

## CHAPTER 7

# Assembling Animals

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### Introduction

During the original excavations of the site, Clark recorded an extremely dense concentration of faunal material along with artefacts made of bone, antler, wood and stone. However, although the trenches were excavated by grid square, Clark's published account of his work provides very little information on the spatial patterning of the faunal remains. This extends to the archive, for while the grid square from which stone tools were recovered is recorded on the artefacts themselves, this information was not recorded on the animal bone. Clark suggested that most of the site had been excavated; his rationale being that there were much smaller quantities of material towards the edges of the trench. This is clearly illustrated by his plot of flint density (Clark 1954, figure 3) but whether the same drop-off occurred with the animal bone distribution is unclear.

The lack of documentation for the location of faunal material has contributed to the impasse in debates surrounding the site. Without any understanding of spatial patterning which might permit differentiation of the faunal material, either through time or by activity area, the assemblage has been treated as homogenous. Thus, the remains have been thought to reflect uniform patterns of activity (such as butchery and carcass processing at a kill site or hunting camp), often (though not always) carried out at the same time of the year (e.g. Caulfield 1978; Andresen et al. 1981; Legge and Rowley-Conwy 1988). The picture derived from this way of understanding the faunal assemblage presents a stark contrast with interpretations of the site derived from its material culture inventory, one of the richest in Europe, and one that cannot be easily attributed to the 'boredom reducing activities' of a small hunting party (Legge and Rowley-Conwy 1988). This chapter and the next attempt to reconcile the information from faunal remains and material culture by analysing all finds on the same spatial and temporal basis. In addition, this chapter and Chapter 23 will also address specific factors that have had an impact on the appearance of Clark's assemblage: namely marrow processing, taphonomy and Clark's own collection and retention policies.

The lack of understanding of the spatial patterning of faunal remains has also impacted on more recent interpretations of the site. Both Chatterton (2003) and Conneller (2000, 2004) have argued that much of the material recovered by Clark represents patterned, formal deposition of animal remains in the waters of the lake. However, without spatial information it is difficult to understand whether this is indeed the case, and if it is, what form this patterning takes.

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Our current excavations have expanded far beyond the area excavated by Clark, both across the Mesolithic dryland and into areas that would have been further out into the lake. However, as part of these excavations we have also excavated in and around Clark's trenches and now have a much better understanding of the nature and distribution of the faunal remains he encountered. From this, it is now clear that the material encountered by Clark is just a small, though admittedly highly idiosyncratic, part of a much more complex site that spans many centuries. Faunal remains have also been found across most other parts of the site, both dryland and wetland, in varying states of preservation. Although there are both similarities and differences in the types of animal remains deposited across the site, no other area is similar to Clark's in terms of concentration of remains. Thus the material Clark and many subsequent authors saw as typical of a Mesolithic site with good organic preservation appears, in fact, highly unusual.

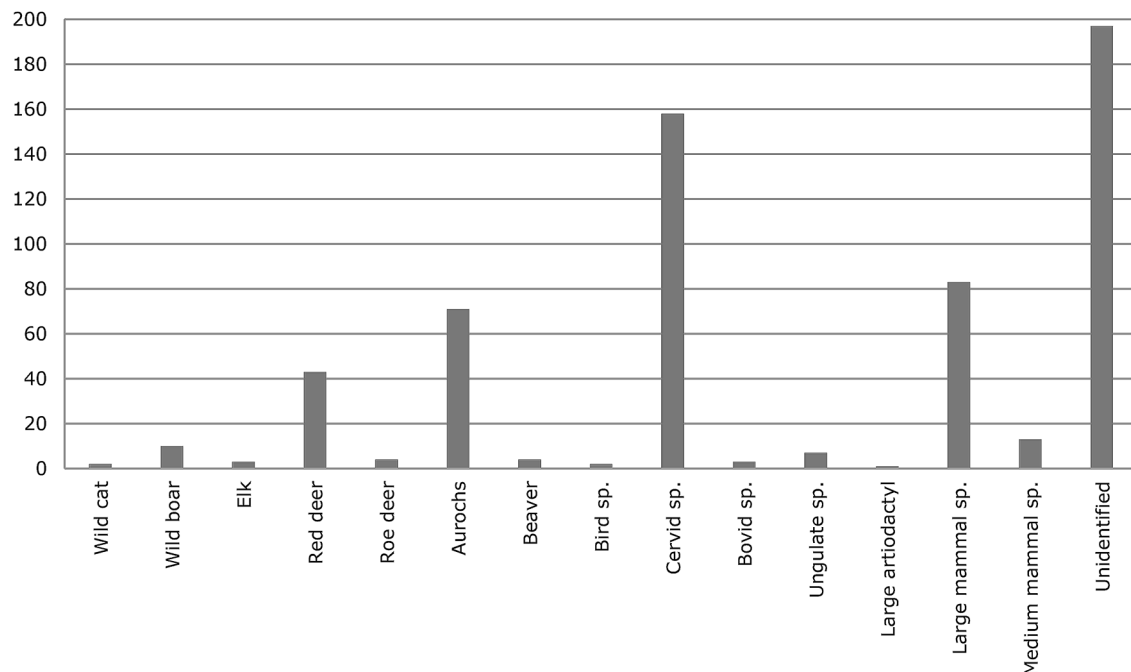
## Dryland

### Overview

A total of 601 faunal remains (581 bone and 20 antler) were found across the dryland area of the site through excavation (termed here the hand-collected assemblage). There were also 473 fragments of bone found through flotation of soil samples.

The material from this area is particularly poorly preserved, typically desiccated, fragmentary, fragile and in the majority of cases, affected by root penetration. As a result, a large number of remains, 193 bone specimens and four antler specimens of the hand-collected assemblage cannot be identified to taxon or element by standard methods and so are classified as unidentified. A total of 303 of the bones, including unidentified, cervid, ungulate, large and medium mammals specimens and six antler specimens, were analysed using ZooMS (see Chapter 23).

Of the hand-collected faunal assemblage, 137 specimens have been identified to species, and a further 267 have been assigned to broad categories (such as bovid, or large mammal), whilst 197 specimens are unidentifiable (Figure 7.1). The majority of the material derives from large mammals, notably species of cervids (mainly



**Figure 7.1:** NISP of each species found within the dryland hand-collected assemblage (Copyright Star Carr Project, CC BY-NC 4.0).

red deer and elk), although aurochs are also well represented. However, a wide range of species are also present (albeit in much smaller quantities), including medium mammals (such as wild boar and roe deer), and species that are poorly represented in other parts of the site (such as wild cat and species of bird). It is important to note that the representation of the larger mammals may reflect the more robust nature of their bone, which would take longer to degrade beyond the point of identification than elements from small or more gracile species, though where bones are very fragmented, smaller taxa remain more identifiable from small pieces.

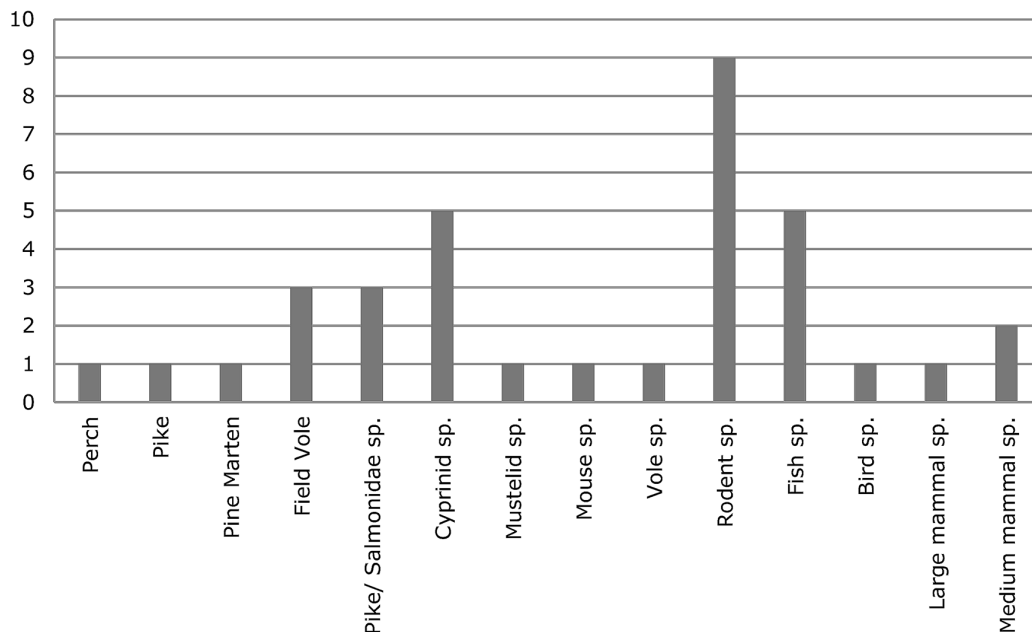
As well as the hand-collected assemblage, a further 473 specimens have been recovered from flotation of the soil samples (Chapter 15). The majority of these fragments cannot be identified to taxon or element ( $n=438$ ). The identifiable fragments ( $n=35$ ) represent a range of animal taxa including small mammals, fish and birds (Figure 7.2).

### *NISP by element*

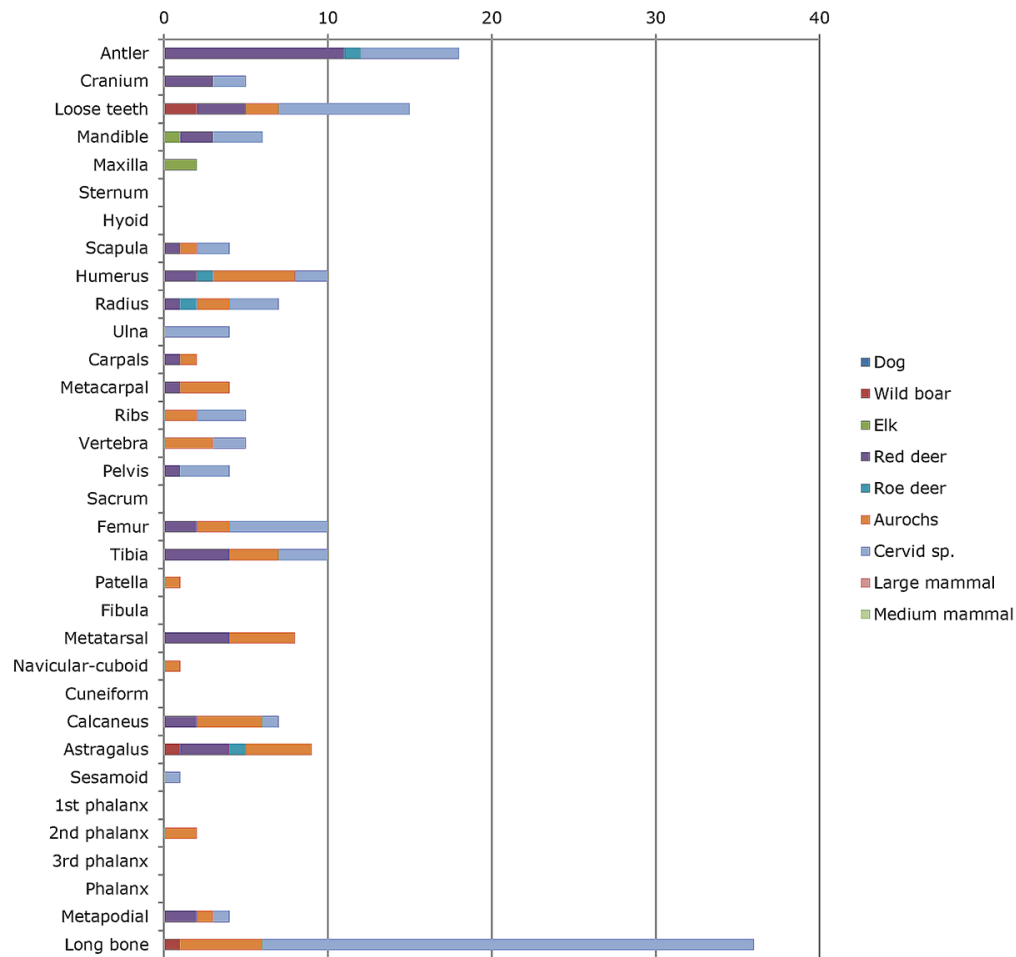
Elements of the limbs are most common, and with the exception of two specimens of wild boar, all derive from cervids (including elk, red and roe deer) and aurochs (Figure 7.3). Although the majority are only identified as long bone fragments, the upper and lower parts of both forelimbs and hindlimbs are present amongst those elements that can be identified more fully, as are metapodials, and the smaller bones of the ankles. Elements of the torso are less common and again derive from the larger animals; vertebrae and ribs are sparse and are restricted to the cervids and aurochs, whilst pelves are limited to cervids. Cranial elements (excluding antler) mostly derive from cervids, and where they can be identified more fully, to red deer, though beaver (which is represented by a mandible and loose teeth) and wild boar are also represented. Wild cat is represented by two phalanges.

### *Discussion*

Broadly speaking, the character of the material from the dryland scatters is suggestive of tasks associated with butchering and processing animal carcasses and craft activities involving the working of bone and antler. This appears to be focused on cervids and aurochs, though there is also evidence for the processing of fish and of



**Figure 7.2:** NISP for the species found during flotation of the dryland soil samples (Copyright Star Carr Project, CC BY-NC 4.0).



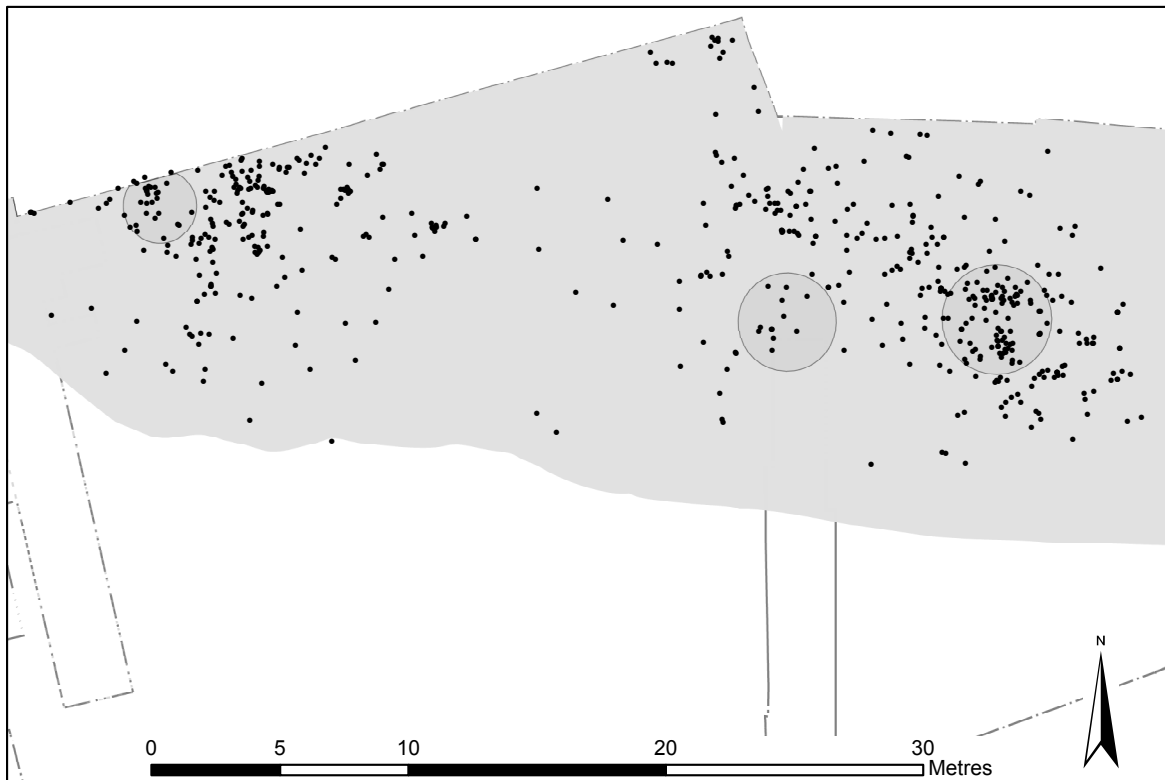
**Figure 7.3:** Distribution of elements on the dryland for the main species represented on the site (Copyright Star Carr Project, CC BY-NC 4.0).

small mammals and birds. Much of the material is located in two main scatters; one focused on the western structure, the other from within and around the central and eastern structures (Figure 7.4). In all cases there are assemblages of material both within the structures themselves and potentially related to their use, and within the surrounding areas.

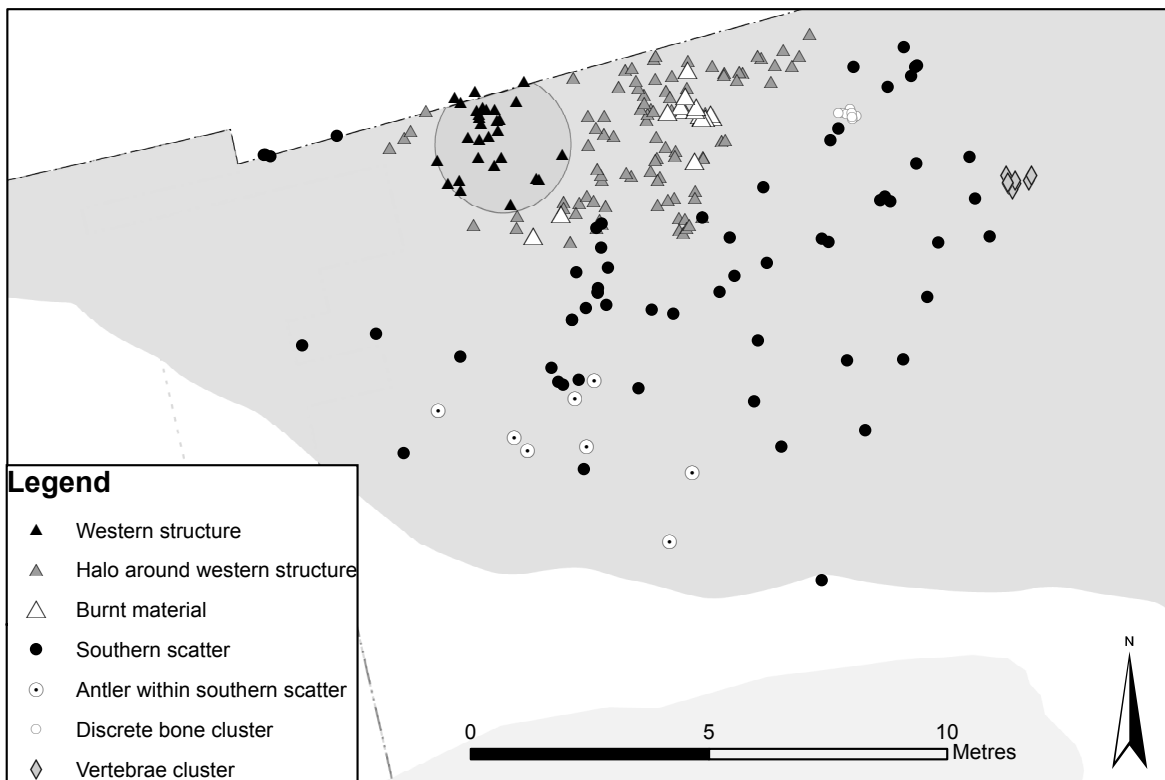
A relatively large concentration of bone and antler ( $n=240$ ) was found within the western structure and across the surrounding area (Figure 7.5). Most of this consists of poorly preserved, highly fragmented material, the majority of which derives from the limbs and podial elements of a range of medium and large mammals. Smaller quantities of material from the torso and crania (including antler) of medium and large mammals were also present, along with the remains of smaller animals (beaver and wild cat). Though evidence for human modification is relatively slight (which may be a product of the poor preservation and the fragmentary state of the material), the highly fragmented nature of the material, particularly outside the structure, suggests that much of the assemblage probably represents dietary waste (particularly the breaking of bones to extract marrow and fat) and craft-related activities.

The assemblage found within the western structure consists of 29 specimens, all of which are highly fragmented (Figure 7.5). Those that can be identified represent a range of medium and large mammals: red deer ( $n=5$ ), aurochs ( $n=2$ ), roe deer ( $n=1$ ), wild boar ( $n=1$ ), cervid species ( $n=1$ ), ungulate ( $n=1$ ), large ungulate ( $n=1$ ), large mammal ( $n=4$ ) and medium mammal ( $n=3$ ). Most of the material that can be identified to element represents long bones (aurochs metacarpal and partial patella, red deer radius, red deer tibia, large mammal humerus, medium mammal femur, two medium mammal long bones and an unidentified long bone),





**Figure 7.4:** Spatial plot of the faunal remains on the dryland with circles depicting the three principal structures (left to right: western structure, central structure and eastern structure) (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.5:** Plot of specimens from the area of the western structure (Copyright Star Carr Project, CC BY-NC 4.0).

and three astragali, (two red deer and one wild boar). Cranial elements are represented by three fragments of mandible (red deer, cervid species and large ungulate), an ungulate molar and a section of roe deer antler, whilst a small amount of material comes from elements of the torso (one large mammal pelvis fragment, a fragment of large mammal rib and a partial large mammal vertebrae). Two of these retain evidence for human modification: a fragment of large mammal humerus midshaft has a spiral fracture to one edge and the distal end of a red deer tibia has been removed from the main body of the element by a spiral fracture. The latter and three other fragments (14%) have also been exposed to heat.

A comparable range of material is present in the assemblage outside the structure (n=108) (Figure 7.5: halo around western structure spread). Whilst over half the assemblage was unidentifiable (n=66), the remaining specimens represent a slightly larger range of animals to those in the structure: aurochs (n=5), red deer (n=2), roe deer (n=2), wild boar (n=1), bovid species (n=1), cervid species (n=5), large artiodactyl species (n=1), large mammal species (n=18), medium mammal species (n=3), beaver (n=2), and wild cat (n=2). Most of the identifiable fragments represent bones of the lower limbs (one astragalus, two carpals, one humerus, two mandibles, one patella, three phalanges, two radii, three tibia, two metapodial fragments and 19 long bone fragments), whilst the torso is represented by a single fragment of pelvis and two fragments of vertebrae, and the crania by two loose teeth, two antler fragments and a fragment of burr. Of these remains, only one specimen clearly exhibits evidence of human modification: a fragment of large mammal long bone that has been longitudinally split. A total of 16 specimens (15%) exhibit signs of being exposed to heat, with the majority forming a discrete concentration to the east of the structure (Figure 7.5: burnt material). Only four of the charred remains can be identified to species and these remains consist of a fragment of an unidentified element attributed to wild boar by ZooMS, two wild cat phalanges and a partial roe deer radius. The fact this burnt material occurs together could reflect the presence of a small hearth outside the structure, or perhaps the cleaning out of hearth debris.

Beyond this is a more diffuse scatter of material (Figure 7.5: southern scatter) extending to the south as far as the lake shore and to the east, consisting of 68 specimens (8 antler, 60 bones). Broadly speaking, this is similar in character to the more dense scatter of material associated with the western structure and the immediate surrounding area and probably represents a similar range of practices. Of the specimens that can be identified to species, four derive from aurochs and 11 from red deer, whilst 22 are identified to broader taxonomic categories (seven cervid species, nine large mammal, four medium mammal, and two ungulate species). Most of this material derives from limb elements: 9 fragments of long bone, two femora, two tibiae, one metatarsal, two phalanges, two astragali and one carpal. Cranial elements are represented by antler (n=8), a fragment of mandible and three loose teeth, whilst the torso is only represented by three fragments of rib and a thoracic vertebra fragment. Of these, a relatively small proportion exhibit evidence for human modification: two long bone fragments have been longitudinally split, one red deer metatarsal has a spiral fracture, and there is a cut mark on an aurochs thoracic vertebra. A discrete scatter of eight fragments of poorly preserved antler (four of which can only be identified as antler and the other four as compacta) was found towards the south-west edge of the scatter. Though there is no evidence for human modification, these may reflect material deposited during an episode of antler working, carried out close to the lake shore. Overall, the character of the whole assemblage, the elements represented and the highly fragmented character of the material is suggestive of the processing of animal remains, either for butchery or craft activities.

A discrete concentration of animal bone (Figure 7.5: discrete bone cluster) is located within this more diffuse scatter, roughly 5 m away from the western structure. This consists of ten specimens, three of which can be identified as aurochs (a carpal, a fragment of distal femur, and a thoracic vertebra), six as deriving from a large mammal (all of which are vertebrae, including two thoracic vertebrae) and one that could not be identified to species or element. There is no evidence for human modification, though as with most of the material on the dryland this may be due to the poor surface preservation. However, the close spatial association of the material does suggest a small dump of bone generated through a discrete episode of a task such as butchery.

A similar cluster of bone (Figure 7.6) lies to the edge of the diffuse scatter, again consisting largely of vertebrae (n=7) and two unidentified fragments, all from a large mammal. The remains were found in a semi-articulated state and probably represent material deposited as waste from a task such as butchery.

Comparable assemblages of bone and antler were recorded from the eastern side of the site in the areas within and around the eastern and central structures. In total, 12 specimens of bone come from within the hollow of the central structure (Figure 7.7). Of these, three are identified as aurochs (a partial mandibular premolar, a partial mandibular second molar and one fragment that was unidentifiable), whilst three can only be identified as large mammal (a fragment of molar, a fragment of scapula and a fragment that could only be identified as long bone) and five cannot be identified to taxon or element (one of which derives from a long bone). Five specimens were tested





Figure 7.6: A discrete cluster of bone on the dryland (Copyright Star Carr Project, CC BY-NC 4.0).

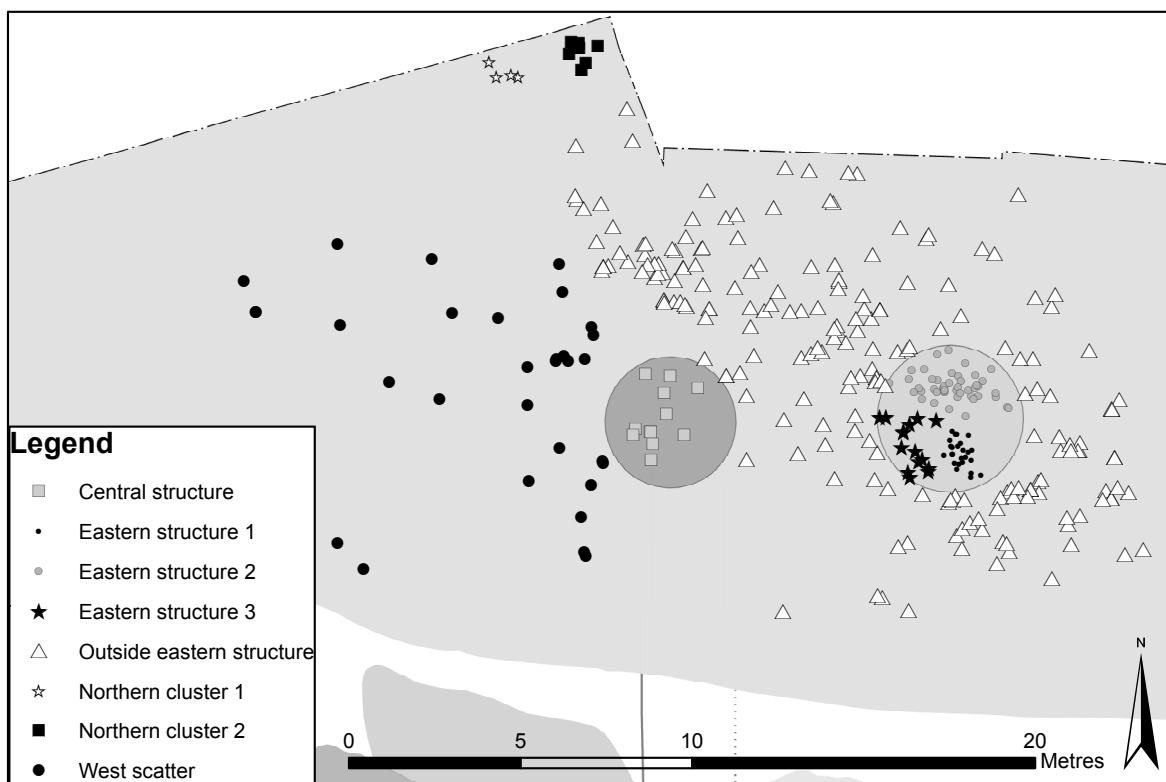


Figure 7.7: Spatial distribution of material around the central and eastern structures (Copyright Star Carr Project, CC BY-NC 4.0).

using ZooMS; however, only two revealed results, both identifying aurochs (the second molar and the unidentified fragment). None of the material exhibits signs of human modification. A fragment of a rodent cranial fragment was also recovered during the flotation of the soil sample from one of the surrounding postholes [382]. Overall, given the sparsity of material, it is very difficult to establish the nature of the activities that this may represent.

A larger assemblage of 26 fragments of bone comes from fill (337) of pit [336], just to the south-west of the central structure. However, only one fragment can be identified (a mustelid species, first phalanx). All but one of the fragments show evidence of having been exposed to heat, and were either burnt (black) or calcined (white). Small quantities of bone were also recovered from the fills of two postholes that formed part of the northern structure ([358]  $n=20$ ; and [459]  $n=1$ ), and a small, natural feature, less than a metre to the west ([462]  $n=9$ ). None of this material can be identified to taxon or element, and none exhibit evidence for human modification. However, all of the bone fragments from feature [462] are calcined. Again, given the small quantities of material from these features and the lack of identifiable specimens it is not possible to interpret them further, although it is interesting that so much heat-affected material comes from two of these fills.

A total of 87 specimens have been recorded from within the eastern structure, forming three discrete concentrations. Though poor preservation has made identifications difficult, the assemblage includes a range of anatomical elements from a variety of species. The material is highly fragmented, with some evidence for human modification (mostly focused on the breaking open of bones) and probably represents dietary waste, particularly the extraction of marrow or fat, and potentially the manufacture of tools. Several fragments were also heat affected (one is calcined), which could either reflect the cooking of meat or accidental exposure to heat sources such as hearths. The spatial patterning of the material may reflect discrete episodes of such activity that were carried out at different times.

The first concentration consists of a densely packed cluster of 25 specimens on the southern edge of the eastern structure (Figure 7.7: eastern structure 1). Just over half of this assemblage ( $n=14$ ) was identified by ZooMS to cervid species. A further five specimens can be identified by morphology to red deer ( $n=1$ ), wild boar ( $n=2$ ), aurochs ( $n=1$ ) and large mammal ( $n=1$ ). Only a very small proportion of this material ( $n=7$ ) can be identified to element: two teeth (a second incisor of a wild boar, one premolar of a red deer), and parts of limbs (a metatarsal fragment of an aurochs, a femur fragment identified as cervid species and three long bone fragments identified as cervid species ( $n=2$ ) and large mammal ( $n=1$ ). There is no evidence for human modification, though this is not surprising given the poor levels of preservation. Two fragments have been heat affected.

The second concentration (Figure 7.7: eastern structure 2) consists of 47 highly fragmented specimens spread across the northern half of the structure. The majority of this material ( $n=30$ ) was identified by ZooMS as deriving from cervid species, with the remains of wild boar ( $n=1$ ), red deer ( $n=1$ ), and aurochs ( $n=1$ ) identified by morphology. Just under half of the assemblage can be identified to element ( $n=21$ ). These represent a range of different skeletal parts, notably limbs; femora (cervid species), humeri (cervid species), tibiae (cervid species), ulnae (cervid species), metatarsals (red deer), a carpal (red deer) and a calcaneus (red deer), but also fragments of rib (cervid species) and skull (cervid species) and one fragment of antler (cervid species). Six specimens of bone show traces of human modification: four spiral fractures (a humerus fragment, tibia fragment and two metatarsal fragments), one percussion break (pelvis fragment), one longitudinally split (femur fragment). Three specimens have been heat affected, resulting in one becoming calcined (unidentified fragment) and two blackened (an ulna fragment and an unidentified fragment).

The third concentration (Figure 7.7: eastern structure 3) is located in the eastern part of the structure. This consists of 15 fragments of bone: 10 identified as cervid species (by ZooMS), a fragment of aurochs, a large mammal, and three that cannot be identified to species due to fragmentation. Only six specimens can be identified to element, mostly limb bones (a fragment of cervid radius and cervid metapodial, and three long bone fragments, two identified as cervid species and one as large mammal), and a fragment of cervid species pelvis. The cervid metapodial exhibits both a spiral fracture and a percussion break, whilst the cervid radius fragment exhibits a spiral fracture and appears to have been longitudinally split. Two further specimens (both unidentified) have been charred.

Whilst the assemblage within the eastern structure generally reflects the processing of medium and large mammals, the remains of other species were also recovered from the flotation of soil samples, mostly from the fills of the central hollow: the majority ( $n=341$ ) are unidentifiable apart from a fragment of pine marten, some rodent bones and fish bones. All but one of the fragments found during flotation from this area are burnt or calcined. The fish bones comprise northern pike ( $n=1$ ), perch ( $n=1$ ), northern pike/salmon species ( $n=3$ ) and cyprinid species ( $n=5$ ). The rodent bones comprise field vole ( $n=3$ ), mouse species ( $n=1$ ), vole species ( $n=1$ ) and rodent ( $n=4$ ). It should be noted that a structure which is likely to have had plant



flooring would have provided a good habitat patch for these rodents, with food, warmth and protection from other predators. Overall, the faunal specimens within the eastern structure probably represent the remains of dietary and craft activities.

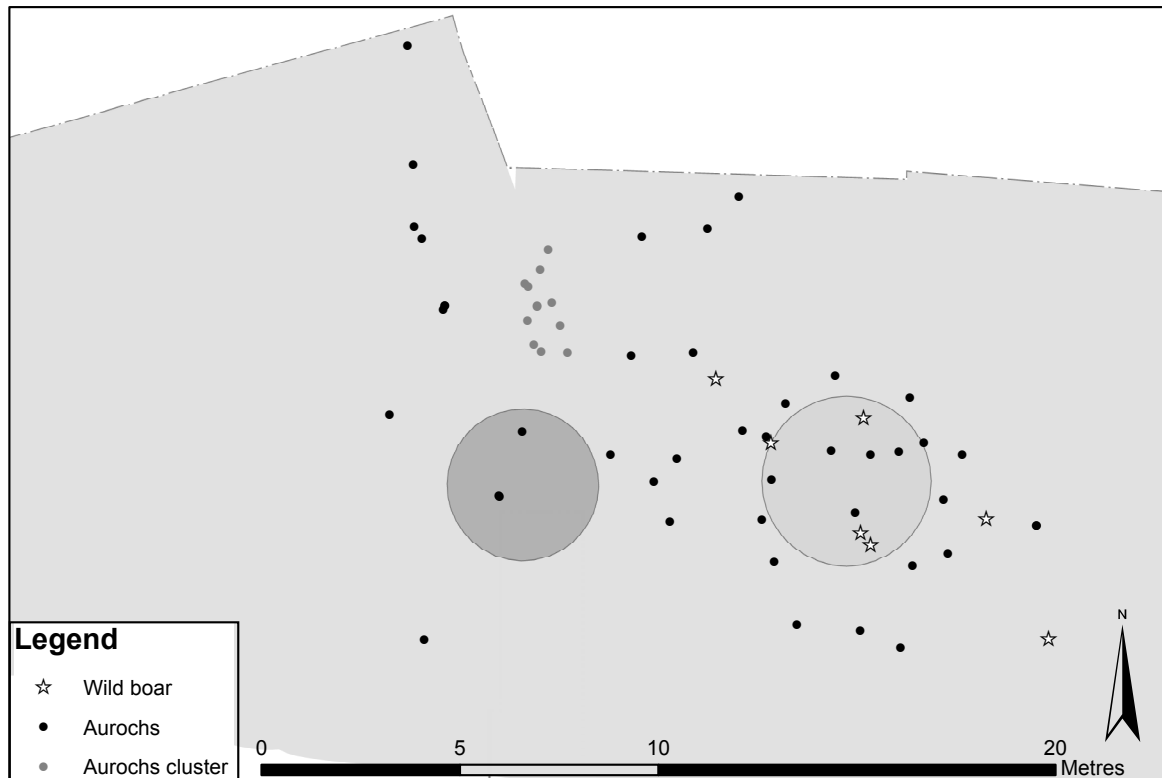
A smaller assemblage ( $n=44$ ) was also recovered from the fills of one of the outer postholes [169]. The six specimens that can be identified consist of a fragment of bird species coracoid, four separate fragments of rodent species incisor, and a small fragment of large mammal long bone. All but one specimen (fragment of large mammal long bone) exhibit varying degrees of heating: blackened, charred (grey/blue-white) or calcined (white).

Further evidence for butchery, processing and craft activities can be found in the assemblage from outside the eastern structure (see Figure 7.7, outside eastern structure). This consists of 207 fragments that extend approximately 25 m on a north-west/south-east alignment. Of these, 168 can be identified to species or to broad taxonomic categories. The remains of large mammals are the most common, with aurochs ( $n=43$ ), red deer ( $n=11$ ), elk ( $n=1$ ), cervid ( $n=77$ ), large mammal ( $n=27$ ) and ungulate ( $n=1$ ) all represented. The remaining material derives from wild boar ( $n=4$ ), beaver ( $n=2$ ) and roe deer ( $n=1$ ) and a single fragment from a tetraonid bird species. The assemblage is largely made up of limb elements (femur=5, humerus=12, metacarpal=3, metatarsal=3, metapodial=5, radius=2, tibia=2, tibiotarsus=1, ulna=2, patella=1 and long bone fragments=35; astragalus=2, calcaneus=6, navicular-cuboid=2 and sesamoid=1), as well as smaller quantities of material from the torso (ribs=4, vertebrae=4, pelves=4, scapulae=4), crania (mandibles=3 and loose teeth=9) and antler ( $n=4$ ). Two specimens, the astragalus and calcaneus of an aurochs, were found articulated in the ground. 11.5% ( $n=24$ ) of the assemblage exhibits evidence of human modification with a mixture of spiral fractures, percussion breaks and evidence of longitudinal splitting. There are also eight specimens that appear to have been exposed to heat, and these are mostly to the north-east of the eastern structure. Taken together, the assemblage is very suggestive of mixed occupation waste, particularly butchery debris (due to the large number of fragmented limb elements), processing waste (ribs, vertebrae, scapulae and podial elements) and possibly tool/artefact production waste (longitudinally split bones, antler fragments, beaver mandibles and deer loose teeth). The lithic evidence, particularly from refitting, indicates that while in situ activity is present in this area, a significant component is likely to represent debris cleared out from the eastern structure (see Chapter 8).

Some degree of patterning can be observed in this large scatter of material. Wild boar remains appear to be focused around the area of the eastern structure, with five of the seven fragments recorded within 1.5 m of the outer set of postholes (Figure 7.8). Two of these are in an area where lithic material cleaned out of the eastern structure was deposited (see Chapter 8). As very little wild boar material can be identified to element it is not possible to say anything more about this pattern. An area with a higher concentration of aurochs bone is located further to the north-west. This consists of 12 fragments forming a broadly linear alignment approximately 2.5 m long (Figure 7.8: aurochs cluster). The fragments that can be identified to element derive mostly from limbs (humerus, metatarsal, astragalus and a long bone fragment); though other parts of the skeleton (the scapula and vertebrae) are also present. There is a spiral fracture on the humerus fragment. This material could potentially represent an episode of butchery or processing of an aurochs carcass.

Two more clusters of material are present to the north (Figure 7.7: northern cluster 1 and 2), and may represent discrete episodes of activity, each of which resulted in the deposition of a small assemblage. Though the poor preservation of the material makes it difficult to determine the precise nature of these activities, the assemblage appears to be consistent with butchery or the processing of animal remains for dietary or craft purposes. The first (northern cluster 1) consists of four very poorly preserved specimens, none of which can be identified to species and only one of which can be assigned to a skeletal element (a fragment of long bone). The second cluster (northern cluster 2) consists of eight specimens, three of which can be identified to taxon or element (a red deer distal tibia epiphysis, an aurochs tibia midshaft fragment and a fragment of large mammal tibia midshaft). Of these the fragment of large mammal tibia exhibits a spiral fracture to one edge and the red deer distal tibia fragment has also been removed from the main body of the element by a spiral fracture.

To the west of the main concentration of bone and antler is a more diffuse spread of material (Figure 7.7: west scatter). This consists of 31 specimens (29 bone and two antler). Only eight can be identified to species: red deer ( $n=5$ ), aurochs ( $n=2$ ) and elk ( $n=1$ ). A further eight can be assigned to broad taxonomic categories: bovid sp. ( $n=2$ ), cervid sp. ( $n=1$ ), large mammal ( $n=2$ ), large ungulate ( $n=1$ ), ungulate ( $n=1$ ) and bird ( $n=1$ ). There is a mix of elements representing all areas of the body; cranial elements are represented by a partial mandible, maxilla, and two loose teeth, a fragment of the occipital and a pedicle, as well as an antler tine and a



**Figure 7.8:** Distribution of wild boar and aurochs around the central and eastern structures (Copyright Star Carr Project, CC BY-NC 4.0).

fragment of compacta. Limb bones are also present (a tibia, two long bones, a second phalanx, an astragalus, a metatarsal and a metapodial fragment), as are bones of the torso (a fragment of pelvis and a lumbar vertebra). Of these, only three fragments (two unidentified fragments and a bird species long bone) exhibit evidence of being heat affected.

## The wetland

### Overview

This section relates to the wetland deposits but excludes material associated with the detrital wood scatter or Clark's area, as these are different in character and will be discussed separately. Generally speaking, faunal material was found in small quantities across much of the wetland area, though with slightly higher concentrations in the areas around the central and eastern platforms. However, none of this material lay directly on top of the timbers and therefore was not necessarily associated with their use. The preservation in these deposits was very variable and there was a large number of bone and antler specimens that exhibited evidence of demineralisation, compression, warping and splitting.

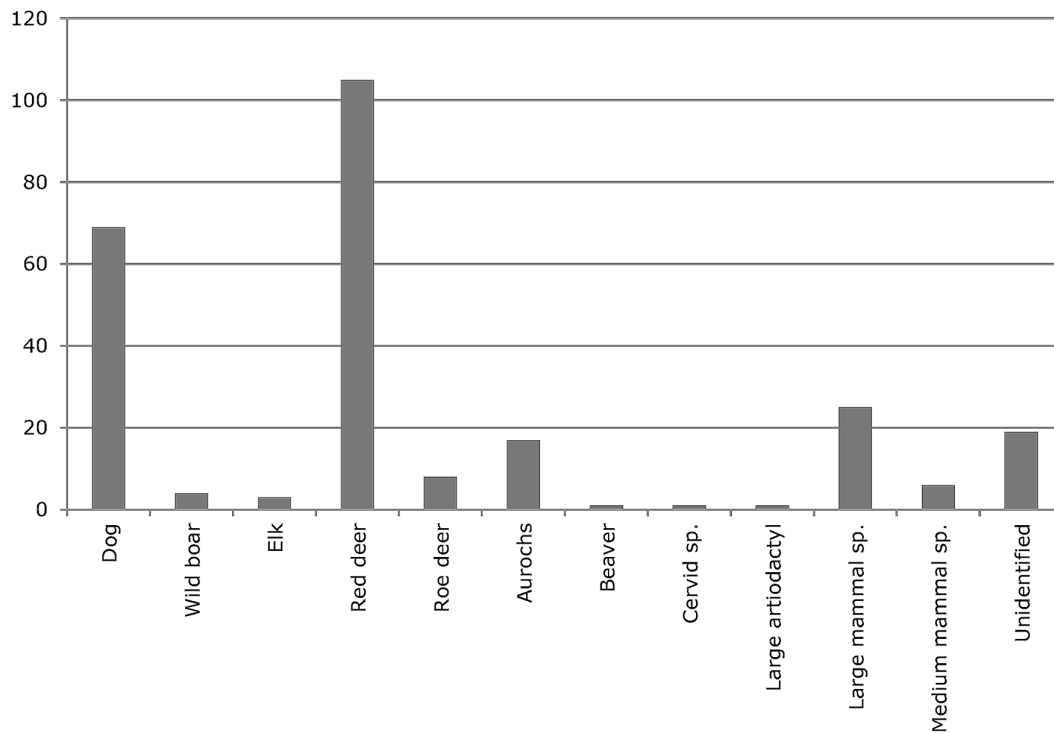
A total of 62 specimens of antler and 198 specimens of bone were recovered from the main trench (Figure 7.9). The most dominant species by far was red deer ( $n=105$ ) followed by dog ( $n=69$ ), aurochs ( $n=18$ ), roe deer ( $n=8$ ), wild boar ( $n=4$ ), elk ( $n=3$ ) and beaver ( $n=1$ ). There were also several specimens that could not be identified to species: large mammal ( $n=26$ ), medium mammal ( $n=5$ ), cervid species ( $n=1$ ) and large artiodactyl ( $n=1$ ). Nineteen specimens could not be identified to taxon or element due to poor preservation.

In addition, a further nine specimens were recorded from other areas of the site, beyond the main trench: two from test pit SC18 and six from test pit SC20, both at the end of the peninsula and one from SC29 in the

field to the north of the Hertford Cut, which had become demineralised (Table 7.1; see Figure 3.3 for trench locations). Of these remains, all of the long bone specimens exhibited evidence of human modification in the form of spiral fractures and percussion breaks. One specimen of red deer tibia midshaft from SC20 also exhibited evidence of carnivore modification: the breakage to the proximal end was uneven and was accompanied by tooth marks and tooth scores. Due to the small numbers and spread of these remains it is not possible to identify any clear patterns of distribution; however, it is of interest that the evidence for the deposition of faunal remains is spread across the wider landscape.

| Test pit | Species      | Element      | NISP |
|----------|--------------|--------------|------|
| SC18     | Red deer     | Metatarsal   | 1    |
| SC18     | Unidentified | Unidentified | 1    |
| SC20     | Red deer     | Tibia frag.  | 1    |
| SC20     | Red deer     | Femur frag.  | 2    |
| SC20     | Red deer     | Astragalus   | 1    |
| SC20     | Large mammal | Tibia frag.  | 1    |
| SC20     | Unidentified | Unidentified | 1    |
| SC29     | Unidentified | Unidentified | 1    |

**Table 7.1:** Animal bone data retrieved from test pits elsewhere on the site.



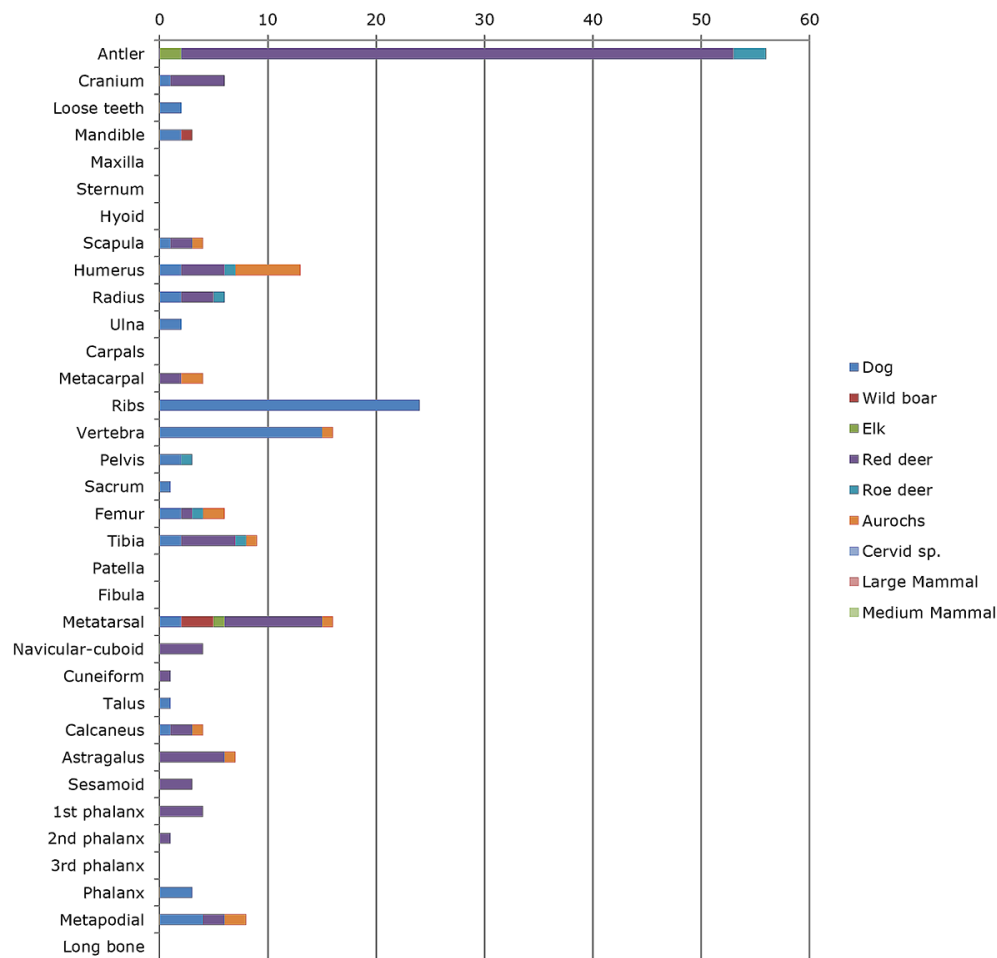
**Figure 7.9:** NISP values for the wetland (Copyright Star Carr Project, CC BY-NC 4.0).

### *NISP by elements*

Dog is represented by the full range of body parts, though some of the small bones such as podial elements (carpals, tarsals and metapodials) are lacking (Figure 7.10). Red deer is mainly represented by cranial elements (including antler), long bones and podial elements. There is a distinct lack of elements from the torso (pelvis, sacrum, ribs and vertebrae) for the majority of species. Aurochs is mostly represented by long bones and podial elements (though a fragment of scapula and pelvis is also present). Roe deer is represented by long bones and antler, and a fragment of pelvis. The remaining taxa are represented by small numbers of skeletally unrelated elements, although both wild boar and beaver are represented by at least one mandible each. The majority of the missing elements are gracile and small (sternum, hyoid, carpal, patella, fibula and third phalanx) and could easily have been lost through post-depositional movement in areas that may have been at least seasonally submerged, or through preservation issues.

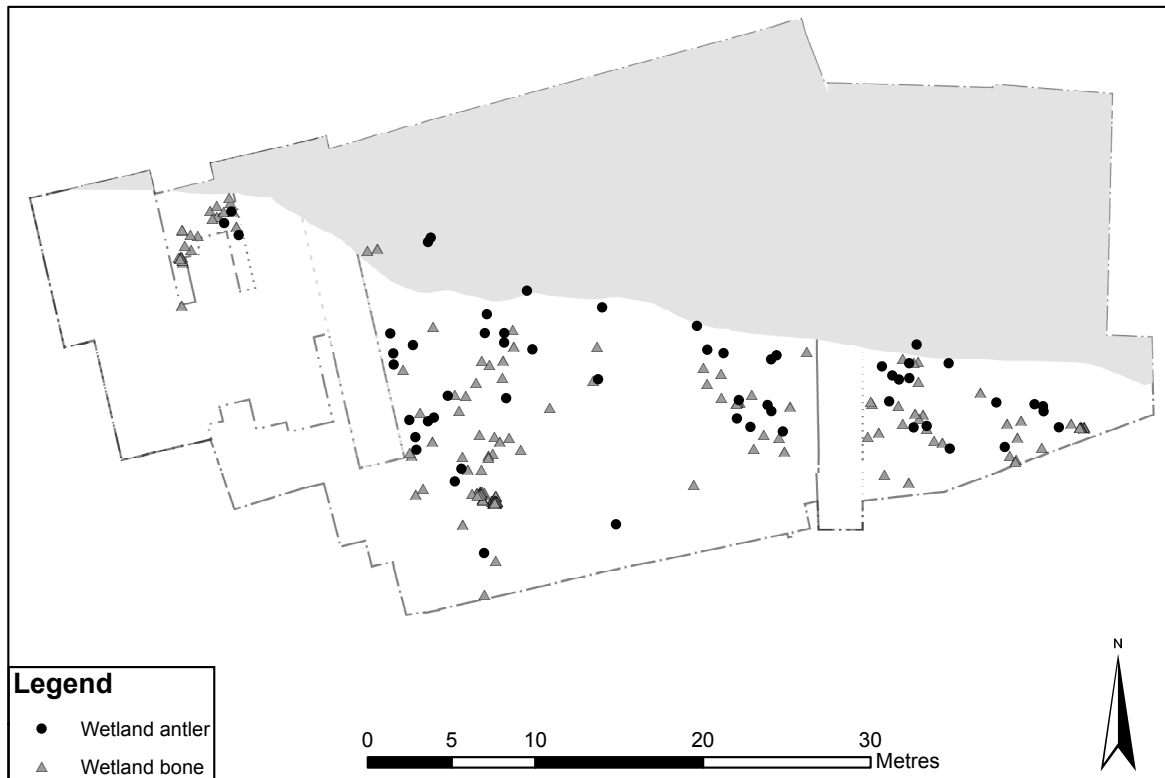
### *Discussion*

Broadly speaking, the bone assemblage consists of relatively diffuse scatters of fragmentary material, mostly from the lower limbs, few of which had clear anatomical associations with other elements in the same area. A high proportion ( $n=83$ , 32%) of this material exhibits signs of human modification, mostly spiral fractures and longitudinal breaks. If the almost complete skeleton of the dog is discounted from these calculations, the percentage of modified material increases to 44%. This, along with the highly fragmented nature of the material is suggestive of debris associated with dietary processing.



**Figure 7.10:** NISP values for the wetland for the main species represented on the site (Copyright Star Carr Project, CC BY-NC 4.0).





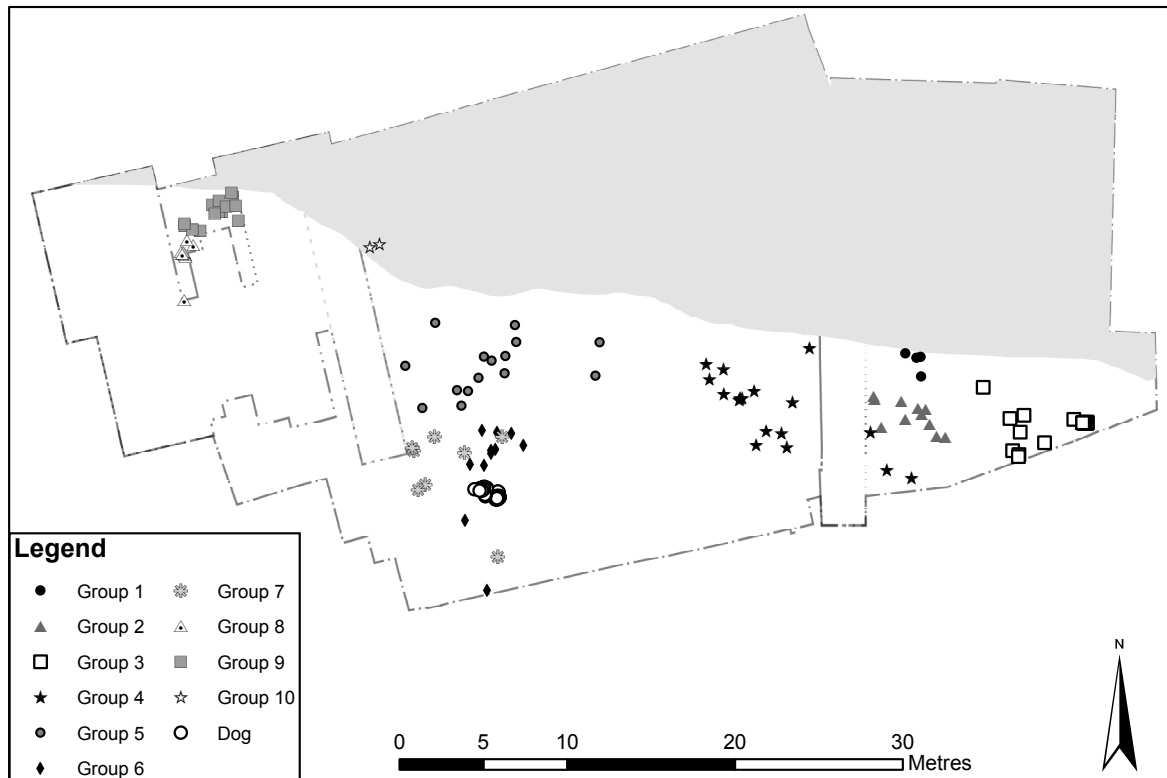
**Figure 7.11:** Plot of the distribution of the wetland bone and antler (Copyright Star Carr Project, CC BY-NC 4.0).

The largest concentration of material occurs in the east of SC34, in the area around the eastern platform and the sediments just to the north (Figure 7.11). The material was found in several areas within this part of the site, and probably reflects chronologically separate deposits. The first is located just to the north of the platform (Figure 7.12: group 1) and consists of the proximal half of a large mammal metapodial, the distal end of an aurochs metapodial, a fragment of unidentifiable bone and a very compressed frontlet <113901> (Chapter 26). Both metapodial fragments have their ends removed by percussion breaks.

A larger assemblage, consisting of a wider range of elements, was recorded above the eastern platform (Figure 7.12: group 2). This consists of red deer (the distal end of a humerus, the distal end of a metapodial, and half of an antler frontlet <113732>), roe deer (the proximal end of a radius, and a fragment of midshaft of a tibia), elk (a partial metatarsal), beaver (a partial mandible consisting of partial mandibular ramus and dental arcade lacking teeth), large mammal (a fragment of tibia midshaft and a fragment of rib midshaft) and medium mammal (a fragment of metapodial midshaft and a long bone fragment). All of the long bones had either percussion breaks, spiral fractures, or a mixture of the two, probably for the purpose of extracting the marrow and fats. An attempt had also been made to longitudinally split the tibia fragment, and the beaver mandible has been modified (the ascending ramus removed) by a percussion break, both suggesting preparation for tool production.

A separate spread of faunal remains was found to the east of the eastern platform (Figure 7.12: group 3), consisting mostly of long bones and podial elements. Of these, the majority derived from red deer (a complete scapula, a fragment of tibia midshaft, the proximal end of a metatarsal, a fragment of metapodial midshaft, complete calcaneus, astragalus, two navicular-cuboids, a cuneiform, two first phalanges and three sesamoids). The remains of other species were present but in smaller quantities, notably aurochs (proximal metacarpal, a fragment of distal femur), wild boar (two partial third metatarsals and a partial fourth metatarsal) and large mammal (a fragment of long bone midshaft).

Most of this material has been generated through the butchery and processing of animals. The red deer material occurs in three tight groupings of articulating and semi-articulated elements, all within one metre square. The first consists of a complete calcaneus, astragalus, navicular-cuboid and a lateral cuneiform, whilst the second group is made up of two complete first phalanges and three sesamoids. All of these elements are sided to the right and probably represent the removal and deposition of the lower foot of a red deer (Figure 7.13).



**Figure 7.12:** Plot of the different groups of bone as described in the text (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.13:** Articulated calcaneus, astragalus, navicular-cuboid and lateral cuneiform (top) and articulated first phalanges and sesamoids (bottom) found to the east of the eastern platform (Copyright Star Carr Project, CC BY-NC 4.0).

The third group was found slightly lower within the sediments and consists of the proximal end of a metatarsal and a fragmentary navicular-cuboid. The distal half of the metatarsal also shows evidence of having been removed by a spiral fracture and an attempt at longitudinal splitting has occurred. As the metatarsal and navicular-cuboid were found later and the navicular-cuboid is a repeating element, this suggests these remains may belong to a separate deposition stage. In addition, there is evidence for percussion breaks, spiral fractures or a combination of the two on all of the remaining long bone fragments within this area, and the aurochs femur and the red deer tibia, metatarsal and metapodial fragment were all longitudinally split. These episodes of butchery and deposition are not contemporary as the groups of articulating and semi-articulated red deer elements occur within the wood peat (310), and represent a stratigraphically later event than the other material, all of which was deposited into the fine detrital mud (317) and reed peat (312).

Similar assemblages of material were recorded from other parts of the wetland. In the area above the central platform (Figure 7.12: group 4) was a spread of faunal remains consisting of red deer (two fragments of distal humerus, a complete astragalus, a complete but fragmentary navicular-cuboid, a fragment of metacarpal midshaft, the proximal end of a metatarsal and the proximal end of a radius) as well as aurochs (a fragment of midshaft and two distal humeri, a partial calcaneus and a complete astragalus) and the proximal end of a roe deer femur, a fragment of large artiodactyl tibia midshaft and a fragment of medium mammal humerus and rib. Of these, all but one of the long bones are modified by spiral fractures or percussion breaks (potentially for marrow extraction) and one fragment of red deer metacarpal and aurochs humerus are longitudinally split, which is suggestive of preparation for tool production. The lithic evidence indicates that the repair, maintenance and use of adzes was a major task in this area and these elements may have been caught up in similar activities.

Similarly, in the area above the western platform, there was a fairly diffuse scatter of 16 specimens, mostly the limb elements (long bones, metapodials and astragali) of red deer and aurochs (though fragments of red deer pelvis and crania were also present), as well as a roe deer pelvis (Figure 7.12: group 5). Seven specimens exhibit evidence for human modification; notably spiral fractures, percussion breaks and longitudinal splitting. This suggests this spread is the result of a mixture of marrow-extraction activities and tool production.

Animal bone was also recovered from the deposits of marl to the south of the platform (Figure 7.12: group 6), and in the overlying wood peat (Figure 7.12: group 7). This latter group consisted of red deer (partial scapula, distal end of a tibia, partial proximal end of a metatarsal and a complete astragalus), aurochs (a fragment of femur midshaft and a partial metatarsal) and large mammal (spinous process of a thoracic vertebra and a fragment that could not be identified to element). Four of the eight specimens (all long bones) exhibited human modification in the form of spiral fractures and percussion breaks for marrow extraction and two specimens (aurochs metatarsal and red deer metatarsal) were longitudinally split, most likely for tool production.

Comparable forms of activity can also be seen in the material recorded in the area to the north of Clark's excavations. Again, the faunal material occurs in different stratigraphic units and represents separate episodes of activity undertaken at different times. The earliest episode is represented by material from the reed peat (312) and consists of the elements of the left hindlimb of a red deer (a fragment of distal femur, a fragment of distal tibia, a complete astragalus, a partial calcaneus, partial navicular-cuboid, the proximal end of a metatarsal, two complete first phalanges and the proximal end of a second phalanx) (Figure 7.14), two large mammal specimens (a fragment of long bone and a fragment of neural arch of cervical vertebra) and an unidentified fragment that could not be identified to species or element (Figure 7.12: group 8).

The red deer specimens occur within a small area, less than 0.5 m across, were all from the left side of the body and four elements were still articulated in the ground (the calcaneus to the astragalus and the two first phalanges). As such, they probably represent a single limb. Five of the specimens exhibit evidence of human modification: the femur fragments retain a spiral fracture; the distal tibia has been removed from the main body of the element by a percussion break and resultant spiral fracture; the distal half of the metatarsal has been removed by a percussion break and resultant spiral fracture; and the calcaneus has a clear percussion break to its proximal end even though it was still articulated to the astragalus. Taken together, the material probably represents a discrete episode of activity in which one complete leg was utilised for meat and marrow and then the elements were discarded together. The large mammal long bone, which lay less than a metre to the north-east, also has a percussion break to one end and represents a further episode of dietary processing.

Stratigraphically later than this material is a spread of bone from the overlying wood peat (310). This consists mostly of fragments of the limb bones of aurochs (fragment of a metapodial midshaft), red deer (distal end of a metatarsal), roe deer (distal end of a humerus), as well as unidentified large mammal (indeterminate long bone





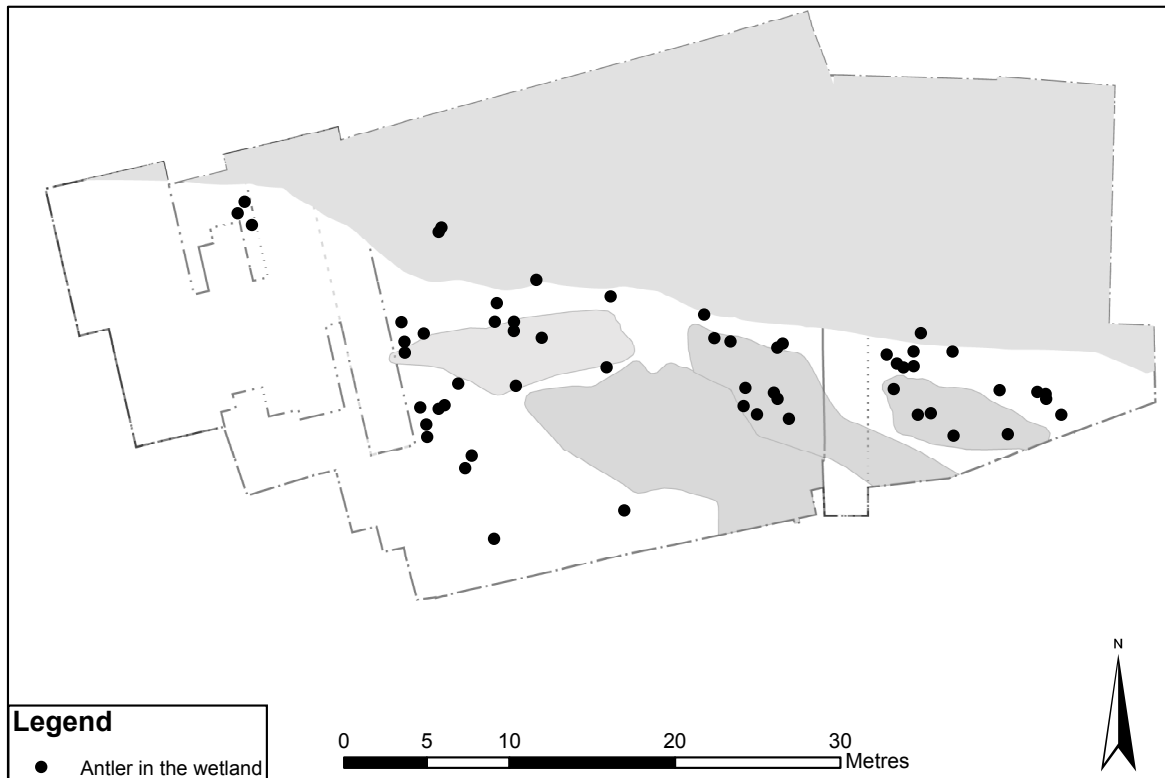
**Figure 7.14:** Semi-articulated red deer hindlimb found to the north of Clark's excavations (Copyright Star Carr Project, CC BY-NC 4.0).

fragments), though fragments of rib and part of a mandible (alveolar), both from an unidentified large mammal were also present, whilst three small fragments could not be identified to species or element (Figure 7.12: group 9). With the exception of two unidentified fragments, all the specimens were humanly modified by either percussion breaks or spiral fractures as a result of marrow and fat extraction, or represented small fragments of bone debitage from percussion breaks. Interestingly, this includes the large mammal rib fragment, which appears to have been longitudinally split, possibly as part of tool production.

Two further specimens of bone were found within the wood peat (310) on the very edge of the lakeshore, just to the east of Clark's excavations (Figure 7.12: group 10). They consist of a fragment of large mammal long bone and a fragment of red deer metacarpal midshaft. Both are humanly modified, with the long bone fragment exhibiting a spiral fracture and charring to one edge, and the metacarpal fragment having been longitudinally split.

Antler has a similar distribution to the bone and was produced largely through the deposition of waste resulting from the working of the material (Figure 7.15). To the east of the site, two clusters of antler were recorded just to the north of the eastern platform. Of these, one consisted of seven fragments and formed a scatter around a highly compressed red deer frontlet <113901>, with a second concentration of four more fragments lying close by. A further four fragments of material (3 sections of beam and a piece of compact tissue) lay within the peat that had formed above the platform. Of these, three pieces (one from above the platform, and two from the area to the north) exhibit traces of groove-and-splinter working. However, preservation in this area was poor, and more of the material may have been worked.

Comparable assemblages are recorded from other parts of the wetland. Thirteen fragments of antler of mostly red deer, but also elk and roe deer, were recorded from the peat above the western platform. The red deer antler consists of five sections of beam, a tine, two fragments of compact tissue and two pieces that cannot be identified to species. None of the material exhibits evidence for working, although preservation in this area was poor, which made positive identification difficult. However, the material was generally very small and may



**Figure 7.15:** Antler within the wetland (Copyright Star Carr Project, CC BY-NC 4.0).

reflect debris from antler working in the area. Part of the beam and crown of a roe deer antler and two fragments of elk antler (one of which exhibits evidence for groove-and-splinter working) were also present in this area. A further 11 pieces of red deer antler (seven beam sections, three tines, a fragment of compact tissue) and four pieces of material identified only as antler were found in the peat over the central platform, of which eight show evidence for working using the groove-and-splinter technique. A pedicle fragment and two frontlets, also of red deer, were also present in this area and may also have derived from antler working.

Whilst the majority of the material from the wetland reflects butchery and dietary waste, and the debris from craft activities, two more unusual episodes of deposition were also recorded from this area. The first is a nearly complete, semi-articulated skeleton of a dog that was deposited into the wetland approximately 12 m from the shore (Figure 7.12). Most of the skeleton was present and many of the elements were found in a semi-articulated state (see Chapter 23: Figure 23.26; Table 23.7). There is very little archaeological material in this area and the remains probably reflect the deliberate deposition of a complete dog carcass into the wetlands. The second is the mandible of a wild boar <109227> found amongst the timbers of the western platform. Whilst this may represent the casual deposition of butchery waste, there is very little faunal material in the immediate area (only three fragments in the surrounding 2.5 m) and no other wild boar remains within 8.5 m. As such, the material may reflect a more deliberate act of deposition, possibly associated with the construction of the western platform (Figure 7.16).

## Detrital wood scatter

### Overview

While the majority of material in the wetlands represents the small-scale discard of dietary and craft waste, there are two areas where deposition of faunal material was both more clearly patterned and focused, and these





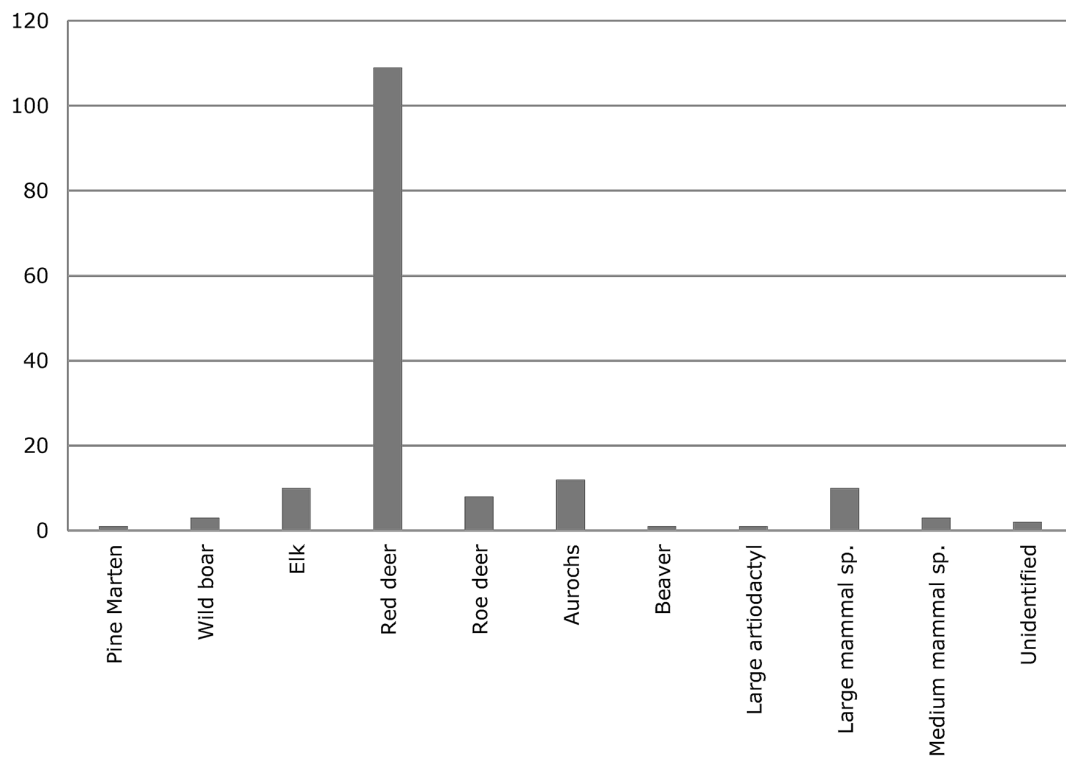
**Figure 7.16:** Wild boar mandible <109227> found within the western platform (Copyright Star Carr Project, CC BY-NC 4.0).

will be discussed in detail. One such area was the detrital wood scatter, representing some of the earliest evidence for activity at the site. The majority of bone was found spread within and to the south-west of the wood scatter, and as was suggested in Chapter 6, this feature may have facilitated the deposition of faunal material into an area of the wetland. The sediment conditions in this area were less extremely acidic than elsewhere on the site: in places pH 5.6, as opposed to pH 2.3 nearby. However, although some bones were relatively well preserved, there were also numerous specimens that exhibited demineralisation, compression, warping and splitting (Chapter 22).

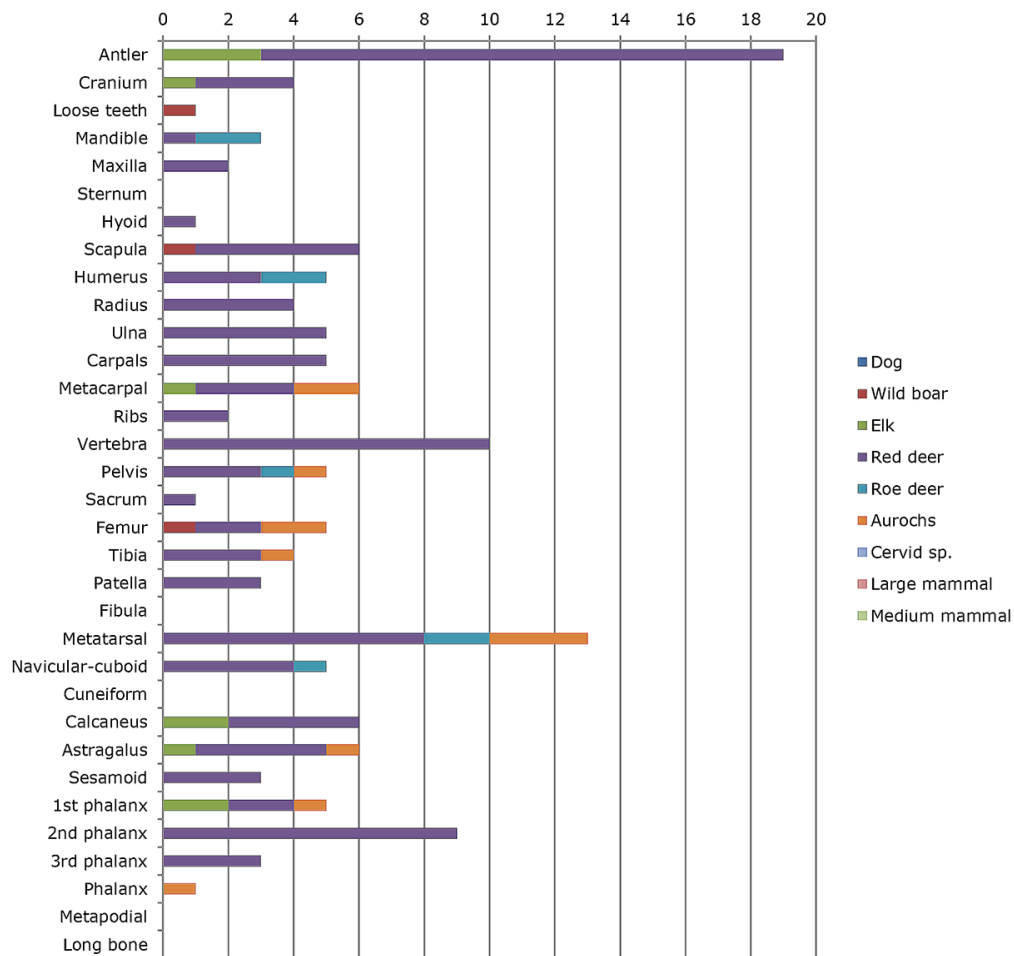
A total of 160 faunal specimens were found in this area of the site (141 specimens of bone and 19 specimens of antler) (Figure 7.17). A range of species have been identified: red deer specimens are most common ( $n=109$ ), followed by aurochs ( $n=12$ ), elk ( $n=10$ ), roe deer ( $n=8$ ), wild boar ( $n=3$ ), pine marten ( $n=1$ ) and beaver ( $n=1$ ). There are several specimens that cannot be identified to species (either due to high fragmentation or poor preservation): large artiodactyl ( $n=1$ ), large mammal ( $n=10$ ) and medium mammal ( $n=3$ ). There are also two specimens that cannot be identified to taxon or element due to the small size of the fragments and therefore have been categorised as unidentified.

#### *NISP by elements*

Red deer is represented by the majority of the elements of the body, though these are not all present in equal proportions (Figure 7.18). Ribs in particular are poorly represented, as are the vertebrae of the lower back (lumbar vertebrae) and neck (cervical vertebrae). Other animals are represented by a more limited range of



**Figure 7.17:** NISP values for the taxa found within the detrital wood scatter (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.18:** NISP values for the detrital wood scatter for the main species represented on the site (Copyright Star Carr Project, CC BY-NC 4.0).

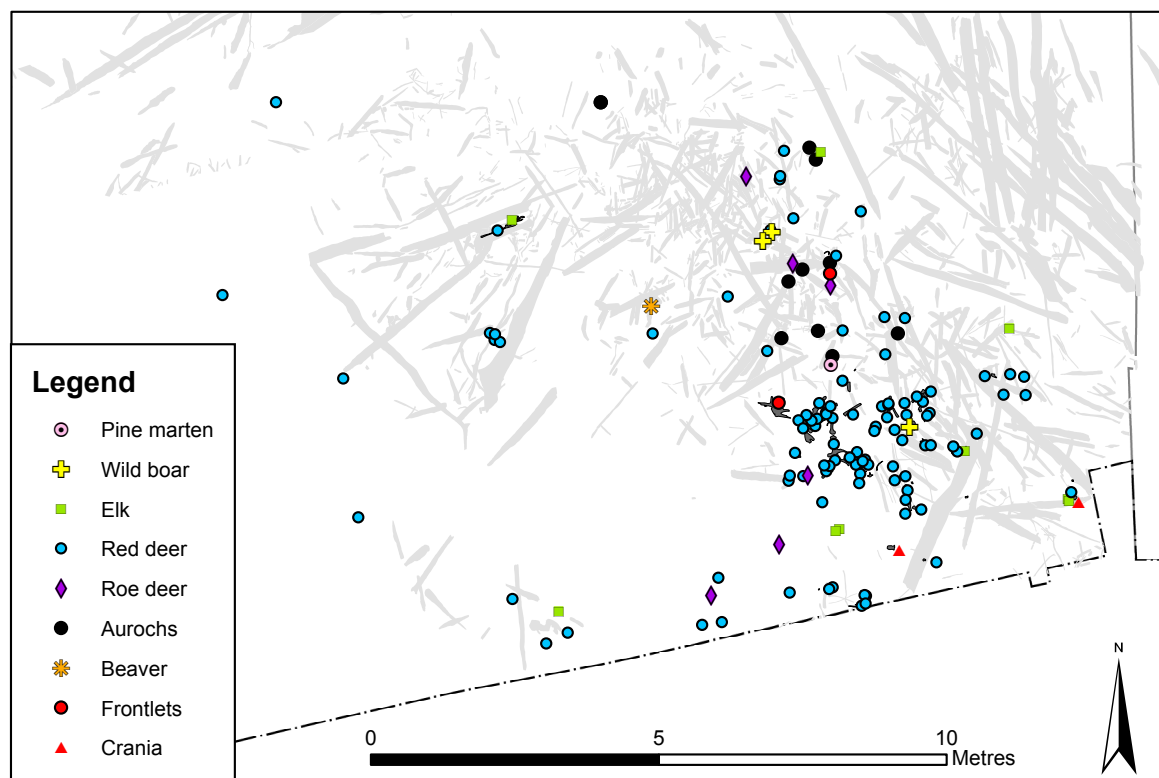
elements from different parts of the body, which occur in small quantities: aurochs by bones of the limbs (though a fragment of pelvis is also present), elk by crania (including antler) and limb elements, and roe deer by podials, pelvis, mandible and humeri. The remaining taxa are represented by individual elements from skeletally unrelated parts of the body.

### Discussion

The faunal material from the detrital wood scatter falls into two main assemblages (Figure 7.19). The first is located towards the southern end of the area and the majority of this material was deposited within a gap in the dense concentration of wood (Figure 7.20). This southern scatter consists of substantial parts of the bodies of several red deer, some of which were deposited in an articulated state, along with smaller quantities of elk bone (including a cranium and phalanges). The rest of the assemblage is scattered across the northern half of the detrital wood scatter and to the west and consists of smaller quantities of red deer (podial elements, phalanges, antler, long bone, scapula, rib, pelvis), elk (limb elements), aurochs (the hind limbs), and a very small number of roe deer, beaver, wild boar and pine marten.

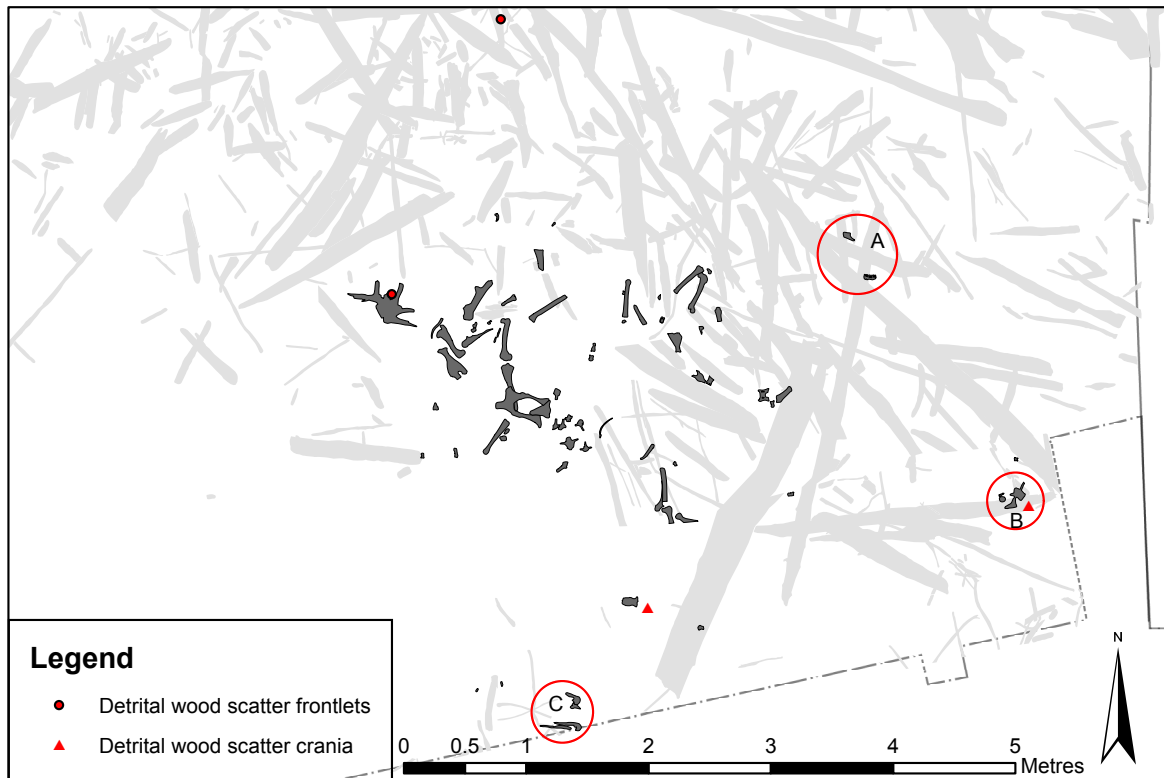
The southern assemblage is made up almost entirely of red deer and consists of four near-complete limbs, along with the remains of several partial limbs, parts of the torso (mainly the thoracic vertebrae and pelvis), and crania (a female red deer skull, a fragment of mandible, and two red deer antler frontlets <99528> and <103625>), and a scattering of other elements (Figure 7.21).

The four near-complete limbs (left and right front limbs, and two left hind limbs) lay within the gap in the detrital wood scatter. The femur and tibia from the left hind leg, and the humerus, radius and ulna from the right front leg were articulated, whilst many of the remaining limb elements lay in a semi-articulated state (i.e. they were in anatomical position but not articulated). Several of the limbs were nearly complete. Of the first



**Figure 7.19:** Distribution of animal remains across the detrital wood scatter (Copyright Star Carr Project, CC BY-NC 4.0).



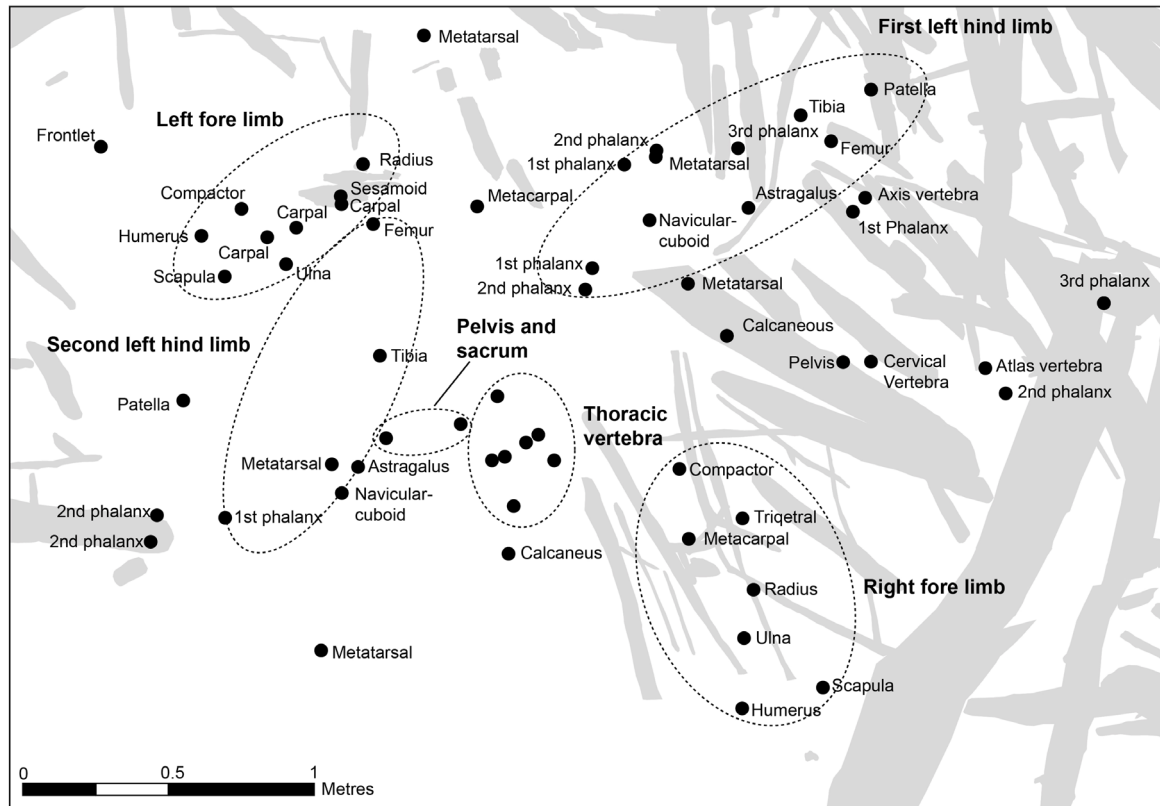


**Figure 7.20:** Plot of the red deer remains found within the gap of the detrital wood scatter and groupings A, B and C, as described in the text (Copyright Star Carr Project, CC BY-NC 4.0).

left hindlimb, the femur, patella, tibia, navicular-cuboid, astragalus, calcaneus, metatarsal, first and second phalanges were present; whilst only the third phalanx and tarsal bones were missing. The second left hindlimb is much more spread out but still in rough anatomical position and consists of femur, tibia, navicular-cuboid, astragalus, calcaneus, metatarsal and first phalanx; whilst some of the phalanges and tarsal bones were absent. The front left limb (including the scapula) was also nearly complete (missing just the phalanges and carpal bones). Most of this material was also semi-articulated with the exception of the radius, which lay 0.25 m from the ulna, and the metacarpal, which lay 0.2 m from the radius. The right front limb was less complete, consisting of the scapula, humerus, radius, ulna, metacarpal and triquetral, but missing most of the smaller podial elements. Two areas of the torso were also found in a semi-articulated state (a scatter of thoracic vertebrae, and a lumbar vertebra, pelvis and sacrum).

In addition, several other elements from different parts of the body, but lacking anatomical relationships, were also present in this area. These consist of limb elements (two right metatarsals and phalanges), the scapula of a large mammal, pelvis (the left side of a second red deer pelvis and the left side of the pelvis of a large mammal), two crania (frontlet <103625> and a female cranium) and a cervical and atlas vertebra. The female red deer cranium (Figure 7.20), found slightly to the south, has a complete braincase but is missing the nasal bones and maxilla, i.e. it has been broken just anterior to the orbits and was also missing the mandible. In addition, a small section of red deer premaxilla and maxilla that refit and contain permanent second and third premolars, and a section of mandible containing a mixed dentition with deciduous third and fourth premolars and a permanent first maxillary molar, were recovered close to this main concentration of material (Figure 7.20: group A).

The only specimens identified to species other than red deer were an articulating right calcaneus and astragalus of an adult elk, a second, unassociated elk calcaneus, a roe deer left humerus, and a possible wild boar scapula. The elk astragalus exhibits a potential projectile wound with no sign of healing. Apart from the



**Figure 7.21:** Distribution of red deer elements within the gap of the detrital wood scatter (Copyright Star Carr Project, CC BY-NC 4.0).

frontlets, the only red deer specimen in this area that exhibits clear signs of human modification is the radius of the front right limb which has cut marks on the midshaft anterior surface. However, the female skull also exhibits a break between the orbits and at the posterior end of the nasal bones there is no palatine bone present but the braincase is complete. Although there are no obvious signs of human modification, the area of the breakage to the front of the skull has begun to demineralise so evidence may have been obscured by this deterioration.

Overall, the faunal material associated with the gap in the detrital wood scatter consists largely of parts of the bodies of at least two red deer (based on the presence of two left hindlimbs), deposited in an articulated state with very little prior manipulation. A significant proportion of this material (three limbs and the thoracic vertebrae) also lay in their correct anatomical positions in relation to each other; the left and right forelimbs and shoulders lay next to each other with the scatter of semi-articulated thoracic vertebrae between them, whilst one of the left hind legs lay on the same side as the left front leg. The position of these parts of the body in the ground is consistent with the deposition of a partial carcass in a supine position. However, a significant portion of the animal is missing, notably, much of the spine (six thoracic vertebrae, five lumbar vertebrae, cervical vertebrae and caudal vertebrae), the cranium and the rear right leg. In addition, the articulating pelvis, sacrum and thoracic vertebrae are out of position and the second left hind limb clearly represents a separate individual.

There are three ways in which this could be interpreted. The first is that much of the assemblage represents the deposition of a complete red deer carcass, placed in a supine position in the lake. As it decomposed the body broke apart and the actions of the water moved the pelvis towards the thoracic vertebrae, whilst the

**Figure 7.22 (page 145):** The elk skull <108941> in situ (Copyright Star Carr Project, CC BY-NC 4.0).



missing elements (the right hindlimb, ribs, and lumbar vertebrae) moved outside the excavated area. The head may also have moved out of position and could be represented by the female cranium recorded to the south, or may have been removed prior to deposition (and potentially replaced with the frontlet that was recorded just to the west). Subsequently, further material, including a second complete limb, was deposited into the same area. However, this scenario does not explain the cut marks on the midshaft of the right radius, unless these were caused during the hunting and killing of the animal.

The second is that separate parts of the bodies of two or more red deer were deposited into this area, and represent an attempt to reconstruct (or at least to represent) a single animal. The repeating left hindlimb would suggest that it was the number of limbs that was important, not the fact that they came from the same animal. Similarly, the incompleteness of the carcass (notably the missing ribs and vertebrae) may reflect elements that were not deemed necessary in the representation of the animal.

The third interpretation is that the assemblage reflects separate episodes of deposition where large parts of different animals were deposited at this location, potentially at different times. Unfortunately, there is not enough evidence to argue more strongly for one scenario over the other: stable isotope results could not distinguish between individual bones and the antler frontlet in terms of diet (see Chapter 23: Table 23.11). In addition, although metrics were taken, the proportions of these remains are very similar and there is no clear distinction between individuals.

To the south of the gap in the detrital wood scatter are two discrete scatters: group B and group C (Figure 7.20). Group B is composed of the cranium of a juvenile male elk, two elk phalanges (which articulate), and a red deer sesamoid (Figure 7.20: group B). The elk skull is made up of partial antlers (palmate portion with missing tines), a partial frontal bone with the breakage occurring just in front of the orbits and a complete braincase (Figure 7.22). A partial maxilla was found in close proximity to the skull. These were not articulated, but the





size, robusticity and close proximity of the two suggests they would have originated from the same individual. The palatine bone of the elk skull was also found in close proximity but was not articulated.

Within group C (Figure 7.20), a partial humerus, two partial radii (one proximal end, one mid shaft which may have derived from the same element), an ulna and a number of phalanges of a red deer were found in a small cluster, probably representing a partial right forelimb, with four metatarsals, a scapula and a hyoid bone nearby. The humerus, both radii and all four metatarsals exhibit evidence for human modification in the form of percussion breaks, spiral fractures or a combination of the two. In addition, the ulna shows signs of being chewed by a carnivore.

The faunal remains from the rest of the detrital wood scatter are much more diffuse and more indicative of the deposition of waste deriving from the butchery, dietary processing (particularly the extraction of marrow or fat) and craft activities such as antler working. As in the area around the gap in the wood scatter, the specimens largely consist of red deer although a wider range of species are also present; mostly aurochs, but also pine marten, wild boar, roe deer, and elk (Figure 7.19).

The specimens either occur individually or in much smaller articulating groups that generally involve the bones of the ankle or podial elements and phalanges. The red deer assemblage consists of antler, much of which has been worked, as well as limb elements which includes a semi-articulated ankle (navicular-cuboid, calcaneus, astragalus and sesamoid). The aurochs are represented by a similar range of limb elements, two of which (a metatarsal and the first phalanx) were articulated, whilst roe deer are represented by limb bones and one mandible fragment.

There is also evidence of antler working (Chapter 24). Amongst red deer remains are four fragments of beam and one tine showing groove-and-splinter antler working, plus five beams which have been trimmed. Two pieces of elk antler have also been worked, one as an elk antler mattock preform. In addition, there is a number of the bones that exhibit signs of human modification: 24 percussion breaks, 17 spiral fractures, 2 longitudinally split bones (aurochs metatarsal and red deer metatarsal) and a red deer radius and tibia with cut marks. Out of the 24 percussion breaks, 20 are on long bones (humerus, radius, ulna, metacarpal, femur, tibia, metatarsal), and four are on a calcaneus, mandible, rib and first phalanx. The majority of this patterning suggests breakage for marrow extraction. The longitudinally split bone is likely to have occurred for tool production. The cut marks are likely to be the result of skinning or meat removal. Overall, this assemblage probably represents material gathered together from tasks involving the processing of animal bodies, which have then been deposited into the lake.

### Clark's area

This section relates to the previously unexcavated baulk between Clark's cuttings I and II and the area to the south of Clark's trenches. The assemblage from within the baulk formed a very dense concentration of material, with smaller concentrations present just beyond the southern edges of Clark's trenches (Figure 7.23). The density of material fell to the south, where a more diffuse scatter of bone and antler was recorded. The preservation of the assemblage in this area was much better than in other parts of the site, possibly due to the buffering effect of the neutral pH backfill and the area of calcareous marl to the south (see Chapter 22).

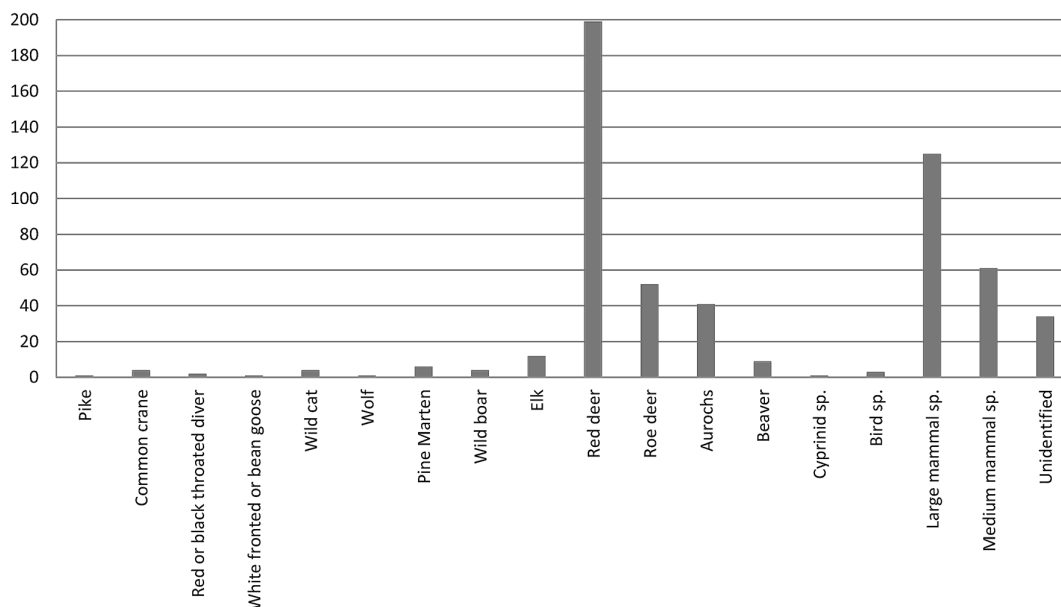
A total of 560 specimens were recorded from this area; 519 bone and 41 pieces of antler. Of these, just over half (298 specimens, 53% of the total) came from the baulk between cuttings I and II: an area of approximately 4 × 1 m. The most dominant species is red deer (162 bone and 37 antler specimens), followed by roe deer (49 bones and three pieces of antler), aurochs (41 bones) and elk (12 bones). There are a number of species which have less than five specimens: beaver, pine marten, wild boar, wild cat, wolf, common crane, red- or black-throated diver, white-fronted or bean goose and pike. Of these, wolf, common crane, red- or black-throated diver, and white-fronted or bean goose were only found in this area of the site. In addition, two specimens of fish were identified; a pike posterior abdominal vertebra and a pharyngeal bone belonging to a cyprinid fish (Figure 7.24).

**Figure 7.23 (page 147):** Tightly packed faunal remains in Clark's baulk area, along with wood and flint (Copyright Star Carr Project, CC BY-NC 4.0).









**Figure 7.24:** NISP values for the faunal remains in Clark's area (Copyright Star Carr Project, CC BY-NC 4.0).

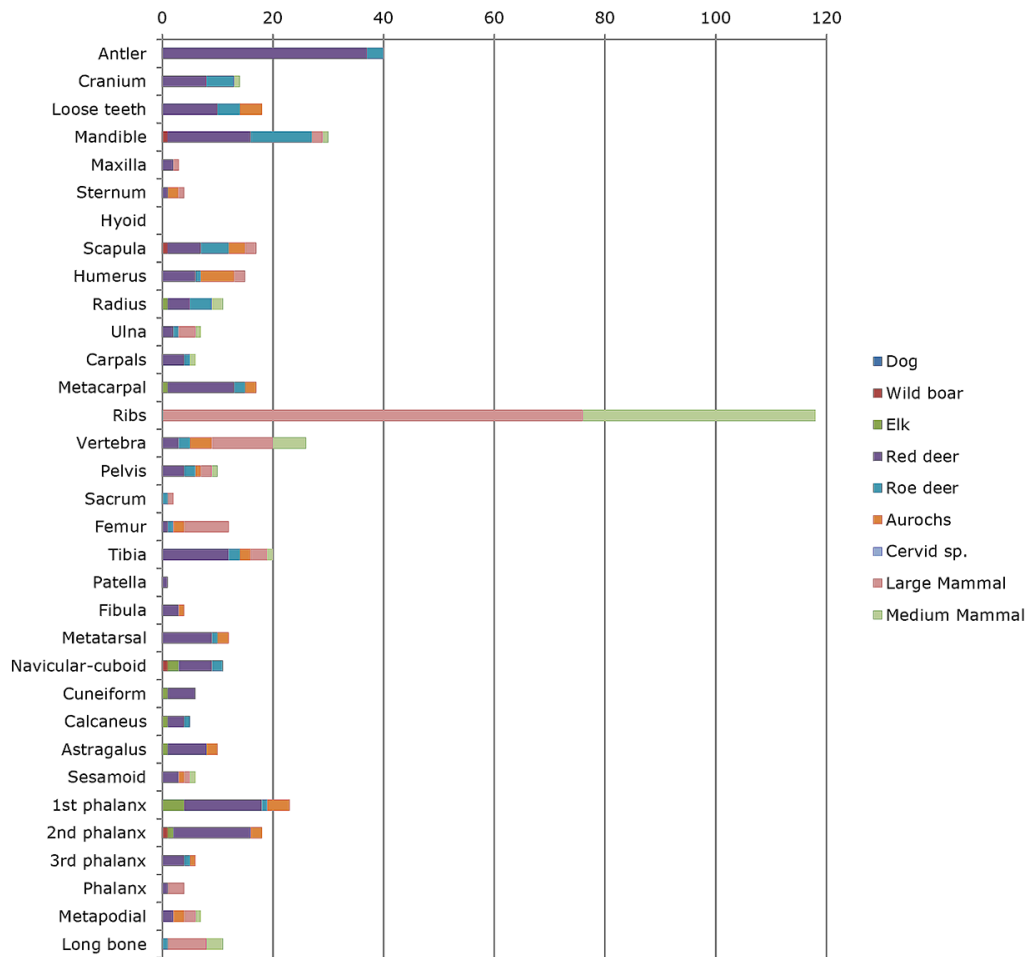
#### *NISP by elements*

Overall, ribs have the highest representation ( $n=118$ ), followed by antler, whilst most of the other elements are represented by fewer than 20 specimens (Figure 7.25). The only element which is not represented is the hyoid, although these are very fragile and are unlikely to survive well. For red deer, the assemblage represents most elements of the skeleton with fragments of limbs, torso and crania all present. There is a strong emphasis on the lower parts of the limbs (particularly the tibia, podial elements, phalanges and small bones of the ankle), the mandible, and antler, whilst the torso is poorly represented, consisting of small quantities of fragments of pelves and vertebrae. However, fragments of femur identified as large mammal were present, as were large quantities of ribs, both of which may derive from red deer. The other larger mammals are represented by smaller quantities of material and are less representative of the whole skeleton. Roe deer are largely represented by crania, torso (pelvis) and limbs, with the crania (which are represented by frontlets and a large fragment of skull) better represented than limb and podial elements. Elk are represented only by limb elements, which is in contrast to the material recorded by Clark, where the species is represented by a far greater range of elements (Legge and Rowley-Conwy 1988, 105).

Other species are represented by sparser quantities of material, showing little patterning in terms of particular parts of the body. Beaver, for example, are represented by very low numbers of fragments of mandibles, scapulae and limb elements, whilst for wild boar podial elements as well as scapula and mandibular fragments are present. Of the smaller mammals, pine marten is represented by complete limb bones (radius, ulna, and tibia) and pelvis, all of which occur singly, and two complete vertebra. Wild cat shows a similar pattern of complete elements, with the exception of one radius, which has been deliberately broken. Bird species are represented by single limb bones.

#### *Discussion*

It is important to note that the material from this area represents a sample of the much larger assemblage excavated and recorded by Clark (1954) and subsequently reassessed by Legge and Rowley-Conwy (1988). Unfortunately data on the spatial distribution of this material is not available, but the representation of elements per species from Legge and Rowley-Conwy's dataset should be taken into account, with the caveat that this represents a selectively collected assemblage, with unidentifiable, fragmented mid-shaft elements, representing material that had been smashed for marrow, not retained (see Chapter 23). This is likely to contribute to the low



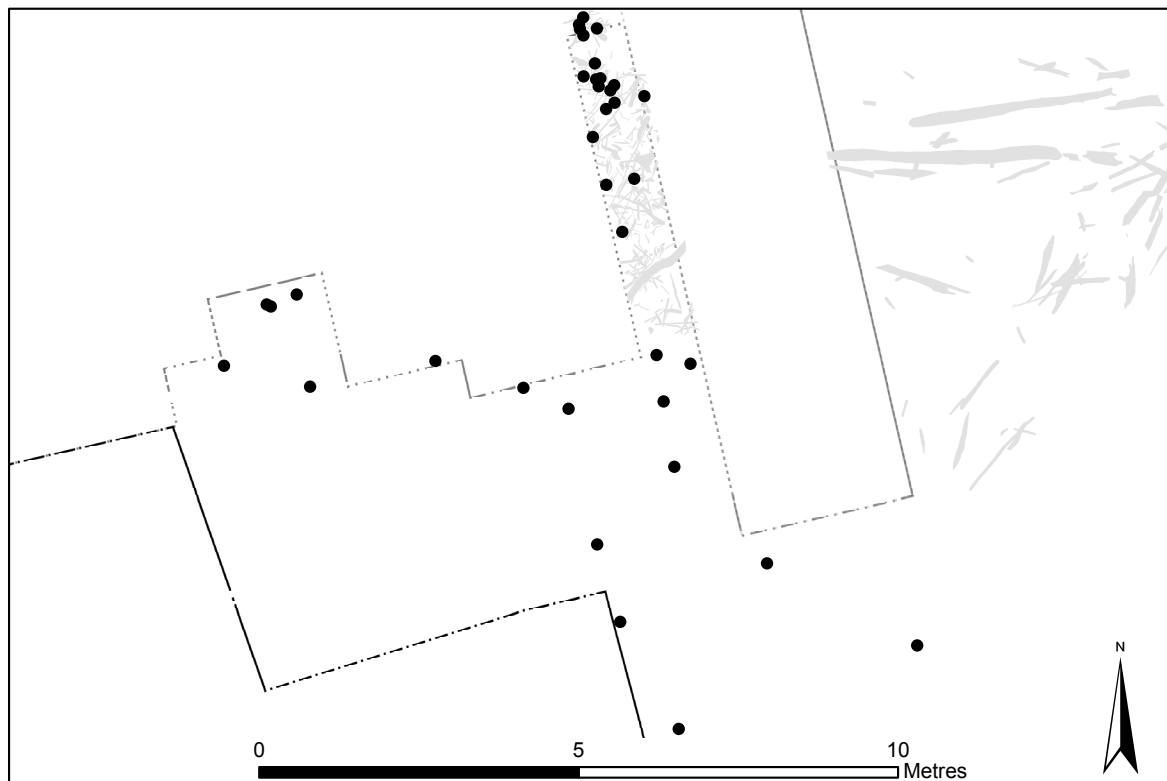
**Figure 7.25:** NISP of elements in Clark's area for the main species represented on the site (Copyright Star Carr Project, CC BY-NC 4.0).

representation of femora and humeri in Legge and Rowley-Conwy's dataset, resulting in their identification of Star Carr as a hunting camp. As Marean and Kim (1998, 88) state: 'most head-dominated and head-and-hooves-dominated patterns in the literature are an artifact of the exclusion of mid-shafts.'

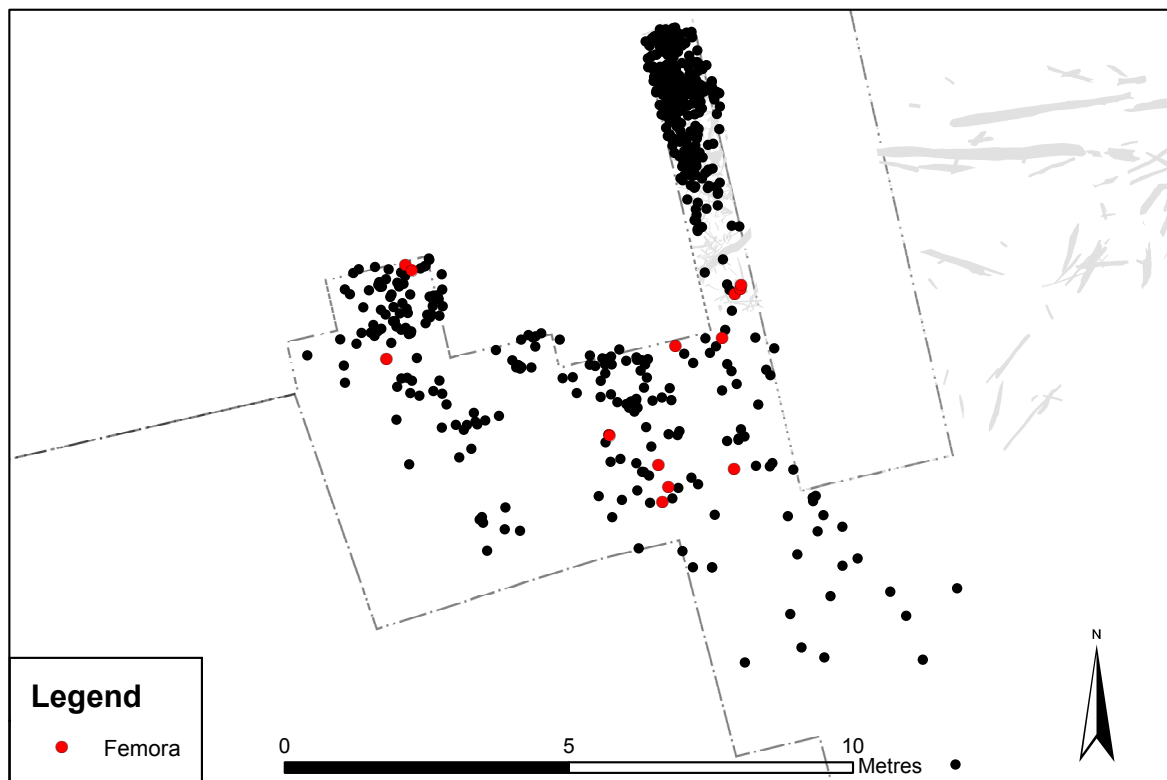
Overall, there is no obvious patterning in terms of species distribution, with the remains of different animals randomly spread across the whole area. In particular there are no discrete dumps of individual species, even for those species that are less well represented such as aurochs (Figure 7.26). There is some possible patterning in terms of the distribution of elements, for instance, podial elements have a higher concentration in the north of the baulk (29% of bones) compared to the south (16%). These derive from a wide range of species (red deer, aurochs, elk, wild cat and wolf). Femora are absent from the baulk but occur in the area to the south of Clark's trenches (Figure 7.27), and there appears to be a gap in the distribution of ribs in the south-east of the area (Figure 7.28). This could, potentially, reflect differences in deposition, though given the relatively small sample that the assemblage represents in comparison to the material recorded by Clark, any such interpretation should be treated with caution.

The number of red deer frontlets is much higher in this area compared with other parts of the site, and four of these were found in the north end of the baulk. It is noteworthy that around one frontlet <115876>, two roe deer crania with attached antlers were found (Chapter 26) (Figure 7.29).

Very little material was recorded in a fully articulated state but groupings of semi-articulated material or concentrations of bones from the same parts of the body were present. The majority of these were the bones of the feet (metatarsal, metacarpal, astragalus, cuneiform, navicular-cuboid and phalanges), though distal ends of the

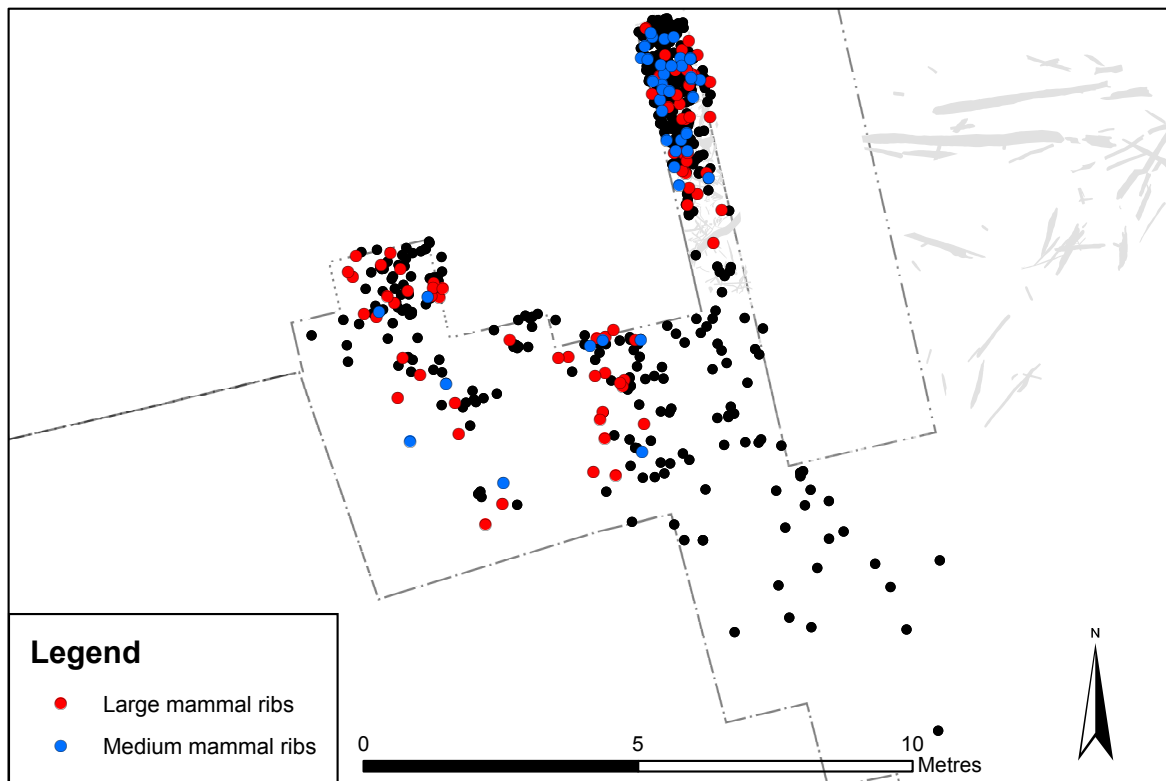


**Figure 7.26:** Aurochs remains within Clark's area (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.27:** Plot of the femora of all species within this area showing representation to the south but none within the concentration in the baulk (Copyright Star Carr Project, CC BY-NC 4.0).





**Figure 7.28:** Plot of the ribs from the area showing an area to the south-east of the area with no ribs at all (Copyright Star Carr Project, CC BY-NC 4.0).



lower limb bones were also present. Most of the material derived from red deer, though clusters of articulated or semi-articulated elk, aurochs and roe deer material were also present. In all cases these groupings of material consisted of small numbers of elements (typically two or three), often in a fragmented state. More occasionally other parts of the body were also present in discrete concentrations.

A significant proportion of the assemblage (57% or 318 specimens) shows evidence for human modifications in the form of percussion breaks, spiral fractures and cut marks. These occur on a large range of elements; the mandible, maxilla, sternum, scapula, humerus, radius, ulna, metacarpal, rib, vertebra, pelvis, femur, tibia, navicular-cuboid, calcaneus, metatarsal and phalanges, and are present on most of the species. In some cases these modifications occurred on material found in a semi-articulated state, suggesting the processing and subsequent disposal of parts of the animal carcass. For example, the distal ends of a metacarpal, and first and second phalanx, as well as a complete third phalanx, all of a red deer were found in small cluster. The proximal head of the first phalanx had been removed by a spiral fracture whilst the mid-section of the first phalanx exhibited evidence of a percussion break. Though the material could not be sided, all the elements were of similar size and may represent the processing of parts of the foot of a single individual. Similarly, the distal ends of two first phalanges and the proximal end of a second phalanx, all of red deer, were found in an articulated state. There were percussion breaks to both first phalanges on their mid shafts, whilst the second phalanx exhibited a spiral fracture that had removed its distal end. Again, this suggests the processing of foot bones, potentially for the extraction of marrow, after which the material was deposited whilst still in articulation. A further 23 bones exhibit signs of longitudinal splitting thought to be associated with tool production.

Cut marks and scoring are also present on some of the specimens, reflecting the defleshing or dismembering of animals. The clearest evidence comes from the scapula of a wild boar where the position of cut marks around the posterior aspect of the glenoid processes probably resulted from the removal of the animal's forelimb. In other cases, cut marks are found on lower limb and podial elements with spiral fractures or percussion breaks and were presumably created during the butchering and processing of these animals. Other parts of the assemblage were generated through the processing of the skull, both for dietary and craft processes. The mandibles of five roe deer have had their ascending rami removed and breakages along the jawline beneath the tooth row caused by percussion breaks, probably for the extraction of marrow, and a mandible of a red deer and a wild boar had been treated in the same way. Score marks were also present on the parietals and around the pedicles of several roe deer crania, probably resulting from defleshing and skinning, whilst several modified red deer antler frontlets were also present. A small proportion of the assemblage (32 specimens) has evidence for animal action (gnawing), including one of the frontlets. However, there is no sign of weathering in contrast to the dryland areas.

Overall, the material from this part of the site (including the material recorded by Clark) represents a dense, roughly circular concentration of bone with a halo of dispersed material around it. There is little evidence from the material excavated in 2015 that there is any spatial patterning in terms of the representation of particular species or elements. Whilst we cannot tell if such patterning existed in the remainder of the assemblage, the fact that the MNI of the main species is very similar to that recorded by Clark (as presented in Chapter 23) supports the suggestion that the overall distribution of species was relatively homogenous. That said, there are some concentrations of material, such as the cluster of red and roe deer frontlets present in the baulk between cuttings I and II, and variations in worked flint that Clark recorded (see Clark 1949, Plate VIII; Clark 1950, figure 2; Clark 1954, figure 4). This may suggest that the assemblage was generated through discrete episodes of deposition. Unlike the detrital wood scatter, there is no evidence for the deposition of fully articulated limbs. Instead, the assemblage is consistent with the butchery and processing of carcasses for meat, marrow, skins, sinews, and tool manufacture. Given the environmental context of the assemblage (i.e. probably beneath shallow water; see Chapter 19) these tasks are unlikely to have been carried out at this particular location and the material has probably derived from activity areas at other parts of the site.

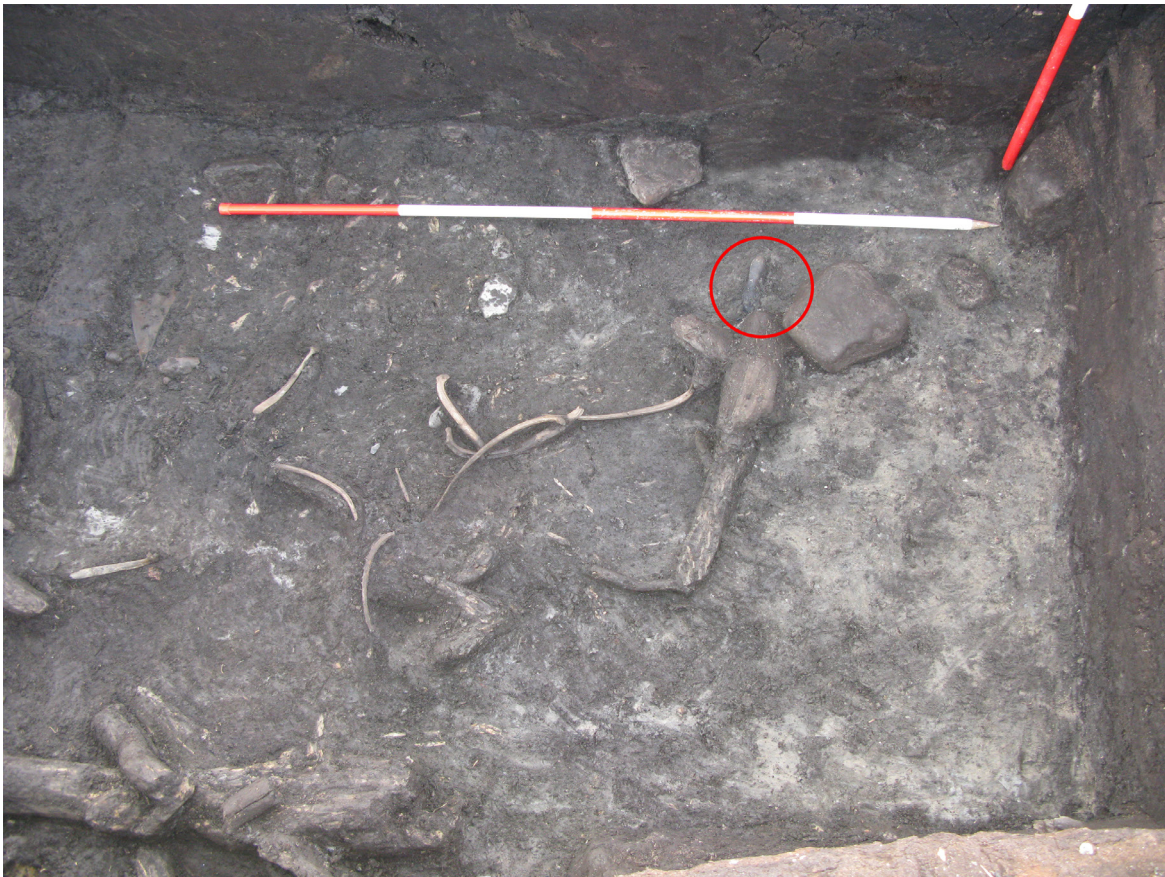
**Figure 7.29 (page 151):** A photograph to show the close proximity of one of the roe deer crania <116483> next to the red deer frontlet <115876> (the roe deer antler sits over the skull to the bottom left of the frontlet). The other roe deer skull <116473> had been excavated but was also located next to the red deer frontlet (Copyright Star Carr Project, CC BY-NC 4.0).



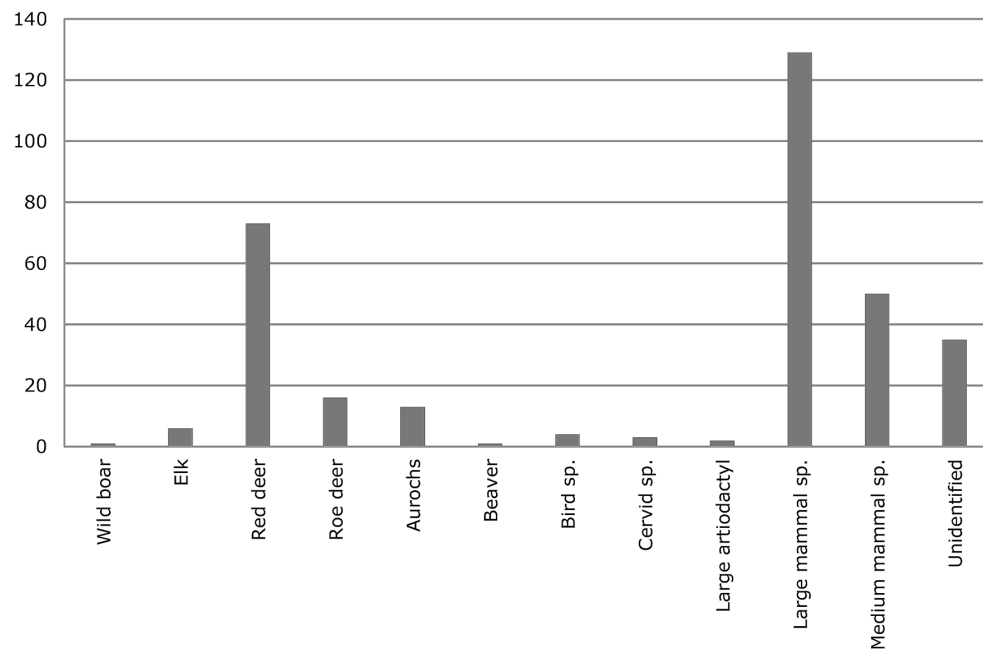
### *Clark's backfill*

In addition to the faunal assemblage recovered from the unexcavated areas around Clark's trenches, a significant proportion of material has also been recovered from the backfill within his excavations. Before the current project began it was considered likely that faunal remains would be present within Clark's backfill. Roger Jacobi, having looked at the collections in the Natural History Museum, suggested that it appeared to be a selectively curated assemblage, focused on material that was relatively complete and identifiable to species (Jacobi pers. comm.). This was supported by both Robert Erskine, who worked on the original excavation and described to us how unwanted bone was left on the spoil heap, and David Lamplough, a volunteer on the recent project who had worked at Star Carr as a boy in the 1950s and had collected a small box of spoil heap finds.

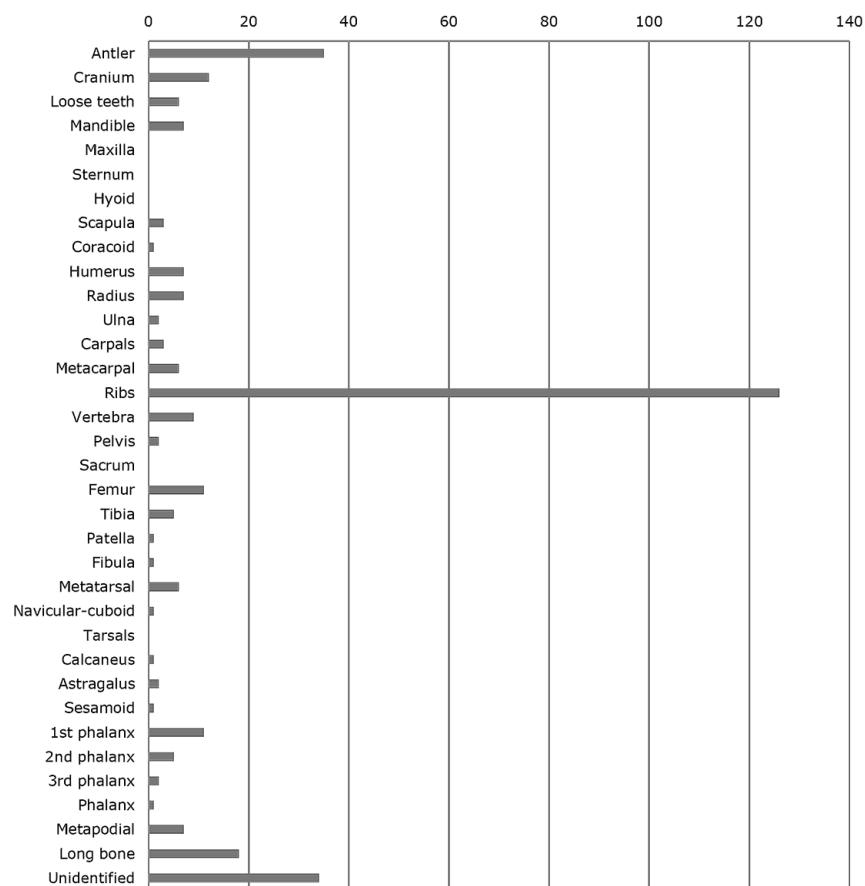
Faunal material was recorded within the backfill of Clark's cutting II during the re-excitation of the trench in 2010 (Figure 7.30) and from the other trenches in 2015. A total of 333 specimens were recorded. Unsurprisingly, species representation broadly matches that of Clark's excavated assemblage, with a dominance of red deer, followed by smaller quantities of aurochs, roe deer and elk (Figure 7.31). Ribs are by far the most abundant element and were probably discarded because they are difficult to assign to species. However, a range of other elements are also present (albeit in smaller numbers), representing much of the skeleton (Figure 7.32). There are also some noticeable taphonomic differences between the majority of the in situ bones and the backfill material: a large proportion of the backfill faunal material is partially desiccated which has created splits, cracks, delamination and flaking of the cortical bone. Unfortunately, it is not possible to determine exactly how much material was discarded by Clark as only some parts of the area he investigated have been re-excavated. In addition, we do not know how many were lost at the time through degradation on the spoil heaps.



**Figure 7.30:** Large mammal ribs found while excavating Clark's backfill in cutting II (north end of the trench). Note the handle of a trowel (in red circle), left there in 1950 (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.31:** NISP values for species found in Clark's backfill (Copyright Star Carr Project, CC BY-NC 4.0).



**Figure 7.32:** NISP values of all elements that were recovered from Clark's backfill (Copyright Star Carr Project, CC BY-NC 4.0).

## Conclusions

Since it was first excavated, the faunal assemblage from Star Carr has been used to infer aspects of the site's economy and function. For Clark, it established the time of year the site was occupied, the size of its population, and its place within a wider pattern of seasonal mobility (Clark 1954; 1972). Subsequent researchers have reinterpreted this material to draw new conclusions as to the economic basis of the site, looking in particular at the representation of particular species or the parts of the animals that made up the assemblage (Caulfield 1978; Andresen et al. 1981; Legge and Rowley-Conwy 1988). In all cases, these studies have assumed the assemblage recorded by Clark represented both the entirety of the faunal material from the site and the entirety of material from Clark's excavations and was, therefore, representative of the forms of economic activity taking place at Star Carr. We now know this is not the case. Not only is animal bone present across a much wider area, but the material recorded by Clark represents an episode of deposition that was focused on a particular area and was limited to a specific point in time (Chapter 9). If we are to understand the forms of activity that generated this assemblage it needs to be placed within the wider context of the faunal material from the site as a whole.

Excluding the material from the detrital wood scatter and Clark's area, the combined assemblages from the wetland and dryland contexts are consistent with the butchery and processing of substantial parts of the bodies of red deer and aurochs. Much of the assemblage from the wetland was generated through the dismemberment and subsequent processing of the limbs of these animals, after which some of the material was deposited at the edge of the lake. This can be seen most clearly in two specific clusters of material. The first is the small cluster of limb elements recorded just to the north of the area investigated by Clark. These indicate the removal and subsequent disarticulation of the entire hind limb of the deer, after which the femur, tibia and metatarsal were broken open, probably to extract marrow or fat, resulting in the loss of parts of these elements. This material was then gathered together (the bones of the ankle and the phalanges still articulated) and deposited into the wetland at the edge of the lake. The second is the assemblage of articulated and semi-articulated red deer elements deposited to the east of the eastern platform. This reflects the removal of the foot from the rest of the limb, after which the bones of the ankle and the phalanges have been discarded (again, whilst still articulated), whilst the metacarpal was retained, probably for dietary processing or use in craft activities.

These practices are reflected (albeit more broadly) in much of the material from both the wetland and dryland parts of the site. The fragments of limb bones from the wetland (typically humeri, radii, tibia, metacarpals and metatarsals, and more occasionally femurs), which make up the majority of the assemblage, lack anatomical associations and show a high degree of modification (83 specimens, 32%), typically spiral fractures and percussive breaks. This is consistent with the removal and subsequent processing of limbs (particularly, though not exclusively lower limbs) and their subsequent deposition into the lake. Equally, the lower numbers of astragali and the lack of other elements of the ankle or the phalanges is consistent with the removal and differential treatment of these parts of the limb, which may have been discarded whilst still articulated (as was the case in the examples above), or taken and processed further at another part of the site. Similarly on the dryland, groups 2 and 3 in the eastern structure include fragments of the upper and lower limb bones of red deer and aurochs that exhibit spiral fractures, percussion breaks and longitudinal splitting. A comparable range of material is also present within and around the western structure and is also represented in the discrete cluster of fragments of the limb bones of aurochs, red deer and an unidentified large mammal that was recorded at the northern end of the site.

However, it is clear that other parts of these animals were also being processed on the site. On the dryland the two clusters of vertebrae recorded from the western side of the site, one of which was found in a semi-articulated state, probably represent dumps of butchery waste associated with the processing of the torso. Given that one of these was also associated with several aurochs limb and podial elements it is likely that other parts of the body (potentially of the same animal) were being processed at the same time. Similarly, the spread of aurochs elements recorded to the north of the eastern structure probably reflects the detritus of butchery and processing tasks that involved parts of the limbs, shoulders and spine of the animal. More broadly, the scattering of fragments of pelves, vertebrae, ribs, mandibles and crania across the dryland, some of which also have percussion breaks, reflects the butchering and processing of the torsos and skulls of these animals. Though the evidence from the wetland is sparse, the pedicle, frontlets and unshed antler of red deer, as well as the more isolated occurrence of scapulae and vertebrae of both red deer and aurochs, again indicate the processing of parts of the torso and crania.

Part of the assemblage from the detrital wood scatter has been generated through similar forms of activity as other parts of the wetland, notably the butchery and processing of the limbs and parts of the torsos of red deer, aurochs and elk, and to a lesser extent wild boar. In most cases this involved the disarticulation and processing of the long bones, notably the humerus, radius and metapodial elements, and the removal of the elements of the ankle and the phalanges, sometimes whilst still in articulation. In addition, the presence of fragments of mandible, scapula and pelvis also suggests that other parts of the carcass were being processed and deposited in this area. However, whilst people undertook these prosaic activities they were also depositing more substantial parts of the bodies of red deer into the wetland at the southern end of the detrital wood scatter. Depending upon how this material is interpreted it either reflects the deposition or reassembling of at least one complete animal carcass, or multiple episodes of deposition involving entire limbs, parts of the torso, and potentially the head. Either way, this material does not necessarily represent butchery and dietary practices and instead reflects other ways in which animal bodies were being treated.

Broadly speaking, the assemblage from the area investigated by Clark (including the material recorded as part of this project) is very similar to the assemblages recorded from the other parts of the site and has probably been generated by similar sets of practices. To begin with, a broadly comparable range of animals is present in both assemblages (though the quantities of material and the representation of individual species do vary). In terms of the treatment of the larger mammals there is evidence for the separation and subsequent processing of the limbs, the discarding of articulating ankle bones, and the processing of the phalanges, as well as butchery/processing of substantial parts of the torso.

Furthermore, the heavy processing of the lower jaws of red and roe deer, indicated by the high proportion of mandibles with percussion breaks, can also be seen on the dryland assemblages in the form of the fragments of mandible and loose teeth. In terms of the smaller mammals, the much lower quantities of material beyond Clark's area make comparison more difficult. However, a similar range of species are present in both areas and in the case of beaver, the emphasis on the processing of the mandibles that can be seen in both the dryland and Clark's area assemblages suggests that the species is being treated in comparable ways. Where the assemblages from these parts of the site differ is in the quantity of material deposited in the area investigated by Clark, the amount of this material found in articulation (or in a semi-articulated state), and the degree of preservation (including fragmentation). This would suggest that the main difference is in the way that the remains were curated and deposited and not the economic and craft activities through which the assemblages were generated.

A question that remains is whether the assemblages (both from Clark's area and the site as a whole) reflect the processing of whole animals or parts of carcasses brought onto the site, or to what extent particular animal body parts have been removed from site. Unfortunately, the poor levels of preservation on the dryland parts of the site, the highly processed nature of the assemblage, and the fact that large parts of the site remain unexcavated make any conclusions as to the completeness of the carcasses on the basis of the under-representation of particular elements problematic. Elements of the torso and cranium and to a lesser extent the upper rear limbs, are less common, a fact that could suggest that either the carcasses were incomplete when they arrived or that some parts of the body were subsequently removed. However, just under a third of the material from the dryland was unidentifiable both to species and element (30%,  $n=183/601$ ), the area around the western structure being particularly poor (43%  $n=105/240$ ), whilst some material could only be identified as long bone fragments of indeterminate species. This could easily account for at least some of the under-represented elements. What is more, the absence of elements from the assemblage need not reflect material that has been left behind at kill sites, or taken away to residential base camps. Large elements such as the femur can be largely destroyed through intensive processing for marrow, whilst other elements may be removed and used to manufacture tools. Furthermore, the ethnographic record shows that hunter-gatherers selectively remove elements from prey animals after they have been killed, curate elements separately after butchery, or deposit certain bones in different ways (e.g. Jordan 2006; Nelson 1983; Tanner 1979). Nor should we assume that there was a single, consistent way in which animals were brought onto the site or were subsequently dealt with. In some cases animals may have been brought onto the site as complete carcasses, butchered and processed and then deposited in their entirety. In other cases, limbs, torsos or heads may have been brought to the site, or parts of carcasses may have been taken away to other places in the landscape. Given the dynamic character of activity within the surrounding landscape (Conneller and Schadla-Hall 2003) there is unlikely to be a single, constant set of economic practices at Star Carr.