

CHAPTER 8

Making Space through Stone

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Introduction

Clark's excavations at Star Carr were the culmination in a shift from his career in the 1930s as a 'passionate connoisseur of flints' (1974, 35) to the pioneer of economic archaeology in Britain in the late 1940s and 1950s. In fact Clark explicitly sought a site with good organic preservation to explore his new economic theories and as a result the weight placed on the lithic analysis in his publication was somewhat reduced in comparison with his previous work. For instance, in the report on the excavations at Farnham (Clark and Rankine 1939) the lithic report took up more than a third of the entire publication. However, in the publication of Star Carr, flint was only the third specialist report and shorter than the Farnham report. In it Clark provides a basic description of tools, technology and raw material, whilst interpretations of the site based on the lithics are discussed separately in the first chapter. Here lithic evidence was used to define the extent of the settlement, the gender of those occupying the site and their activities. Tool types were plotted but not commented on, beyond the remark that their distribution appears essentially homogenous (Clark 1954, 22).

Since Clark's excavations, new work at the site, not least the current excavations, has enhanced our understanding of the spatial extent and temporal depth of occupation. Rather than a drop-off in flint indicating the boundaries of a homogenous area as Clark imagined, our open-area excavations have revealed that this drop off simply indicates a change in the nature, intensity and focus of activities. To this end, this chapter is focused on differential use of lithic material across space. Lithic material is the most frequent find on the site and unlike organic material it does not decay. As a result we have an assemblage of material with equivalent levels of preservation across the entire site, permitting a much more accurate understanding of the differential use of wetland and dryland than possible for other materials where taphonomy is a major issue. Much of our understanding of the nature and structure of activities on the dryland must thus, by necessity, derive from the lithic assemblage.

The approach to the assemblage from the current excavations draws on the 'palethnographic' approach of Leroi-Gourhan and his students (Leroi-Gourhan and Brezillon 1972; Pigeot 1990); the techno-sociological aspect of the chaîne opératoire (Schlanger 1994). The assemblage has been analysed to understand the social dimensions of activities involving stone tools. The methods employed have been concerned to understand

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differences in use of the site across space and over time and how practices of manufacture, use and discard created space for Mesolithic people (*sensu* MacFadyen 2006). The focus of the analysis reported here is spatial, with refitting used not simply to understand the technical choices employed but the movement of lithic material around the site. Microwear has been employed to better understand the nature of activities in particular areas, preserving materials long since decayed, as well as addressing the interconnectivity of materials and actions. A combination of these techniques has been used to understand the role lithic materials and stone tools played in people's lives and the results of these analyses are outlined here and in Chapter 35: what choices were made in the selection of raw materials? Were particular tools curated and valued? What guided the discard and deposition of lithic material?

Activity areas: the dryland and the wetland

In the following discussion the open-area excavations comprising trenches SC22, SC23, SC24 and SC34 (Figure 8.1) have been divided into six parts and dealt with in turn: the western, central and eastern dryland areas and the western, central and eastern wetland areas (Figure 3.12). These six parts have been further subdivided according to area and in the wetland by area and layer. This results in a much more meaningful assessment of the lithic material in which spatial variation in activity areas can be discerned, as well as changes over time. The division of the assemblage into smaller areas was made in a variety of ways: material associated with major features such as structures and platforms; dryland and wetland-edge lithic material forming spatially discrete scatters; and finally areas with more diffuse spreads of lithic material deposited either within open water or between the major dryland knapping scatters. Due to the diachronic nature of peat formation at the lake edge (Chapter 4), vertically discrete wetland-edge flint scatters can cut across the peat stratigraphy. The division of material in this way resulted in 13 wetland sub-assemblages and 15 dryland sub-assemblages, which

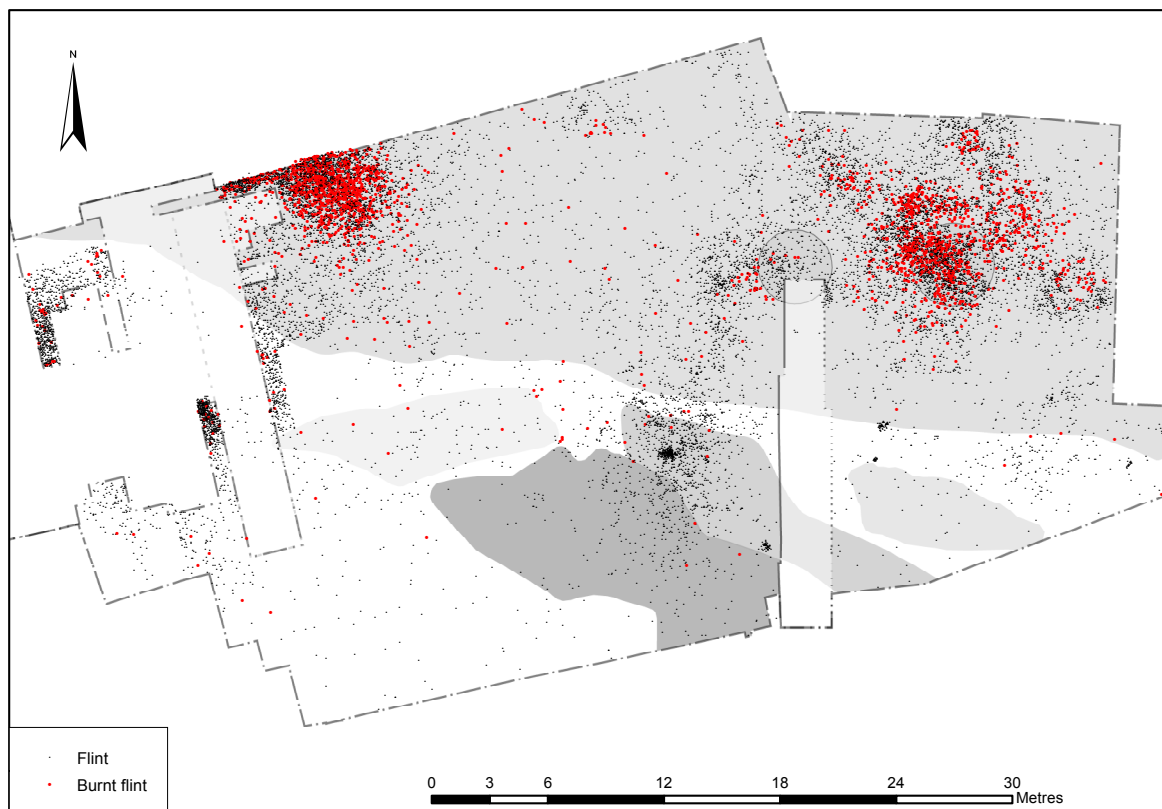


Figure 8.1: Distribution of flint and burnt flint across the site (Copyright Star Carr Project, CC BY-NC 4.0).

will be discussed below in turn. Connections between these areas which might indicate contemporaneity were explored through refitting (see Chapter 35 for methods).

Test pitting also occurred beyond the main area of open excavation; to the east along the eastern peninsula and to the north in the field beyond the Hertford Cut (Figure 3.3). The material from these areas gives a flavour of the nature of activities and intensity of use of areas of the site that remain to be extensively explored, and in the case of the area to the north of the Hertford Cut have probably been entirely ploughed out.

As will be outlined in this chapter, practices of discard and deposition of lithic material at the site are complex and varied. Dryland areas were busy areas of knapping and inhabitation, with the use and clearance of structures leading to the emergence of areas of middening, in addition to in situ knapping areas. As a site with a long duration of occupation, lithic material from previous occupations would have been visible and was often scavenged, cores rarely being recovered from areas where they were knapped. While most refit groups cluster within small areas of the site (within a scatter or adjacent scatters), some long-distance refits indicate material being moved large distances across the site (Figure 8.2). Microwear indicates the pieces moved were all utilised. While this might on occasions indicate contemporaneity between areas, reuse of lithic material still visible from earlier occupations is also a strong possibility.

There is also considerable complexity in lithic patterning in the wetland, with lithic material from open water contexts presumably representing depositional practices and platforms seemingly kept clean of lithic debris. During the later occupations of the site, previous areas of reedswamp and open water were colonised by peat and fen and carr vegetation and the wetland began to be used for flint-knapping and the production and use of particular tools. Due to the rapidity of peat development (Mellars and Dark 1998), these are high-resolution scatters where shifts in the way the wetland was used over time can be discerned. A final feature of the wetland and wetland edge is the presence of lithic 'caches'. These consist mainly of clusters of partially worked nodules or cores, though some are more varied, such as the $\times 6$ cache (named for the site grid square in which it was recovered), which consists of tools and cores. Many caches consist of good-quality raw material and were presumably established as secondary sources of raw material in the landscape, intended for use but for whatever

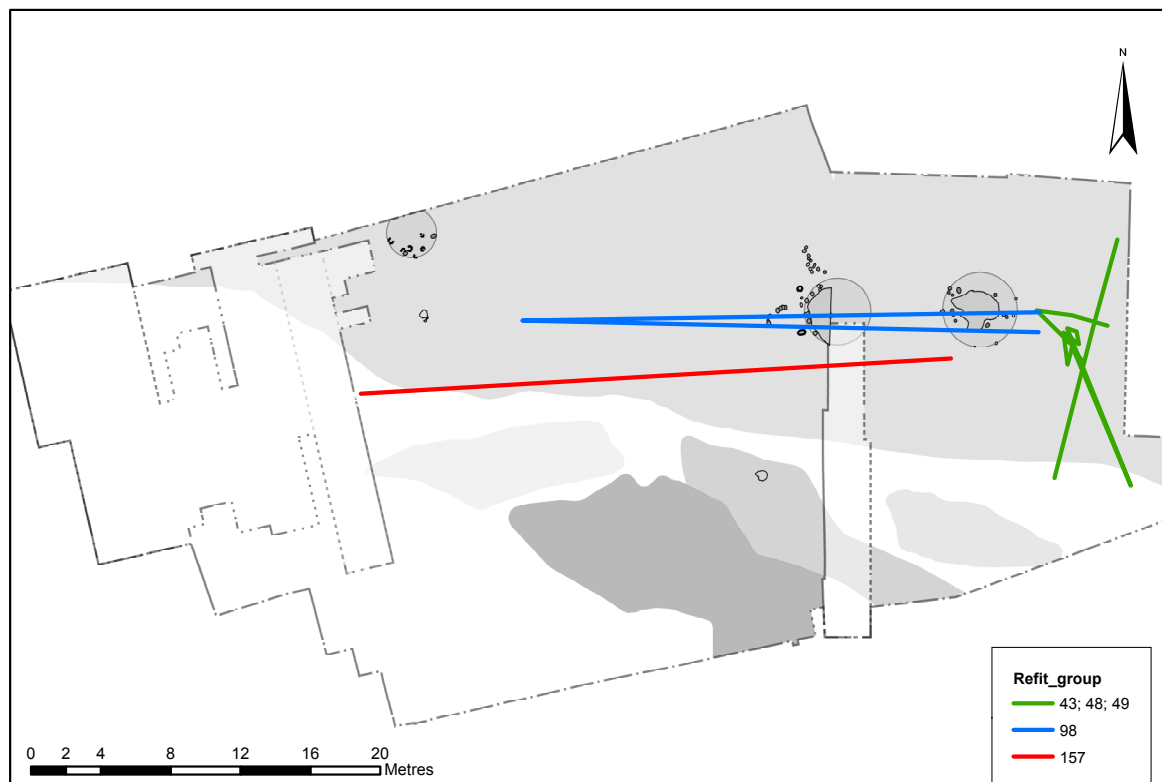


Figure 8.2: Long distance refits across the site (Copyright Star Carr Project, CC BY-NC 4.0).

reason not returned to. However, other caches may have had a different intention: two nodules of flint seem to be part of the western platform, either as large stones to reinforce it, or (given this structure is also associated with a pig mandible) as part of a more formal act of deposition associated with its construction. The caches at Star Carr, as is the case elsewhere in the Vale of Pickering (Conneller 2000; Conneller 2003; Chapter 11 this volume), are thus varied in their form, composition and likely purpose (see Chapter 35 for further discussion).

Dryland

Western area

The western dryland area is defined as stretching from the area of high lithic densities in the north-west of trench 34, up to scatter 7 in the middle of the northern part of trench 34, to the wetland edge in the south. It has been divided into three smaller areas (Figure 8.3): an extremely dense scatter with a high proportion of burnt flint encircling a semi-circle of postholes (the western structure, see Chapter 5); immediately to the west of this is a dense area of lithic material (Moore's area) which runs into the northern section of trench SC34 and is truncated to the south by Clark's excavation; surrounding these is a lower-density scatter of material (western structure surrounds).

Western dryland structure

The assemblage from this structure is distinguished by its high density and high proportion of burnt flint (Figure 8.3; Table 8.1). It is located within a ring of possible postholes, where lithic material is at its most concentrated and densities reach 432 pieces per square metre; the scatter extends around 2 m beyond the post-ring

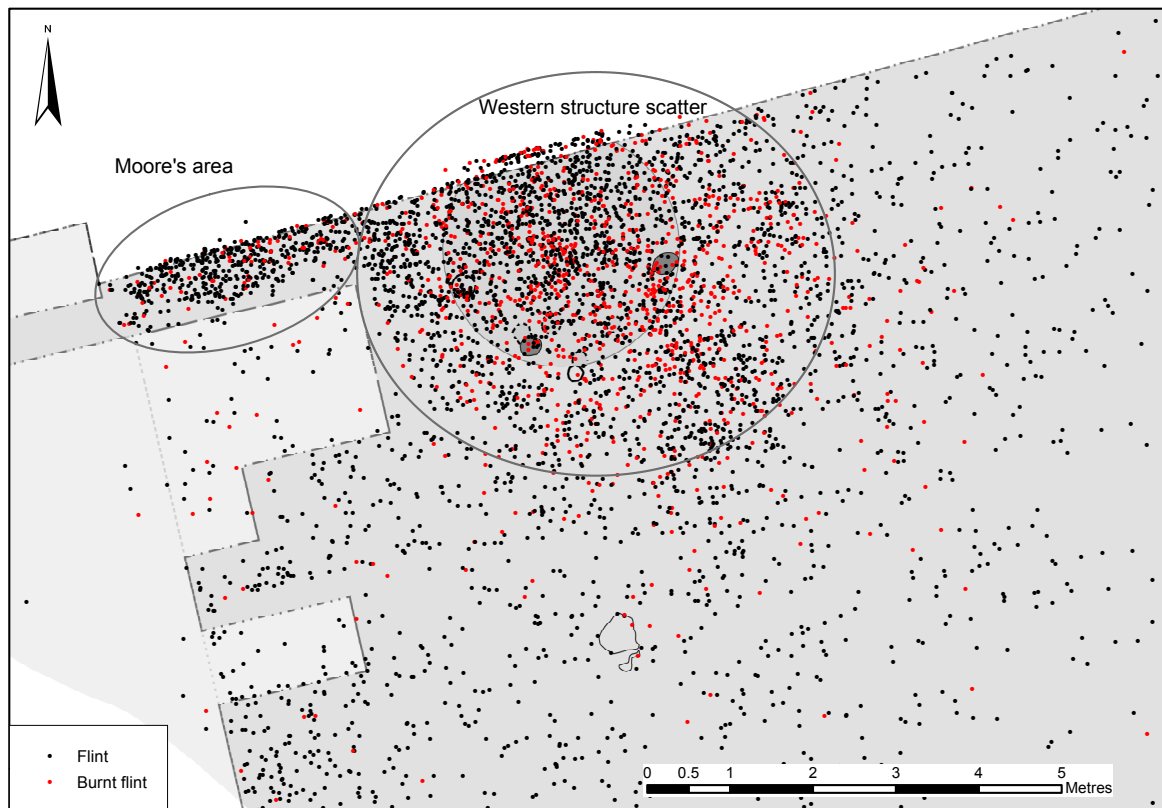


Figure 8.3: Plot of the flint and burnt flint in the western dryland structure, Moore's area and western structure surrounds (Copyright Star Carr Project, CC BY-NC 4.0).

	Western structure		Western structure surrounds		Moore's area	
Category	No.	%	No.	%	No.	%
Tools total:	329	6.50	56	5.65	32	6.20
Awl	14	0.28	5	0.86	1	0.19
Axe	2	0.40	1	0.17	0	0
Burin	53	1.05	6	1.03	3	0.58
Denticulate	2	0.40	1	0.17	0	0
Hammerstone	1	0.20	0	0	0	0
Micro-dent	5	0.10	2	0.34	0	0
Microlith	49	0.97	8	1.38	9	1.74
Notch	3	0.60	0	0	0	0
Scraper	62	1.22	7	1.21	6	1.16
Scraper/borer	1	0.20	0	0	0	0
Scraper/burin	2	0.40	0	0	0	0
Strike-a-light	3	0.60	1	0.17	0	0
Truncation	7	0.14	0	0	0	0
Retouched	14	0.28	0	0	0	0
Utilised blade	73	1.44	18	3.1	8	1.55
Utilised flake	12	0.12	4	0.69	3	0.58
Utilised fragment	26	0.51	12	2.07	2	0.39
Tool spalls:	109	2.15	11	1.9	12	2.32
Axe flake	20	0.39	4	0.69	2	0.39
Burin spall	54	1.07	3	0.52	9	1.74
Microburin	31	0.61	4	0.69	1	0.19
Retouch spall	4	0.40	0	0	0	0
Core preparation:	104	2.06	14	2.41	18	3.49
Core tablet	40	0.39	6	1.03	12	2.32
Crested blade	39	0.77	5	0.86	2	0.39
Plunging	18	0.36	2	0.34	4	0.77
SFR/fden	7	0.14	1	0.17	0	0
Debitage total:	4516	89.28	499	86.03	454	87.98
Blade	443	8.76	69	11.9	56	10.85
Flake	779	15.40	83	14.31	122	23.64
Fragment	1935	38.26	149	25.69	230	44.75
Chip	1203	23.78	172	29.65	31	6.01
Core	55	1.09	12	2.07	3	0.58
Core frag	13	0.26	1	0.17	1	0.19
Chunk	88	1.74	13	2.24	11	2.13
Total	5058	100	580	100	516	100
Burnt	1760	34.8	25	4.3	82	15.89

Table 8.1: Composition of the lithic assemblages from the western area.

at more moderate densities. 34.8% of the assemblage was burnt, the highest percentage across the site, with burning more common within the ring of posts but at high levels across the scatter. The high proportion of burning has also caused high levels of fragmentation: small chips account for 23.8% of the assemblage; also considerably higher than any other area on site. This high level of burning could represent the effects of a structure that has burnt down. Alternatively, this may have been a midden area possibly accumulating within the footprint of an earlier structure. Amongst the assemblage there are a number of worn or exhausted pieces, which perhaps make the latter interpretation more likely. The animal bone from this area is not burnt, suggesting different materials may have had different histories and thus supporting the midden theory. However, small, unburnt flint microdebitage is also common; this is generally considered an indicator of in situ knapping, though it is possible that lithic material was worked on mats and discarded into this area.

Tools are found in this assemblage in fairly average proportions for a dryland area of the site (Table 8.1; Figure 8.4). The main tool forms are found in relatively even numbers, with 53 burins, 49 microliths and 62 scrapers. Blades with macroscopic damage are common for a dryland area and awls are also well represented, as is true across the western part of the site more broadly. Two axes are present: an axe of grey Wolds flint was found on the western edge of the ring of possible postholes encircled by five axe thinning and tranchet flakes; the other axe was also made from grey Wolds flint and was recovered from the southern edge of the scatter. Tool spalls are represented, with microburins ($n=31$) present at only a slightly lower level than microliths, indicating a focus on microlith manufacture and retooling. Burin spalls are represented at similar levels to burins, with mainly primary spalls represented, indicating mainly production of these tools, but also some resharpening episodes. No obvious spatial patterning for the majority of the tools and tool spalls is present, except that awls are clustered in the southern part of the scatter, south of the postholes.

Microwear studies reveal a wide range of activities, many of them craft focused (Figure 8.5). Bone (scraping and grooving) and antler working is well represented, with seven examples clustering in the eastern part of the

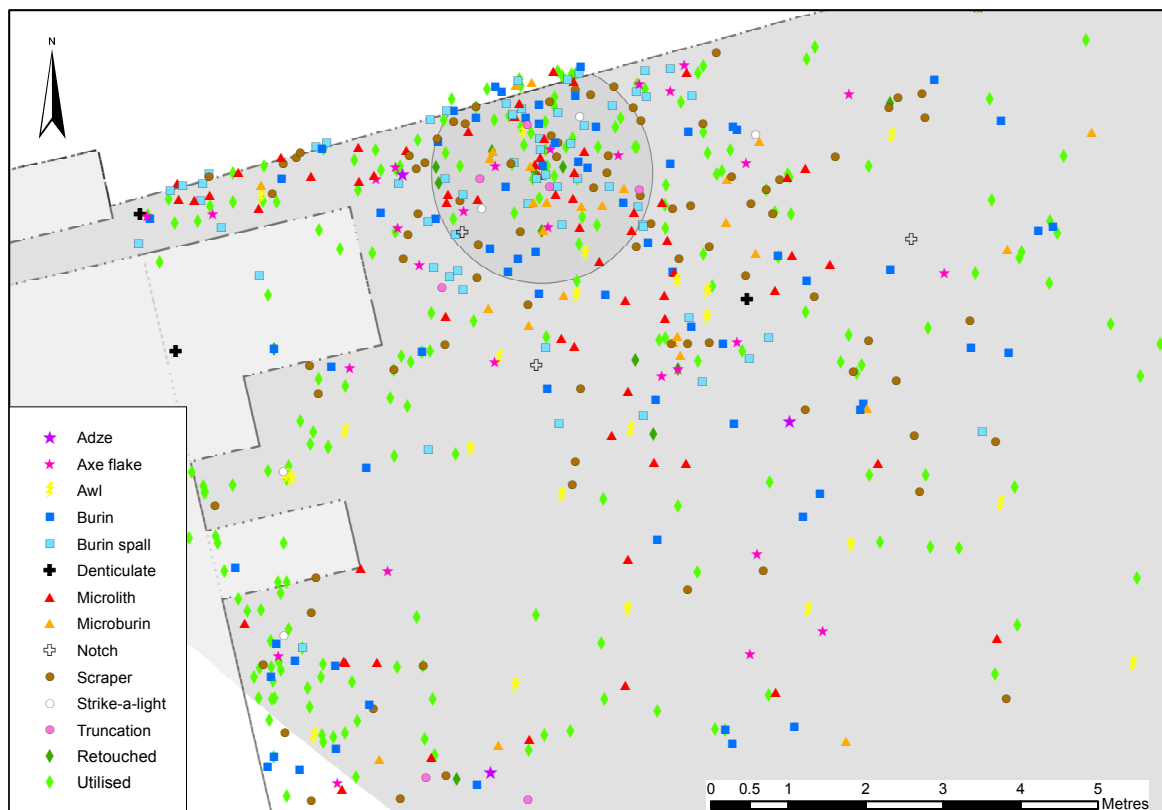


Figure 8.4: Tool distribution from the western structure and surrounding area (Copyright Star Carr Project, CC BY-NC 4.0).

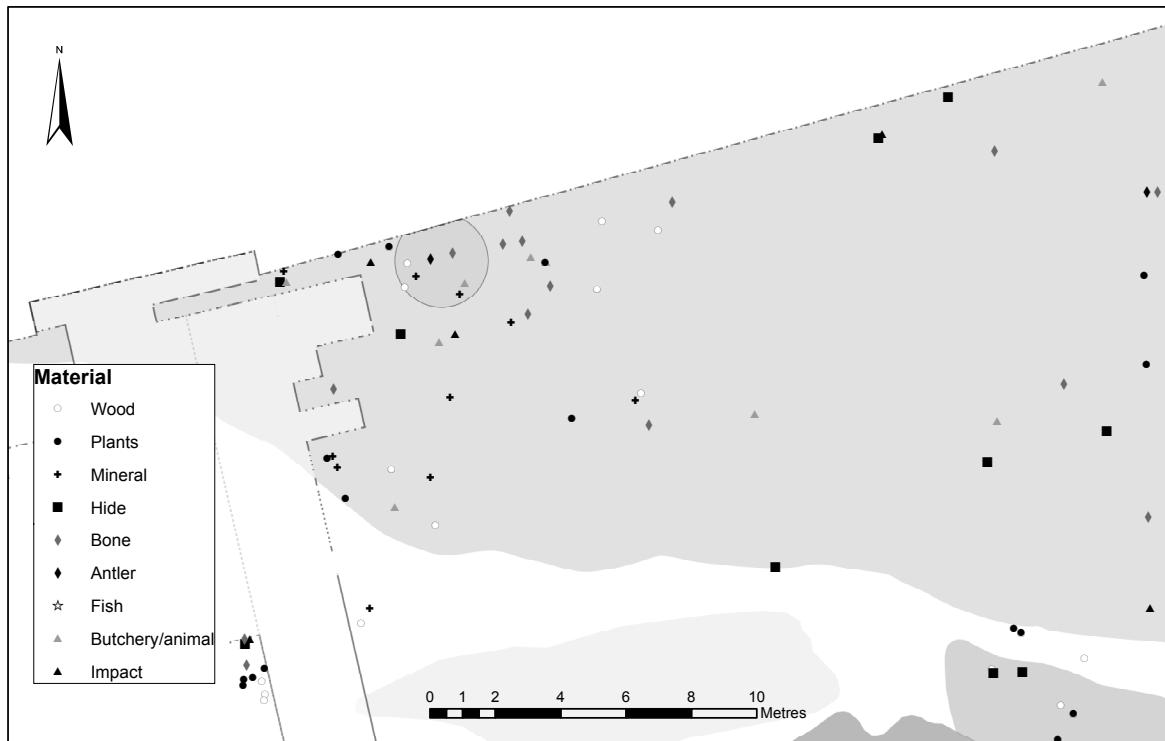


Figure 8.5: Microwear results from the western dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

feature and immediately beyond the area encircled by the postholes. Plant-working traces are present on three pieces and woodworking on two, ranging from the eastern to the western margins of the scatter. Three pieces were also used on minerals: two awls, most likely related to bead production; the other a strike-a-light. An exception to this craft focus is an area to the east of the scatter where two pieces (<93724> and <94948>) were used for butchery: this coincides with an area where faunal remains are also common suggesting *in situ* activity here (Chapter 7). A well-used, hafted butchery tool <94931> was also found within the ring of posts. The barb of a projectile was found just outside the post ring. Re-use of artefacts, as might be expected for such a busy area, is also evident: a microlith <95542> used as a projectile was recycled to cut siliceous plants, probably reeds.

Because of the high level of burning and fragmentation, the decision was undertaken not to undertake refitting of this area *en masse*. Instead a targeted approach was taken and unburnt red flint, grey and white flint, and black flint were picked out to understand the formation of the assemblage. Only one refit occurred between two distinctive red blades, both of which appeared to have been used. Unfortunately this low level of refitting is compatible with both the structure and midden hypotheses for this area.

Western dryland structure surrounds

Surrounding the western dryland structure is a low-density scatter of material, extending up to 10 m from the postholes, numbering 580 pieces. It has low levels of burnt flint (4.3%), especially in comparison to adjacent areas. It is a balanced assemblage with similar levels of burins ($n=6$), microliths ($n=8$) and scrapers ($n=7$). In addition it contains large numbers of utilised flakes, blades and fragments ($n=34$), while awls ($n=5$) are also well represented. Tool spalls are evenly represented with four axe flakes, three burin spalls and four microburins, indicating tool production and maintenance. Numbers of burin spalls are relatively low for the site, though burins are present.

In this lower-density area, particular activities can be more readily discerned: for example, a cluster of three awls located in the western part of the scatter, three burins in the south and four scrapers in the east. There are

more utilised flakes and blades in the western part of the scatter. More broadly though, tools are spread diffusely through this scatter, the result of many different activities over many years. Tool types and use-wear evidence are similar to that from the western feature suggesting continuation of the same suite of activities. Microwear data is available for four awls from this scatter. One example <94227> was used for piercing mineral and possibly animal hide. Another <93991>, found 2.5 m away, was used for piercing and drilling mineral, probably shale, as was <95971> on the eastern margins of the scatter. These three artefacts are likely to have been used in bead production. A shale and an amber bead were found by Clark around 3 m to the south of <94227>. The fourth awl <93521> was found around 4.5 m to the east of the examples used for mineral working. This was used as a multi-purpose plant-working tool, most likely for craftwork, and had been employed for cutting and scraping siliceous plants, probably reeds. In addition to these pieces, four tools retain evidence for wood-working, three of which are clustered to the east of the structure, while bone working and butchery are also represented. The microwear evidence from the area surrounding the structure indicates a focus predominantly on a range of craft activities, with butchery also occurring. This range of activities is similar to those recorded within the western structure, indicating these spaces were used in the same way, or if the structure represents a midden, that the lithic material recovered from it may represent artefacts originating from this area.

Moore's area

Immediately to the west of the western structure lies 'Moore's area', an area originally excavated by John Moore in 1948 (Chapter 2), which represents a continuation of the high flint densities noted in the north-east part of Clark's site. Moore's area has been truncated in its southern part by Clark's excavations and extends into the sections to the north, so its original extent is unclear. Thus the material recovered from this area in 2013–15 can be considered a sample of this dense area noted by Moore and so provides more detail on the area of highest lithic densities for Clark's site.

The flint recovered from Moore's area consists of 516 pieces from an area $2.7 \times .0.75$ m. Though the area excavated is small, the lithic distribution appears to have a discrete curved distribution, possibly indicative of a bounded feature, though no postholes or pit were noted. It displays much lower proportions of burnt flint (15.9%) than the western and eastern dryland structures; however, this could be explained by the fact that only the very edge of this scatter is present.

The tool assemblage is dominated by microliths (n=8) and utilised blades (n=8), though scrapers (n=6), burins (n=3) and one awl are present. Similar proportions of formal tools were recovered in 1948 by Moore. Tool spalls are dominated by burin spalls (both primary and secondary examples), though a microburin (microburins were also recovered by Moore) and two axe-sharpening flakes are also present. Microliths and used blades are scattered throughout, while axe flakes and burin spalls cluster to the east, and scrapers to the west, where they join a cluster of scrapers recovered by Moore. Microwear reveals that a blade <95749> was used for butchery, while another <95662> was used as a craft tool for piercing dry hide and scraping it using a mineral additive, presumably ochre (Figure 8.5).

Central area

The central dryland area stretches from scatter 7 in the north-west, to the easternmost part of trench SC23 (Figure 8.6). It encompasses four areas: the central structure; its surrounding area of small scale lithic scatters and tool use (central structure surrounds); scatter 6, an area of flint knapping and tool use to the north of the central structure; and scatter 7 to the north-west. The central dryland area in general has much lower densities of lithic material than the areas to the east and west. Burnt flint is also less common than other dryland areas with only two possible hearths; one in the south-central part of scatter 7 and one immediately to the west of the central structure.

Central dryland structure

The central hollow of the central dryland structure was located during the 2014 season, having been overlooked during the excavation of VP85A and SC23 (Chapter 5). As a result, the exact extent of the structure and

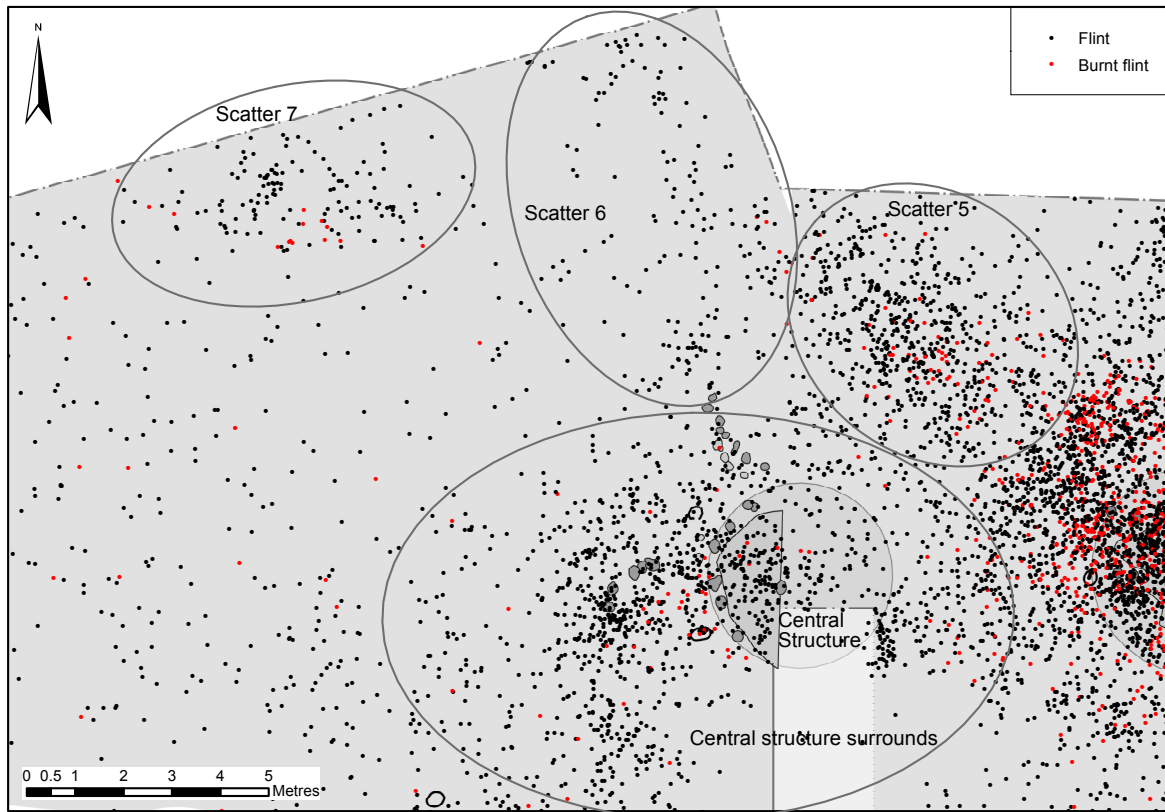


Figure 8.6: Distribution of flint and burnt flint in the central dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

of the assemblage that derives from it is uncertain. The following discussion also includes the material excavated during the 1980s excavations, which was analysed by CC in 1996–7. The radiocarbon evidence suggests this area was a focus of activity on at least three occasions and as a result some complexity can be expected.

The assemblage from the central structure differs considerably from those deriving from both the eastern and western structures. It is a small assemblage of 407 pieces, with densities reaching 125 pieces per square metre, and this only in a discrete area; the scatter to the south-west that may actually lie outside the posthole ring. Densities in the region of 30–40 pieces per square metre are more typical. Burnt flint is also rare at 4.2% and is scattered throughout the feature suggesting it did not have a hearth or if it once did that it was cleared out. This is the lowest proportion of burnt flint not just for a structure but for any dryland area, including those that seem mainly generated through tool use. However, there is a cluster of burnt flint, including a concentration within posthole [336] immediately to the south-west of the structure (Chapter 5). This could suggest clearance of material from the structure or an external hearth located at an entrance to the south-west of the structure, though whether this was used at the same time as the structure is uncertain.

The assemblage within the structure is also more coherent than those recovered from the other two structures. Refitting has been relatively successful with a large group of eight pieces and five additional groups coming from the structure, despite the fact the material from the 1980s excavations could not be located to be incorporated into the current project's refitting programme. The most extensive refit group (87) consists of a partly worked core of brown flint which was reduced and discarded in and beyond the area of the structure (Figures 8.7 and 8.8).

Activity areas can also be discerned (Figure 8.9). A cluster of two burins and five burin spalls (two refitting as a snap) can be seen in the south-eastern part of the structure (most recovered during the 1980s excavations), amongst a dense knapping scatter of brown till flint. In the northern part of the feature are a cluster of three

	Central structure				Central surrounds		Scatter 6		Scatter 7	
Category	2013 -4	VP85A	Total	%	No.	%	No.	%	No.	%
Tools:	22	6	28	6.88	112	9.4	18	12.16	24	14.2
Awl	0	0	0	0	1	0.08	0	0	0	0
Axe	0	0	0	0	1	0.08	0	0	1	0.59
Burin	2	3	5	1.23	8	0.67	5	3.38	0	0
Denticulate	0	0	0	0	0	0	0	0	0	0
Hammerstone	0	0	0	0	2	0.17	0	0	0	0
Microdenticulate	0	0	0	0	0	0	0	0	1	0.59
Microlith	4	1	5	1.23	14	1.17	0	0	4	2.37
Notch	0	0	0	0	1	0.08	0	0	0	0
Scraper	3	1	4	0.98	19	1.59	2	1.35	1	0.59
Scraper/burin	0	0	0	0	0	0	0	0	1	0.59
Scraper/notch	1	0	1	0.25	0	0	0	0	0	0
Strike-a-light	0	0	0	0	2	0.17	0	0	3	1.77
Truncation	0	0	0	0	1	0.08	1	0.67	0	0
Retouched	0	0	0	0	3	0.25	0	0	1	0.59
Utilised blade	4	1	5	1.23	34	2.85	7	4.73	8	4.73
Utilised flake	1	0	1	0.25	10	0.84	0	0	2	1.18
Utilised fragment	7	0	7	1.72	16	1.34	3	2.03	2	1.18
Tool spalls:	6	1	7	1.72	22	1.85	5	3.38	0	0
Axe flake	0	0	0	0	5	0.42	3	2.03	0	0
Burin spall	4	0	4	0.98	12	1.01	2	1.35	0	0
Microburin	0	1	1	0.25	4	0.34	0	0	0	0
Retouch spall	2	0	2	0.49	1	0.08	0	0	0	0
Core prep:	7	3	10	2.46	34	2.58	4	2.7	2	1.18
Core tablet	3	1	4	0.98	14	1.17	3	2.03	1	0.59
Crested blade	2	2	4	0.98	15	1.26	0	0	1	0.59
Plunging	1	0	1	0.25	2	0.17	1	0.67	0	0
Flanc de Nucleus	1	0	1	0.25	3	0.25	0	0	0	0
Debitage:	275	87	362	88.94	1045	87.67	121	81.76	143	84.61
Blade	38	12	50	12.28	154	12.92	18	12.16	26	15.38
Flake	79	31	110	27.03	375	31.46	44	29.73	38	22.48
Fragment	128	33	161	39.56	449	37.67	53	4.62	60	35.5
Chip	24	10	34	8.35	29	2.43	2	1.35	18	10.65
Core	3	0	3	0.74	18	1.51	0	0	1	0.59
Core frag.	1	0	1	0.25	1	0.08	2	1.35	0	0
Nodule	0	0	0	0	0	0	0	0	0	0
Chunk	2	1	3	0.74	19	1.59	2	1.35	0	0
Total	310	97	407	100	1192	100	148	100	169	100
Burnt	15	2	17	4.18	69	5.79	4	2.7	20	11.83

Table 8.2: Composition of the lithic assemblages from the central area.

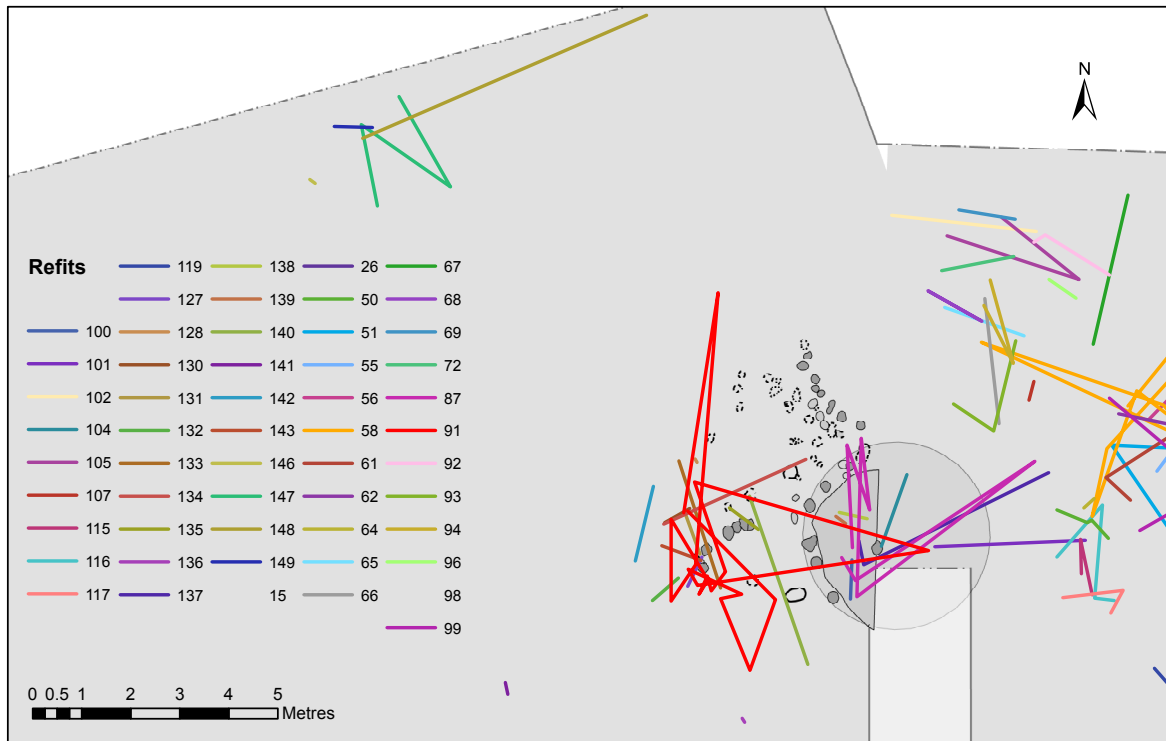


Figure 8.7: Refits in the central area (Copyright Star Carr Project, CC BY-NC 4.0).



Figure 8.8: Refit sequence 87 (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

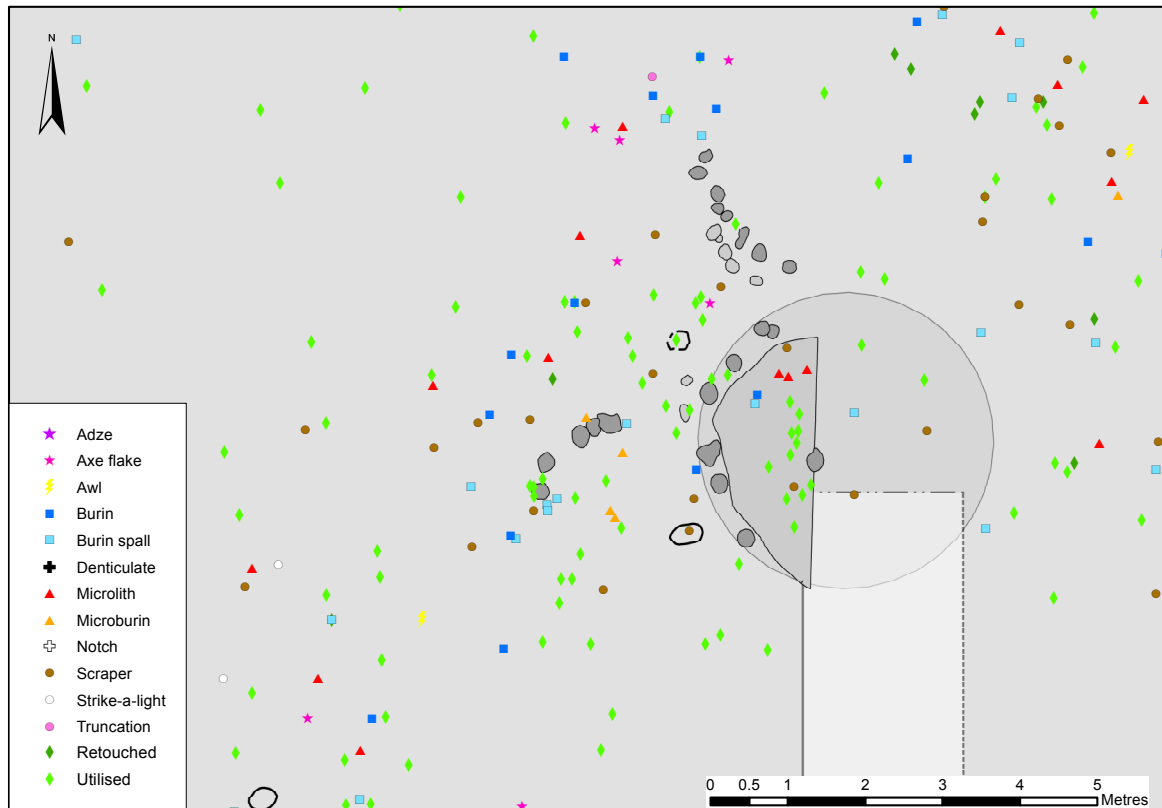


Figure 8.9: Tools from the central structure and surrounding area (Copyright Star Carr Project, CC BY-NC 4.0).

microliths, all obliquely blunted points made from brown till flint. Utilised blades cluster in the western part of the structure.

Microwear on one <107673> of the group of three microliths suggests it was used to pierce hide, either as an awl or as a projectile (Figure 8.10). Just outside the hollow, but within the postholes and only 0.7 m from this cluster of microliths is a bladelet <102584> which was used as the tip of a projectile. A blade was also used to scrape bone.

The high spatial integrity of the assemblage could be used to argue for a short-lived structure that has preserved the remnants of the activities of the people who inhabited it. However, in contrast to the eastern structure, refits tend to cross the boundaries of the central hollow and postholes. While material can of course be moved in and out of structures, the level of movement suggests that this knapping event occurred after the structure had decayed or had been dismantled. Furthermore, given the amount of scavenging of flint from previous occupations, it is likely that large refit groups, particularly ones including cores such as group 87, belong to the later phases of the site. Both strands of evidence suggest that the majority of this assemblage post-dates the central structure and that this feature was either kept clean of flint or was used in a very different way from both the eastern and western structures. The knapping episode represented by the refitting material may be focused on a cluster of burnt flint to the west of the structure, as is another refitting cluster to the west of the burnt flint, in the area of the central structure surrounds.

Central dryland structure surrounds

The area surrounding the central dryland structure can be characterised by moderate lithic densities, representing both knapping scatters and areas more focused on tool use. The southernmost part of the scatter represents an area of tool use and either small-scale knapping (with a handful of pieces removed from a core) or small dumps of knapping sequences into the wetland edge.



Figure 8.10: Microwear results from the central dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

Overall scrapers are the dominant formal tool type ($n=19$) in this area and several refit into short knapping sequences indicating these were tools produced in this area. Two retouch spalls, further evidence for scraper manufacture, were also recovered. Microliths ($n=14$) and burins ($n=8$) are relatively common. Both burins and a microburin join into refit sequences indicating on-site production (Figure 8.11). A single awl and an axe were also recovered. Utilised flakes, blades and fragments are extremely common with 60 examples represented. These are also numerous in the central structure reinforcing the argument made above of connection between the two areas. Tool spalls attest to manufacture and maintenance activities with burin spalls most common ($n=12$) (some manufacture spalls but mainly resharpening spalls), microburins ($n=4$) and five axe flakes (representing the thinning and resharpening of at least two axes) all represented.

Several discrete clusters of lithic material can be discerned, suggesting this area has undergone less clearance than other areas of the site. A knapping scatter overlapping the western semi-circle of postholes is associated with three microburins and surrounded by a scatter of scrapers, four burin spalls (from a grey till and a Wolds burin) and two burins. Utilised flakes and blades are strongly associated with this scatter with 11 examples recovered. Large quantities of this small cluster refits, indicating the knapping of a large, tested or minimally reduced, distinctive grey/brown till nodule. This raw material group consists of a large refitting sequence (refit group 91) containing 19 pieces (Figure 8.7) and six further refit groups (127–132), all of two pieces. Refitting within the various sequences belonging to this nodule are two burins, a scraper and a microburin, indicating a multipurpose manufacturing event. One of the burins from this refit group was taken 6 m to the north to be used in scatter 6, an unmodified fragment was moved 4.5 m to the east to the area of the central structure, a flake was found 2 m to the south and an utilised bladelet was found 1.5 m to the east. Two tools (a scraper and a burin) from this sequence were recovered within the scatter of refitting debris centred on $\times 19$ where they were made. The core belonging to this refit group was not found. It would have been large and still productive and is likely to have been removed for later use. To the east of this scatter a cluster of burnt flint may represent a hearth, which may have been the focus for the knapping represented by this large refit group, as it appears



Figure 8.11: Refit sequence 91 incorporating two burins and a scraper. A microburin probably also belongs to this group (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

to have been for the refitting material in the central structure. As has been argued for the refit group from the central structure, it is likely this refitting scatter represents some of the latest activity in this area.

Refits indicate scrapers were also made in the area of the central structure surrounds. Two scrapers, made from different raw material units, were manufactured immediately to the north of the $\times 19$ scatter. One was recovered from the immediate area and the other used just north of the ring of postholes belonging to the central structure, a distance of around three metres.

A remarkable collection was recovered from pit [336]. Within this feature 25 tightly packed pieces of flint were found in an area of relatively low densities. Of these 18 were burnt and the remainder were all of Wolds material. Three artefacts were examined for microwear. One was unused, two others (<107972>, <107985>) were slightly burnt but preserved enough information to indicate they had been used, both to scrape an indeterminate hard material. The burning on this material precludes microwear in most cases, but evidence of use on two of the three pieces examined could mean this represents a personal toolkit rather than knapping debris.

To the south of this is a more generalised scatter of tools containing all major tool types including an awl and an axe. Microliths are particularly common here and this scatter seems to continue beyond the area of dark sediment (termed the occupation deposit, see Chapter 20) into the northern part of the 'axe workshop' (see below), where two microburins were also found. A microlith <107851> on the far western part of this scatter has hafting traces, which is unusual as it had no visible signs of impact. A second microlith, an extremely large obliquely blunted point found 1.7 m from the previous example, was used for a short time to scrape hide with a mineral additive, while its tip was used to pierce hide. In general the microwear results from the area surrounding the central structure indicate a focus on animal-related activities such as butchery, cutting bone and scraping hides, with one of the pieces used on hide also used to scrape bone. A single piece indicates plant working.

To the east of the structure is a low-density spread of material within which tools are relatively rare and consist mainly of scrapers (though a burin and two burin spalls and a single microlith were also recovered from this area). The only evidence of clustering is a group of six utilised pieces which were found immediately to the east of the structure. This area also contains knapping debris, in particular the reduction of a nodule of coarse grey flint. The high levels of refitting of this material indicates this scatter has seen little disturbance.

Scatter 6

Scatter 6 is a low-density scatter stretching from the north of the central structure to the north-east corner of SC34 (Figure 8.12). At its southernmost part is a small cluster of material. This seems to be a fairly disparate collection of material, perhaps derived from a clearance episode relating to an adjacent structure, or perhaps truncated by a structure. This small scatter is associated with three burins and two refitting tranchet flakes from an axe made of grey Wolds flint, though the axe itself was absent. A third tranchet flake from a different axe made of till flint was also found in the same area. A microlith <108736> found on the south-western edge of this cluster was used for cutting siliceous plants and was probably hafted. A plant-working tool was also used here, which was later re-used as a strike-a-light and a bone working tool. Just 0.8 m to the west of this cluster was a burin that refits to the large refit group 91 focused in the central structure surrounds.

Beyond this southern area formal tools are rarer. Two scrapers were recovered from the northernmost part of the site within a scatter containing a number of blades and pieces with macroscopic damage. One of these pieces, a fragment, was used for cutting soft-medium hardness material, possibly hide, and another was used for butchery. Just south of the scrapers is a handful of flakes and fragments that seem to derive from the same core. The only other formal tool is a burin. Used pieces are common and distributed throughout the scatter. Tools used to work bone and/or antler are common in this area with four examples recovered.

With the exception of the small cluster in the southern part of scatter 6, this appears to be an assemblage generated by tool use. Small debitage and burnt material are very rare. The scatter can thus be divided into three areas: the southern cluster, possibly representing clearance with evidence for burin production and use, axe resharpening and plant working; a central area with more varied tool use activities but with a focus on working bone and antler; and a northern area perhaps more focused on hide working and butchery, this latter correlating with faunal remains (northern cluster 1 and 2, see Chapter 7) including red deer and aurochs, identified as a possible butchery area. This scatter demonstrates a shift in the use of space from the intensely used high-density areas in and around the eastern and western dryland structures to a more diffuse area of activity on the clay.

Scatter 7

Scatter 7 is a small diffuse scatter, consisting of 169 pieces of worked flint in the northern part of SC34. A cluster of 10 pieces of burnt flint in the southern part of the scatter may represent a hearth. This scatter seems to represent a fairly discrete episode involving the reduction of four nodules. Two areas of activity are associated

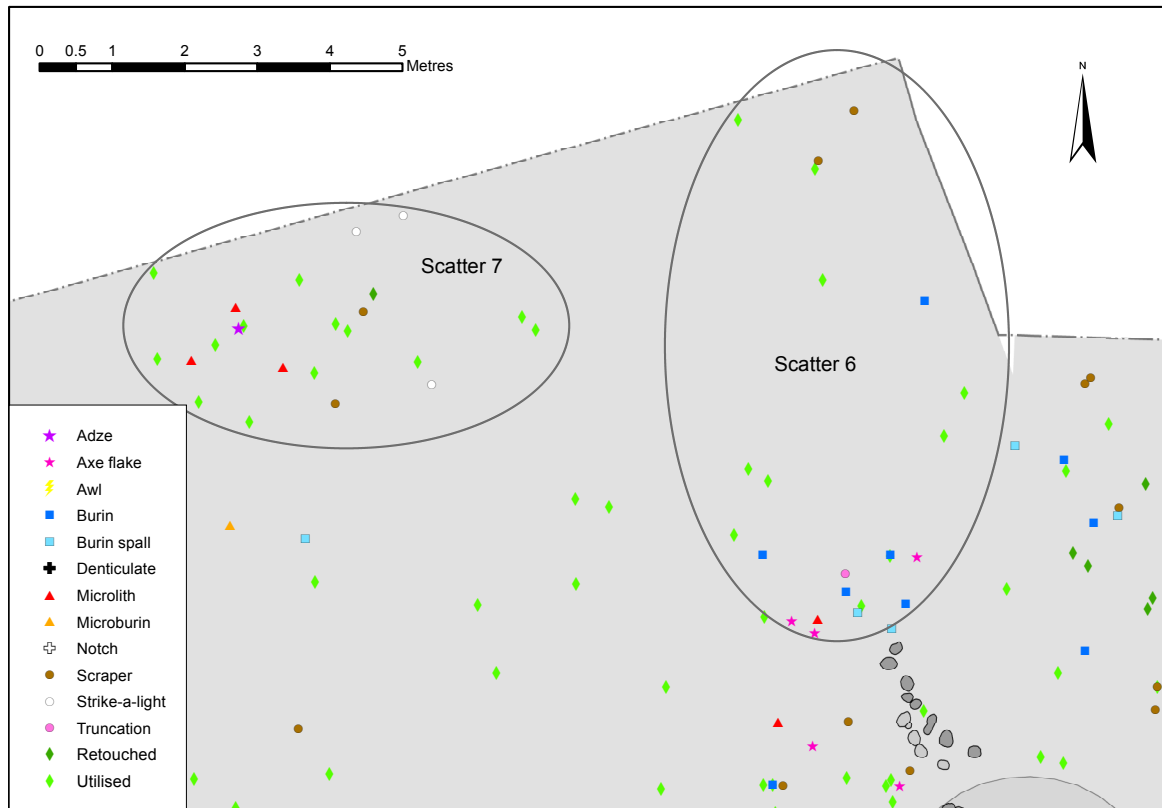


Figure 8.12: Distribution of tools in scatters 6 and 7 (Copyright Star Carr Project, CC BY-NC 4.0).

with the hearth. The first, to the north and west of the hearth, consists of a knapping scatter generated by the reduction of two nodules of brown speckled flint and one of grey. The first of these includes refit group 155, the second, refit groups 146, 148 and 149. One of the pieces from group 148 was found in the northern part of scatter 6, indicating connections between these two areas (Figure 8.12). Three microliths were recovered from the central part of the scatter: two are obliquely blunted points almost identical in size, the third a burnt fragment. One of the complete examples shows evidence of hafting and use as a projectile. Also within the central part of the scatter is an axe made from Wolds flint.

To the east of the hearth is a smaller scatter where a second brown nodule (including refit group 147) was reduced. A core that shares the very distinctive black/grey blotch of this refit sequence (though cannot be refitted) was recovered from scatter 4, possibly suggesting contemporaneity, or that the core was scavenged during a subsequent occupation. Products from this reduction sequence are also found in the northern part of scatter 7 suggesting contemporaneity. Within this eastern part of the scatter, tool use also occurred: a scraper was recovered and a blade fragment was used for grooving bone and scraping antler. One strike-a-light was recovered from this area, with a further two on the north-eastern margin of scatter 7. Utilised pieces are common and found distributed throughout the scatter. This whole area seems to represent a short-term activity area with two individuals undertaking different tasks around a hearth, sitting, facing the waters of the lake.

Eastern area

The eastern area encompasses the vast majority of trench SC23. Its focus is the eastern structure which contained vast quantities of flint including large amounts of burnt material (Figure 8.13). High densities are also recorded around the structure, particularly to the north and west in the form of scatter 4 where burnt flint is

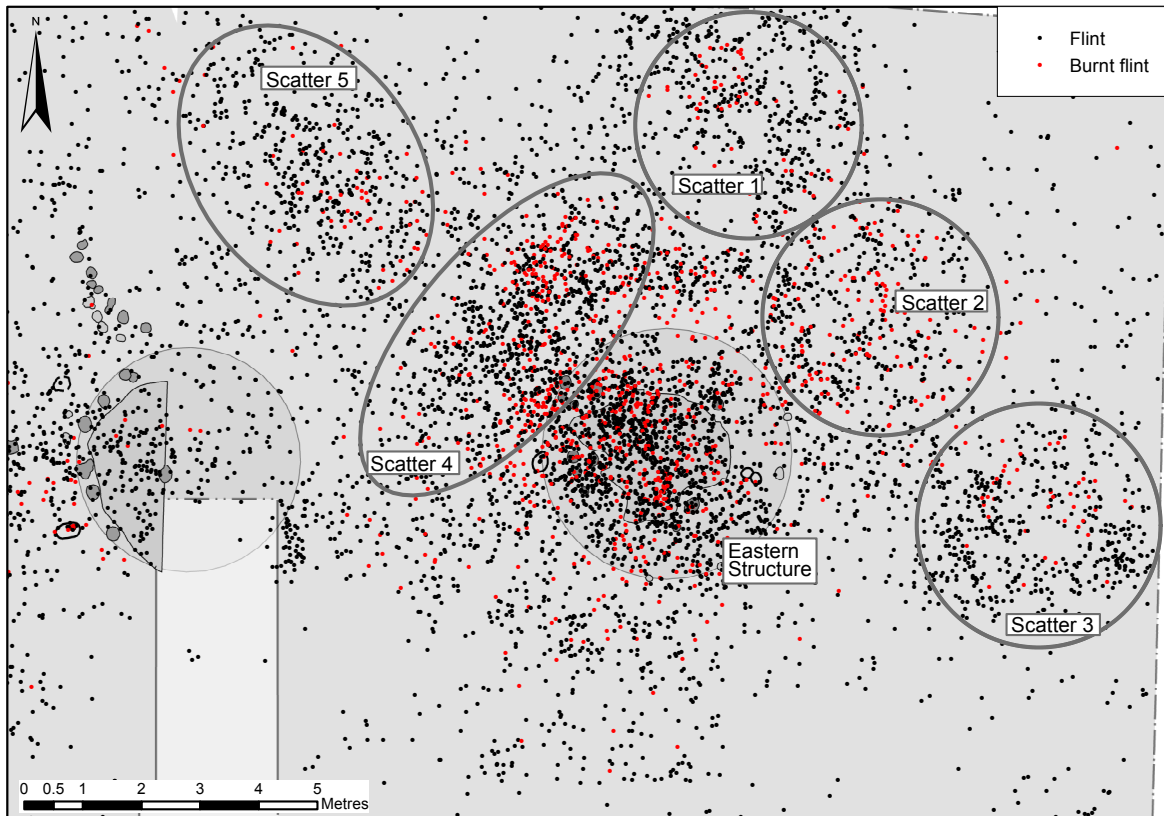


Figure 8.13: Distribution of flint and burnt flint in the eastern dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

also common. Further to the north and east are three scatters, all with central hearths indicated by burnt flint, of which 1 and 2 probably, like scatter 4, have links to the structure. The whole area is characterised by clearance, middening and reuse of flint from adjacent scatters. Scatter 3 appears more discrete and may represent a later occupation. To the north-west is scatter 5; a lower density area characterised by some flint knapping but also areas of tool-use and discard. Between these lithic concentrations are empty areas, some distinctively linear in nature. One runs NE-SW, extending from the edge of the eastern structure to the lake; another runs NW-SE, between the northern edge of the central structure and scatters 4 and 5. At Tågerup, Sweden, similar linear empty spaces between areas of high lithic density have been identified as paths between dumps of material cleared out from an adjacent structure (Karsten and Knarrström 2003, figure 98). If the examples from Star Carr are also paths, the former would provide access from the eastern structure to the water's edge, the latter access to northern areas of the site now destroyed by the Hertford Cut.

Eastern dryland structure

A dense assemblage of lithic material was recovered from the eastern dryland structure. This was noticeably concentrated in the upper fill of the central hollow, while the lower, more organic layer contained relatively little material. A similar pattern has been noted by Grøn (2003) for Southern Scandinavian structures and is likely to indicate an organic covering/flooring of planks, bark, reeds or branches which prevented material working its way into the lower fill. Lithic material also clusters outside the central hollow but within the area of postholes. Burnt flint is common (23.3%) (Table 8.3) and is scattered across the structure with some clustering in the south-central area possibly representing a hearth, though the patterning is not clear. The presence of such a high density of sharp lithic material in an area where people would be living, or at least carrying out

	Eastern structure		Scatter 4		Scatter 1		Scatter 2		Scatter 3		Scatter 5	
Category	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Tools:	135	7.03	55	4.1	47	5.22	54	4.3	41	6.2	39	5.78
Awl	0	0	0	0	0	0	2	0.16	1	0.15	1	0.15
Axe	2	0.1	0	0	0	0	1	0.08	0	0	0	0
Burin	14	0.73	15	1.12	8	0.89	5	0.4	2	0.3	4	0.6
Denticulate	0	0	0	0	1	0.11	0	0	0	0	0	0
Hammer-stone	0	0	2	0.15	2	0.22	0	0	0	0	0	0
Micro-denticulate	0	0	0	0	0	0	0	0	2	0.3	0	0
Microlith	33	1.72	12	0.89	10	1.11	18	1.43	6	0.91	5	0.74
Notch	0	0	0	0	1	0.11	0	0	0	0	0	0
Scraper	20	1.04	11	0.82	10	1.11	15	1.19	10	1.51	12	1.78
Scraper/ burin	1	0.05	1	0.07	0	0	0	0	0	0	2	0.3
Scraper/ knife	0	0	0	0	0	0	0	0	1	0.15	0	0
Strike-a-light	0	0	0	0	0	0	1	0.08	1	0.15	0	0
Truncation	0	0	1	0.07	0	0	1	0.08	0	0	0	0
Wedge	0	0	0	0	0	0	0	0	0	0	0	0
Retouched	1	0.05	4	0.3	3	0.33	2	0.16	0	0	4	0.6
Utilised blade	12	0.62	7	0.52	8	0.89	6	0.48	11	1.66	8	1.19
Utilised flake	0	0.05	1	0.07	2	0.22	0	0	2	0.3	2	0.3
Utilised fragment	2	0.1	1	0.07	3	0.33	3	0.24	5	0.76	1	0.15
Tool spalls:	50	2.6	22	1.64	17	1.89	29	2.31	4	0.6	6	0.89
Axe flake	5	0.26	2	0.15	5	0.55	1	0.08	0	0	0	0
Burin spall	31	1.61	16	1.19	11	1.22	21	1.67	4	0.6	6	0.89
Microburin	14	0.73	4	0.3	1	0.11	7	0.56	0	0	0	0
Retouch spall	0	0	0	0.07	0	0	0	0	0	0	0	0
Core preparation:	17	0.88	15	1.12	16	1.77	16	1.27	5	0.76	18	2.67
Core tablet	5	0.26	4	0.3	4	0.44	6	0.48	3	0.45	7	1.04
Crested blade	11	0.57	7	0.52	4	0.44	7	0.56	1	0.15	4	0.6
Plunging	0	0	0	0	4	0.44	0	0	0	0	3	0.44
Flanc de nucleus	1	0.05	4	0.3	4	0.44	3	0.24	1	0.15	4	0.6
Debitage:	1769	92.09	1249	93.2	821	91.12	1157	92.12	611	92.43	612	90.67
Blade	263	13.69	166	12.4	146	16.2	174	13.85	100	15.13	120	17.78
Flake	401	20.87	273	20.4	187	20.75	244	19.43	138	20.88	165	24.44
Fragment	919	47.84	678	50.6	431	47.84	646	51.43	313	47.35	291	43.11
Chip	156	8.12	90	6.72	42	4.66	67	5.33	55	8.32	23	3.41
Core	9	0.47	8	0.6	5	0.55	8	0.64	4	0.6	6	0.89
Core frag	1	0.05	1	0.07	1	0.11	2	0.16	0	0	0	0
Nodule	0	0	1	0.07	1	0.11	0	0	0	0	1	0.15
Chunk	20	1.04	32	2.38	7	0.78	16	1.27	1	0.15	6	0.89
Total	1921	100	1341	100	901	100	1256	100	661	100	675	100
Burnt	448	23.32	406	30.3	121	13.43	355	28.26	63	9.53	70	10.37

Table 8.3: Composition of the lithic assemblages from the eastern area.

various activities, could be considered unusual. A number of hypotheses designed to explain this phenomenon were tested during the course of the analysis:

1. The lithic material represents in situ lithic material from a number of occupations, which had simply been covered by further organic matting as it built up.
2. Lithic material had been cleared up regularly and deposited elsewhere but smaller elements from successive occupations had been missed or worked their way through organic matting.
3. Lithic material had been cleared, with the exception of the debris from the final phase of occupation.
4. The whole structure had been used as a rubbish dump once it was no longer used, as appears to have occurred at Staosnaig, Colonsay (Mithen 2000).

In order to test these hypotheses, all lithics from the structure were measured and laid out in refit trays. As might be expected, it was immediately apparent that the material did not make sense as an assemblage that was the product of a single short-term knapping station. Instead it appeared to be the product of a complex set of actions. Numerous raw material units were represented but only by a couple, or at best, a handful of pieces, indicating movement of material both in and out of the structure over a long period of time. Quantities of fragmented pieces are higher within the central hollow (52.1%) than the area outside it but within the posts (47.9%), indicating that the central area saw most intense use. However, both areas have slightly high levels of fragmentation in comparison to adjacent dryland areas, which average at 46.4%, and wetland edge areas where fragmentation averages at 21.4%, indicating the structure was a focus of activity.

In order to understand whether the debris of successive occupations were represented in the central hollow, lithic material was divided into 30 mm spits, according to height recovered and the composition of each spit recorded (by JB). Refits were recorded within and between spits. Unfortunately this exercise indicated that considerable post-depositional movement had taken place through the sediment, both within the central hollow itself and within the buried soil that comprised the area within the postholes. Refit sequences spanned up to 250 mm in height, with no apparent difference noted between the area of the central hollow and the postholes; thus any potential evidence for build-up of material over time had been extinguished.

However, there is some evidence for clearance of material from the central hollow. Lithic artefacts in the central hollow are generally small in size: an average of 24 mm (not including sieved pieces). This can be compared with an average size of 30 mm for material from within the post-ring and an average of 34 mm for the adjacent scatter 3. This would suggest that the larger material has been cleared out of the structure, and to a lesser extent from within the post-ring, and deposited elsewhere. The small size of the material also probably suggests that lithics were the result of in situ production rather than the structure being re-used as a midden, a fact supported by the coherence of the radiocarbon dates; the Staosnaig midden has discordant radiocarbon dates (Mithen 2000).

Considerable effort has been expended on refitting material from the structure and as a result refitting rates may be artificially inflated in comparison with neighbouring scatters. 46 refit groups were located (Table 8.4;

Refit group size	Number of groups
2	29
3	8
4	5
5	1
6	0
7	0
8	2
9	0
15	1

Table 8.4: Size of refit groups from the eastern structure.

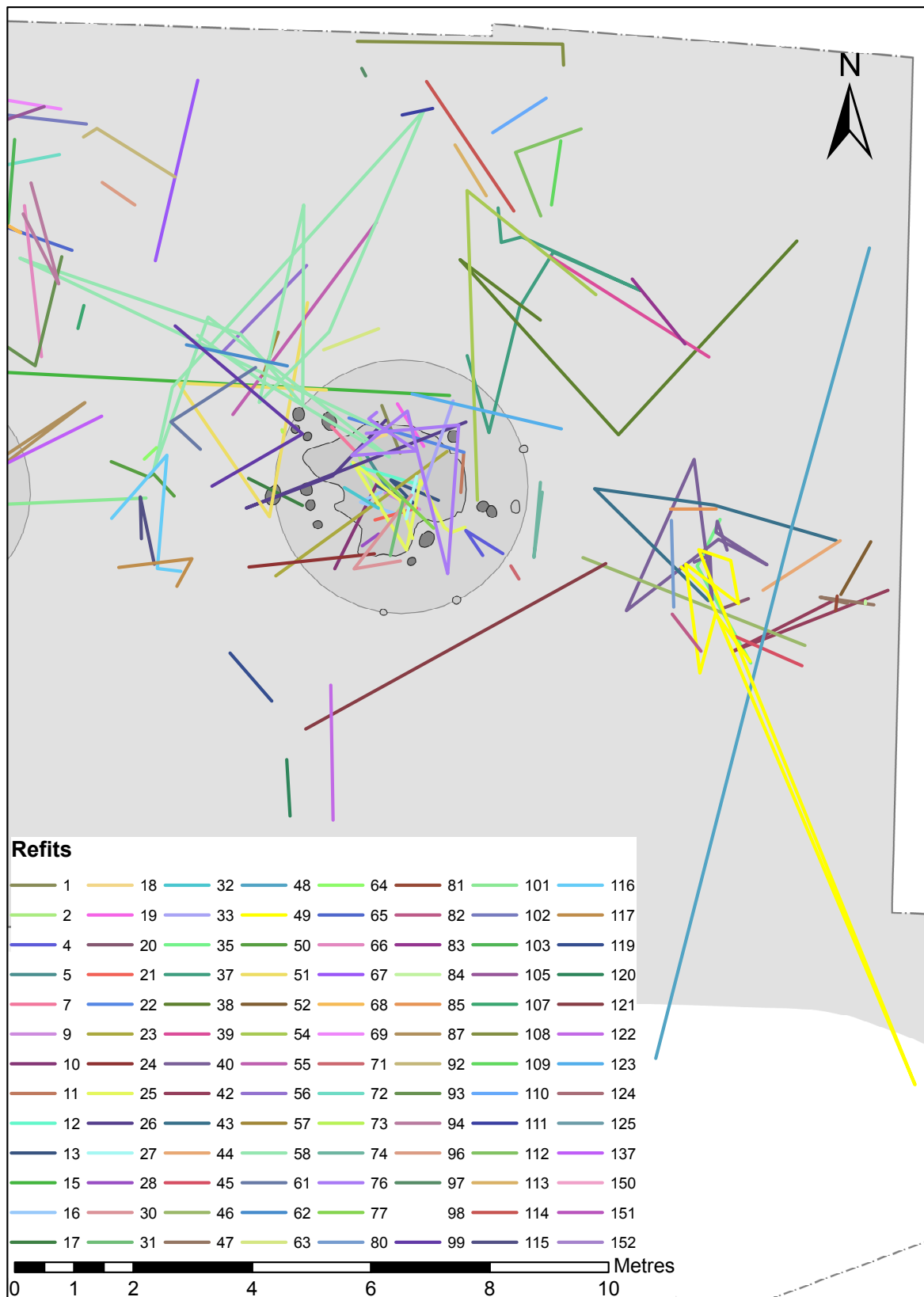


Figure 8.14: Refits from the eastern area (Copyright Star Carr Project, CC BY-NC 4.0).

Figure 8.14). Of these, most are small, consisting of a pair of refits, often snaps, rather than technological refits. However, there are longer sequences: two groups of eight pieces (refit groups 25 and 76) and one of 15 (refit group 58, of which only three pieces were recovered from the structure; the remainder are from scatter 4). Given the level of bioturbation it is unclear whether these longer chains of refits indicate the structure was never very thoroughly cleared or whether these represent evidence from a final occupation that was not cleared away. The average level of lithic material within the structure is 24.83 m OD. The average height of the three largest refit groups is 24.87, 24.79 and 24.84 m OD, possibly suggesting that two sequences may derive from a later occupation but the figures are certainly not definitive.

Another noticeable feature of the refitting is that refit sequences tend not to extend beyond the structure. Seven pieces extend slightly beyond the putative post-ring, all to the south-west. This could represent the location of the entrance to the structure, or since none of these refits extends more than 0.5 m from the post-ring, could suggest this structure had sloping sides. In addition three or possibly four sequences cross the structure boundary. Two join to scatter 2 (it is argued below that scatter 2 may at least partially represent cleared material from this structure). The third example is refit sequence 58, a knapping sequence encompassing the reduction of a small red bladelet core (Figures 8.15 and 8.16), which includes the production of a burin. Products from this core were found widely distributed across the north-west part of trench SC23, across a distance of 7.5 m. Most of the sequence was recovered from scatter 4, though the burin was recovered from a cluster of burins and burin spalls in scatter 1. The final two pieces in this sequence, an elongated flake and the small red core, were recovered from the structure. The fact they are in sequence suggests these were taken into the structure rather than being the product of reuse of the area after the structure was no longer standing. However, a core tablet from this sequence was also found in this structure. This is difficult to position exactly in the sequence; it represents an early removal, possibly the first, and has no sign of additional use. This could mean that this core also started life in the structure before being moved out, then back; or alternatively sequence 58 may represent material knapped in the structure that was incompletely cleared out into scatter 4, with some products undergoing use to the north. Alternatively the entire sequence may post-date the structure. The fourth sequence involves a burin with three removal spalls. The initial spall was found in the northern part of scatter 4 and the burin itself was deposited in the western part of the same scatter. However, the intermediate secondary sharpening spalls were found on the very edge of the post-ring. This could suggest that a burin first used in scatter 4 was taken into the structure for further use and resharpening before being deposited in scatter 4; however, since both of these spalls are on the very edge of the post-ring it is possible that they fall within the very edge of scatter 4.

A further reason for believing that material within the structure represents *in situ* working, rather than dumped material, is that there is some element of coherence within the assemblage. Burins and burin spalls are common, particularly within the north-west quarter of the scatter (Figure 8.17). Burin spalls tend to be primary spalls indicative of manufacture rather than resharpening and the burins associated with these spalls were not recovered from the structure, being moved for use elsewhere. Scrapers also cluster in this area, though they are also found more widely across the structure. Microliths and microburins were generally found in the margins of the structure, though a small cluster of microliths was located in the southern part of the central hollow, in the area of the possible hearth. Microliths ($n=33$) are the most common formal tool, followed by scrapers ($n=20$) and burins ($n=14$). Two axes were found within the structure and one c. 100 mm beyond the margins of the post-ring, possibly in the area of the entrance.

There are different patterns for the production and deposition for different tool types. Though some microliths appear to have been manufactured within the structure, the focus seems more on deposition of these artefacts, as microliths outnumber microburins 33 to 14. Burins, as described above, were manufactured in large numbers but used and deposited within the structure more rarely and most were removed for use elsewhere. Axes were resharpened (Figure 8.18), but the focus seems more on their maintenance and deposition than use in the structure. A refitting scraper indicates that at least some of these tools were manufactured within the structure.

Microwear reveals some of the tasks that took place within the structure (Figure 8.19). Scraper <90296> was used for hide working; this piece was not hafted and had been resharpened but not used post-resharpening, suggesting the maintenance and storage of tools was taking place here. Another scraper <91420> from the structure was hafted. Scraper <85844> from the south-eastern edge of the post-ring had traces of being used on moistured hide, typically involving the scraper being launched onto the hide and thus likely to have been an outside

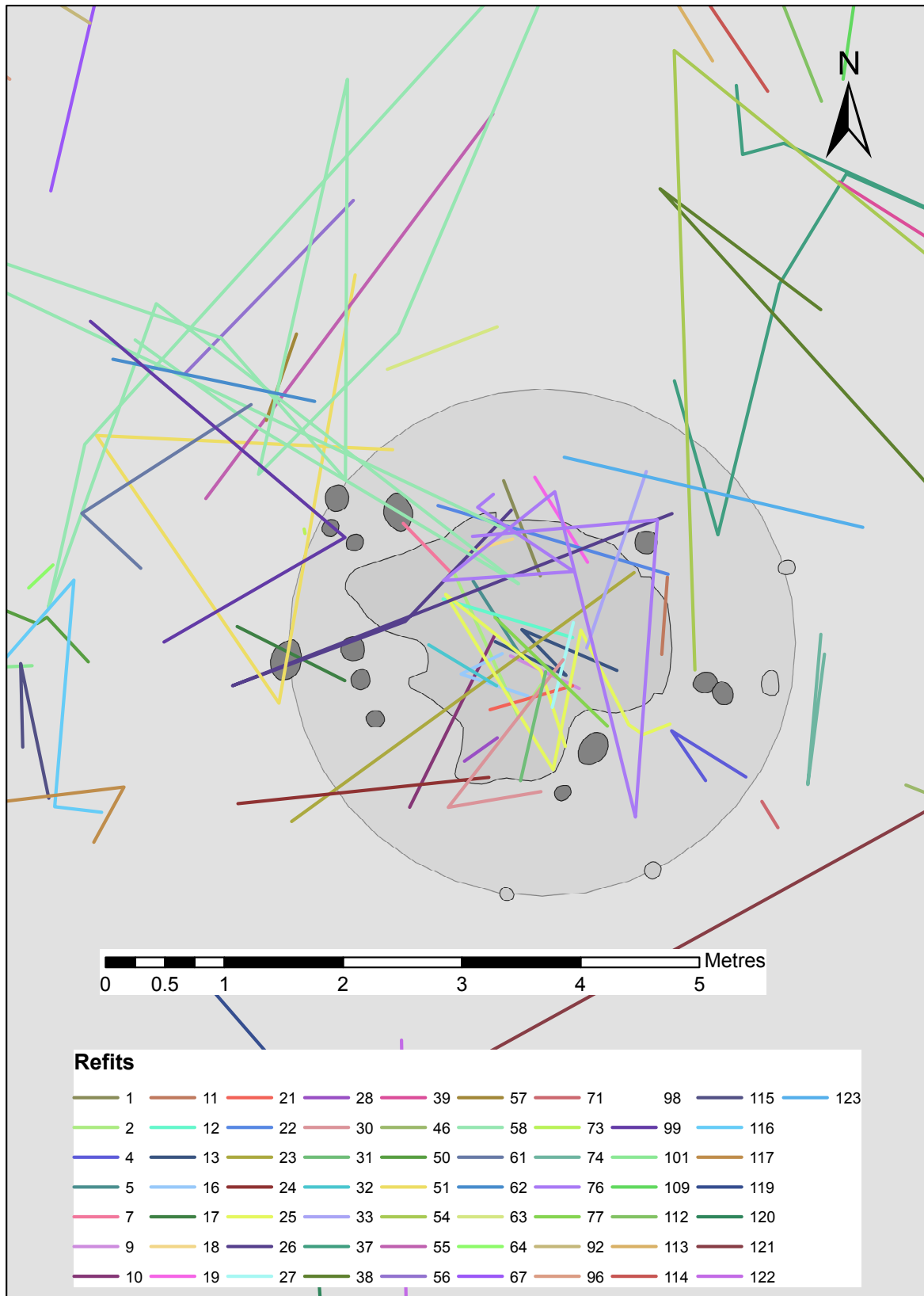


Figure 8.15: Refits within and around the eastern structure (Copyright Star Carr Project, CC BY-NC 4.0).



Figure 8.16: Refit group 58, incorporating a burin, and extending between scatter 4, scatter 1 and the eastern structure (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

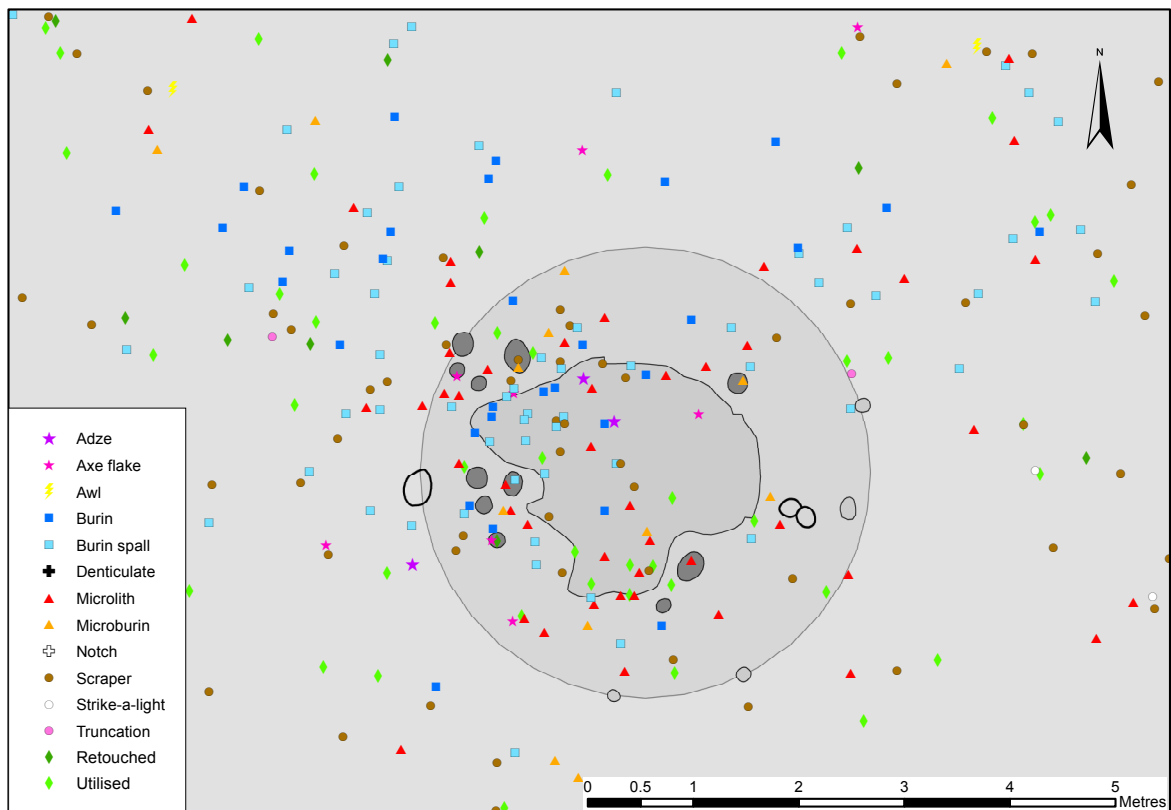


Figure 8.17: Tools from the eastern structure (Copyright Star Carr Project, CC BY-NC 4.0).



Figure 8.18: Axe and resharpening sequence from inside the structure (refit group 76) (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

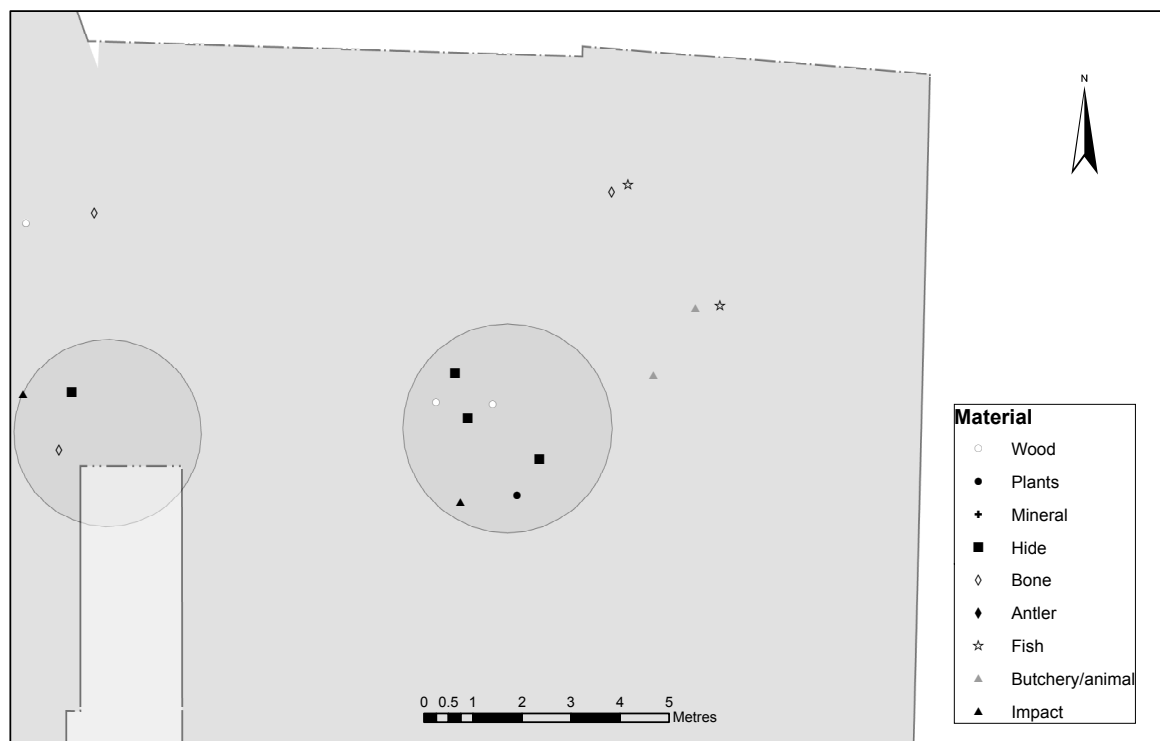


Figure 8.19: Microwear results from the eastern dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

task. It may belong to an earlier or later phase of the site when the structure was not present; however, like several other tools in the structure it may have been brought in for rejuvenation or future use as part of a personal toolkit. A large blade <90863> which had not been produced either within the structure or the wider area was hafted and used to work plants and wood (cutting and scraping). At some point it was de-hafted with the hafted zone then re-used to scrape plants. An axe <92077> had been used for chopping wood: as this task is unlikely to have been undertaken in the structure it also seems to have been a piece brought in for repair, storage or deposition. The combination of hafted, imported and resharpened tools suggests many of the tools here are more than ad-hoc pieces and instead represent curated personal toolkits, stored and repaired within the structure.

In sum, the structure was composed of a central area of organic matting on which activity took place over a long period. Material was cleared out but a proportion remained, covered by matting. Some of the later phases of use may be better represented. The activities that took place within the structure were varied but included short knapping sequences and the production of tools for use elsewhere. The discard of microliths and repair of composite tools, of which components had been manufactured elsewhere, also seems to have occurred. Other tools were also brought in to be repaired; these include axes, scrapers and a large blade used to work wood or plant material. Some of these may represent personal toolkits stored in the structure. There does appear to be some spatial patterning within the structure, but it is difficult to ascertain whether this simply reflects the last period of use of the structure or represents repeated patterns, reflecting strict regulations surrounding the use of space by particular individuals, as described by Grøn (2003) for Siberian groups.

Scatter 4

Scatter 4 is located immediately to the north and north-west of the eastern structure. It is crescentic in form and, with the exception of the southernmost part, seems to respect the eastern structure. It is likely to represent either activities undertaken outside the structure or material cleared from the structure and dumped outside, or both. The scatter contains a large quantity of burnt flint which clusters in the southern and north-western parts but is part of a more diffuse spread of burnt flint around the structure. This could represent material cleared out from the structure. Refits are also quite broadly scattered around this scatter, rather than the tight focus on knapping clusters, which again might suggest a redeposited assemblage. However, refits either seem to respect the boundary of the structure or represent coherent transfers of usable material from scatter 4 to the eastern structure, which might argue in favour of complementary activity areas. Both hypotheses, and a combination of the two, are thus possible.

Scatter 4 produced a large assemblage of 1341 pieces, 30% of which are burnt (Table 8.3). Levels of tools are relatively low, perhaps as a result of high levels of burning rendering them unrecognisable, or because this scatter represents dumped debitage from which the tools have been retained. Burins dominate the assemblage (33 examples), though 12 microliths and 11 scrapers were also recovered. Burins are found throughout the scatter, though burin spalls (both manufacture and resharpening examples) are confined to the western half (Figure 8.17). Microliths, utilised pieces and scrapers have a much tighter distribution than burins, being confined to the south-west part of the scatter.

Refitting demonstrates that burins travelled widely across this area. Three resharpening spalls from refit group 51 were recovered from the northernmost, southernmost and westernmost parts of the scatter, while the burin was discarded up against the northern boundary of the structure, in all a distance of 10 m (Figure 8.15). Refit group 58 consists of the reduction of a red bladelet core, the products of which were moved around scatter 4, with two pieces (including a burin) recovered from scatter 1, while the final removal and the core were found within the eastern structure; these pieces scattered over a distance of 25 m. Another two burin and burin spall refit sequence (55 and 61) were recovered four metres apart and two metres apart respectively. Refit group 63 consists of three shatter fragments, which have shattered when burnt. Two of these pieces were found in the northern part of scatter 4, c. 1 m apart. The third refit (unfortunately recovered from sieving) almost certainly derives from within the ring of postholes, over a metre to the south. Other refits travelled less widely: in the south-west of the scatter refit 50, four shatter fragments from a burnt core were recovered within a square metre.

Scatter 1

Scatter 1 lies 5 m north of the eastern structure and consists of 901 pieces of flint (Figure 8.20). It is around 4.5 m in diameter and the northernmost part extends into the northern section of the site. It includes a small

sub-scatter measuring around 1.5 m in diameter. A discrete cluster of 41 pieces of burnt flint (both plotted and sieved finds) in squares J9–J10 indicate a hearth. The assemblage is broadly balanced in terms of essential tool frequencies (Figure 8.20). However, examination of tool spalls suggests a focus on production and maintenance of burins, with 18 spalls represented; a mixture of primary production spalls and secondary resharpening spalls. Burin production seems to have taken place in the centre of the scatter where six primary burin spalls were recovered alongside two burins. Burins are distributed more broadly both in the centre of the scatter but also on its margins, indicating patterns of use and discard. One burin refits into a knapping sequence mainly reduced within scatter 4 but the final stages of reduction took place within the eastern structure.

Other areas were used for the production/use of different tools. In the northern part of the scatter three tranchet flakes indicate an axe was reworked. A denticulate was also found with the axe flakes: it is interesting to note that there is also an association of these two types in the axe workshop (see below) and denticulates may have been used in woodworking or haft maintenance. Microlith production seems a very minor activity: a single microburin is associated with two microliths (both obliquely blunted points) and three further microliths are found on the margins of the scatter. Scrapers tend to be found in the southern part of the scatter (within the southern cluster), generally singly or in pairs. Two pieces have been examined for microwear in the southern sub-scatter: one burin was used for fish processing (Robson et al. 2016) and a flake had been hafted and used to work bone.

Refit groups focused in this area do not extend beyond scatter 1 into other scatters. There is some spatial overlap between scatter 1 and scatter 2, where refit groups are more widely dispersed, but these groups are more focused on scatter 2. A burin from a refit sequence from scatter 4 was found on the edge of scatter 1; however, from a single connection it is difficult to say whether this indicates contemporaneity, diachronic superimposed activity areas or scavenging of flint from an earlier occupation.

Overall scatter 1 gives the impression of being a multi-functional area. Knapping was an important part of activities with a tested nodule, two hammerstones and several shatter fragments recovered. Both tool

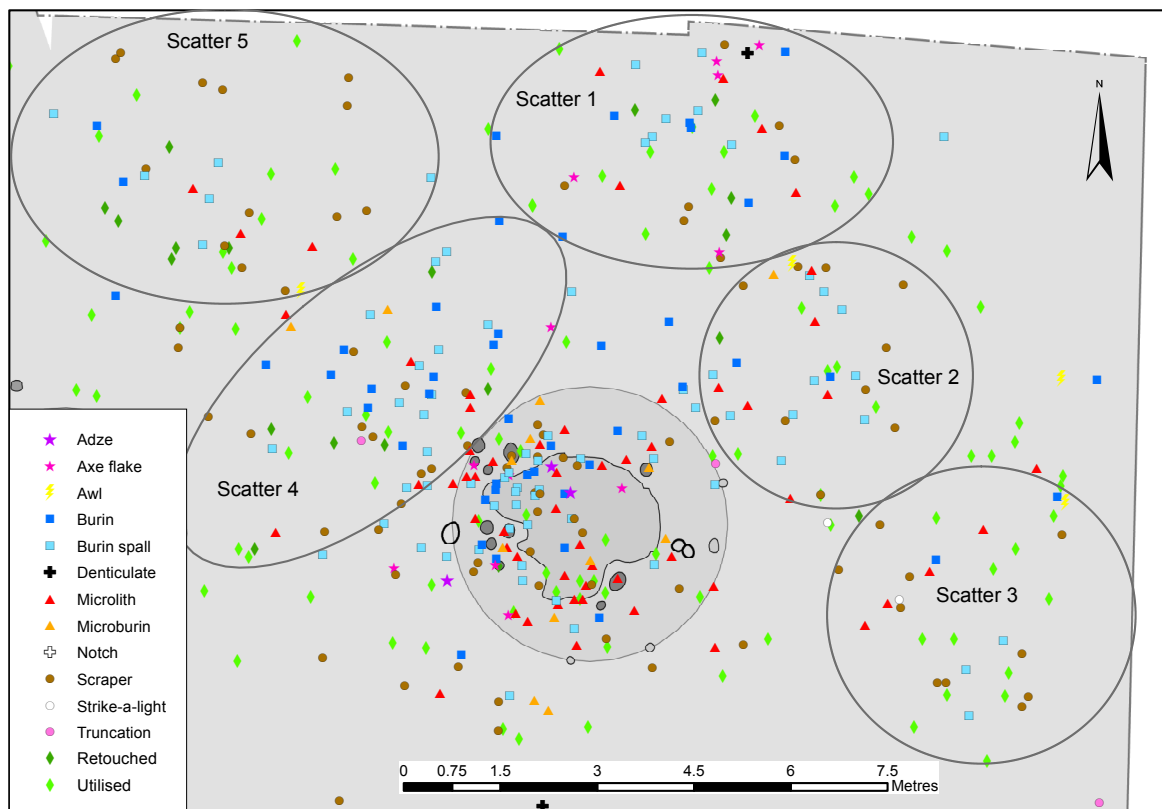


Figure 8.20: Tool distribution in the eastern dryland area (Copyright Star Carr Project, CC BY-NC 4.0).

production (microliths and burins) occurred, as did tool use, involving bone working and food preparation, the former possibly connected to the latter.

Scatter 2

Scatter 2 measures c. 5 m by 4 m and is located immediately to the north-east of the eastern structure. A large scatter of burnt flint (188 pieces), measuring c. 2×2 m across may represent a hearth (Figure 8.13). This cluster of burnt flint is surrounded by a more diffuse spread of burnt flint, perhaps indicating this scatter has been disturbed either by human or natural agencies. The burnt flint in scatter 2 also seems to represent part of a more general spread of burnt flint surrounding the eastern structure and thus may be attributable to clearance of material from this feature.

Microliths are the dominant tool type (18 examples) from scatter 2, with scrapers also common ($n=15$) and burins rarer ($n=5$), though 21 burin spalls were recovered, mainly primary examples; a pattern similar to that from the structure (Table 8.3). No distinct tool clusters are discernible, though there are seven burin spalls and two burins clustered in the vicinity of squares K4-5. Microliths and microburins are concentrated in the northern part of the scatter with seven microliths and five microburins spread across a 3×2 m area (Figure 8.20). An axe that seems to have been reworked as a core was found on the eastern edge of the scatter and a strike-a-light and truncation were also recovered.

Evidence for use-wear has been found on three pieces, all indicating a concern with butchery and food preparation. Two pieces have evidence for butchery and one has evidence for fish processing. Some activities (primary burin spalls, axe reworking, fish processing) seem similar to those undertaken in the eastern structure and the diffuse spread of burnt flint and lack of distinctive spatial patterning to activities could mean that this scatter has at least partially been generated through clearance and dumping of material from the structure. This hypothesis appears to be supported by the refits. Two refit groups centred in scatter 2 cross into the structure (Figure 8.14); neither appears likely to have entered the structure because they were useable blanks or tools. The refit groups in scatter 2 are also fairly dispersed (as are those from scatter 4), perhaps also indicating clearance activities.

Scatter 3

Scatter 3 is a small collection of 661 pieces. The scatter measures around 4 m in diameter and appears to represent a series of small clusters of knapping debris located around a hearth, evidenced by a small, discrete cluster of burnt flint (22 pieces) (Figure 8.13). Of the scatters surrounding the eastern structure it appears the most coherent with higher levels of refits and longer sequences represented. One refit sequence (group 40) has 11 pieces (Figure 8.21) while another (group 49) has 12 (Figure 8.14). Most are found entirely within the area of scatter 3, with some notable exceptions which indicate transport of blades to task areas, often on the wetland edge. Scatter 3 also has the lowest proportion of burnt flint (9.53%) suggesting its hearth was relatively short-lived and was not cleared out (or at least not within this area).

Scrapers are the most common tool type ($n=10$), which mainly cluster within the south-western part of the scatter, in the same area as burin spalls (four examples, both primary and secondary). Refitting suggests that at least some of the scrapers were manufactured within the scatter. Microliths by contrast are found in the northern part of the scatter, along with an awl, two burins, two micro-denticulates and a strike-a-light. No microburins were recovered. Blades and flakes with macroscopic edge damage are common and spread across the northern and southern parts.

Refitting of two long sequences indicate the import of two partially reduced nodules. One of these is a high-quality distinctive cloudy grey till, of which there are three large refit groups: groups 43 (6 refits), 48 (3 refits) and 49 (12 refits) (Figure 8.22). This was imported to the site as a part reduced nodule; it was knapped in scatter 3 and many blades were produced, of which several were used elsewhere on site, while the core itself was removed for use elsewhere. The products of this core were used to the north-west of scatter 2 and in the wetland immediately to the south where a large blade from this group was used for woodworking. A second part reduced core of poorer-quality flint was also brought to the area and reduced. The nodule on which this core was made was irregular, making working difficult and it was abandoned due to working problems. This raw material unit was knapped in broadly the same square metre area as group 43/48/49, immediately to the west



Figure 8.21: Refit group 40, knapping of a part reduced till pebble from cortical flakes to discarded core (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

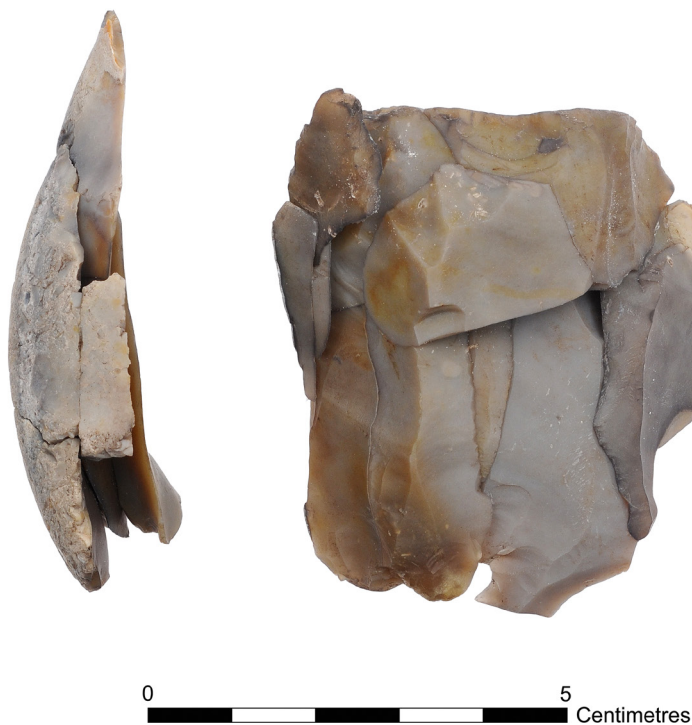


Figure 8.22: Refit groups 43 (left) and 49 (right). A high-quality, grey till flint, the products of which are widely dispersed (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

of the potential hearth. However, in contrast its products remain in the immediate area, most likely because of the poor quality of the raw material.

Scatter 3 appears to be a relatively high-resolution scatter. Its high proportion of refits and coherent structure suggests it has seen minimal disturbance and scavenging of flint. Both of these features suggest it is relatively late in the sequence and almost certain to post-date the intense activity in the area that involved the use of the structure. The wetland refits are unfortunately not far enough lakewards to be dateable within the Bayesian model, though their stratigraphic position confirms the hypothesis that they belong to the later history of the site.

Scatter 5

Scatter 5 is a relatively low-density elliptical scatter in the north-western part of trench SC23, just extending into trench SC34. Burnt material is relatively diffuse although a concentration of 23 pieces could represent a hearth (Figure 8.13). Scrapers are the most common tool recovered from the scatter (n=12) with lower numbers of microliths (n=5) and burins (n=4). The only tool spalls recovered are burin spalls (n=6); both primary and secondary examples. Scrapers are found dispersed throughout the scatter, some on the northern and southern margins but also within the central part of the scatter (Figure 8.20). Utilised pieces are common and have a similar distribution to scrapers. Microliths were recovered within the central and south-eastern part of the scatter, including a cluster of three within a square metre. Burins and burin spalls are found in the western part of the scatter, several of which refit, though often across reasonable distances (2–3 m). This seems to be an area of tool use and very small scale knapping, perhaps with a focus on use.

The wetland

Introduction

The archaeology of the wetland and wetland edge has a very different character to the dense foci of knapping and tool use on the dryland. While some knapping scatters are present on the wetland edge, in general the material recovered from this zone consists of tools and utilised pieces, either discarded in areas where they were used, or on occasions subject to more formal deposition. Burnt flint and small debitage are rare. The rapidity of peat formation means that individual episodes of activity can be discerned in a way that is impossible on the dryland.

As with the dryland, the wetland has been divided into three areas (north, central and east), with both wetland-edge and purely wetland assemblages discussed in this section. In several areas peat growth has permitted assemblages to be split stratigraphically revealing the changing character of activities in the area.

Western area

The western area stretches from the small area wedged between Clark's trenches and north of his cutting III in the west, to the western platform in the east. It encompasses both wetland assemblages (that would have been deposited either in open water or areas that held standing water on a seasonal basis) and wetland edge assemblages (the product of activities that took place when peat growth had led to the development of fen and carr vegetation).

Area north of cutting III (bead area)

This is an area of cracked and friable peat which also appears to have suffered from bioturbation and trampling: the lithics appear to be spread through the depth of peat, though this varies in different areas. For instance, one tight cluster of burnt flint, which presumably represents a single event, is all found at the same level apart from two pieces found c. 100 mm lower. Similarly, *mèches de foret* (drill-bits) in the same grid squares sometimes have a big height difference between them, of up to 120 mm.

This is a dense area of lithic-focused activities. Knapping was certainly being undertaken, as demonstrated by large numbers of small chips, core maintenance flakes and debitage (Table 8.5). However, the area was also a focus for the production and use of tools. A wide range of formal tools were recovered, with almost equal

	North of Clark's area		Fen flint scatter	
Category	No.	%	No.	%
<i>Tools:</i>	228	23.01	46	13.65
Awl	18	1.82	6	1.78
Axe	1	0.1	0	0
Burin	15	1.51	7	2.08
Denticulate	3	0.3	0	0
Hammerstone	0	0	0	0
Micro-denticulate	1	0.1	0	0
Microlith	18	1.82	4	1.19
Notch	0	0	0	0
Scraper	16	1.61	5	1.48
Scraper/burin	1	0.1	0	0
Strike-a-light	2	0.2	0	0
Truncation	1	0.1	1	0.3
Wedge	1	0.1	1	0.3
Retouched	4	0.4	1	0.3
Utilised blade	90	9.08	15	4.45
Utilised flake	20	2.02	2	0.59
Utilised fragment	37	3.73	4	1.19
<i>Tool spalls:</i>	13	1.31	5	1.48
Axe flake	1	0.1	3	0.89
Burin spall	9	0.91	2	0.59
Microburin	3	0.3	0	0
Retouch spall	0	0	0	0
<i>Core preparation:</i>	23	2.32	12	3.56
Core tablet	8	0.81	4	1.19
Crested blade	14	1.41	4	1.19
Plunging	1	0.1	4	1.19
<i>Debitage:</i>	727	73.36	274	81.31
Blade	137	13.82	86	25.52
Flake	180	18.16	85	25.22
Fragment	237	23.91	83	24.63
Chip	156	15.74	8	2.37
Core	13	1.31	5	1.48
Core fragment	0	0	1	0.3
Nodule	0	0	0	0
Chunk	4	0.4	6	1.78
Total	991	100	337	100
<i>Burnt</i>	45	4.54	8	2.37

Table 8.5: Assemblages from the western area wetland edge.

numbers of the three main types, microliths ($n=18$), burins ($n=15$) and scrapers ($n=16$) (Figure 8.23). However, the large number of awls ($n=18$) recovered from the area is particularly noteworthy, given their relative rarity on Mesolithic sites. The recovery of beads also from this area suggests these were used in bead production, a hypothesis that has been reinforced by microwear analysis and experimental work (Chapter 33). Four of the awls recovered from this area were used on soft mineral, suggesting in situ bead manufacture. Another was used on bone. This may suggest that bone or tooth beads were also being manufactured here: Clark recovered two cervid tooth beads suggesting tooth beads may also have been made at the site. Several of the microliths are relatively thick and sturdy and thus may also have been deployed as awls. Microwear suggests one was used to cut and scrape bone, though another was used as a projectile (Figure 8.24). Microliths were being made in the area, as indicated by the presence of microburins, though the low microburin ratio (1:0.11) indicates a greater focus on use/deposition than production.

While bead manufacture appears to have been a major task, other activities were also carried out in this area. Burins were made, used and resharpened, as is indicated by the presence of primary and secondary burin spalls, and scrapers were also recovered in large numbers. Other tools are also present, including an axe with no visible polish formation but extensive use damage on both ends (possibly resulting from percussion), strike-a-lights, denticulates and a wedge. Blades with macroscopic edge damage are also common.

This is a high-density scatter for a wetland edge situation, with almost 200 lithic artefacts per square metre; a density which also increases further away from the dryland. Macroscopic damage on artefacts that does not make sense as use-traces is likely to be evidence of trampling, suggesting this area was frequently accessed. Burnt flint is also relatively common for a wetland edge assemblage. A lot of this material is relatively lightly burnt, rather than white and heavily cracked. Several clusters and large chunks of charcoal were found in this area, suggesting hearths, which are likely to be responsible for the condition of the flint (Chapter 32). The light burning on the flint may indicate that these fires were of low intensity or short duration.

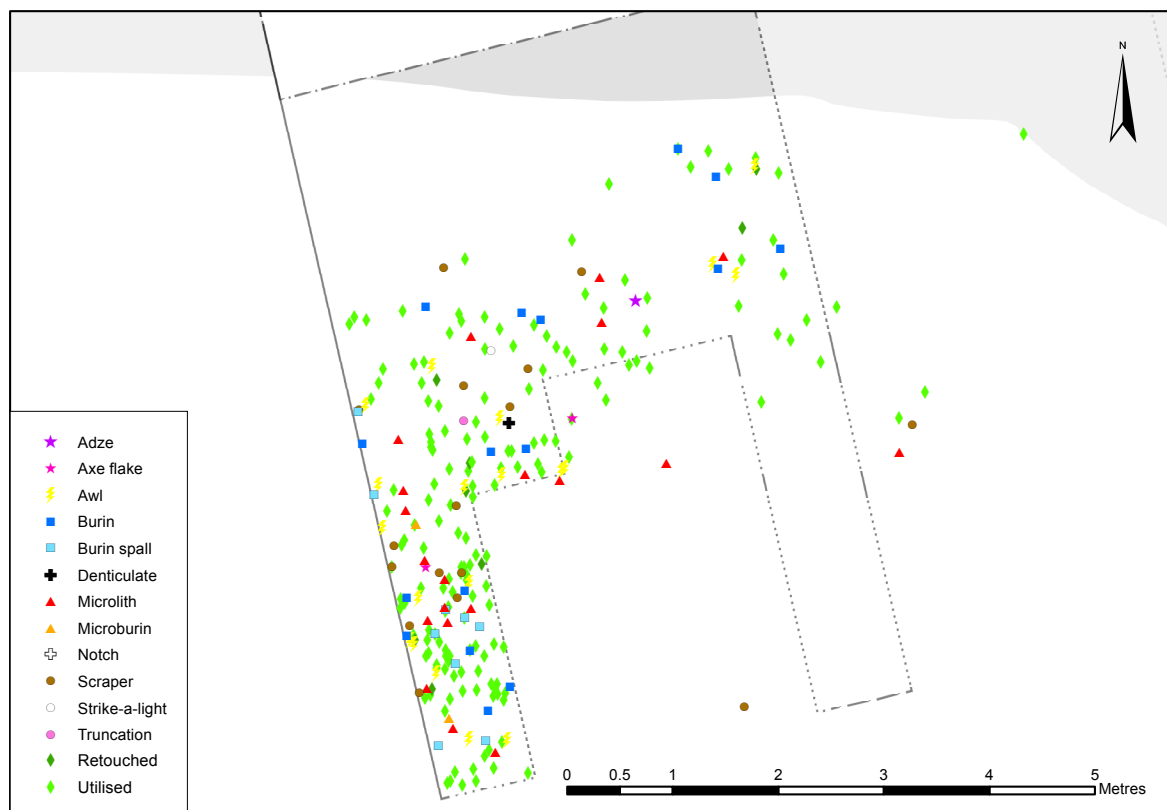


Figure 8.23: Distribution of tools in the bead area (Copyright Star Carr Project, CC BY-NC 4.0).

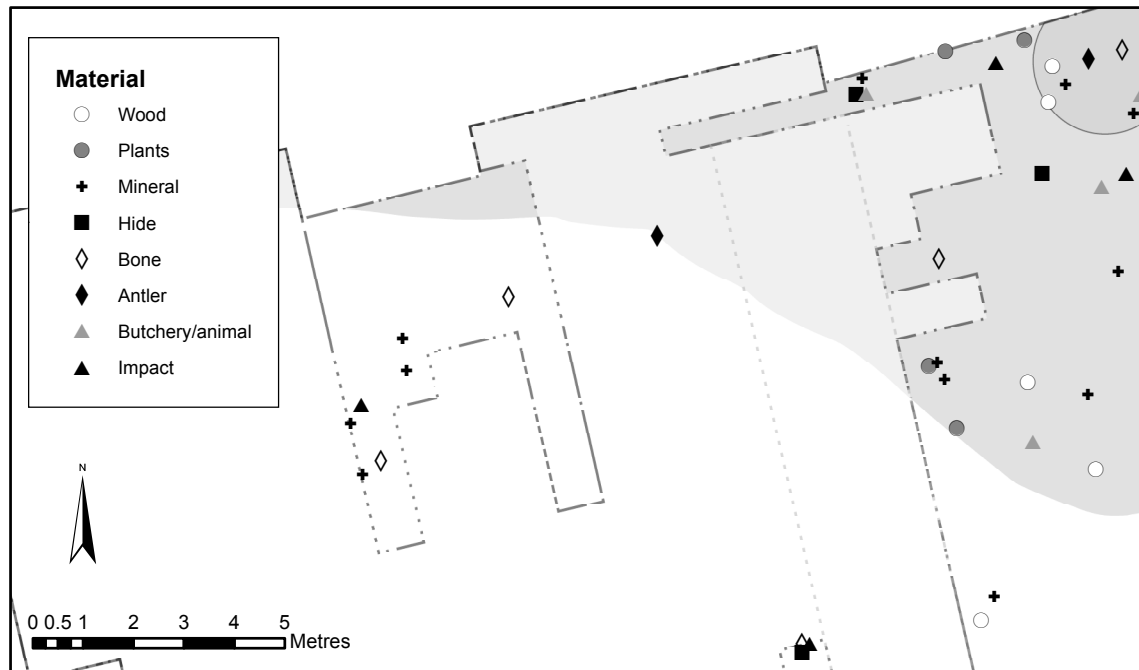


Figure 8.24: Microwear results from the western area wetland edge (Copyright Star Carr Project, CC BY-NC 4.0).

Fen flint scatter

This sub-assemblage represents (apart from a Late Mesolithic composite tool) the latest evidence for occupation of Star Carr (see Chapter 9). The majority of this scatter has been excavated by Clark as it falls between his cutting II and his large eastern trench. While this scatter is located on the dryland/wetland boundary, as it is so late in the sequence this area of fen and carr is likely to have been relatively dry and stable at the time of occupation (Chapter 19). As a result this has more characteristics of a dryland assemblage than the bead area, north of cutting III, with lower quantities of tools and more knapping debris. Knapping appears to have taken place around a hearth, as indicated by a small cluster of burnt flint, with traces of another a couple of metres to the south. These may relate to the cluster of charcoal patches plotted by Clark (1954, figure 7; see also Chapter 32), suggesting knapping and tool use were taking place around a series of hearths.

A broad range of tools were recovered from this scatter (Table 8.5, Figure 8.25), with burins, awls and scrapers more or less equally common amongst the formal tools and large quantities of utilised blades. A relatively large number of awls ($n=6$) were recovered from this area. All are small and slightly asymmetric, suggesting the product of a relatively short-term episode. Two were selected for microwear analysis: one had slight traces of possible use; the other was used to perforate soft stone, suggesting that traditions of bead making continued at the site at this late date. Other tools also indicate craft activities: burins were used here and resharpened, and are associated with antler, while a scraper was used for woodworking. Utilised blades have a strong association with craft activities. Though we only have a small part of this area due to its previous truncation by Clark's excavations, it seems too varied and craft-focused to represent a small ephemeral occupation. It probably relates to domestic occupation elsewhere on the site, either an undated area excavated by Clark or an area on the dryland yet to be excavated. A refit between the fen scatter and a small discrete scatter to the south of the eastern structure suggests this late activity is connected to continued occupation of the dryland. Though there is less evidence for this later phase, it may be that this activity is less readily datable, as it was focused on the dryland and upper fen and carr levels where there is poor preservation of organic material.

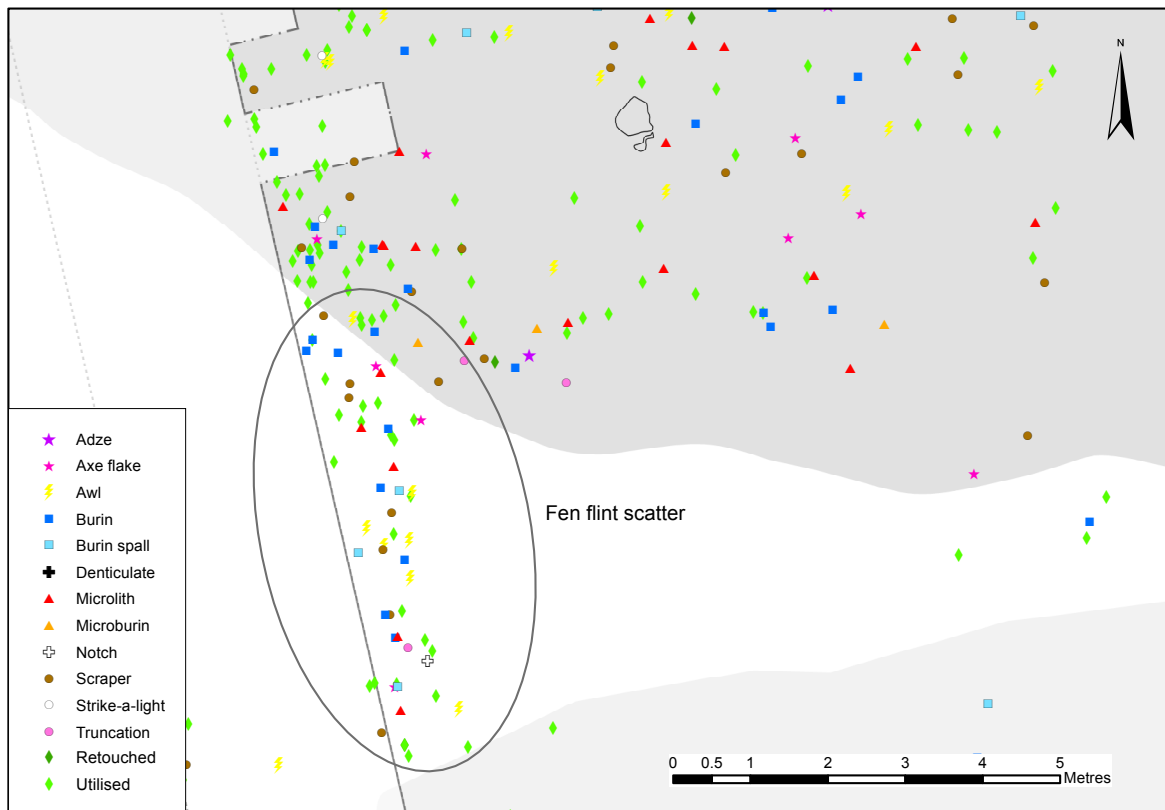


Figure 8.25: Distribution of tools from the area of the fen flint scatter (Copyright Star Carr Project, CC BY-NC 4.0).

Clark's area

Clark's area was identified as an area of dense deposition, and the character of this lithic material conforms with this hypothesis. This assemblage is heavily dominated by tools and pieces with macroscopic edge-damage. In terms of formal tools, scrapers are most common ($n=17$) followed by burins ($n=13$) and microliths ($n=8$), though the presence of smaller numbers of awls, serrates, denticulates, notches and truncations hints at the wide variety of activities embodied by this assemblage (Figure 8.26). However, most noticeable are the sheer quantities of blades, flakes and fragments with macroscopic edge damage. Many of these have been used to harvest and work plant material. There are high proportions of utilised blades in particular (22%) (Figure 8.26). A dominance of tools and pieces with edge damage is a noticeable feature of wetland lithic assemblages across the Vale of Pickering (Conneller and Schadla-Hall 2003); however, this seems to be on a different scale with 49.8% of lithics being either tools or exhibiting macroscopic damage. In other wetland areas at Star Carr percentages of tools and used pieces range from 12–33%. Also of note are the sheer quantities of lithics recovered ($n=621$) from this 5×0.9 m area, providing a maximum density of 371 pieces per m^2 and an average of 138 per m^2 . While this is not the densest area of the site in terms of lithics, it should be noted that this sub-assemblage does not represent in situ knapping debris unlike other areas of the site with high lithic densities. More appropriate comparators are other wetland areas; the adjacent area south of Clark's area has maximum densities of 46 pieces of flint per m^2 .

There are some suggestions that different types of activity are represented in this assemblage. For instance, although wetland assemblages rarely contain burnt flint or small chips (<10 mm) there are both in this assemblage. While small chips are uncommon they are present at the northernmost end of the excavated baulk: two were recovered from excavation and there is also 4.73g of microdebitage from wet-sieved samples. Burnt flint is more common ($n=15$, or 2.4% of the assemblage). This also clusters towards the northern part of excavated baulk and some, though not all, are at a slightly higher level, c. 50–100 mm above the majority of the flint

	Clark's area		South of Clark's area		Western platform		Brushwood	
Category	No.	%	No.	%	No.	%	No.	%
Tools:	309	49.8	84	33.73	3	23.08	18	30.51
Awl	2	0.32	1	0.40	0	0	1	1.70
Axe	0	0	0	0	0	0	0	0
Burin	13	2.09	4	1.61	0	0	1	1.70
Denticulate	4	0.64	0	0	0	0	0	0
Hammerstone	0	0	0	0	0	0	1	1.70
Micro-denticulate	2	0.32	2	0.80	0	0	0	0
Microlith	8	1.29	1	0.40	0	0	0	0
Notch	1	0.16	0	0	0	0	1	1.7
Scraper	17	2.74	7	2.81	0	0	2	3.39
Scraper/burin	0	0	0	0	0	0	0	0
Strike-a-light	0	0	2	0.80	0	0	0	0
Truncation	1	0.16	1	0.40	0	0	0	0
Wedge	0	0	0	0	0	0	0	0
Retouched	3	0.48	3	1.20	0	0	0	0
Utilised blade	136	21.9	33	13.25	2	15.38	9	15.25
Utilised flake	41	6.44	16	3.21	1	7.69	1	1.70
Utilised fragment	82	13.2	14	5.62	0	0	2	3.39
Tool spalls:	9	1.45	5	2.01	1	7.69	1	1.70
Axe flake	3	0.48	3	1.20	0	0	0	0
Burin spall	5	0.8	2	0.80	1	7.69	1	1.70
Microburin	0	0	0	0	0	0	0	0
Retouch spall	1	0.16	0	0	0	0	0	0
Core preparation:	16	2.58	7	2.81	0	0	0	0
Core tablet	7	1.13	6	2.41	0	0	0	0
Crested blade	9	1.45	1	0.40	0	0	0	0
Plunging	0	0	0	0	0	0	0	0
Debitage:	287	46.22	153	61.44	9	69.23	40	67.8
Blade	64	10.30	29	11.65	1	7.39	7	11.86
Flake	85	13.69	66	26.51	0	0	13	20.24
Fragment	116	18.68	32	12.85	2	15.38	16	22.03
Chip	2	0.32	3	1.20	2	15.38	0	0
Core	15	2.41	20	8.03	2	15.38	3	5.08
Nodule	0	0	1	0.40	2	15.38	0	0
Chunk	5	0.80	2	0.80	0	0	1	1.70
Total	621	100	249	100	13	100	59	100
Burnt	15	2.41	8	3.21	2	10.53	0	4.17

Table 8.6: Lithic material from the western wetland area.

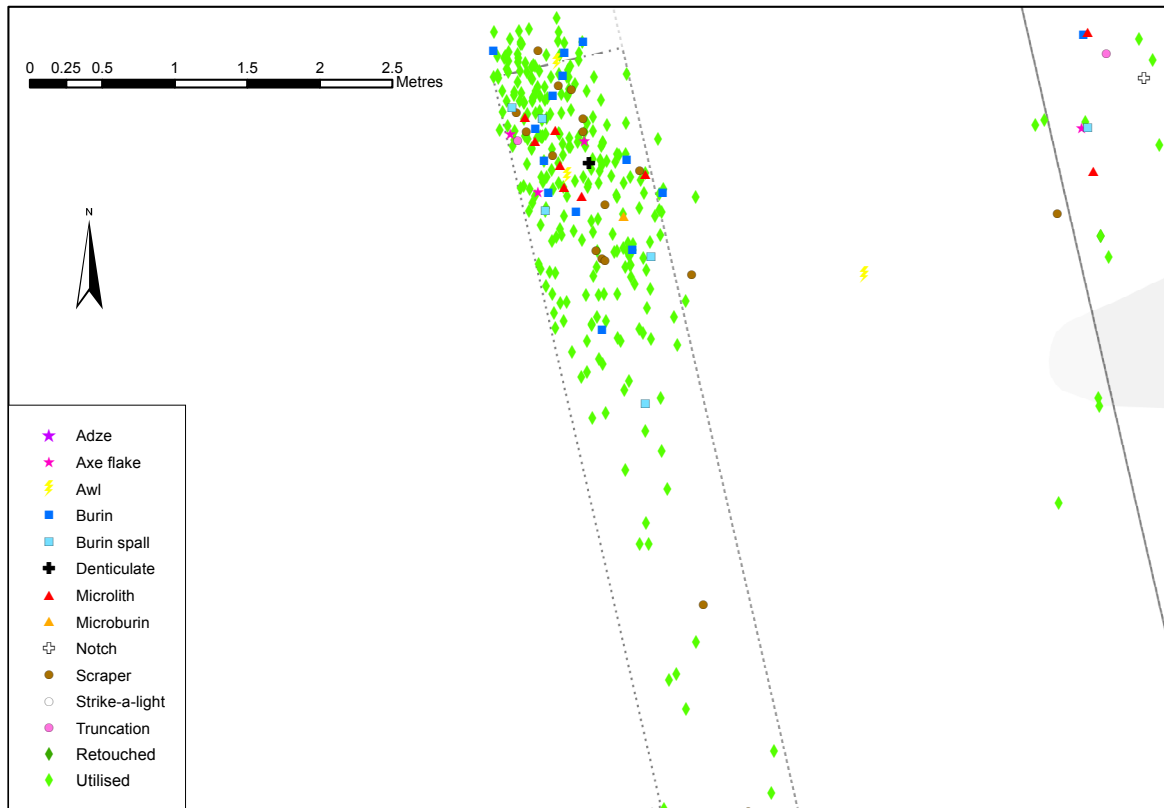


Figure 8.26: Distribution of tools from Clark's area (Copyright Star Carr Project, CC BY-NC 4.0).

assemblage. There are also some burin spalls representing both manufacture and resharpening which is unusual for a wetland assemblage. Microwear evidence is also more varied in the most northern part of this area with evidence of two awls used for working bone, a scraper used for hide working and a small retouched bladelet with impact damage (Figure 8.27). This seems indicative of a rather different set of activities involving flint-knapping, tools manufacture and hearths; either slightly different depositional activities or perhaps the upper levels of the baulk capture the very southernmost part of later activity spreading down from the fen carr scatter.

However, despite a small element of possibly later knapping activity nearer the dryland, the majority of this assemblage can be characterised as representing a super-dense area of discarded, mostly used, tools: a hyper-wetland assemblage. South of the most northerly metre of the excavated baulk, microwear also indicates typical wetland uses (see Chapter 35): cutting siliceous plants and woodworking. Previous work has suggested that such assemblages were composed of tools discarded in the course of activities in the wetland (Conneller and Schadla-Hall 2003). However, the sheer quantity and range of tools in this area would argue against casual loss and discard. Similarly, this assemblage does not represent clearance of waste flint from a settlement area as has been argued for waterlogged deposits in Scandinavia, as the assemblage is not representative of the lithic debris (mainly knapping waste) that might be found in middens or knapping stations. Only a carefully selected range of artefacts have been deposited, most of which are formal tools or blanks that have been used.

South of Clark's area

The lithic material recovered from contexts to the south of Clark's area is a typical wetland assemblage with a strong focus on tools and pieces with macroscopic edge damage (33.73%). It is in many ways similar in composition to the material from Clark's area, though lithics are at a much lower density and it has a lower proportion of tools and used pieces. In terms of actual tool types represented it is also similar to Clark's area in

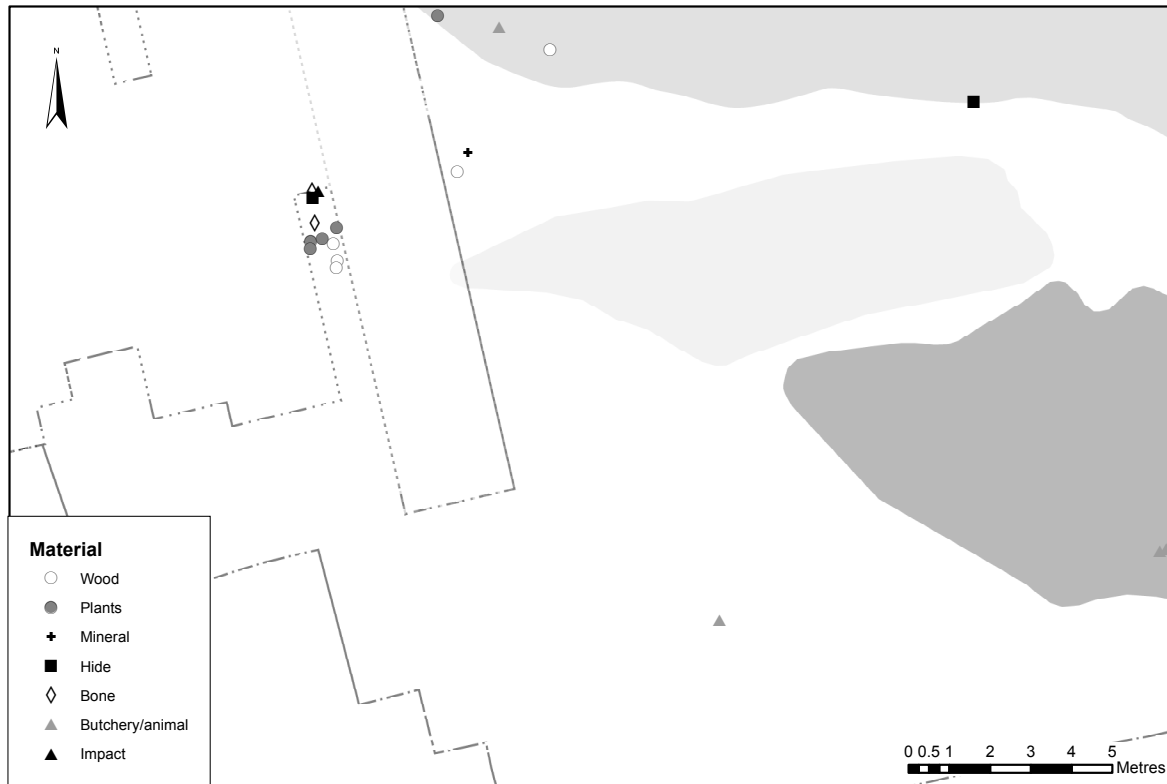


Figure 8.27: Microwear results from the western part of the wetland (Copyright Star Carr Project, CC BY-NC 4.0).

the dominance of scrapers ($n=7$), followed by burins ($n=4$) and microliths ($n=1$). It has a similarly wide range of additional tools: an awl, two serrates, two strike-a-lights and a truncation, and large quantities of utilised blanks ($n=63$) (Figure 8.28).

However, like Clark's area, it does have a number of characteristics that are unusual for a wetland assemblage: cores are common and there are more small chips and pieces of burnt flint than expected. Burnt flint is spread across the area; some pieces are from higher in the stratigraphic sequence when this area may have been more stable. However, other pieces are relatively low in the sequence and likely to have been emplaced when this area was at least seasonally open water. Several of these pieces are only slightly burnt, suggesting they may have still been useable and several others are tools or have use-damage. The presence of a number of cores which do not appear to have been knapped in the area is of interest. Refitting on the dryland has demonstrated that cores are rarely recovered from areas where they were knapped. Most of the cores were recovered from the north-eastern part of this area and at a similar level in the sequence and so could conceivably be part of a single episode of deposition. However, it is probably more realistic to think of the recovery of cores across the wetland from a variety of different contexts as part of a more informal sort of discard, based on the removal of large stones from the dryland settlement area.

Clark's backfill

During the re-excavation of Clark's cutting II in 2010 and cleaning of the area around the north and south of cutting I in 2015, lithic artefacts were encountered in Clark's backfill. Most of these were isolated pieces of the sort that might easily be missed by excavators in dark waterlogged sediments where sieving was not deployed. However, in 2015 a dense mass of flint was located towards the south-west part of what would have been cutting I. This consists of 1279 pieces (not all this material was recovered as it was in the section of our excavated area). It appears to represent an entire season's debitage, as tools were rare. It was noted by CC in her study of

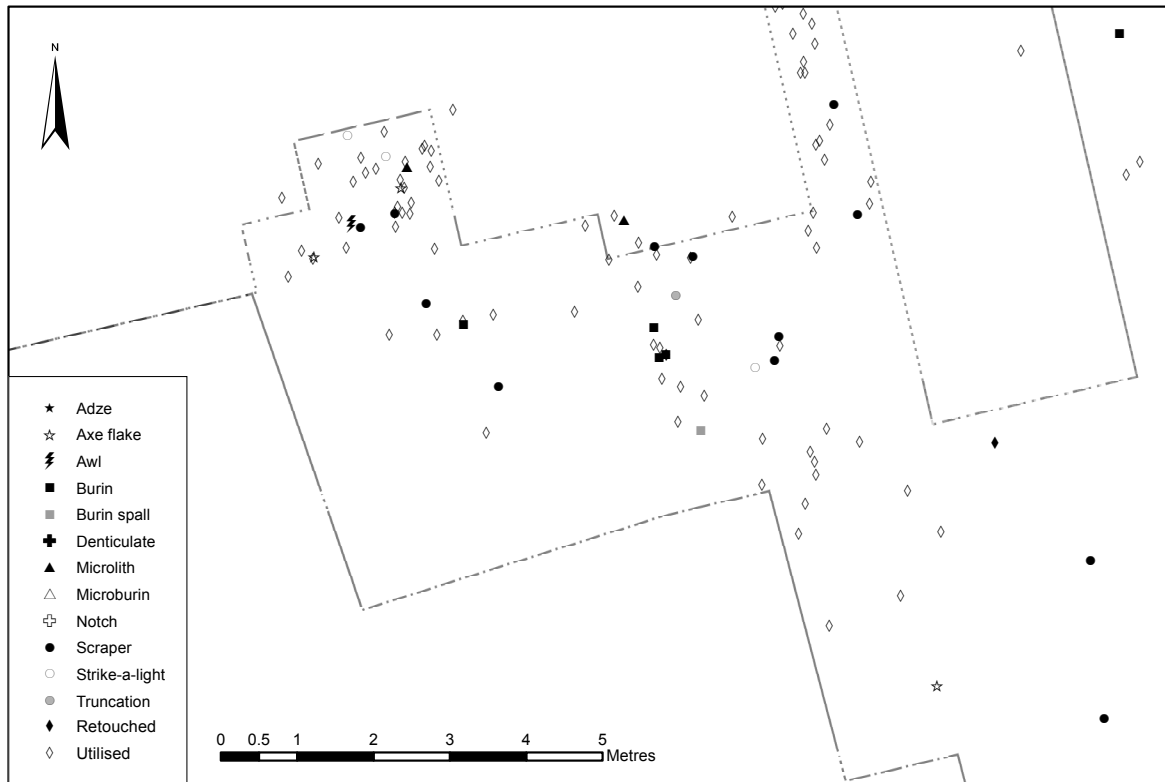


Figure 8.28: Tools from south of Clark's area (Copyright Star Carr Project, CC BY-NC 4.0).

the material from Star Carr in the 1990s that a large part of the debitage was missing; however, it was assumed that it had been dispersed, as was the custom of the time, across different museums – lithic material from Star Carr has been noted as far afield as the Archaeology Department Museum, Legon, Ghana (CC personal observation). However, the lithic material distributed to different museums tends to be tools, rather than debitage. In the introduction to the 1954 publication Clark writes that while a representative series of finds has been presented to different museums 'the residue of the material, including the complete flint waste of the 1951 season has been deposited in the University Museum of Archaeology and Ethnology at Cambridge' (Clark 1954, xxiii). This suggests that the debitage from the 1949 and 1950 seasons was not retained. Cutting I was excavated in 1949, so it is likely we have located that year's debitage. One piece is even labelled in pencil 43"/G3, which would be compatible with a grid from that year of excavation, which demonstrates (as the numbers would suggest) that this material was analysed by Clark and reported on before discard.

Cutting I cut through the bead manufacturing area in its northern part and there Clark located a cluster, or cache, of 11 stone beads and one amber bead (Chapter 33). The flint from the area north of Clark's cutting III, excavated by the current project, consists of some knapping debris but also tools and blanks that have been brought in and evidence for tool maintenance. It is likely that cutting I has clipped the edge of this area, where densities were lower. In cutting I much higher densities of flint were recorded in the wetland where Clark (1949) notes an extremely dense area of flint and organic finds, centred on his square K, which appears a continuation of the sort of evidence we encountered excavating his adjacent baulk.

The material recovered from the backfill is certainly compatible with having originally derived from cutting I, even though it represents the product of a selective discard policy. Blades are dominant. Many appear to have evidence for use, though because of its uncertain history utilisation has not been recorded. Burnt material is very rare, as are small flakes. The possibility remains that such pieces were not collected at all, but this is not the character of the more isolated material recovered from the remainder of Clark's backfill, which as argued above represents artefacts overlooked during excavation. It thus seems likely that this represents the remains of

a wetland assemblage, consisting of tools (retained, now in museums), and blades and large flakes (discarded), and lacking small debitage and burnt flint. Some tools and spalls are present. None of these can be described as classic examples of their type, and may have been discarded for this reason, or possibly overlooked in the initial analysis.

Western platform

There is very little flint associated with the platform; it seems to have been an area that was deliberately kept clean. Only 18 pieces were recovered from a similar level to the platform. These appear to consist mostly of a wetland assemblage of blades with edge damage, particularly in the south, some of which actually appear to be slightly lower than the platform. The material in the northern part is different, including two small chips, a burin spall and two pieces of burnt flint (Figure 8.29). These are more indicative of dryland knapping assemblages and may conceivably have derived from dryland activities further to the north. A few artefacts can be highlighted: two extremely large tested nodules (110 mm and 160 mm in length) were located in between two timbers of the platform (Figure 8.30); and a large core was recovered from within the platform timbers just a couple of metres to the west. While the two large nodules were at a slightly lower level, they did appear to be related to the platform. While a structural role, or function as a raw material cache cannot be ruled out, these, along with a wild boar mandible described in Chapter 7, may represent more formal foundational or depositional practices associated with this platform.

Brushwood

A small assemblage of lithic material (59 pieces) was recovered from the brushwood. This is a typical wetland assemblage with a high proportion of tools (30.5%), and a lack of burnt flint and small chips.

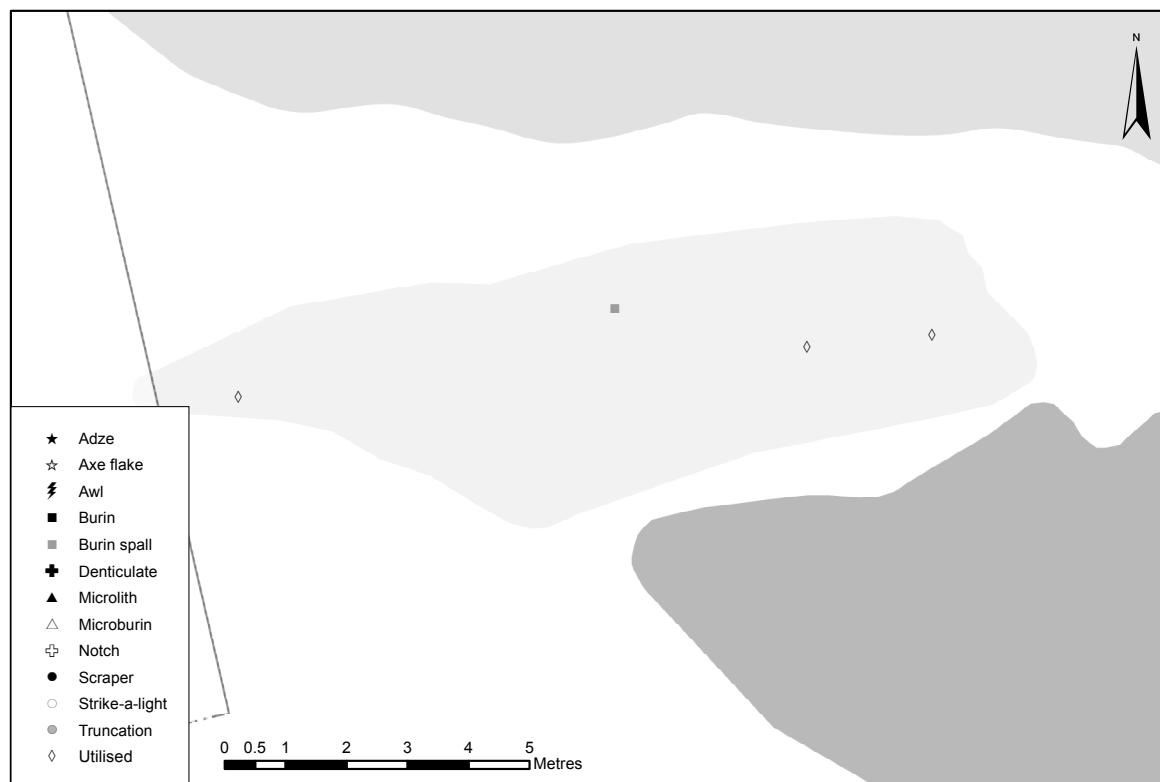


Figure 8.29: Distribution of tools and spalls from the western platform (Copyright Star Carr Project, CC BY-NC 4.0).



Figure 8.30: Cache of two large nodules of till flint within the western platform (Copyright Star Carr Project, CC BY-NC 4.0).

Though the brushwood both underlies and covers the western part of the western platform, all the lithic material is recovered from the upper part of the brushwood, overlying the western platform, indicating little use of this area for lithic-focused activities during the early history of the site. The proportions of tools recovered are similar to the underlying western platform (31.6%); however, the forms of tools differ, suggesting continuity of tool use in the area but with a focus on different sorts of activities. Whereas the tools from the western platform are mainly blades with macroscopic edge-damage, in the brushwood utilised blades were recovered alongside a wide range of formal tools: an awl, a burin, a notch and two scrapers (Figure 8.31). Two cores and a hammerstone seem to represent the clearance of large bulky objects from the dryland. With the exception of a couple of utilised blades and a burin these tools are all concentrated in the north-western corner of this area, closest to the dryland where they are likely to represent a small, discrete activity area.

South of the western platform

This is a diffuse low-density scatter of 80 pieces which spans considerable depths of wetland deposits (as described in Chapter 20). It represents very low-density activity or deposition, initially in open water and later on boggy and seasonally wet ground. The majority (49 pieces) derives from the later history of the site when this was an area of fen or carr which had formed above the marl. The assemblage from this wood peat is characterised by a broad range of tools: burins are most common ($n=5$), corresponding with moderate amounts of antler waste found in this area (Chapter 7). A possibly reworked axe, a microlith and two scrapers were also found. As is usual amongst wetland assemblages, utilised pieces are common. One such flake was used for butchery.

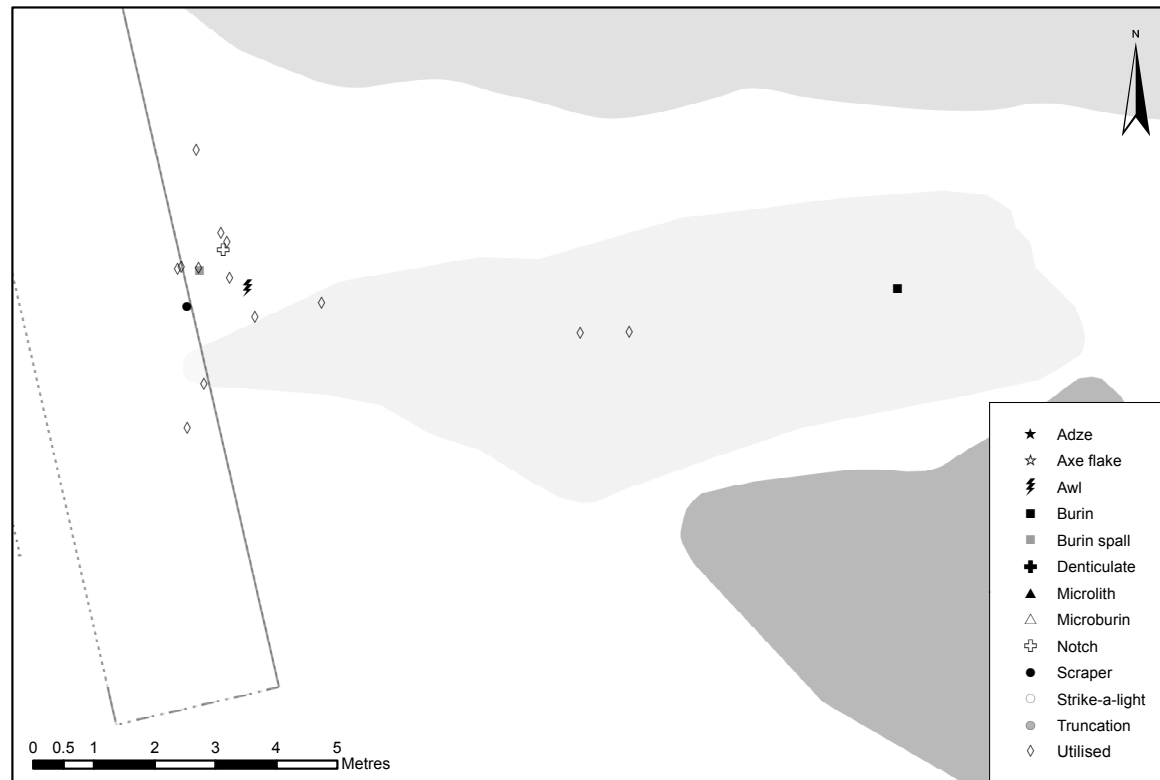


Figure 8.31: Tools from the brushwood (Copyright Star Carr Project, CC BY-NC 4.0).

In the underlying reed peat, formal tools are rarer, with only a single burin recovered, but blades and flakes with macroscopic wear are more common, representing 40% of the assemblage. Only three pieces were recovered from the underlying marl: a blade and two fragments, none with any obvious evidence of use. It seems that activities using lithics and depositional practices focused on lithics were rarely undertaken in this area.

Central area

Detrital wood scatter

The detrital wood scatter lies to the south-west of the central platform and to the south of the western platform (Chapter 6). The lithic material associated with the detrital wood scatter is located in the lower contexts of the site, indicating it is likely to have been deposited into open water. It is possible that this material represents in situ tool use and discard during a very dry season when lake levels were low, but it seems more likely it represents purposeful deposition. In terms of composition this assemblage is very similar to that from the Clark's area but densities are much lower (Figure 8.32). There are very high proportions of tools and pieces with macroscopic damage (47.5%), which is comparable to the proportions of such artefacts in Clark's area (49.8%). Small chips and burnt flint, present in Clark's area in extremely low numbers, are entirely absent. As in Clark's area, the tool assemblage is dominated by pieces, particularly blades, with macroscopic damage. 20.8% of this sub-assemblage consists of used blades, in comparison with 21.9% in Clark's area.

Used pieces are concentrated in the northern and central parts of the detrital wood scatter. Formal tools are not common amongst the detrital wood: microliths are most common, with five examples, while scrapers ($n=2$) are also present and there are single examples of a notch, denticulate and chamfered piece, the latter the only known example from the site. These tools are widely distributed across the area, with the exception of a small cluster of three microliths, all obliquely blunted points, which were found in a broadly linear

	Detrital wood scatter		Central platform		Axe workshop	
Category	No.	%	No.	%	No.	%
Tools:	57	47.5	30	16.95	94	9.18
Awl	0	0	1	0.56	1	0.1
Axe	0	0	2	1.13	4	0.4
Burin	0	0	1	0.56	17	1.66
Chamfered	1	0.83	0	0	0	0
Denticulate	1	0.83	0	0	3	0.3
Hammerstone	0	0	1	0.56	1	0.1
Micro-denticulate	0	0	0	0	1	0.1
Microlith	5	4.17	5	2.82	14	1.38
Notch	1	0.83	0	0	2	0.2
Scraper	2	1.67	0	0	9	0.87
Truncation	0	0	2	1.13	1	0.1
Wedge	0	0	1	0.56	0	0
Retouched	0	0	0	0	4	0.4
Utilised blade	25	20.83	4	2.56	21	2.05
Utilised flake	10	9.33	3	1.69	10	0.98
Utilised fragment	12	10	2	1.13	6	0.6
Tool spalls:	1	0.83	3	1.69	23	2.25
Axe flake	0	0	3	1.69	18	1.76
Burin spall	1	0.83	0	0	4	0.4
Microburin	0	0	0	0	0	0
Retouch spall	0	0	0	0	1	0.1
Core preparation:	4	3.33	5	2.82	31	3.03
Core tablet	1	0.83	2	1.13	18	1.76
Crested blade	3	2.5	3	1.69	10	0.98
Plunging	0	0	0	0	3	0.3
Debitage:	58	48.33	139	78.53	876	85.55
Blade	16	13.33	25	14.12	188	18.36
Flake	23	19.17	37	20.9	258	25.19
Fragment	17	14.17	61	34.46	281	27.44
Chip	0	0	7	3.95	132	12.98
Core	2	1.67	10	5.65	5	0.5
Chunk	0	0	7	3.95	12	1.17
Total	120	100	177	100	1024	100
Burnt	0	0	1	0.56	10	0.98

Table 8.7: Composition of wetland assemblages from the central area.

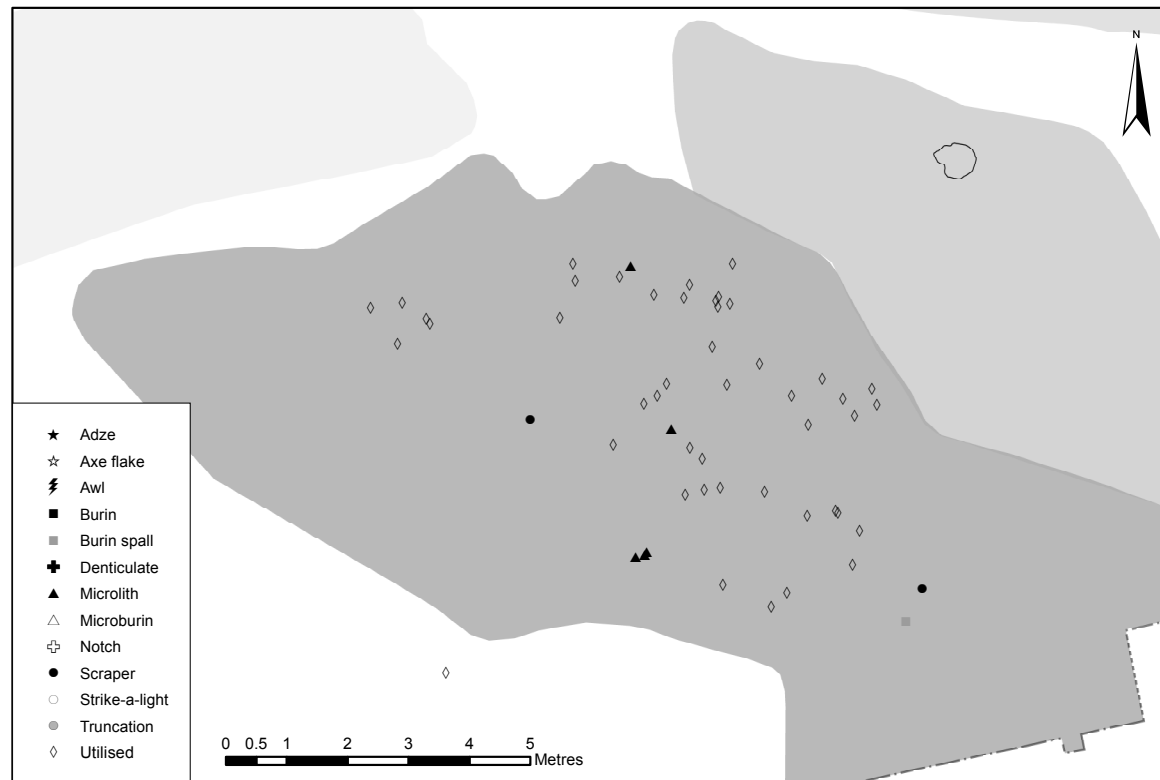


Figure 8.32: Tools from the detrital wood scatter (Copyright Star Carr Project, CC BY-NC 4.0).

arrangement across 180 mm. Spatial distribution and microwear evidence indicate this is likely to represent a composite projectile. All three microliths had soft animal traces (for further discussion see Chapter 35). This projectile may have been lost during hunting, though no haft was observed during excavation. Alternatively, dehafting and deposition of this group is also a possibility. In addition to the three microliths, four further pieces were studied for microwear (Figure 8.33): of these, two, <99314> and <109601>, were used on siliceous plants, whilst the third <108704> was used on soft wood, while the final piece, a scraper <99480> was not used.

Central platform

While both the western and eastern platforms have been kept relatively clean of flint, a moderate-sized assemblage of 177 pieces is associated with the central platform. However, this statement needs qualification in that while the main body of the platform itself is relatively clean, there is a marked concentration of material along its western margins. Some of this material consists of axes and axe flakes, suggesting that it may derive from the overlying 'axe workshop', perhaps sinking into, or being trampled into the softer peat on the southern margins of the platform. Some isolated pieces are present, as can be seen on the other platforms, but a key feature of this platform is the presence of small discrete clusters of lithic material, particularly deposited along its western edge.

These clusters vary in their size and composition. Some are small, such as a cluster of 4 small chips (<10 mm) spread over a 90 mm × 20 mm area and a vertical height of <15 mm. The largest of these clusters (the ×6 cache) is also the most southerly. This consists of 57 pieces, spread over an area of 550 × 550 mm, with the majority within an area of 330 mm × 210 mm (Figures 8.34 and 8.35). The scatter is spread vertically over 40 mm. It was noted during excavation that this cluster was located either side of a flat piece of wood and it was hypothesised that the lithic material was originally deposited in a bag onto this wood. Following decay of the bag, the material would spill either side of the wood. However, it is equally possible that an act of deposition centred on the wood led to material being displaced from the wood into the viscous mud either side through water action or

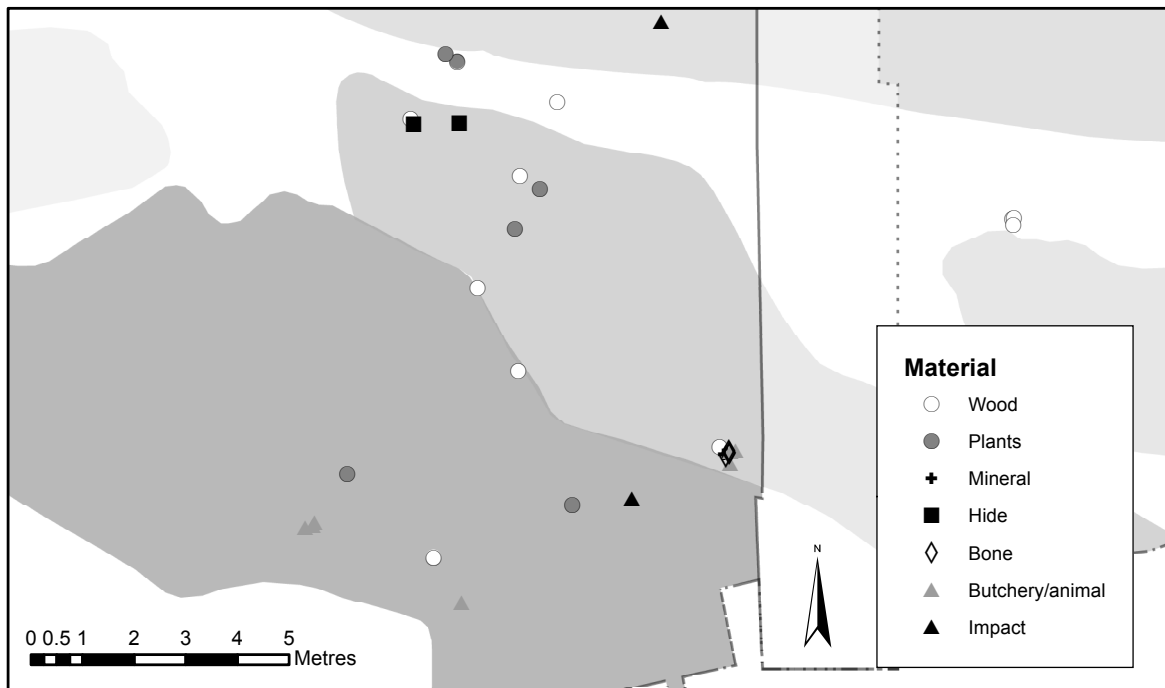


Figure 8.33: Microwear results from the central wetland. The dark grey shading represents the extent of the detrital wood scatter and the lighter grey represents the extent of the central platform (this also includes material at a higher level, above these two structures, which forms part of the axe workshop) (Copyright Star Carr Project, CC BY-NC 4.0).





Figure 8.35: X6 cache (with refits) from the edge of the central platform (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

through the trampling actions of people using the platform. A large component of this scatter is a cluster of nine cores, mostly in their last stages of use and seven shatter fragments, most of which refit to produce two cores. It also consists of bladelets, flakes and fragments.

Microwear on 12 pieces indicates most of these had been used, mainly in the processing of an animal carcass: two pieces, <98971> and <98987>, were used for butchery, one <98985> to scrape soft animal material, four, <98981>, <98988>, <98989> and <98994>, for sawing and scraping bone, one piece <98953> was used on wood, another probably on mineral <98982>, and three (a core, flake and bladelet) were not used. This cluster has the feel of a personal toolkit that may have been lost, or deposited because it was at the end of its use life or even, given the use of the wetland for animal deposition, because of its involvement in animal-related tasks (Chapter 7).

This cluster is in many ways indicative of the sort of material found on the platform more generally. Formal tools are rare (Figure 8.36): five microliths and two scrapers were recovered, again mainly from the western margins of the platform. Two extremely small axes were recovered next to each other on the very margins of the platform. Neither preserves traces of use though their morphology indicates that they are at the ends of their use life and so it is likely that resharpening removed evidence of previous wear. These and axe flakes to the north may derive from the overlying layer, which is focused on axe repair and maintenance (see below). Other tools are represented by single examples. A modest collection of flakes and blades with macroscopic damage was recovered (n=9). These share a similar western distribution to the microliths though a microlith and an utilised piece were also recovered from the far south-east of the platform. Burnt flint is very rare: a single example was recovered at the northern end of the platform and this may, as has been argued in the context of the western platform, be derived from dryland activities further to the north.

Figure 8.34 (page 199): Cache/flint deposit, from the central platform, in situ (Copyright Star Carr Project, CC BY-NC 4.0).

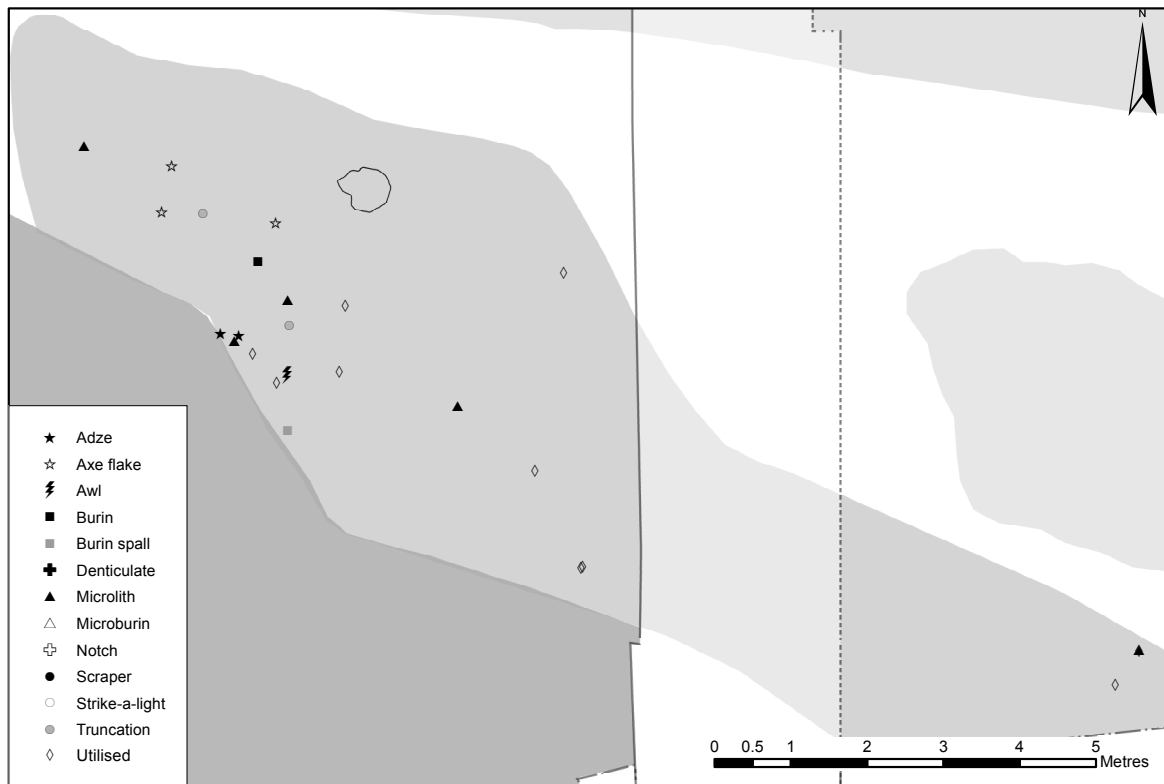


Figure 8.36: Tools from the central platform (Copyright Star Carr Project, CC BY-NC 4.0).

To sum up, the lithic evidence from the central platform suggests it was mainly kept clean. However, there are a series of clusters of flint along its western margins. While most of the clusters clearly seem to be associated with the knapping of a single nodule, there may also be personal toolkits represented. While some of this material may have been trampled from the overlying axe workshop, others seem to be discrete deposits of material, either deposited by people clearing traces of activity that occurred on adjacent dryland areas or representing flint waste derived from the clearing out of boats.

Axe workshop

The axe workshop is one of the largest and densest activity zones in the wetland usually characterised by low lithic densities. 1024 pieces were recovered from an area of 35 m². This is likely to represent an intense, short-lived activity event (Figure 8.37). The material is a high-integrity, vertically discrete scatter, spanning just a few centimetres in depths. The scatter is remarkably dense in places and despite being situated on a slight slope; the viscosity of the peat has kept in place large quantities of even the smallest microdebitage. Refitting rates are extremely high. The scatter is situated at the base of the wood peat and top of the reed peat and activity took place at a time when the area was becoming drier. It partially overlies the central platform, often with only a few centimetres of peat separating the axe workshop from the timbers of the platform, and there is some overlap between assemblages associated with the platform and the axe workshop. At the time this assemblage was created it is likely that the platform still represented a feature in the landscape; probably a slight rise of drier ground, but some of the uppermost timbers at the southern and western margins of the platform may still have been partially exposed. The level of the flint scatter seems to dip down from the western end of the platform, suggesting this area retained some of the platform's topography.

This assemblage is so called due to the quantity of axes, axe manufacture debris and resharpening flakes recovered. Four axes were recovered, plus two further examples from the southern area of the central platform

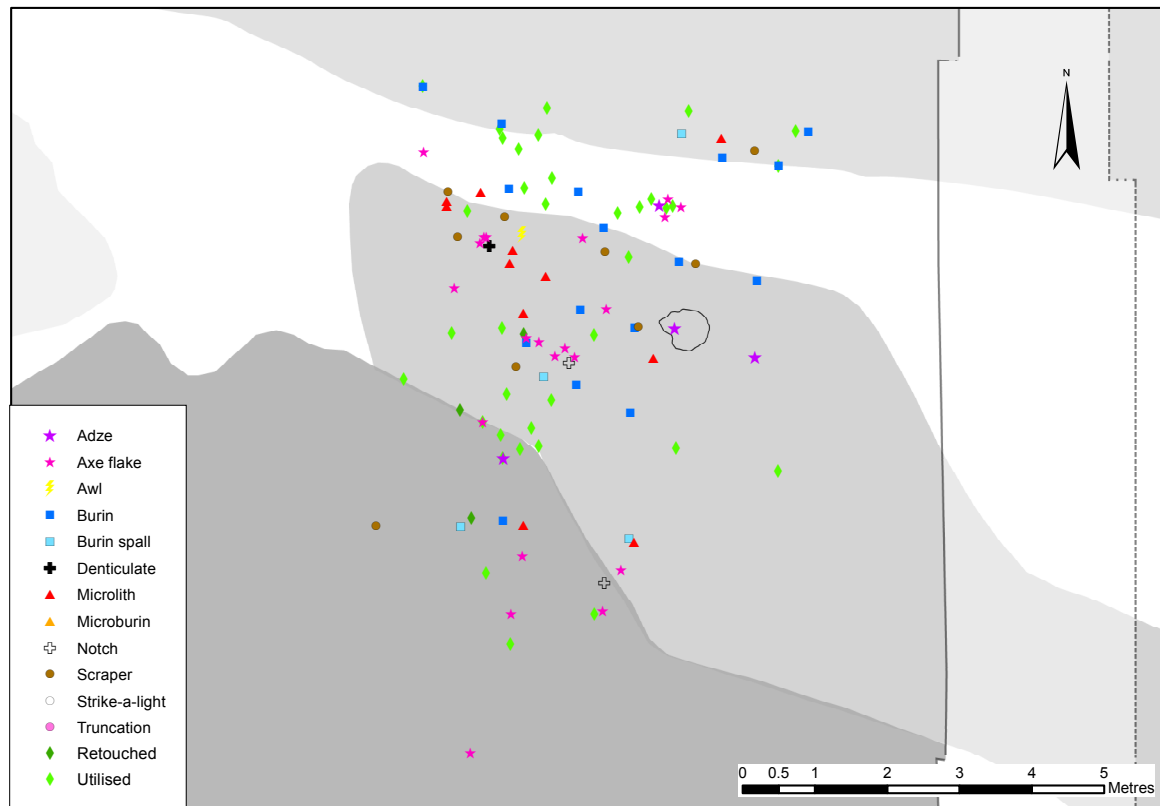
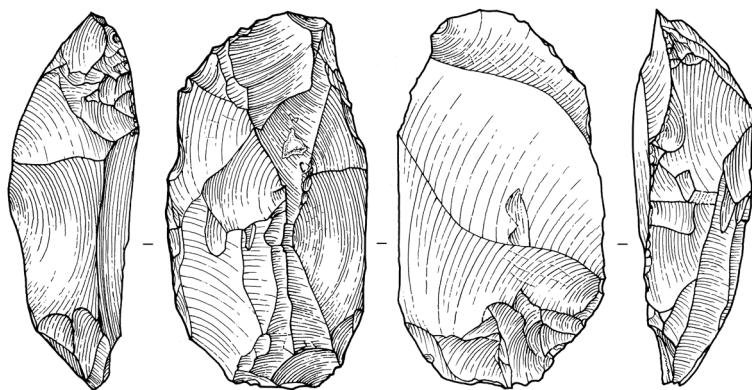


Figure 8.37: Tools found within the axe workshop scatter. The small sub-circular feature is charcoal spread (318) (Copyright Star Carr Project, CC BY-NC 4.0).

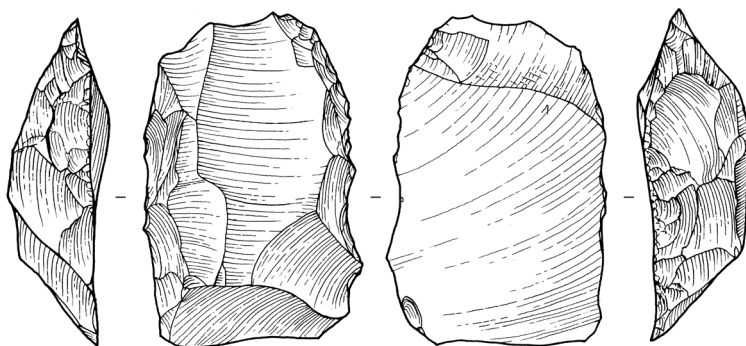
where there is an overlap between the axe workshop scatter and the material associated with the platform. There is greater vertical distribution of material in this southern area suggesting that some of these heavier pieces may have sunk into the underlying platform layer. Also recovered were two extensive refit sequences where the axes themselves were not found and several single tranchet flakes from axes were also missing from the area.

Of the recovered axes, two, <94367> and <99101>, are small (only 48 and 54 mm in length) and seem to have been made on large flakes (Figure 8.38). The other two axes, <99454> and <99150>, are larger. All the axes recovered appear to have been made and finished elsewhere with the refit sequences here only indicating resharpening. This ranges from a single tranchet flake refitted to <99454> (refit group 159), to minor resharpening and thinning of <99101> (refit sequence 126), to a long reshaping and resharpening sequence associated with <94367> (refit sequence 88) (Figures 8.39 and 8.40). Of these axes, only <94367> had evidence of use (woodworking of moderate intensity). Following this, the axe was rejuvenated, but no further use was made of it. An additional sharpening flake from refit sequence 88 was examined for microwear but no evidence for use was found. The remaining axes from this area did not have traces of use, possibly indicating that these too had been rejuvenated before being abandoned. However, <99101> had extensive surface abrasion, at odds with the freshness of the remainder of the assemblage. This suggests that this piece had a different history to the others, e.g. perhaps it had been transported in a bag for some length of time. This axe is the smallest of the four recovered (only 48 mm) and so may have had an extended life history before its deposition here. A small axe with very similar wear was recovered immediately to the south at the level of the platform, perhaps confirming the hypothesis that some of the heavy pieces in the southern part of this scatter had sunk to the level of the platform.

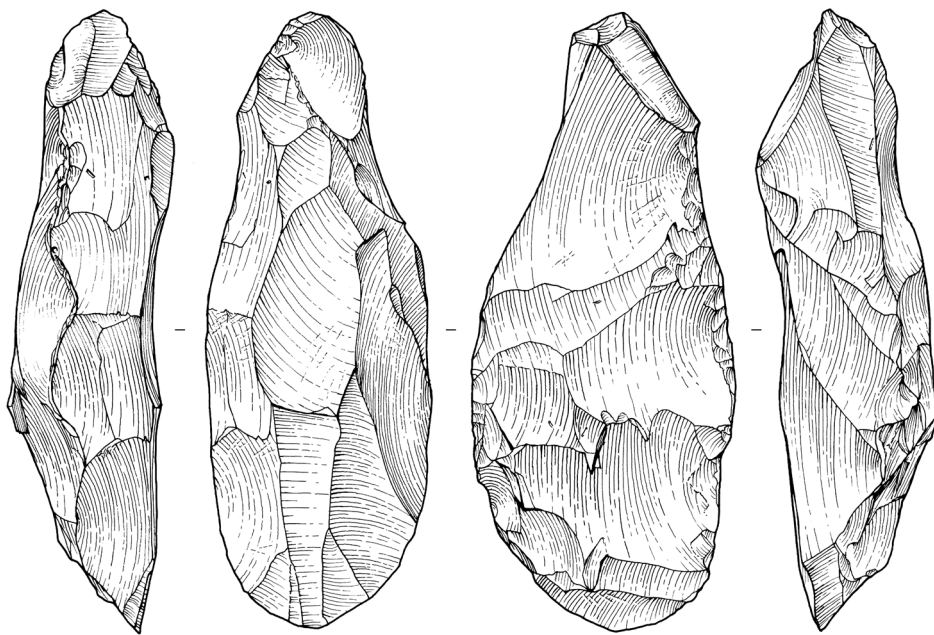
Figure 8.38 (page 203): Axes <94367>, <99101> and <99454> (Copyright Craig Williams, CC BY-NC 4.0).



94367



99101



99454

0 2cm



Figure 8.39: Refitted axe shaping sequence (group 88) including axe <94367> showing (top right) series of tranchet removals sharpening the reverse face, and along uppermost face (both left and right) longitudinal thinning flakes using the surface created by the tranchet blow as a platform. Two transverse thinning flakes (base of image) were also removed along the margins (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

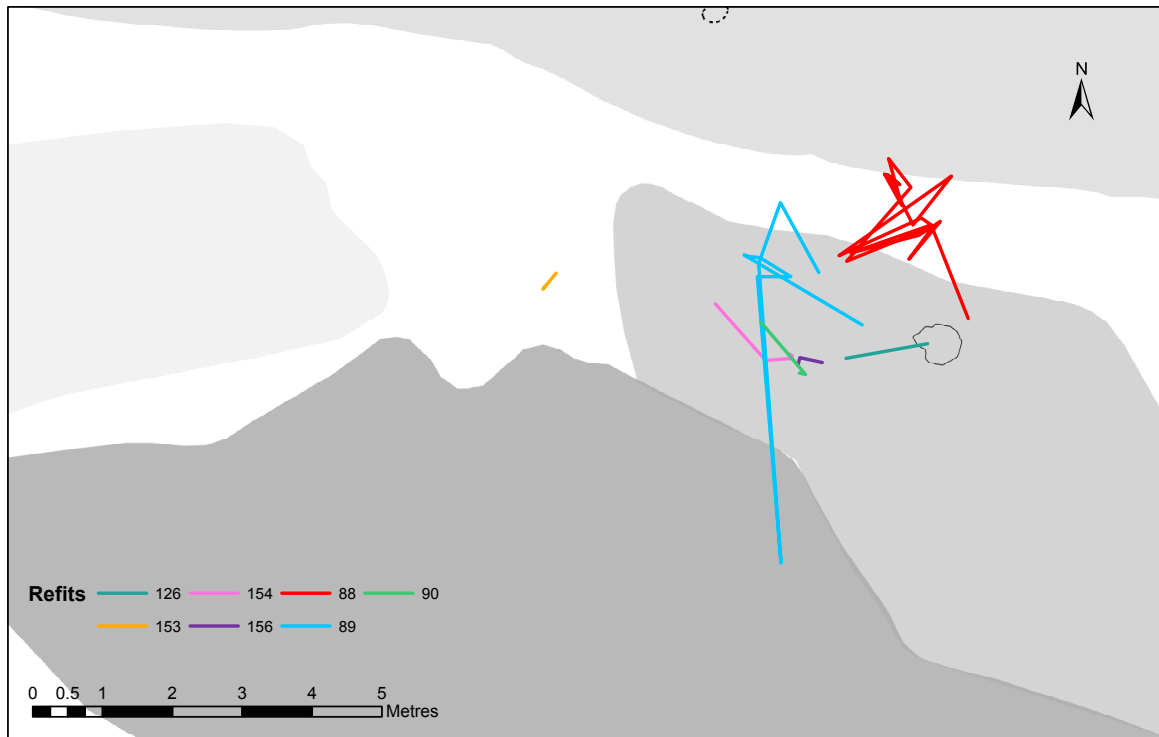


Figure 8.40: Refits from the axe workshop to the north and west of charcoal spread (318) (indicated by circle; see also Chapter 32) (Copyright Star Carr Project, CC BY-NC 4.0).

The two axes represented by the most extensive debitage scatters, one made from Wolds flint and the other from speckled grey till flint, were not recovered and seem to have been removed for use elsewhere. Both these sequences, in contrast to the other sequences where axes were recovered, may represent manufacturing sequences, shaping preformed pieces of material that had been imported to site, though it is equally possible that these represent extensive reworking sequences. Microwear indicates that one of these missing axes (grey till refit sequence 89; Figure 8.41) was used before being removed from the area and a tranchet flake (<98825>) was used for a short duration to chop wood. This is the second-to-last removal in the sequence, while the subsequent removal has no traces of use. This suggests the axes were made, or remodelled, used, rejuvenated, and then removed for use elsewhere.

Axe thinning and sharpening flakes are found in three small clusters around 1–2 m apart from each other (Figure 8.40). These seem to cluster around a hearth/charcoal spread (318) (see Chapter 32). Each cluster is associated with an extended knapping/refit sequence. Immediately to the north of the charcoal spread is refit sequence 88, the reworking of a brown till axe <94367>, found in a fairly tight cluster with the exception of the first removal in the sequence which was found closer to the charcoal spread. The axe itself was recovered from the centre of this cluster, despite being used part of the way through this sequence. The second cluster was found to the north-west of the charcoal spread and consists of the production/reworking of a grey till axe (refit group 89). This has a wider distribution, with three tranchet flakes from this sequence found beyond the immediate area of the scatter. One of these pieces, found closest to the charcoal spread, has been used, though the northernmost piece has not. The southernmost piece, found 4.4 m from the knapping area, was not examined for wear. The final cluster relates to the manufacture of a white Wolds axe that was not recovered from the site. Three small refit sequences (90, 154, 156) relate to this cluster, probably all from the same axe.

Other tools are present in addition to axes, indicating a broad range of activities in this area (Figure 8.37). Burins ($n=17$) are the most common formal tool and burin spalls ($n=4$), both primary and secondary, indicate the manufacture and resharpening of these tools; however, the disparity suggests that many were brought in to be used and discarded here. Microliths are the next most common type, represented by 14 examples.



Figure 8.41: Axe resharpener sequence (group 89) with tranchet blows and longitudinal thinning flakes removed from both faces (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).

Microburins are absent, suggesting the microliths were brought here as finished tools. Nine scrapers were recovered, as well as rarer examples of a range of other tools: an awl, a truncation, a serrate, three denticulates and two notches. Blades, flakes and fragments with macroscopic damage are present, though in lower numbers than in other wetland assemblages.

There is some spatial patterning to this material. Several utilised blades were found within the small cluster of material represented by the small brown axe reworking sequence. The north-west cluster was associated with a wide range of tools and tasks. Four microliths, three scrapers, an awl and a denticulate were found. One of the scrapers and the awl had been used for working hide, while a core had been used for working wood, reinforcing the idea that woodworking was an important component of activities here. The western scatter is associated with burins and a burin spall, a scraper, a notch used to work wood and some utilised blades, two of which had been used to work plants. The woodworking notch is strongly associated with axe flakes, perhaps suggesting haft maintenance, and given the evidence also for plant working, haft bindings for the axes may have been manufactured at the same time.

Much of the debris in this area is found in small clusters, usually in the range of 4–22 pieces. Each small cluster seems to represent a coherent collection, usually material from a single raw material unit, though they lack associated small debitage. These may represent very short-term knapping events where a handful of flakes and blades were removed from a core or material dumped in the wetland deriving from knapping events on the dryland.

Eastern area

The eastern area encompasses the eastern platform and the proximate wetland edge scatters, ‘caches’ (named after a raw material cache located there) and the SC22 scatter.

	Eastern platform		Caches		SC22 scatter	
Category	No.	%	No.	%	No.	%
Tools:	2	20	18	5.75	65	21.45
Awl	0	0	0	0	1	0.33
Axe	0	0	0	0	0	0
Burin	0	0	1	0.32	3	0.99
Micro-denticulate	0	0	0	0	0	0
Microlith	0	0	6	1.92	4	1.32
Notch	0	0	0	0	1	0.33
Scraper	0	0	2	0.64	8	2.64
Scraper/burin	0	0	0	0	1	0.33
Retouched	0	0	0	0	3	0.99
Utilised blade	0	0	6	1.92	24	7.92
Utilised flake	2	20	2	0.64	8	2.64
Utilised fragment	0	0	1	0.32	12	3.96
Tool spalls:	0	0	1	0.32	7	2.31
Axe flake	0	0	1	0.32	3	0.99
Burin spall	0	0	0	0	1	0.33
Microburin	0	0	0	0	3	0.99
Core preparation:	0	0	3	0.96	10	3.3
Core tablet	0	0	0	0.32	5	1.65
Crested blade	0	0	3	0.96	5	1.65
Plunging	0	0	0	0	0	0
Debitage:	8	80	291	60.38	221	72.94
Blade	2	20	9	2.88	53	17.49
Flake	6	60	35	11.18	51	16.83
Fragment	0	0	34	10.86	79	26.07
Chip	0	0	189	60.38	24	7.92
Core	0	0	15	4.79	11	3.63
Nodule	0	0	4	1.28	0	0
Chunk	0	0	5	1.6	3	0.99
Total	10	100	313	100	303	100
Burnt	0	0	1	0.32	4	1.32

Table 8.8: Composition of assemblages from the eastern wetland area.

Eastern platform

It has already been demonstrated that the platforms were kept clear of lithic debris and the same is true of the eastern platform which has by far the smallest lithic assemblage of all the platforms. Only 10 pieces were recovered, almost all flakes (n=8), of which two had macroscopic damage. The remaining two pieces were seemingly unmodified blades. All lithic material was recovered from the northern part of the platform suggesting it may relate to activities to the north rather than primarily associated with the platform itself.

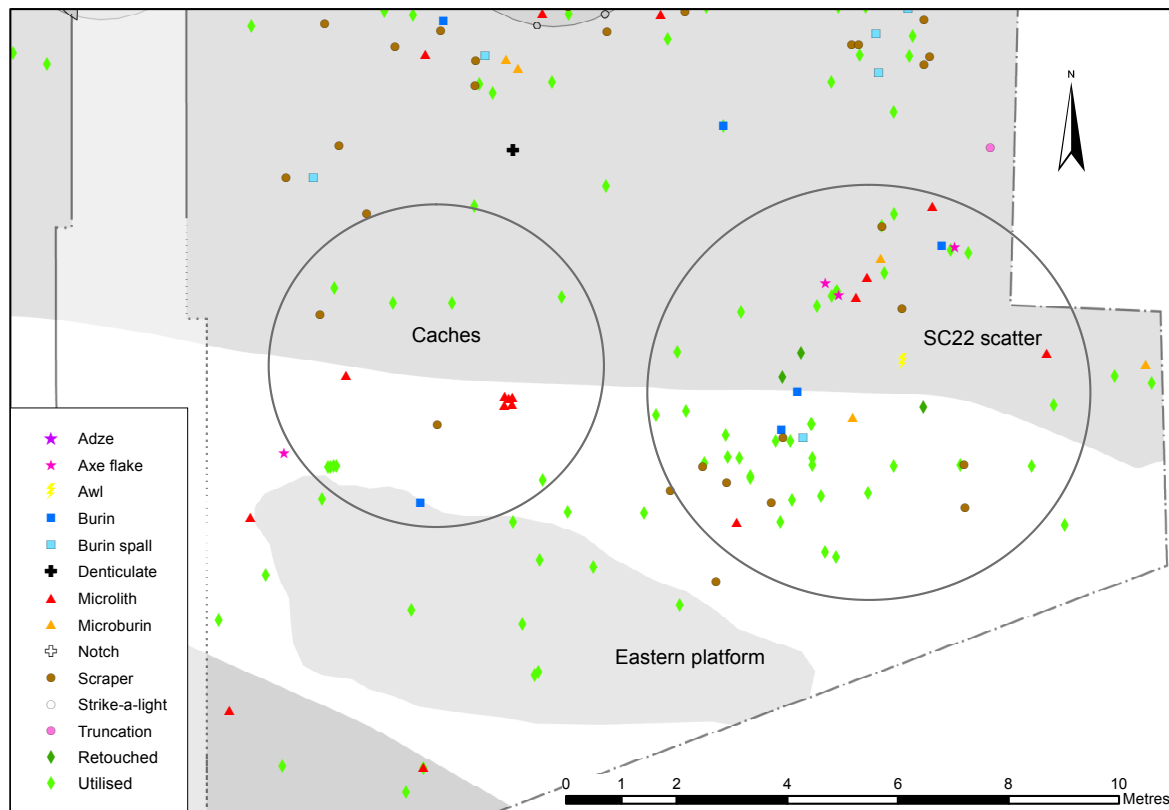


Figure 8.42: Distribution of tools from the eastern wetland (Copyright Star Carr Project, CC BY-NC 4.0).

Caches

In general this is an area with a very low density of lithic material extending between the dryland areas of trench SC23 and the wetland area of the eastern platform (Figure 8.42). This consists of low levels of tools (two scrapers, a burin and two microliths) as well as utilised and unused flakes and blades. There are three clusters of material within this low density background scatter which reveal the area was also used in very specific ways. The first of these is a cache of cores, preforms and chunks of raw material; the second a tight cluster of knapping debris associated with an antler frontlet; and the third, a Late Mesolithic composite tool.

The cache consists of 19 pieces, most of which probably derive from one large nodule that has been split (Figure 8.43). Most of these have been turned into cores through the removal of a few blades, though four remain unmodified shatter fragments and two have single or two removals. Seven of these pieces refit into three groups though probably all but four pieces derive from the same raw material unit. It is likely that this was a raw material cache; though some of the nodules contain flaws, most are high quality. A handful of pieces appeared to have been used. Three of these were examined for wear traces; all retained evidence for scraping wood (Figure 8.43). This cache was found amongst tree roots and it may be that the nodules were used to mark the tree to aid recovery of the nodules.

A second small cluster around 500 mm across consists of small chips and debitage, most of which derive from a single brown cortical till raw material unit. Some of the material refits. This seems to relate to some knapping activity that necessitated shaping, either of a preform core or the preform of a core tool. This small scatter is associated with an antler frontlet. The 3D distribution of this material suggests it may have been deposited in a pit, though none was glimpsed during excavation.

The final cluster in this area most likely dates to around a millennium after Star Carr was abandoned by Early Mesolithic groups. This is a cluster of five Late Mesolithic microliths consisting of four narrow, elongated scalenens and a narrow-backed blade; the former likely serving as barbs, the latter as a tip. If it was a composite tool



Figure 8.43: The AC8 cache. Most pieces derive from a single large nodule of till flint (Copyright Star Carr Project, CC BY-NC 4.0).

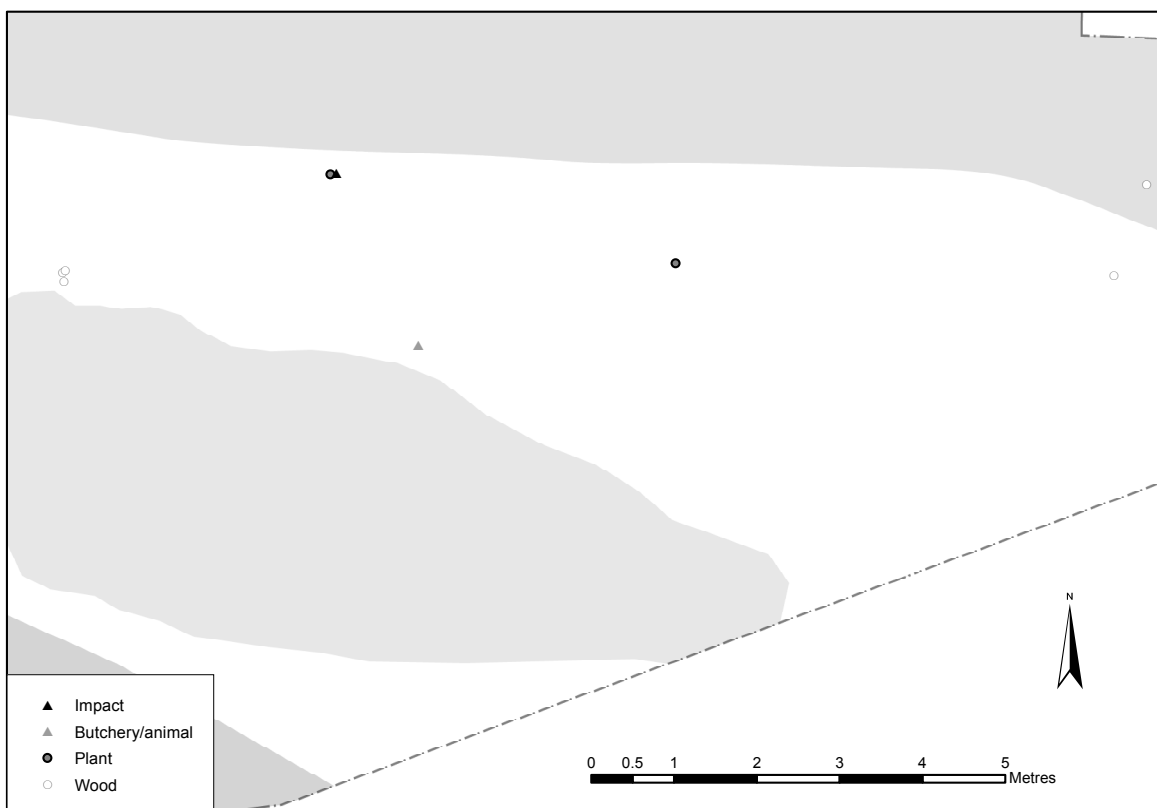


Figure 8.44: Microwear results from the eastern wetland area (Copyright Star Carr Project, CC BY-NC 4.0).

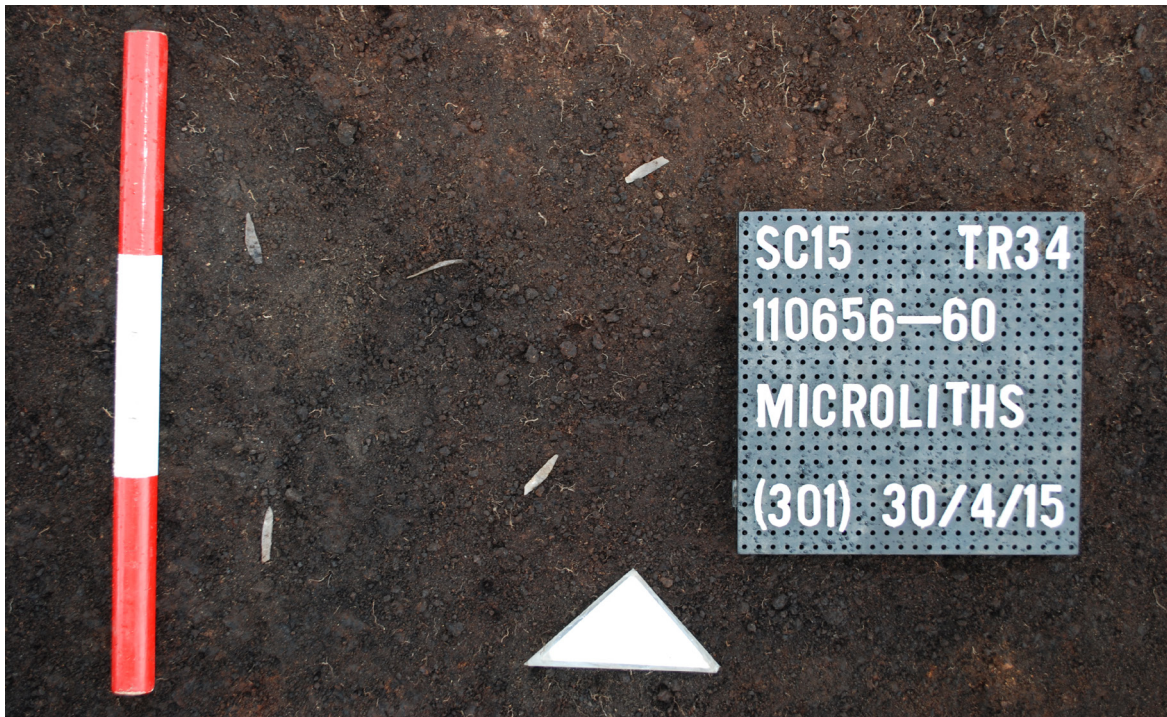


Figure 8.45: Late Mesolithic composite in situ (Copyright Star Carr Project, CC BY-NC 4.0).

it has been slightly disturbed (Figure 8.45). Myers (1986) has argued in the context of the Pennine Mesolithic that some of the isolated microlith clusters recovered from this region may represent caches.

SC22 scatter

The SC22 area assemblage stretches from the dryland of SC23 to the eastern end of the eastern platform. It has more evidence for lithic-focused activities than the cache area, yielding a moderate assemblage of 303 pieces. This has some temporal depth, spanning activity associated with the upper wood peat layers and the lower reed peat. The upper part of this scatter consists of a small assemblage of 45 pieces and on the basis of the Bayesian model (see Chapter 17) represents some of the latest activity at the site. A single microlith was recovered from this scatter, of Deepcar type, suggesting typological change over the lifetime of the site. A scraper and a composite scraper/burin were recovered from this layer as well as several utilised blades.

Also within the upper contexts of the site are a series of small scatters of knapping debitage which include tool production. Three microburins and a broken microlith indicate production and retooling. Axe flakes are also present in the northernmost part of the scatter, though no axes were recovered from the area. Tools are common in this upper layer with scrapers prominent, particularly in the southernmost part of the scatter. Three burins were recovered: two found adjacent to a burin spall and four microliths broadly distributed across the area. Two utilised blades from this area refit to group 48/49; a clear grey nodule that was knapped within the dryland scatter 3 (see eastern dryland area above). One of these blades was used to work wood on the wetland edge. In the reed peat below, the assemblage is a more classic wetland one consisting of large blades and flakes often with macroscopic edge damage. A scraper was also recovered.

The northern and eastern test pits

To the north and east of the main area of open excavation a series of test pits were excavated during the early years of the current project (see Chapter 3). These give some indications of the spread of activity across the site, as well as its nature and intensity.

North of the Hertford

Eight test pits were excavated north of the Hertford Cut. Test pits SC25-28 were excavated along the spine of the northern peninsula. SC32 was located to the west, immediately north of the main excavations, whilst pits SC31, 29 and 30 represent a west to east series going down toward the lake edge in the east. The dryland test pits in this series were almost entirely ploughed out but provide a record of activities in the area (Chapter 3). SC25 was the closest to the Hertford Cut and lithic material was recovered from recent ploughsoil (n=53), a layer of mixed ploughsoil and upcast from the cut (n=41), a pre-upcast ploughsoil (253), and from the glacial till and tree throws within it (n=94) (Table 8.9). As a result, the collection from this pit derives probably both from the

Category	SC25	SC26	SC27	SC28	SC32
Tools:	17	6	1	0	0
Awl	2	0	0	0	0
Axe	0	1	0	0	0
Burin	1	0	0	0	0
Denticulate	1	0	0	0	0
Hammerstone	0	0	0	0	0
Microlith	2	1	1	0	0
Micro-denticulate	1	0	0	0	0
Scraper	10	3	0	0	0
Utilised blade	0	1	0	0	0
Utilised flake	0	0	0	0	0
Utilised fragment	0	0	0	0	0
Retouched	0	0	0	0	0
Tool spalls:	6	3	0	0	0
Axe flake	0	1	0	0	0
Burin spall	5	0	0	0	0
Microburin	1	2	0	0	0
Core preparation:	1	1	0	0	0
Core tablet	1	1	0	0	0
Crested blade	0	0	0	0	0
Step fracture removal	0	0	0	0	0
Debitage:	417	172	62	5	8
Blade	25	19	7	0	2
Flake	99	37	11	1	3
Fragment	254	98	40	4	3
Chip	32	12	0	0	0
Core	6	5	3	0	0
Nodule	0	0	1	0	0
Chunk	1	1	0	0	0
Total	441	182	64	5	8
Burnt	13	5	0	0	0

Table 8.9: Material from test pits located on the northern peninsula.

broad area of the test pit and the area of the Hertford Cut to the south. The figures suggest moderate densities of flint both in this area and to the south and activities to the south involving use of scrapers. SC26 has smaller quantities of flint (n=182). These also derive from a variety of contexts; notably ploughsoil (n=150), tree throws (n=15) and a sandy glacial till (n=13), the latter of which is likely to represent material that is broadly in situ. Moving further south, flint densities decrease with 63 pieces from SC27, all from the ploughsoil with the exception of two which were found within the basal mineral sediment. Finally in SC28, only five pieces were recovered, all from the plough soil. The series of three test pits SC29-31 running west to east were all empty of flint, while only eight pieces were recovered from SC32 to the north of the main excavations; four from ploughsoil and the remainder from upcast.

	SC6		SC8	
Category	No.	%	No.	%
<i>Tools total:</i>	24	14.91	19	6.46
Axe	0	0	1	0.34
Burin	4	2.48	0	0
Denticulate	0	0	0	0
Hammerstone	0	0	0	0
Microlith	6	3.73	5	1.7
Scraper	5	3.11	4	1.36
Truncation	0	0	1	0.34
Utilised blade	7	4.35	5	1.7
Utilised flake	0	0	1	0.34
Utilised fragment	1	0.62	0	0
Retouched	1	0.62	2	0.68
<i>Tool spalls:</i>	1	0.62	9	3.06
Axe flake	1	0.62	4	1.36
Burin spall	0	0	3	1.02
Microburin	0	0	1	0.34
Scraper spall	0	0	1	0.3
<i>Core preparation:</i>	7	4.35	14	4.76
Core tablet	3	1.86	8	2.72
Crested blade	1	0.62	4	1.36
Plunging	1	0.62	2	0.68
Step fracture removal	2	1.24	0	0
<i>Debitage total:</i>	129	80.12	252	85.71
Blade	22	13.66	27	9.18
Flake	36	22.36	77	26.19
Fragment	56	34.72	126	42.86
Chip	11	6.83	14	4.76
Core	4	2.48	1	0.34
Chunk	0	0	7	2.38
Total	161	100	294	100
Burnt	5	3.11	32	10.88

Table 8.10: Assemblages from test pits on the northern part of the eastern peninsula.

Eastern peninsula: north area

Test pit SC6 yielded a moderate density of material with 160 pieces in situ (Table 8.10 and Figure 8.46). The northern part of the test pit was cut by a disused drainage ditch so the original figure would have been higher. This assemblage, though small, has a wide range of tools and is balanced between the 'essential' types (Mellars 1976). The only evidence for tool preparation/maintenance is an axe flake. SC8, 20 m to the south-west, has slightly higher densities of 294 in situ pieces. In contrast to SC6, burins are absent from the assemblage (though three burin spalls are present), with microliths and scrapers dominating. A key activity appears to have been

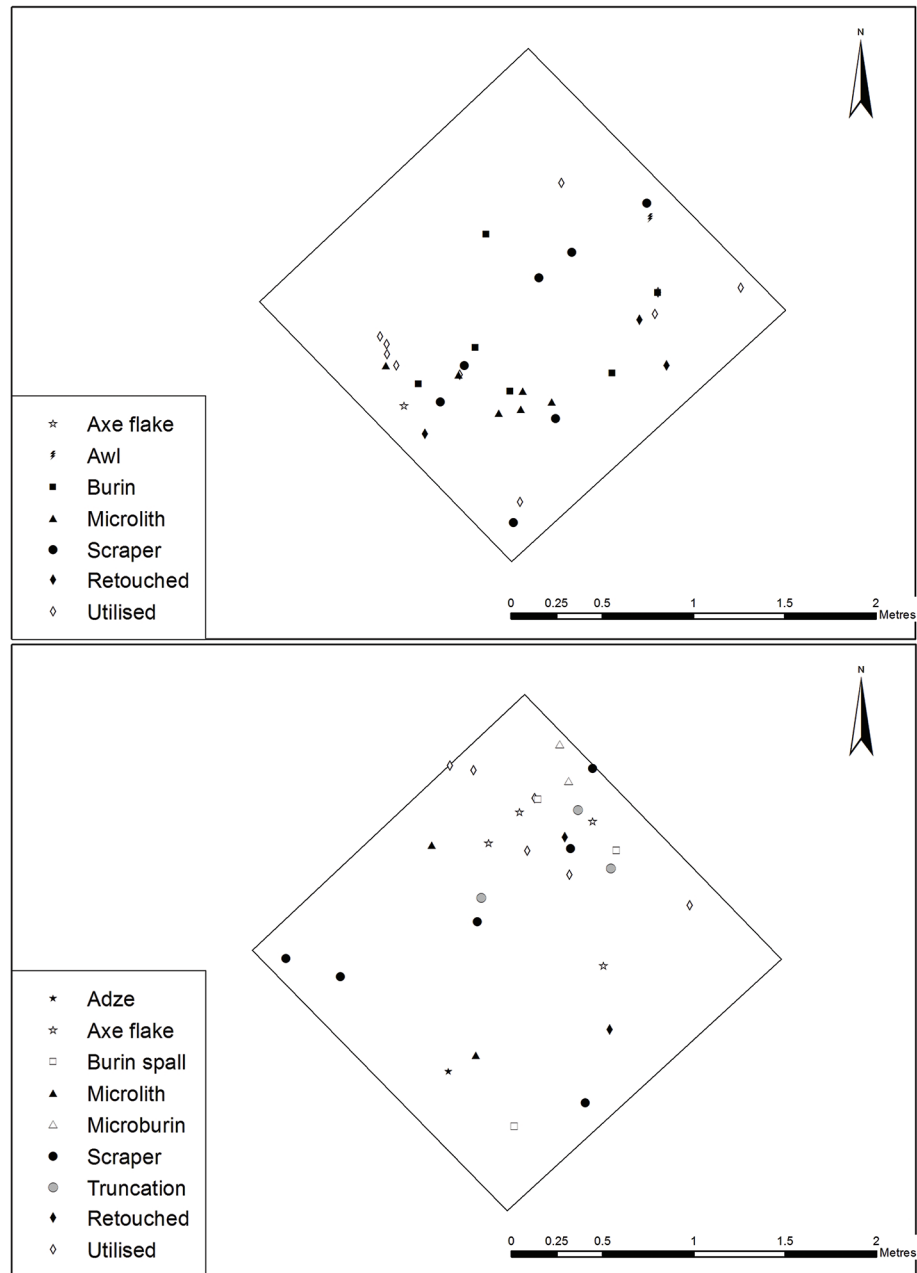


Figure 8.46: Distribution of tools in test pits SC6 (top) and SC8 (bottom) (Copyright Star Carr Project, CC BY-NC 4.0).

axe production/maintenance with four till axe flakes clustering in the northern corner of the test pit and an axe made of Wolds material recovered from the southern part. The northern area appears to have been a tool production area more generally as two of the burin spalls and two microburins were also recovered here. Burnt flint is clustered in this same area possibly indicating a hearth.

Eastern peninsula: central area

Several test pits were excavated in this area including the larger trench SC21, which stretches along a low shelf between dryland and wetland (Figure 8.47 and Table 8.11). SC21 represents one of the lowest-density areas of the site with only 63 pieces of flint recovered from an 11×3 m area. Tools in this area are also rare with only two burins and a single example of a microlith, scraper and truncation recovered. Three utilised pieces derive from the part of the trench closest to the water's edge. To the south of this trench is SC2, a wetland test pit located immediately to the west of the shoreline and only one piece of flint was recovered from this pit: a retouched fragment. To the east of SC2 is SC4, a 1 m^2 test pit, revealing a low- to medium-density scatter based on the reduction of a brown nodule of till flint; two utilised pieces are present but no formal tools. The northernmost dryland test pit in this area is SC10, located c. 20 m to the east of SC21. This also revealed a low-density scatter of 37 pieces. Formal tools and tool spalls were absent with only two retouched fragments and an utilised blade recovered. Finally in this central area are (from west to east) test pits SC1 and SC12, providing evidence for low-density lithic activities. In the southern part of the central area are test pits SC1 and SC12 (Figure 8.48). SC1 yielded 36 pieces of flint including a burin and two scrapers, recovered side by side. There is no evidence for tool production or maintenance. Two utilised pieces were found on the southern boundary of the test pit.

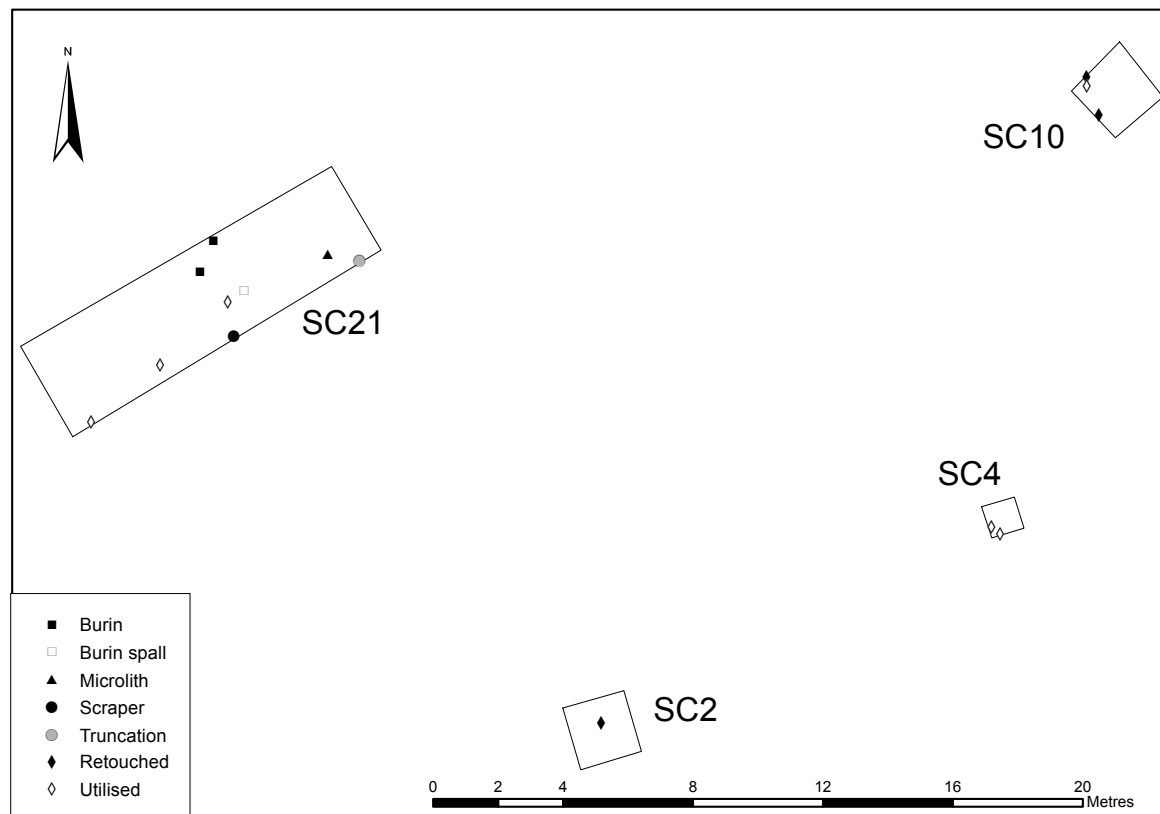


Figure 8.47: Distribution of tools in trench SC21 and test pits SC2, SC4 and SC10 (Copyright Star Carr Project, CC BY-NC 4.0).

Category	SC1	SC2	SC4	SC10	SC12	SC21
Tools total:	4	1	2	4	5	9
Burin	1	0	0	0	0	2
Hammerstone	0	0	0	0	1	0
Microlith	0	0	0	0	0	1
Scraper	2	0	0	0	2	1
Truncation	0	0	0	0	0	1
Utilised blade	1	0	1	1	0	2
Utilised flake	0	0	1	0	0	1
Utilised fragment	0	1	0	0	0	1
Retouched	0	0	0	3	2	0
Tool spalls:	0	0	0	0	0	2
Burin spall	0	0	0	0	0	1
Microburin	0	0	0	0	0	1
Core preparation:	1	0	0	4	4	2
Core tablet	0	0	0	1	1	0
Crested blade	0	0	0	2	3	1
Plunging	1	0	0	0	0	1
Step fracture removal	0	0	0	1	0	0
Debitage:	18	0	26	30	107	51
Blade	5	0	7	10	11	12
Flake	1	0	6	7	34	17
Fragment	9	0	11	10	51	17
Chip	1	0	0	2	7	5
Core	1	0	0	0	3	0
Chunk	1	0	2	0	0	0
Total	23	1	28	37	115	64
Burnt	1	0	2	4	30	1

Table 8.11: Assemblages from test pits on north-central part of the eastern peninsula.

SC12, only 1.7 m to the east of SC1, has increasing densities of material (n=115), including a cluster of burnt flint probably indicating a hearth.

Eastern peninsula: southern area

Six test pits were excavated on the southern portion of the eastern peninsula (Table 8.12; Figure 8.49, Figure 8.50). The larger 2 m test pit SC14 was excavated along the spine of the peninsula and the smaller test pits SC3 and SC5 were located to the west and east respectively. Very little material was recovered from the two smaller test pits: only one core came from SC3, whilst 12 pieces came from SC5. The material from the latter, though disturbed by spring action, has the appearance of a wetland assemblage with a couple of large utilised blades recovered. The material from SC14 is similar to that from test pits in the north-central portion of the peninsula in terms of densities with only 44 pieces recovered. Formal tools are present and are dominated by truncations, a tool relatively rare on the site. Three of these were recovered from the western corner of the trench adjacent to two utilised fragments and an utilised blade and in the same area as a cluster of burnt flint, possibly indicating a hearth. A scraper was also recovered from this test pit.

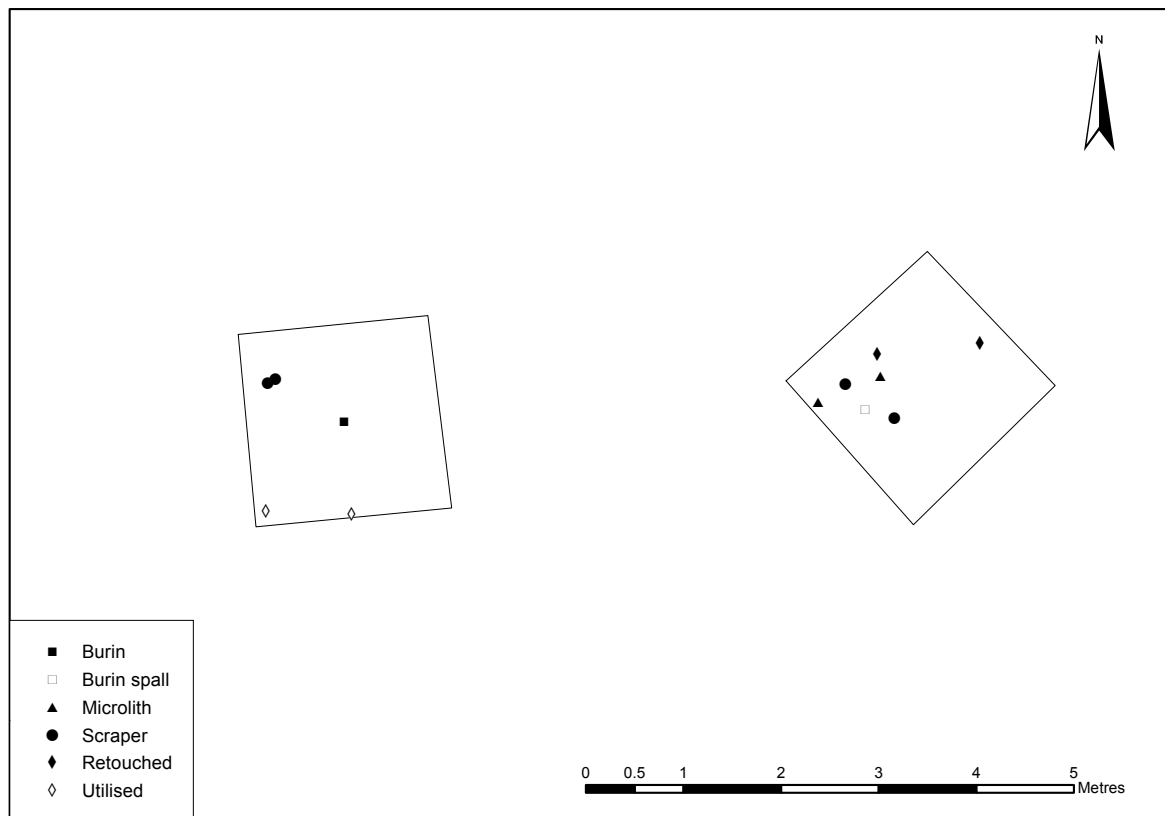


Figure 8.48: Distribution of tools in SC1 (left) and SC12 (right) (Copyright Star Carr Project, CC BY-NC 4.0).

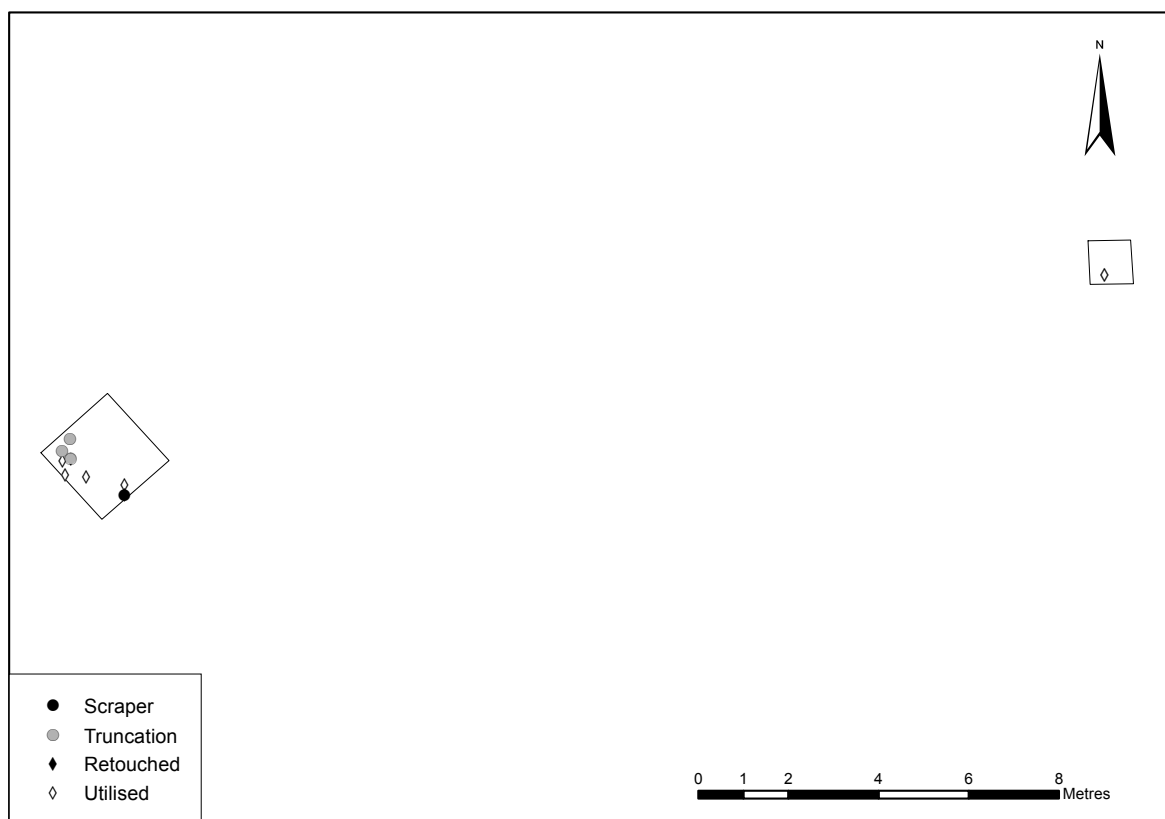


Figure 8.49: Distribution of tools in test pits SC14 (left) and SC5 (right) (Copyright Star Carr Project, CC BY-NC 4.0).

Category	SC3	SC5	SC14	SC16	SC18	SC20
Tools total:	0	2	4	36	37	1
Burin	0	0	0	2	3	0
Denticulate	0	0	0	0	1	0
Hammerstone	0	0	0	0	1	0
Microlith	0	0	0	7	6	0
Scraper	0	0	1	8	1	0
Scraper/burin	0	0	0	1	0	0
Truncation	0	0	3	4	0	0
Utilised blade	0	2	2	6	16	0
Utilised flake	0	0	0	0	2	1
Utilised fragment	0	0	2	2	4	0
Retouched	0	0	0	6	3	0
Tool spalls:	0	0	0	7	4	0
Axe flake	0	0	0	0	2	0
Burin spall	0	0	0	6	1	0
Microburin	0	0	0	1	1	0
Core preparation:	0	0	2	15	8	0
Core tablet	0	0	2	8	4	0
Crested blade	0	0	0	7	3	0
Step fracture removal	0	0	0	0	1	0
Debitage:	1	10	34	608	249	3
Blade	0	2	5	74	40	1
Flake	0	3	10	125	57	2
Fragment	0	5	16	341	125	0
Chip	0	0	0	55	21	0
Core	1	0	0	8	3	0
Chunk	0	0	3	5	3	0
Total	1	12	44	666	298	4
Burnt	0	0	5	187	60	0

Table 8.12: Lithic material from test pits in south-central area of the eastern peninsula.

Three test pits were excavated on the southernmost part of the peninsula (Table 8.13, Figure 8.50). Twenty metres to the south-west of SC14 lies SC16. Here densities rise considerably with 666 pieces recovered indicating an intense area of activity. Tools are common, with the formal tools balanced between scrapers (n=8) and microliths (n=7). Burins are less common (n=2) though a composite scraper/burin is also present. Truncations, as in SC14, are common, with four examples recovered. Retouched and utilised blanks are also well represented. Tool production and maintenance is indicated by the presence of a microburin and two burin spalls. Burnt flint is common across the test pit with no indications of any clusters. This, combined with the high densities, could indicate an area of greater spatial complexity such as a midden or structure. SC18 produced a relatively dense scatter of 298 pieces, dominated by microliths (n=6), with smaller quantities of burins (n=3) and a single scraper. Retouched and utilised blanks are common (n=26). Tool production and maintenance activities are indicated by a couple of axe flakes in the western corner, a burin spall and a micro-intermediate, indicating microlith production. Tools are clustered in the central area where all the burins, a denticulate, two

Sub-assemblage location	% tools	% utilised blades	% chips (<5 mm)	% burnt flint
<i>Open water/ seasonally submerged</i>				
Detrital wood scatter	47.50	20.83	0	0
Clark's area	49.80	21.90	0.32	2.41
South of Clark's area	33.73	13.25	0.20	3.21
Brushwood	30.51	15.25	0	4.17
Western Platform	23.08	15.38	15.38	10.53
Central Platform	16.95	2.56	3.95	0.56
Eastern Platform	20.00	0	0	0
<i>Wetland edge/fen carr</i>				
North of cutting III (bead area)	23.01	9.08	15.74	4.54
Axe workshop	9.18	2.05	12.98	0.98
Fen flint scatter	13.65	4.45	2.37	2.37
<i>Dryland</i>				
Western Structure	6.50	1.44	23.78	34.8
Central Structure	6.88	1.23	8.35	4.18
Eastern Structure	7.03	0.63	8.12	23.32
Moore area	6.20	1.55	6.01	15.89
Scatter 1	5.22	0.89	4.66	13.43
Scatter 2	4.30	0.48	5.33	28.26
Scatter 3	6.20	1.66	8.32	9.53
Scatter 4	4.10	0.52	6.72	30.30
Scatter 5	5.78	1.19	3.43	10.37
Scatter 6	12.16	4.73	1.35	2.70
Scatter 7	14.20	4.73	10.65	11.38

Table 8.13: Comparison of key features of dryland and wetland assemblages.

microliths and a scraper were recovered. The assemblage from the waterlogged test pit SC20 at the end of the peninsula is entirely wetland in character. It consists of a large blade (78 mm) and three large flakes, one of which bears evidence for utilisation.

Discussion

Analysis of the lithic material from the current excavations has revealed distinct contrasts between the lithic material recovered from the dryland and the wetland areas of the site. Broadly, the lithic material from the dryland can be characterised as composed of dense in situ knapping scatters, often focused on hearths, interspersed by areas of tool use. There are also structures and middens where varying amounts of clearance and maintenance have been carried out. The activities undertaken on the dryland were extremely varied with knapping and all categories of tools and tool spalls represented. Because of the focus on knapping, proportions of tools within structures and large scatters are low, between 4.1% and 7.03% (Table 8.13), though percentages are higher in the smaller scatters and tool-use areas. Burnt flint by contrast is common, in general greater than 10% and up to 34.8% in the western structure.

In the wetland, lithic assemblages are, with some exceptions, of low density and mainly composed of used and discarded tools. Percentages of tools vary between 16.95% and 49.8% in wetland areas and between 9.18%

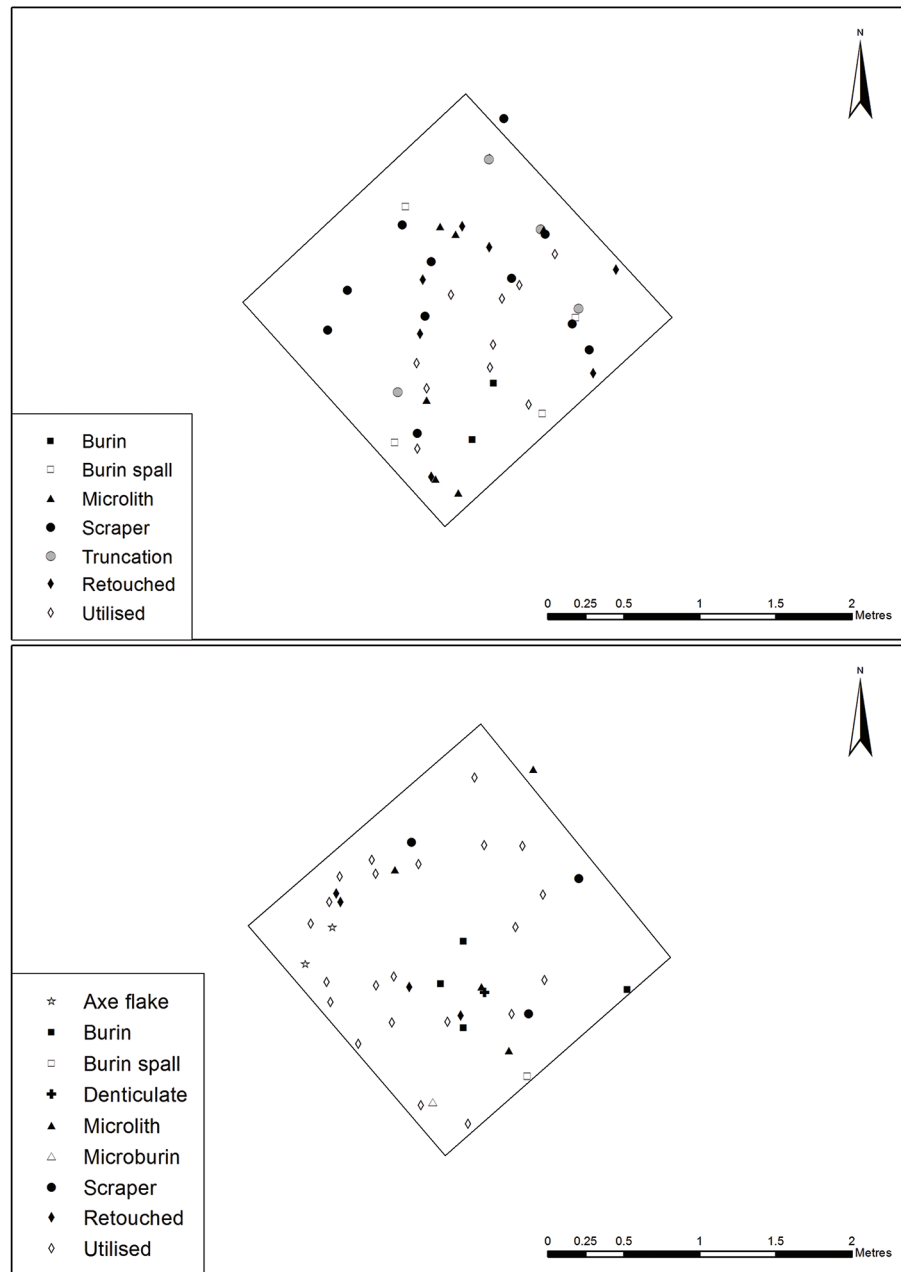


Figure 8.50: Distribution of tools in test pits SC16 (top) and SC18 (bottom) (Copyright Star Carr Project, CC BY-NC 4.0).

and 23.01% in wetland edge areas where knapping also occurred. Burnt flint is rare, representing between 0% and 15.38% of wetland assemblages and where it occurs is usually closest to the dryland (Figure 8.1). Small chips are also rare, between 0% and 15.38% of wetland assemblages, with examples again mainly towards the dryland size.

Blades are also longer in the wetland, averaging at 44.9 mm for wetland edge examples, 47.7 mm for Clark's area, and 49.2 mm for the detrital wood scatter, in comparison with an overall assemblage average of 42 mm. Utilised blades have a particularly strong association with the wetland composing between 13.25% and 21.9% of wetland assemblages, excluding platforms where, with the exception of the central platform, they are

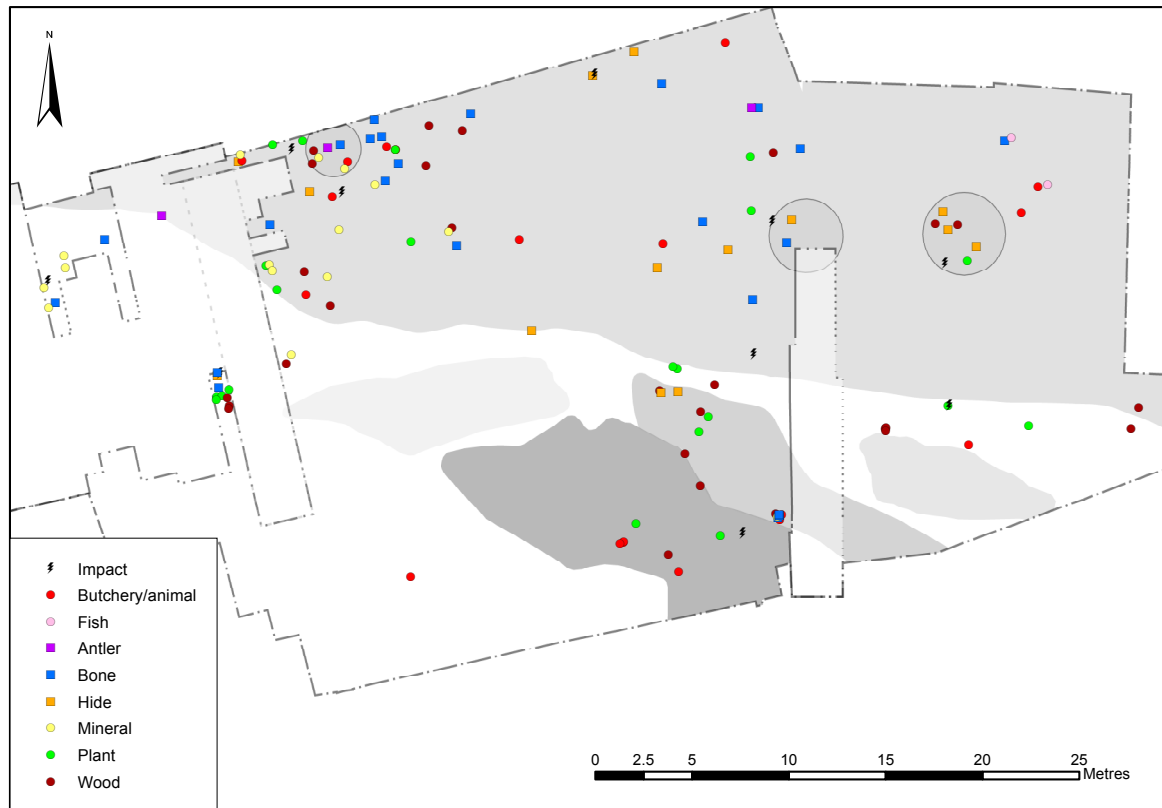


Figure 8.51: Microwear results across the site (Copyright Star Carr Project, CC BY-NC 4.0).

uncommon. They are particularly well represented in Clark's area. Utilised blades are less common in wetland edge assemblages, apart from the bead manufacturing area north of Clark's cutting III, where they are found in large numbers. Microwear indicates that the tools deposited in the wetland had a much more restricted range of use than those from the dryland: tools along the wetland edge were mainly used to work plants and wood; those from open water were used for plants, wood and in particular, the killing and butchery of animals (Figure 8.51). This latter group must represent artefacts deposited in the lake waters and may represent formal acts of deposition connected with the animal-focused wetland depositional practices (see Chapter 10).

Conclusions

The excavation of a large open area and the use of an arsenal of techniques have allowed us to understand the rhythms of lithic procurement, working, use and deposition on a large site that was occupied for a long period of time. Such patterns could only be guessed at if a smaller area had been excavated. A key feature is the complexity of the lithic patterning. Star Carr is very different from Upper Palaeolithic sites where a tendency for short or single occupations makes refitting unproblematic and spatial patterning clear (see e.g. Conneller and Ellis 2007; Conneller 2007). While some discrete refitting scatters are present at Star Carr, these are the exception rather than the rule. Material has been cleared from structures and dumped elsewhere, as well as scavenged from previous occupations. In the wetland there are episodes of deposition resulting from activities on the lake edge but also from more formal acts of deposition.

A second clear finding points to ways in which different topographic/environmental zones were used, a pattern broadly noted before (Mellars and Conneller 1998; Conneller and Schadla-Hall 2003) but elaborated in this study. The dryland was used for flint knapping and tool manufacture, butchery and varied domestic and craft-focused activities. The wetland edge was used for discrete tasks, occasionally involving flint knapping/tool manufacture but more often activities focused on the cutting of reeds and rushes and for woodworking. Further out in the lake tools were deposited: these were often utilised blades, used for butchery as well as the same reed/woodworking tasks seen for the wetland edge. These patterns of wetland deposition were repeated in very similar ways from the earliest occupation of the site, the detrital wood scatter, to the deposition of material in Clark's area several hundred years later (see Chapter 9), suggesting long-term rules governing deposition.

