Exploring the archaeological heritage of the Uddeler Heegde: an experiment

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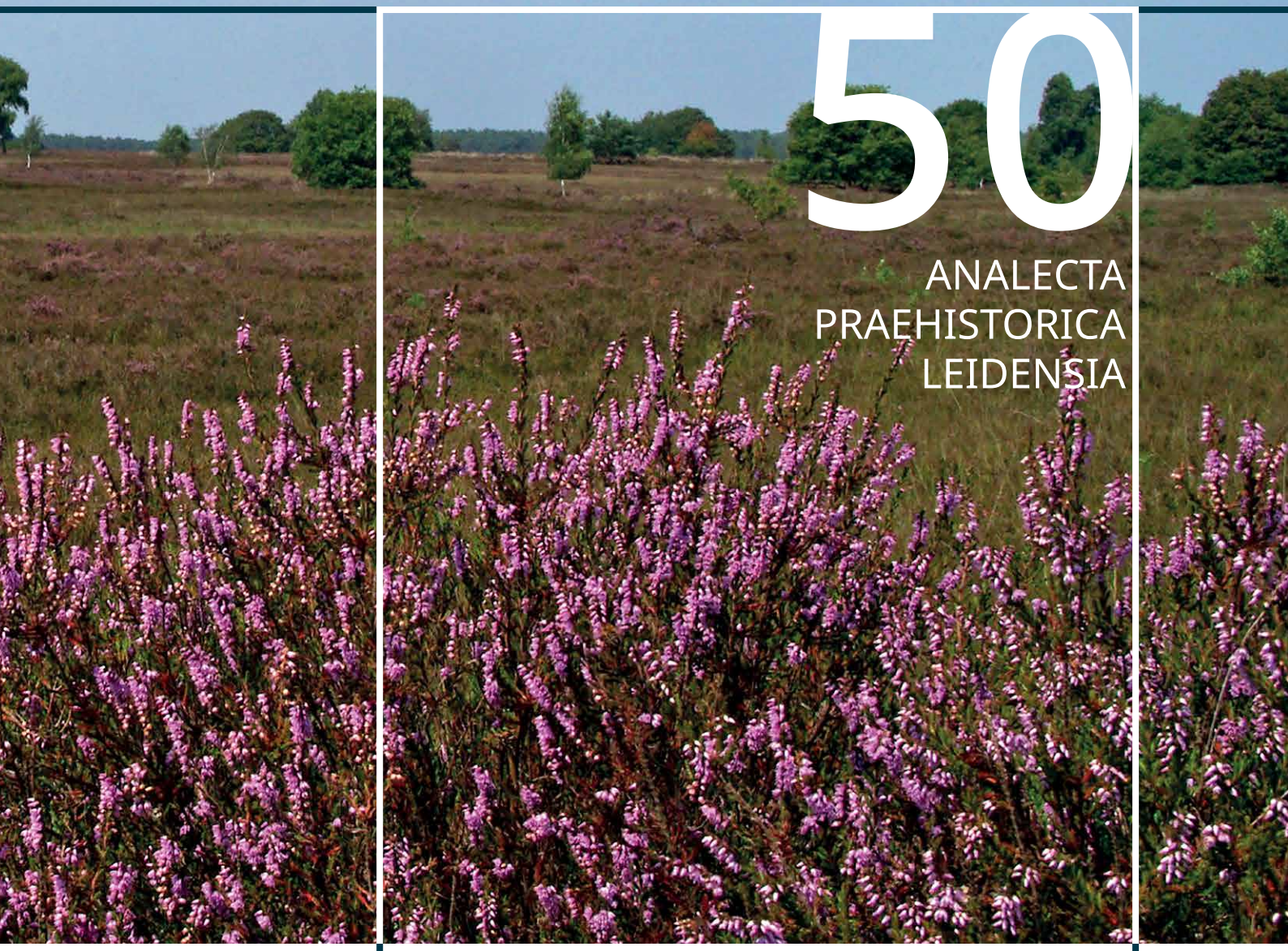
A HUMAN ENVIRONMENT

Studies in honour of 20 years Analecta editorship by prof. dr. Corrie Bakels



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Exploring the archaeological heritage of the Uddeler Heegde: an experiment

Alexander Verpoorte, David Fontijn and Arjan Louwen

In the summers of 2013 and 2014 the Faculty of Archaeology of Leiden University has carried out archaeological fieldwork in a rather exceptional environment. Where since the implementation of the Valetta Treaty most excavations are aimed at ex-situ preservation of archaeological sites threatened by building activities, the site that was under investigation in 2013 and 2014 found itself in a nature reserve. As nature reserves are aimed at the very purpose of preservation, why then investigate an archaeological site that could easily profit from such a protected status? The recent access to high resolution LIDAR data for the entire surface of the present day Netherlands is only just beginning to reveal the richness of archaeological sites hidden beneath the foliage and undergrowth of the forests and heaths crammed in between the vast field systems of the Dutch countryside. From late prehistoric barrow landscapes and celtic fields to Medieval cart tracks, all these features still find themselves at the very surface in these nature reserves. These sites of various age can provide a unique glimpse into the past but their location at the very surface also makes these sites vulnerable and, as is becoming more clear in recent years, are threatened by nature itself. Tree roots, burrowing animals and ongoing podzolization are all examples of natural processes that gradually obscure these sites from sight. To map both the state as well as the research potential of such an archaeological 'palimpsest' an archaeological field experiment was carried out in one of the largest nature reserves of the Netherlands at a site called 'Apeldoorn – Uddeler Heegde'. This article reports on the most important new insights of the fieldwork in the form of a landscape biography.

Keywords: Nature reserves, landscape biography, AHN, barrows

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1. Introduction

Natural parks and nature reserves are perhaps the most important areas for the protection of archaeological heritage for the long term in the Netherlands and beyond. The archaeological richness of nature reserves has become even more visible by the availability of detailed Digital Elevation Models (AHN = Actueel Hoogtebestand Nederland). A pilot study in the municipality Apeldoorn, for example, found a significant number of prehistoric, medieval and post-medieval features on the second generation AHN (Van Heeringen *et al.* 2012). They included forty-two possible prehistoric burial mounds that were unknown so far and had no archaeological status as protected monuments. Most of these mounds were located in the national park of the Veluwe. This paper reports on a small experiment in the archaeology of nature reserves.

From an archaeological perspective, (at least) four issues regarding the archaeology in nature reserves come to the fore:

1. Nature reserves and natural parks are richer in archaeological heritage than expected on the basis of archives like Archis (Dutch National register of archaeological observations);
2. The AHN provides information about the 'visible' archaeology, the top of the 'iceberg' of less visible archaeological traces such as subsurface features, find scatters and other ephemeral traces;
3. Nature reserves are dynamic parts of the landscape where economic activities impact the soil, *e.g.* due to forestry and nature management; the quality of archaeological preservation in nature reserves is not as obvious as it may seem;
4. The implementation of archaeological field methods such as large surface stripping using mechanical diggers is problematic in a natural park where vegetation, soil life, and fauna require protective measures as well; investigation and protection of the archaeological heritage in nature reserves therefore requires an integrative approach (Elerie and Spek 2007; 2010).

The archaeological investigations in the Uddeler Heegde, municipality of Apeldoorn, Central Netherlands (figure 1), offered a unique opportunity to think about these issues. The Uddeler Heegde is a forested area that is part of the Royal Domain "Het Loo". It consists partly of 'old' forest, going back to medieval times (a so-called *malebos*) and new forest, dating to the reforestation in the 19th century for commercial purposes (de Rijk 1990, Jochems 1990). The research area is located on the western slope of the central, Saalian-aged, ice-pushed ridge of the Veluwe. The area was chosen because it contains a row of four possible prehistoric burial mounds, that were recently recognized on the AHN, as well as one mound, recog-

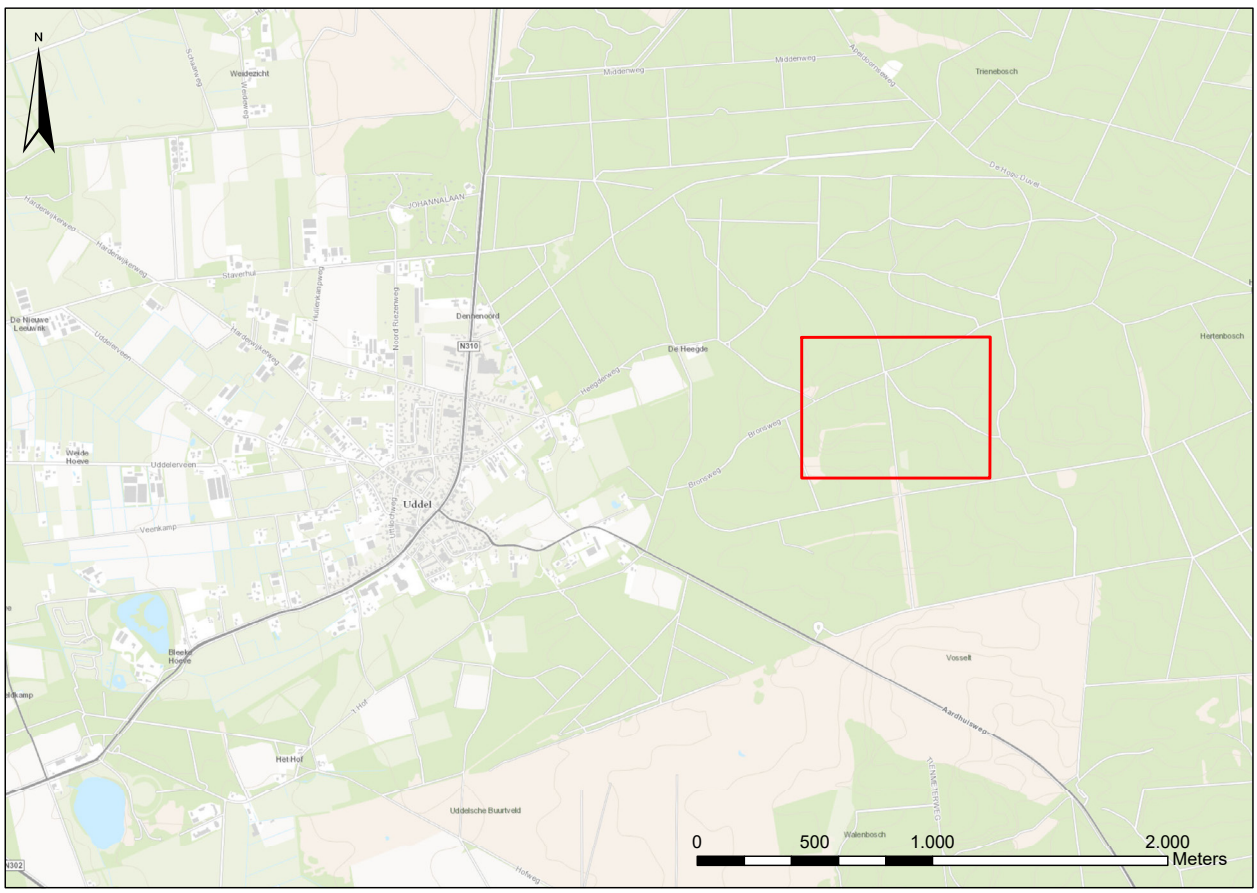


Figure 1: Location of the research area.

nized and protected as an archaeological monument. The aim of the fieldwork was: 1) to check whether the mounds were indeed anthropogenic, 2) document the barrow landscape, and 3) evaluate the preservation of archaeological traces. Another aim was to advice on protective measures. Specifically, we were interested in the effects of the so-called "10-meter-zone" of protection around burial mounds, and the minimum depth of disturbance before archaeological investigations are obligatory. Training of students was another important goal of our fieldwork. The fieldwork consisted of two campaigns of three weeks in 2013 and 2014 (Louwen *et al.* 2014, Fontijn *et al.* 2016).

2. Approach and Methodology

The approach for the Uddeler Heegde is to minimize the impact while trying to maximize information. The strategies were inspired by a number of sources. One source of inspiration was a paper titled 'Making time work' by Evans *et al.* 2014. The question of what is lost by the routine method of machine stripping made us aware of the importance of ploughsoil archaeology. Artefact distributions such as scatters of pottery or lithics may signal human activities that are easily overlooked when the focus is only on (cut-and-fill) features such as ditches, pits and postholes. Another source of inspiration was the issue of palimpsests and place

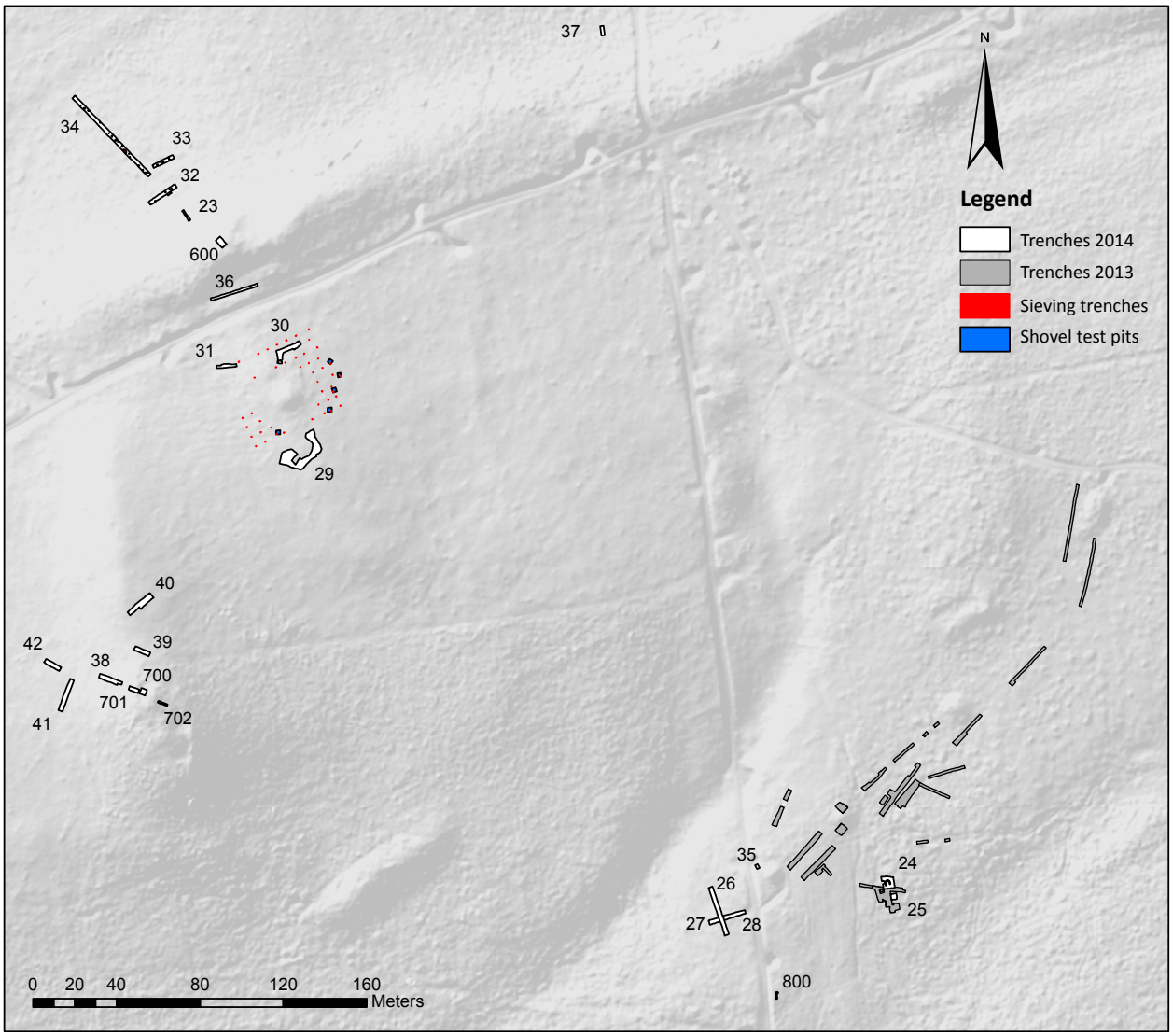


Figure 2: Location of test trenches in the research area.

use histories (*e.g.* Binford 1982, Bailey 2007, Fanning *et al.* 2009). Focusing on the prehistoric barrows, this made us think about the extent to which the building of barrows 'disturbed' an already inhabited landscape or 'protected' earlier, inhabited land surfaces, and to what extent the prehistoric barrows 'structured' later uses of the landscape. The place use history includes geological history, landforms, soil development as well as the traces of 19th century forestry activities. Overall, we may consider our approach as a form of microarchaeology (cf. Weiner 2010). Protecting the ever scarcer, diverse and more valuable heritage demands a strategy of minimizing the use of destructive and invasive methods like standard excavation, while maximizing the information gained from new investigations, given budgetary and organizational constraints.

Based on these broader considerations, the following mix of methods was applied in the research area of the Uddeler Heegde:

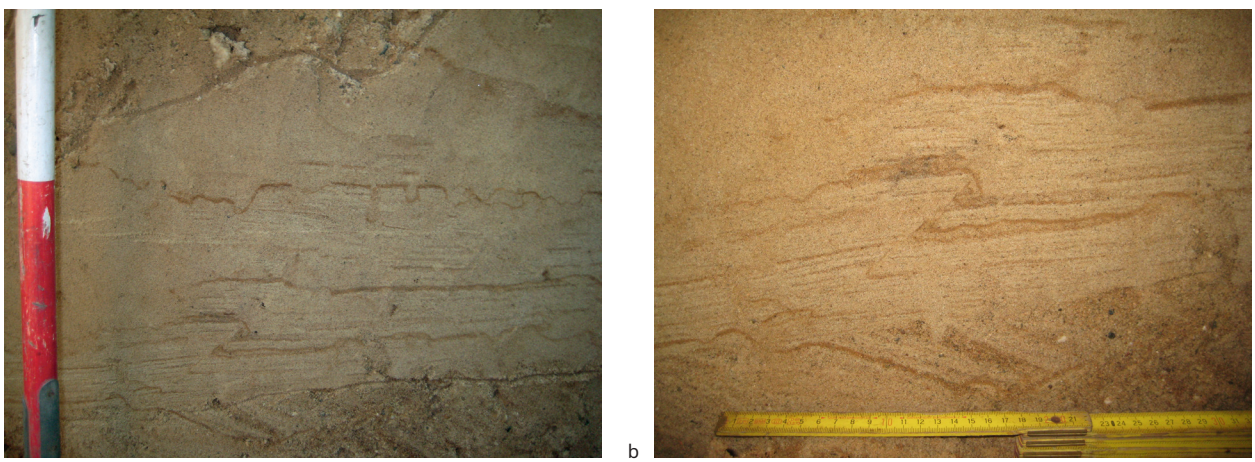
1. Trenches were dug with a small excavator (3.5 ton), mostly narrow (120cm – one bucket wide), sometimes irregular in shape to keep at least four meters away from the trunk of beech trees, deepened until 5 to 15 cm below the ploughsoil; small parts (1 meter wide) were deepened with an excavator for geological investigation;
2. Test pits were dug by hand (2x2 m and 50x50 cm), mostly removing the A-horizon with shovel, and the B-horizon with trowel; a sample of 25 liter was dry sieved and checked in the field;
3. So-called "Boxes" in (possible) mounds were excavated by hand using a shovel, sized 3x3 m to 5x5 m, with extensions if needed, with one level each 15 cm; sections with paleosols were sampled for pollen;
4. Metal detection was used systematically in all trenches and boxes;
5. Augerings to identify soil types, lithology, and plowing were made with an Edelman auger (7cm, 10cm or 12cm in diameter), in rows (lines), every 10 meter, up to a depth of ca 100cm below plough-soil, maximum over 200cm;
6. Small sections along roads and water pits were cleaned by shovel for additional observations.

The distribution of trenches is illustrated in figure 2.

3. Results

We present the results in the form of a landscape biography of the Uddeler Heegde. But it is a biography with gaps and breaks, with periods of amnesia and parts unmemorized.

The oldest traces that we documented date back to the Saalian age. Fine sands, dated to 250,000 years ago, were probably deposited by the Rhine-Meuse river system (Busschers 2008). These deposits were transformed by the activity of the Late Saalian glaciers that shaped the landscape and created the main aspect of the current relief. With the melting of the glaciers at the end of the Saalian, large amounts of sediments were transported by meltwater streams and filled in glacial basins. The deepened section in trench 29 exposed laminated, more or less gravelly, sands with cross-beddings, occasional microloadings and some imbrications (figure 3). We interpret the sediments as



a b

Figure 3: Details of sedimentary structures: (a) microloadings (red pole is 20 cm); (b) fault (scale in cm).

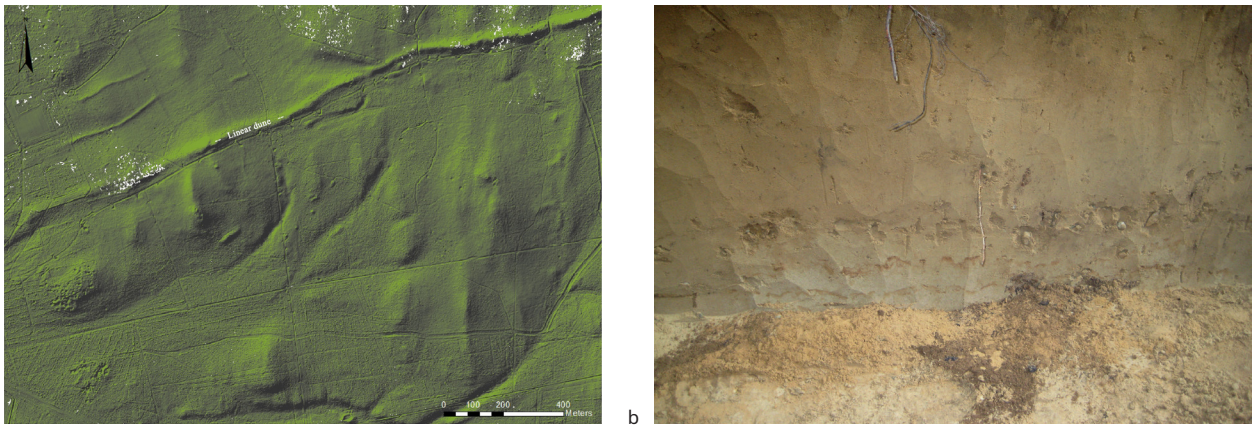


Figure 4: (a) Partial view of the linear dune (from west to northeast corner) with (b) section with gravel layer interpreted as Beuningen Gravel Bed (section is ~150cm wide).

melt water deposits near the edge of the stagnant or retreating glacier (cf. kame terraces as described by Eilander *et al.* 1982). Cover sands were deposited on the landscape during the Weichselian.

We documented two features associated with aeolian action at the end of the Weichselian. Across the Uddeler Heegde runs an east-west oriented linear dune, dating to the Younger Dryas period (figure 4a). Linear dunes are formed by two prevailing wind directions approximately perpendicular to each other, in this case a northwesterly and a southwesterly wind. A small trench at the base of the dune exposed a section with a line of small gravels, predating the formation of the linear dune (figure 4b). We interpret this gravel bed as the Beuningen Gravel Bed, formed by deflation around 16,000 years ago (Vandenberghe *et al.* 2013). At the end of the last ice age, near-surface sediments dominated by coarser to finer sands have the relief that is more or less the same as can be observed today.

Evidence of human presence is documented in the vicinity of the Uddeler Heegde from the Late Paleolithic onwards. A surface collection with Hamburgian material is known from the Groot Zeilmeer as well as Elspeet and we may assume that Paleolithic and/or Mesolithic hunter-gatherers visited the research area. However, we have not found any traces from this period in our excavation. The earliest evidence of human habitation is a weathered ceramic fragment that may date to the Late Neolithic.

More substantial evidence of human land use dates back to the Bronze Age. It consists at least partially of a landscape of barrows, including a short alignment of four mounds with a length of approximately 250

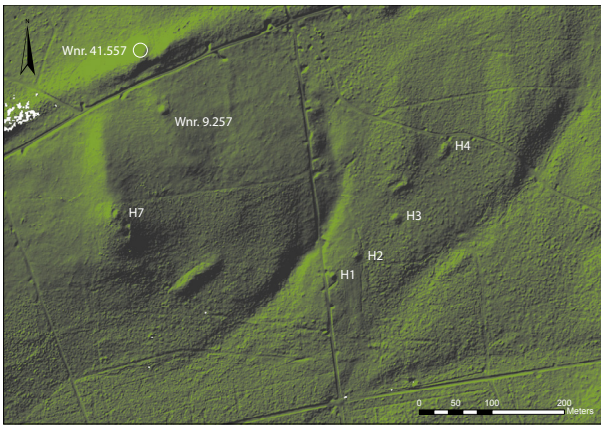


Figure 5: Overview of the barrow landscape. H1 to H4 indicate four mounds of an alignment. Wnr 41.557 turned out to be a natural elevation of the top of the linear dune. Wnr 9.257, in the text indicated as barrow H5, is a protected archaeological monument. The mound indicated with H7 proved to be also an anthropogenic mound.

meters, and an isolated burial mound approximately 300 meters to the west. Barrow H5 is the largest and protected as an archaeological monument, but the age and exact nature of the mound remain unknown and it is not evident that it has a Bronze Age construction date (figure 5; table 1).

The four barrows in alignment are between 50 and 100 meter apart. Barrow H2 was partially excavated using two boxes in the margins of the mound. An old surface with paleosol and dispersed charcoal was visible below an overlying unit in which the topsoil (a humuspodzol) was formed

Figure 6: Section of barrow H2.

Figure 7: Section of barrow H7.

(figure 6). No strata or sods could be recognized due to bioturbation and soil formation. Two charcoal samples from the top of the paleosol have been dated and provide a *terminus post quem*. The results indicate that the mound was probably constructed during the Middle Bronze Age in an open environment where alder trees were present in the wetter parts of the landscape (Doorenbosch 2013, 139). For the moment, our hypothesis is that the alignment was erected during the Middle Bronze Age; at least we have no indications for a Late Neolithic origin.

Barrow H7 was also tested to check whether the mound was of anthropogenic origin. It is positioned on a marked location on a high ridge. Despite significant

		Barrow type	Burial type	Diameter	Height	Phases	Dating	Remarks
alignment	H1	n.d.	n.d.	< 10 m	< 1 m	n.d.	n.d.	
	H2	Featureless	n.d.	~ 10 m	> 0.5 m	Not visible	Terminus post quem 1858-1627calBC 1900-1691calBC	Small posthole below barrow
	H3	n.d.	n.d.	10-20 m	~ 1 m	n.d.	n.d.	
	H4	n.d.	n.d.	10-20 m	~ 1 m	n.d.	n.d.	Small mound attached
isolated	H5	n.d.	n.d.	> 20 m	> 2 m	n.d.	n.d.	Protected monument (AMK nr 116)
	H7	Featureless	n.d.	~ 10 m	> 0.5 m	Not visible	Middle Bronze Age (ceramic, typology)	Sods?

Table 1: Overview of the barrows of the Uddeler Heegde (n.d. = no data).

disturbances in the immediate surroundings, an old surface with dispersed charcoals and the overlying sediment unit were recognizable (figure 7). Whether or not the mound was constructed with sods remains ambiguous, because the field observations were not straightforward. Phases of construction were not visible. No distinct, peripheral features were found.

The small barrow group of the Uddeler Heegde fits well in a wider pattern. Bourgeois (2013) describes an increase of barrow construction activities including the reuse of older barrows during the Middle Bronze Age. New barrows were constructed in Late Neolithic barrow landscapes for example at nearby Ermelo. In addition, new locations were chosen for mound building, probably on already existing heathlands that were used as pastures and commons. As we found no evidence of Late Neolithic barrows, the Uddeler Heegde seems to be a case of this Middle Bronze Age expansion of the barrow landscape.

Almost a millennium later, the barrow landscape was reused for cremation burials. We uncovered a small urnfield in the vicinity of barrow H2. The full extent of the urnfield cannot be reconstructed anymore, because large parts of the surroundings have been disturbed by ploughing. We found positive evidence of four ring ditches, one more elongated or oval ring ditch, and one so-called *langbed* (elongated ditch). One of the ring ditches had an opening towards the southeast. Two ring ditches contain a cremation grave. Another ring ditch contained a concentration of charcoal, perhaps the last remnants of a cremation grave (figure 8).

The two cremation graves were dated using the apatite fraction of cremated bone. S8.1 is dated in the range 916-836 calBC (95.4% probability), whereas S14.4 falls between 902 and 822 calBC (95.4% probability) (table 2). The results are virtually the same, dating both cremation graves in the Late Bronze Age. Cremation grave S8.1 (figure 9a) was lifted as a block and carefully excavated in the laboratory (de Bondt 2015). It consists of a small, bowl-shaped pit of circa 60 cm diameter, with some grave goods, mainly in the top of the fill, and almost 900 grams of cremated human remains mostly in the lower part of the fill. Charcoal fragments were dispersed throughout the fill, but the majority was found at the top. It seems that little of the infill has been lost. The remains are highly fragmented, but still provide important clues. The cremation contains the remains of at least two individuals, one male and one possible female. Both are adults, one possibly an older individual. Two vertebral fragments have some indication of osteoarthritis, but it is not conclusive; no other pathologies were observed. The amount of cremation is far too small for complete individuals, indicating that skeletal elements were carefully selected from the pyre.

Grave goods were found in the top of the fill and consists of about 50 ceramic sherds and one bronze fragment. No animal bones were discovered. Some of the sherds have a distinct decorative pattern of fields with horizontal or vertical incisions and recall the shape of a *Henkeltasse* (figure 10). Some sherds were secondarily heated. It is not clear whether all the sherds belong to one and the same pot, however, it is clear that the pot or pots are not complete and were probably included with the cremated remains as pottery fragments. The bronze fragment is a 2 cm long and 2 cm wide thin sheet of bronze with six triangular dentitions, possibly a small part of a serrated knife, serrated sickle (cf. Steensberg type

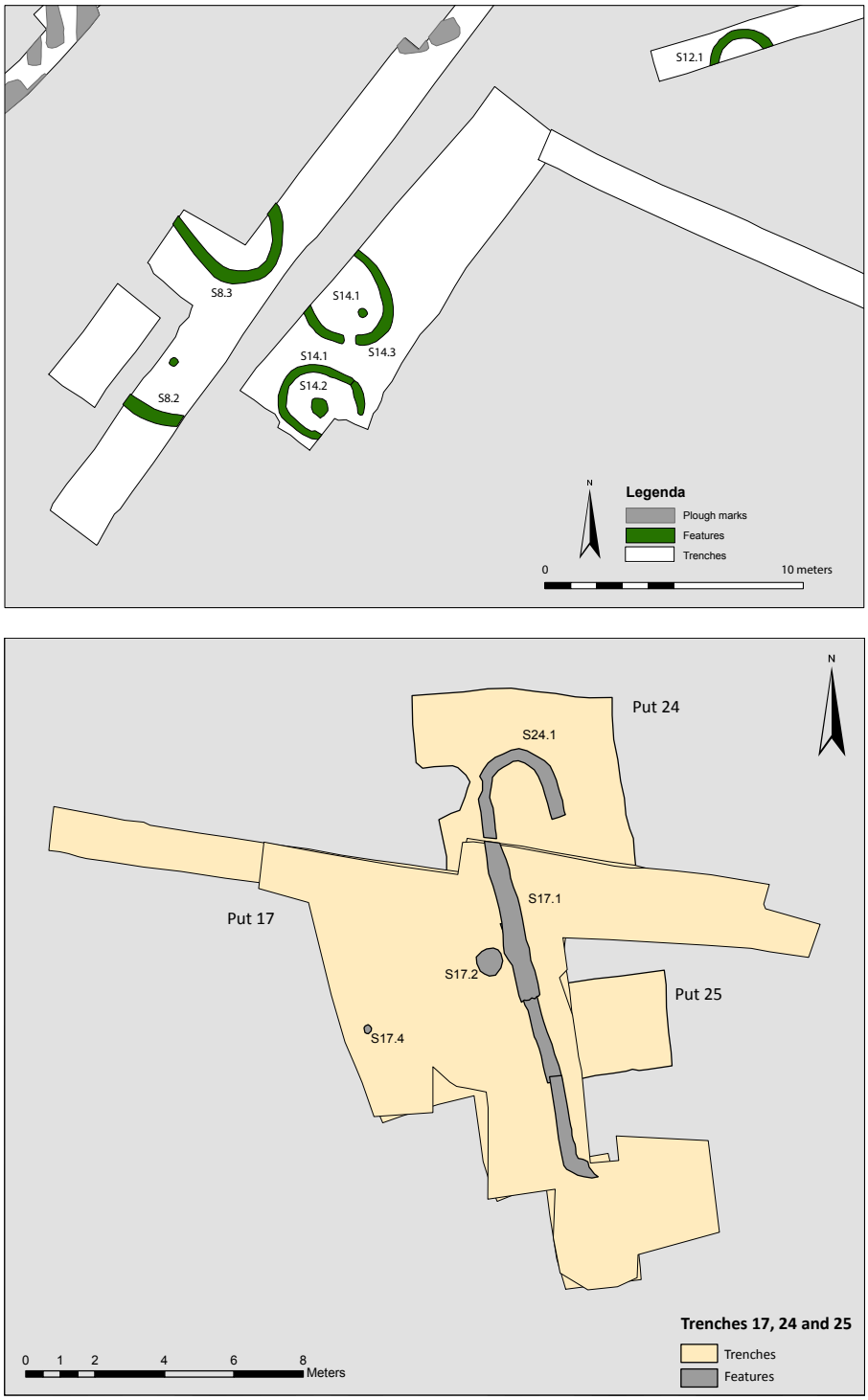


Figure 8: Overview of ring ditches, elongated ditch and barrows. A. Plan of the ring ditches. B. Plan of the elongated ditch.

V) or perhaps a grooming tool (figure 11). It was not burned secondarily.

The second cremation grave S14.4 has not been studied in the same detail (figure 9b). It consists of a small, bowl-shaped pit of circa 50 cm diameter. At least fragments of cranium, ribs, vertebrae, pelvis and femur could be recognized among the cremated human remains. They were concentrat-

a

b

Figure 9: A. View of cremation grave S8.1 in the field. B. View of cremation grave S14.4 with ring ditch with opening.

ed in a compact cluster of approximately 20 cm diameter. Small charcoal fragments were only observed at the base of the infill. It seems likely that the remains do not represent a complete individual, but are a selection of fragments from the pyre. No grave goods such as pottery or bronze were found.

Almost another millennium later, during Roman times, two cremations were buried in the immediate vicinity of the largest barrow H5 (figure 12). One

Figure 10. Decorated pottery sherd, probably fragment of a *Henkeltasse* (scale in cm).

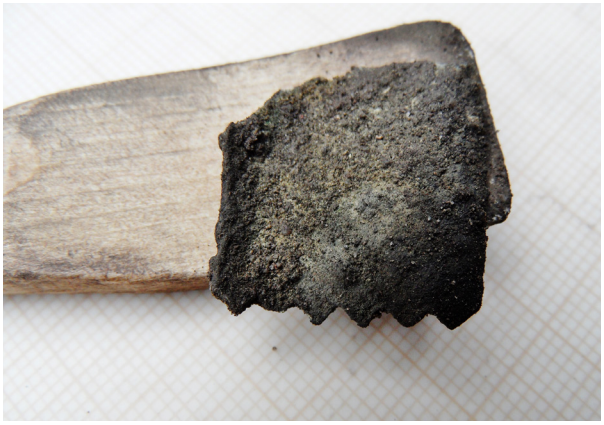


Figure 11: Thin bronze fragment with serrated edge (scale in mm).

Sample name	Dated material	Lab Code	^{14}C age (yrs BP; 1σ	Calibrated result (95.4% probability)
S8.1_v336	Apatite	GrM-12324	2742 ± 15	916 – 836 calBC
S14.4_v525	Apatite	GrM-12326	2715 ± 15	902 – 822 calBC
S30.1_v500	Apatite	GrM-12323	1988 ± 15	40 calBC – 56 calAD
S30.5_v634	Apatite	GrM-12082	1880 ± 15	74 – 210 calAD

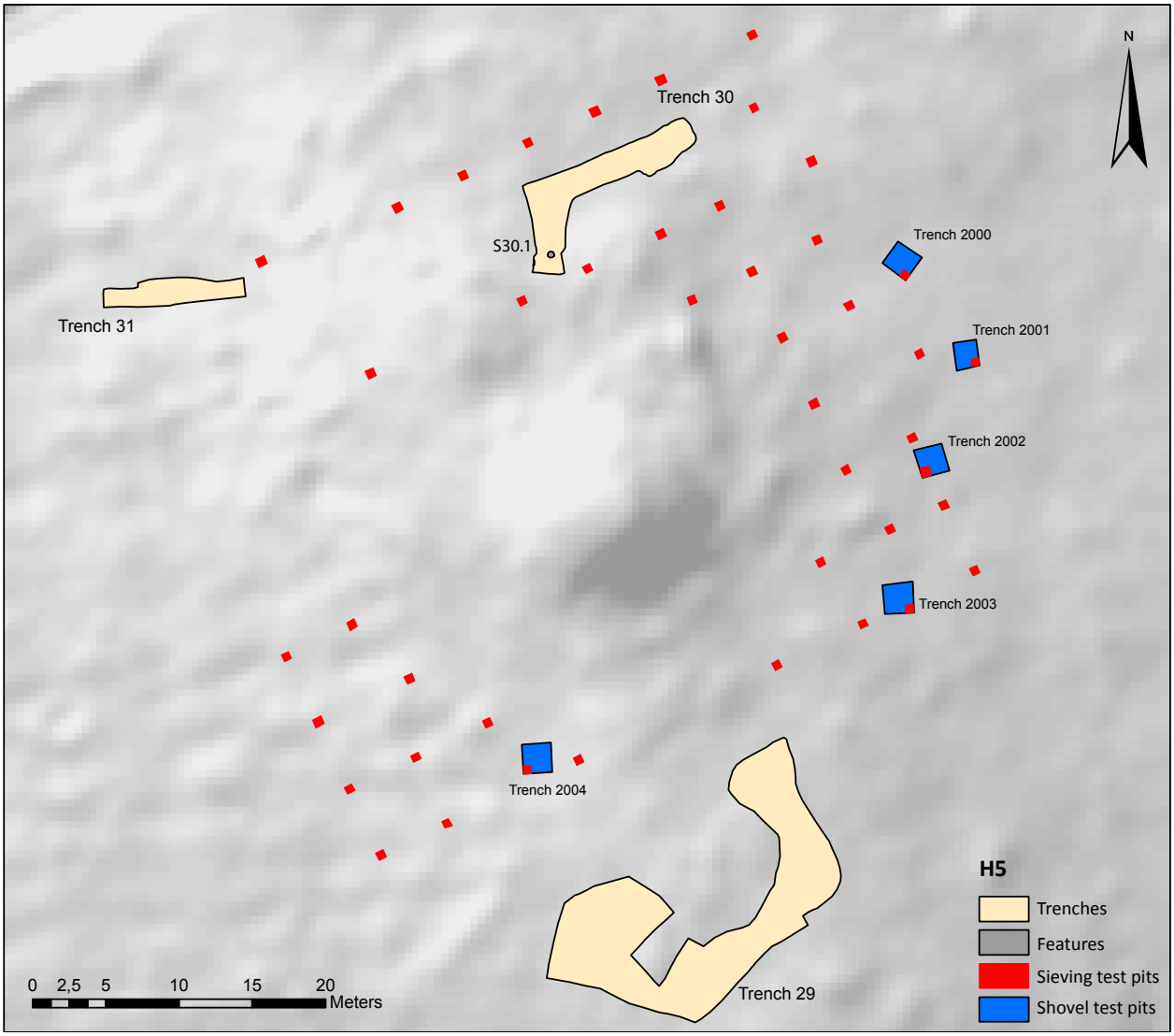
Table 2: Radiocarbon dating of cremated remains from the Uddeler Heegde.

cremation grave S30.1 consists of a small, bowl-shaped pit of circa 50 cm cross-section with dispersed cremated remains and charcoal in the infilling. Radiocarbon dating of the apatite fraction returned an age range of 40 calBC to 56 AD (table 2). The other cremation grave S30.5, dated to 74-210 AD (table 2), was only documented in a section. The grave is also a small, bowl-shaped pit with dispersed cremated remains and charcoal. No other finds such as grave goods were found and no ring ditch or other peripheral features were encountered in the area.

Except for burial practices, ephemeral traces of other practices have been discovered in the surroundings of barrow H5. Thirty five sherds of hand-formed pottery were found scattered near the surface to the north of the barrow. The sherds are all weathered with abraded breaks indicating that they were lying on or near the surface for quite some time. Two sherds exhibit possible rodent gnaw marks. The majority of the sherds date approximately to the Bronze to Roman Age, one could be Late Neolithic and another is probably late medieval. The sherds do not seem to relate to habitation as we did not find any features such as postholes. Many scenarios can be offered in explanation such as broken pots from collecting food and materials in the woods, post depositional disturbance of the graves of which the sherds were originally part, or ritual fragmentation as part of the mortuary practices that also involved the burial of the cremations.

More than a millennium later, during the 11-13th century AD, the Uddeler Heegde was used for the production of charcoal. This land use is documented by the discovery of one *Grubenmeiler* in trench 34 (figure 13). The pit was approximately 140 cm in cross-section with a depth of about 80 cm below current surface. Based on the sharp boundary between the A- and B-horizon, an estimated 10 to 15 cm was later removed from the surface, probably as a result of collecting litter and sods probably from the 17th to

Figure 12 (next page): Plan of trenches and test pits surrounding barrow H5 (center), with detail of the cremation graves S30.1 (a) and S30.5 (b).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Trench 30
S30.1
Trench 31
Trench 2000
Trench 2001
Trench 2002
Trench 2003
Trench 2004
Trench 29
0 2,5 5 10 15 20
Meters
H5
Trenches
Features
Sieving test pits
Shovel test pits

a


AUH 14
PUT 30
VLAK 3
SPOOR 1
26-06-14

b


AUH 14
PUT 30
VLAK 94
SPOOR 5
26-06-14

Figure 13: Location of the Grubenmeiler in section.

early 20th century. The pit has a flat base with straight sides. The infill consists of three units: a charcoal-rich, 20 cm thick layer at the base containing charcoal over 3 cm in diameter, a grey layer of 15 cm with dispersed charcoal fragments, and an upper, brownish layer of 40 cm with dispersed charcoals. There is no red discoloration of the sand below or beside the pit. All identifiable charcoals were determined as oak (*Quercus* sp.), mostly from the stem, some branches, and one possible root. A maximum of 23 tree-rings could be counted. Thirteen out of 100 fragments showed cavities filled with small charred pellets. They are the charred excrement of insect larvae that hatched in the wood (van Hees 2015, see also Van Hees *et al.* in this volume). Our hypothesis is that the Uddeler Heegde was in use for cutting wood and producing charcoal as well as keeping of animals such as pigs. The production of charcoal is frequently connected to iron production. We did not find indications of iron production in the Uddeler Heegde. Other late medieval traces have not been found – perhaps except for a small fragment of pottery in sieving residue of a shovel pit.

A significant change in the landscape of the Uddeler Heegde took place in the 19th century when parts of the area were planted with oak and douglas pine (figure 14). The most significant archaeological traces of this transformation in vegetation and landuse are ploughmarks. Large stretches of the research area are disturbed by ploughing. We documented parallel stripes of about 150 cm wide at regular intervals and found changes in the direction of ploughing, variation in types and sizes of ploughs, and differences in depth. The zonation of the original soil could be read in the horizontal plane with sometimes quite distinct A, E and B horizons. Other traces probably linked to forestry consist of shovel marks, indicating smaller scale turning of the soil. Parts of the research area, in particular north of the linear dune, were used for cutting sods or stripping the surface, resulting a sharp boundary between the current A-horizon and B-horizon in the soil profile. An estimated 15 cm of the soil profile has been removed. Only one part of the research area was not disturbed by ploughing: that is the beech forest, a remnant of the late medieval *malebos*. Here, the dominant soil type is the moder podzol in contrast to the dominance of humus podzols in the other areas (figure 15).

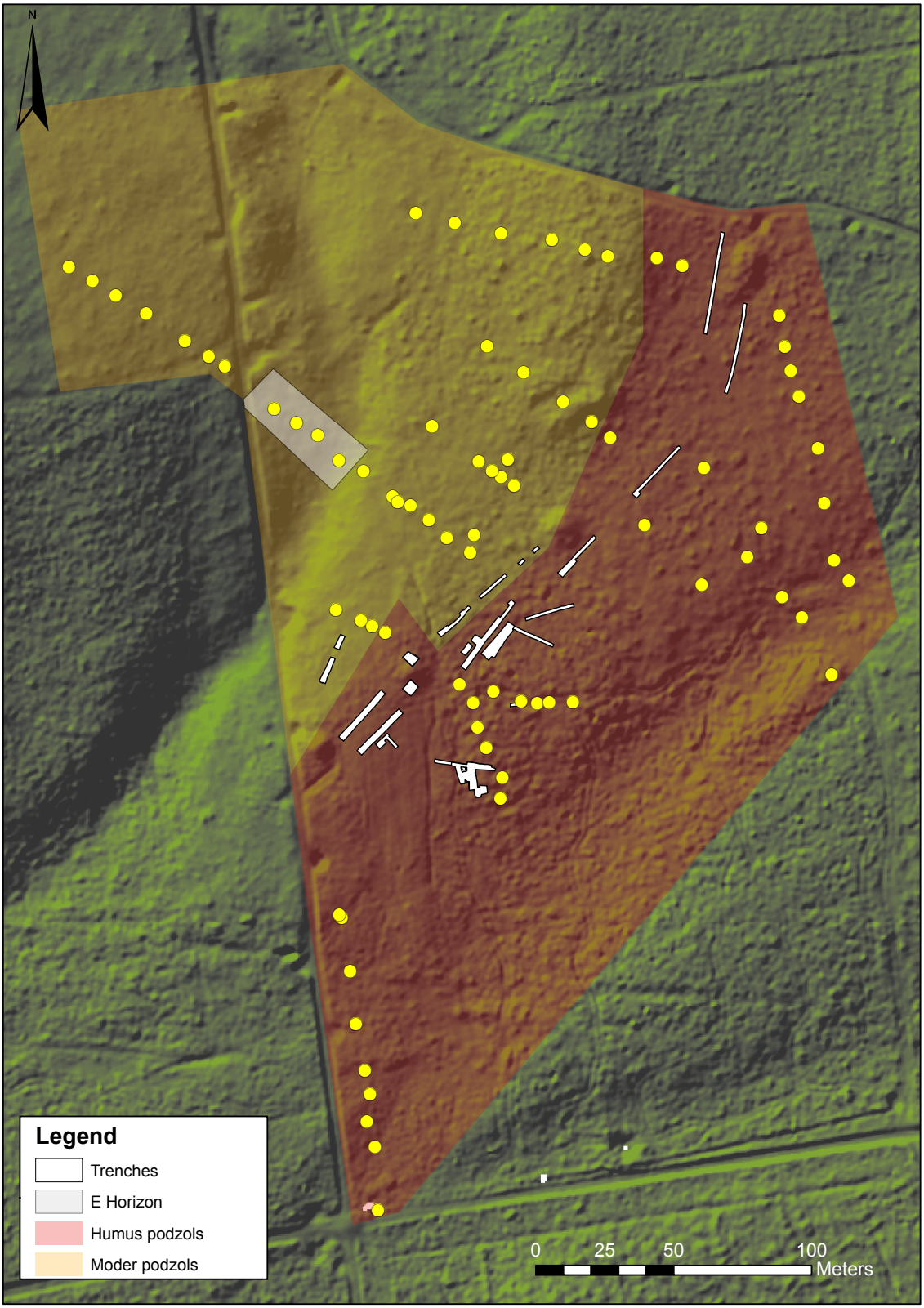
4. Discussion and conclusion

The investigations of the Uddeler Heegde illustrate the potential of nature reserves as archaeological archive. Its millennial-scale rhythm of human practice resulted in a variety of traces. However, none of these are related to houses, settlements or farming. Judging from the findings, there are at least three issues that deserve

Figure 14: Examples of plough and shovel marks.

further discussion: the methodology, the barrow landscape, and the preservation conditions.

The first issue concerns the advantages and disadvantages of the chosen methodology. The main advantage is the limited scale of impact of the methods which takes into account other, ecological values like vegetation and fauna as well as other types of landuse like the experience of visitors. Another advantage is that the combination of methods allowed us to scan a relatively large area in a limited amount of time with a restricted budget. In other words, it is a cost-efficient methodology to evaluate the preservation conditions in the research area. However, we should not disregard the disadvantages. The limited scale of impact also restricts the amount and quality of information. This is clearly demonstrated by the information about the barrows: for many aspects of the individual barrows, no data is available, which also limits the statements about the barrow group as a whole. The small boxes in the barrows are insufficient to recognize important aspects of mound construction such as phasing. The narrow trenches make recognizing pit-and-fill features and patterns of features such as postholes difficult because there is little contrast with the surrounding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Meters

sediment. In terms of a historical narrative, the information gained is limited and lacking in detail.

A second issue, related to the insights into prehistory that were gained, concerns the relation between the highly visible barrows and the invisible subsurface features, find scatters, and ephemeral traces. Taking into account the limitations of the data, the current evidence from the Uddeler Heegde is in accordance with a chronology of barrow landscape evolution where barrow construction increases significantly in the Middle Bronze Age. In contrast to the long time depth of the nearby Ermelo barrow landscape, the Uddeler Heegde can be interpreted as a new construction. The short alignment associated with a more isolated barrow on a marked location fits in a wider pattern of Middle Bronze Age barrow landscapes. The evidence of Late Bronze Age and Roman Age cremation burials as well as a scatter of Bronze to Roman Age ceramic sherds is testimony to the later reuse of this barrow landscape and the extent to which older barrows structured later activities. A brief scan of the evidence in the surroundings of barrows in the Netherlands makes clear how diverse the types of activities can be. There is not just evidence for other barrows, addition to barrows and secondary burial in existing barrows, but also evidence of houses, *spiekers*, alignments of posts, alignments of pits (with stones), round structures of postholes, cremation burials, urnfields, and depositions of pottery. Not to forget that the pollen evidence points to heathlands in use as pastures and as corridors for travelling, visiting, exchange and trade. It shows that barrows themselves are to some extent like the panda or polar bear: they are a pars *pro toto*, a symbol for a wider landscape.

A final issue to address is the preservation conditions and conservation measures adequate to the protection of the archive in nature reserves. Judging from the results of the Uddeler Heegde, two conditions are critical for preservation: 1) the history of forestry, and 2) soil formation. The history of forestry determines the degree of ploughing in plots. However, even in plots with significant disturbance by ploughing, small islands can be relatively well preserved as the case of the small urnfield demonstrates. Soil formation and associated bioturbation has a significant impact because traces are preserved in the upper part of the soil profile. Natural processes like tree-falls also lead to degradation of the archaeological archive. Small-scale soil disturbance during the cutting of trees for example can already touch on archaeological traces. If nature reserves are key to the long-term preservation of parts of the archaeological archive, then conservation measures need to be taken that are adequate for the factors that potentially disturb the archive, but also regarding the archive itself. Two measures are clearly inadequate for nature reserves. They are the 10-meter-zone around protected barrows and the minimum depth of disturbance before archaeological investigations have to take place. Based on the results of the Uddeler Heegde, there is no justification for either of these measures and certainly not for limiting protective measures to barrows only. Cremation burials, an urnfield and a scatter of ceramics were located outside the 10-meter-zone surrounding barrows demonstrating the range of human activities in the landscape. Any disturbance depth beyond the A-horizon would have disturbed if not destroyed these traces. To ensure that nature reserves function as long-term archaeological archives, the measures for securing conservation need to be adjusted to protect large areas and entire landscapes as well as entire soil profiles.

Figure 15 (previous page): Distribution of two podzol types in part of the research area.

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