0	0	40, 3r	0	0	0	0	1	0	57	0
A.2010.48	Pit group 13	11603	5595	8^{th} Fill of well/ pit 11026	C14 hazelnut shell/ spelt grains	0	0	0	7, 1r, 2t	0	2	0	0	0	0	0	1	0	0	0	0	40, 3r	0	0	0	0	1	0	57	0
Totals						2	49	25	84	1	71	2	6	1	23	6	44	50	2	1	9	1297	3	28	1	6	91	94	1896	
species ubiquity (presence in X of 32 LIA contexts)						2	17	5	17	1	17	2	4	1	9	4	14	2	1	1	6	32	1	12	1	3				

Table 3 Pond Farm A. 2015.36

Feature	context	sample	sample type	Context desc.	comments, 14C dates,	14C date	Phase/ period	*Alnus glutinosa*	*Alnus /sp juvenile*	*Betula pendula/ pubescens*	*Betula sp. twigwood*	twigwood cf. *Berberis*	*Corylus avellana*	*Corylus avellana juvenile*	twigwood cf. *Corylus avellana*	6 yr twigwood cf. *Fabaceae* cf. *Ulex*	*Fagus sylvatica*	*Fraxinus excelsior*	*Ilex aquifolium*	*Maloideae*	*Quercus* sp.	*Quercus* rwd	*Quercus* twigwood	*Salix/ Populus* sp.	*Salix/ populus* twigwood	*Ulmus* sp.	cf. *Ulmus* sp. twigwood	Unidentifiable	Unidentifiable twigwood	Total identified	other
1003	1004	SA100 BF43	bulk 26L and char spot	Charcoal rich posthole fill (post pipe?)	lots of fine rootlets but some larger frags, Is this charred post. Common charred fungal bodies. NB Maloideae may be a single intrusive piece or whole assemblage is post use rather than a post	na	? Iron Age	0	0	0	0	0	0	0	0	0	0	0	0	1	45	0	0	0	0	0	0	0	0	46	
1007	1005	SA101 SA102	bulk 29.5L and char spot	upper fill of treethrow with Silchester Ware	mod, fragmentary assemblage in good cond, c.70%ID *Betula* sp. dated to…	1710 ±29 SUERC-65356	240-410 cal AD Late Roman	3	1	14	1	0	5	0	1	0	0	3	1	0	68	0	0	0	0	0	0	3	0	100	
1019	1018	SA105	bulk 32L	Palisade Trench charcoal rich fill	scrappy and lots of organic residue, but attempt IDy given the context	2083 ±29 SUERC-65355	?Middle-Late Iron Age	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	16	
1070	1071	106 not on IADB	char spot	Palisade trench incl charcoal spot sample assoc with pedestal beaker (overlain by slump 1018, was prev incorrectly marked as being from 1018, change records).	outer rings (poss 5-15yr offset) of large oak fragment dated to…… Keep separate from bulk (maybe be chronologically separate	na	200-30 cal BC Middle-Late Iron Age	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
1026	1028	SA122 BF42	bulk 22L and char spot	Later cut across ditch, modifying entranceway. Not first fill but discrete dump, worth dating	lots of organic detritus incl poss modern but seemingly discrete lens of charcoal in good condition. 5yr juvenile oak dated to….	1655 ±29 SUERC-67561	263-276 (1.6%), 329-430 (89.2%), 492-529 (4.6%) cal AD Late Roman-Early Saxon/ Early Medieval	0	0	4	0	0	0	0	0	0	0	0	0	0	34	3	0	0	0	2	0	0	1	44	2 bark
1048	1049	SA119 107	bulk 22L and char spot	desc as soil on sample sheet. Is in later ditch modification, not discrete dump	small assemblage of good cond charcoal incl larger pieces	na	?Late Roman-Early Saxon/ Early Medieval	14	0	26	0	0	33	2	0	0	0	0	1	0	23	1	0	0	0	0	0	0	0	100	
2003	2004	SA204 BF39	bulk 28L and char spot	Tree Throw under outer bank and ditch, fill	mod rich, large frags, unlikely residual. Several pieces of oak are vitrified. 2 frags charred hazelnut shell dated	2213 ±29 SUERC-67562	370-200 cal BC Middle Iron Age	0	0	0	0	0	1	0	0	0	0	1	0	0	95	0	0	0	0	0	0	3	0	100	2 charred hazelnut shell
2014	2016	SA202	bulk 38L	Pit with scorched lining and conc charcoal second fill	very rich, huge flot almost entirely wood charcoal but fragmented, 10% assemblage from residue. 160 frags Idd=<5% subsample. NB (intrusive?) peg tile in top of this upper fill	na	Early Medieval	0	0	0	0	0	0	0	0	1	0	0	0	0	158	0	1	0	0	0	0	0	0	160	
2014	2015	SA203/ 217	bulk 42L	Pit with scorched lining and conc charcoal first fill	v rich, huge flot almost entirely wood charcoal. Oak incl 3 sapwood, 2 of which cf. twigwood? dated to……	851 ±29 SUERC-67563 & 831 ±29 SUERC-67564	1050-1260 cal AD Early Medieval & 1160-1260cal AD Early Medieval	0	0	0	0	0	2	0	1	0	0	0	0	0	94	0	1	0	0	0	0	0	2	100	
2027	2028	SA206	bulk 6L	Small isolated pit near the levelled ditch, just inside or underlies the bank, charcoal rich fill with pottery	small but charcoal in good condition Alder charcoal dated to …..	2184 ±29 SUERC-67568	370-170 cal BC Middle Iron Age	23	0	0	0	0	5	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	2	36	
2029	2053	211 212	Bulk 91.5L and char spot	charcoal smile in ditch slot (NB missing bulks for 2065 and 2066 under charcoal ie 10 and 20 fills, see slots 2036 and 2049 instead but also have in monolith 214)	relatively rich sample (100 frags =60% subsample) 2yr twigwood charcoal from bulk and twig cf. elm handpicked from section dated	1451 ±29 SUERC-67569 & 1377 ±29 SUERC-65360	560-660 cal AD Early Saxon & 610-680 cal AD Early-Mid Saxon	0	0	6	0	0	0	0	0	0	1	0	1	0	72	0	0	6	1	1	1	3	8	100	
2029	2030	SA205	bulk 32L	Ditch fill (desc as first fill but is above charcoal smile)	small assemblage of large pieces, some>10mm	na	?Early Saxon	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	31	

2036	2047	SA207	bulk 28.5L	2nd 2^0 fill of ditch slot	Residue only	na	? Mid-Late Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	14	
2036	2045	SA208	bulk 35L	1st 2^0 fill of ditch slot	small fragmentary assemblage	na	? Mid-Late Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	29	
2036	2044	SA209	bulk 31L	1^0 fill of ditch slot. Ditch construction	small scrappy assemblage dominated by twigwood oak twigwood dated to….	1746 ±29 SUERC-67570	230-390 cal AD Mid-Late Roman	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	4	0	0	0	0	1	3	12	1 puffed vesicular piece of parenchyma
2049	2055	213	bulk 28.5L	first 2^0 fill of ditch slot (without charcoal smile) ie early ditch (1^0 fill not sampled)	charcoal in flot too finely divided for id, useable pieces from residue. NB in this sample cf. berberis ID made on external anatomy of spiny twig only as too young for internal. Oak sapwood dated to….	1668 ±29 SUERC-67571	250-290 (4.7%) 320-430 (90.7) cal AD Late Roman	0	0	0	0	1	0	0	0	0	0	0	0	0	11	1	0	0	0	0	0	2	0	15	
4017	4016	400	bulk 5L	charcoal in post hole, possible charrred post or tree burnt in situ, early clearance? Is part of what GPR suggested was a roundhouse	possible post. Large pieces, all oak, wide spaced rings, convincingly a large mature timber. I piece chosen for 14C as flatter closer rings, approaching sapwood, prob a 10-20 year age offset	2474 ±29 SUERC-65361	780-430 cal BC (Late Bronze Age-) Early Iron Age	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	100	
TOTAL	**17**							40	1	50	1	2	47	2	3	1	1	4	3	1	797	6	6	6	1	3	1	12	16	1004	
Species totals by phase																															
(Late Bronze Age-) Early Iron Age								0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	100	
Mid-Late Iron Age 5 contexts								23	0	0	0	0	6	0	0	0	0	1	0	1	162	1	0	0	0	0	0	3	2	199	
Roman 5 contexts								3	1	14	1	2	6	0	2	0	0	3	1	0	123	1	4	0	0	0	0	6	3	170	
Early Medieval 6 contexts								14	0	36	0	0	35	2	1	1	1	0	2	0	412	4	2	6	1	3	1	3	11	535	
Spp ubiquity total site								3	1	4	1	2	6	1	3	1	1	2	3	1	17	3	3	1	1	2	1	5	5		
Spp Ubiquity by phase (by spp incl juvenile																															
Mid-Late Iron Age 5 contexts								1	0	0	0	0	2	0	0	0	0	1	0	1	5	1	0	0	0	0	0	1	1		
Roman 5 contexts								1	1	1	1	0	2	0	2	0	0	1	1	0	5	1	1	0	0	0	0	3	1		
Early Medieval 6 contexts								1	0	3	0	2	2	1	1	1	1	0	2	0	6	2	2	1	1	1	1	3	3		

Table 4 Wood Farm A.2016.50

Feature	context	sample	sample type	Context desc	comments, 14C dates	Phase/ period	*Alnus glutinosa*	*Betula pendula/ pubescens*	*Carpinus betulus*	*Corylus avellana*	*Corylus avellana roundwood*	*Corylus avellana twigwood*	*Ilex aquifolium*	*Maloideae*	*Prunus sp.*	*Quercus sp.*	*Quercus roundwood*	*Salix/ Populus sp.*	Unidentifiable	Unidentifiable twigwood	Total identified	other
under bank	104	1	Wood charcoal from bulk	Pit fill nr top of ditch	sparse charcoal	later, modern?	0	0	1	0	0	1	0	0	0	9	0	0	0	0	11	
pit	113	22	Wood charcoal from bulk	pit fill, rel high in sequence, post-dates bank deflation deposit (see also 104)		Post IA	0	0	0	0	0	0	0	0	0	2	0	0	2	0	4	
bank	121	25	Wood charcoal from bulk	Upper portion of bank/ deflation sequence	*Charcoal residue only*	post IA	0	0	0	0	0	0	0	0	0	12	0	0	0	0	12	
under bank	107	2	Wood charcoal from bulk	Colluvial deposit with large (little moved) artefacts and charcoal lens immediately under monument bank. Wedge of coll above 119	NB Deposit does contain at least an element of colluvium, however, given the contents it is felt reasonable to assume the contents including charcoal relate to occupation debris from very close by (just upslope) deposited just prior to bank construction 2063±29 BP SUERC-69371 *Ilex aquifoilium* 2026 ±29 BP SUERC-69372 Maloideae	170 cal BC-5 cal AD ; 115 cal BC-55 cal AD Late Iron Age	0	0	0	1	0	0	1	1	1	11	0	5	0	1	21	
ditch	115	5	Charcoal (hand picked)	primary ditch fill? Very low in sequence, large frag, should closely relate to ditch and bank construction But actually on comparison with the bank dates, seems to reflect earlier activity unsurprisingly worked into the primary fill as the ditch was cut and re-stabilised	2186±28 BP SUERC-69378 *Corylus avellana* roundwood 4 years dated	360-175 cal BC Middle Iron Age	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
ditch	118	16	Wood charcoal from bulk	Secondary fill over lens 114 and context 116	small assemblage, fragmented and vitrified	?M-LIA	0	0	0	0	0	0	0	0	0	7	0	0	0	0	7	
ditch	106	17	Wood charcoal from bulk	Secondary fill	small assemblage, but good cond, mature		0	0	0	0	0	0	0	0	0	14	0	0	0	0	14	
under bank	119	20	Wood charcoal from bulk	Colluvial deposit with large (little moved) artefacts and charcoal lens immediately under monument bank, base of Holocene sequence	Assemblage rel fragmentary but numerous and good cond, a few larger clean and fresh, no evidence of movement/ transport, suggest v local 2017±29 SUERC-69380 *Salix/ Populus* sp. dated	100 cal BC-60 cal AD Late Iron Age	0	0	0	0	0	0	3	3	1	50	0	1	0	0	58	root wood 1
bank	110	23	Wood charcoal from bulk	Within bank upcast		?IA	0	0	0	0	0	0	0	0	0	1	0	1	0	1	3	
base of bank	109	3	Wood charcoal from bulk	Exposed base of bank (the "pale sand"), Possibly a very short lived rainwash event after deturfing of the London Clay and immediately prior to creation of the bank. Charcoal believed to relate to activity contemporary with bank construction	Assemblage small and fragmentary but good condition (NB with 1 grain *Triticum* cf. *spelta* 2515±28 BP SUERC-69376 c.5yr *Quercus* rwd dated	795-540 cal BC Early Iron Age	1	1	0	3	1	0	0	1	0	15	1	1	1	1	26	
Total site							1	1	1	4	2	1	4	5	2	121	1	8	3	3	157	
total IA							1	1	0	4	2	0	4	5	2	98	1	8	1	3	130	
Spp ubiquity total site								0	0	0	0	0	0	0		0	0	0	0	0	0	
Spp Ubiquity by phase (by spp incl juvenile)																						
Early Iron Age 1 context							1	1	0	1	1	0	0	1	0	1	1	1	1	1	10	
Middle-Late Iron Age 6 contexts							0	0	0	1	1	0	2	2	2	5	0	3	0	2	18	

Table 5 Windabout Copse A.2016.80

N or S Encl.	Feature	Context	Context desc	sample	comments	14c	Phase/ period	*Acer campestre*	*Alnus glutinosa*	*Alnus juvenile*	*Betula pendula/ pubescens*	*Corylus avellana*	*Corylus avellana* rwd	Corylus avellana twd	*Fraxinus excelsior*	*Fraxinus excelsior* rwd	*Ilex aquifolium*	*Maloideae*	Maloideae juvenile/ rwd	*Prunus* sp.	*Prunus* cf. *spinosa* rwd	*Prunus* cf. *spinosa* twd	*Quercus* sp.	*Quercus* rwd	*Quercus* twd	*Salix/ Populus* sp.	*Taxus baccata*	rwd cf. *Tilia* sp.	Unidentifiable	Unidentifiable twd	Total identified	other
S	kiln/oven 603	603	EIA kiln/ oven	140	Several frags>10mm. *Quercus* sp, most v narrow rings, even the rwd ie slow-grown	2393 ±33 SUERC-75085	740-390 cal BC EIA	0	1	0	0	0	10	0	3	0	0	0	0	0	0	0	85	0	0	1	0	0	0	0	100	
S	Grave 902	961	posthole/pit with quernstone cap	135	good cond but fragmentary. A few pieces>10mm. C.50% analysed	2438 ±33 SUERC-75079	760-400 cal BC EIA	0	7	0	0	0	0	0	0	0	0	0	0	1	0	0	92	0	0	0	0	0	0	0	100	
S	Beam slot 421	423	fill of beam slot	154	north end of beam slot. Scrappy assemblage, related to disuse. Not suitable for 14C dating	na	? Poss EIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	
S	NE outer ditch 504	511	primary ditch fill	100	primary fill of NE outer ditch. Small assemblage but good cond.	2054 ±33 SUERC-75081 & 2454 ±35 SUERC-75082	2 conflicting dates, 760-410 cal BC EIA and 170 cal BC-20 cal AD M-LIA	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	29	0	1	0	0	0	0	0	36	
S	SE Inner ditch	512	primary ditch fill	101	primary fill of SE inner ditch. Modest but fresh assemblage. Some mineral dep. *Corylus* rwd 5-10 yrs	2004 ±34 SUERC-75089	100 cal BC-80 cal AD LIA-ERB	0	7	0	1	5	6	2	0	0	0	0	0	2	0	0	11	2	0	6	0	0	5	1	48	
S	ditch 614	612	charcoal dump in upper fill of ditch	144	excellent cond. Huge <5% analysed. Twig and rwd incl. *Quercus* rwd <6 yrs, dom 3-4 yrs, 2 pieces with rip/ coppice heel Maloideae twig and young rwd *Corylus* rwd 4 years 11mm	2009 ±34 SUERC-75084 (charred barley grains) & 1989 ±33 SUERC-75080 (Maloideae charcoal)	100 cal BC- 70 cal AD & 60 cal BC- 80 cal AD LIA-ERB	4	0	1	0	5	2	0	0	0	0	14	3	4	7	1	5	35	11	0	0	2	0	10	104	
S	ditch 610	615	primary ditch fill	150	primary fill of outer/ middle ditch. Small assemblage but good sized pieces	2069 ±27 SUERC-77672	175-1 cal BC M-LIA	0	4	0	0	2	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	11	
S	Posthole 917	918	first fill of posthole	102	Several frags degraded pre-charring. Rotten post burnt out? *Taxus* post-use?	na	?RB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	1	0	1	0	100	
N	Ditch cut 10012	930	ditch fill	103	basal fill of long central ditch feature. Charcoal rich but highly fragmented so much <2mm	1925 ±34 SUERC-75094 & 1882 ±34 SUERC-75094 (oak twigwood charcoal)	30 cal BC-140 cal AD (93.8) 150-170 cal AD (0.7%) 190-210 cal AD (0.9%) LIA-ERB & 50-230 cal AD E-MRB overlap =ERB	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	6	0	1	0	0	0	0	1	17	
N	grave 902	949	cremation grave fill	121	associated with cremated remains. Good cond., fragmented, c.90% analysed	1993 ±34 SUERC-75075 (cremated bone) & 1920 ±34 SUERC-75074 (charred hazel twigwood)	90-70 cal BC (1.4%) 60 cal BC-80 cal AD AD & 1-170 cal AD (94.0%) 190-210 cal AD (1.4%) LIA-ER	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	98	0	0	0	0	0	0	0	100	
N	grave 902	950	cremation grave fill	122	associated with cremated remains. Good cond., c.75% analysed. NB c.40% highly reflective (hot temps)	1983 ±34 SUERC-75073	60 cal BC-90 cal AD (94.9%) / 100-120 cal AD (0.5%) LIA-ERB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	0	3	0	0	0	0	0	100	
N	grave 902	949	cremation grave fill	123	associated with cremated remains. Good cond., c.40% analysed.	see above	LIA-ERB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	6	0	0	0	0	1	100	
N	grave 902	949	cremation grave fill	124	associated with cremated remains. Good cond., fragmented, c.25% analysed	see above	LIA-ERB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	1	0	0	0	0	0	100	
N	grave 902	958	cremation grave fill	134	"under trample layer " of grave base but prob. Base of same basal fill . 20% highly reflective pieces	2042 ±34 SUERC-75090	90- 70 cal BC (1.4%)/ 60 cal BC-80 cal AD	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	97	0	2	0	0	0	0	0	100	

							(94%) LIA-ERB																									
N	969	969	Basal fill of pit 969	145	large assemblage , many thin flaky pieces. Several vitrified pieces	3058 ±36 SUERC-75093 & 2435 ±35 SUERC-75083	conflicting 1420-1220 cal BC MBA & EIA (hazelnut)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	99	0	0	0	0	0	0	0	100	
N	Ditch cut 10012	10018	ditch fill	117	third fill of long central ditch feature. Large assemblage <10% ID. *Quercus* rwd incl cut at 15 and 20 years, mix of fast and slow grown. Queried as pyre dump but incl large roundwood and no bone, so if from pyre only basal part. Dated to...	2023 ±34 SUERC-75092	160-130 cal BC (2.5%) 120 cal BC-60 cal AD (92.9%) LIA	0	0	0	0	0	0	0	6	2	0	0	0	0	0	0	55	37	0	0	0	0	0	0	100	
Total site								5	19	1	1	19	18	2	9	2	9	15	3	9	7	1	972	74	25	7	1	2	6	13	1220	
Total EIA								0	8	0	0	0	10	0	3	0	0	0	0	2	0	0	280	0	0	1	0	0	0	0	304	
Total MIA-LIA/ER								4	7	1	1	12	8	2	0	0	9	14	3	7	7	1	506	37	24	6	0	2	5	13	669	
Species ubiquity overall site 16 contexts								2	4	1	1	5	3	1	2	1	1	2	1	5	1	1	16	3	7	2	1	1	2	4		
Species ubiquity by phase:																																
Early Iron Age 4 contexts								0	2	0	0	0	1	0	1	0	0	0	0	2	0	0	4	0	0	1	0	0	0	0		
Mid-Late Iron Age 3 contexts								1	1	0	0	2	0	0	1	0	0	1	0	0	0	0	3	1	1	0	0	0	0	0		
LIA-Early Roman 6 contexts								1	2	1	1	3	2	1	0	0	1	1	1	3	1	1	8	2	6	1	1	1	1	4		

Table 6 Pamber Forest A.2017.05

Enclosure	Feature	context	sample	sample type	Context desc	comments,	14C dates	Phase/ period	*Acer campestre*	*Alnus glutinosa*	*Alnus/ Corylus*	*Betula pendula/ pubescens*	*Betula sp. twigwood*	*Cornus sanguinea/ felix-mas*	*Corylus avellana*	*Corylus avellana juvenile*	*twigwood cf. Corylus avellana*	*Fraxinus excelsior*	*Ilex aquifolium*	*Maloideae*	*Maloideae twigwood*	*Pinus sp.*	*Prunus sp.*	*Prunus spinosa*	*Quercus sp.*	*Quercus roundwood*	*Quercus twigwood*	*Salix/ Populus sp.*	*Salix/ populus twigwood*	Unidentifiable	Unidentifiable twigwood	other
1	Pit/ scoop 1003	1004	101	bulk	charcoal rich fill of "natural feature" under bank	large well pres assemblage (c30% frags used for ID)	5136 ±28 BP SUERC-77648 *Quercus* sapwood dated	4035-3805 cal BC Early Neolithic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
1	layer 1009	1009	100	bulk	charcoal lens immediately under monument bank	well pres larger pieces.but small assemblage (75% ID), Fe dep	2249 ±30 BPSUERC-77649 *Corylus* roundwood dated	395-205 cal BC Middle Iron Age	0	2	0	0	0	0	0	0	0	0	1	4	0	0	0	0	72	0	0	7	0	0	0	
1	Ditch 1012	1013	105	bulk	primary ditch fill	v sparse, rooty. Dated frag entered ditch, presumably from 1004 in early stabilisation of sides	5098 ±30 BP SUERC-77650 *Quercus* sp. NB mature, age offset	3970-3800 cal BC Early Neolithic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	
2	ditch 2003	2005	208	bulk	late secondary ditch fill (nothing dateable in primary or earlier secondary)	good charcoal but a few unid due to vitrification. Given the dates, this is clearly a mixed age assemblage	1523 ±30 BP SUERC-77652 Ilex dated 9518 ±30 BP SUERC-77651 *Pinus* dated	425-605 cal AD Early Saxon/ Earliest Medieval/ 9125-8745 cal BC Early Mesolithic	0	0	1	0	0	0	0	0	0	0	8	0	0	8	1	0	24	0	0	0	0	0	13	
2	Tree throw 2012	2013	206	bulk	remnant soil under bank	moderate, much Fe dep, rather rooty	na	?MBA-MIA	1	1	0	0	0	1	0	2	1	4	0	2	0	0	0	0	30	0	1	0	1	4	2	
2	tree throw 2014	2015	213	bulk	treethrow with prehist flints. Strat under bank	small but well pres and some frags >10mm, likely in situ but is also modern veg, detritus	977 ±30 BP SUERC-77661 2yr 9mm *Salix/ populus* branching twig dated	995-1155 cal AD Early Medieval	0	0	0	1	0	0	0	0	0	0	0	4	1	0	0	0	60	0	0	3	0	0	0	2 large charred partial spine/ thorns eg hawthron/ blackthorn
2	2205	2204	202	bulk	layer (Charcoal deposit queried as scattered cremation but no bone in bulk)	queried as a crem white friable flecks in excavation but no bone obvious in sample. Rooty. Modern hazelnut (not well sealed?)	2178 ±30 BP SUERC-77657 juvenile *Quercus* dated	365-165 cal BC Middle Iron Age	0	1	0	0	0	0	0	2	1	0	0	0	0	0	0	0	11	4	0	0	0	1	0	hazel nut shell (modern)
2	pit 2211	2212	219	bulk	first secondary fill of pit in 2.3	rooty but well pres large charcoal, heavy Fe dep. (2 oak rwd are 5 yr)	2221 ±30 BP SUERC-77653 *Quercus* rwd dated	380-200 cal BC Middle Iron Age	5	3	0	0	0	0	8	0	0	1	1	0	0	0	0	0	56	4	0	2	0	3	0	
3	Ditch 3003	3009	307	bulk	secondary ditch fill	small fragmented assemblage, Fe encrusted	2264 ±30 BP SUERC-77658 juvenile *Quercus* dated	400-205 cal BC Middle Iron Age	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	1	0	0	3	0	
3	gully 3013	3014	309	bulk	single fill of gully	NB Residue analysed only, flot charcoal needed	2250 ±30 BP SUERC-77662 *Betula* dated	395-205 cal BC Middle Iron Age	0	0	0	12	0	0	1	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	1	
3	monument bank 3017	3017	310	bulk	basal bank deposit	Large charcoal frags. Modern roots and leaves in sample. *Quercus* and *Corylus* rwd 4-5 years	2259 ±30 BPSUERC-77659 4 yr juvenile *Quercus* dated	400-205 cal BC Middle Iron Age	3	4	0	17	0	0	10	1	0	6	2	3	0	0	0	7	33	2	0	0	0	4	0	

3	pit 3020	3021	311	bulk	fill of RB "charcoal pit"	100 frags=c.15% frags, scan shows rest dom by *Quercus* to. Occ fissured pieces (burnt damp?), most large and well pres. Variable ring widths. Where whole radius visible 15-20 years, rest unknown but >10 years	na	Mid-Late RB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	1	0	0	0	0	
3	Pit 3020	3022	328	bulk	fill of RB "charcoal pit"	leaf litter but clean plentiful charcoal, large pieces. 100 frags=c. 15%. 1 17-20 yrs. Macros incl grains of wheat and barley	na	Mid-Late Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	1	0	0	0	0	1 parenchymatous mass
3	pit 3020	3032	320	bulk	basal fill of "charcoal making" pit	large, rich 10% Idd. Large pieces up to 50mm. Many friable, highly reflective but substantial. Scan shows oak dominates rest of sample. Where countable most >10 years, 10 pieces 15-20 years, but some in assemblage may be older, I unid piece warped, part charred, may have been rotten wood.	1812 ±30 BP SUERC-77660 , 5 outer rings *Quercus* dated, may be up to 15 year age offset	125-325 cal AD Mid-Late Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	149	0	0	0	0	1	0	
3	pit 3020	3032	314	bulk	basal fill of RB "charcoal making pit	recorded as wood in field but is charred, large flat piece 85x40 mm, min 30 years, no clear cut marks but poss plank-like	na	RB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
3	3112	3113	333	bulk	Primary fill of flint nodule filled pit by water filled gully	Scrappy charcoal, Fe encrusted, friable, a little weathered/ rounded	3212 ±30 BP SUERC-77667 3 yr *Quercus* twig dated	1600-1415 cal BC Middle Bronze Age	0	0	0	4	0	0	3	0	0	0	0	0	0	0	0	0	72	0	2	0	0	5	1	
3	gully 3154	3115	322	bulk	basal fill, charcoal rich dump in intercutting gully/ pit system	Huge assemblage, rest also heavily dom by *Quercus*. Several fissured, a few vitrified. Fragmentary, most >5 years, probably >10, 1 >20 yrs. Plentiful burnt flint in the sample. Macros: buds only	3395 ±30 BP SUERC-77668 NB up to 200 year age offset Mature *Quercus* dated	1760-1620 cal BC Early-Middle Bronze Age	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	249	0	0	0	0	0	0	
3	gully 3166	3129	319	bulk	fill of gully/ large pit in centre of trench, earliest in intercutting pit sequence	v large well pres assemblage, rest also dom by *Quercus*. Some narrow rings, others v wide. Several >15 years, 15-20mm d. Large rwd-mature wood assemblage. Fe external only	3255 ±30 BP SUERC-77669 Outer rings of large *Quercus* rwd dated	1615-1450 cal BC Middle Bronze Age	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0	0	0	
3	pit 3030	3131	317	bulk	single fill of pit (cuts or is secondary fill of 3027)	scrappy, modern leaf litter but moderate assemblage. Corylus rwd, *Prunus spinosa* (8mm d) rwd and Quercus rwd all 5 yrs. Macros incl hazelnut shell, barley grain	2176 ±30 BP SUERC-77670 *Corylus avellana* 5 yr twigwood dated	365-120 cal BC Middle Iron Age	0	0	0	21	1	0	1	1	0	0	0	0	0	0	0	3	55	1	0	0	0	5	0	
3	pit/ posthole 3154	3155	323	bulk	basal posthole/ small pit fill	Fe encrusted ext and int. Several >20mm d/ 25 yrs. V wide rings and less so, mature assemblage	1861± 30 SUERC-77671 *Quercus* sp. roundwood outer rings dated	80-230 cal AD Early-Mid Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	0	0	0	0	1 *	twig with spine and rides length ways

3	Pit 3162	3163	330	bulk	Primary fill of gully/ pit in centre of trench, cuts / overlies gully 3166	Mature oak >20 yrs on pieces large enough to observe, little curvature. Some frags >50mm l though moderate no. frags	na	MBA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
3	Treethrow 3173	3172	335	bulk	secondary fill of treethrow or pit	small but clean fresh assemblage, large pieces, Fe encrusted	na	?MBA-MIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	
3	Pit 3020	3023	321 A	bulk	second fill of RB "charcoal pit"	large assemblage, 100 frags=c. 10%, large frags. Several fissured (burnt damp?). Scan shows rest dom by Quercus. 2 frags minimum 20 yrs, 1 15 yrs 22mm, 1 20 yrs 30mm d.	1804 ±30 BP SUERC-77663 13 yr *Quercus* rwd dated to	125-325 cal AD Mid-Late Roman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	2	0	0	0	1	0	
3	Tree-throw 3027	3031	329	bulk	Final fill of treethrow underlying bank	Fe encrusted, small and fragmentary assemblage	na	?MBA-MIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	0	0	0	
Total									9	11	1	55	1	1	23	6	2	11	12	14	1	8	1	10	1769	13	6	12	1	27	17	2011
Total Bronze Age									1	1	0	4	0	1	3	2	1	4	0	3	0	0	0	0	740	0	3	0	1	9	3	776
Total Middle Iron Age									8	10	0	50	1	0	20	4	1	7	4	7	0	0	0	10	297	11	1	9	0	16	1	457
Total Roman									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	544	2	2	0	0	2	0	550
Spp ubiquity total site (24 contexts)									3	5	1	5	1	1	5	4	2	3	4	5	1	1	1	2	24	5	5	3	1	9	5	
Spp Ubiquity by phase (incl juvenile tho noted separately)																																
Mesolithic 1 context									0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Neolithic 2 contexts									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
Bronze Age (-pre MIA) 7 contexts									1	1	0	0	0	1	2	1	1	1	0	2	0	0	0	0	7	0	2	0	1	2	2	
Middle Iron Age 7 contexts									3	3	0	3	1	0	4	3	0	2	3	2	0	0	0	2	7	4	0	2	0	4	1	
Roman 6 contexts									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	2	0	0	2	0	
Early Medieval 2 contexts (1 incl Mesolithic material, assumed all but pine are Early Med)									0	0	1	1	0	0	0	0	0	0	1	1	1	1	1	0	2	0	0	1	0	0	1	