OXFORD ARCHAEOLOGICAL RESOURCE ASSESSMENT 2011

PALAEOLITHIC TO MESOLITHIC

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Abbreviations

BP radiocarbon years Before Present ('present' is defined as 1950)

LAA Oxford Local Authority Area

MIS Marine Isotope Stage

OHER Oxford Historic Environment Record
UAD Oxford Urban Archaeological Database

Introduction

This assessment report forms part of the resource assessment stage of the Oxford Archaeological Plan for the district. The archaeological assessment aims to inform resource management in planning and development control as well as aid academic investigation and research. Throughout these reports the 'city' will refer to the area covered by the UAD while 'LAA' (Local Authority Area) will be used for sites beyond the historic centre.

At a regional level available syntheses have been provided by the Solent Thames Research Frameworks for the Lower to Middle Palaeolithic (Wenban-Smith *et al*. 2010) and the Late Upper Palaeolithic to the Mesolithic (Hey *et al*, 2010). At a county level, the most recent synthesis is the Solent Thames Research Frameworks covering the Lower to Middle Palaeolithic (Hardaker 2007) and the Late Upper Palaeolithic to the Mesolithic (Hey and Roberts 2008). A comprehensive overview of the Palaeolithic and Mesolithic of the Upper Thames has been published in the Thames Through Time Series (White, Schreve and Morrigi 2011). Previous notable papers have also been produced in for the Tom Hassall Lectures (Roe 1994; Barclay 1996) and in 1986 (Roe; Case). In addition primary resources from the Oxfordshire Historic Environment Record (OHER) and the Oxford Urban Archaeological Database (UAD) have been consulted. Further publications by Roe (1968; 1981) and Wymer (1968; 1999; Wymer and Bonsall 1977) have also been consulted.

The nature of the evidence base

Unlike later periods the archaeological record for the Palaeolithic and Mesolithic periods is largely comprised of lithic artefacts and related palaeo-environmental evidence. There are few, if any, structural remains and artefacts made of organic materials are extremely rare. The evidence for the Lower and Middle Palaeolithic periods has largely been recovered from gravel extraction sites and the distribution is therefore biased towards the gravel terraces. The number of Upper Palaeolithic and Mesolithic artefacts recorded from the district is likely to be under-represented at present as many lithic artefacts identified from museum archives or 19th century recorded observation are recorded only as being 'prehistoric' and the accompanying information is often limited.

Key themes

It is difficult based on the current evidence to identify any distinct phases of activity in the Palaeolithic and Mesolithic periods in the Oxford district however the following key points can be highlighted:

- The interglacial Wolvercote Channel Deposit (probably MIS 9) has produced what appears to be an *in situ*, or little disturbed, tool manufacturing site. This is currently the oldest and most significant Lower Palaeolithic assemblage known from the district.
- Most Lower Palaeolithic material from the district consists of stray finds of rolled artefacts from the Summertown-Radley Gravel Formation (mainly MIS 7-6). The only major assemblage of material comes from the Cornish's Pit site in Iffley
- No British Mousterian material has yet been found in the district, and the reported possible Levallois flake from Davenant Road is probably of Lower Palaeolithic age (Wymer 1968).
- Until recently no Upper Palaeolithic artefacts were known from the district, however a few objects of this age were identified in museum collections

during the Oxfordshire Solent-Thames Research Assessment and illustrate the potential for material of this age being found in the future (Hey and Roberts 2008).

- The Mesolithic is poorly represented in the district at present although this is likely to be due to lack of recording rather than an absence of human activity of this age. There are some stray finds from along the alluvial floodplain around the city and two larger assemblages from Iffley Fields on the gravel/mudstone interface and Littlemore Hospital on the Corallian Ridge. There are also small assemblages from higher ground around the city at Boars Hill and Shotover.

Environmental evidence from the Palaeolithic and Mesolithic has been recorded at several sites in and around the district from archaeological investigations and geological surveys (See *General Resource Assessment* for an overview):

Key sites

- Radcliffe Infirmary Geo-archaeological Investigation (Ruddy 2009)
- Minchery Farm palaeo-environmental analysis (Parker 1996)
- Sidlings Copse palaeo-environmental analysis (Day 1991)

The Palaeolithic in Oxford

The dating framework

The Palaeolithic in Britain spans a period from at least 700,000 years ago when the earliest documented evidence for human activity in the country is recorded until around 12,000 calibrated years BP at the end of the Pleistocene epoch.

The Pleistocene is the most recent geological epoch and occurred from about 2.6 million years ago until the end of the last glacial period about 12,000 calibrated years BP. It is known as a period of global climatic instability during which there were a succession of major warm and cold episodes involving glacial ice advances and retreats. Although geological deposits relating to some of these episodes are found on land, most knowledge of the complexity of climatic change during the period comes from the analysis of marine isotopes in deep sea cores. Therefore, in referring to Pleistocene deposits in Britain, including those associated with Palaeolithic archaeological remains, it has become common to refer to global Marine Isotope Stage (MIS) as well as local names (Bridgeland 1994). Table 1 summarises the Pleistocene deposits of the Oxford district.

<table>
<tr><th>Period ka (thousand years ago)</th><th>MIS</th><th>Glacial stage</th><th>Oxford Gravels</th><th>Industry</th></tr>
<tr><td>12 ka - present</td><td>1</td><td>Flandrian (Holocene)</td><td>Floodplain</td><td>Mesolithic to modern</td></tr>
<tr><td>30-12 ka</td><td>2</td><td rowspan="4">Devensian (glacial)</td><td rowspan="3">Northmoor Gravel (floodplain gravels)</td><td>Late Upper Palaeolithic</td></tr>
<tr><td>60-30 ka</td><td>3</td><td>Early Upper Palaeolithic
Late Middle Palaeolithic (British Mousterian)</td></tr>
<tr><td rowspan="3">110-60 ka</td><td>4</td><td rowspan="3"></td></tr>
<tr><td>5a-c</td><td></td></tr>
<tr><td>5d</td><td rowspan="5">Summertown-Radley Gravel Formation
Eynsham Gravel (MIS 5e)
Stanton Harcourt Gravel (MIS 6)
Stanton Harcourt Channel Deposit (MIS 7)</td></tr>
<tr><td>130-110 ka</td><td>5e</td><td>Ipswichian Interglacial</td><td></td></tr>
<tr><td>190-130 ka</td><td>6</td><td></td><td></td></tr>
<tr><td>245-190 ka</td><td>7</td><td>Aveley Interglacial</td><td rowspan="4">Lower/Middle Palaeolithic (Handaxe and Levallois industries)</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">8</td><td rowspan="2"></td></tr>
<tr><td></td></tr>
<tr><td>340-300 ka</td><td>9</td><td>Purfleet interglacial</td><td rowspan="3">Wolvercote Gravel
Wolvercote Channel Deposit (MIS 9)</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">10</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td></td></tr>
<tr><td>425-380 ka</td><td>11</td><td>Hoxnian Interglacial</td><td rowspan="2">Hanborough Gravel</td><td>Lower Palaeolithic: handaxe and flake tool industries)</td></tr>
<tr><td></td><td>12</td><td>Anglian (Glacial)</td><td></td><td></td></tr>
<tr><td>c. 700-480 ka</td><td>13-17</td><td>‘Cromerian Complex’</td><td>Northern Drift group</td><td>Lower Palaeolithic: handaxe and flake tool industries)</td></tr>
</table>

Table 1: Pleistocene chronology of the Oxford district

Chronology

The Palaeolithic is traditionally considered to consist of three main periods: a Lower Middle and Upper Palaeolithic. Currently the earliest evidence of occupation in Britain during the Lower Palaeolithic dates to at least 700,000 years ago in East Anglia (Barton 2009, 19). No material of pre-Anglian age (MIS 12 and older) is currently recorded from the Oxford City district. Evidence from Suffolk indicates that the earliest human inhabitants of Britain migrated during warm climatic conditions with evidence of average summer temperatures of 18-23°C (Barton 2009 19). The majority of Lower/Middle Palaeolithic evidence for Britain dates to MIS 11-6 and most of the finds from the Oxford district date to this period. The British Late Middle Palaeolithic British Mousterian industry occurs during the earlier part of MIS 3 from about 60,000 years ago. As yet there does not seem to be evidence for this industry in the district (Hardaker 2007). The Upper Palaeolithic occurs during the later part of MIS 3 from about 40,000 years ago until the end of the period about 12,000 calibrated years BP. In Britain this period is traditionally divided into an Early Upper Palaeolithic and Late Upper Palaeolithic, separated by the extreme cold phase of the Last Glacial Maximum (LGM) about 21,000-19,000 years ago when humans appear to have been absent from the country. Late Upper Palaeolithic recolonisation of Britain following the LGM started about 16-15,000 calibrated years BP (Barton 2009).

The Lower Palaeolithic context

The lack of finds and features for the Lower-Middle Palaeolithic in the Upper Thames Valley in comparison to the Lower Thames Valley is notable and has been interpreted as being a result of Oxfordshire being on the upper limit of human habitation at this time as well as some distance from good sources of flints (Roe 1981; Roe 1994: 2). There are three main areas of Lower/Middle Palaeolithic artefact finds distribution in the county: 1) in the south east around Henley and Dorchester where the ancient gravel terraces have been particularly prolific 2) the Chiltern slopes at Benson and fan gravels at Wallingford and 3) the Upper Thames Valley north of the Goring Gap (Roe 1994: 5). Although the majority of Lower Palaeolithic artefacts in the Upper Thames Valley are recorded from gravel extraction sites there are also a number of single finds particularly from the Oxford area in correlation with the Summertown-Radley Gravel Formation. The majority of the artefacts discovered in Oxford are located on or immediately near to the terraces and are 'rolled' artefacts likely deposited as a result of fluvial action (Wymer 1968). Truly in-situ artefacts from the Lower/Middle Palaeolithic period in Oxfordshire are very rare (Hardaker 2007). However the potential of the Wolvercote Gravel (Wolvercote Channel Deposit - see below) and the Summertown-Radley Gravel Formation (e.g. at Stanton Harcourt and Berinsfield; Hardaker 2007) to preserve significant remains has been demonstrated.

Key characteristics of the Oxford landscape in the Lower-Middle Palaeolithic

During the Pleistocene each new glacial phase brought new superficial deposits and carved new pathways for the rivers and tributaries. The course of the river Thames itself underwent many changes primarily as a result of these glacial shifts, and it linked with continental river systems during cooler periods with low sea levels when England was connected to mainland Europe. Recent research has focused on attempting to reconstruct the ancient landscape of the Thames Valley through defining its relative elevations and the precise course of the river (Maddy *et al*. 1991; Bridgeland 1994; Robinson 2003).

The potential for geo-archaeological sampling

Geo-archaeological sampling can provide a stratigraphic framework for archaeological deposits and interpretations of site formation processes. In the case of development sites they can also assess the potential impact of development on

Palaeolithic deposits and ancient gravel sequences. Geological evidence can help recreate chronological sequences for the deposition of sediments and locate peat deposits and palaeo-channels. Environmental sampling for the purpose of collecting flora and faunal evidence can be useful in understanding past climates at a regional level and sampling from preserved peats can be especially profitable.

Oxford palaeo-channels and geo-archaeological examination of gravel deposits

Palaeo-channels have been identified in a number of investigations across the gravel terrace e.g. Worcester Place (Parson 2006) however no detailed collation of these observances has been undertaken. Usually these channels remain undated and are not subject to detailed geo-archaeological analysis because such work is often difficult to justify during small scale developer funded projects.

To date two significant investigations of palaeo-channel and gravel deposits have taken place in the district,: the examinations of the Wolvercote Channel Deposit exposed at the Wolvercote Brick Pit from the late 19th century to the 1930's (summarised in Wymer 1968) and, more recently, geo-archaeological investigation at the Radcliffe Infirmary (Radcliffe Observatory Quarter) site, where extensive basements are planned as part of a centrepiece development for departments of the University of Oxford. There have also been limited geological descriptions of the Cornish's Pit site in Iffley where handaxes were found (Sandford, 1924), and of four sites in the city where mammoth remains have been found (see below).

The Wolvercote Channel

There has been considerable debate over the geo-archaeological sequence exposed at the Wolvercote Channel Deposit in North Oxford. The artefact assemblage is recorded from sediments at the base of the interglacial channel in association with palaeontological and palaeobotanical remains. The channel was previously attributed to MIS 7 or 5e (summarised in Roe 1994: 13), but is now accepted as being most likely of MIS 9 age (Bridgeland 1994). The assemblage from the channel is probably in near primary context and is recognised as being of national importance. However, the channel deposits have not been exposed since the 1930s, despite several attempts in the 1980s to locate them, and as a result the context and dating remain uncertain. The location and analysis of the Wolvercote Channel Deposit should be a research priority for the district.

The Wolvercote Channel in context by Francis Wenban-Smith

The Upper Thames Valley contains various outcrops of Pleistocene terrace deposits, dating between the end of the last ice age *c.* 10,000 BP (years Before Present) and early in the Pleistocene, perhaps as long as 1,000,000 BP. The Wolvercote Channel site is located on part of Terrace 3, the so-called "Wolvercote Terrace" (British Geological Survey 1982). The sequence of deposits in this terrace was well-recorded at the Wolvercote Brick Pit in the late 19th and early 20th century (Bell 1904; Sandford 1924). Here, the sequence was seen to comprise a widespread gravel deposit *c.* 2-4 m thick — the "Wolvercote Gravel" — which was overlain, and cut through, by a channel filled with fine clayey/silty brickearth deposits: the "Wolvercote Channel". Environmental remains within the Wolvercote Channel fill seem to suggest that its lower parts formed during temperate, probably interglacial conditions; but that its upper parts formed during climatic deterioration at the end of an interglacial. The date of the deposit sequence in the Wolvercote Terrace is uncertain, but it is almost certainly older than deposits in the lower Summertown-Radley terrace, which includes deposits dating to interglacials at *c.* 125,000 BP (marine isotope stage [MIS] 5e) and 200,000 BP (MIS 7), and younger than deposits in the higher Hanborough terrace, which includes interglacial deposits dating to *c.* 400,000 BP (MIS 11); therefore the general view (Bridgland 1994) is held that the Wolvercote Terrace

contains deposits dating to the period *c.* 350,000-250,000 BP, covering MIS 10-8.

The Wolvercote Terrace produced an important collection of Palaeolithic artefacts from the lower part of the Wolvercote Channel deposits, recovered from the Wolvercote Brick Pit when it was open in the late 19th and early 20th century, comprising numerous pointed handaxes with a distinctive plano-convex cross-section, as well as waste debitage (Roe 1981: 118-128). The mint condition of many of them suggests they were recovered from an undisturbed occupation horizon associated with the interglacial conditions at the base of the Wolvercote Channel sequence. It is also notable that a high proportion of the handaxes are made of flint, a scarce raw material in the vicinity, and thus indicating targeted collection of the most suitable raw material, possibly imported from a substantial distance. There are also reports of occasional finds and faunal remains from higher up the sequence, in deposits associated with cooler conditions. The Wolvercote Terrace thus contains, in its Wolvercote Channel facies, rare evidence of undisturbed Palaeolithic occupation in conjunction with mammalian remains and other palaeo-environmental evidence that can make a significant contribution to current research priorities, both regionally in the Thames basin and the Solent-Thames area (Wenban-Smith *et al.* 2010), and nationally in the UK (English Heritage 2008).

Subsequent to completion of work in the Wolvercote Brick pit early in the 20th century, a number of attempts have been made to relocate and reinvestigate the Wolvercote Channel deposits (Briggs *et al.* 1985; Bridgland & Harding 1986). These have, however, been generally unsuccessful. Bridgland and Harding cleared a series of sections along the railway cutting that runs north-south immediately to the east of the site, but failed to find any sign that the Wolvercote Channel deposits extended in this direction beyond the footprint of the old brick pit. They did, however, find remnant pockets of the Wolvercote Gravel lying in the Oxford Clay bedrock, corresponding with reports (Pocock 1908: 89) of gravel in "holes in the Oxford Clay" on the western side of the old Wolvercote Brick Pit, towards the railway. It is however uncertain whether the Wolvercote Channel was genuinely a channel, and thus might be expected to extend as a continuing feature beyond the brick pit, or whether the "channel" deposits filled intermittent pockets overlying, and in places cutting through, the Wolvercote Gravel, and thus could be present almost anywhere above mapped outcrops of Terrace 3.

The Radcliffe Infirmary site

A recent geo-archaeological assessment carried out by Museum of London Archaeology on samples taken from the Radcliffe Infirmary site was intended to examine the potential there for Lower/Middle Palaeolithic evidence within the Summertown-Radley Gravel Formation (Ruddy 2009: 1). Three phases of braided river development were recorded, indicated by coarse grained gravel sediments, interspersed with lower energy channel flow, or episodes of standing water (as indicated by fine grained sediments). The majority of the gravel beds were initially thought to correlate with the Stanton Harcourt Gravel (MIS 6). However, three OSL dates obtained from the fine grained material led to a reappraisal of the chronology. Two OSL samples were taken from the fine grained sediment at a height of 60.83m OD and produced a date of 86.10+/- 9.19 Ka BP, and 76.12 +/- 26.22 Ka BP. Another OSL date was taken at an elevation of 61m OD and produced a date of 95.66 +/- 13.5 Ka BP. These dates would suggest that a longer chronology of lithostratigraphy survives on the site than previously believed. The OSL dates fall within the Early Devensian period leading to the association of the upper gravel units with the Northmoor Gravel member. The lower units may therefore form part of not only the Stanton Harcourt Gravel (MIS 6) but also the Eynsham Gravel (MIS 5e) (Braybrooke 2010: 74).

Cornish's Pit, Iffley

Handaxes were found at Cornish's gravel pit in Iffley at the end of the 19th and at start of the 20th centuries. Geological recording was also done in a nearby pit in the 1920s. The artefacts were reported as coming from the base of the Summertown-Radley Gravel Formation, close to the surface of the underlying Oxford Clay. Pleistocene faunal remains, including woolly rhino, mammoth and horse were reported from a similar stratigraphic position. The site information has been reviewed and summarised by Wymer (1968) and Nicholas (2010).

Subsequent re-evaluation of the collection, now held by the Pitt Rivers Museum, has established that a larger number of flints were collected than previously published. In 2000 the Iffley tools were re-examined by Lee (2001: 104-112). Lee analysed 145 tools from Iffley and agreed with previous assertions that the assemblage was predominantly Middle Acheulian in date. His analysis summarised that the Iffley tools tended to be shorter than nearby comparable assemblages, such as those from the Wolvercote Channel assemblage, with the average length of a handaxe being 8.52 cm. Several different tool categories were recorded by Lee including:

- Flake tools and debitage [scrapers etc].
- Chopping tools, only one quartzite tool is recorded from Iffley (Wolvercote similarly had a lack of chopping tools)
- Handaxes, produced from cores [flakes are removed from the core, which forms the finished artefact].
- A further number of miscellaneous core tools are recorded that do not fall into any particular category.

With the computerization of the Pitt Rivers Museum Accession books (completed by 2002, pers. comm. Alison Petch 2009), and the ongoing cataloguing it has become clear that the full extent of the Iffley tools was not realised at the time of Lee's work, and that a further 40 objects await analysis (Nicholas, undated, see web page link below).

Ashmolean Museum Forecourt, Beaumont Street

A 1994 watching brief during the excavation of the Ashmolean forecourt recovered a large mammoth tusk from undisturbed gravel of the Summertown-Radley Formation at 59.40 OD (Andrews and Mepham 1997). The tusk was found lying flat in a sandy lens within the finely–bedded gravel, but no geo-archaeological work on the gravels seems to have taken place. An age of about 40,000 years ago (i.e. MIS 3) was reported for the mammoth, although the grounds for the age estimate are unclear. In view of the complexity of the gravels at the Radcliffe Infirmary site, not far to the north, a reassessment of the context and age of this find would be useful. The hand axes are rolled and likely not to be in primary context.

Bodleian Extension, Broad Street

Several molars of mammoth were recorded from the Summertown-Radley gravels at the site of the Bodleian Extension in 1938 (Sandford 1938: 5). The gravels were reported as being deeper at this site than then known elsewhere in the city.

Magdalen Grove

In 1922 R T Gunther recorded an in-situ Mammoth tusk exposed by gravel-diggers in Magdalen Grove within the walled grounds of Magdalen College (Gunther 1924). Subsequent investigation recorded 'a charnel-house of elephant-remains'. The workmen reported that below 'the shell-bed' a bear bone was recovered. A drawn

section of the exposure is provided by Sandford (1924)

The English Nature Site of Special Scientific Interest (SSSI) description notes that fossiliferous sediments underlying the Summertown-Radley Terrace of the Upper Thames were exposed by shallow workings in the north-western corner of Magdalen Grove. These form part of an important and controversial stratigraphy recognised in the deposits of this terrace, which has been claimed to provide evidence for the existence of a formerly unrecognised inter-glacial stage in the British Late Middle Pleistocene. The sediments at Magdalen Grove are described as richly fossiliferous, yielding mammal bones, mollusca and pollen. Although probably representing the tributary Cherwell, they have been correlated with deposits at Stanton Harcourt, in the valley of the main river. The fossil assemblage from the Eynsham Gravel indicates that it was deposited during the penultimate interglacial (correlated with Oxygen Isotope Stage 7 of the 'deep sea' record). This interglacial is a recently identified episode midway between the Hoxnian and Ipswichian Interglacials of the traditional Pleistocene record. (Natural England SSSI Statement, n.d.)

Evidence for *in situ* Palaeolithic sites

There are currently no demonstrably in-situ sites recorded in the archaeological record for the Oxford City district. However the unrolled condition of the Wolvercote Channel Deposit assemblage indicates that it was probably in a near primary context.

The artefactual evidence

Lower – Middle Palaeolithic evidence

Evidence for the Lower and Middle Palaeolithic periods in England is rare due to the geological context in which they are found and the great time depth involved. The evidence for these periods consists almost entirely of lithic artefacts and associated palaeoenvironmental material. Lower/Middle Palaeolithic artefacts are grouped typological into three modes: Mode 1 simple flake-pebble core assemblages ('Clactonian'); Mode 2 assemblages with hand axes ('Acheulian'); and Mode 3 prepared core and flake technologies ('Levallois') (Barton 2009).. In the Oxford district Palaeolithic artefacts have been found primarily concentrated in the Pleistocene deposits of the Upper Thames valley gravel terraces. There is currently no Mode 3 material identified in the Oxford district. Upper Palaeolithic typologies are referred to as Mode 4, and there is very little evidence for this period in Oxford at present.

The most significant Lower Palaeolithic site in Oxford is the Wolvercote Channel where an assemblage of over 150 flint artefacts was recorded, Cornish's Pit in Iffley similarly produced a large number of Palaeolithic artefacts, however both sites were early 20th century observations of extractive pits and were not subject to detailed recording.

The Wolvercote Channel (OHER 1379)

The Lower Palaeolithic archaeology of the Wolvercote Channel Deposit is a research priority of national importance. The Channel was exposed in the Wolvercote Brick Pit, which was in operation from the late 19th century until the 1930s. Artefacts were collected there by a number of people, and geological observations were recorded by Bell in 1904 and Sandford in the 1920s (summarised in Wymer 1968). A majority of the material is currently held by the Pitt Rivers Museum. The assemblage is distinctive as it contains several hand axes of 'plano-convex' form, and also some material made of quartzite cobbles rather than flint. The Wolvercote material has been assessed several times in recent decades, but there is still uncertainly about the dating and geological context of the material as the channel has not been identified since the 1930s. Other Lower Palaeolithic finds from the North Oxford/Wolvercote area have sometimes been included in discussions of the assemblage from the channel deposit, leading to some confusion in the literature (see Tyledesly 1986 for details).

Cornish's Pit (OHER 8077)

Until very recently the assemblage from Cornish's Pit, Iffley, was assumed to consist of about 28 rolled hand axes. Recent work on the artefacts and associated archive at the Pitt Rivers Museum has identified the original site location, shown that the assemblage consists of 185 artefacts and confirmed that it was associated with Pleistocene fauna (Nicholas 2010). This site should now be considered of high research interest.

Other recent finds of Palaeolithic material in the city includes the following. Excavations within the northeast chapel of Christ Church Cathedral in 1963 (UAD 200) recorded a single flint flake of possible Clactonian type (Sturdy and Case 1963: 91). Two Lower Palaeolithic hand axes were recorded as being found at St Ebbe's church in 1971 (UAD 243), one from under the foundations of the Saxon church and the other from the gravel in the Rectory garden (anon 1972: 239).

A number of Palaeolithic finds are included in the Oxford Historic Environment Record (OHER) and the Oxford Urban Archaeological Database (UAD). A significant proportion of the finds are 19th and early 20th century records with limited

supplementary evidence, and much of the information in the records comes from two major gazetteers Publisher in the 1960s (Wymer 1968; Roe 1968). The comparable gazetteer for the Upper Palaeolithic period does not identify any material from the Oxford City district (Bonsall 1977). However, some specialist re-examination of stone tool collections from Oxfordshire held by the Ashmolean Museum resulted in the identification of two artefacts of this age and illustrates the potential that further records exist (Hey and Roberts, 2008). New techniques in identifying assemblages from non-flint materials such as quartzite have also been developed since the first catalogues were compiled (MacRae in Hey and Roberts 2008). This also has the potential to identify significant amounts of new data within the archaeological record. Figure 1 illustrates the distribution of known Palaeolithic artefacts across the district.

Upper Palaeolithic evidence

Early Upper Palaeolithic artefactual evidence is rare at a national level and there are few finds from Oxfordshire; a single bifacial leaf point was found in the floodplain gravels at Sutton Courtenay in the 1990s and a unifacial blade point was dredged up from the backwater at North Hinksey in 1904 (Hey and Roberts 2010: 2). There is no further evidence for the Early Upper Palaeolithic in Oxfordshire.

Three main industrial traditions are recognised for the Late Upper Palaeolithic in Britain; and these are represented by Creswellian (c.13,000-12,000 BP), Final Palaeolithic (c.12,000-10,700 BP) and Long Blade or Epipalaeolithic (c. 10,300-9800 BP) industries. Few artefacts from of this age recorded from Oxfordshire, and there is only one excavated site (the long blade site at Gatehampton Farm, Goring) (Hey and Roberts 2008). At present there are few artefacts of this age known from the Oxford City district. These consist of two blade end-scrapers (New Hinksey Waterworks and Bardwell Road) and a lame mâchuré (Headngton Allotments). However, these pieces were identified in museum collections during the Solent-Thames research assessment and there is a possibility that more material has been found but remains unidentified.

The Mesolithic in Oxford

The Mesolithic dates from the start of the Holocene approximately 9,600 calibrated years BC (10,000 radiocarbon years BP) to the time of the beginning of the Neolithic period about 4000 calibrated years BC (5200 radiocarbon years BP).

In England the period is traditionally divided into an Early (about 9600-6000 calibrated years BC) and Later (about 6000-4000 calibrated years BC) facies mainly based on established typological and technological criteria for lithic artefacts and well-supported by radiocarbon dating and associated palaeoenvironmental evidence (Barton and Roberts 2004). The people at this time were hunter-gatherers who practiced high logistical mobility within what was an increasingly wooded environment. Mesolithic human activity in inland areas seems to have been focused along rivers valleys, especially during the Later phase (*ibid*.). Although most of the evidence for Mesolithic activity in England consists of stone artefacts, there is a high potential for preservation of organic remains from sites associated with peats, such as at the classic early Mesolithic site at Thatcham in Berkshire (Wymer 1962). Although the population were mobile hunter-gatherers some occupation evidence has been recovered from excavations, including the identification of hearths and activity areas. There are also possible rare examples of structures and storage pits from some sites.

The Mesolithic in Oxfordshire is poorly represented with only two sites having been professionally excavated to date: Fyfield and Tubney (Bradley and Hey 1993) and Nettlebed (Boismier and Mepham 1995). The majority of evidence for the Mesolithic in the region comes from stray finds, museum collections, small residual assemblages noted by commercial archaeological projects, and more substantially from major fieldwalking surveys in the Upper Thames Valley (Holgate 1986 and the Chalk Downs (Ford 1987) which indicate a strong distribution of flints across the river valleys and their slopes.

Of the 54 OHER records for the Palaeolithic to Mesolithic evidence in the district, just eight could be identified as Mesolithic with any certainty and no sites have thus far been excavated.

Evidence for *in situ* activity

Whilst no definite in situ Mesolithic sites have been archaeologically excavated within the Oxford City district to date, residual artefacts have been recorded in several excavations. Figure 2 illustrates the distribution of known Mesolithic artefacts in the district. There seems to be a good potential for Mesolithic activity on ground above the alluvial floodplain.

Key characteristics of the Mesolithic landscape

The Upper Thames Valley had a tundra landscape during the Younger Dryas cold phase before the start of the Holocene. Environmental analysis from sites at Abingdon and Minchery Farm, Oxford has provided evidence for a sparsely wooded landscape populated by only a few species such as beech, willow and poplar (Parker 2000). Birch would have dominated wetter areas along the river and stream corridors (Moore, 2002, 216). This period also saw the last significant glacial meltwater with evidence of deeply incised channels forming a complex system of braided rivers and streams (Robinson and Lambrick 1984). Environmental evidence from sites beyond the district such as Mingies Ditch and Farmoor to the west of Oxford indicate that arctic or sub-arctic conditions prevailed until around the middle of the 10th millennium BC (Morigi, Schreve and White 2011: 142-2; Robinson and Wilson n.d). At Minges Ditch a temperate biological assemblage demonstrating the transition to a warmer climate was dated to 9380 +- 110 BP (HAR-8366; 10,626=_174 cal BP)(Allen and

Robinson 1993). Within the LAA samples taken during archaeological investigations at Minchery Farm (Kassam Football Stadium OHER 16787) cover the period from when the climate was predominately sedges and grasses characteristic of the late glacial tundra, to the present (Parker and Anderson 1996).

As the Mesolithic progressed increased woodland provided a dryer climate and reduced sedimentation (Hey and Roberts 2010). Evidence from peat deposits discovered during archaeological investigations at St Aldates for example indicated shallow, standing water during the later Mesolithic at about 7200-6900 calibrated years BC (8170±130 BP OxA-4354) (Robinson and Lambrick 1984).

Deposits of peat and tufa (formed through the development of waterlogged ground where the clays and limestones meet) can provide environmental evidence for climate change during the Palaeolithic and Mesolithic. In the Upper Thames Valley several ongoing projects carried out by Oxford Brookes University and by the Geological Conservation Review have identified peat and tufa deposits across the region and have provided environmental sequences from around 10,000 BP to the present (Parker and Anderson 1996: Parker and Goudie 1998; Parker 2000; Day 1990; 1991).

Detailed summaries of two sites within or close to Oxford have been published; one outsite the LAA at Sidlings Copse (Day 1990; 1991) covers a period from around ca 9500 yr BP to the present and one inside the LAA at Minchery Farm (Parker and Anderson 1998) from around ca 13,000 yr BP to the present. The Minchery Farm samples indicate the gradual spread of oak, hazel, elm and alder from around ca 10,000 yr BP (*ibid.).* There areas of shallow water would have gradually become reedswamp, then marsh before finally becoming woodland (Robinson 2003).

Environmental evidence from sites such as Mingies Ditch and Farmoor indicate a steady increase in woodland and by the middle of the 6th millennium BC, the region was likely densely covered by a mixture of deciduous woodland trees (Robinson and Wilson n.d). For example an organic deposit from a channel of the Windrush at Minges Ditch produced evidence for dense Alder Woodland dating to 5630-5340 cal BC (HAR-8355: 6540+__80BP) (Morigi, Schreve and White 2011: 180). A distinct decline in woodland is noted in Upper Thames pollen sequences from around ca 5000 yr BP onwards (known as 'The Elm Decline') (Parker 2000; Parker *et al*. 2002). Evidence for The Elm Decline in the region is often followed by evidence for agricultural activity in pollen sequences, however the relationship between possible causes (elm disease, tree clearance for agriculture, climatic change) remain uncertain (Morigi, Schreve and White 2011: 181-2).

Mesolithic artefacts

In has been suggested that Mesolithic sites in Oxford were primarily located on sandy geologies such as the Corallian Ridge to the east and west of the city (Case 1952-3). At Minchery Farm, Littlemore a small quantity of Mesolithic debitage; flakes with cortex, cores and core rejuvenation flakes indicated that knapping took place in the near vicinity (RPS 2001). The recovery of a small amount of late Mesolithic or early Neolithic flintwork at the Manor Ground, London Road, Headington (Hart 2003) and at Oxford Science Park, Littlemore (Moore 2002: 216) is also consistent with the documented spread of Mesolithic activity from initial sites close to the Thames (e.g. Abingdon) to higher ground beyond the immediate environs of the river. Comparable sites at these higher elevations have been identified at Hatford, Longworth and Fawler (Case 1986). Elsewhere on the Corallian ridge at Littlemore Hospital a lithic scatter was discovered comprising of 18 flakes, one axe trimming flake, one crested blade, one end scraper and one microlith (OHER 16602). Further west a collection of seven residual flint flakes of likely Mesolithic date were recovered during an

evaluation at St Clements Street Car Park located close to the River Cherwell (Garner 2011: 32-3).

Another site of note in east Oxford consisted of a scatter of flints found in the early 20th century from the gravel/mudstone interface near Fairacres Road, Iffley (OHER 3652). The collection of flints from this site is currently held by the Pitt-Rivers Museum and comprises 35 flakes, one core and eight microliths (Case 1952: 11). On the Summertown-Radley Formation gravels in the city the 1960s excavations at Logic Lane produced bladelet core and end-scraper of Mesolithic date as well as a Bronze Age arrow head and a small group of undiagnostic flints (Radcliffe 1963: 43).

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Further resources:

Geology

- Geological Conservation Review

Summary descriptions of site evaluation of geological stratification for the county: http://www.jncc.gov.uk/default.aspx?page=2947)

- *British Geological Survey Online Maps:*

http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html

Archaeological Evidence

- Oxford Urban Archaeological Database, Oxford City Council

A database of archaeological records for the historic city centre area. For a map of the area covered by the UAD see visit:
http://www.oxford.gov.uk/PageRender/decP/UrbanArchaeologicalDatabase.htm
To search a version of the database visit:
http://www.heritagegateway.org.uk/gateway/

- Oxfordshire Historic Environment Record, Oxfordshire County Council

A database of archaeological records for the County of Oxfordshire. To search the database visit the Heritage Gateway:
http://www.heritagegateway.org.uk/gateway/
or Oxfordshire Heritage Search:
http://publicapps.oxfordshire.gov.uk/wps/portal/publicapps/applications/heritage

- Oxford History Centre (formerly the County Records Office)

Holds large collection of historic maps and historic documents from the medieval

period to the present.

http://www.oxfordshire.gov.uk/cms/public-site/oxfordshire-history-centre

- *Oxoniensia*

Archaeological and architectural journal for Oxfordshire
http://www.oahs.org.uk/oxof.php

- Archaeology Data Service.

Holds archive of grey literature by participating archaeological units from c2000 onwards. Also holds complete catalogue of several archaeological journals including Medieval Archaeology as well as complete archive of CBA publications:
http://ads.ahds.ac.uk/.

- Portable Antiquities Scheme

Voluntary scheme recording archaeological objects recorded by members of the public including those by metal-detector users
http://www.finds.org.uk/

Museum Archives

- The Ashmolean Museum:

http://www.ashmolean.org/
Also for ceramics online see the Ashmolean Potweb:
http://potweb.ashmolean.org/PotChron7g.html

- The Pitt Rivers Museum:

http://www.prm.ox.ac.uk/
The Collection of Flints from Iffley have been reviewed by Nicholas, M, (undated). See http://england.prm.ox.ac.uk/englishness-Iffley-Bell.html (accesssed July 2011)

- Oxfordshire County Museums:

http://www.oxfordshire.gov.uk/cms/public-site/oxfordshire-museum

Appendix 1: Figures

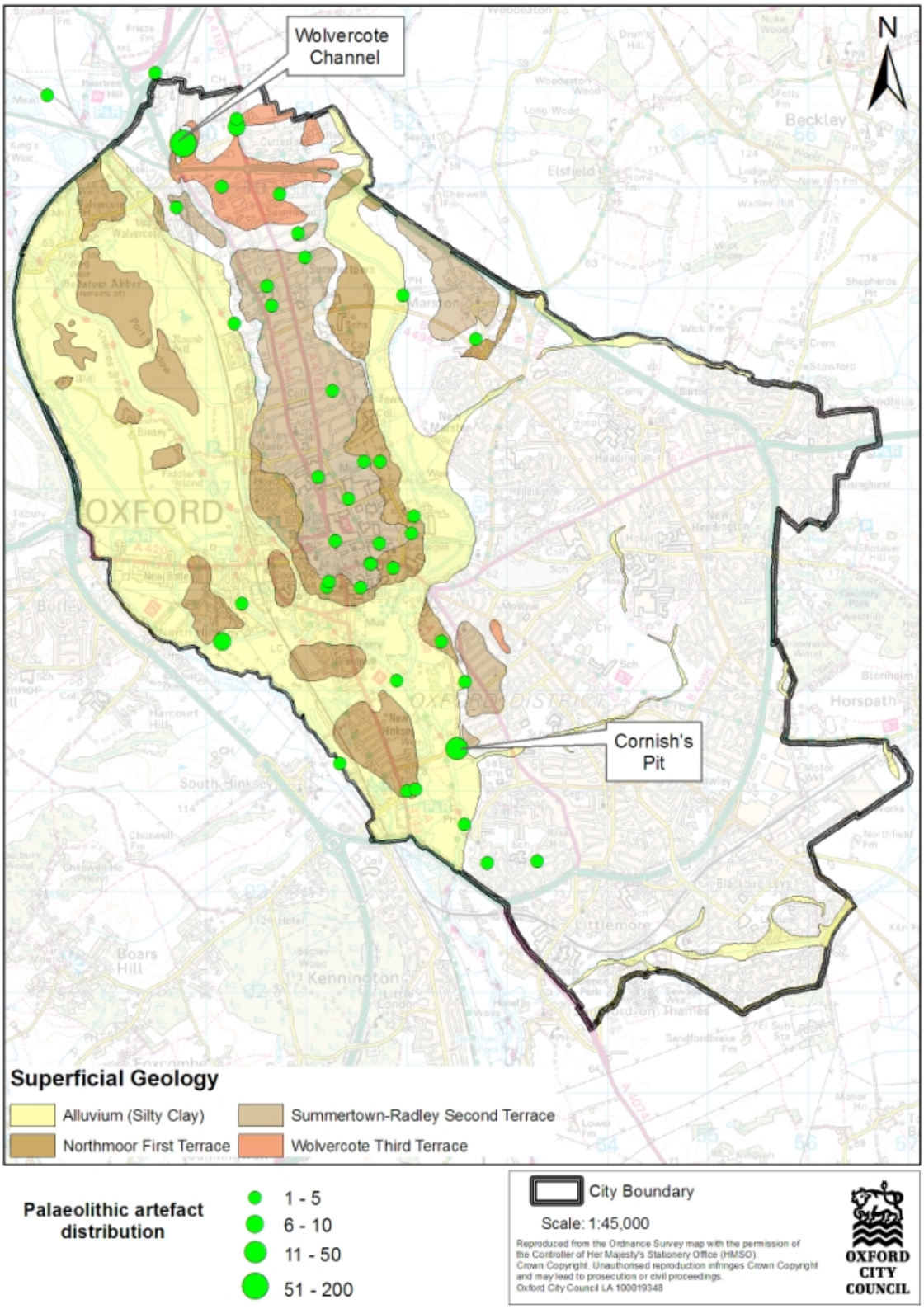

Figure 1: Distribution of Lower/Middle Palaeolithic Finds in Oxford District

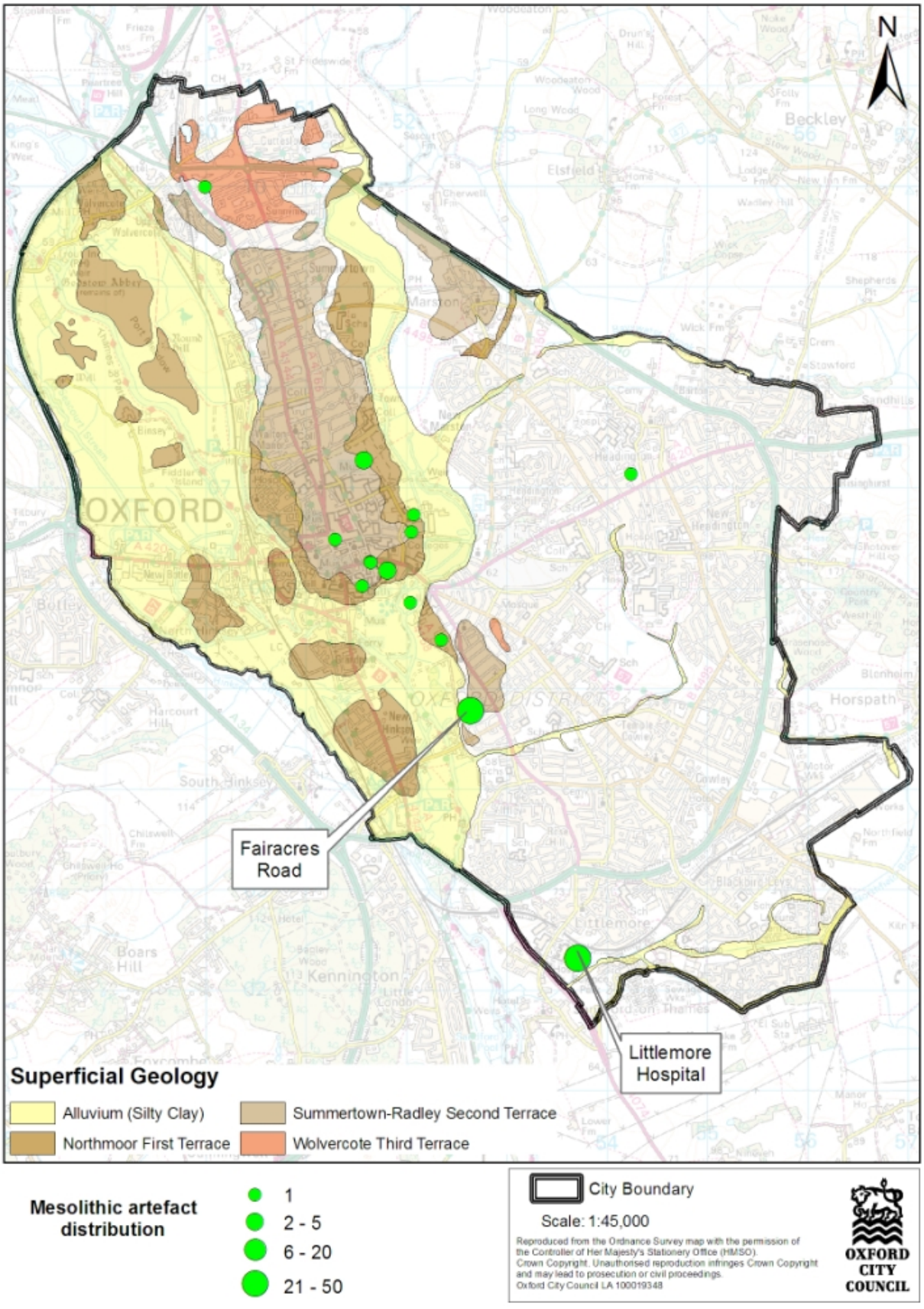

Figure 2: Distribution of Mesolithic artefacts in Oxford District