ICE AGE JOURNEYS: RESEARCH BY A COMMUNITY ARCHAEOLOGY GROUP AT FARNDON FIELDS, NEWARK, NOTTINGHAMSHIRE

by

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SUMMARY A flattish interfluve near the confluence of the Rivers Devon and Trent, now known as Farndon Fields, was a focus for hunters towards the end of the last Ice Age. People visited intermittently over the Late Glacial period, some 14,700 to 12,900 (cal BP) years ago. The location and range of flint tools recovered suggests an ambush spot where animals were killed and processed, close to a river crossing or near boggy ground. These activities resulted in an extensive flint-scatter, recorded by fieldwalking between 1991 and 2005. Work conducted in 2009, along the line of the new A46 road, demonstrated the presence of two in situ *clusters of knapping debris and tools. Since 2012 investigations by a volunteer group 'Ice Age Journeys' (supported by Heritage Lottery Funding) have aimed at determining the state of preservation of deposits outside the road-line. Fieldwalking, augering and test-pitting were used in conjunction with LiDAR (to elucidate topography) and the condition of the recovered artefacts, to assess the post-depositional disturbance of the scatters. This work has shown that the varied micro-topography and sedimentation-histories across this (now agricultural) landscape have influenced preservation and vary markedly from field to field. The 'N cluster', known from 20 years of fieldwalking, is now ploughed-out, though a broad pattern of activity could still be determined as near-pristine artefacts survived in 2012–13. To its south, test-pitting has uncovered substantial and coherent sets of artefacts, suggesting that fine-grained Late Glacial Interstadial deposits (similar to those in which the A46 clusters were recovered) are probably more extensive than previously envisaged. Further south again, the appearance of new clusters and undamaged flints suggests that recent ploughing has bitten deeper into previously undisturbed deposits. These locations are close to relatively thick deposits of alluvium and wind-blown coversand where future fine-resolution mapping could help to predict areas in which preservation of Late Glacial sequences might be more complete. It also appears that the configuration of the river valley has changed over time, so that wider-scale mapping may help in understanding why Ice Age people repeatedly chose this location over an extended period.*

INTRODUCTION

Ice Age Journeys

'Ice Age Journeys' was launched in July 2012 in Newark Town Hall by FARI Archaeology (Farndon Archaeological Research Investigations) supported by a Heritage Lottery Fund (HLF) grant. This project name aims to encapsulate the nature of the late glacial archaeology recovered during the construction of the new A46 road, where, at Farndon Fields, an extensive scatter of flint tools was left by hunters some 14,000 years ago between the rivers Trent and Devon. 'Ice Age' – because the style of the flint tools identifies the people as the first colonizers of Britain after the Last Glacial Maximum (see chronology in Table 1). 'Journeys' because we model the lifestyle of these people as following/intercepting animal herds that provided both food and resources, so on a constant journey, and, just as importantly, it stands for our journey of investigation and learning about these distant ancestors.

The £50,000 HLF grant had four approved purposes; the first three were for outreach activities to the local community and reports on that work are available on the Ice Age Journeys web-site (www.iceagejourneys.org.uk). In brief, field investigations were conducted as part of a training programme for volunteers where all were welcome, and this was combined with extensive outreach led by the volunteers. The fourth approved purpose was to 'develop a plan for the future maintenance of the site'. This rather ambitious objective was broken into two parts: understand what is there – so that we can come up with a plan to help preserve it. This report concentrates on the investigations to 'understand what is there', focusing on the position, condition and any damage to artefacts to enable an assessment of the state of preservation across part of the site. This task is not finished, not least because we have good reason to believe that the site is probably more extensive than the known surface scatter of flints.

The artefacts will be deposited in Newark Museums accession code NEKMS 2013.1. The field numbers and artefact coding follows that reported in Garton and Jacobi (2009) and Harding *et al*. (2014, Figure 2.1), except that the southern part of field 373A, now split by the A46 road, is called 373D.

After describing the previous fieldwork and summarizing the geological context, the results of three studies are presented (the methods used are described in Appendix I). The first deals with fieldwalking in fields 373D and 373A, bringing in the evidence of aerial photography and topography (as recorded by LiDAR) to explore the results. The other studies present the results of a sequence of investigation techniques in two different fields, 374 and 373B, where different topographies were subjected to 'intensive' fieldwalking (defined in Appendix I) followed by hand-augering and test-pitting. Although in adjacent fields, the outcomes are quite different, demonstrating the level of detail required to assess this extensive site. Our new understanding of the current state of preservation, and the potential for the preservation of Late Glacial sequences of deposits, has implications for the future research and management of the site.

Previous fieldwork and context

It is reputed that the late Allan Rushby, a Farndon resident, had found flints in these fields, but there is no documentation and the whereabouts of any artefacts are unknown. Hence, the discovery of the site can be attributed to systematic fieldwalking as part of the planning for the new A46 road (initiated in 1991 and built in 2009) linking Newark to Widmerpool. That work recovered clusters within an extensive scatter of flint over at least 15 hectares; four seasons of fieldwalking and the patterning, typology and condition of the Late Upper Palaeolithic (LUP) artefacts are described in Garton and Jacobi (2009). Some of the flint is Holocene (Mesolithic to Early Bronze Age – Table 1), but a considerable proportion is older and has a 'white' hydrated surface (here described as 'corticated', see Appendix III). A number of these 'white' flints are forms diagnostic of the Late Magdalenian (the continental label) or Creswellian (the label for the British variant, and the one used in this report). This phase of the LUP is dated to around 14,000 years ago, based on calibrated radiocarbon dates from butchered hare and horse bones from caves in the Creswell Crags, on the Nottinghamshire–Derbyshire border (Charles and Jacobi 1994, table 5; Jacobi and Higham 2009, Figure 10). Various stable isotope ratios from combined Greenland ice-core data have been used to reconstruct past temperatures for this time (Rasmussen *et al*. 2006; 2014). These show that the preceding period of intense cold (Last Glacial Maximum) was transformed very rapidly to temperature conditions not too far from those of today (the Late Glacial Interstadial), initially with open grasslands and gradually changing to more shrub-dominated habitats and increasing birch (Pettitt and White 2012, 427–30). As the climate improved after the Last Glacial Maximum, modern humans moved back across the land-bridge from Europe carrying with them a range of hunting equipment including

Table 1: Summary of stratigraphic labels of subdivsions/chronology/archaeological cultural periods.

Stage	*Years calibrated BP ≈ years ago*	*British stratigraphic sub-divisions*	*Continental sub-divisions*	*Archaeological sub-divisions* calibrated BP ≈ years ago***
	11,700 onwards	Holocene, Flandrian or Post Glacial	Holocene	Neolithic 6,000–4,200 Mesolithic *c*.11,500–6,000
GS-1 (Greenland Stadial 1)	12,900–11,700	Late Glacial Stadial or Loch Lomond Stadial	Younger Dryas	Final Palaeolithic 'long blade' *c*.12,900–11,500
GI-1 (Greenland Interstadial 1)	14,700–12,900	Late Glacial Interstadial or Windermere Interstadial	Allerød Bølling	LUP – Federmesser *c*.14,100–12,900 LUP – Creswellian *c*.14,700–14,100
GS-2 (Greenland Stadial 2)	23,000–14,700	Late Devensian, Last Glacial Maximum (LGM) or Dimlington Stadial	Late Pleniglacial	No evidence for human activity

Stages defined by the Greenland Ice-cores (Rasmussen *et al*. 2014, 25, Figure 1) with BP dates expressed before 2000 AD.

* Industries, and their continental connections, are summarized by Barton 2005 and Cooper 2006; 2013, 46–9.
** Approximate time periods after Barton 2009, Table 2.2; Jacobi and Higham 2009; Pettitt and White 2012; Harding *et al*. 2014, Figure 2.2; Milner *et al*. 2013, 13–15; Whittle *et al*. 2011, Figure 15.8.

LUP = Late Upper Palaeolithic.

projectile points of bone and antler (harpoons and barbed spears) and ones combining flints as insets (Barton 2009, 25–37). It is suggested that worn and discarded flint-equipment at Farndon Fields was left by Ice Age hunters, who intercepted their prey and then processed their meat, pelts and bone close to where these animals were killed as they crossed the Rivers Trent and Devon (Garton and Jacobi 2009, 35).

When the new A46 road was built, it was designed by the Highways Agency to avoid the two obvious clusters and a denser scatter of lithics identified by fieldwalking (Figure 2). The archaeological interventions were restricted to ditches dug along the road corridor, mostly towards the outer edges. The full results of the archaeological works by the Cotswold Wessex Archaeology team were published with commendable speed (Harding *et al*. 2014) and are an essential background to our work described below.

In brief, the A46 excavations recovered two previously unknown knapping episodes within alluvial deposits; they were both buried below the reach of the plough and *in situ*. They are attributed to different stages of the LUP because of their different technologies and surface condition: the earlier is assigned to the Creswellian, the later to the Federmesser (Harding *et al*. 2014, and described further in Appendix III; see Table 1 for chronology). Taking all of the known material together, this suggests that the Farndon Fields area was re-visited intermittently during the Late Glacial Interstadial which lasted nearly two thousand years from about 14,700 to 12,900 BP (Table 1).

Geology/geomorphology

The location is on the east side of a low watershed separating the Rivers Trent and Devon one and a half km south-west of the rivers' current confluence (Figure 1). The 'site' lies on the gentle slope dropping, by no more than around 1.2 m and with only slight hummocks and hollows (Figure 2), down towards the Devon in the east. The British Geological Survey (BGS) published a map at 1:50,000 scale in 1996 (BGS 1996 E126; Howard *et al*. 2009) and a summary is now available online as *Geology of Britain Viewer* (BGS, 2015). The flint-scatters lie on the Holme Pierrepont Sand and Gravel Member and mostly outside of the mapped extent of Alluvium along the River Devon (the latter

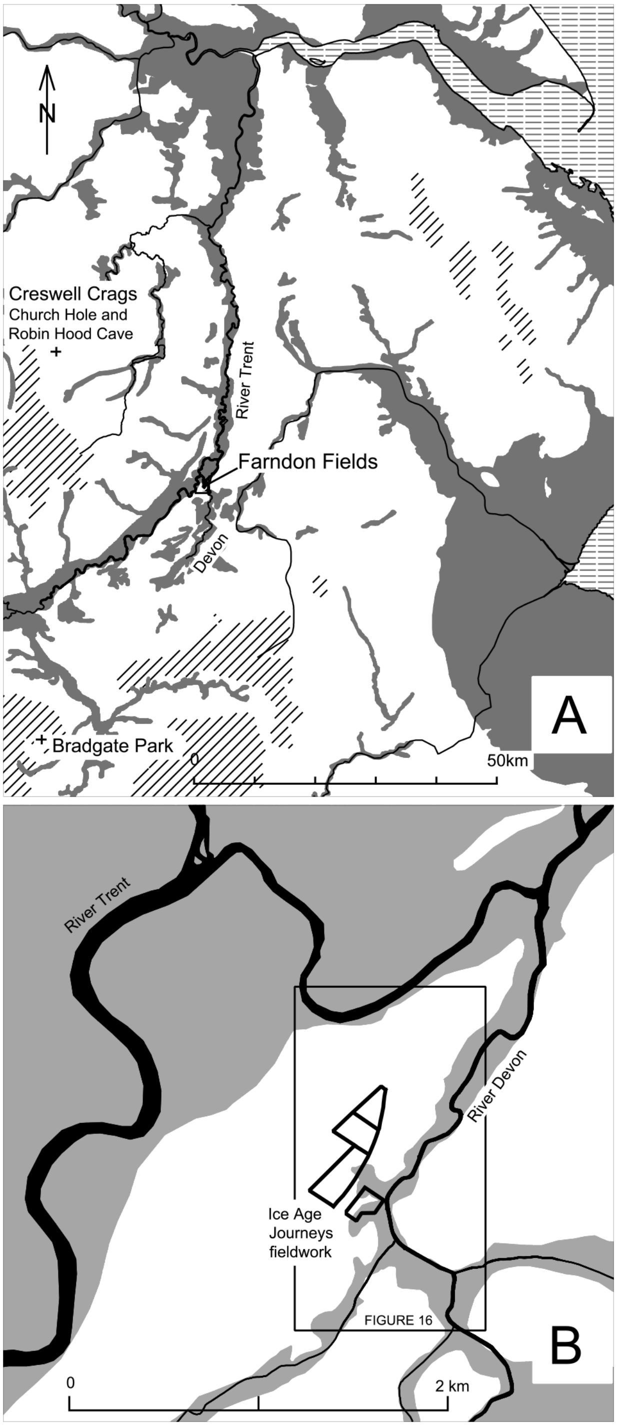

FIGURE 1: Location of Farndon Fields on the interfluve between the Rivers Trent and Devon, just south-west of Newark, Nottinghamshire. Farndon Fields centred at SK780520, with the fields reported here in outline in B. Dark tone represents alluvium (after British Geological Survey, 1996), land over 122m hatched. Based on Ordnance Survey mapping © Crown copyright.

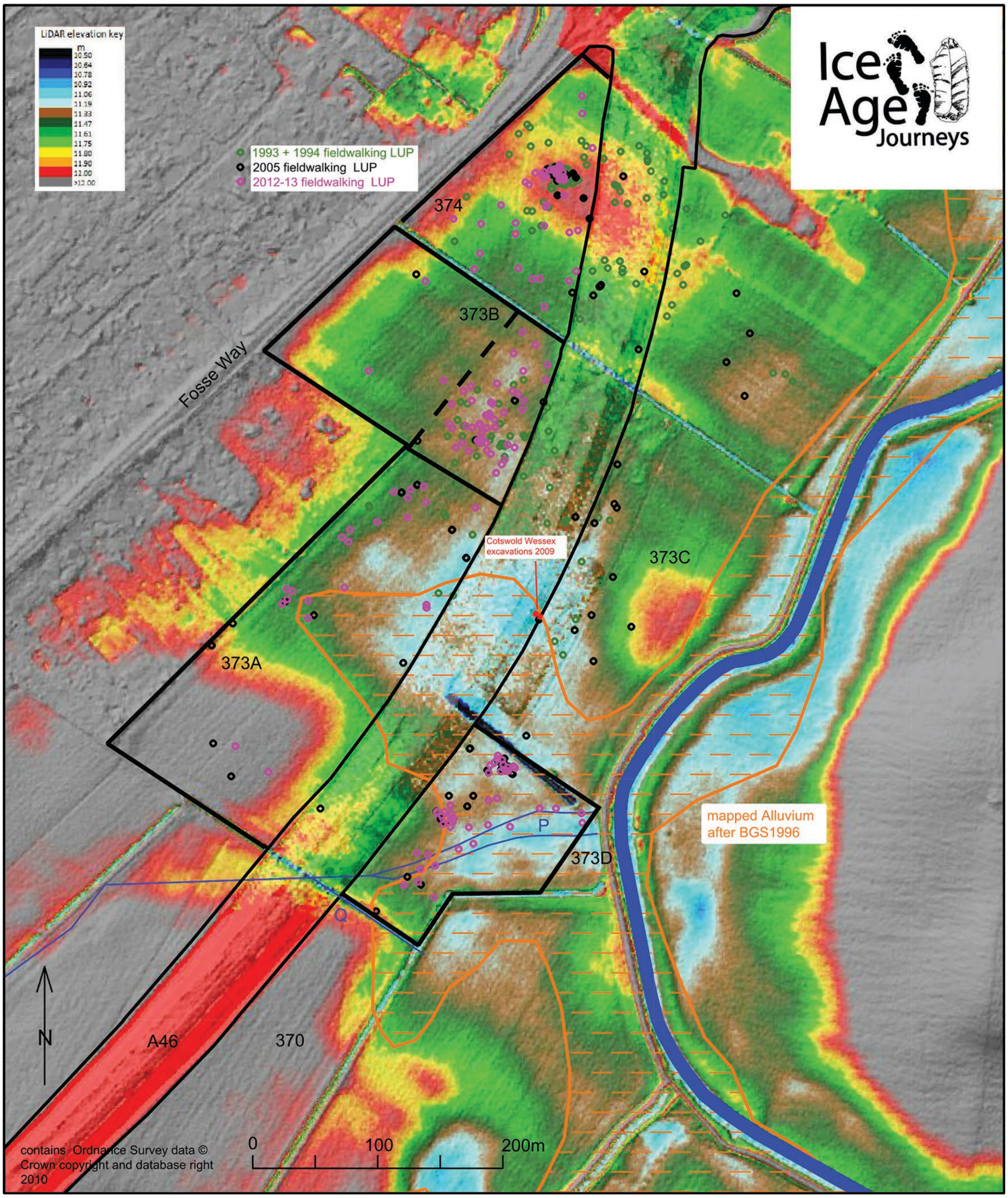

FIGURE 2: Farndon Fields: topography, as recorded by LiDAR, with modern surfaces between 11m and 12m aOD picked out by colours from pale blue to red (image by Ian Ross derived from Environment Agency data, see Appendix I). The line of the Fosse Way is visible in the grey part of the LiDAR image. Fields are numbered in black. The LUP artefact findspots from fieldwalking are circles, coloured by season of recovery. The excavations conducted in advance of the A46 road-construction where *in situ* knapping clusters were discovered on the NE side of the 'embayment' are marked in red (Harding *et al*. 2014, Figure 2.3). Orange outline with dashes are 'mapped Alluvium' after British Geological Survey (1996). Channels P and Q marked as blue lines. Based on Ordnance Survey open-data © Crown copyright and database right 2010.

are shown as orange outline in Figures 2, 3 and 15). The underlying bedrock is the Triassic Edwalton Formation (Mudstone).

The Holme Pierrepont Sand and Gravel terrace-deposits (Brandon and Sumbler 1988, 130–1; Bridgland *et al*. 2014, 30) are usually considered to be of Late Pleistocene Age (some 28,000–11,000 BP), laid down in braided channels criss-crossing the wide valley floor, only later being formed into morphological terraces by incision of the rivers after the Last Glacial Maximum. Radiocarbon dating of organics from near the base of the Holme Pierrepont Sand and Gravel in the Trent Valley shows at least two separate phases of aggradation (Howard *et al*. 2011, 429), highlighting the complexity of mapping and classifying these deposits. The fine-medium gravel pebbles (<20mm in our test-pits) are interpreted as being generically those of the Devon, rather than the coarser gravel of the Trent (A.S. Howard personal communication; Bridgland *et al*. 2014, 105). Work on the A46 road-scheme showed that the terrace-gravels are overlain by variable deposits up to 1.5m thick (Harding *et al*. 2014, Figure 2.25), some of which are probably Younger Dryas coversands, though these are commonly reworked by wind or water (Baker *et al*. 2013; Harding *et al*. 2014, 28–9). Coversands are at least initially windblown ('aeolian') sediments, often derived from open and unvegetated surfaces (such as wide braided river channels exposed at low water) during 'cold' periods; sand grains move by bouncing across the surface ('saltation') and are usually deposited relatively close to their source, trapped by increased vegetation or water bodies. The course of the River Devon is flanked by alluvium and attributed as Holocene in age by BGS (1996, E126) – hereafter referred to as 'mapped Alluvium'. The archaeological investigations have shown that the extent of the mapped Alluvium does not include some thinner deposits (see p. 122) and that it must be older than Holocene because of the contained archaeological artefacts (see below), so should be considered diachronous (both Late Glacial and Holocene). Hence, the published BGS mapping provides an overall stratigraphic framework, but this coverage does not discriminate geological variations at fine resolution as superficial deposits of different genesis had to be grouped together and deposits shallower than 1m are not represented (A. S. Howard personal communication; Smith 2009).

The excavations by the Cotswold Wessex Archaeology team produced some key work in identifying and understanding the sequences of superficial deposits. They demonstrated that some of the Alluvium must date in part to the Late Glacial Interstadial because it contains *stratified* LUP flint-scatters even though OSL (Optically Stimulated Luminescence) dates appear to be too young (Harding *et al*. 2014, 37, 65, Figure 2.11). This team coined the term 'embayment' to refer to the *c*.150m wide hollow containing the mapped Alluvial sediments (*ibid*. 17). They also identified sands, reasonably interpreted as coversands, along the road-line to the S of the known flint-scatters. Dating by OSL was beset with issues caused by bioturbation (movement of sediments by plants and burrowing animals) within shallow deposits, but primary coversands banked against the terrace-edge produced basal ages of 11,940±1020 and 10,050±2340 BP, compatible with a Younger Dryas origin. The Younger Dryas is usually dated *c*.12,900–11,700 years ago (Table 1).

ICE AGE JOURNEYS FIELD INVESTIGATIONS – THREE STUDIES

Investigations in Fields 373A and 373D

These fields, divided by the new A46 road, were both fieldwalked at 5m intervals (methodology described in Appendix I). In field 373A, the cereal crop had been drilled and was about 5cm high but did not obscure the surface which was weathered with well-washed pebbles. In field 373D, failure of the rape-crop meant that it had been sprayed with weedkiller and, although the surface was weed-strewn, the visibility was mostly good and the surface very well washed. This field was noticeably different from the others in that there were areas of abundant stones/cobbles (rounded Bunter quartzites and angular skerry fragments – the local name for harder interbedded sandstone and siltstone, common in the Mercia Mudstone Group, and often forming resistant 'islands' at outcrop) and a scatter of concrete/brick. These were not recorded in detail but it seemed likely that these materials were related to the course, then dumping/infilling, of a former river channel recorded in aerial photographs and LiDAR (see below). Parts of field 373D had been freshly ploughed, including a strip alongside the new A46 (brown lines in Figure 3); these were in poor-visibility condition compared with the rest of the field, but were nevertheless walked for completeness.

An oblique aerial photograph of the Fosse Way (identified in Figure 2), taken by OGS Crawford in June 1933, shows upstanding flanking banks of a stream running through field 373D (SK7752/8; CCC 9100/9758). By 1947 these banks had been flattened, but the linear channel-hollow clearly shows in LiDAR data (P in Figures 2 and 3) and was recorded as a variation in surface-stone and sediment-type in 2005 (Garton and Jacobi 2009, 10). One of the drilled BGS cores lay within this AP-channel (BGS 1 in Figure 3). Although no materials suitable for radiocarbon dating were recovered, the sediment sequences suggest they are undisturbed and of probable Holocene age (Appendix II). A second channel course (Q in Figure 3) was recorded crossing the A46 to the south of these aerial photo marks: as this cuts coversand deposits it is interpreted by Harding *et al*. (2014, 42, 66, Figures 2.8, 2.24) as Late Pleistocene or Holocene age. To the west of these two channels, a stream is traceable as cut-drains and sinuous lines in historic (1900) Ordnance Survey mapping

Pattern of artefact distribution from fieldwalking (Figure 3)

All items from fieldwalking in 2013 are plotted in Figure 3; these included later Mesolithic to Early Bronze Age flints and a post-Medieval gunflint. Only the potential LUP artefacts are considered further. These artefacts are coloured magenta in Figure 3 so as to contrast with those recovered in earlier sessions walked as part of the A46 investigations (black = all the area walked in 2005; dark green = only north of old field boundary in 373A walked in 1993). In both fields more LUP items were recovered than had been collected previously. In part of field 373A, a dense scatter of post-Medieval artefacts (mostly early 20th century – green dashes in Figure 3) is interpreted as a dump infilling a surface hollow partly coincident with the mapped Alluvium.

In field 373A, the light scatter of flint is densest in the north-west part, particularly around the western 'tip' of the mapped Alluvium which approximately coincides with the 11.5m contour aOD. It is possible that this could represent the emergence of another potential cluster. Only a very few items (from all fieldwalking sessions) were plotted within the mapped Alluvium or above the 12m aOD contour; those from 2013 include two lightly and two densely corticated LUP pieces.

In field 373D, the fieldwalking-pattern was partly dictated by poor visibility in the north-west strip of the field (see above). However, even taking that into consideration, there are two obvious clusters of LUP material: one coinciding with the 'S cluster' first identified in 2005 (Garton and Jacobi 2009, 3), another to its south-west, which is 'new'. Whilst these could be true clusters, they might also represent slightly raised peaks within a single scatter disturbed by the plough. It has also been suggested (Harding *et al*. 2014, 69) that the 'S cluster' could be in up-cast sediments from digging-out the drain to its north. (This drain does not appear to have been subject to re-cutting during the A46 construction works: Harding *et al*. 2014, 23). While the spread of the cluster (some 20m) might seem too far for upcast, the clear gap in any flint alongside the drain in both the 2005 and 2013 plots might indicate artefact-free upcast. Any relation of the clusters to the nearby sediments of channel P recorded by aerial photographs and LiDAR is also unknown, though the latest channel course is likely to be Holocene (see above), hence the scatter of LUP artefacts along its course must reflect disturbance.

Flint artefacts (Figure 4)

The small number of LUP items (22) from field 373A includes both primary knapping waste and retouched tools (Appendix III, Table 3). A method of scoring the plough-damage to these LUP flints, based on easy to spot recent breaks which reveal the original flint colour, is described in Appendix

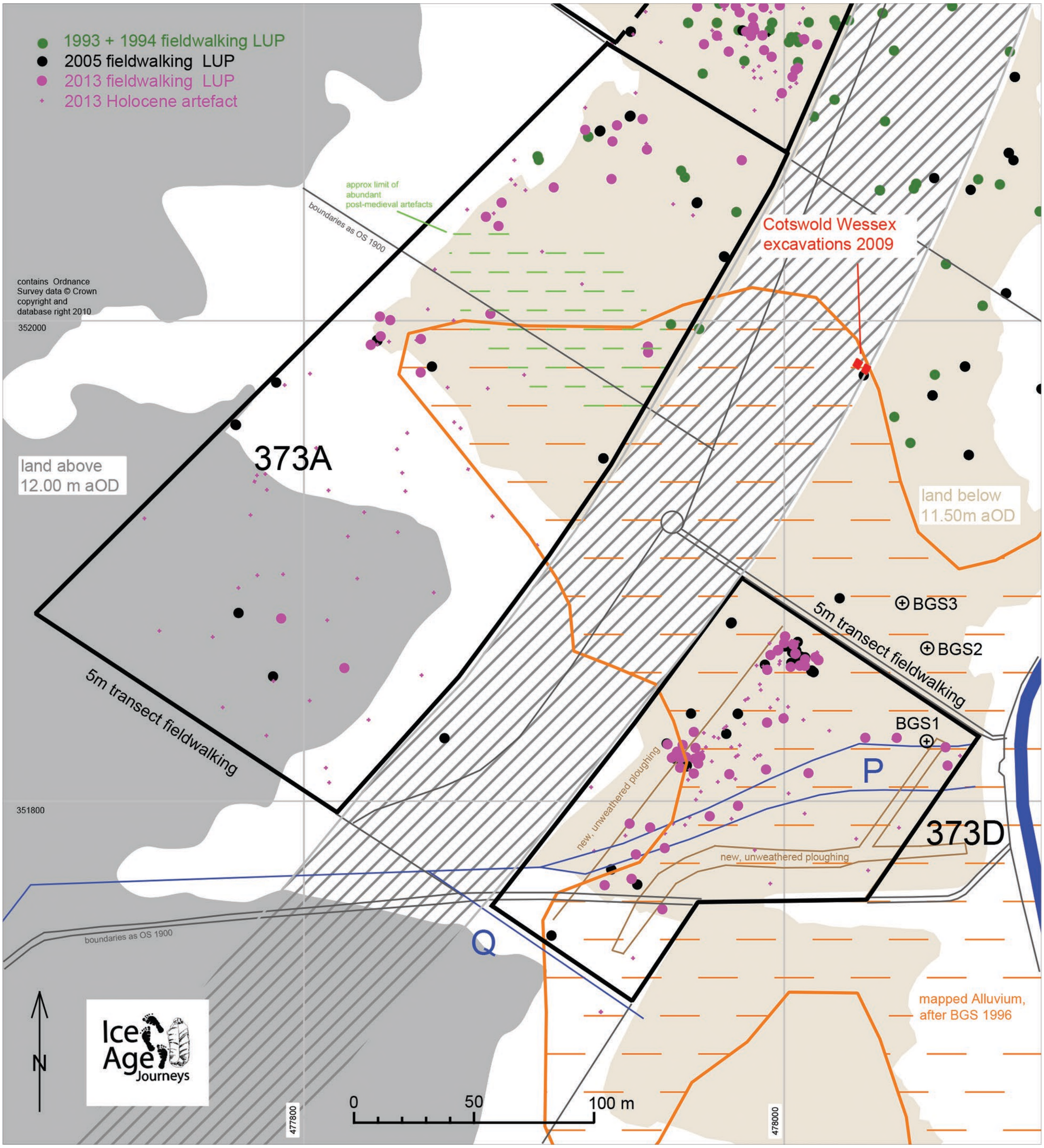

FIGURE 3: Farndon Fields: fieldwalking scatters in fields 373A and 373D, showing all 2013 findspots (magenta), and just LUP from 1993–2005 coloured as key (from Garton and Jacobi 2009, illus. 3). Cores 1–3 drilled by BGS located by crosses. Field boundaries redrawn from 1900 Ordnance Survey; land above 12m grey and below 11.5m aOD brown (generated from same Environment Agency LiDAR data as Figure 2). The excavations conducted in advance of the A46 road-construction where *in situ* knapping clusters were discovered on the NE side of the 'embayment' are marked in red (Harding *et al*. 2014, Figure 2.3). Orange outline with dashes are 'mapped Alluvium' after British Geological Survey (1996). Channels P and Q marked as blue lines. Area of abundant post-Medieval artefacts marked as green dashes. Based on Ordnance Survey open-data © Crown copyright and database right 2010.

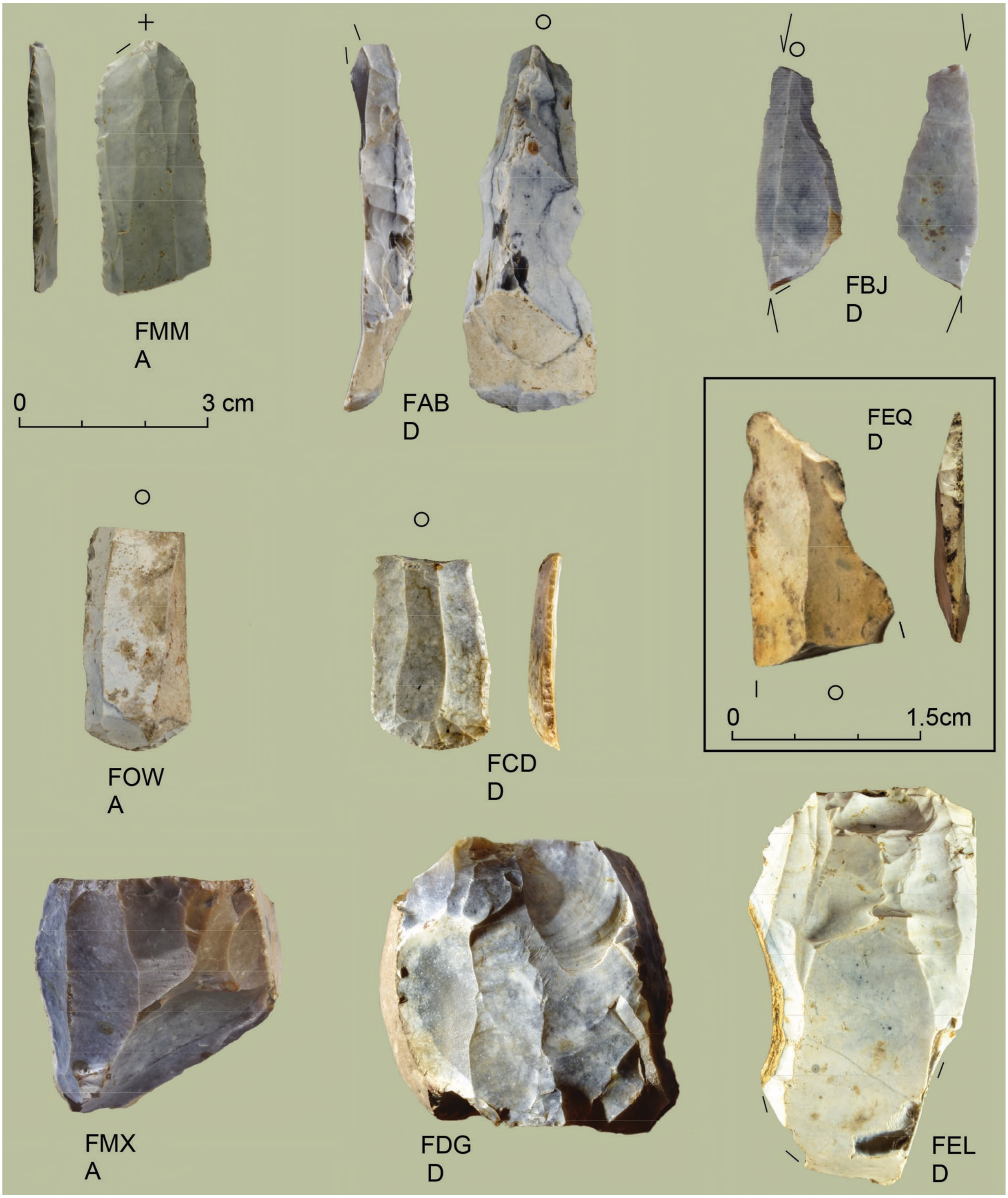

FIGURE 4: Farndon Fields: LUP artefacts from fieldwalking fields 373A and 373D in 2013 (cf. Figure 3). The field is indicated by A or D below the three-letter artefact code, with additional detail in Appendix III, Table 3. Proximal end of flake indicated: cross = position of point of percussion, o = platform absent. Arrow = burin spall. Only plough/modern breaks are indicated (not ancient/corticated breaks). All at scale 1:1 bar FEQ which is at scale 2:1. Photographs by Bill Pointer and Ian Ross.

III. Much of the LUP flint from field 373A has been plough-bashed (score ≥3), with few relatively undamaged flints (score 1–2: Appendix III, Table 2). This might have been interpreted as little recent disturbance if it had not been for the apparent increase in find-spots since 1993 and 2005 (Figure 3). It might be said that the time since the last walking (eight ploughings) is probably long enough to create plough-bashed flints even if they had been relatively newly incorporated into the ploughsoil.

Cores and tools attributable to the LUP were recovered from both of the nominal areas denoting the two clusters and from the rest of field 373D (Appendix III, Table 3). They include an end-scraper (Figure 4 FCD) with trimmed margins that would not be out of place in the 'N cluster' in field 374 (cf. Garton and Jacobi 2009, illus. 10) and a double burin (Figure 4 FBJ: cf. illus. 11.34). Damage-scores from the two clusters are presented separately in Appendix III, Table 2. As the 'new' cluster was not recorded in 2005 it is presumed to have recently been incorporated into the ploughsoil, but only a single relatively undamaged flint was recorded. The roughly equal number of plough-bashed (score ≥3) and relatively undamaged items (scores 0 and 1–2) from the 'S cluster' is similar to the proportions logged in the 2005 material when this cluster was first recorded (Garton and Jacobi 2009, 12).

Where artefacts are plough-bashed (scores ≥3), this cannot be used as a reliable indication of the time that the material has been in ploughsoil. Other factors (operator variability and differences in surface weathering/vegetation cover) may dictate the discovery of apparently 'new' clusters for the first time. However, the opposite – undamaged and less damaged flints (scores 0–2) – must almost always be indicative of relatively recent disturbance, so this is of significance in the study of flint-scatters. Hence, there should be particular concern for the preservation status of the 'S cluster' and its relationship to any adjacent scatter and deposits.

Conclusions for fields 373A and 373D

The 2013 fieldwalking has extended the limits of the known LUP flint-scatter, perhaps with a cluster at the western tip of the mapped Alluvium, and with another apparent cluster in the southern part of field 373D. The variability in the surface condition of the artefacts, with both dense and lighter cortication, may suggest that both LUP blade technologies (Creswellian and Federmesser) could be represented, but this requires further work. The pattern of distribution suggests specific foci of activity within a wider LUP palimpsest. There has been an interval of some eight years since the previous fieldwalking record, and the appearance of new clusters and undamaged flints suggests that ploughing has bitten deeper into previously undisturbed deposits over this time.

The clusters within 373D are both within the area of mapped Alluvium, now known to have been deposited in part during the Late Glacial Interstadial (see above), though the progression of alluvial sedimentation through time has yet to be determined. Surface variations (in topography and stone/sediments) suggest an infilled Holocene channel. The genesis of these stream/channel deposits requires further investigation to determine the timing of channel incision and how they relate to the geography of the Late Glacial landscape.

Fieldwalking can only ever be a guide to the extent of past activity that has already been disturbed: hence the apparent blanks/sparse areas of flints within both fields are of prime interest. In field 373A these appear to relate to the deeper mapped Alluvium (below 11.5m aOD) and coversands (above 12m aOD contour). Similarly, there is no LUP flint along the southern boundary of field 373D (and only a single item recorded in 2005 from here and the whole of the field to its south; Garton and Jacobi 2009, illus. 3). This coincides with stone-free sands above 12m aOD that are almost certainly part of the same band of coversands identified in the A46 line (p. 108) and 373A. The mutual geographical exclusivity of cover sediments and topsoil flint distributions (save for a few finds which could well be due to deeper penetration, such as treethrows) might be interpreted as showing potential for buried LUP materials and surfaces. It is not known if these deposits covered *in situ* LUP material, or if surfaces were eroded prior to deposition, or if there is a variable pattern in which both scenarios occurred.

This uncertainty has immediate significance because a new road (the Southern Link Road) is to be constructed imminently (planned for 2016) with a new roundabout in the field (370, located in Figure 2) directly to the south of 373D.

Investigations in Field 374

Previous fieldwork and LiDAR

Field 374 has been walked systematically on four occasions (1991, 1993, 1994, 2005), with a cluster (previously referred to as the 'north cluster' (Garton and Jacobi 2009, 3) and here as the 'N cluster') first identified in 1993. The extent of this cluster has expanded over the years, with increasing amounts of damaged flint items (*ibid*. 11–12). In 1994 a 5 × 5m test-pit was excavated within the cluster to ascertain the context of the LUP material and to identify any archaeological features (Wessex Archaeology 1994, A.1.9, D.1.2).

The density and character of the artefacts from the 'N cluster' suggest that it was a focus of activity involving knapping and tool use (Garton and Jacobi 2009, 28). Evidence for knapping comes from debitage (by-products) that includes crested flakes, blades, and small flakes (spalls) from the preparation (faceting) of core platforms. The retouched tools include end-scrapers and burins interpreted as a butchery and processing event, with some of the blades/tools knapped for use on the spot. The broken points could have been from hafted weapons such as darts or spears, perhaps lodged in the carcasses of prey.

In 1994, a series of hand auger-holes were recorded on a 25m grid over fields 374 and 373B (Wessex Archaeology 1994, Appendix 2). These identified two thick sand bodies, later interpreted as palaeochannels (Bates 2011, 78, Figure 89; Harding *et al*. 2014, 42–3, Figures 2.4, 2.25). One, overlain by a clay-rich subsoil, runs along the boundary of fields 374 and 373B, the other runs through the northern part of field 374 (X in Figures 5, 6 and 15). These features may have partly determined the topographically high point in the terrace-gravel lying between them, almost certainly originally more pronounced than the gentle rise in the surface of the ploughed field today, but clearly shown by LiDAR in Figure 2. The 'N cluster' lies on the western edge of this high point.

The LiDAR also shows four slightly deeper furrows, some 24m apart and parallel with the new A46 line (Figure 2). These furrows were identified in the field during 2012 when the field was ploughed and harrowed, but left unsown for fieldwork over the following summer.

Pattern of artefact distribution from fieldwalking (Figure 5)

Struck flint was found scattered over the whole surface of the field. Any gaps are mostly along the north-west boundary and southern tip of the field. As the north-west boundary follows the line of the adjacent Roman Fosse Way, this gap may be due to an 'edge-effect' where the plough has penetrated less deeply on turning. The gap along the southern tip of the field may have a different cause. Limited augering and test-pits (not described further here) showed clay-rich deposits up to 1.4m deep, and the scarcity of flint of any date suggests that the uppermost layer is alluvium deposited after the Neolithic. A large stained flint blade was the only possible LUP artefact recovered.

The distribution of corticated flint in field 374 is clearly clustered and lies within and west of previous cluster-distributions (Figures 5 and 7). There is also a sparse scatter of corticated flint south of the 'N cluster' (Figure 5), contrasting with the previously recorded distributions where very few items were recovered (Garton and Jacobi 2009, illus. 3).

Flint artefacts (Figure 8)

A small proportion of the total flint collected was LUP (12%). The corticated items include a high proportion of blades and tools similar to those recovered in previous fieldwork (Appendix III, Table 4). They include artefacts with diagnostic manufacturing techniques and a composite scraper-burin (Figure 8 ELT) similar to tools found in the Creswellian e.g. Church Hole, Creswell Crags, Nottinghamshire (Jacobi 2007, 93) and Gough's Cave, Cheddar, Somerset (Jacobi 2004, Figure 15; David 2007, Figure 2.7).

The damage scores for the flints in the 'N cluster' (a nominal rectangle defined on the basis of the 1991–2005 distributions in Garton and Jacobi 2009) are plotted separately from the rest of the field in Figure 6. This shows that over half of the artefacts are either unaffected, or are only slightly damaged. This result suggests that many of the items recovered by fieldwalking in 2012 had not been in

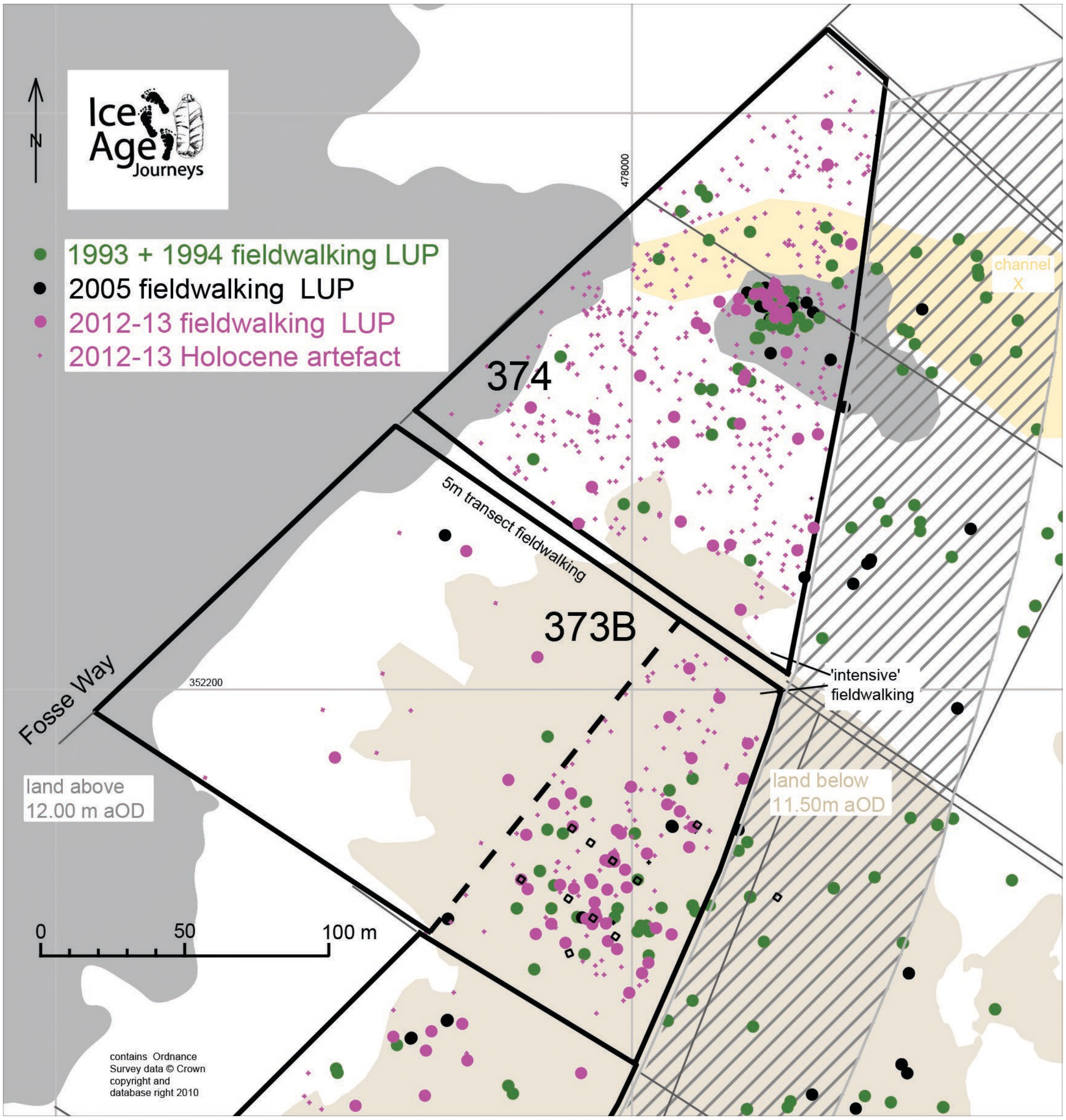

FIGURE 5: Farndon Fields: fieldwalking scatters in fields 373B and 374, showing all 2013 findspots (magenta), and just LUP from 1993–2005 coloured as key (from Garton and Jacobi 2009, illus. 3). The new A46 road (grey hatched), with field boundaries redrawn from 1900 Ordnance Survey; palaeochannel X in cream after Bates (2011, 78) and Harding *et al*. (2014, 42–3); land above 12m grey and below 11.5m aOD brown (generated from same Environment Agency LiDAR data as Figure 2). Based on Ordnance Survey open-data © Crown copyright and database right 2010.

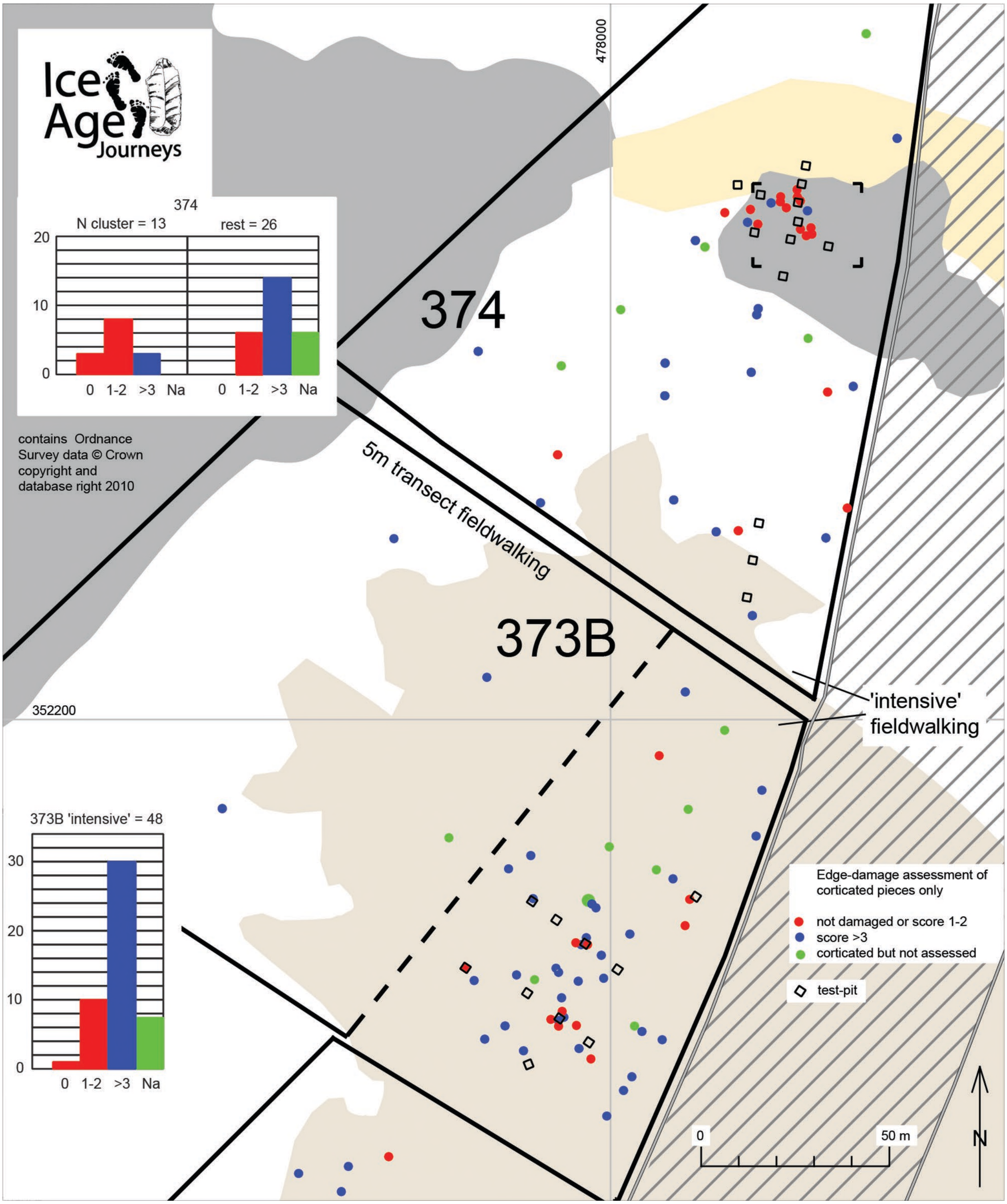

FIGURE 6: Farndon Fields: damage assessment of LUP flints (scored 0–≥3 as Appendix III) and test-pit locations in fields 373B and 374. The nominal area of the 'N cluster', first recorded in 1993 (Garton and Jacobi 2009, illus. 2–4), is also indicated. The new A46 road (grey hatched), with field boundaries redrawn from 1900 Ordnance Survey; palaeochannel X in cream after Bates (2011, 78) and Harding *et al*. (2014, 42–3); land above 12m grey and below 11.5m aOD brown (generated from same Environment Agency LiDAR data as Figure 2). Based on Ordnance Survey open-data © Crown copyright and database right 2010.

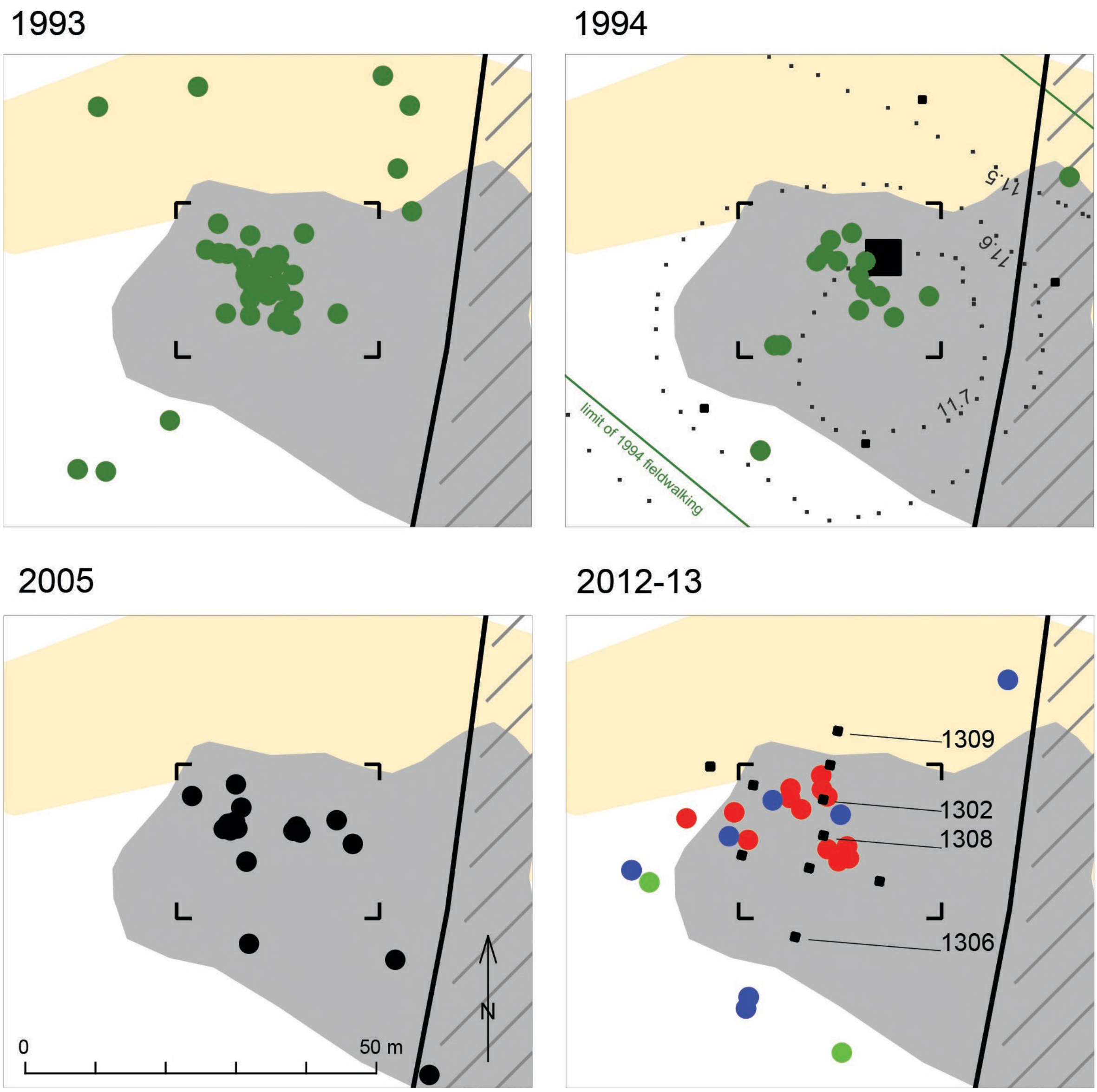

FIGURE 7: Farndon Fields: distribution of LUP artefacts, collected in different seasons, forming the 'N cluster' within field 374 (located in Figure 6). To aid comparison, the new A46 road (grey hatched – constructed in 2009), current field boundary, and nominal area of the 'N cluster', first recorded in 1993 (Garton and Jacobi 2009, illus. 2–4), are shown in all views. Land above 12m aOD grey (generated from same Environment Agency LiDAR data as Figure 2). Subsoil contours, generated from augering conducted in 1994, shown as dotted lines at 0.1m interval. Black squares are test-pits excavated in 1994 and 2013. Data from test-pits 1302 and 1308 were used to construct the depth of artefact recovery in Figure 12, and selected artefacts from them are illustrated in Figure 8. Based on Ordnance Survey open-data © Crown copyright and database right 2010.

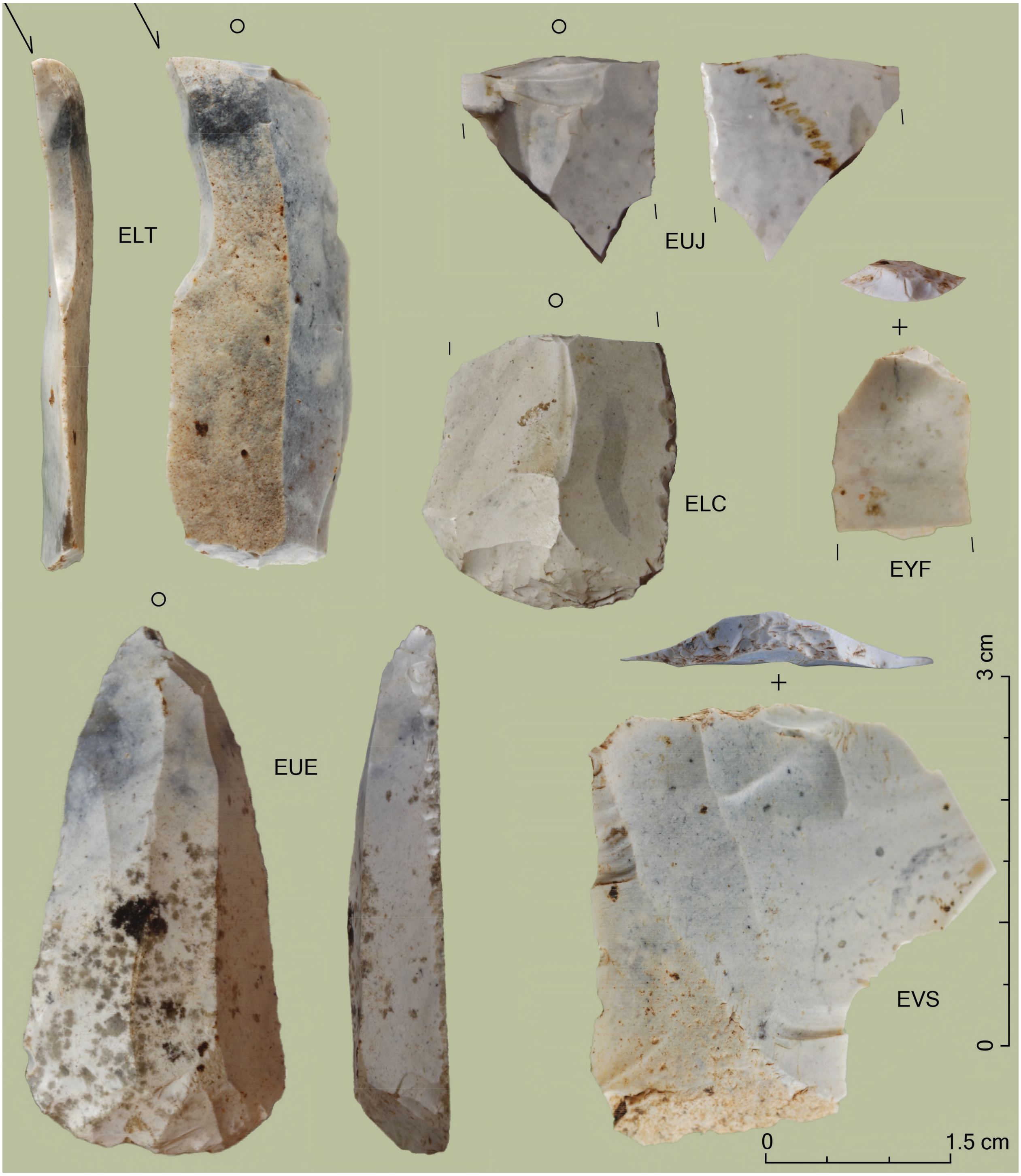

FIGURE 8: Farndon Fields: LUP artefacts from 2012 fieldwalking of the 'N cluster' in field 374 (ELT, ELC) and from 2013 test-pits (EUE, EUJ, EYF, EVS: detail in Appendix III, Tables 4 and 5). Proximal end of flake indicated: cross = position of point of percussion, o = platform absent. Arrow = burin spall. Only plough/modern breaks are indicated (not ancient/corticated breaks). Scale 2:1. Photographs by Bill Pointer and Daryl Garton.

the ploughsoil long enough to sustain substantial damage. Some of the LUP flint was immediately adjacent to the furrow recognized on the LIDAR – it was undamaged. The LUP artefacts from outside of the 'N cluster' have a noticeably higher damage score of ≥3.

Test-pits (Figures 6 and 7)

The results of hand-augering (led by RT) along three transects across the 'N cluster' were used to model the sub-surface sediments and topography. Following this, nine 1 × 1m test-pits were dug to examine apparent variations in stratigraphy (pits 1301–6, 1308), and the edge of palaeochannel X (pits 1307, 1309). Sloping ground was targeted where it was hoped that undisturbed flint-bearing deposits might lie below the base of the ploughing.

In each of the test-pits, the same basic stratigraphic sequence was recorded: a dark brown humic topsoil with a distinct, undulating, boundary to a thin red-brown sandy clay loam, which merged into loamy sands of variable depth before reaching terrace-gravel. Additional hand-augering (by SC) at 1m intervals between and beyond test-pits 1306–1309 (Figure 7) did not locate any different deposits. The undulating ploughzone meant that, when excavating, the underlying loam appeared first as small reddish-brown patches that became more extensive as spits were removed – this mixing is referred to as a 'transition' in Table 5 and Figure 12 (also in test-pits in field 373B, below). We interpreted the sandy-clay-loam as a bioturbated mantle where progressive pedogensis (soil development) had so strongly overprinted any original stratification that none survived. Artefacts within it cannot be located to an original unit or horizon – they have moved, predominantly in the vertical plane, probably leaving the original 'activity clusters' (in the horizontal plane) more or less undisturbed (just 'blurred' on a scale of a few centimetres laterally – see p. 123).

The LUP artefacts, identified by their corticated condition, were restricted to four of the test-pits (Appendix III, Table 5). Only two adjacent test-pits (Figure 7) were very productive (1302 = 12 and 1308 = 26 artefacts), each producing one diagnostic LUP form, an end-scraper (Figure 8 EUE) and a blade with a butt *en éperon* (a technique of carefully removing flakes to isolate the platform, Figure 8 EYF). In each of these test-pits, 70% of the LUP items were recovered from the ploughsoil/transition layer (Figure 12). Some items from the ploughsoil are virtually pristine (e.g. scraper EUE having just one modern nick), others are very fragmentary (e.g. probable scraper fragment EUJ: Figure 8, Appendix III). The few items lower than 40cm deep (so below the normal ploughzone) were all identified as from, or close to, burrows (some being evident by voids).

The distribution of flint items in these test-pits suggests that the cluster was quite tightly confined, but had not been fully uncovered in the 5 × 5m area (727) excavated by Wessex Archaeology in 1994 (Figure 7).[2] In this case, most of the items (54) were reported from the ploughsoil, with six artefacts from the upper part of the subsoil (at 0.04–0.07m deep). On the basis of the density of flint items per 1 × 1m square, both test-pits 1302 and 1308 were more productive than their equivalent in area 727, though the attention to sieving, and the keenness of volunteers to collect the smallest fragments, perhaps played their part.

Conclusions for state of preservation within field 374

The distribution of LUP artefacts recovered by fieldwalking in 2012 is strongly clustered, and lies to the west of previously recorded fieldwalking distributions (Figure 7). These artefacts, which include undamaged pieces (Figure 6), were on the down-slope side of the high point suggesting that recent ploughing had bitten into formerly undisturbed deposits on its western side.

Our test-pits excavated in 2013, to the west of the 1994 area, demonstrate that the former excavations did not reveal the full extent of the cluster, but that the spread of material is confined so that the term 'cluster' is still appropriate. The LUP material from the test-pits includes debitage and retouched tools (*en éperon* butt EYF and end-scraper EUE) which, together with the composite scraper-burin ELT from fieldwalking, are forms attributable to the Creswellian (Figure 8). Although material has been collected from the 'N cluster' over some 20 years, it is all consistent and can be interpreted as a single locus of activity probably covering only one or a few closely-spaced events. Contamination from later flint-using activities is minimal.

Over the years, the 'N cluster' has produced 132 items from fieldwalking and another 102 items from test-pits (using the data in Appendix III, Tables 4 and 5, and Garton and Jacobi 2009, Table 3). These 234 items include two cores and 47 tools/utilized pieces. Although the number of cores is low, there is clear evidence for knapping (crested pieces and probable faceting spalls). Artefacts from the subsoils of the excavations demonstrate that the spread of activity was at least 16m across, with undamaged items from fieldwalking suggesting a larger cluster perhaps some 25m across. Using the artefact numbers from excavation, we might expect anywhere between one and 26 artefacts per square metre, though clearly this has not included any knapping focus where numbers would be expected to be far higher (cf. Harding *et al*. 2014, Figure 2.28).

The most disappointing aspect of these results is that virtually all of the material is in the ploughsoil, with the test-pits showing little potential for the survival of unploughed remnants of stratigraphy or even bioturbated deposits (Figure 12). Any associated dating or environmental material has therefore been lost. On the positive side, some of the artefacts were in near pristine condition when collected in 2012–13. So, even though not from sealed contexts, enough survives to suggest that future excavation could recover an (albeit blurred) pattern of flints that would allow interpretation of past human behaviour. However, further ploughing will unfortunately continue to dilate the cluster (because of the sloping ground) and break up the artefacts.

Investigations in field 373B

Previous fieldwork and LiDAR

Field 373B has been walked systematically on four occasions (1991, 1993, 1994, 2005); a light scatter of material was reported in all seasons bar 1994 where the density of finds was higher (Garton and Jacobi 2009, illus. 2). LiDAR shows that the field shelves very gently into a slight hollow (Figure 2). A vertical aerial photograph from 1954 shows what appear to be white piles of lime to the south (NMR RAF/58/1435 frame 131); such agricultural improvement may have resulted in increased biological activity. Eric Kirton, formerly a farm contractor, reported that he had subsoiled this field with a single bar some 3ft deep in the early 1960s when the field was cultivated for a market gardener (personal communication).

Pattern of artefact distribution from fieldwalking (Figure 5)

On the basis of the previous artefact distributions (Garton and Jacobi 2009, illus. 2), we had asked the farmer not to crop part of the field adjacent to the new road to give us access for both fieldwalking and test-pitting. Following our request, the field was ploughed and harrowed, but only the west part was sown with barley. This western, sown part of the field was walked at 5m transect intervals, whilst the eastern part was walked intensively (Appendix I) and was also subjected to auger-survey and test-pitting.

5m transects on west part of field

A very sparse scatter of LUP artefacts (including one tool, Figure 9 FPJ) and Holocene items was recorded (Figure 5) replicating earlier results (Garton and Jacobi 2009, illus. 2A, 2D). There is no obvious cover of later sediments (Wessex Archaeology 1994, Appendix 2), so this area is perhaps beyond the preserved limit of LUP activity.

'Intensive' fieldwalking on east part of field

Both Holocene and LUP artefacts were found scattered over the area walked with a clear gap along the south margin that abuts field 373A, though the LUP items were noticeably more concentrated within the southern part of the area (Figures 5 and 6). This corresponds with the denser part of the scatter collected in 1994, though this was not replicated in 2005 (Garton and Jacobi 2009, illus. 2).

Flint artefacts from intensive fieldwalking

The recovered artefacts include five cores and blades with a range of edge-modification/use (Appendix III, Table 6). The forms, and the variable condition of cortication and staining (Figures 9 and10), suggest that both LUP technologies (Creswellian and Federmesser) are represented, the latter by a curved backed point (Figure 9 FKG: Appendix III). The damage scores (Figure 6) show that many of the flints scored as ≥3 so are heavily plough-bashed. This might suggest that since fieldwalking in 1994 when the density of the scatter was the highest recorded, plough-damage has been relatively insubstantial. However, as will be demonstrated below, the presence of some relatively undamaged items urges caution.

Test-pits (Figure 6)

Four transects were hand-augered. The relatively deep sandy sediments in the north part of the field

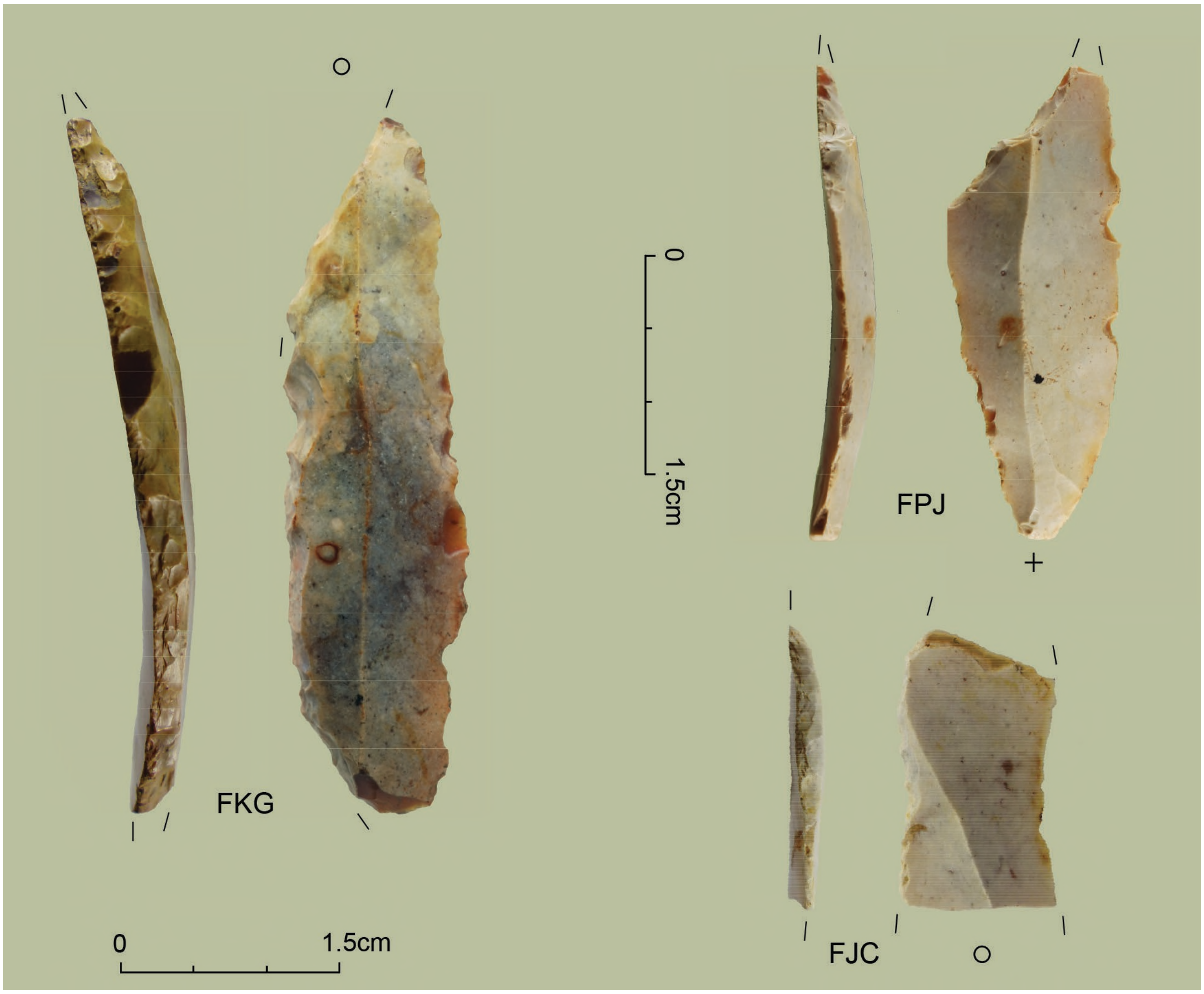

FIGURE 9: Farndon Fields: LUP artefacts from field 373B collected in 2013 (Appendix III, Table 6); FKG and FJC from ‘intensive’ fieldwalking in east part of field, and both within 10m of test-pit 1402; FPJ from fieldwalking 5m transects in west part of field. Proximal end of flake indicated: cross = position of point of percussion, o = platform absent. Only plough/modern breaks are indicated (not ancient/corticated breaks). All scale 2:1. Photographs by Ian Ross and Daryl Garton.

probably correlate with the palaeochannel identified by the A46 team (p. 113). The northern-most test-pit (1409) was located towards the southern limit of these deposits. In the south part of the field the stratigraphic sequence was consistent above the terrace-gravel, though the upper deposits were variably truncated (Figure 11). Nine test-pits were located within the flint-scatter where augering had indicated silty subsoil. Three of these test-pits were sited where relatively undamaged artefacts had been found during the previous season's fieldwalking (1402, 1406, 1410).

Stratigraphy (Figure 11)

Most pits had a dark brown humic ploughsoil with a distinct, undulating, boundary (hence 'transition' as p. 118) to a red-brown silty clay loam (02) which gradually merged into a slightly paler sandy loam (03) which became progressively sandier with depth. Bioturbation, marked by Fe oxides and Fe/Mn concretions, was clear at the base of 02 and was increasingly evident in 03. Pebbles/other inclusions in these two horizons were uncommon. At the base of 03, though the matrix changed little, common small stones/pea-gravel were found within a band some 0.10m deep (05) before coarser sand and gravel (06) was reached. Evident towards the base of 03, but not in the sediments above, were narrow linear scores produced by subsoiling in two directions, almost certainly on a number of occasions.

On seeing some flints *in situ* within the silty loam (02) in test-pits 1402 and 1406, it was commented (by SC) that block sampling (for micromorphology) would probably only allow detection of the very evident bioturbation, which appeared strong enough to disrupt any sediment structures. Plate 1 shows fine channels in sediment originally adjacent to the face of a flint blade and is indicative of bioturbation which was also evident as fine rootlets and worm casts in the adjacent sediments. The presence of groups of small flakes within each test-pit suggests

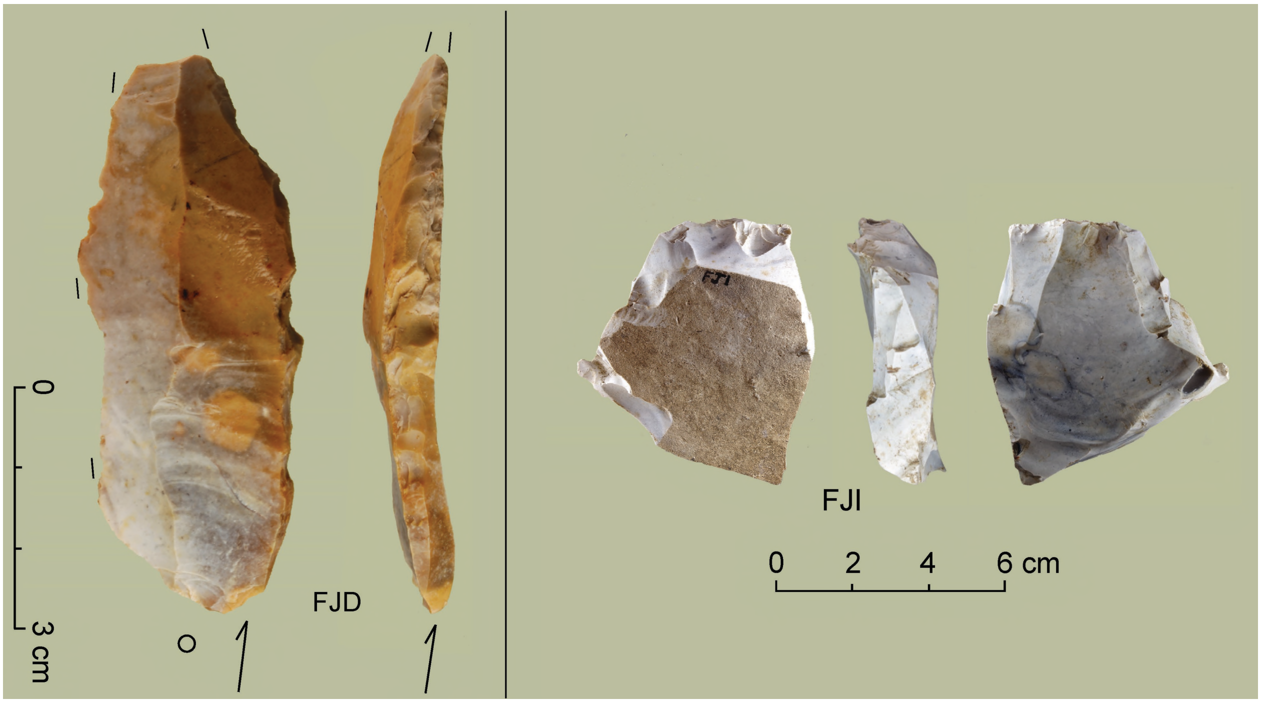

FIGURE 10: Farndon Fields: LUP artefacts from 'intensive' fieldwalking in field 373B (Appendix III, Table 6); FJD lay 10m to north and FJI 1m to north of test-pit 1402. Only plough/modern breaks are indicated (not ancient/corticated breaks); o = platform absent. Backed blade FJD at scale 1:1; core FJI at scale 1:2. Photographs by Daryl Garton and Bill Pointer.

PLATE 1: Farndon Fields: A: burin FXH detached from sediment which shows fine channels adjacent to the flint surface indicative of bioturbation in field 373B; B: excavation in progress in test-pit 1406 with flint being revealed in silty loam (also showing worm-channels) below ploughsoil. The depth of the ploughsoil base is marked by P+black line; yellow-heads of nails mark the sample for fine-sieving (Appendix I). Photographs by Ian Ross and Daryl Garton.

that bioturbation was insufficient to disaggregate the flint-scatter (it is intended to investigate refitting, though in such confined test-pits it is inevitable that the results will be limited). Disruption from criss-cross subsoiling seems to have been limited as intact, delicate, blades (like Figure 13 FUY, found immediately adjacent to a score), have survived without evident damage. (Eric Kirton reported that the subsoiler used in the 1960s had a single round bar at its tip i.e. it was not winged).

As in field 374, we interpreted the silty-sandy loams as a bioturbated mantle where progressive pedogensis (soil development) had overprinted sediments originally deposited in the Late Glacial Interstadial. These deposits might have been continuous with what were bedded deposits of the 'embayment'. Thus, the original context of the flint-scatter might have been temporary emergence surfaces in a sequence of very low energy alluvial accretion, but proof is lacking and seems most likely to survive in more deeply buried deposits lying to the south (see below).

The pebbly (05) and sandy loam horizons (03) were found in all the test-pits. The silty loam (02) was very variable in depth; it is noticeable that the two test-pits (1402 and 1406) with quantities of flint also have the deepest deposits between ploughsoil and gravel (greater than 0.30m), though having that depth did not always produce substantial numbers of flints (e.g. 1410 in Figure 11, and none in the sandy deposits in test-pit 1409). The relatively high level of the base of the ploughsoil in test-pit 1406, the only one above 11m aOD (Figure 11), is probably also significant. Hence, although the survival of the silty loam (02) below ploughsoil may be a necessary condition for the recovery of artefacts, the LUP activity is variably distributed.

The number of artefacts recovered from the two productive test-pits is plotted by depth in Figure 12.

This shows that relatively few items were within the ploughsoil, with a significant number in the sediments immediately below the 'transition' (p. 118). The depth range of the artefacts is attributed to post-depositional vertical movement; there is a growing literature which suggests that this does not significantly affect the original horizontal pattern of deposition. Examples of relevance include Hengistbury Head, Dorset (Collcutt 1992, 64–78); Newton Cliffs, Nottinghamshire (Garton *et al*. 1989, 104); and Farndon A46 (Harding *et al*. 2014, 66–7, Figure 2.35). The variability in the number of artefacts between test-pits in field 373B is suggestive that they also reflect broadly the original distribution from past activities. From the current distribution it could represent one continuous scatter (with rapid fall off of artefacts to the east, west and south), or, given the productive test-pits were 20m apart, two separate scatters.

Flint artefacts (Figures 13 and 14)

LUP artefacts were recovered from six test-pits (Figure 11). There was only one potentially diagnostic piece from the test-pits with six or fewer items; a blade from 1407 has a faceted butt that is similar to *en éperon* – a specifically Creswellian signature (Barton 1990). There were a significantly larger number of artefacts from test-pits 1402 (163) and 1406 (84), and both include diagnostic LUP forms, including from 1406 two *en éperon* butts (Figure 14 FQB, FQE). Both test-pits include crested blades from core preparation (FUI, FXL) and delicate blade tools representing activities closely related in time. The tools comprise end-scrapers (FUY, FQE), a borer (FYO), a burin (FXH with edge-modification that looks like use wear) and a denticulated blade (FUU/FUN; Figures 13 and 14). Only scraper FSP from the ploughsoil is of a different character (Figure 13). These artefacts are tabulated by context, raw material and form in Appendix III, Table 7.

Virtually all the items from test-pits 1402 and 1406 are corticated; video footage clearly shows progressive colour change as one blade surface was exposed to air. Modern breaks show the original flint of many of the corticated artefacts to have been brown in colour.

Conclusions for state of preservation within field 373B

Fieldwalking evidence might suggest that since 1994 the plough-base has been pretty stable; this is probably due to the fact that there is a slight surface hollow (Figure 2). Some lightly damaged artefacts were recovered during fieldwalking in 2013 (Figure 6) and in the following season test-pitting uncovered substantial, coherent sets of LUP material (Figures 13 and 14).

The two test-pits that produced a range of *in situ* material can be interpreted as perhaps resulting from two, near contemporary, knapping events that both produced blades to make tools for use on the spot. Cores with faceted platforms found in fieldwalking close to these test-pits (Figure 10 FJI and Garton and Jacobi 2009, illus. 6.6), are consistent with this probable Creswellian industry. A scraper from the ploughsoil of 1402 (Figure 13 FSP) and other artefacts from fieldwalking in close proximity include some heavier tools (e.g. backed blades: Figure 9 FKG; Figure 10 FJD) perhaps representing slightly later (Federmesser) activity. Only further excavation (possibly aided by trace-element analysis of the flint raw material), could help to substantiate, or disprove, this speculation.

The known area of activity rapidly diminishes around test-pits 1402 and 1406 (Figure 11 – although other zones remain to be investigated, see below). The flints were found where silty loam (possibly derived from original alluvium) was deepest, though the survival of this deposit did not always produce a substantial LUP assemblage (e.g. 1410, four items, Figure 11). It is probable that it was the truncation of this deposit that has produced the scatter identified by fieldwalking around these test-pits. Continued ploughing in this field will surely threaten the preservation of these assemblages, particularly given that the ploughsoil in test-pit 1406 had a higher base level of some 0.08m above that of the adjacent pits (Figure 11).

The typology of the flints, the surface topography and possibly even the sediment type combine to suggest that these two knapping clusters are on the edge of the same embayment of alluvium as

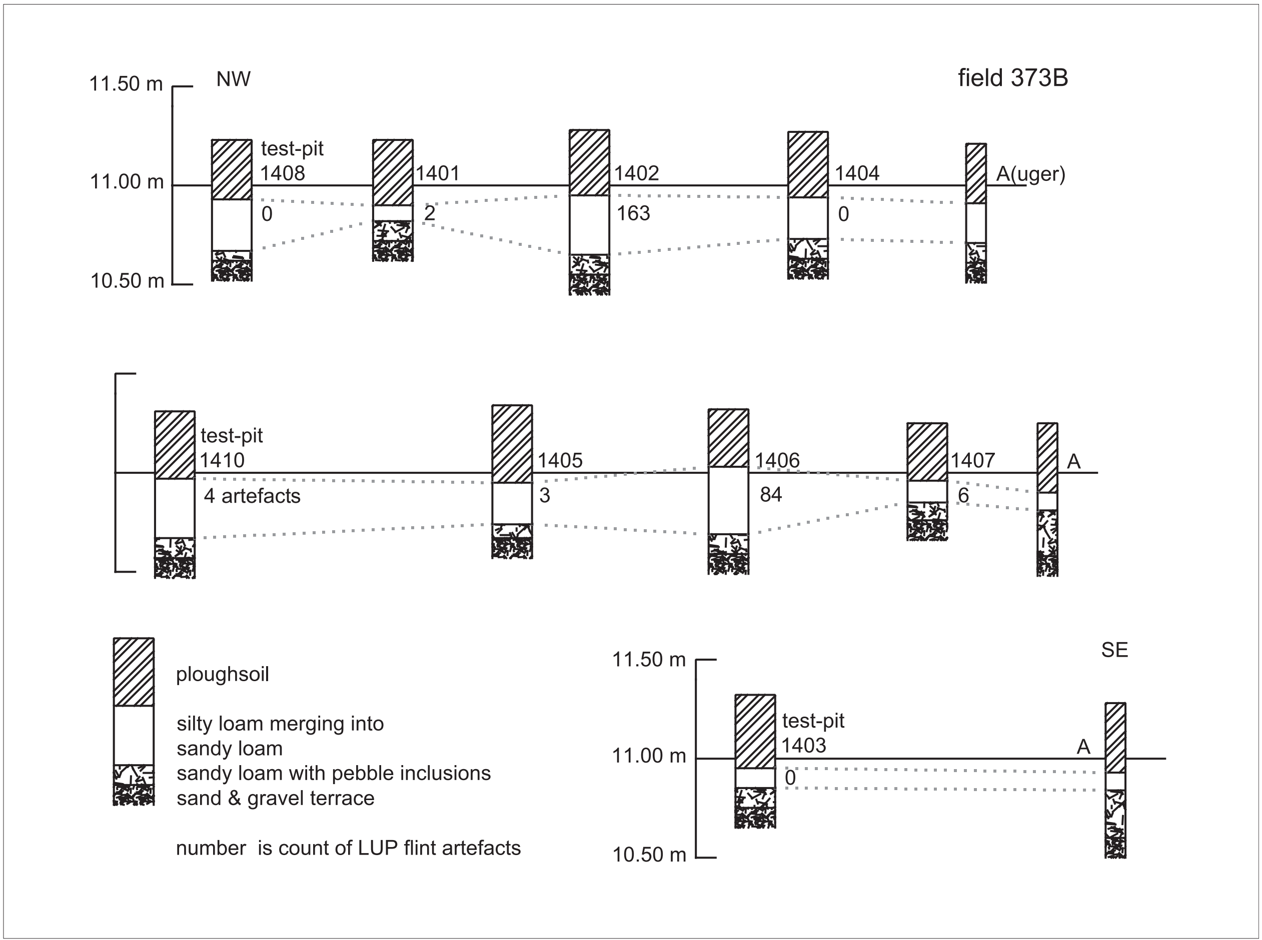

FIGURE 11: Farndon Fields: stratigraphy in test-pits and selected auger-cores in field 373B. The test-pits are placed in approximately correct relation to each other (located in Figure 6), with the vertical scale of the pits exaggerated x5. The total number of LUP artefacts is given to the right of each test-pit; for further details see Appendix III, Table 7.

the typologically contemporary clusters found on the A46 road scheme (Harding *et al*. 2014, 42). As in that work, there is also some evidence for two stages of LUP activity. The recovery of silty loam containing LUP flint, outside of the mapped Alluvium, suggests that fine-grained Late Glacial Interstadial deposits are probably more extensive than currently confirmed.

DISCUSSION AND CONCLUSIONS

At Farndon Fields we have studied in detail three 'site' areas within the more extensive spread of LUP artefacts. Though all are part of the same Late Glacial landscape and are presumed to be more or less contemporary, there are differences in their state of preservation which suggest that human activity was not the only thing responsible for this variation. Amongst factors which must be considered are topographical position, sedimentary and post-depositional histories and the nature of agricultural regimes. Each of these seems to have been influential in producing very different types of preservation.

Site 374 The 'N Cluster' appears to be a discrete concentration of finds belonging to a single period LUP assemblage. It is much more extensive than originally believed but is now divorced from its

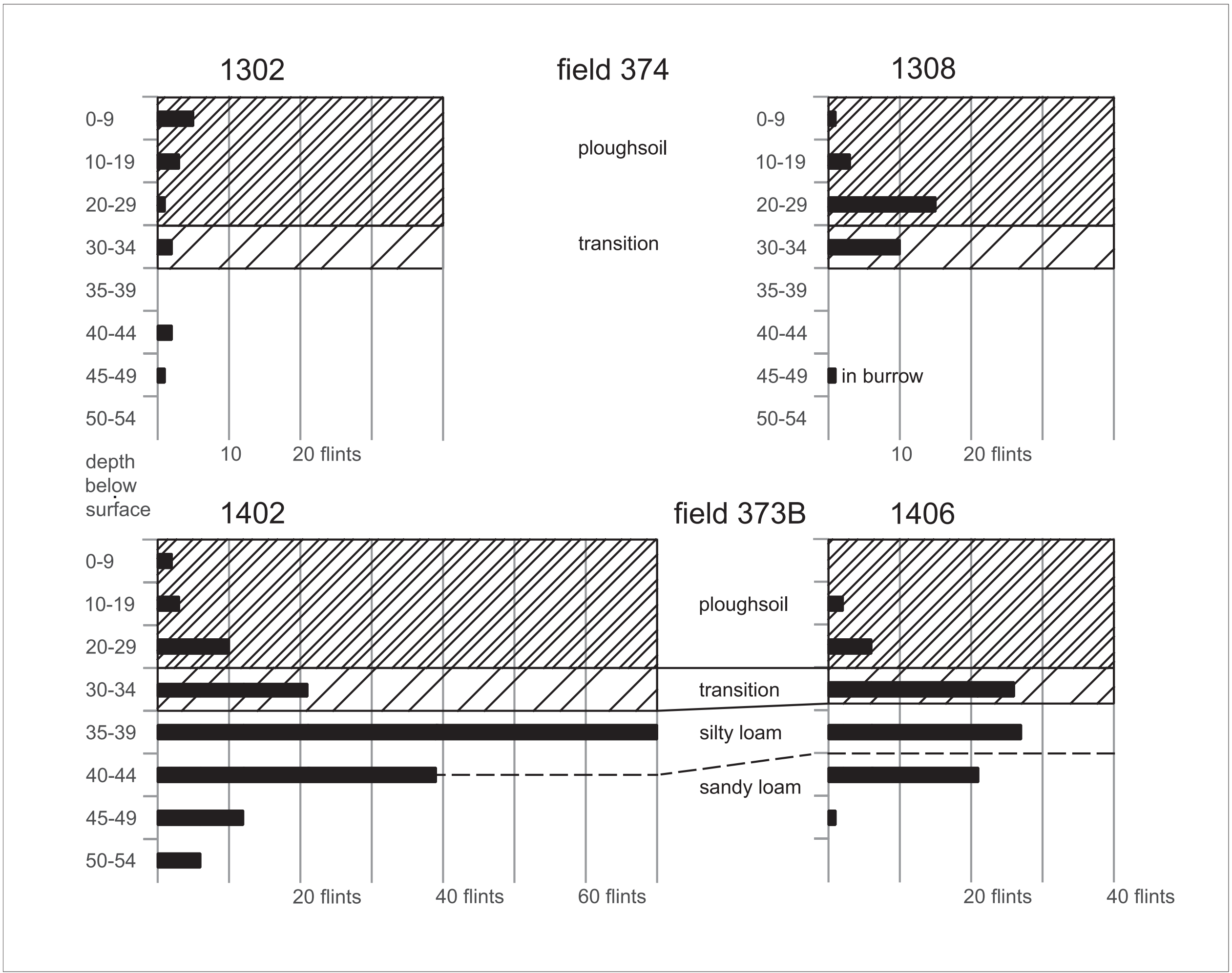

FIGURE 12: Farndon Fields: diagram showing the number of flints by depth in four test-pits (located in Figures 7 and 11). The flints in field 374 are mostly from the ploughsoil, so this area is heavily truncated, while the material in field 373B is still predominantly below the ploughsoil ('transition' refers to the undulating boundary at the base of the ploughsoil where the degree of disturbance to the flint is often unclear). This probably reflects their different topographic locations: the 'N cluster' is on a high point vulnerable to ploughing whilst 373B is situated within a slight hollow as illustrated in Figures 2 and 6.

original stratigraphic context. Although in a slightly disturbed position the virtually pristine condition of the artefacts suggests that they retain their broad spatial patterning derived from past activities. Given the presence of retouched tools and debitage this concentration probably represents an area of primary knapping activity where blades were made and converted into tools. Further study of the ancient fractures on the tools might determine whether they were used and discarded on the same spot or whether the broken examples were broken in manufacture. The integrity of this concentration continues to be fragmented by ploughing, particularly because it is on gently sloping ground.

Site 373B This is a scatter with multiple foci which lies on the edge of the embayment. It has been damaged by sub-soil drilling and continues to be ploughed, but test-pitting has shown that some of the flint artefacts are preserved *in situ* so that it has high potential for further investigation. The flints, although not in a sealed context, appear

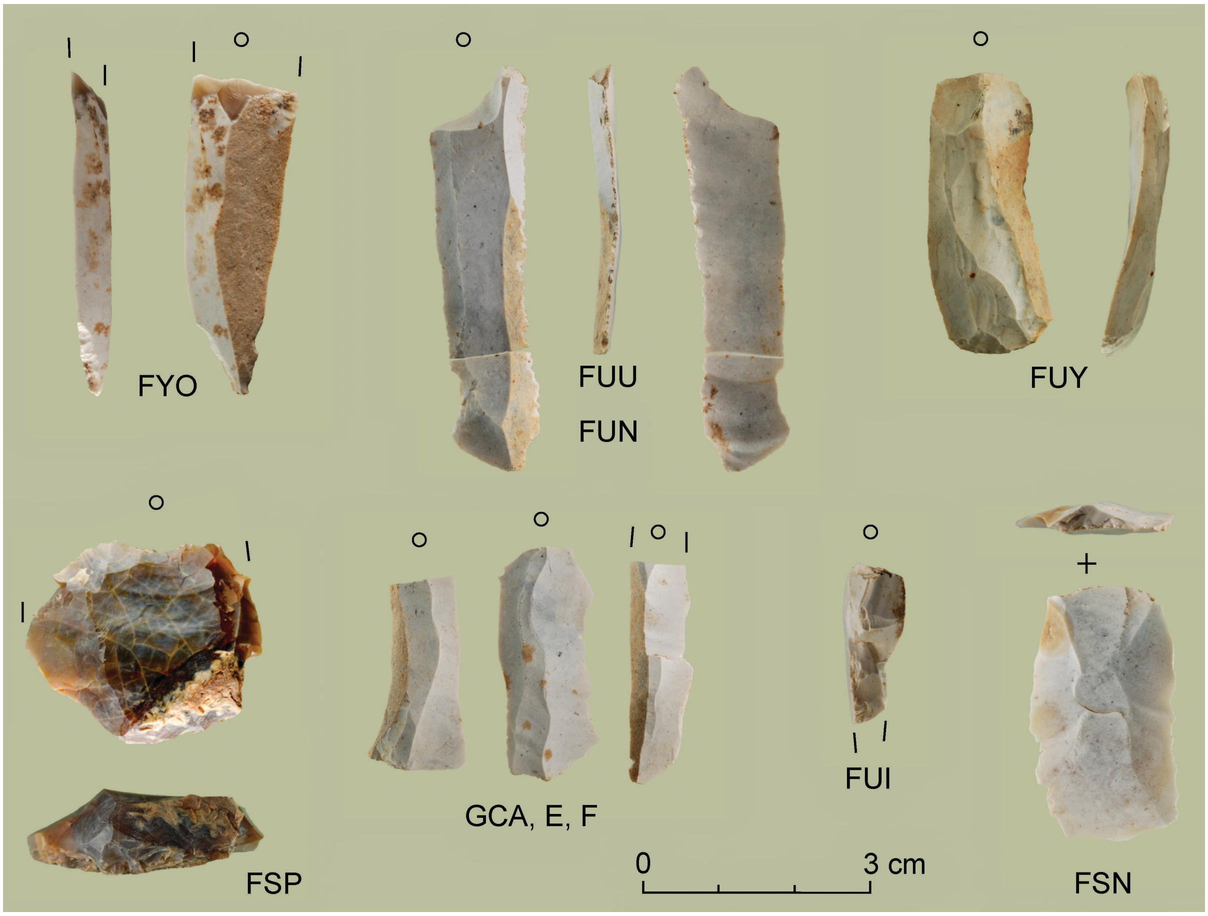

FIGURE 13: Farndon Fields: LUP artefacts from test-pit 1402, detail in Appendix III, Table 7. Proximal end of flake indicated: cross = position of point of percussion, o = platform absent. Only plough/modern breaks are indicated (not ancient/corticated breaks). All at scale 1:1.

to be associated with silty loam, a sediment stock that may have been derived from an alluvial environment; other zones within, or protected by, alluvium may possibly survive along the northern boundary with field 374. The retouched tools are not particularly numerous but significantly include a curved backed point of Federmesser type. It is therefore one of the few new localities from which artefacts unequivocally belonging to the two LUP periods have been recovered.

Sites 373A and **373D** These two sites show clear indications that undisturbed LUP clusters/scatters have begun to be seriously damaged by ploughing. Their state of preservation is still being studied but it seems likely because of the known occurrence of coversands nearby that original Late Glacial land surfaces may survive intact and therefore offer considerable archaeological potential. LUP cores and retouched tools recovered from both of the clusters suggest this is another location where manufacturing and tool use occurred. If the proposed clusters were confirmed, this would demonstrate specific activity foci over much or all of the embayment.

As the above discussion indicates, a number of issues still remain to be more fully resolved. Primary amongst these is whether, in addition to the Creswellian, it will be possible to distinguish scatters of Federmesser material (cf. Harding *et al*. 2014, 69). So far, separation of LUP artefacts into

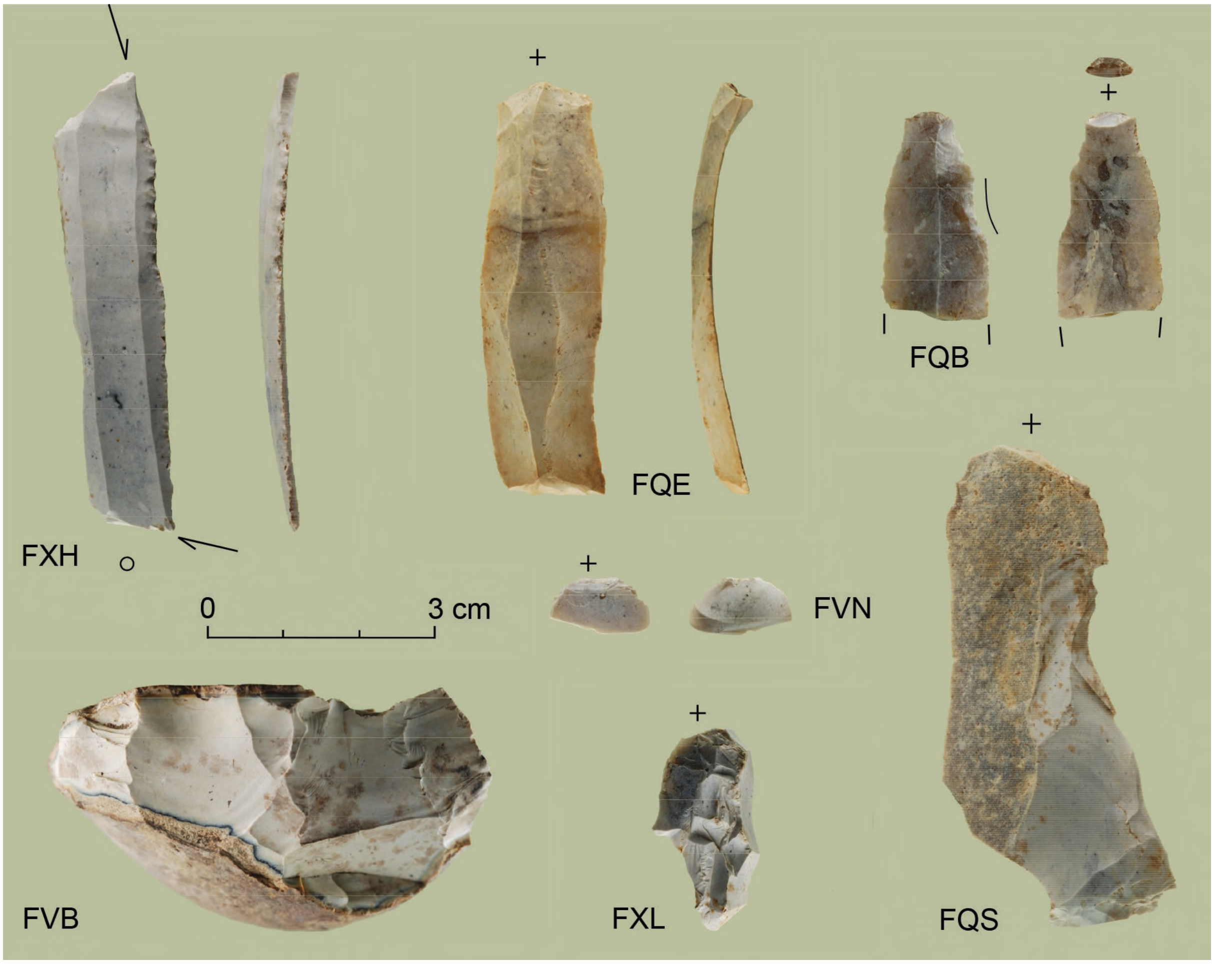

FIGURE 14: Farndon Fields: LUP artefacts from test-pit 1406, detail in Appendix III, Table 7. Proximal end of flake indicated: cross = position of point of percussion, o = platform absent. Arrow = burin spall. Clear extent of edge-modification on FQB indicated by a black line. Only plough/modern breaks are indicated (not ancient/corticated breaks). All at scale 1:1.

these entities has been possible mostly because of the different surface appearances (cortication) of the flints. Creswellian pieces tend to have a dense cortication with a white or blue surface appearance whereas the Federmesser pieces are generally reddish brown in colour. However, there are exceptions to this 'rule' and what is needed now is a systematic examination of the techno-typology of the assemblages to see if these differences can be confirmed independently of surface condition.

A further matter of interest concerns the sourcing of flint in the LUP scatters. Clearly, few of the manufactured flints are local to Farndon Fields so must have been imported by the Late Glacial hunter-gatherers who visited the sites. Visual similarities of the lithic raw material with types that occur at other LUP sites within 35km of Farndon Fields such as the Creswell Crags and Bradgate Park (Figure 1; Lynden Cooper pers. comm.) need to be further investigated. In addition to using trace-element analysis for tracking the potential provenances of the sources (see Pettitt *et al*. 2012, Figure 3; Pettitt *et al*. 2015), Simon Chenery has suggested that this technique may also enable identification of different groups within the collections. If so, this could have the potential to confirm knapping groups where refits were not possible, identify curated

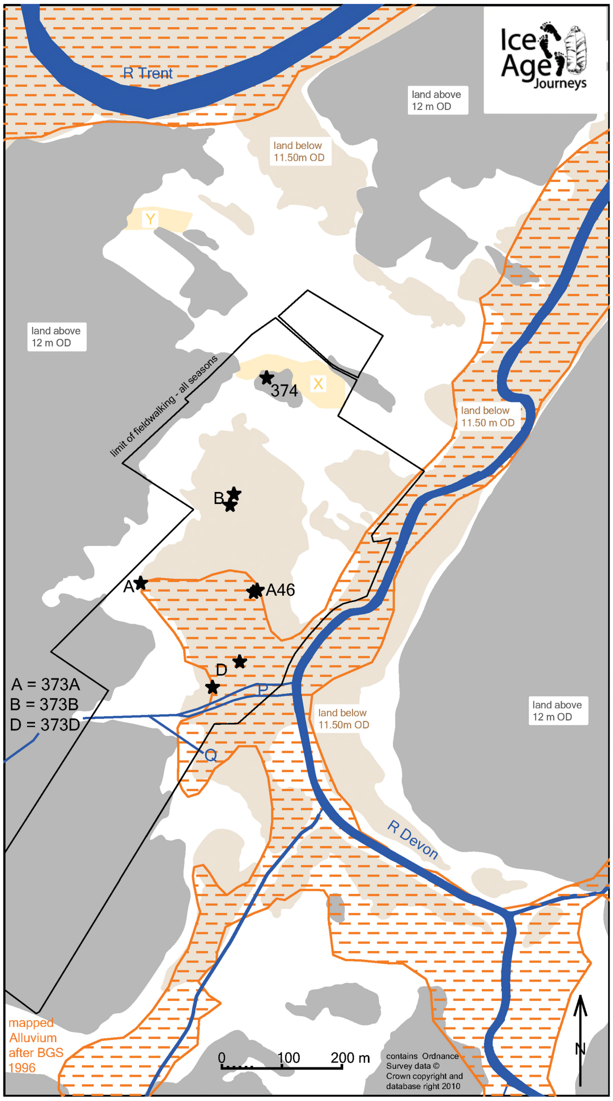

FIGURE 15: Farndon Fields: summary plan of currently known features and clusters within the LUP landscape; only the known artefact-clusters are shown (as stars, discussed in text) within the outline of the area fieldwalked (all seasons). Orange outline with dashes is 'mapped Alluvium' after BGS (1996); deposits of Holme Pierrepont Sand and Gravel lie between the 'mapped Alluvium' of the Rivers Trent and Devon. The topographic 'gap' in the land above 12m aOD contour (grey tone), possibly a former course of the Devon, shows clearly. Palaeochannel X (as in Figures 5 and 6) and Y (from aerial photograph NMR SK7752/3) shown in cream. Contours generated from same Environment Agency LiDAR as Figure 2. Based on Ordnance Survey open-data © Crown copyright and database right 2010.

tools (i.e. those brought in and used alongside new knapping products) and identify different groups where occupation scatters overlap. Given the different qualities of the flint resource noted through time (Garton and Jacobi 2009, 31; Harding *et al*. 2014, 70), this might also aid identification of chronological patterning.

We have already shown that the superficial geology needs to be mapped at a finer resolution; detailed modelling of deposits will allow us to predict more accurately the areas where the preservation of Late Glacial sequences of deposits might be most complete. Further investigation will also be necessary to enable us to interpret the Farndon Fields sites in their landscape. For example, the Bradgate Park site can easily be imagined as a 'lookout' and camp for an intercept hunting strategy because it is sited on raised ground just above the narrow mouth of the Little Matlock Gorge (Cooper 2002, 79; 2012, 37). In contrast, Farndon Fields sits on the interfluve between two major rivers; the valley is much wider and modern development makes it hard to envisage the sites in their original context. Its location may also be harder to visualise because of potential changes to the course of the River Devon. LiDAR shows that there is a topographical 'gap' in the longitudinal crest of the Holme Pierrepont Sand and Gravel terrace-deposits to the north of the site complex, and within this 'gap' there are at least two undated palaeochannels (X and Y in Figure 15). This 'gap', previously unrecognized, may be a former fluvial meta-channel and, if so, a significant landscape feature affecting the location of the LUP activity. We need a full geological/hydrological assessment with map regression (perhaps a future project), but, in its absence, we are aware that the configuration of the river valleys is a key element in trying to understand why Ice Age people chose this spot for their activities over an extended period.

To conclude, Farndon Fields is one of the most extensive LUP flint-scatters in Britain, with demonstrably multiple activity-foci (Figure 15), and one of the very few locations in this country where there is evidence of at least two distinctive LUP blade technologies from largely undisturbed contexts (Harding *et al*. 2014, 68). Here, it can be reasonably deduced that the different scatters resulted from groups regularly revisiting a floodplain and channel-edge environs over a long period of time, with debris from past occupations covered by gradually accreting alluvial sediments – a situation more familiar on the continent (cf. Ploux 1994). Although landscape features are subdued today, this strongly implies a memory of the Farndon Fields place, which was perhaps no less distinctive in the past than the Creswell Crags caves or the Bradgate Park camp. Farndon Fields lies between these two locations (Figure 1) and each was perhaps just a day's journey for an Ice Age hunter.

After knowing about the site for some 20 years, and having demonstrated both its potential and recent degradation, we believe it is time to protect this rare Ice Age landscape. Ideally, the site complex and its landscape deserves preservation and measures to avoid deterioration, so that we, and future generations, can learn how the various elements of assemblages, topography and environment fit together to enable us to picture how people lived in the Ice Age. With the help of the landowner, and future grant-aiding bodies, we will continue to seek data that will inform us about the potential survival of deposits and hope to influence the management of the land to positively determine the future of this inhabited Ice Age landscape.

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APPENDIX I: METHODOLOGY

LiDAR (Light Detection And Ranging) and aerial photographs

The topography of our study area was mapped using LiDAR data to provide a backdrop against which we could start to interpret our findings. LiDAR tiles (a close-grid of surface height data collected by airborne survey) were accessed under licence from the Environment Agency. These were manipulated in QGIS to highlight ground levels between 10.5m and 12m aOD. Figure 2 uses 1m LiDAR composite (November 2012) using tiles SK7751 and SK7851 with the new A46 embankment masked by 2m LiDAR composite (2005) from tiles V0043163 and V0043166.

Vertical and oblique aerial photographs (ten 1km grid squares centred in SK7852) were inspected at the National Monuments Record, Swindon, by a volunteer group from Ice Age Journeys in February 2014. We particularly noted marks that might reflect former fluvial channels and field use. Within the known extent of the flint-scatter there were no obvious cropmarks of cultural features, nor indications of ridge and furrow ploughing.

Fieldwalking

The objective was to recover flint items on the field surface whose distribution, forms and condition could be compared to the material recovered from previous fieldwalking sessions. Other humanly-modified stone artefacts were also collected, but other cultural materials such as pottery which, in any case, was rare (apart from post-Medieval examples) were ignored. As fieldwalking only recovers the flint on the surface (experiments elsewhere show that this is some 0.5–7% of the material in the ploughsoil – see Ammerman 1985; Tingle 1987, 89; Clark and Schofield 1991, 94–100; Shennan 1985, 40–4), re-walking of the field can be useful to collect more diagnostic material and also provides a direct comparison of its distribution through time perhaps indicating changing/increasing depth of ploughing. All recognized struck flint was recorded and collected.

Regardless of methodology (see below), each artefact recovered was individually coded and recorded by Total Station survey using British National Grid co-ordinates. The artefacts were washed, marked and catalogued. Only the locations of the genuine, struck, flint were used to prepare the distribution plots (Figures 3 and 5: river-gravel 'natural' flint collected by mistake was discarded prior to deposition in the Newark Museum). The LUP flints were recorded as large (coloured) dots, the Holocene flint as small dots (and are not categorized further in these plots or this report). Only the corticated LUP flints were assessed for recent damage. Three-letter codes, as allocated in the field, are 'finds codes', catalogued in archive.

The distribution of the LUP flint can be viewed 'interactively' against a Google Earth background at http://iceagejourneys.org.uk/geflintfinds.php where some icons (those with black squares) have links to artefact photos. This imaginative presentation of the fieldwalking data was initiated and developed by Ian Ross and Peter Foster.

'Intensive' fieldwalking in 373B and 374

The intensive fieldwalking strategy was designed to achieve 100% surface coverage. The area was divided into 10m grid squares, then walked at 2.5m intervals in both north–south and east–west directions so that two pairs of eyes examined every patch of surface from two directions. Markers indicating the position of finds were put down and a second team collected and recorded the artefacts individually. The fields had been ploughed and harrowed for the project; they were not sown with a crop, and though there were some weeds, this did not hinder inspection of the surface. Fieldwalking only commenced when the surface was weathered and pebbles were well washed.

5m transect fieldwalking in 373A, 373B and 373D

In 2013 a single fieldwalk was conducted in one direction (north-west–south-east), with volunteers spaced at *c*.5m intervals inspecting a 2m-wide area (hence 40% surface coverage). Any inexperienced volunteers walked the same line as an experienced hand but were encouraged to examine only their 2m-wide area. A separate team collected and recorded the artefacts individually.

Coring by British Geological Survey

A Dando Terrier 2002 rig was used to retrieve windowless cores of undisturbed sediment some 10cm in diameter. Three cores (BGS 1–3) of 2–3m depth were removed from site and the holes backfilled with washed gravel. Figure 3 shows the location of the three cores, with BGS 1 drilled by channel P in field 373D, and BGS 2 and 3 targeting the potentially greatest depths of deposit in fields 373D/C. One of our objectives had been to try and locate organic deposits suitable for radiocarbon dating.

These cores were opened and their sedimentology described in the laboratory (Appendix II). Subsequently samples were taken for laboratory analysis to investigate the depth of recent (up to 125 years) soil disturbance using Pb-210 dating, and changes in the geochemical profile with depth, particularly migration of contaminants with changes in river flooding.

Excavation methods

Prior to any excavation, hand-augering (using a dutch-head) was conducted in transects to give an overview of the variation in sediments, and by recording details of position and height at the field surface, contribute to a model of the sub-surface sediments and topography.

Test-pitting, a methodology developed for assessing the character and preservation of flint-scatters (Smit 2010, 8–11), was used for this work. Our primary objective in excavating test-pits was to discover if artefacts survived in undisturbed deposits below the ploughsoil. All test-pits (1 × 1m) were excavated by hand. Topsoil and subsoil spits were removed in quadrants in spits about 25mm deep, with a substantial proportion of each test-pit dry-sieved through a 7mm mesh. Where pits produced artefacts in the subsoil, further samples were wet-sieved through a 3.5mm mesh, with, in field 373B only, smaller sub-samples (200 × 200mm blocks in *c*.25mm spits) sieved through a 1.18mm mesh where the sample had previously been deflocculated using Calgon – these are recorded separately in Table 7 and referred to as 'fine' sieving in Appendix III.

It was anticipated that the recovery of further artefacts would help to characterize past activities and contribute to interpretation of past events. Sieving of sediments allowed recovery of smaller items like spalls that were hard to spot in fieldwalking. This in turn allowed an assessment of whether knapping had been conducted *in situ* or whether ready-made blade blanks had been imported from elsewhere.

Sediment terminology

The variable terminology used by different teams during the evaluation phases of work prior to road construction has been an issue (Harding *et al*. 2014, 18–19, 39). Here 'subsoil' is used merely to signify the sediments below the ploughsoil. Where specific characteristics were recognized and recorded, and there is potential for interpretation (e.g. alluvium, coversand), this will be made clear. Sediments were described in the field using the hand-texturing guide published by Briggs (1977, Table 2.1.).

APPENDIX II: SUMMARY DESCRIPTION OF THE BGS CORES
by Simon Collcutt

The BGS cores (located in Figure 3) did not include distinct (stratified) emergence features or other traces of a significant sedimentary hiatus (or unconformity) and consisted variously of individual flood event (often showing reverse-grading, i.e. pulsed sedimentation) and more persistent current flow deposits; there were no really low-energy deposits thicker than a centimetre or two. The sources of the sediments seem to have included standard Devon catchment sands and fine gravels (including apparent Liassic clasts) and also a lot of finer sand (probably reworked coversand), together with fluctuating amounts of clays and silts. Even in these cores, there was good survival of coherent bedding (often fine lamination) at many levels (i.e. these are not mass-disturbed or foundered deposits). There was no hard evidence for their date, though a Holocene sequence seems likely; there were certainly no clear traces of ground-ice effects or of coarse gravels and/or cross-bedded coarser sands (which probably could not have been cored anyway, had they existed in these intervals). BGS-1 reached a depth of 185cm (with another *c*.40cm of material that had suffered liquefaction during extraction); BGS-2 a depth of 197cm (with compact fine-medium gravel below) and BGS-3 a depth of 198cm (with sandy fine gravel at base). At a bulk level, each sequence appeared to have more finer material in the upper half and slightly coarser clastic material in the lower half; it appeared likely (on macroscopic evidence of sequence and depositional style alone) that the 77cm level in BGS-

1 correlated with the 85cm level in BGS-2. Fine mineralised bioturbation structures (plausibly recent rooting) reached depths of at least 100cm, and sometimes 150cm, in all three cores. All sediments were well oxidised (redder colours and clear presence of Fe & Mn oxides in (hydr)oxidised forms), with no survival of soft organic fragments, fibres or suggestive residues/odours. No carbonate (shell) or apatitic (bone) remains were observed. Human input (recent) was apparent only in the topsoil capping each core. More detailed logs of each core are held in the project archive.

APPENDIX III: DETAILS OF FLINT RAW MATERIALS, DAMAGE ASSESSMENT AND LUP TYPOLOGY

All flint/quartz/chert collected by fieldwalking or test-pitting was allocated a unique code. All finds were washed and catalogued detailing raw material, cortication and if burnt, in addition to form (flake/blade/core/core rejuvenation flake), and modification/retouch as a tool. The initial processing was conducted by volunteers, and then the lithics were laid out and Nick Barton gave the group 'masterclasses' on their typology and forms. These sessions were also attended by lithics specialists including David Budge, Lynden Cooper, Daryl Garton, Julia Kotthaus, Alison Roberts and Dave Underhill. Subsequent to this inspection, the final analyses and reporting were conducted by DG with advice from NB.

Flint raw materials

A range of flint raw materials were used for making artefacts. The most common is a fine mid-dark translucent flint (which can be honey/orange-brown or grey or black in colour) some with semi-opaque/cloudy mid grey-brown speckles and mottles. Small amounts are in an opaque flint (some being slightly granular in appearance), that can be characterized as Wolds-type flint (opaque buff-white-grey with paler mottles), ultimately from the Lincolnshire and Yorkshire Wolds (Henson 1985; Hopson 2005, 33–5). Where present, any cortex was rolled and/or variably iron-stained showing that all flint types were from derived sources like gravels (including Wolds-type). Unmodified nodules collected from the field-surface included a range of raw materials that were notably small but did not include corticated translucent flint of any size. The cortex on the field nodules was very variable in thickness and staining; it rarely compared well with that on demonstrably LUP artefacts (e.g. Figure 8 ELT; Figure 13, FYO, FUY; Figure 14, FQS). The origin of this flint is not known in detail, but was clearly not from the Holme Pierrepont Sand and Gravel in this immediate locality: trace-element analysis of some of the LUP artefacts from fieldwalking suggests potential sources in north Lincolnshire and East Anglia (Pettitt *et al*. 2012, Figure 4).

All recognized struck flint was recorded. Typologically, some is Mesolithic-Neolithic-Bronze Age (Table 1), but a considerable proportion is typologically older and only these earlier forms have a surface alteration here referred to as cortication (Shepherd 1972, 114–19; Rottländer 1975, 107) ranging from 'dense white' to patchy and slightly 'milky', some also with an orange stain. In the Cotswold Wessex Archaeology excavations on the A46, differences in cortication were shown to represent two distinctive LUP blade technologies: Creswellian and the chronologically later Federmesser (Harding *et al*. 2014, 66; see Table 1). Items from the excavated Creswellian scatter are described as mostly 'covered by a well developed white, less frequently blue, surface patina', whilst those from the later scatter have 'a slight red-brown surface stain' (Harding *et al*. 2014, 46, 56). DB, SC and DG saw these artefacts in the ground; the condition of the Creswellian scatter corresponds mostly with artefacts described here as having a dense cortication. The surface condition is regarded as a strong hint of potential age, but, without other diagnostic features and associations, cannot be regarded as infallible. This can be illustrated by an exception to this 'rule': an end-scraper (figured by Garton and Jacobi 2009, illus. 10.21), is a shiny dark brown, yet is typologically indistinguishable from others drawn on the same page attributed to the Creswellian. The typological forms and condition of some fieldwalked artefacts (e.g. the large size of fragmentary, lightly/patchily corticated cores), suggest Federmesser or later LUP material, but out of context their attribution cannot always be confidently asserted. Hence, the term LUP will continue to be used here to include both of these cultural forms/periods except in cases where there is good reason to differentiate.

Flint condition/damage assessment

As most of the surfaces of the LUP flint is corticated it is easy to spot recent breaks which reveal the original flint colour. The surface and outline of each flake was assessed for damage, with a score from 0 = none; 1 = less than 50% damage per side; 2 = over 50% damage on each flake-side, up to 8 (as in Garton and Jacobi 2009, 11). Very small flakes, fragments that were so thin that any original flint colour could not be detected, and any burnt flints were not assessed (green dots in Figure 6). Flints with scores of ≥3 are referred to as 'plough-bashed', items with scores of 1–2 as 'less damaged', items of score 0 'undamaged'. It is surmised that, in general, the flakes that have been within the ploughsoil longest should have most damage, with less/no damage on those incorporated most recently. Hence, those with less/no damage are used as a broad indicator of *recent* disturbance to the subsoil (heeding the very small numbers sometimes available).

Flint from fields 373A and 373D

Table 2: Farndon Fields: damage scores of corticated flint from fields 373A and 373D collected by fieldwalking at 5m transect intervals in 2013

Field	*Damage score*	*0*	*1–2*	*3+*	*Not assessed*	*Totals*
373A	all field	0	4	13	5	22
373D	S cluster	3	9	8	0	22
	'new' cluster	0	1	6	6	13
	rest of field	1	4	5	2	12

Table 3: Farndon Fields: form and raw material condition of flint recovered by 5m transect fieldwalking in fields 373A and 373D in 2013. (Figures in square brackets are number of faceted butts recorded). Three-letter codes are artefacts illustrated in Figure 4

Flint-type	*Chunk/ thermal*	*Core*	*Core rejuv./ crested*	*Flake*	*Blade*	*Total number*	*Number of which were retouched/used tools*
373A						53 total	
corticated	2	1 FMX	1	9 [1]	9 [1]	22	3 (1 end scraper FOW, 2 used /retouched items, FMM with faceted butt)
burnt	2	–	–	2	1	5	1 gun-flint
other (i.e. not corticated or burnt)	3	3	2	13 [1]	5	26	3 (1 long end-scraper, 1 end-scraper fragment, 1 Neolithic leaf-shaped arrowhead)
373D S cluster						33 total	
corticated	1	1 FDG	2	11	7	22	2 (1 end-scraper on crested blade FAB; 1 end-scraper FCD)
burnt	–	–	–	2	2	4	
other	–	–	–	6	1	7	2 horseshoe scrapers
373D 'new' cluster						24 total	
corticated	–	1 FEL	–	7	5	13	1 obliquely truncated blade fragment FEQ
burnt	–	–	–	–	1	1	
other	1	1	1	5	2	10	
373D rest of field						49 total	
corticated	–	1	–	9 [2]	2	12	2 (1 double burin on truncation FBJ; 1 edge-used/retouched fragment)
burnt	1	1	–	5 [1]	3 [1]	10	
other	2	1	3	14	7	27	2 (1 serrated blade; 1 Mesolithic scalene triangle microlith)

Core rejuv = core rejuvenation flake.

Lithics from field 374

Fieldwalking

Most of the artefacts retrieved were of flint (323), alongside five probable chert flakes (one rolled), and two cobbles with lightly battered ends, both possibly used as prehistoric hammerstones. Similar cobbles on the field-surface were common but noticeable signs of wear were rare.

Much of the flint in and around the 'N cluster' is corticated and of undoubted LUP form. Where visible because of modern damage, all of the corticated flint appeared to be translucent. The size and character of some of the uncorticated large flakes and blades outside of the 'N cluster' are suggestive of potential LUP material.

Most of the material from the rest of the field is not corticated, has features attributable to Mesolithic-Bronze Age industries, and is primarily struck from small cobbles. An exception is a single narrow blade fragment, most probably Mesolithic, that is very lightly corticated.

Test-pits

1302 (Figure 8) The twelve corticated items include a virtually complete end-scraper (EUE) made on a blade with a straightish profile. Both of its lateral edges are modified by light retouch and there is an oblique-truncation at the proximal end of the tool that may have been for piercing, or a device for hafting. A blade fragment of similar breadth has similar light retouch on one of its lateral edges (EUJ) and a flute along the ventral face ending in a step fracture, reminiscent of scrapers found previously in this cluster (Garton and Jacobi 2009, illus. 10.23, 25), and perhaps a result of breaking (during use) at the level of hafting.

1308 (Figure 8) The artefacts from 1308 include seven broken blades (*c*.10–15mm wide), one of which has a butt *en éperon* (EYF) where the outer edge of the platform has been heavily abraded. This technique of carefully removing flakes to isolate the platform is one of the key 'technological signatures' of the Creswellian (Barton 1990). There are another three items with butts that are not strictly *en éperon*, but bear faceting, so are probably by-products of this technology, which also produced EVS as a core preparation flake.

Lithics from field 373B

Intensive fieldwalking

Nine cores were recovered: they include examples with no (3 + 1 burnt), light (2) and dense cortication (3 – FJI). The last three are the largest (max dimension 66–86mm); the other cores are smaller (max dimension 48mm). The variation in size and condition may suggest that both LUP technologies (Creswellian and Federmesser) are represented. Only FJI (Figure 10), a narrow remnant, has a faceted platform. One quartzite pebble has a battered end, possibly from use as a prehistoric hammerstone.

Two backed blades were recovered. The largest (Figure 10 FJD) is a curved backed blade where part of the backing seems to have been removed by a burin-like facet from the proximal end. Plough damage shows that the original flint was honey brown with a large patch of buff opaque mottling. The second backed blade is a bi-point (Figure 9 FKG) with continuous backing that belongs within the continuum of curved point shapes; its thickness perhaps suggests a Federmesser attribution (cf. Bodu and Valentin 1997, Figure 2). It is heavily corticated and stained; plough damage shows the original flint to be translucent honey brown.

Table 4: Farndon Fields: form and raw material condition of flint recovered by 'intensive' fieldwalking in field 374 in 2012; the last column identifies the numbers of items located within the rectangle depicted in Figures 6 and 7 defining the 'N cluster'. (Figures in square brackets are number of faceted butts recorded). Three-letter codes are artefacts illustrated in Figure 8

Flint-type	*Chunk/ thermal*	*Core*	*Core rejuv./ crested*	*Flake*	*Blade*	*Total number*	*Number of which were retouched/used tools*	*Within 'N cluster'*
corticated	1	–	1	21 [1]	16	39	5 (2 end scrapers ELC, 1 composite scraper-burin ELT, 1 backed fragment, 1 borer with worn tip)	14 [1] (includes ELC and ELT)
burnt	27	–	1	18	5	51	–	5
Wolds-type	2	–	–	12	4	18	2	–
other	39	16	4	128	28	215	11	4

Core rejuv = core rejuvenation flake.

Table 5: Farndon Fields: form and raw material condition of flint from test-pits dug in field 374 in 2013. Test-pits 1302 and 1308 are located in Figure 7. (Figures in square brackets are number of faceted butts recorded). Three-letter codes are artefacts illustrated in Figure 8

Context	*Flint-type*	*Chunk/ thermal*	*Core rejuvenation*	*Spall*	*Flake*	*Blade*	*Total number*	*Number of which were retouched/used tools*
1302 ploughsoil	corticated	–	–	1	4	2	7	2 (1 end-scraper EUE, 1 edge-modified frag EUJ)
	burnt	–	–	–	1	–	1	
	Wolds	–	–	–	1	–	1	
	other	–	–	–	1 rolled	–	1	
1302 transition	corticated	–	–	–	2	–	2	
1302 subsoil	corticated	–	–	–	3	–	3	
1303 ploughsoil	burnt	–	–	–	1	–	1	
	Wolds	–	–	–	1	–	1	
	other	–	–	–	–	1	1	
1303 transition	corticated	–	–	1	–	–	1	
	other	1	–	–	–	–	1	
1304 ploughsoil	corticated	–	–	–	3	–	3	
	other	1	–	1	1	–	3	
1304 subsoil	other	–	–	–	1	–	1	
1308 ploughsoil	corticated	–	–	6 [1]	6	2 [1+ 1# EYF]	14	
	other	–	–	–	1	–	1	
	burnt	–	–	–	1	–	1	
1308 transition	corticated	–	–	–	3	1	4	
	burnt	1	–	–	–	–	1	
	other	–	–	–	2 [1]	–	2	
1308 subsoil	corticated	–	1 [1 EVS]	–	3	4 [1]	8	
	burnt	1	–	–	–	–	1	

Other = not burnt or corticated; Wolds flint is not corticated; # = butt *en éperon*.

Table 6: Farndon Fields: form and raw material condition of flint recovered by 'intensive fieldwalking' in field 373B in 2013. (Figures in square brackets are number of faceted butts recorded). Three-letter codes are artefacts illustrated in Figures 9 and 10.

Flint-type	*Chunk/ thermal*	*Core*	*Crested*	*Flake*	*Blade*	*Total number*	*Number of which were retouched/ used tools*
corticated	2	5 FJI	1 [core tablet]	24 [4]	16	48	8 (2 backed blades FJD, FKG; 5 edge-used FJC, 1 truncation)
burnt	18	1	–	17	1	37	3 (all fragments)
other	6	3	2	23	6	40	2 (1 worn-edge, 1 truncation)

Test-pits

1402 (Figure 13) The number and proportion of small flakes and spalls (36%) suggest that this test-pit is close to a knapping focus. This can also be demonstrated by several refitting flakes (spotted by Alison Roberts). It is hoped to investigate refitting further, though in such a confined test-pit and with the surrounding squares not excavated, it is inevitable that the results are likely to be limited. Three of the larger blades had been converted into retouched tools (Figure 13, FUY, FUU/FUN, FYO). They all bear some primary cortex, so may have been from the earlier stages of knapping. These delicate, longish blades from the subsoil contrast with the single tool found in the ploughsoil, a burnt, heavily used end-scraper (FSP). It is unclear from the profile and ventral features whether it was made on a blade or a squat flake – either are possible. Its heavily used, under-cut, scraper-end is dissimilar to the neat distal retouch on long end-scrapers found elsewhere on this site (Garton and Jacobi 2009, 21). A small number of burnt items were recovered through the profile (Table 7).

1406 (Figure 14) Nine items were burnt, of which two where almost certainly fragments from the same flake. This evidence of burning was only noticeable from broken hackly fractures, it was not visible in the surface cortication: hence more items may have been burnt than recorded here. The quantity of spalls and blades, together with crested blades (FXL), suggest that this test-pit was close to the spot where knapping had been conducted. Ten struck blades/flakes have faceted butts, and at least one spall that also has the characteristic hinge fracture of faceting chips (FVN: cf. Newcomer and Karlin 1987, Figure 4.2), confirms that some core-platforms were faceted. Two of the faceted butts are typical examples of the *en éperon* technique (FQB, FQE: latter also has a straight distal truncation). Scars on the dorsal faces of the blades suggest that they were from both single (FQE) and opposed-platform (FXH) cores, but the only core actually from the test-pit (FVB) is of curiously different form (though in similar condition). It is made on a small nodule (maximum dimension *c*.50mm) and its original surface provided a platform for the removal of several flakes (none more than 30 mm long). This small raw material also has an unusual cortex in that it is thick and heavily iron-stained, rather than the typically thin cortex present on many of the blades and flakes (e.g. FQS). Since it was much too small for making blades, it could only have been intended for some expedient knapping purpose or was perhaps an apprentice piece? Typologically, the blade with the distal truncation (FQE) and the double-ended burin (FXH) both belong in the LUP, with the *en éperon* butts (FQB, FQE), confirming a Creswellian attribution.

ENDNOTES

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2. Test-pit 727 (5 × 5m) excavated in 1994 is located in Figure 7 with the south-west corner plotted at the co-ordinate given in Wessex Archaeology (1994, Appendix 3, p. 58). This positioning is assumed as other test-pit co-ordinates are specified as at the south-west corner in the archive. However, this positions the test-pit some 3m west of the co-ordinate of the 'E corner' recorded on the context sheet for Trench 727. Because of this uncertainty, we avoided placing any of our test-pits within this patch in 2013.

Table 7: Farndon Fields: form and raw material condition of flint from test-pits dug in field 373B in 2014 (located in Figure 11). (Figures in square brackets are number of faceted butts recorded). Three-letter codes are artefacts illustrated in Figures 13 and 14

Test-pit context	*Flint-type*	*Thermal/ chunk*	*Crested*	*Spall*	*Flake*	*Blade*	*Total+spalls from fine wet-seived samples**	*Number of which were retouched/used tools*
1402 ploughsoil	corticated	–	–	1	6 [1]	4	11	
	burnt	2	–	–	1	–	3	1 (end-scraper frag FSP)
	other	–	–	–	1	–	1	
1402 transition	corticated	–	–	1	3	1	5	
	burnt	1	–	–	–	–	1	
1402/02 silty loam	corticated	–	1 FUI	40	35 [3 FSN]	13 GCA, GCE, GCF [1]	89+12	4 (1 denticulated blade FUN/FUU**, 1 borer FYO, 1 tip from retouched implement)
	burnt	–	–	–	–	–	+1	
	other	–	–	2	–	–	2	
1402/03 sandy loam	corticated	–	–	8 [1]	17	3	28+5	1 (?burin spall)
	burnt	2	–	1	–	–	3+2	
	other	–	–	–	1	–	1	
1402/04 subsoil score/ disturbed	corticated	–	–	5 [1]	11 [1]	2	18	1 (end scraper FUY)
	burnt	1	–	–	–	–	1	

Other = not burnt or corticated; *samples only from 1402/02 and 1402/03; ** two join, but counted as two as it is an old break.

Test-pit context	*Flint-type*	*Thermal/ chunk*	*Crested or core*	*Spall*	*Flake*	*Blade*	*Total+spalls from fine wet-seived samples**	*Number of which were retouched/used tools*
1406 ploughsoil	corticated	–	1 core FVB	–	1	2 [1]	4	
	burnt	1	–	–	2	1	4	
1406 transition	corticated	–	–	1	3	1	5	
	burnt	1	–	1	1	–	3	
1406/02 silty loam	corticated	1	1 crest FXL	8 [1 FVN]	10 [1]	6 [2#]	26 +16	3 (edge-used blade FQB#, distal truncation FQE#; double-ended burin with edge-modification/use-wear FXH)
	burnt	–	–	–	–	–	+1	
	other	–	–	1	2	–	3	
1406/03 sandy loam	corticated	–	1 crest	16	14 [4]	5 [1] FQS	36+12	1 (proximal truncation)
	burnt	–	–	1	–	1	2+3	
	other	–	–	–	–	1	1	

Other = not burnt or corticated; # = butt *en éperon*; *samples only from 1406/02 and 1406/03.

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