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A Fen Island in the Neolithic and Bronze Age: Excavations at North Fen, Sutton, Cambridgeshire

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Excavations at North Fen, Sutton, revealed prehistoric activity on a small gravel island within the fen. A buried soil horizon survived across most of the site, which produced pottery and large quantities of worked flint of later Neolithic/early Bronze Age date. Associated features included shallow pits and hollows and two large waterholes, one of which contained a timber-revetted platform securely dated to the early Bronze Age. Environmental evidence from this feature shows that it was situated within an area of pasture. It is argued that the site was probably occupied discontinuously through the course of the later Neolithic and early Bronze Age. Patterning in the spatial distributions of different flint tool types across the site suggests discrete episodes of activity focused on differing tasks. The occupation horizon was subsequently buried by an alluvial soil layer, representing abandonment of the site under conditions of increased wetness and flooding, before the island was engulfed by the fen during the later Bronze Age or Iron Age.

Introduction

The apparent poverty of the settlement record of the later Neolithic and early Bronze Age across much of southern Britain has long been a cause of frustration. Due to plough damage, most occupation sites survive only as small clusters of truncated pits, or as scatters of flint and pottery in the topsoil. The Fenland is one of the few areas where *in-situ* occupation horizons can be preserved, thanks to the protection afforded by later fen deposits. Excavations by Oxford Archaeology (OA) at North Fen, Sutton, provided a valuable opportunity to investigate a site of this kind. Apparently occupied in a series of discrete episodes over the course of the later Neolithic and early Bronze Age, the site contributes to debates on the nature of settlement dynamics during this period.

The site lies in the western part of Sutton parish, immediately to the north of Long North Fen Drove (centred TL 4046 8137; Fig. 1). It is situated at *c* 0.5 m OD on a small 'island' of 1st/2nd terrace river gravels and sand, 1.4 km across, overlying Upper Jurassic clays. The gravel island is capped by a thin layer of peaty soil and is surrounded by deeper Nordelph Peat deposits interleaved with 'fen clay'. Prior to excavation, the site was under arable cultivation. The fieldwork was carried out between October 2004 and February 2005 on behalf of Woolpit Business Parks Ltd, in advance of construction of an irrigation reservoir.

This report includes edited versions of the artefact and environmental studies, full versions of which will be made available on the OA website (www.thehumanjourney.net). The finds and archive will be deposited with the Cambridgeshire County Archaeological Store under site code SUGAR04.

Archaeological background

Current understanding of the environmental history of the area suggests that the North Fen terrace had become an island surrounded by the fen by the later Neolithic/early Bronze Age, separated from the much larger Chatteris island a short distance to the north (Fig. 2; Hall 1992; 1996; Waller 1994). A major palaeochannel of the River Ouse probably active during the Neolithic/Bronze Age lies 300–400 m to the south of the island; its course is approximately followed by the post-medieval drainage work known as Hammond's Eau. Deposits of 'fen clay' to the south and west of the island represent brackish marsh conditions resulting from a marine incursion along the Ouse corridor. Brackish conditions had reached Haddenham (4 km upstream of the site) by 2870–2410 cal BC and attained their maximum extent in the early or middle Bronze Age (Evans and Hodder 2006). Freshwater fen lay to the east of the island.

Fieldwalking carried out as part of the Fenland Survey led to the discovery of several prehistoric sites on the North Fen gravel island (Fig. 2; Hall 1996). Two Neolithic flint and pottery scatters were found, one lying 100 m to the south of the site

(SUT1) and the other 500 m to the west. The pottery from the SUT1 site is of plain bowl type, suggesting an early Neolithic date (Last 1996). Soilmarks representing five round barrows, presumed to date to the early Bronze Age, were also found scattered across the island, to the north, east and west of the site (Hall 1996; van Velzen 2003). Further Neolithic flint scatter sites and clusters of round barrows and ring ditches were identified during the Survey on the larger Chatteris gravel island to the north (Hall 1992). Subsequent test pit evaluation of one of the scatters at Stocking Drove Farm (CHA37), 700 m north-west of the site, revealed a buried soil deposit that produced flintwork of late Neolithic/'Beaker period' date and a few sherds of Impressed Ware and Grooved Ware pottery (Crowson *et al*. 2000).

Further evidence for prehistoric activity on the North Fen island was revealed in 1996 by an 18.8 ha evaluation carried out by the Cambridgeshire County Council Archaeological Field Unit (now OA East). The first stage of the evaluation was a fieldwalking survey, which produced only a sparse scatter of prehistoric flintwork. Thirty trial trenches were then excavated, revealing two areas of archaeological interest. The first was within Trench 4, immediately to the south of the present site. A series of shallow hollows containing vestiges of a buried soil were encountered within this trench, although it was uncertain whether the hollows were of natural or anthropogenic origin. Finds included flintwork ascribed to the Neolithic. The second area of interest was within Trench 18, 300 m to the north-east of the present site, where further shallow, irregular features produced a few pieces of pottery and worked flint again suggested to be of Neolithic date (Last 1996).

More recently, excavations have been carried out by the Sutton Conservation Society at the SUT7 round barrow, 300 m to the north-east of the site (Fig. 2). The barrow was plough damaged but contained a primary cremation burial within an inverted Collared Urn, radiocarbon dated to 1870–1690 cal BC (3440±30 BP). Further fragments of Collared Urns and Food Vessels may derive from ploughed-out secondary burials (Aileen Connor, this volume).

During the later Bronze Age or Iron Age, the North Fen island became uninhabitable due to rising water tables, and was engulfed by fen peat (Waller 1994; Hall 1996, 54–8; Last 1996). No later prehistoric, Romano-British, Saxon or medieval sites are known on the island or in its near vicinity. Large-scale reclamation of this part of the Fens began in the mid 17th century with the construction of Hammond's

Eau and the Old and New Bedford Rivers (Darby 1983). Ordnance Survey maps from the late 19th century onwards show the site under agricultural use.

Test pit survey

The first phase of the fieldwork comprised a test pit survey. Twenty-four 1 m^2 test pits were excavated by hand on a 20 m grid (Fig. 3). The test pits showed that a consistent sequence of deposits existed across most of the site. The modern ploughsoil sealed a layer of peat, which in turn sealed a silty sand buried soil deposit, overlying the natural sand and gravel. A 15-litre sample of each deposit within each test pit was sieved for artefacts through a 5 mm mesh. Worked flint was recovered from the buried soil in 9 of the 24 pits, at densities of up to four flints per pit (16 pieces in total). The flintwork was largely undiagnostic, but did include a thumbnail scraper of late Neolithic/early Bronze Age date.

Excavation strategy

An area measuring 100 x 60 m was subsequently stripped using a mechanical excavator under archaeological supervision (Fig. 4). This revealed that buried soil deposits survived across much of the site, particularly its southern, eastern and western parts. Four of the best-preserved areas of buried soil (Areas 1–4) were sample-excavated using a 1 m grid. Within Area 1, alternate grid squares were hand-excavated to give a 50% sample, while in Area 2 a 20% sample was excavated, and in Areas 3 and 4 a 10% sample. In total, 200 squares were excavated. A 15-litre sample from each square was dry-sieved for artefacts through a 5 mm mesh. A further 12 grid squares from Areas 1-3 were bulk sampled for wet sieving. Artefacts were also systematically collected from the exposed surface of the buried soil and natural gravels across the site, and their locations plotted. Aside from the buried soil, only a small number of archaeological features were uncovered, all of which were excavated by hand. During the latter stages of the excavation, four large slots were mechanically excavated to ensure that there were no further archaeological deposits sealed beneath the buried soil. All on-site recording was undertaken in accordance with standard OA procedures (OA 1992).

Archaeological sequence (Fig. 4)

Palaeochannel

A former stream channel (1233) running across the site on a NW-SE alignment was cut into the natural sand and gravel and sealed by the buried soil. Two machine-excavated sections showed that the channel was 1.4 m deep and contained a series of sterile clay, silt and sand fills. The channel clearly predates the archaeological activity at the site, and probably dates to the late Pleistocene or early Holocene.

The buried soil sequence

A sequence of two buried soil layers was identified overlying the natural sand and gravel (Fig. 5). The lower layer (1060) was a grey-brown to yellow-brown silty sand up to 0.25 m thick that extended across almost the whole site. This deposit was overlain in parts of the southern, eastern and western areas of the site (Areas 1–4) by a distinctive layer of more humic grey-brown silty sand that typically survived to a thickness of 0.05–0.10 m (1050). The upper surface of this deposit lay at *c* 0 m OD. While a few modern plough scars could be seen cutting down into the buried soil layers, the degree of disturbance was limited. Both layers produced worked flint, small sherds of later Neolithic/early Bronze Age pottery, and occasional fragments of animal bone. The ceramics largely belong to the Grooved Ware (*c* 3000–2000 BC) and Beaker (*c* 2500–1700 BC) traditions. Fragments from a single Impressed Ware vessel (*c* 3400–2500 BC) and possible Food Vessel sherds (*c* 2100–1500 BC) were also present. Two radiocarbon dates of 2397–2139 cal BC (OxA-19133: 3806±31 BP) and 2132–1921 cal BC (OxA-19050: 3640±29 BP) were obtained on charred material from layer 1050 (Table 1).

Thin section analysis was carried out on three monolith samples taken through the buried soil sequence (see Macphail below). Layer 1060 can be characterised as the Neolithic/early Bronze Age 'subsoil', containing occasional fine charcoal and burnt flint. It is likely that many of the artefacts from this 'subsoil' layer have been transported down from the original ground surface by biological action. The lower part of layer 1050 can be characterised as the Neolithic/early Bronze Age 'topsoil', a humic layer containing very abundant fine charred matter. The upper part of layer

1050 (0.05 m thick) contains little charred material and represents a humic soil that formed out of alluvium, burying the occupation horizon. This represents a period of abandonment of the site, probably due to increased wetness and flooding, before fen peat formation commenced.

The buried soil was sealed by a layer of clayey peat (1070), around 0.10 m thick, which extended across the whole of the site. This represents freshwater inundation of the site and clayey sedimentation under 'backswamp' conditions (Macphail, below), probably commencing in the later Bronze Age (Hall 1996; Waller 1994). The peat was directly overlain by the modern topsoil (1000).

Hollows, pits and postholes

A small number of shallow hollows, pits and postholes were found in association with the buried soil. All of these were recorded as being cut into 'subsoil' layer 1060, and either sealed by or showing no relationship to 'topsoil' layer 1050. They had silty sand fills similar in character to the upper buried soil layer. With one possible exception, they can all probably be regarded as broadly contemporary with the later Neolithic/early Bronze Age occupation horizon.

Irregular hollow 1209 was found at the eastern edge of buried soil Area 2 (Fig. 6). It measured 5 m by 3 m in size and up to 0.25 m deep. A lower deposit of sterile silty sand was overlain by a darker layer (1157) which contained 72 pieces of worked flint and six small fragments of late Neolithic/early Bronze Age pottery, including two Beaker sherds. The high density of flint from this feature, and from the buried soil deposits immediately to its west, suggests that the hollow was a significant focus for activity.

Three possible irregular pits, up to 0.29 m deep, were revealed during excavation of the 1 m sample squares in Areas 1 and 2 (1072, 1155 and 1211; Fig. 6). Pit 1211 contained three flint flakes, two scrapers, a few sherds of late Neolithic/early Bronze Age pottery and fragments of animal bone. Pit 1155 produced a single flint flake.

Three small features in the western part of the site may have been shallow pits, up to 0.25 m deep, although they could equally well represent natural hollows (1007, 1023 and 1030, Fig. 4). Feature 1023 contained three flint flakes, a flint knife and sherds of Impressed Ware pottery. Feature 1007 produced a few sherds of late

Neolithic/early Bronze Age pottery. Feature 1030 contained two flint flakes, a few Beaker sherds and a single fragment of probable late Bronze Age/early Iron Age pottery. It may therefore post-date the main period of activity on the site, although plough disturbance to this feature raises the possibility that the late Bronze Age/early Iron Age sherd is intrusive.

A pair of possible postholes (1016 and 1018) in the north-west corner of the site produced no finds. These were up to 0.25 m deep, and in one case (1018) contained abundant charcoal.

Waterholes

Two waterholes – one certain and one possible – were located at the margins of the areas of well-preserved buried soils. Waterhole 1295 lay in the south-western corner of the site, cutting through buried soil layer 1060 into the natural gravel, and was 3.5 m in diameter and 0.7 m deep (Figs 7 and 8). A wooden revetment structure (1294) at the southern edge of the feature had been preserved due to the waterlogged conditions. This consisted of a group of horizontal alder poles, stacked one on top of the other (1305–9 and 1311–13), retained by two vertical hazel stakes driven into the base of the waterhole (1304 and 1310). Tool marks on the wood are characteristic of the metal axes of the early Bronze Age (see Goodburn below), and a radiocarbon date of 2014–1776 cal BC (OxA-19051: 3559±29 BP) was obtained from alder pole 1308 (Table 1). The void behind the revetment had been back-filled with sand and gravel (1302), to create a platform to stand on while drawing water. The waterhole itself contained a sequence of naturally-deposited fills. The lower fill (1293) consisted of clay containing large amounts of waterlogged organic material. This was followed by two erosion deposits of sand and gravel (1303 and 1301), and a final layer of clay containing organic material (1292). Seven pieces of worked flint were recovered from the waterhole, along with a few sherds of late Neolithic/early Bronze Age pottery from upper fills 1292 and 1301. The waterhole was subsequently sealed by peat (1291), which filled a shallow hollow left at the top of the feature.

Possible waterhole 1199 overlay the palaeochannel, cutting through both 'subsoil' layer 1060 and the upper channel deposits (Fig. 9). The waterhole was 2.8 m in diameter and 0.8 m deep, with an irregular profile. It contained a series of naturally-deposited, waterlogged clay, silt and sand layers. The only finds came from the uppermost fill (1009), consisting of an incomplete human cranium, a fragment of a human longbone, and a few pieces of animal bone. The cranium has been radiocarbon dated to 2194–1979 cal BC (OxA-19107: 3690±27 BP; Table 1).

Artefacts and economic evidence

Flint

Hugo Lamdin-Whymark

A total of 513 worked flints and 42 pieces (275 g) of burnt unworked flint was recovered (Table 2; Figs 10–11). The majority of the flint was recovered as a scatter preserved within buried soil layers 1050 and 1060. The scatter may have undergone some vertical displacement from deposition on the original land surface, but the presence of localised concentrations suggests the scatter had undergone little horizontal movement. Most of the flintwork dates from the late Neolithic/early Bronze Age, but a small number of Mesolithic and/or early Neolithic flints were also present.

Raw material and condition

The raw material exploited was predominately a mid to dark brown flint, but some pieces of a distinctive light to mid grey mottled flint were also observed. The cortical surface, where present, was abraded to differing degrees, with some pieces retaining several millimetres of white chalky cortex, whilst the cortex on other pieces was worn away to a smooth or pitted surface. Thermal fractures were frequently observed in all the raw materials utilised. The majority of the original nodules were relatively small, probably around fist-sized, but larger nodules were also worked as indicated by a 95 mm blade (SF 137) and a 1.5 kg core from which over 100 mm flakes were removed. The condition of the cortex and presence of thermal fractures indicate the flint derives from secondary sources, such as glacial or river gravels. The local gravels contain a limited number of flint nodules, but some flint is likely to have been imported from further afield. A few flints exhibited a relatively fresh white cortex and may originate from a chalk region. A single flint flake exhibited a dark green cortex with an underlying orange band. This flint is characteristic of the Bullhead Bed at the base of the Reading Beds; this flint is likely to originate from a source to the south around the Thames Valley (Dewey and Bromehead 1915; Ellison and Williamson 1999).

Thirteen white corticated flints from earlier industries were also exploited as a raw material. A single- and a multi-platform flake core each exhibited two episodes of knapping and two flakes had clearly been struck from corticated cores. Nine tools were also manufactured from corticated flakes including four scrapers (Fig. 10.3 and 10.7–8), a serrated flake, a knife, a retouched flake, a fabricator (Fig. 10.14) and a tanged arrowhead (Fig. 10.9). The fabricator was manufactured on a fine parallel-sided blade that after retouching still measures 95 mm long by 21 mm wide and 10 mm thick. This blade probably dates from the early Mesolithic. It is not possible to date the other corticated flakes, but it is notable that a small number of Mesolithic or early Neolithic flints were identified in this excavation and that other Neolithic activity has been identified elsewhere on the gravel island (Hall 1996; Last 1996). These flints may, therefore, represent local discoveries, although it is also possible that they were collected further afield.

The reworking of earlier flints may simply reflect the opportunistic exploitation of chance discoveries. However, the transformed colours and unfamiliar artefact forms, for example Mesolithic blade technology, may have been considered to be of significance in the early Bronze Age. These occasional discoveries were both familiar, as struck flints, but alien due to their unusual colour and form. As such, these artefacts may have been associated with the past, ancestors or other more mysterious origins. The working of corticated flints may, therefore, have been of more significance than simply exploiting raw materials and perhaps involved the creation of implements imbued and empowered with attributes of these earlier artefacts.

The flint was generally in fresh condition, exhibiting only occasional nicks and edge-damage consistent with light disturbance such as trampling. Asymmetric notches typical of plough-damage were notably absent, suggesting the assemblage had not been disturbed by ploughing (Mallouf 1982). The majority of the flint bore no evidence of recortication, but as considered above, several white corticated flints had been reworked as raw materials; the secondary retouch was not corticated. Several flints exhibited an orange-brown mineralised surface deposit.

Technology

A small number of flakes and tools derive from a Mesolithic and/or early Neolithic blade-orientated industry. These flints, including the majority of the blades and bladelets, reflect a careful reduction strategy and frequently exhibit platform preparation and the scars of earlier blade removals on their dorsal surface. The latter indicates that the blade was struck from a core specifically orientated to blade production. The majority of serrated flakes were manufactured on blades, but the dating of these tools is problematic as several of these early flints have been reworked and used in the early Bronze Age, including at least one of the serrated blades. When cortication is not present it may not be possible to determine whether the tool is genuinely early, or the product of later reuse. This issue will be explored further when considering the spatial distribution of artefacts.

The majority of the flint forms a coherent assemblage that dates from the late Neolithic/early Bronze Age. The flint assemblage is dominated by small non-specialised flakes that appear to have been detached using both hard and soft hammer percussors, such as antler and stone, possibly including the two flint hammerstones recovered. Few flakes exhibit platform-edge abrasion and only two rejuvenation flakes are present, suggesting little care was taken to maintain core forms or regulate the morphology of flakes. In total, twenty cores were present with single- and multi-platform flake cores most frequently encountered. The cores showed little evidence for the preparation of the platform or the platform-edge prior to flake removal. The negative flake scars on the cores reflect the removal of unspecialised flakes and it is notable that no blade scars were observed. Cores were relatively frequently encountered with one core per 15.5 flakes recovered. The cores varied in weight from 14 g to 130 g with one exceptionally large flake core weighing 1499 g. Excluding the latter core, the cores averaged 38 g weight and appeared to have been abandoned when exhausted. The high frequency of cores is indicative of knapping, but no refits were identified and other debitage commonly associated with knapping, such as irregular waste and chips, is relatively scarce. The scatters therefore do not appear to represent *in situ* knapping, but contain some knapping debitage redeposited from another location.

Retouched artefacts are exceptionally common and represent 28.4% of the total assemblage. Scrapers are the most common tool type with 56 present in the assemblage, followed by simple edge-retouched flakes (36), serrated flakes (16), notches (9), knives (8) and piercers (6). Other tools that were less frequently encountered comprise three fabricators, two triangular arrowheads, a barbed and tanged arrowhead, a dagger and the tip of possible pick-like implement. A further five flints exhibited unclassifiable or unidentifiable miscellaneous retouch, four of these flints were broken and one may represent a fragment of a knife.

The scrapers include a wide variety of forms and sub-forms, but no form clearly dominates the assemblage (Table 3). The assemblage includes both irregular and regularly worked forms with variable standards of retouch including relatively irregular edges and finely retouched forms; a thumbnail scraper and an end scraper exhibited scale flaking. The scrapers are quite small with average dimensions of 32 mm long by 31 mm wide and 9 mm thick; the maximum length of any scraper is 57 mm and the maximum breadth is 54 mm wide (Fig. 12). The scrapers typically have length to breadth ratios between 1.5:1 and 1:1.5. The small proportions of the scrapers and the presence of thumbnail forms suggest a Beaker date. In this respect the absence of scrapers on blades is also notable as these typically found in Mesolithic and early Neolithic assemblages (Riley 1990).

In total, 54 of the 56 scrapers recovered were complete enough to allow recording of the retouched edges. Thirty-nine scrapers exhibited a single working edge, whilst 15 scrapers bore two working edges, providing a total of 69 retouched edges. These working edges were distinguished either by a break in the retouch or a change in the angle of retouch or curvature of the edge. Therefore a circular disc scraper is considered to be one edge of 360°, whilst an oval disc scraper will have two edges with retouched arcs of up to, but probably less than, 180°. Seven retouched edges exhibited straight retouch, whilst sixty-two edges were curved. The curved edges had an average diameter of 34 mm and only six edges had diameters above or below 20–45 mm. On average, an arc of 123° was retouched, equating to an average scraping edge of 35 mm in length. The vast majority of scraping edges exhibit an arc of retouch between 40° and 160°, but the retouched arc on several scrapers clustered around 250°; a single scraper was entirely circular with retouch around 360° of the circumference (Fig. 13).

The relative uniformity in the diameter and arc of the retouched edge, particularly for scrapers with a single retouched arc of less than 180°, is in distinct contrast to the broad variety of scraper forms and may indicate that the form of the scraping edge is of more significance than the overall form of the scraper (i.e. parallel sided or horseshoe) or position of retouch (i.e. side scraper or end scraper). The size of the artefact is also clearly significant as the scrapers demonstrate a tendency towards a small size of roughly equal length and breadth; this category would also include two thumbnail forms. The scraper form is of more significance where an arc of higher than >180° has been retouched or where the scraper has two working edges with arcs totalling more than >180°. These forms are: disc scrapers of oval or circular form and end and side scrapers and thumbnail scrapers of D-shaped form. These may be considered the characteristic scraper forms in this assemblage.

The tasks for which these scrapers were employed are open to speculation, particularly as none of the scrapers exhibited macroscopic use-damage, such as edge-rounding. Hide preparation and woodworking represent the most probable tasks, but considering the limited size of the scrapers, especially the thumbnail forms, they may have been used for a very specific activity.

The working of plant materials is attested by the presence of 16 serrated flakes, many of which bore a thin band of silica gloss behind the teeth. This band of gloss develops from a transverse motion that separates plant fibres, presumably for cordage or weaving. Use-wear studies have yet to determine the species of plant that generates this gloss (Juel Jensen 1994). The majority of the serrated flakes are manufactured on blades and in two cases these blades appear to be Mesolithic (Fig. 10.12). However, one of these blades is corticated white, whilst the serration is not corticated, indicating that the blade has been re-used.

The three arrowheads include a tanged form (Sutton type A, Green 1980; Fig. 10.9) and two triangular forms (Fig. 10.10–11). It is possible the triangular forms are unfinished barbed and tanged arrowheads, as neither have been extensively worked and both exhibit hinged removals that would hinder further pressure flaking, but they may simply represent a relatively crude arrowhead form. The four small flakes from polished implements originate from a minimum of two artefacts; two flakes were of a light brown flint with a high polish and the other two were mid grey. The fabricators include a fine example reworking a Mesolithic blade (Fig. 10.14), a broader rod-shaped form (SF 133), and a minimally worked flake with characteristic wear on the bulb (SF 419). The presence of three fabricators is perhaps surprisingly considering the limited evidence for fire as attested by the small quantity of burnt stone and low proportion of burnt artefacts in the assemblage as a whole (4.3%). The eight knives include two backed forms and six more irregular forms on flakes. The latter forms exhibit invasive low angle to semi-abrupt retouch along straight to slightly curving blade edges, with little modification to the original form of the flake blank. Two of the knives have been intentionally broken, with one exhibiting two snaps forming a wedge-shaped element (Fig. 10.13).

An artefact of particular note is the flint dagger (Fig. 11.15). The dagger is a simple tanged form measuring 137 x 54 mm and a maximum of 13 mm thick. The implement was manufactured from a mid grey mottled flint, with a small dark grey translucent area and patch of abraded cortex at the base of the tang. The colour of the flint and characteristics of the cortex suggest the raw material originates from a gravel source. The blade-edge of the dagger measures *c* 47 mm in length and has been finished with fine invasive flaking, which was probably produced by delicate soft hammer percussion and pressure flaking. The blade edge exhibits several nicks which may result from use or edge-damage. The tang has straight sides measuring 85–90 mm in length by 50 mm wide that taper to 18 mm wide at the distal end. The tang exhibits relatively coarse flaking, with occasional step fractures, and lacks the refined finish of the blade. The dagger is unlikely to have been hafted in a wooden or horn handle as it lacks notches to facilitate attachment. The tang forms a good handle, although given the crude flaking it may be presumed that the handle was finished by binding, perhaps with raw hide or plant cord. Flint daggers are relatively uncommon finds with a limited distribution pattern across the British Isles (Grimes 1931). This discovery falls within one of the most distinctive concentrations in the East Anglian Fens (ibid. Fig. 2).

Spatial patterning (Figs 14–20)

For the purpose of spatial analysis, the site can be sub-divided into four 'flint zones' (A-D) on the basis of distinctions in the density and composition of the flint assemblages (Fig. 14). These zones are discussed individually below.

Flint zone A comprises a dense spread of flint centred on hollow 1209 and the eastern part of buried soil 1050 (Area 2). The assemblage contains a limited number of flake cores, but does not represent an *in situ* knapping scatter as chips and pieces of irregular waste were scarce and no refits were identified. Moreover, the zone is dominated by retouched artefacts that account for 44.2% of the total assemblage. Scrapers are the most common retouched tool with 31 examples present, including 5 early Bronze Age thumbnail forms. Piercers (4), notches (5), knives (5) retouched flakes (18) and fabricators (2) are also well represented in comparison to the other zones. In contrast, serrated flakes are underrepresented with a single example present. Blades only form a small component of the assemblage, representing 3.6% of the flake assemblage. The large number of retouched tools indicates the scatter is the product of various activities, possibly with particular focus on scraping actions.

Flint zone B equates to buried soil Area 1. The scatter in zone B is more diffuse than zone A, and whilst no distinct clusters were present some variation exists in the density of flints across the area. The scatter contains fewer flints than zone A, but cores, chips and pieces of irregular waste are more numerous. This indicates that knapping debitage forms a larger component of this assemblage, but the dispersed distribution suggests this debitage is not *in situ*. Retouched pieces form 18% of the assemblage and whilst scrapers remain the most common tool type they are less dominant than in zone A. The presence of three serrated flakes and all three of the arrowheads from the excavation further suggests an emphasis on different activities. The arrowheads and the thumbnail scraper date from the early Bronze Age and most of the flake debitage is probably contemporary, but eight blades and bladelets, representing 13.4% of the flake debitage, may indicate the presence of some Mesolithic and/or early Neolithic flintwork.

Flint zone C covers an extensive area in the south-eastern part of the site, including buried soil Area 4, but yielded only 20 flints. The scatter is very diffuse and despite the presence of two cores, the emphasis is on retouched artefacts with ten implements, including five serrated flakes and blades.

Flint zone D covers the western half of the excavation area, including buried soil Area 3. The flint recovered represented a low density spread with no distinct concentrations. The assemblage includes a number of exhausted flake cores and a larger partly worked core weighting 1499 g, but these cores were distributed across the area and provide no indication of a distinct knapping area. Retouched tools represent 19.2% of the assemblage and notably scrapers (8) are outnumbered by edge retouched flakes (9); serrated flakes are also relatively common with seven examples present. The flint dagger was found at the edge of this zone and represents the only diagnostic early Bronze Age artefact from the area. The flake debitage is broadly comparable to the other areas and is probably broadly contemporary with the dagger, but it is notable that blades and bladelets represent 8.7% of the flake debitage and that 13 flakes exhibited blade-like attributes. This may indicate the presence of some flint from an earlier blade-orientated industry.

Discussion

The fresh condition and distribution of the flintwork across the excavation area indicates the flint scatter is *in situ*. Moreover, the zones that have been defined appear to reflect different activities. Flint zone A represents a relatively dense scatter and includes a high proportion of retouched artefacts with a particular emphasis on scrapers. In contrast, the scatter in flint zone B is more diffuse and includes a higher proportion of knapping debris. The range of retouch tools present are, however, broadly similar to zone A, but form a lower proportion of the assemblage. Flint zones C and D represent comparatively low density scatters, but notably have an emphasis on serrated flakes rather than scrapers. Zone D also produced a number of cores. These patterns may be interpreted as different activity areas, with intensive hide or woodworking in zones A and B, some plant working in zones C and D and flint knapping around zones B and D. However, this activity may not all be contemporary. The distribution of serrated flakes and elevated proportions of blades coincide in zones B, C and D. These artefacts may date from the Mesolithic and/or early Neolithic and reflect a diffuse scatter of early flintwork with an emphasis on plant working. Early Neolithic flintwork has been recovered south of the excavation area (the SUT1 flint scatter site: Hall 1996; Last 1996) and it is possible that some of this early flintwork relates to this activity. Alternatively, it is possible that some of these flints have been imported to this area and reused as earlier flints were being reworked in the early Bronze Age. The thumbnail scrapers, tanged arrowhead and general flake morphology in zones A and B and the dagger in zone D can confidently be assigned to the Beaker period, indicating that at least some of the activity in zones A, B and D is broadly contemporary.

The densest area of the scatter in zone A is particularly notable as it forms a discrete group associated with hollow 1209. Recent research has emphasised that deposits in pits are frequently drawn from surface contexts, although these deposits are very rarely preserved (Garrow 2006; Lamdin-Whymark 2007). In general, the flint assemblages from Beaker pits elsewhere in East Anglia are broadly comparable in composition to the surface scatters at North Fen, although some differences exist in the retouched assemblages (Table 4). Garrow (2006, 128–9) suggests that scrapers are overrepresented in pit deposits and that they may have been specially selected for deposition. The assemblage from North Fen, however, contains a comparable proportion of scrapers to the average from pit deposits. It is, however, notable that with the exception of serrated flakes and scrapers, other retouched artefacts are poorly represented in pits, but represent common occurrences in the surface deposits at North Fen. It therefore appears that the dominance of scrapers in pit deposits reflects the frequent exclusion of other tools, such as piercers, knives, daggers, and arrowheads, rather than the intentional selection of scrapers.

Catalogue of illustrated flint

1 Context 1019. SF 37. Zone A. Horseshoe-shaped end scraper with a spur on the left distal edge. Early Bronze Age.

2 Context 1235. Zone C. Other scraper of irregular form. Early Bronze Age.

3 Context 1157. SF 415. Zone A. End and side scraper of D-shaped form with a slight spur on the distal edge. This scraper was manufactured on a corticated flake, the retouch is not corticated. Early Bronze Age.

4 Context 1019. SF 44. Zone A. End and side scraper of D-shaped form. Early Bronze Age.

5 Context 1019. SF 55. Zone A. End and side scraper of D-shaped form. Early Bronze Age.

6 Context 1061. SF 379. Zone B. Thumbnail scraper of D-shaped form. Early Bronze Age.

7 Context 1019. SF 122. Zone A. Thumbnail scraper of D-shaped form manufactured from a white corticated flake. Early Bronze Age.

8 Context 1019. SF 30. Zone A. Thumbnail scraper of oval form with 360° edge-retouch. This scraper was manufactured on a lightly corticated flake, the retouch is not corticated. Early Bronze Age.

9 Context 1047. SF 378. Zone B. Tanged arrowhead of Sutton type A. This arrowhead was manufactured on a lightly corticated flake; the retouch is not corticated. Early Bronze Age.

10 Context 1003. SF 323. Zone B. Triangular arrowhead. Early Bronze Age.

11 Context 1019. SF 17. Zone B. Triangular arrowhead. Early Bronze Age.

12 Context 1241. Zone C. Serrated flake manufactured on a fine plunging blade exhibiting parallel dorsal blade scars. The serration is very fine and silica gloss is present on the edge on the ventral and dorsal surface. Mesolithic, but possibly reused in the early Bronze Age.

13 Context 1019. SF 24. Zone A. 'Other' knife. Low angle invasive retouch along the right hand side. Intentional breaks at the proximal and distal ends. Early Bronze Age.

14 Context 1157. SF 445. Zone A. Fabricator manufactured by reworking an earlier white corticated blade probably of early Mesolithic date. The tool exhibits heavy rounded wear on the right distal and left proximal edges. Early Bronze Age.

15 Context 1027. SF 74. Zone D. Tanged flint dagger. Note the fine pressure flaking on the blade edge and crude flaking on the tang. Early Bronze Age.

Pottery and fired clay

Lisa Brown

A total of 241 sherds (576 g) of prehistoric pottery was recovered (Table 5). Most sherds (78%) came from the buried soil deposits, the remainder from a small number of cut features. The assemblage spans the later part of the middle Neolithic (*c* 3300 BC) to the late Bronze Age/early Iron Age (*c* 1000–800 BC) but most classifiable sherds are late Neolithic/early Bronze Age (*c* 2000–1800 BC). Recording and analysis followed Prehistoric Ceramics Research Group guidelines (PCRG 1997). In addition to the pottery, a very small amount of amorphous fired clay was recovered from the site (Table 5); details are available in the archive.

The condition of the pottery is generally poor, most sherds appearing weathered, rolled, abraded or laminated and, in some cases, reduced to crumb and dust size particles. No correlation between fresher condition and taphonomic occurrence was observed, in that the sherds from features were in a similar condition to those from buried soils. This indicates either that soil conditions as well as exposure were a factor in preservation, or that sherds from features had been subject to attritional processes prior to inclusion in their fills. Two sherds from buried soil layer 1050 (Area 1) were refired, probably as a result of accidental incorporation in a bonfire or hearth.

Fabric

Seven distinctive fabrics within four ware groups were identified. The most common fabrics were grog-tempered and coarse flint-tempered wares. A single shell-tempered sherd (C1) was recovered from buried soil deposit 1003. Grog-tempered ware G1, used in the manufacture of Grooved Ware vessels and Beakers, was by far the most common fabric. The more friable fabric G2 appears to correlate with large jar forms, but the assemblage is too small to demonstrate this with certainty. The only recognisable form in sandy ware (Q2) was a late Bronze Age/early Iron Age bowl.

C1: Fine laminar glauconitic sandy ware with sparse platey shell (almost entirely leached) and rare white calcined flint up to 3 mm.
F1: Coarse flint-tempered ware. Fine laminar glauconitic clay with moderate frequency of coarse rounded quartz sand and spars to moderate density ill-assorted of calcined white flint 1–7 mm, mostly 1–3 mm.
F2: Coarse flint-tempered ware. Fine smooth slightly micaceous clay with sparse to moderate ill-assorted ?calcined white flint 1–6 mm.
G1: Smooth 'soapy' lightly sanded (rounded quartz) fabric with inclusions of red and, more rarely, grey grog. Fires to grey interior, reddish surfaces.
G2: Smooth, friable lightly sanded (rounded quartz) fabric containing red grog. Fires to relatively uniform reddish-orange throughout.
Q1: Common to abundant fine to medium grade rounded quartz sand (opaque to grey) with glauconite pellets. Generally fires to uniform dark grey with brownish margins and/or surfaces.
Q2: Matrix as Q1 but with sparse inclusions of fine angular, calcined grey flint up to 2 mm. Fires to dark grey.

Form and decoration

Fifty-three sherds representing at maximum 23 individual vessels were classifiable by form or broad stylistic tradition. Most of the diagnostic sherds were recovered from the buried soil layers.

The earliest pottery from the site belongs to the Impressed Ware (Peterborough Ware) tradition of the middle to late Neolithic. Fragments of Fengate type bowls in flint-tempered ware with impressed decoration came from pit 1023 (Fig. 21.1–3). A grog-tempered carinated bowl with whipped cord and linear incised decoration from buried soil layer 1050 may also be an example of Peterborough Ware (Fig. 21.4).

Five sherds of Grooved Ware were identified. Three of these came from the buried soil, comprising a highly abraded decorated sherd in fabric G1 from context 1125, a crudely made whipped cord decorated sherd in flint-tempered ware F2 from context 1186, and a rim sherd with fingertip decoration from context 1019 (Fig. 21.5). waterhole 1295 produced two probable Grooved Ware sherds, one cord impressed example in fabric F2 and a sherd with wide shallow parallel horizontal grooves in fabric G1. Two grog-tempered sherds with incised decoration from buried soil layer 1050 (Fig. 21.6–7) were too small for precise classification and could be either Grooved Ware or coarse Beaker fragments. The Grooved Ware sherds are, however, generally very small and some of the decorated fragments could arguably belong to Food Vessels instead.

Two Beaker sherds with twisted cord impressed decoration, probably from a single vessel, came from hollow 1209 (Fig. 21.8–9). Five grog-tempered Beaker sherds were recovered from buried soil. Decorated examples include a sherd with incised horizontal lines and one with a herringbone pattern (Fig. 21.10). A grog-tempered sherd decorated with multiple fingernail impressions in rows (Fig. 21.11) may belong anywhere within the Impressed Ware tradition but precisely resembles the decoration on a Beaker from Bury St Edmunds, Suffolk (Clark 1970; Gibson and Woods 1997, 154) and is similar to one from Foulmire Fen Terrace, Haddenham, Cambridgeshire (Pollard and Johnston 2006, fig. 2.22.6).

A small fragment of a thick-walled vessel with deep fingertip impressions in the same fabric from buried soil layer 1060 probably belonged to an early Bronze Age Food Vessel or other large urn form. The latest classifiable sherd is a small, well-finished late Bronze Age or early Iron Age bowl rim in fine flint-tempered sandy ware Q2 from pit 1030 (Fig. 21.14).

Discussion

Most of the pottery is of late Neolithic/early Bronze Age date. A similar range of late Neolithic/early Bronze Age pottery in flint-tempered and grog-tempered fabrics has been noted at fen edge sites elsewhere in the local area, including Colne Fen (Knight 2004) and Foulmire Fen Terrace, Haddenham (Pollard and Johnston 2006, 62–3).

Catalogue of illustrated pottery

1 Impressed Ware bowl, probably Fengate type; fabric F2, decorated with ?bird bone impressions on top of rim and inner rim and neck. Pit 1023, context 1022

2 Impressed Ware bowl, probably Fengate type; fabric F2, decorated with ?bird bone impressions. Pit 1023, context 1022

3 Impressed Ware; fabric F1. Pit 1023, context 1022

4 Carinated Impressed Ware bowl with corded and incised decoration; fabric G1. Buried soil layer 1050 (area 2), context 1197

5 Grooved Ware(?) jar fragment; fabric G1, smoothed surface with fingertip impressed rim. Buried soil layer 1060, context 1019

6 Base of Grooved Ware jar or coarse, large beaker; fabric G2, incised horizontal linear decoration. Buried soil layer 1050 (area 1), context 1049

7 Grooved Ware or coarse Beaker sherd; fabric G1. Buried soil layer 1050 (area 1), context 1069

8 Beaker base; fabric G1, corded decoration. Hollow 1209, context 1157

9 Beaker sherd; fabric G1, probably part of no. 10, corded decoration. Hollow 1209, context 1157

10 Beaker sherd, incised herringbone decoration; fabric G1. Buried soil layer 1050 (area 1), context 1061

11 Body sherd; fabric G2, roughly smoothed with fingernail impressed decoration, burnt residue adhering to inner surface. Beaker? Buried soil layer 1060 (area 1), context 1046

12 Body sherd with impressed decoration; fabric G1. Beaker? Pit 1211, context 1210

13 Ovoid jar with short rim; fabric F1, roughly smoothed. Context 1003,

14 Small fine bowl with short out-turned rim; fabric Q2, smoothed surface. Probably late Bronze Age/ early Iron Age. Pit 1030, context 1029

Worked wood

Damian Goodburn

Waterhole 1295 contained an *in-situ* revetment structure (1294) formed from ten pieces of worked wood, including two vertical stakes and eight horizontal poles (Figs 7–8 and 22). Both vertical stakes (1304 and 1310) and five of the vertical poles (1305–8 and 1312) were retrieved from site. Species identifications by Dana Challinor indicate that the vertical stakes were of hazel (*Corylus avellana*) and horizontal poles 1305–8 were of alder (*Alnus glutinosa*).

Condition of the material

The worked wood was covered by a slight concretion that was removed by gentle hand cleaning in fresh water. The material towards the base of the waterhole was well preserved but slight abrasion in use and the concretion destroyed any fine 'signature marks'. These marks are distinctive striation patterns left by nicks in the blade edges of individual tools (Sands 1997). Thus, the material can be classified as fairly well preserved, but not absolutely pristine. Small holes made by later plant roots were seen in most of the material, as is commonly the case with prehistoric waterlogged wood.

Structure 1294

Structure 1294 was clearly some form of revetment within the base of the waterhole. It was made up of a series of horizontal poles stacked one on top of the other retained by two roundwood stakes on one side and gravel and sand backfill on the other. As found the stacked poles stood *c* 0.6 m high and had been pushed over slightly by the weight of the backfill. The line of the revetment may have been cut through in antiquity, breaking decayed horizontal poles that originally ran full length between the upright stakes. As found the two stakes could not have retained the poles against the pressure of the backfill to the south if the horizontal poles were not originally continuous. At any one point between four to six poles lay one upon another. All the material is worked roundwood of a size that would normally be called 'poles' by woodsmen today, that is larger than brushwood or rods but smaller than logs (ie. *c* 40–95 mm diameter; see below).

In the last few years a considerable number of later prehistoric 'waterholes' have been excavated in southern Britain. Most of the features have dried out at some point since their creation and organic internal structures have been lost, although in some features roundwood and timber structures have survived. These had a number of forms and probable functions, from timber well linings resembling historic structures to ephemeral reinforcement of the bases of these erosion prone features. However, most appear to have been small platforms or step-like revetments with adjoining ledges, constructed from a wide variety of woody materials including light wattle work, horizontally placed poles and even jointed, cleft timbers in a few cases (Masefield *et al*. 2003). In some deeper examples the bases of notched log ladders have been found (eg Framework Archaeology 2006).

The main purpose for these small revetments and platforms found in the bases of the best preserved waterholes appears to have been to provide a secure place to stand or crouch whilst filling up water containers. This would appear to have been the function of structure 1294. It would seem that this arrangement was not built for livestock but for controlled human access. Some waterholes show signs of having been fenced at the top to deny animal access. This would additionally have prevented fouling of the supply and helped to preserve the sides of the cut from erosion.

Axe marks and dating

There are clear datable trends in the size and form of axe marks from the Neolithic to Roman periods (O'Sullivan 1997; Sands 1997; Brunning *et al*. 2000; Goodburn 2003a; 2004). Of key interest here is whether the worked roundwood was cut with stone or early metal tools or a combination of the two. The marks on the ends and sides of the poles are clearly from axes as is evident from their orientation, although it should be noted that prehistoric 'axe heads' were sometimes hafted cross-wise as adze heads for specialised woodwork such as boat or wheel making (Goodburn 2004, 129). Where the surfaces are well preserved the axe stop marks (lines mirroring the blade edges where a tool stopped cutting) can been seen. They were comparatively wide, smooth and very rounded.

The most complete axe marks were found on the ends of the basal pole of the revetment (1308). Here the marks were up to 75 mm wide with a curve of *c* 13mm. They were clearly the result of the use of a keen, thin metal blade (bronze or possibly hard copper), as typical British ground stone axe blades rarely produce axe stop marks over 35 mm in width due to the thickness of the blade at the edge (O'Sullivan 1997, 300). Experimental work and archaeological evidence also shows that ground stone axe cut marks from axes of typical British lentoid cross section are also much rougher than those created with early metal tool edges (Orme *et al*. 1983).

During the Bronze Age, the larger axes used for heavy and rough work seemed to have varied measurably in blade width from period to period. Typical maximum widths for early Bronze Age stop marks are *c* 70–100 mm (Goodburn 2003b). The width of the stop marks declines a little in the middle Bronze Age to *c* 65–70mm wide (Goodburn 2004, 131) and becomes smaller still in the late Bronze Age at *c* 45–50mm wide (Goodburn 2003a, 104). This variation in broad sizes mirrors changes in the forms of the largest class of axes from each period from flat axes through palstave forms to small socketed axes typical at the end of the period.

It can be suggested that the very curved axe stop marks found in this assemblage may have been produced by the use of a large cresentic-bladed flanged axe (Megaw and Simpson 1979, 220). These tools are apparently typical of the secondary phases of the early Bronze Age in southern Britain. Thus, on technological grounds an early Bronze Age date can be proposed for structure 1294, perhaps *c* 2300–1800 BC. This agrees with the radiocarbon date from timber 1308 of 2014–1776 cal BC (Table 1).

The horizontal poles

This material was similar cut pole sections taken from small whole tree stems. Indeed, it is likely that the alder poles derive from perhaps two stems. Alder is a wetland, often stream edge, deciduous species with a fairly straight growth habit and its softwood is easily cut with bronze tools. The parent trees were felled and the 'tops' and side branches cut off with metal axes. The stems were axe cut, 'bucked' into pole lengths of *c* 1.75 m which could be carried by one adult on the shoulder and ranged from *c* 43–95 mm diameter. In such a location this material is likely to have been very local.

The poles being axe-cut to length had two faceted, pointed ends, and so were initially thought to have been reused stakes. When a pole is cross-cut quickly with an axe a blunt 'wedge point' is normally left on both ends so they may be easily mistaken for a stake by modern observers. The poles survived stacked four or five high, lightest to the top, with those higher being less well preserved. Some survived as amorphous fragments such as 1312, but most were much better preserved.

The best preserved horizontal pole was basal pole 1308, which was recorded as 1.73 m long *in situ*, and was 95 mm in diameter at the largest end (Fig. 22.6). Both ends were roughly axe-cut to blunt 'chisel' ends and had also been carefully axe notched. These notches retained clear, very curved, axe stop marks up to 75 mm wide and were cut to fit snugly round the bases of vertical stakes 1304 and 1310, almost in the manner of a notched 'laft' or housing joint. The other smaller poles appear to have had blunt wedge-type ends together with the other being broken. Although the axe stop marks were fairly well preserved on some items, no substantial tool signatures, ridges or striations from the use of nicked blades were found, due to compression and the effects of the concretion.

The retaining stakes

Two poles 60–65 mm in diameter were cut out of straight hazel stems probably growing on slightly higher ground than the alder. Each stake was lifted in at least four sections, but it could be seen that stake 1310 survived 0.94 m long. Stake 1304 had an elongated axe-cut point formed of two adjacent concave facets while stake 1310 was hewn to a 'pencil'-form point with many small facets (Fig. 22.1–2).

Animal bone

Lena Strid

The animal bone assemblage comprised 136 fragments (1.3 kg), mostly in a very poor condition. Cattle was the only identified species, represented by two fragments from waterhole 1199.

Human bone

Ceridwen Boston

Two fragments of human bone were recovered from the upper fill of waterhole 1199. The anterior part of an adult cranial vault included most of the frontal bone, the eye orbits, part of the nasal and parietal bones. The large supra-orbital ridges suggest that the individual was male, as do the marked temporal lines. Complete fusion of the coronal suture on both the ectocranial and endocranial aspects indicated that the individual was greater than the age of 40 years when he died. The anterior sagittal suture was incomplete but also was fully fused, suggesting an age greater than 43 years. The cranium has been radiocarbon dated to 2194–1979 cal BC (Table 1). One fragment of long bone shaft was also recovered. It appeared to be either humerus or femur, the latter being more probable. Pathology was not noted on any of the bone fragments.

Charred plant remains and charcoal

Dana Challinor

Eleven bulk soil samples were taken for the recovery of charred plant remains and charcoal from the buried soil and contemporary pits and hollows. Following assessment of the material, six charcoal samples were analysed in more detail. Twenty charcoal fragments from two sieve sizes (2 mm and 4 mm) were identified from each sample. Where there were large quantities of oak present in the sample, non-oak pieces were deliberately chosen for identification. The charred plant remains did not merit further analysis, but the results of the assessment are recorded below.

Ten taxa were positively identified in the charcoal analysis: yew (*Taxus baccata*), elm (*Ulmus* sp.), oak (*Quercus* sp.), alder (*Alnus glutinosa*), hazel (*Corylus avellana*), lime (*Tilia* sp.), poplar/willow (*Populus/Salix*), blackthorn (*Prunus spinosa*), hawthorn/apple/pear/service (Maloideae) and ash (*Fraxinus excelsior*). Much of the hazel and all of the yew came from small diameter roundwood stems. The samples produced, on the whole, quite mixed assemblages with an average of four taxa per sample. Nonetheless oak was present in all of the samples, and clearly dominated several including context 1029 from pit/hollow 1030. The use of shrubs/trees for fuel wood such as blackthorn, hawthorn group and hazel (which are typical of hedgerow/scrub) is consistent with the picture of open landscape of pasture/grassland gained from the environmental analyses from waterhole 1295 (see below). Trees such as alder, lime and willow or poplar prefer wet or damp soils, and would have flourished in the fenland environment. However, the yew, elm, oak and lime suggest that woodland resources were also exploited.

Non-charcoal charred plant remains were rare. A few small fragments of hazel nutshell were noted in the buried soil and pits/hollows 1030 and 1211. Pit/hollow 1211 was also the only context to produce any cereal remains, although these were limited to a single whole grain (cf. *Hordeum*, barley) and a few unidentifiable grain fragments.

Environmental evidence from waterhole 1295

The waterlogged fills of waterhole 1295 contained well-preserved organic material, and were targeted for environmental sampling. Bulk samples of 40L in volume (samples 32–3) were collected from the two main fills of the waterhole (contexts 1292 and 1293), and 2L incremental samples were collected at 10 cm intervals through these two fills and overlying peat layer 1291 (samples 34–40; Fig. 7). Assessment showed that the two bulk samples were richest in plant and insect remains, and these were therefore selected for further analysis. A monolith sample was also taken for pollen analysis alongside the incremental samples.

Waterlogged plant macrofossils

Wendy Smith

A 1L sub-sample of sediment from each of the two bulk samples was washed over a 0.25 mm mesh sieve and the flots were sorted under a low-power binocular microscope. Only a sub-sample of each flot was sorted, as after achieving 500–600 identifications further sorting did not significantly enhance the range of taxa recovered. The plant remains recovered from both samples are typical of a range of habitat types, all of which are likely to occur in and around a waterhole set within grassland/pasture (Table 6). The taphonomy of these deposits probably represents the gradual infilling of the waterhole with detritus from surrounding vegetation.

Range of habitats represented by the plant macrofossils

A range of grassland/meadow plants such as buttercups (*Ranculus acris* L/*repens* L./*bulbosus* L.), mouse-ear (*Cerastium* spp.), self-heal (*Prunella vulgaris* L.) and greater plantain (*Plantago major* L.) were recovered. Parsley-piert (*Aphanes arvensis*

L.), a plant typical of cultivated and/or open ground conditions, was also recovered. Several plants typical of waste places were identified, but common nettle (*Urtica dioica* L.) was most frequently recovered. A number of taxa typical of damp to wet conditions were recovered, including celery-leaved buttercup (*Ranunculus sceleraturs* L.), crowfoot (*Ranunculus* subgenus BATRACHIUM (DC) A. Gray), water-starwort (*Callitriche* spp.), rushes (*Juncus* spp.) and sedges (*Carex* spp.). Those taxa most indicative of standing water (e.g. crowfoot and water-starwort) were recovered from the upper deposit (context 1292). Several taxa indicative of scrub, hedges and/or woodland also were recovered, but typically in small quantities. These taxa included bramble (*Rubus* spp.), campion (*Silene* spp.), dogwood (*Cornus sanguinea* L.), hazel (*Corylus avellana* L.) and sloe/blackthorn (*Prunus spinosa* L.). Bramble/blackberry seeds are frequently super-abundant in waterlogged deposits, but their low density here (<20 items) and only small quantities (<5 items) of other scrub/woodland taxa suggests that although some shrubs/trees were in the vicinity, they are unlikely to have been a dominant part of the overall vegetation.

Common nettle (*Urtica dioica* L.) and elder (*Sambucus nigra* L.) are often associated with high nitrogen input, such as cattle manure. There is limited indication for trampled ground in this flora. Both knotgrass (*Polygonum aviculare* L.) and greater plantain (*Plantago major* L.) can occur in heavily trampled areas (e.g. Robinson 1989, 89). Certainly many of the damp to wetland plants can also occur in muddy places, which may be the situation on heavily trampled ground around a water source.

Taphonomy of the deposits

The fills of waterhole 1295 contain a flora that probably represents plants growing in the immediate vicinity of the waterhole (cf. Peglar and Wilson 1978, 147). It is, of course, plausible that manure from livestock visiting the waterhole may also have entered the feature adding to the seed assemblage, possibly with the inclusion of browsed vegetation, given that dung beetles were recovered from the waterhole (D Smith, this report). However, it is more likely that this water feature acted as a pitfall trap accumulating insects and plant remains which accidentally fell or were blown into this feature, which was clearly placed within grassland with limited amounts of trees/scrub.

Conclusions

The waterlogged plant assemblages are dominated by native plants typical of grassland/meadow, wood/scrub and damp to wet ground. A small quantity of plants typical of high nitrogen input (eg elder and common nettle) were identified in the plant macrofossil assemblage, and the insect remains recovered from the deposit include a small proportion of dung beetles. Together, these limited results suggest domesticated livestock were grazing grassland in the vicinity of the waterhole, though clearly not intensively.

Waterlogged roundwood

Dana Challinor

Contexts 1292 and 1293 both contained well-preserved waterlogged roundwood. A selection of 15 pieces from each context were identified in full. There was a marked difference between the two deposits, with the lower deposit (1293) containing only hazel (*Corylus avellana*) and blackthorn (*Prunus spinosa*), while the upper fill (1292) produced oak (*Quercus* sp.), alder (*Alnus glutinosa*), blackthorn, hawthorn/apple/pear/service (Maloideae) and wild privet (*Ligustrum vulgare*). The stems ranged in size from 6–38 mm, although the maturity was more consistent with most being 6–8 years old. It is possible that some of the wood was related to the revetment structure 1294, which was composed of alder and hazel, although the diameter of the poles and stakes of 1294 were larger than the stems which were loose in the fill. None of the pieces appeared to be worked. The wood assemblage is characteristic of hedgerow or scrub, which is consistent with the other environmental evidence from the waterhole.

Pollen

Lucy Verrill

A monolith sample was taken through the fills of waterhole 1295 (contexts 1291–3; Fig. 7), and six sub-samples prepared for pollen analysis. Pollen was preserved in all the samples assessed and the frequencies were high in all levels (Table 7). In general, preservation was good or fair and the percentages of indeterminate pollen were less than 20% of total land pollen (TLP). The pollen assemblage from context 1291 is almost identical to that in context 1292, with high percentages of pollen from herbaceous plants and lesser values of pollen percentages from trees and shrubs. In the lowermost two spectra from context 1293, there are exceptionally high percentages of pollen from herbaceous plants and very low percentages of shrub pollen.

0.96–0.66m (context 1293)

In the basal context, values of arboreal pollen decline from 20% to *c* 10% of the total land pollen sum, before recovering at 0.8 m to *c* 14% TLP. The main tree pollen types represented are alder (*Alnus glutinosa*), birch (*Betula*) and oak (*Quercus*). Percentages of shrub pollen are negligible until 0.8 m, where hazel-type (*Corylus avellana*-type) pollen reaches 27% TLP. Herbaceous pollen, dominated by Poaceae throughout, forms 75% of the pollen sum initially, peaking at *c* 88% TLP at 0.86 m and declining to 58% TLP at 0.8 m. A relatively wide suite of open-ground herbs was recorded, dominated by ribwort plantain (*Plantago lanceolata*) (stable at *c* 11% TLP), with lesser percentages of pink family (Caryophyllaceae), dandelion family (Lactuceae), buttercups (*Ranunculus*) and devil's-bit scabious (*Succisa pratensis*). Two cereal-type grains were recorded. Values of microscopic charcoal are initially extremely high at nearly 300% TLP, but declined to *c* 100% TLP at 0.86 m, remaining stable throughout the profile.

0.66–0.14m (contexts 1291 and 1292)

Very few changes in the pollen assemblage are recorded within this section of the monolith. The arboreal pollen suite is almost identical to that in the underlying context, with the exception of the disappearance of elm (*Ulmus*) pollen above 0.66 m. Shrub pollen percentages increase gently from *c* 8 to *c* 14% TLP. Whilst the total percentage representation of herbaceous pollen remains more or less stable at *c* 70% TLP, fluctuations are evident in the constituents of this group. Grass family (Poaceae) pollen percentages initially recover from the slight depression at 0.8 m, reaching *c* 33% TLP at 0.55 m and 0.3 m, before declining to 22% TLP at 0.14 m. This pattern is mirrored by the increase in ribwort plantain pollen percentages from *c* 16% to *c* 23% TLP. The suite of minor herbaceous plants is much the same as that in the lowermost context. Two cereal type pollen grains were recorded, in the lowermost two spectra of the context.

Discussion

This study has demonstrated the presence of well preserved pollen throughout the sequence, in sufficiently high frequencies for interpretation. The pollen preservation would suggest that accumulation occurred stratigraphically and *in situ*, without redeposition or reworking. Nevertheless, the low sampling frequency and the low pollen sum counted reduce the capacity for interpretation.

The low representation of arboreal pollen indicates that the landscape was open prior to the formation of the feature, and the relative stability of the assemblages in the lowermost spectra suggests that the local and regional vegetation patterns were well-established. The sporadic presence of elm pollen indicates that the sediments post-date the primary (Neolithic) elm decline of *c* 5800 cal BP. Interestingly, the very low values of lime pollen could indicate the sequence post-dates the 'lime decline' which, though asynchronous, is generally of late Neolithic to middle Bronze Age date and associated with human activity (Turner 1962). Lime declines predating the early Bronze Age are also seen in pollen sequences from the Ouse palaeochannel 3.5 km to the south and Foulmire Fen Terrace 5 km to the south (Cloutman 2006a, 41; Peglar 2006, 28) although at both sites, rising water tables may have made some areas previously occupied by lime unsuitable for its growth (Evans & Hodder 2006, 26).

There are few significant changes in the pollen profile. Throughout the sequence, herbaceous pollen taxa dominate, demonstrating that an open landscape was maintained. The predominance of grass pollen accompanied by a range of grassland herbaceous plant taxa indicates that pastoral agriculture was occurring in the vicinity. The occasional presence of cereal-type pollen grains and weeds associated with agriculture, such as mugwort (*Artemisia*) and goosefoots (Chenopodiaceae) suggest that arable agriculture was occurring on the dry-land areas in the vicinity of the site. The peak in hazel pollen at 0.8 m can perhaps be interpreted as the expansion of a copse or an area of hazel scrub, although this does not appear to represent the cessation of agricultural activity. This scrubland persisted in the landscape for the duration of the time represented by the profile, although it was evidently reduced in area. Agriculture continued throughout the profile, albeit perhaps at reduced levels during the time represented by the peat (0.14m spectrum).

Whilst the nearby Ouse channel pollen profile from the fen proper shows much higher arboreal pollen percentages in Neolithic and post-Neolithic levels than that from this site (Evans and Hodder 2006, 26), the Bronze Age profile from the Delphs Terrace, a gravel fen island more directly comparable to the North Fen island, evidences a very similar pollen sequence, with grass and grassland herbs dominating, and tree and shrub pollen persisting at very low levels throughout the profile (Cloutman 2006b, 206). The profile from Foulmire Fen Terrace, another gravel fen island, is also dominated by non-arboreal pollen, but trees, principally alder, are better represented in Bronze Age levels than in either the Delphs Terrace or the North Fen profiles.

Conclusions

The evidence indicates that the sediments accumulated in an open landscape with mixed agriculture occurring in the vicinity. The expansion and contraction of a hazel copse is suggested. The pollen sequence is very similar to others accumulating in similar time periods at other gravel/sand islands within the south-west Fens.

Insects

David Smith

Sub-samples for insect analysis were taken from the two bulk samples from waterhole 1295 (contexts 1292 and 1293). The two insect faunas are very similar in their nature, and will thus be discussed together (Table 8).

The dominant feature of these faunas, perhaps not surprisingly, is the clear evidence for slow-flowing, still or even stagnant waters. The very abundant Hydraenidae *Ochthebius minimus* is commonly associated with slow-flowing shallow water and clogged with vegetation (Hansen 1986). *Hydreana britteni* is also particularly associated with shallow, shaded 'peaty' pools also clogged with vegetation (Hansen 1986). A similar environment is also favoured by the *Limnebius* and *Hydrochus* species along with the hydrophiliids *Enochrus* spp. *Cercyon convexiusculus*, *C. tristis* and *Coelostoma orbiculare* (Hansen 1986). Other areas of the waterhole may have had a more open surface; this is suggested by the presence of a range of 'diving beetles' which are normally associated with such water bodies. Species typical of this type of environment are *Agabus bipustulatus*, *Agabus* spp., *Hydroporus* spp. and *Acilus* spp. (Nilsson and Holmen 1995). There are indicators for the presence of waterside vegetation on the edges of the waterhole. This is clearly indicated by two species of 'reed beetle', *Donacia marginata* and *Plateumaris braccata*. The former is associated with branched burr-reed (*Sparganium erectum* L.) and the later with water reed (*Phragmites australis* (Cav.) Trin. ex Steud.) (Koch 1992). *Noterus acridulus* is similarly associated with reed sweet grass (*Glyceria maxima* (Hartm.) Holmb) (Koch 1992). There is also evidence to suggest that duckweed floated on the surface of the water, indicated by the presence of the small weevil *Tanysphyrus lemnae* which feeds on this plant (Koch 1992).

There are hints in the insect faunas that the waterhole may have been surrounded by rough grassland or pasture. This is primarily suggested by the small proportion of the terrestrial fauna (*c* 8–9%) which are associated with the dung pats of herbivores such as cattle and sheep. This includes the *Geotrupes* or 'dor' beetle and *Aphodius sphacelatus* and *A. fimentarius* 'dung beetles' (Jessop 1986) and the 'rove beetle' *Platystethus arenarius* (Tottenham 1972). Grassland is also suggested by the presence of the two 'chaffers' *Phyllopertha horticola* and *Hoplia philanthus* which are associated with old rough pasture (Jessop 1986). *Sitona humeralis* and the *Hypera* species of weevil are normally associated with medicks (*Medicago spp.)* and clover (*Trifolium* spp.) (Koch 1992). Both of these plants are particularly common in grassland. Rough disturbed areas are also suggested by the recovery of *Brachypertus urticae* which feeds on stinging nettle (*Urtica dioica* L.).

There are very few indicators for the presence of trees or woodlands in the area. The two taxa recovered consist of a small number of individuals of the scolydiid 'bark beetle' *Scolytus rugulosus* which is associated with a range of rosaceae shrubs and trees and a single individual of the weevil *Trachodes hispidus* which is associated with a range of dead wood (Koch 1992). It would therefore seem that the area around the waterhole was essentially clear of dense woodland, except perhaps for scrub.

It is clear from the ecology of the species recovered that this early Bronze Age waterhole was set into a cleared landscape, possibly utilised for grazing. While few other insect analyses have been carried out on comparable early Bronze Age features, analyses of faunas from waterholes within later Bronze Age field systems have been conducted at sites such as Hillfarrance, Somerset (Smith and Tetlow in press) and Perry Oaks, Heathrow (Framework Archaeology 2006). At both of these locations the later Bronze Age landscape is dominated by indicators for grassland and grazing animals. As at North Fen there is also a lack of species associated with deadwood or trees, suggesting a cleared landscape. The landscape associated with these sites is the forerunner of what appears to be pasture, most commonly identified in lowland landscapes during the Iron Age.

Soil micromorphology summary

Richard I Macphail

Five thin sections through palaeosol deposits were analysed from monolith samples 8, 9 and 11 (Fig. 5). The palaeosol can be considered as a humic sandy alluvial gley soil. This soil was bioactive, with artefacts being worked down-profile, although high water tables and the coarse parent material probably led to an acidophyle small invertebrate mesofauna being normally dominant (cf. "grey alluvial soil": Duchaufour, 1982, 187). The soil also continued to accrete; the Neolithic/Bronze Age occupation topsoil which is rich in coarse and fine artefacts, and has a microfabric rich in fine charcoal, was buried by some 55 mm of coarse alluvium in monolith 8. This upper palaeosol developed a humic Ah horizon that is poor in charcoal indicating that the site had been 'abandoned', probably because of increased flooding and site wetness, but before full blown fen peat formation commenced. Increased soil wetness resulted in the preservation of much amorphous organic matter and tissue fragments in the upper part of layer 1050 in monolith 8. The Bronze Age occupation soil (1050 lower) shows no microfeatures indicative of trampling, although there is ubiquitous evidence of burning (very fine charred organic matter, fine and coarse charcoal, and burned flints); no hearth material or strongly burned soil are present, however. Lastly, the site was eventually affected by 'permanent' high water tables, leading to fen peat and backswamp sediment formation. There is only trace evidence of later possible marine inundation, affecting the sediments, although minerals like gypsum found in the sediments overlying the palaeosol testify to the probable influence of marine inundation of the area at times.

Discussion

The discovery of significant later Neolithic/early Bronze Age activity was unexpected. Two earlier fieldwalking programmes (during the Fenland Survey and the 1996 evaluation) had produced no more than 'background' levels of worked flint across the area of the site. Small quantities of worked flint recovered from a 1996 evaluation trench adjacent to the site were thought to represent early Neolithic activity peripheral to the SUT1 flint and pottery scatter a short distance to the south (Hall 1996; Last 1996). Even the test pit survey immediately prior to the stripping of the site produced a largely undiagnostic flint assemblage that did not clearly announce the character of the site. The failure to identify the later Neolithic/early Bronze Age occupation prior to stripping of the site is sobering, and might hint that the paucity of settlement of this period identified in the wider Sutton/Chatteris area during the Fenland Survey (Hall 1992; 1996) does not reflect the true situation.

A buried soil 'occupation horizon' survived across most of the site. Though a minor element of late Mesolithic/early Neolithic flintwork was present, finds from the buried soil were dominated by flint and pottery of later Neolithic/early Bronze Age date. The fragmented and abraded condition of the pottery suggests that it had been discarded on the ground surface and exposed to trampling and weathering, rather than being deposited within midden heaps. The buried soil was rich in fine charcoal, suggesting that hearths had existed on the ground surface, but the scant quantities of charred cereals and hazelnut shell recovered from the bulk samples provide little indication that large-scale food processing took place on the site. A few shallow pits and hollows were associated with the buried soil, typical of the amorphous features generally found on settlements of this date (Bamford 1982; Healy 1988; 1996; French and Pryor 2005). More unusual for a site of this period were two large waterholes, one with an *in-situ* wooden revetment structure. Pollen, macroscopic plant remains and insects from this latter feature provide a picture of an open, grassland-dominated landscape, with dung beetles and nitrogen-loving plants suggesting the presence of livestock (see D Smith, W Smith and Verrill above).

The later Neolithic/early Bronze Age activity clearly spans a significant time period. The ceramics from the buried soil include Impressed Ware (*c* 3400–2500 BC), Grooved Ware (*c* 3000–2000 BC), Beaker (*c* 2500–1700 BC) and possible Food Vessel (*c* 2100–1500 BC), suggesting that occupation took place over a minimum period of *c* 400 years (Garwood 1999; Gibson and Kinnes 1997; Healy 1995). There was no clear spatial patterning to the distribution of these different pottery types across the site. Prolonged or repeated occupation of the site is supported by the radiocarbon evidence. Two samples of charred material from the buried soil produced non-overlapping date ranges of 2397–2139 cal BC and 2132–1921 cal BC at 95% probability (Table 1). The infilling of waterhole 1199 is dated to 2194–1979 cal BC by a radiocarbon sample from its upper fill, and the timber revetment structure of waterhole 1295 is dated to 2014–1776 cal BC. Both waterholes could therefore have been contemporary with the period of occupation of the site implied by the radiocarbon dates from the buried soil. There is a strong possibility, however, that waterhole 1295 was late in the sequence, or perhaps even constructed after the main period of occupation had ended. At the 68% probability level, the radiocarbon date range from this feature is later than the other three radiocarbon determinations from the site, with no overlap (Table 1).

The most reasonable interpretation of the site is that it saw a number of separate episodes of occupation through the later Neolithic and early Bronze Age. There is a general acceptance that this period was characterised by shifting patterns of settlement, though the rhythm of this movement through the landscape is a matter of debate. Brück (1999) argues for fairly mobile settlement, with people moving through the landscape on a seasonal basis, coming together and dispersing at different times of the year. Discussing the evidence from the Lower Welland Valley, French and Pryor (2005, 166) similarly suggest a "mobile and transitory" occupation pattern, with seasonal movements between the higher ground and the floodplain. A slightly different view is taken by Healy (1996, 180), who argues that the evidence from around the Wissey Embayment on the south-eastern fen edge implies shifts of settlement location "at intervals of years or decades".

There may have been a complex pattern of movement through the landscape, with periodic shifts in place of residence (whether over intervals of a few weeks or several years) accompanied by daily cycles of routine offsite 'tasking', for purposes such as taking livestock to pasture, hunting, food gathering and collecting raw materials. This perspective allows us to see North Fen less as a discrete 'settlement site', and more as a window into part of a palimpsest landscape created by numerous episodes of settlement and brief task-specific visits (Edmonds *et al*. 1999). The fact that the site seems to have been returned to on several occasions suggests that it was to some extent a favoured location. However, intrusive investigation elsewhere on the North Fen island would be required to gauge the degree to which the site really was a local focus for activity. Comparison can be made with the late Neolithic/'Beaker period' site on the southern edge of the Chatteris island at Stocking Drove Farm (CHA37), 700 m to the north-west. Test pit evaluation here produced worked flint at a density of 1.8 per m^2, compared with only 0.7 flints per m^2 for the test pitting at North Fen, or 0.4 per m^2 for the gridded excavation of the buried soil. This could suggest that the Stocking Drove Farm site saw more repetitive or intense occupation than North Fen. The densities of finds from North Fen also seem unspectacular in comparison with many broadly contemporary sites elsewhere in the wider Fenland region, particularly the very rich later Neolithic/early Bronze Age sites known along the south-eastern fen edge (Healy 1996; Edmonds *et al*. 1999).

The character of the flint assemblage provides some insight into the activities carried out at the site. Overall, the assemblage contains a low proportion of debitage and shows a lack of refits, suggesting relatively little *in-situ* flint knapping. The proportion of formal tools – particularly scrapers – is high, as is often the case at later Neolithic/early Bronze Age sites (Cleal 1984; Garrow 2006). The distributions of the various flint types show some spatial patterning (Figs 14–20). Particularly notable is the compact spread of flint in and around hollow 1209 ('flint zone A'), which included high concentrations of scrapers and other finished tools, and low quantities of cores and knapping waste. Despite comprising only 36% of the flint from the site, this small area produced 73% of the scrapers and the clear majority of the knives, notches, piercers, fabricators and retouched flakes. This cluster of material may relate to a specific episode of activity centred on the hollow, perhaps with an emphasis on hide, bone and/or wood working. The 'Beaker-type' character of the flint assemblage from this area (see Lamdin-Whymark above) and presence of Beaker sherds from hollow 1209 provide chronological indicators for this episode. Meanwhile, serrated flakes show a quite different distribution, being widely dispersed across the site, with only a single example from flint zone A. This suggests episodes of plant harvesting or processing unrelated to the activity around hollow 1209. Also of note is the fact that all three of the arrowheads from the site were found close together in the north-east corner of the site (Fig. 20). These could derive from a single event, perhaps a visit by a hunting party.

Clearly, though, there are dangers in interpreting the artefact distributions from the site in such a straightforward manner. Simply because most of the finds were recovered from a buried soil does not necessarily mean that they form an unaltered record of *in situ* activity; routine site maintenance and practices of selective deposition are likely to influenced artefact distributions. The possibility that some of the artefacts from the site represent deliberate, 'placed' or ritualised deposits should be acknowledged, even though such deposits are more normally associated with pit contexts (eg Garrow 2006). The complete flint dagger (Fig. 11) could fall into this category, given that these objects are very rare from occupation sites and more usually found in mortuary contexts, implying that they were highly valued (Myers 2005). The human cranium and long bone fragments from the upper fill of waterhole 1199 could also have been deliberately deposited, perhaps to mark the decommissioning of this feature. Human bone fragments have been found at a number of other late Neolithic/early Bronze Age occupation sites around the fen edge (Healy and Housley 1992, 953), suggesting that the curation of such relics was a fairly common practice.

The role of the two waterholes is important to understanding the inhabitation of this site. Clearly, these features show a desire to control and manage the supply of water, though whether this was for the use of people, livestock or both is a moot point. It is difficult to demonstrate a direct association between the waterholes and the 'occupation' activity at the site; both waterholes were peripheral to the artefact scatters in the buried soil, and themselves produced very few finds. Given the environmental evidence for pasture from waterhole 1295, it would be tempting to assume that the waterholes were associated with livestock, and could therefore have been in use during periods when the site was not settled *per se* but used as grazing land. Arguing against this is that fact that the timber-revetted platform within waterhole 1295 seems unsuited for use by livestock (see Goodburn above), suggesting that the feature is in fact more likely to have provided water for human use. However one views the function of these waterholes, the key point is that they imply an *investment* by a community or family group in a particular place which they had (or claimed) long-term rights to, and either used continuously or returned to regularly over a period of several years.

The secure early Bronze Age date of waterhole 1295 appears to make it the earliest certain feature of this kind yet identified in the region. The one possible early Bronze Age parallel is a timber-revetted waterhole from the Glinton-Northborough Bypass excavations in the Lower Welland Valley; this produced a radiocarbon date of 1920–1650 cal BC, but its dating is confused by the large fragments of later Bronze Age pottery also recovered from the feature (French and Pryor 2005). It has previously been argued that waterholes were a later Bronze Age innovation, closely related to the adoption of more permanent modes of settled farming at that time (Evans 1999). The waterholes at North Fen raise questions of the extent to which this later Bronze Age 'settling down' had its roots in developments during the early Bronze Age.

A puzzle thrown up by the Fenland Survey was the contrast between the numerous clusters of early Bronze Age round barrows in the Chatteris/Sutton area – including five barrows on the North Fen island itself – and the apparent paucity of contemporary settlement evidence (Hall 1992; 1996). The excavations reported here may help to redress this balance, though a connection between the people who occupied this site and those buried in the barrows is difficult to prove at present. The one barrow in the area excavated to date – SUT7, 300 m to the north – produced a primary burial associated with Collared Urn pottery and radiocarbon dated to 1880–1670 cal BC (Aileen Connor, this volume). The burial therefore probably post-dates most of the activity at North Fen, though it could possibly have been contemporary with the use of waterhole 1295. Frustratingly, a 'domestic' context for the barrow builders remains elusive.

Occupation of this low-lying gravel island is likely to have become increasingly difficult by the mid 2nd millennium BC. The occupation horizon was overlain by an alluvial layer containing little evidence of human activity, indicating abandonment of the site under conditions of increased wetness and flooding (see Macphail above). This was followed by peat formation as the island was lost to the fen, probably during the later Bronze Age and Iron Age (Hall 1996; Waller 1994).

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Table 1. Radiocarbon dates. Calibrated dates have been generated with Oxcal v4.0 (Bronk Ramsey), using the INTCAL04 dataset (Radiocarbon 46, 2004).

Lab. no.	**Context**	**Radiocarbon age**	**δ^{13}C (‰)**	**Material**	**Calibrated date (68.2% probability)**	**Calibrated date (95.4% probability)**
OxA-19050	1122 (buried soil 1050, Area 1)	3640 ± 29	-24.63	Charcoal (Maloideae)	2108–1951 cal BC	2132–1921 cal BC
OxA-19051	1308 (waterhole 1295)	3559 ± 29	-25.19	Wooden stake (*Alnus glutinosa*)	1951–1880 cal BC	2014–1776 cal BC
OxA-19107	1009 (waterhole 1199)	3690 ± 27	-21.03	Human cranium fragment	2134–2033 cal BC	2194–1979 cal BC
OxA-19133	1289 (buried soil 1050, Area 3)	3806 ± 31	-25.22	Charred hazel nutshell	2291–2200 cal BC	2397–2139 cal BC

Table 2. *The flint assemblage by category type and zone*

	Zone					
Category type	**A**	**B**	**C**	**D**	**Unlocated**	**Total**
Flake	78	57	6	102	22	265
Blade	2	2	1	8	1	14
Bladelet	1	7		3	1	12
Blade-like flake	3	1		13	2	19
Irregular waste	5	8	1	7	3	24
Chip	1	6				7
Rejuvenation flake core face/edge					1	1
Rejuvenation flake tablet				1		1
Janus flake (thinning)				1		1
Flake from ground implement	2	1		1		4
Tested nodule/bashed lump				2		2
Single platform flake core	2	1		2		5
Multiplatform flake core	3	2	2	2		9
Core on a flake		1				1
Unclassifiable/fragmentary core		2		1		3
Barbed and tanged arrowhead		1				1
Triangular arrowhead		2				2
End scraper	7	1				8
Side scraper	10	1		1		12
End and side scraper	6	1		3	1	11
Disc scraper	2			1		3
Thumbnail scraper	5	1				6
Scraper on a non-flake blank	1			1		2
Other scraper	9	2	1	2		14
Piercer	4		1	1		6
Serrated flake	1	3	5	7		16
Notch	5		1	2	1	9
Backed knife	1			1		2
Other knife	4	1		1		6
Retouched flake	18	5	2	9	2	36
Fabricator	2			1		3
Dagger				1		1
Pick					1	1
Misc. retouch	1			3	1	5
Hammerstone					2	2
Total	173	106	20	177	38	514

Burnt unworked flint (g)					42/ 275	42/ 275
No. of burnt worked flints (%)*	5 (2.9)	5 (5)		11 (6.2)	1 (2.6)	22 (4.3)
No. of broken worked flints (%)*	36 (20.9)	26 (26)	8 (40)	55 (31.1)	14 (36.8)	139 (27.4)
No. of retouched flints (%)*	76 (44.2)	18 (18)	10 (50)	34 (19.2)	6 (15.8)	144 (28.4)
No. of flakes per core	16.8	11.2	3.5	18	26+	15.5
% of blades and bladelets in the flake assemblage *	3.6	13.4	14.3	8.7	7.7	8.4

* Percentage excludes chips

Table 3. *Scrapers by form and sub-form*

Scraper type	Sub-Form	Total
End scraper	Double end	1
	Horseshoe <180° retouch	2
	Kite-shaped	3
	Parallel sided	6
	Irregular	1
Sub total		*13*
End and side scraper	'D'- shaped 180°-270° retouch	6
	Parallel sided	2
	Unclassifiable	1
Sub total		*9*
Side scraper	Double side	2
	On a flake	8
	Unclassifiable	1
Sub total		*11*
Thumbnail scraper	'D'- shaped 180°-270° retouch	4
	Oval 270°-359° retouch	1
	Oval 360° retouch	1
Sub total		*6*
Disc scraper	Circular - 360° retouch	2
	Oval 270°-359° retouch	1
Sub total		*3*
Other scraper	Irregular	9
	Denticulate	1
	Unclassifiable	2
	Scraper on a non-flake blank	2
Sub total		*14*
Grand Total		56

Table 4. *The proportions of broad artefact/debitage types in relation to Beaker pit deposits from elsewhere in East Anglia*

Area	**Cores**	**Blades/ flakes**	**Hammer -stones**	**Serrated flakes**	**Scrapers**	**Arrowheads**	**Other tools**
East Anglian Beaker pits (Garrow 2006, 129)	5.8%	78.1%	0	3.8%	11.2%	0.1%	1.1%
North Fen combined	3.9%	67.7%	0.4%	3.1%	10.9%	0.6%	13.4%
Zone A	2.9%	53.2%	0	0.6%	23.1%	0	20.2%
Zone B	5.7%	77.4%	0	2.8%	5.7%	2.8%	5.7%
Zone C	10%	40%	0	50%	5%	0	20%
Zone D	4%	76.8%	0	4%	4.5%	0	10.7%

Table 5. *Pottery*

Fabric	**No. sherds**	**Weight (g)**	**% no. / weight**
unidentified	7	1	3 / 2
C1	1	20	0.4 / 3.5
F1	27	171	11 / 30
F2	34	103	14 / 18
G1	108	173	45 / 30
G2	19	59	8 / 10
Q1	22	5	9 / 1
Q2	23	44	6 / 7
Total	*241*	*576*	
Fired clay	141	189	

***Table 6**. Waterlogged plant remains (excluding wood) from waterhole 1295. Key for semi-quantitative scores: + = 1-3, ++ = 4-9, +++ = 10 - 20, ++++ = 21 - 40, +++++ > 40. Habitat Codes: Co = Copse, Cu = cultivated ground, Dg = Damp ground, F = Fen, G = grassland, Gw = wet grassland, He = Hedges, M = marsh, O = open ground, W = water plant, Wa = waste ground, Wb = Woodland border, Wo = Woodland, Ws = waterside, Typ = typically and V = variable habitats*

Sample Number	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**		
Context Number	**1292**	**1293**	**1293**	**1293**	**1292**	**1292**	**1292**	**1291**	**1291**		
Depth from top of feature (cm)			**80–90**	**70–80**	**50–60**	**40–50**	**30–40**	**20–10**	**10–0**		
Latin Binomial										**Habitat(s)**	**Common Name**
Ranunculus acris L./ *repens* L./ *bulbosus* L.	++	++			+	+		+		G to Gw and/or M	meadow/ creeping/ bulbous buttercup
Ranunculus subgenus RANUNCULUS							+			G to Gw and/or M	buttercup
Ranunculus subgenus BATRACHIUM (DC) A. Gray	+++	++	++	+	+++	+++	++++	+	+	Gw to Ws and/or W	crowfoot
cf. *Aquilegia vulgaris* L.				+						Gw, F & Wo	columbine
Urtica dioica L.	++	+	+	+	++	+	+++	+		V esp. Wo, F and Cu	common nettle
Chenopodium spp.	+	++	+	+	+	+	+	+			goosefoot
Chenopodium spp./ *Atriplex* spp.	+										goosefoot/ orache
Atriplex spp.	+						+				orache
Stellaria media s.l.	++	+	+	+	+	+	+			Cu and O	common chickweed
Cerastium spp.		+		+	+					Typ. G	mouse-ear
Lychnis flos-cuculi L.	+									Gw and/or M	ragged-robin
Silene spp.	+										campion
CARYOPHYLLACEAE											Pink Family
Persicaria lapathifolia (L.) Gray		+	+	+			++			Wa, Cu and O, esp Dg	pale persicaria
Persicaria spp.	+	+	+	+	+	+	++	+			knotweed
Polygonum aviculare L.	+			+		+	+			O	knotgrass
Polygonum spp.	+			+				+			knotgrass
Rumex spp.	++	++	++	++	+++	+++	+++	+		Typ G	dock
cf. Rorippa nasturtium-aquaticum (L.) Hayek	+			+						Ws and/ or W	water-cress
Rubus spp.	++	+	+	+	+	++	+++	+		Typ of Wa	bramble
Prunus avium (L.) L./ *cerasus* L.			+							He, Wb and/or Co	wild or dwarf cherry
Chaerophyllum temulum L.	+									G, He and/or Wb	rough chervil
Torilis japonica (Houtt.) DC		+								G, He and/or Wb	upright hedge-parsley
cf. *Stachys* spp.										V esp. G, He and Wo	woundwort
Galeopsis spp.		+	+	+					+	Typ Dg	hemp-nettle
cf. *Prunella vulgaris* L.					+						possible selfheal
Lycopus europaeus L.		+									gypsywort
LAMIACEAE – *Mentha* spp. type	+		+								Mint Family - mint seed type
LAMIACEAE – unidentified			+								Mint Family
Callitriche spp.	+	+					+++			Typ W, but also Ws	water-starwort
Plantago major L.	+			+	+					O, G or Cu	greater plantain
Sambucus nigra L.	+	+			+	+				He, Wo & Wa	elder
Carduus spp./ *Cirsium* spp./ *Centaurea* spp. – seed head			+							Typ G	thistle/knapweed
Cirsium spp.		++				+	++			Typ G	thistle
Lapsana communis L.	+				+					Wo, He and Wa	nipplewort
Sonchus spp.		+								Typ of Wa and Cu	sow-thistle
Juncus spp.	+++	+++	+	++	+++	++++	+++++	++	+++	Typ of Gw, Gw	rush
Schoenoplectus lacustris (L.) Palla/ *tabernaemontani* (C.C. Gmel.) Palla						+	+		+	W and/or M	common/grey club-rush
Carex spp. – 2-sided		+			+	+	+			Typ Dg, Gw or M	sedge
Carex spp. – 3-sided	+		+		+	++	+	++	+	Typ Dg, Gw or M	sedge
Glyceria spp.		+				+				Ws	sweet-grass
POACEAE – indeterminate			+								Grass Family –

large grass caryopsis											indeterminate
POACEAE – indeterminate medium grass caryopsis			+				+				Grass Family – indeterminate
POACEAE – indeterminate small grass caryopsis					+						Grass Family – indeterminate
Unidentified – bud	+	+	+	+		+		+			Unidentified – large buds
Unidentified – bud scars	++	++	+								
Unidentified - vegetative material (grass/ plant stalks)	++++	+++++									Unidentified – bud scars

***Table** 7. Pollen data from waterhole 1295. All numbers are percentages of total land pollen*

Sample	**Depth m**	**0.14**	**0.30**	**0.55**	**0.80**	**0.86**	**0.96**
Tree pollen %		16.4	14.9	21.6	13.6	9.7	20.6
Shrub pollen %		13.6	12.3	8.4	27.7	2.1	4.2
Herb pollen % (incl. Cereal type)		69.9	73.4	70.1	58.6	88.5	74.8
Spores %		2.1	2.5	2.4	1.4	0.7	8.3
TLP (minus spores and aquatics)		140	285	167	213	145	96
Trees							
Alnus glutinosa	Alder	5.7	3.2	6.6	5.6	2.8	3.1
Betula	Birch	5	5.6	6	3.8	1.4	8.3
Fagus	Beech		0.4				1
Fraxinus excelsior	Ash	0.7	0.4	1.2		0.7	
Pinus sylvestris	Pine		0.4	1.2		0.7	1
Quercus	Oak	3.6	4.2	6	2.8	3.4	5.2
Tilia	Lime	1.4	0.7	0.6	0.5		1
Ulmus	Elm				0.9	0.7	1
Shrubs							
Corylus avellana type	Hazel	13.6	11.2	7.8	27.2	2.1	4.2
Hedera	Ivy				0.5		
Ilex	Holly		0.7	0.6			
Salix	Willow		0.4				
Crops							
Cereal type			0.7	0.6		0.7	1
Herbs							
Apiaceae	Cow parsley family	2.1	1.8	1.2			
Artemisia	Mugwort	0.7					
Carypohyllaceae	Pink family		3.9	0.6	0.9	0.7	3.1
Chenopodiaceae	Goosefoot family	1.4	2.5			2.1	
Cardueae (Asteroideae)	Daisy family	0.7	0.4			2.1	1
Cyperaceae	Sedge family	1.4	1.4	3.6	0.9	2.1	1
Filipendula	Meadowsweet					1.4	
Hypericum	St John's Wort				0.5	0.7	
Lactuceae	Dandelion type	2.9	1.8	3	2.8		2.1
Melampyrum	Cow-wheat	1.4	0.4	0.6	0.5		
Persicaria maculosa	Redshank		0.4				
Plantago lanceolata	Ribwort plantain	23.6	11.6	16.2	9.4	11	12.5
Plantago und.	Plantain	5	4.9	3	6.1	3.4	5.2
Poaceae	Grass family	22.9	34.7	32.3	27.2	54.5	36.5
Potentilla type	Cinquefoil type			1.2	0.5		
Ranunculus sp	Buttercup	2.1	3.5	1.2	4.2	2.1	3.1
Rosaceae und.	Rose family	2.9	2.8	1.8	2.3	2.1	1
Rubiaceae	Bedstraw family		0.4			2.1	
Rumex type	Dock	1.4	0.4	1.2		1.4	1
Saxifraga und.	Saxifrage		0.7	1.8	1.4		
Succisa pratensis	Devil's-bit Scabious			1.2	1.4	0.7	3.1
Teucrium	Germanders					0.7	
Trifolium	Clover		1.1		0.5	0.7	2.1
Urtica	Nettle	1.4		0.6			2.1
Pteridophytes							
Sphagnum							1
Polypodium	Polypody fern						1
Pteridium aquilinum	Bracken		1.1	0.6		0.7	2.1
Pteropsida (monolete) indet.	Ferns	2.1	1.4	1.8	1.4		4.2
Aquatics							
Lemna	Duckweed				0.5		
Indeterminates		3.6	14.4	10.8	10.3	11	7.3
Microscopic charcoal		110	110.9	98.8	98.1	113.1	285.4

Table 8. *Insect remains from waterhole 1295*

Sample no.	**Ecological codes**			**Phytophage host plants (Koch 1989; 1992).**
Feature		1295	1295	
Context		1292	1293	
Sample number		32	33	
Sample volume (l.)		8	16	
Sample weight (Kg.)		9	18.5	
DERMAPTERA				
Forficulidae				
Forficula auricularia (L.)		-	2	
HEMIPTERA				
Family, genus and spp. Indet.		-	12	
COLEOPTERA				
Carabidae				
Nebria brevicollis (F.)		1	-	
Loricera pilicornis (F.)		1	1	
Clivina fossor (L.)		1	1	
Dyschirus globosus (Hbst.)		1	1	
B. guttula (F.)		-	1	
Bembidion spp.		1	1	
Stenolophus mixtus (Hbst.)	ws	1	-	
Pterostichus minor (Gyll.)	ws	-	1	
Dromius longiceps Dej.		-	1	
Halididae				
Haliplus spp.	a	-	1	
Dytiscidae				
Hydroporus spp.	a	-	1	
Agabus bipustulatus (L.)	a	1	-	
Agabus spp	a	-	3	
Acilius spp.	a	-	1	
Gyrinidae				
Gyrinus spp.	a	-	1	
Hydraenidae				
Hydreana britteni Joy	a	1	-	
Hydreana spp.	a	-	2	
Ochthebius bicolon Germ.	a	-	1	
Ochthebius minimus (F.)	a	24	83	
Octhebius spp.	a	30	120	
Limnebius spp.	a	1	6	
Hydrochus spp.	a	-	1	
Helophorus spp.	a	5	16	
Hydrophilidae				
Coelostoma orbiculare (F.)	a	1	1	
C.impressus (Sturm)	df	1	-	
Cercyon tristis (Ill.)	ws	-	1	
Cercyon convexiusculus Steph.	ws	1	-	
Megasternum boletophagum (Marsh.)	df	2	2	
Hydrobius fusipes (L.)	a	-	2	
Enochrus spp.	a	3	5	
Silphidae				
Phosphuga atrata (L.)	df	-	1	
Silpha tristis Ill.		-	1	
Orthoperidae				
Corylophus cassidoides (Marsh.)		-	1	
Staphylinidae				
Micropeplus staphylinoides (Marsh.)		1	2	
Lesteva spp.	ws	1	2	

Trogophloeus bilineatus (Steph.)		-	3	
Trogophloeus corticinus (Grav.)	ws	7	-	
Trogophloeus spp.		-	2	
Oxytelus sculptus Grav.		-	1	
Oxytelus rugosus (F.)		-	1	
Oxytelus nitidulus Grav.		2	1	
Oxytelus tetracarinatus (Block)		-	1	
Platystethus arenarius (Fourc.)	df	-	2	
Platystethus corntus (Grav.)	ws	4	-	
Bledius spp.	ws	-	1	
Stenus spp.		5	4	
Paederus spp.		-	1	
Lathrobium spp.		-	1	
Xantholinus spp.		2	2	
Philonthus spp.		-	2	
Philonthus spp.		2	-	
Tachyporus spp.		-	1	
Tachinus rufipes (Geer.)		-	1	
Aleocharinidae Genus & spp. Indet.		5	6	
Pselpahidae				
Rybraxis sp.		1	-	
Brachygluta spp.		1	3	
Cantharidae				
Cantharis sp.		-	1	
Rhagonycha fulva (Scop.)		-	1	
Elateridae				
Agroties spp.	p	1	1	
Helodidae				
Helodidae Gen. & spp. Indet**.**	a	-	1	
Dryopidae				
Dryops spp.	a	-	2	
Byrrhidae				
Byrrhus pilula (L.)		-	1	
Nitidulidae				
Brachypterus urticae (F.)	p	1	*1*	*Urtica dioica* L. (stinging nettle)
Cryptophagidae				
Atomaria spp.		-	1	
Lathridiidae				
Corticaria/ corticarina spp.		-	2	
Coccinellidae				
Adalia bipunctata (L.)		-	1	
Platynaspis luteorubra (Goeze)		-	1	
Mordellidae				
Anaspis spp.		1	-	
Scarabaeidae				
Geotrupes spp.	df	-	1	
Aphodius sphacelatus (Panz.)	df	2	4	
Aphodius fimentarius (L.)	df	2	-	
Phyllopertha horticola (L.)	p	-	1	
Hoplia philanthus (Fuessl.)	p	-	1	
Chyrsomelidae				
Donacia marginata Hopp	ws	1	-	*On Sparganium erectum* L. (branched burr-reed)
Plateumaris braccata (Scop.)	ws	1	-	*Phragmites australis* (Cav.) Trin. ex Steud. (water reed)
Hydrophassa marginella (L.)	ws	-	*1*	Often *Caltha palustris* L. (Marsh marigold)
Phyllotreta spp.		1	2	
Chaetocnema concinna (Marsh.)		1	-	
Psylliodes sp.		-	1	

Scolytidae				
Scolytus rugulosus (Müll.)	l	1	4	
Cuculionidae				
Apion spp.	p	-	2	
Barypeithes spp.		1	1	
Strophosoma melanogrammum (Forst.)	p	-	1	
Sitona humeralis Steph.	p	-	1	Often on medicks (*Medicago*) and clover (*Trifolium*)
Sitona spp.		1	-	
Bagous spp.	ws	1	-	
Tanysphyrus lemnae (Payk.)	a	2	*1*	*Lemna* spp. (Duckweed)
Notaris acridulus (L.)	ws	-	1	Often on *Glyceria maxima* (Hartm.) Holmb. (reed sweet-grass) and other *Glyceria* species (sweet-grasses)
Trachodes hispidus (L.)	l	-	1	deadwood of range of hardwood trees
Hypera spp.	p	-	1	Mainly *Trifolium* spp. (Clover)
Ceutorhynchus spp.	p	-	1	
Family, genus & spp. indet.				
SUBORDER CYCLORRHAPHA				
Family, genus & spp. indet.		9	30	
HYMENOPTERA				
Formicoidea Family Genus and spp. indet.		5	15	

Ecological groupings

a - aquatic species
aff - aquatic species normally associated with fast flowing water
ws - waterside species either from muddy banksides or from waterside vegetation
m - species normally associated with moorland
df - species associated with dung and foul matter
g - species associated with grassland and pasture
l - species either associated with trees or with woodland in general

List of figures

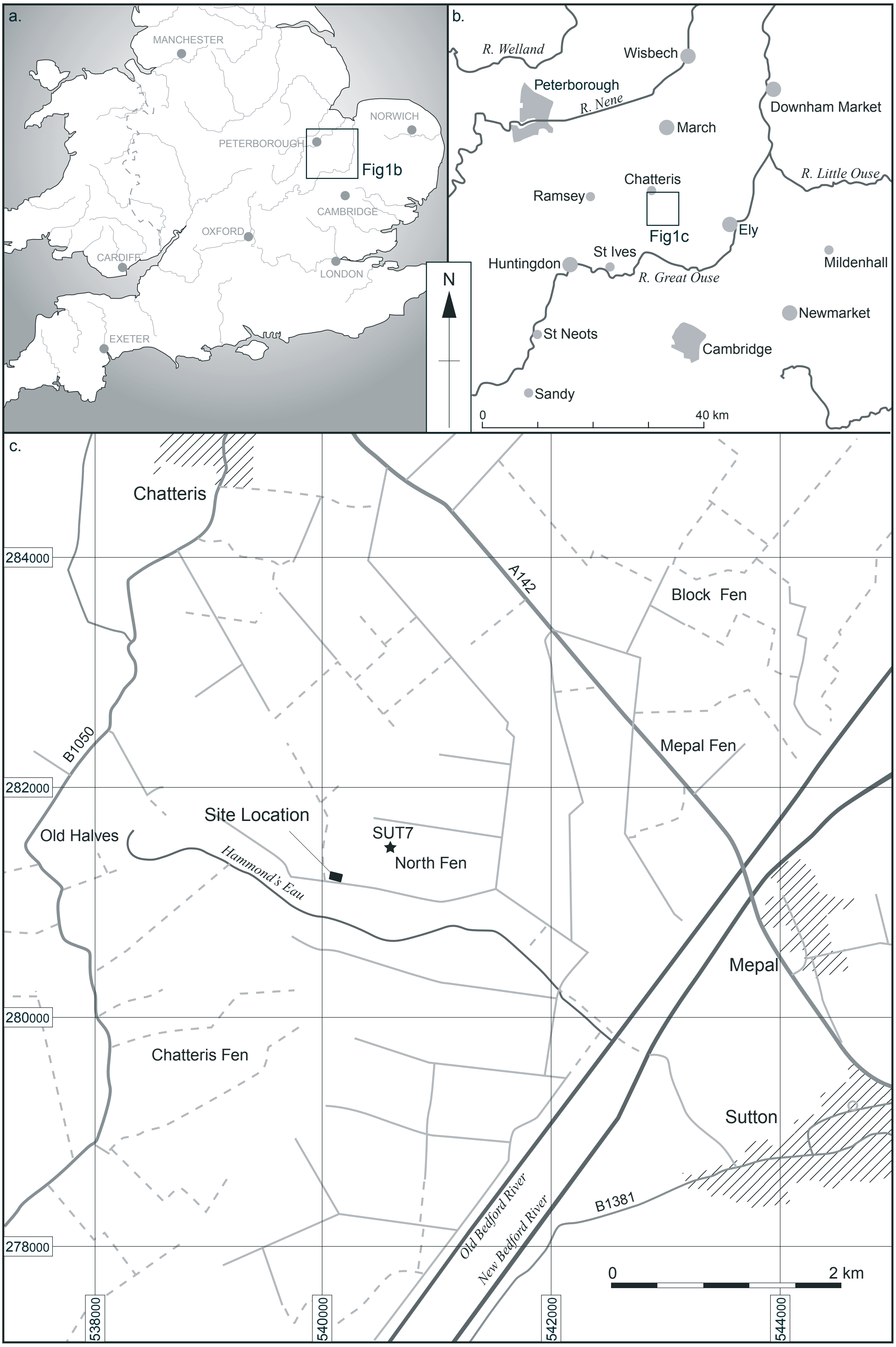


Figure 01: Site Location

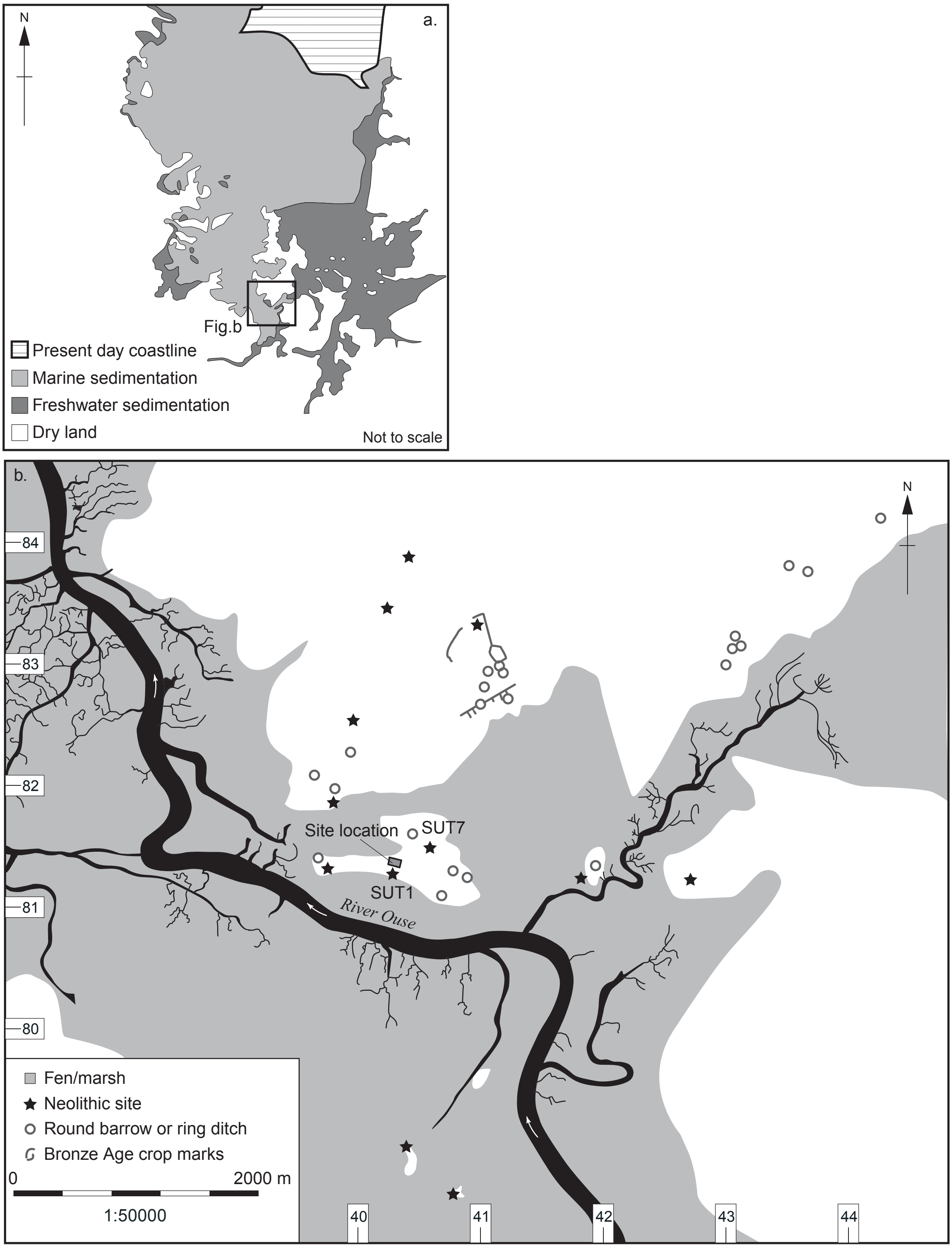


Figure 2: The Neolithic and Bronze Age landscape

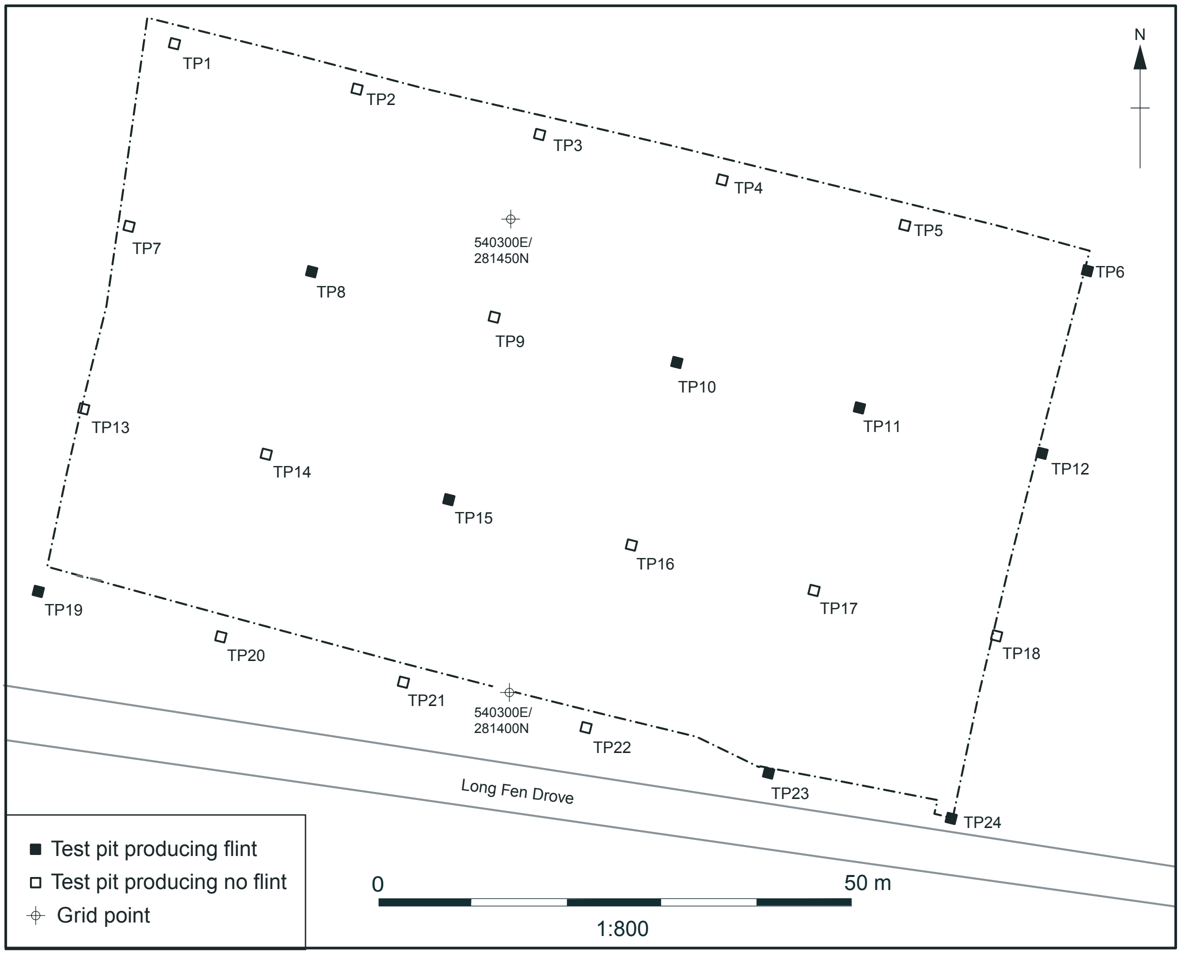


Figure 03: Location of test pits

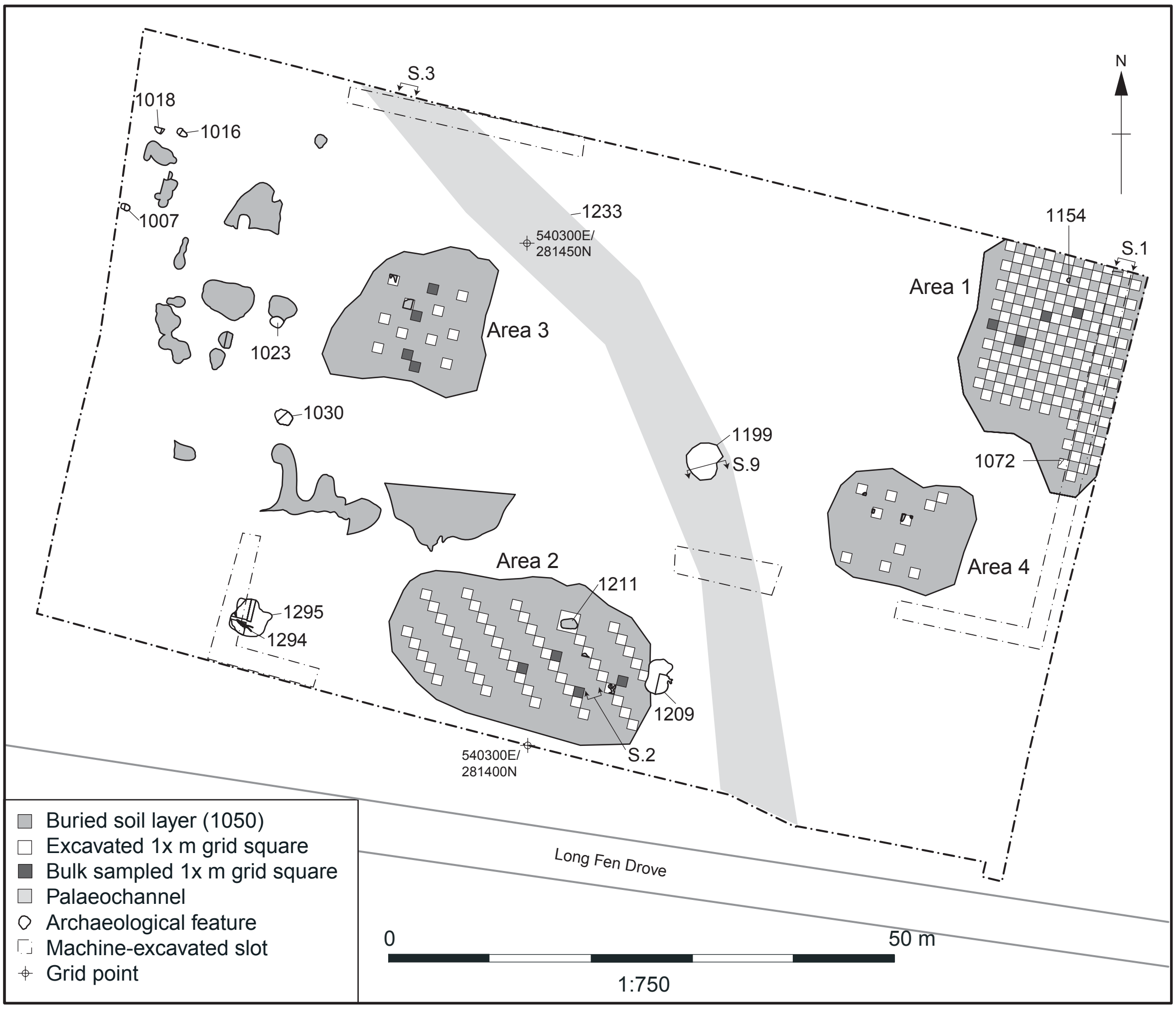


Figure 04: Site plan

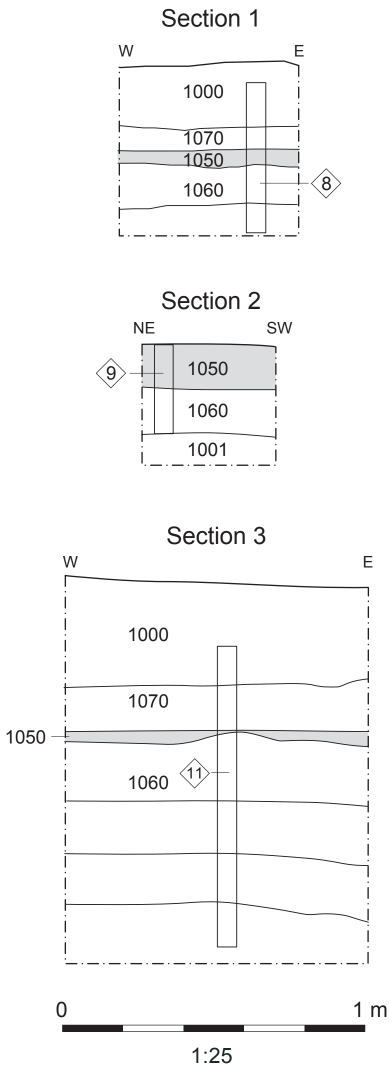
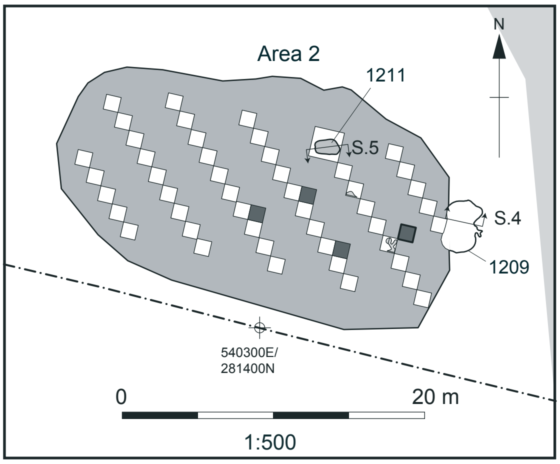


Figure 05: Sections through buried soil sequence



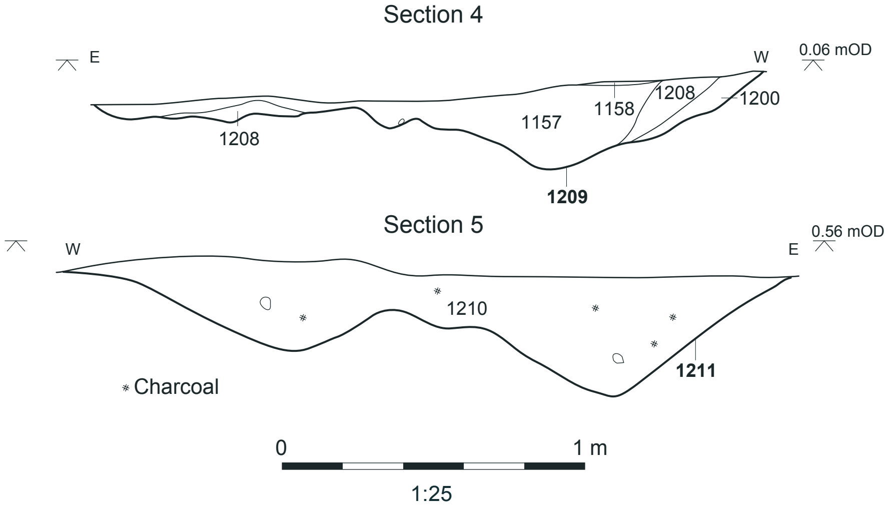


Figure 06: Hollow 1209 and Pit 1211

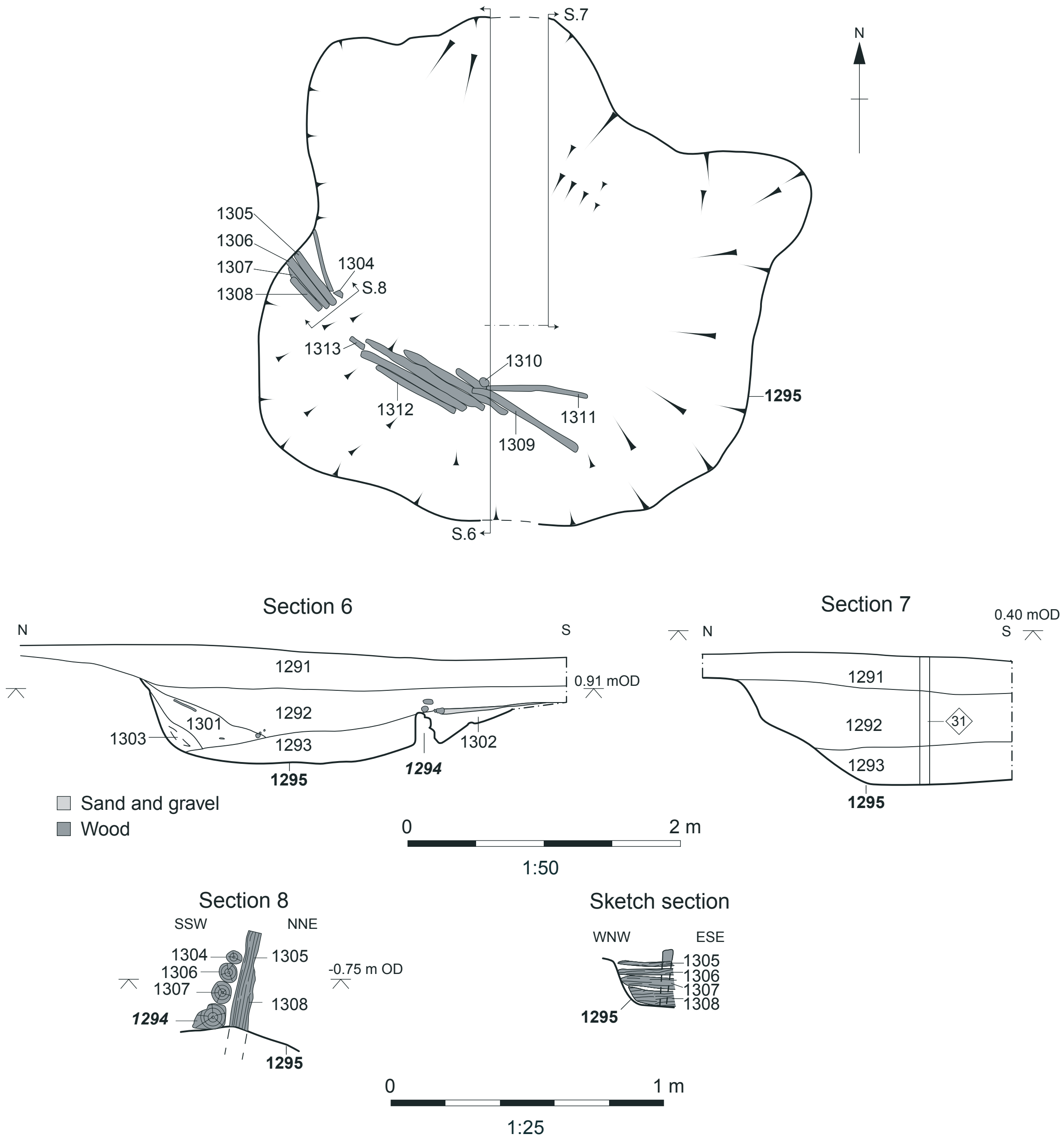


Figure 07: Waterhole 1295

Figure 08: Revetment structure 1294 within waterhole 1295. Scale 1m

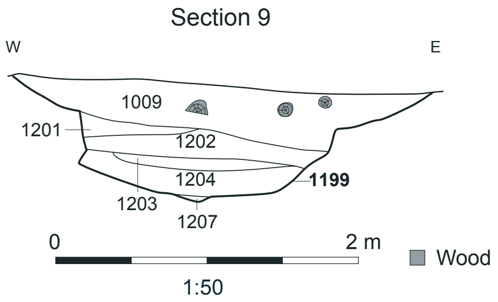


Figure 09: Section through Waterhole 1199

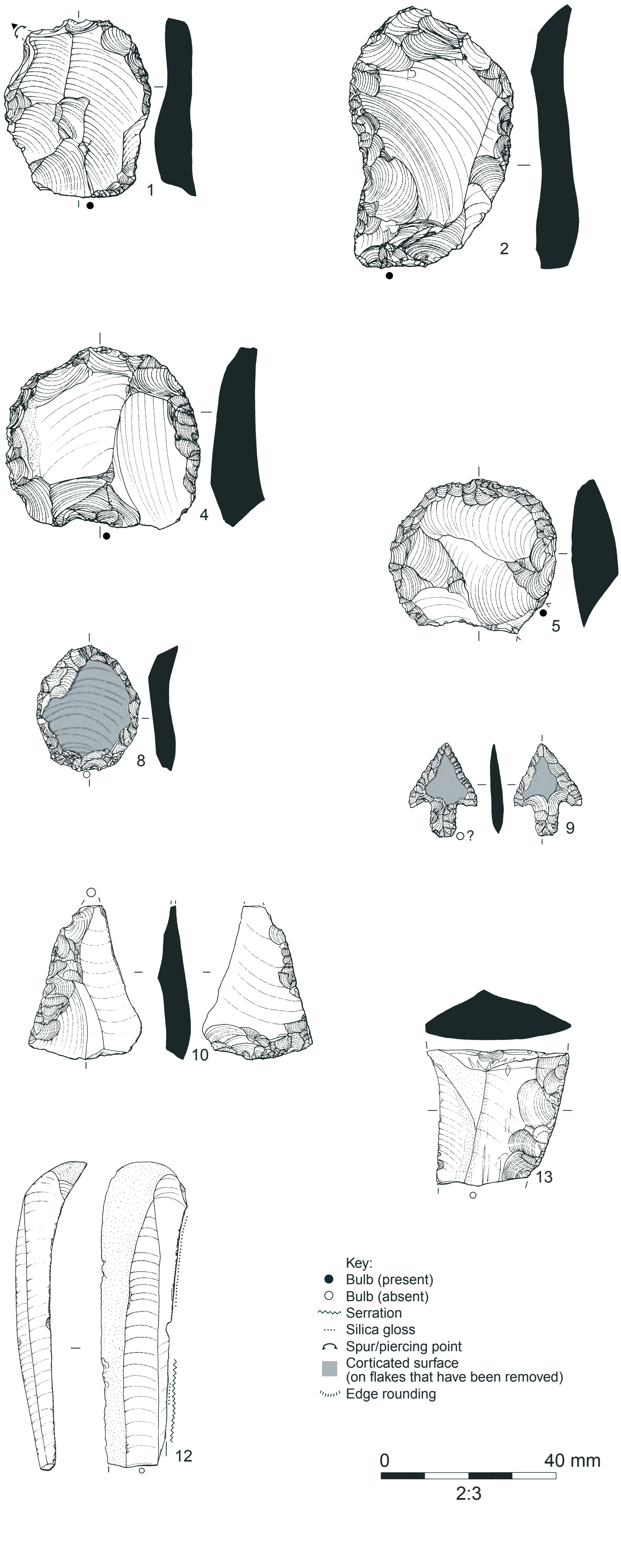


Figure 10: Worked flint, nos 1-14

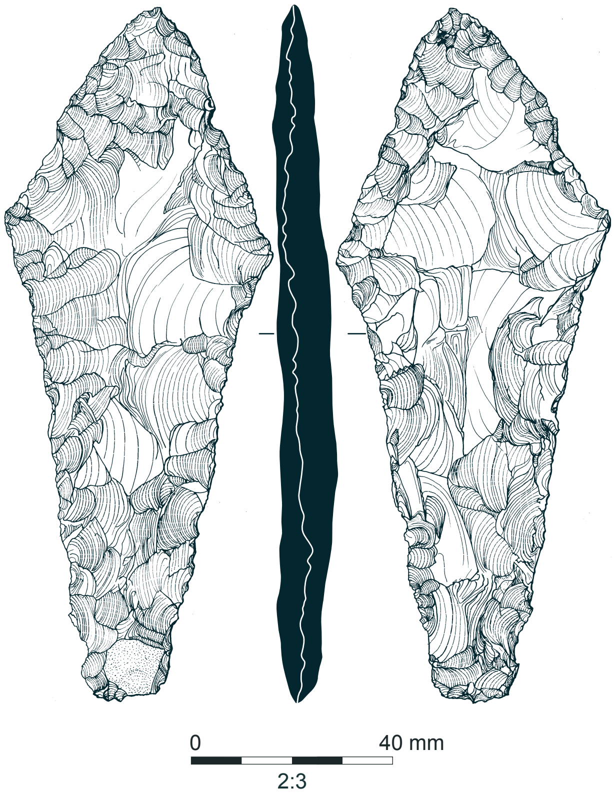


Figure 11: Worked flint, no. 15

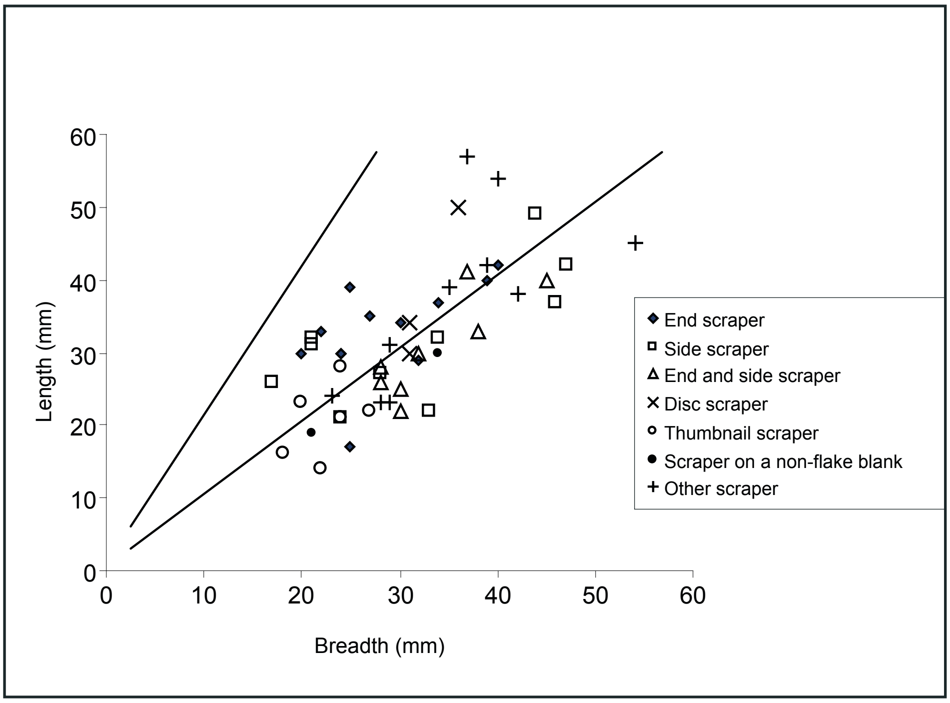


Figure 12: Length to breadth scatter diagram of all complete scrapers by form

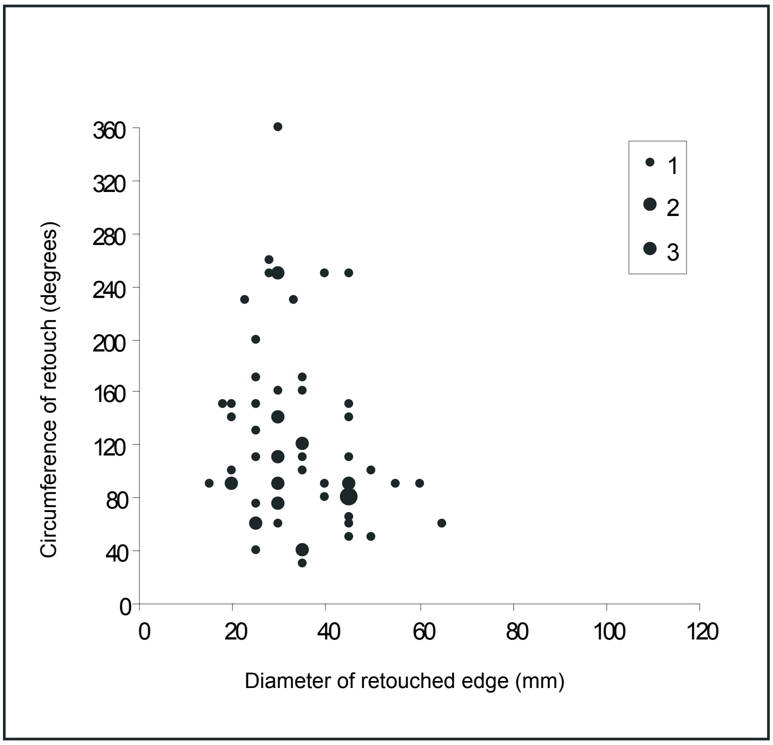


Figure 13: Scatter diagram demonstrating the relationship between the diameter of the retouched edge and the proportion of the circumference retouched

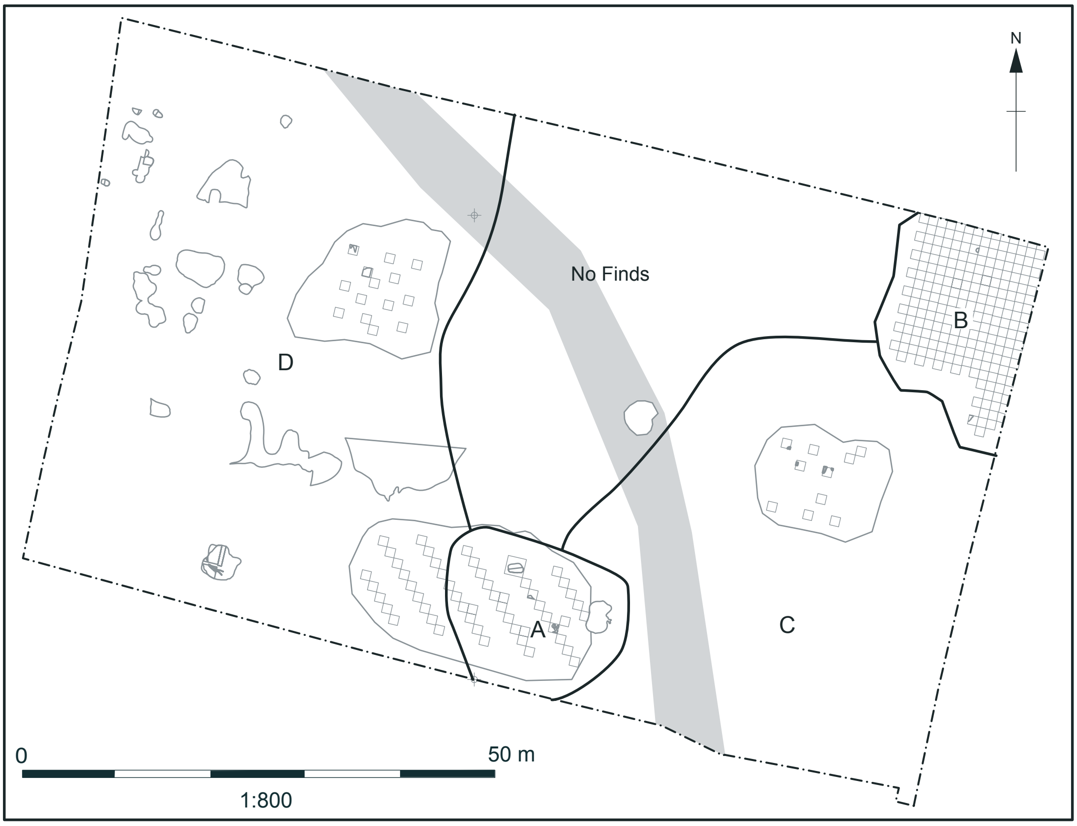


Figure 14: Zones used for analysis of flint distributions

Figure 15: Flint distributions: Flakes

Figure 16: Flint distributions: retouched flakes and miscellaneous retouch

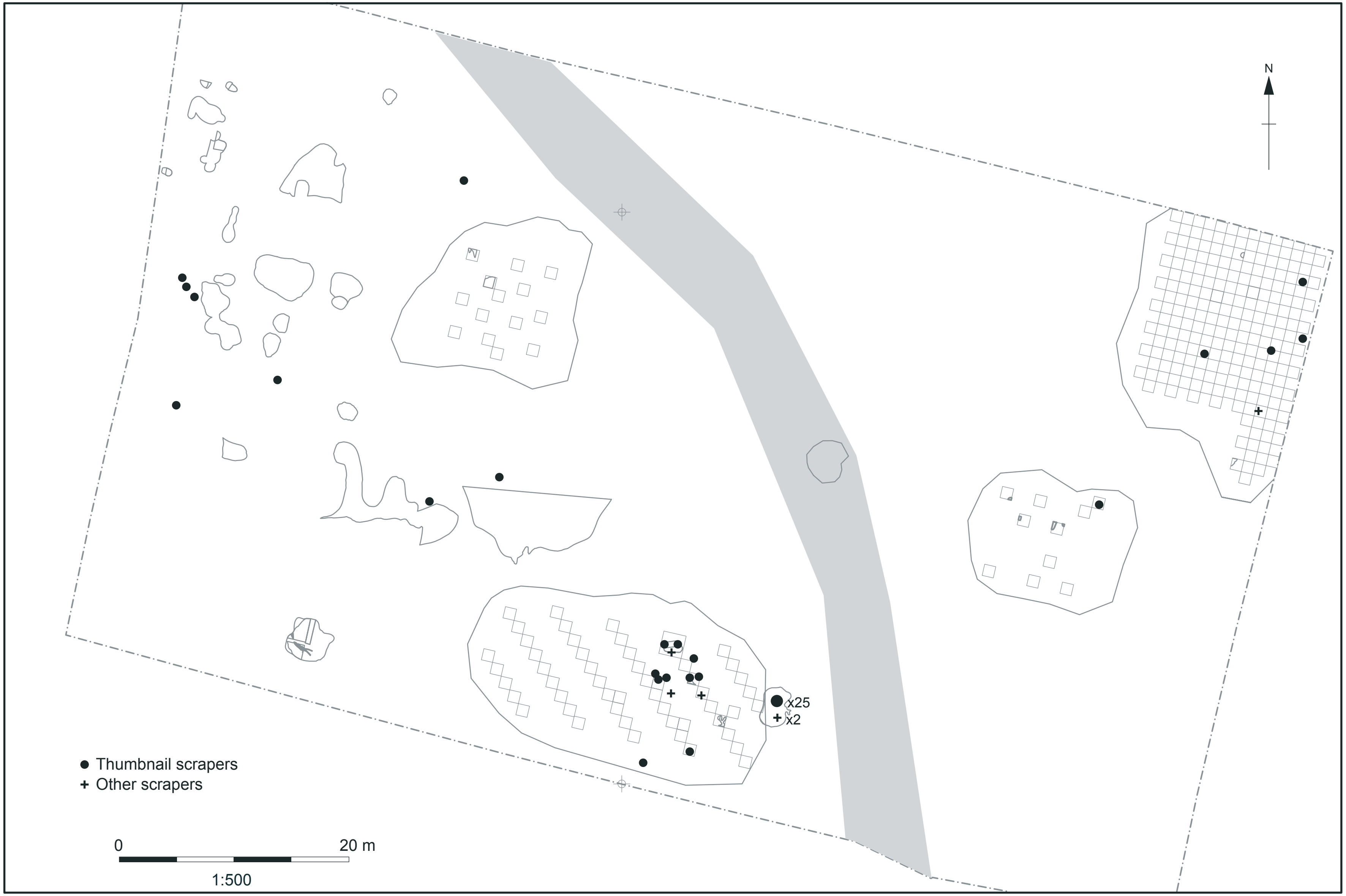


Figure 17: Flint distributions: Scrapers

Figure 18: Flint Distributions: Notches,fabricators, piercers and knives

Figure 19: Flint distribution; serrated flakes

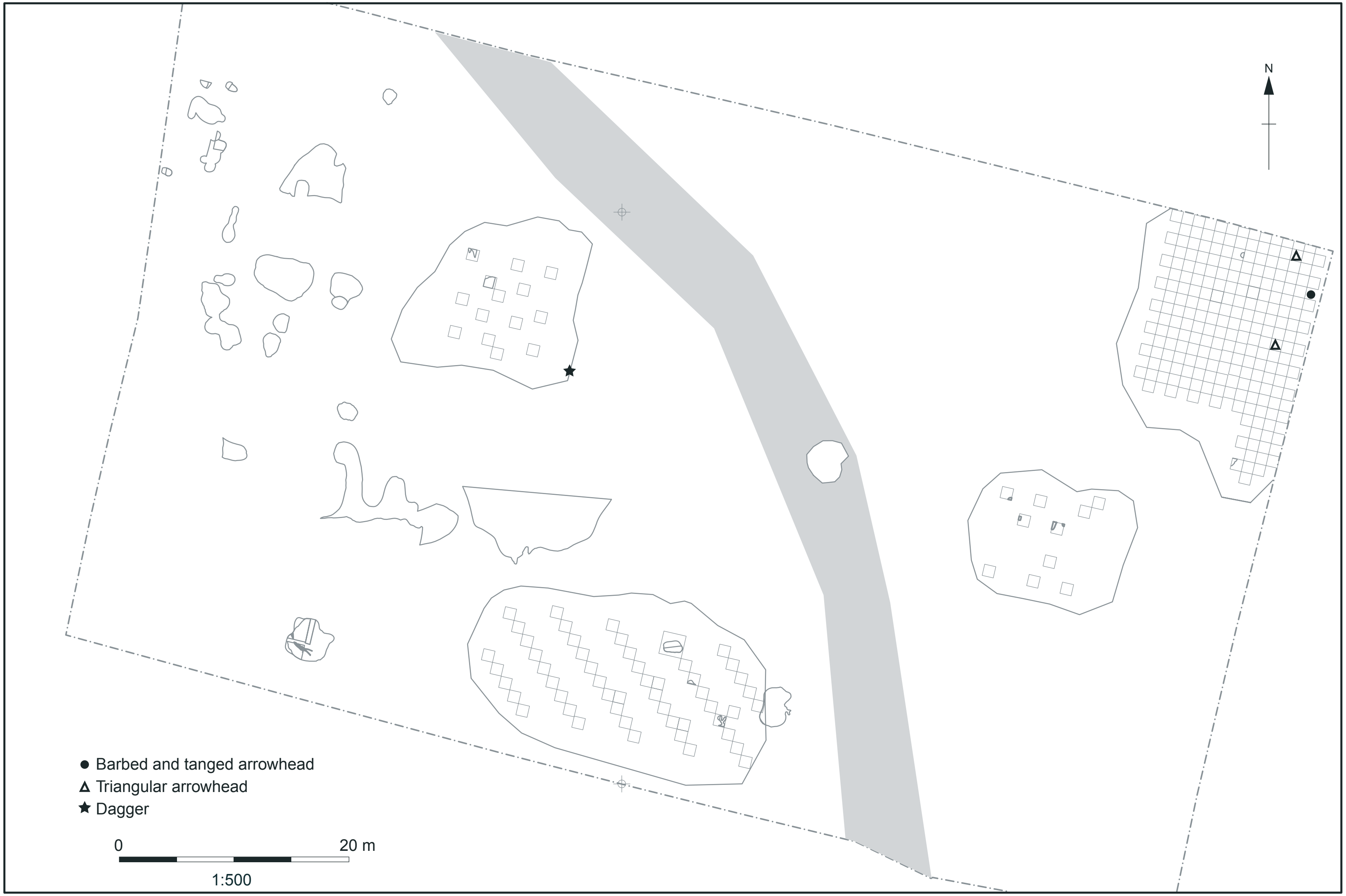


Figure 20: Flint Distributions: Arrowheads and dagger

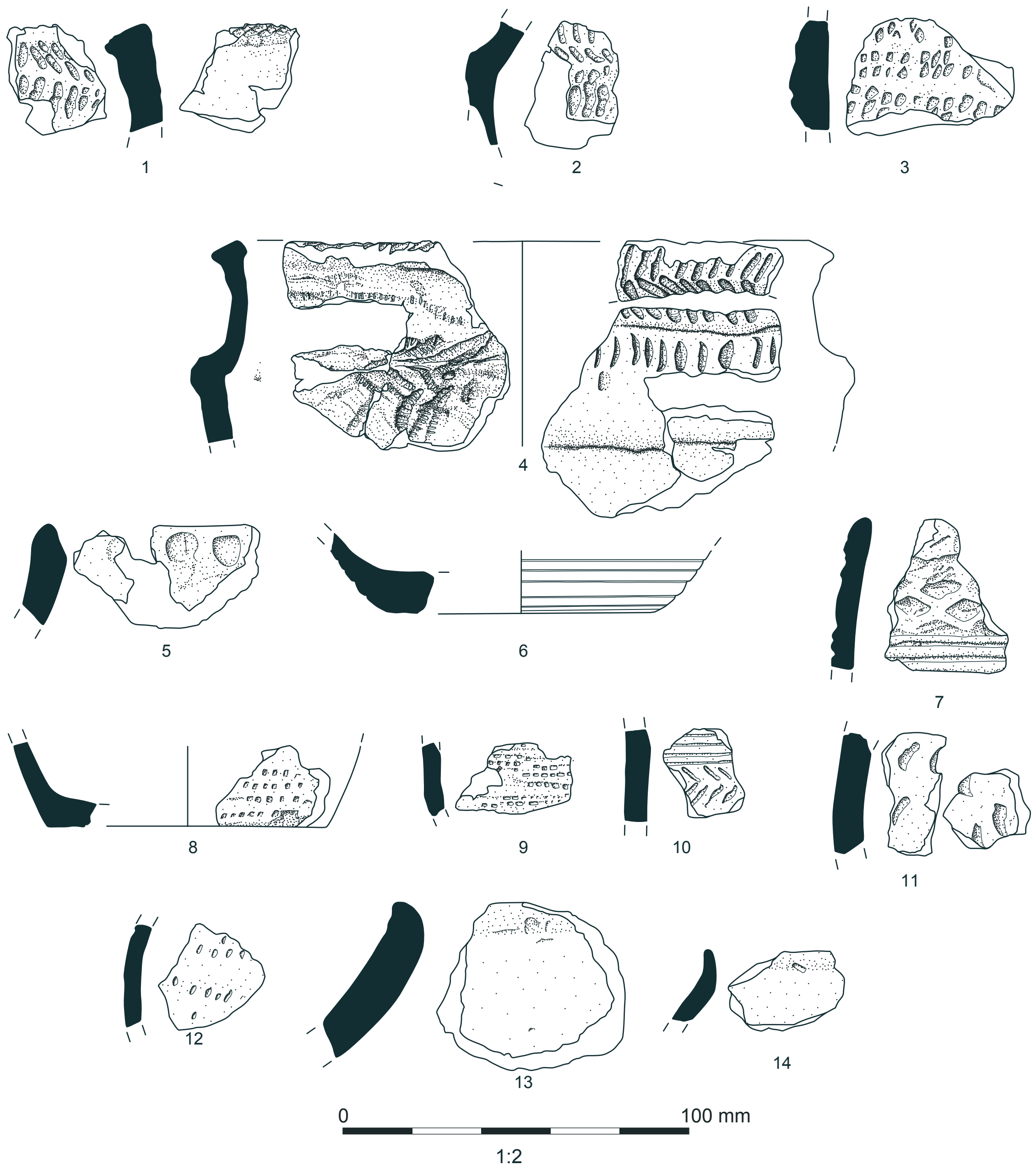


Figure 21: Prehistoric Pottery

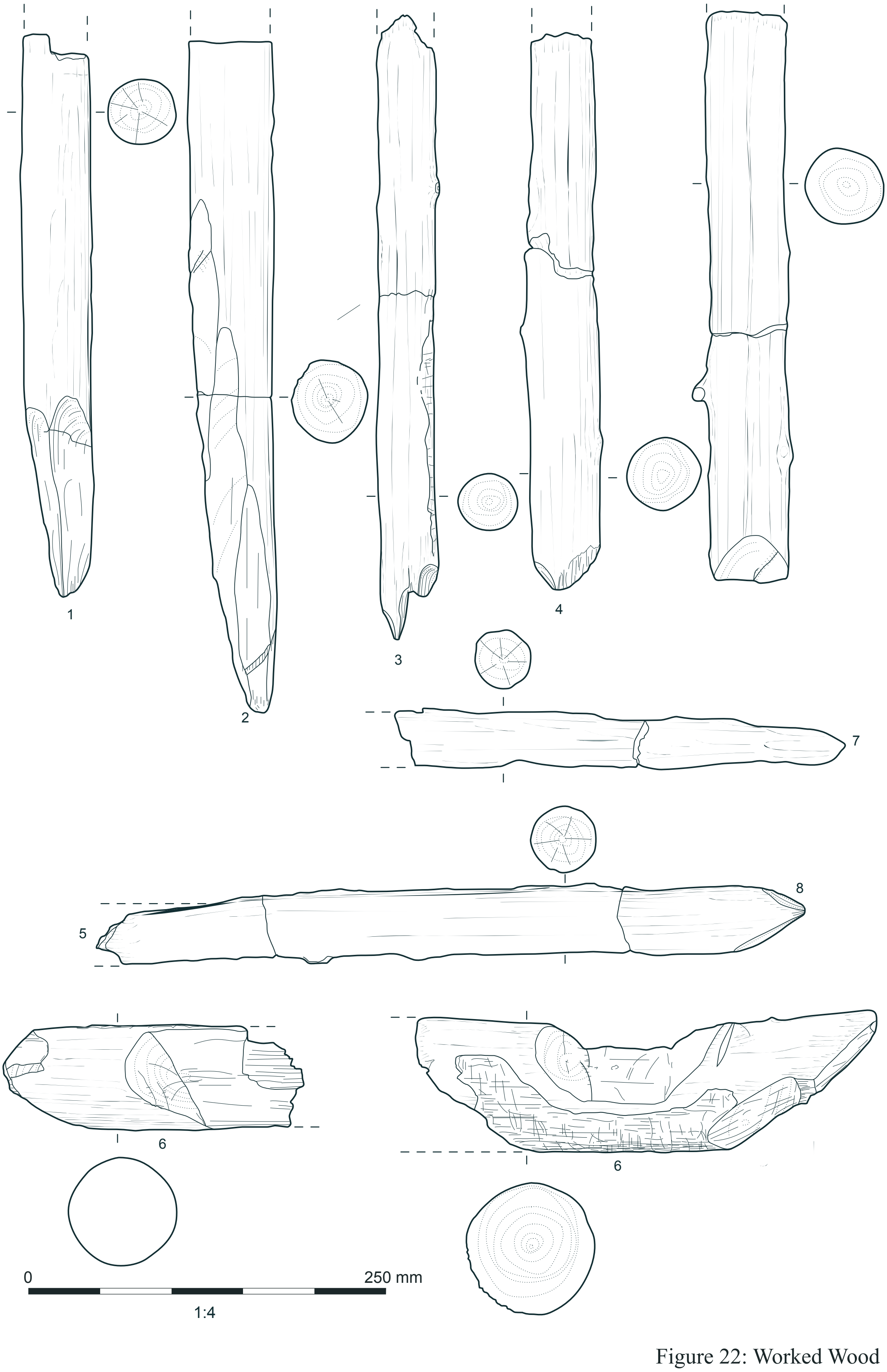


Figure 22: Worked Wood

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