

# HIGH-RESOLUTION ANALYSIS OF THE CENTRAL HEARTH AT THE MAGDALENIAN SITE OF BAD KÖSEN-LENGEFELD

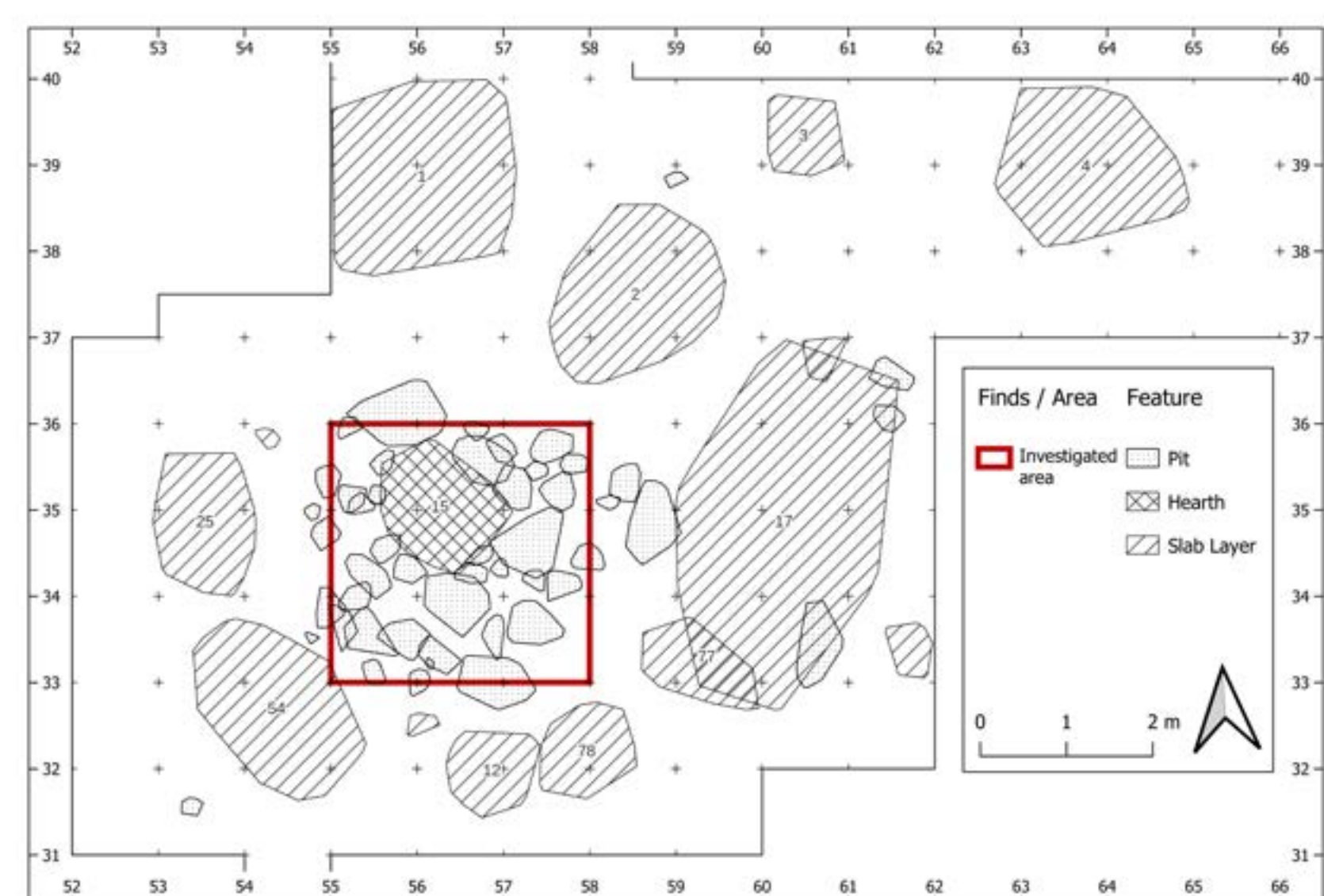


Fig. 1: General plan of the entire excavation area (as of 2023 by Marcel Schemmel), with the division into square meters and the representation of the various features. The red square outlines the investigated area around the central hearth.

Bad Kösen-Lengefeld (Saxony-Anhalt) is a Magdalenian open-air site, which was first discovered in 1954 by V. Toepfer, W. Matthias and F. Waih. Since 2008 the site is excavated under the supervision of Prof. Dr. Jürgen Richter (University of Cologne) and Prof. Dr. Thorsten Uthmeier (University of Erlangen-Nürnberg) in cooperation with the department of historic preservation and archaeology in Saxony-Anhalt. The site of about 100 m<sup>2</sup> is divided in a northern, central and southern area (RICHTER et al. 2021). The central area covers 24 m<sup>2</sup> and contains more than 30 features. This poster presents a high-resolution GIS analysis of the 9 m<sup>2</sup> that surround feature 15 inside the central area (Fig. 1). This area alone contained more than 2200 measured lithic artefacts. Feature 15 (Fig. 2) is a hearth surrounded by smaller features that can be interpreted as postholes. To better understand possible structures, the following GIS-analysis of the lithic artefacts was done. Of the 2200 measured artefacts, 2050 were suited for the analysis. Before the GIS-analysis was made, all artefacts were technologically and typologically interpreted and measured. After that they were imported into QGIS. For a better visibility of different activity zones, the results are presented in the form of heat-maps. All heatmaps show the square meter grid used in the excavation, as well as the different features and their assigned numbers. The colour indicates the density of the distribution. The darker blue an area is, the higher the density of artefacts. And the lighter green an area is, the lower the density of artefacts.



Fig. 2: Oblique view of feature 15 (Richter et al. 2021, 33, Abb. 18)

## Total distribution

The total distribution is shown in Figure 3. The denser areas are clearly visible western and south of feature 15. These areas correlate with different smaller features. Even though north-eastern of the hearth a lesser density can be seen than in the south, the difference to feature 15 is clearly visible. And here, like the more southern dense areas, the dense areas in the north-east correlate to the smaller features. In comparison to this, the area in the south-west is more evenly distributed. Given the focus on feature 15, there seems to be not only a lower density of artefacts in the hearth. But also a U-shape of denser areas framing the feature. The opening of the U points north-west.

## Tool distribution

Comparing the distribution of the as tools identified artefacts with the total distribution of all lithics shows a slightly different picture (Fig. 4). The heatmap was based on 337 artefacts. The overall distribution of those lithics shows a more even picture. The reason behind this is that the south-western and north-eastern areas in relation are way denser than in the total distribution. The modified artefacts only show two less dense areas. One of these areas lies outside the features in the south-east of the area. Here a relatively moderate density is visible in the total distribution. This is a difference to the second spot that can be found in feature 15. It has a low density in both distributions. However, the northern border area of feature 15 has a bigger difference in density to the center of feature 15 in the tool distribution than in the overall distribution. This underlines

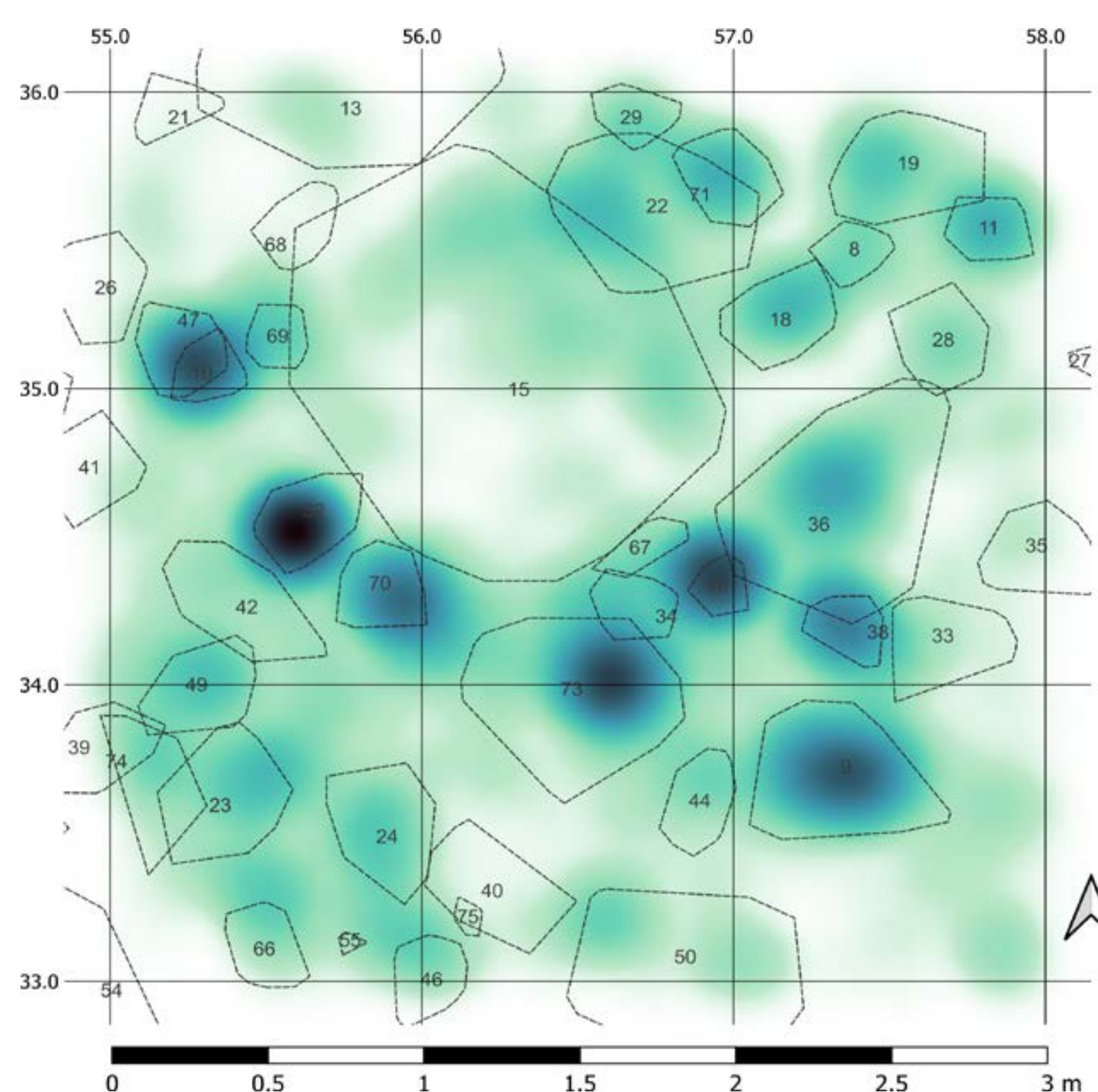


Fig. 3: Heatmap of the overall distribution of the lithic artefacts including the outlines and numbers of the features. The darker an area, the higher the density of artefacts.

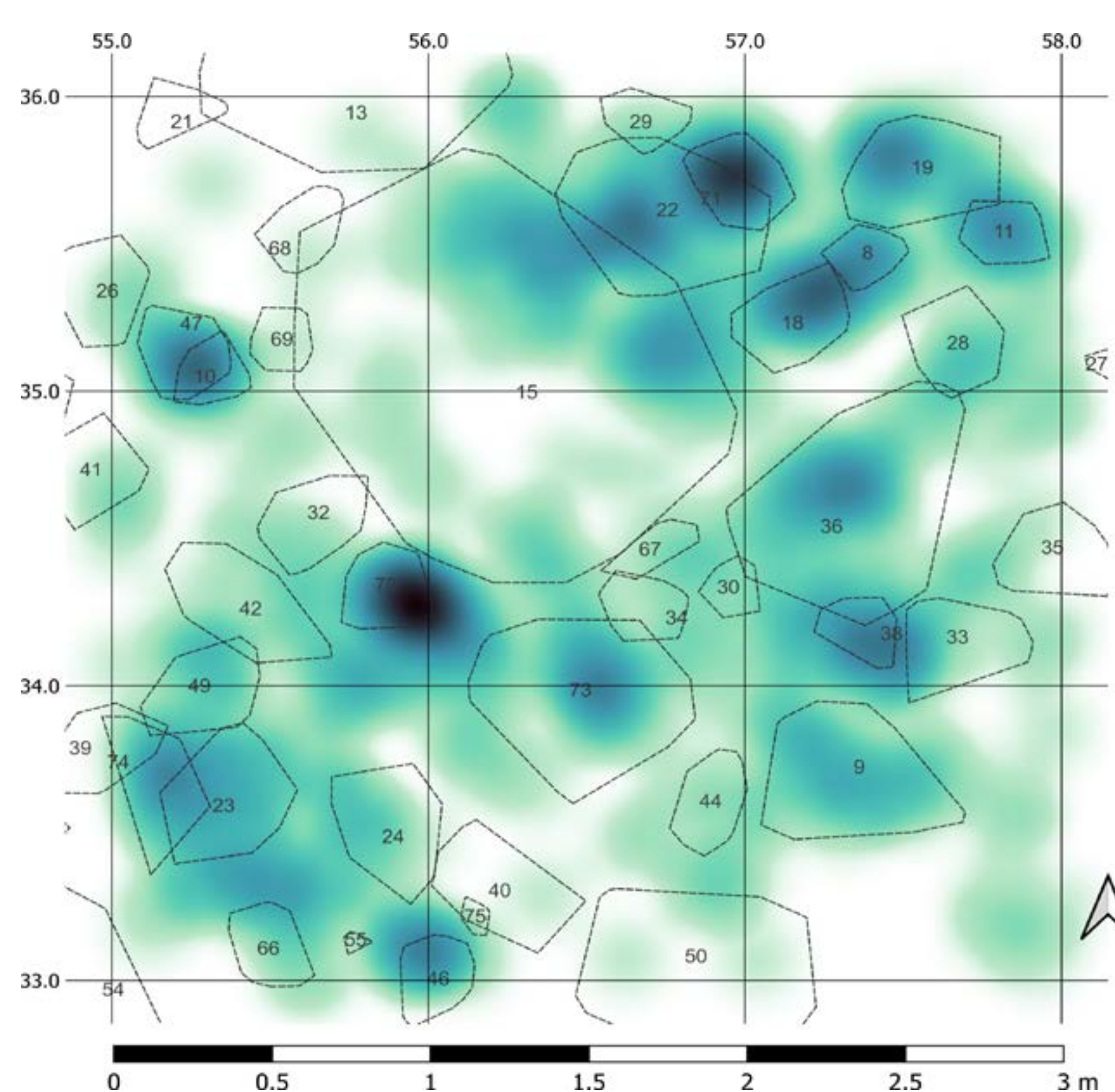


Fig. 4: Heatmap of the distribution of lithic tools including the outlines and numbers of the features. The darker an area, the higher the density of artefacts.

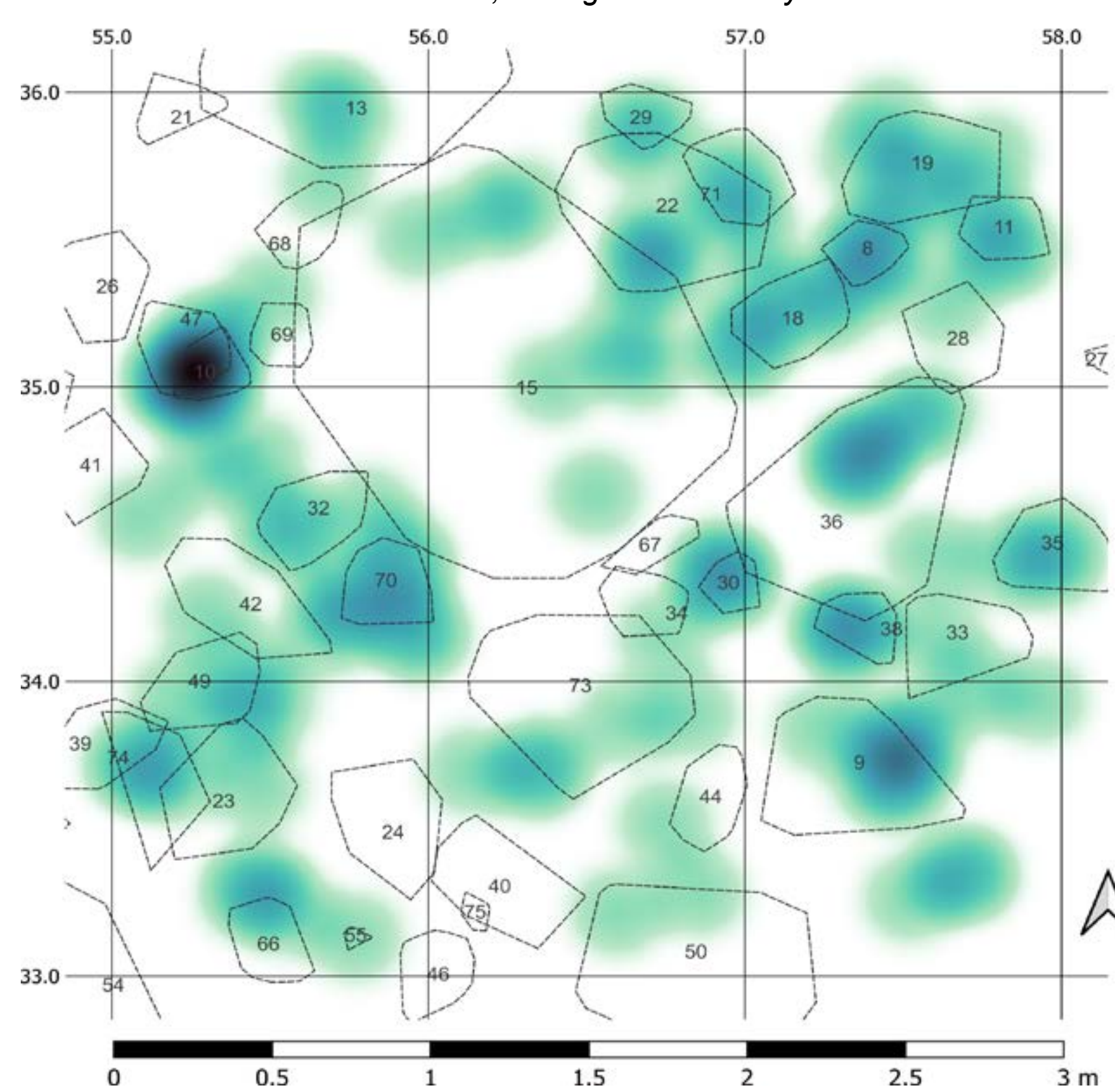


Fig. 5: Heatmap of the distribution of lithic cores and artefacts from core-preparation including the outlines and numbers of the features. The darker an area, the higher the density of artefacts.

the U-shape found before. Another feature shows a difference to the total distribution. Feature 32 that has a high density of overall lithic artefacts, has a rather low density regarding tools. The same applies for the features south-east of feature 15. The main activity zones appear to lie north-east and south-west of feature 15, again, outside the biggest feature.

## Distribution of cores and core-preparation

Looking next at the cores and core fragments and, in addition, at the artefacts produced during core preparation, a slightly different picture emerges (Fig. 5). It needs to be noted that the heatmap must be viewed relatively as only 106 artefacts were used as data. Except

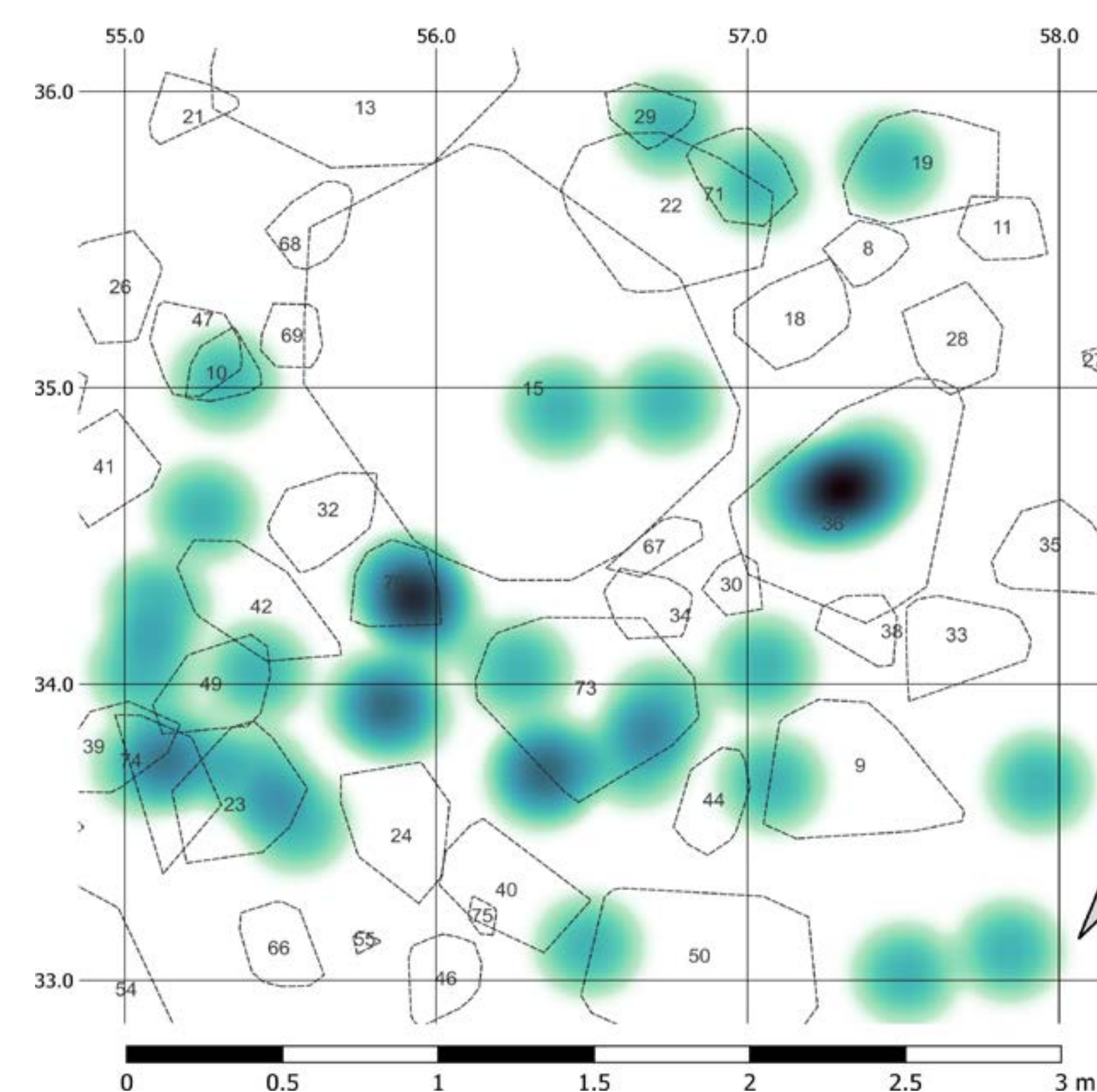


Fig. 6: Heatmap of the distribution of the thermally altered artefacts including the outlines and numbers of the features. The darker an area, the higher the density of artefacts.

for one accumulation in feature 10 the distribution doesn't show any other prominent accumulation. Feature 10 shows a collection of three crested blades, one core, one core fragment, one core tablet and one overshoot blade. This kind of accumulation of all artefacts used in core preparation cannot be found in the rest of the area. Instead, the artefacts categories spread evenly over the area. But like the other distributions, feature 15 contains way less artefacts. As the kind of artefacts are not visible in the figures it is important to note that three distributions can be distinguished. The first is in the south-west forming a kind of C from feature 70 to feature 66. The area around feature 42 alone contains seven cores. Where against around feature 23 there are two core tablets, five overshoot blades and no cores. Both areas are connected by crested blades, that spread over the whole C-form. The second distribution is in the north-east. It shows a similar artefact assemblage as the distribution in the south-west. Both differ from the third area strongly. It lies south-east of feature 15 around feature 9, 30 and 38. This area contains more than 50 % of all core fragments and in relation less artefacts for core preparation. As the other two distributions described have little to none core fragments, this is one of the clearest differences in possible activity zones regarding core preparation.

## Distribution of thermally altered artefacts

In addition to core preparation by knapping, the alteration and preparation of cores and artefacts can also be accomplished by thermal alteration. As the analysed area surrounds the central hearth of the site, the distribution of the relevant artefacts is shown in Figure 6. Even though the heatmap does show a distribution, it is important that it is based on only 34 artefacts. As these out of 2050 are the only thermally altered artefacts. Viewing the distribution, most of the artefacts can be found south of feature 15 and nearly none in feature 15 itself. The distribution does correlate in feature 70 with an accumulation of tools. This is not the case for the accumulation in feature 36 which correlates with no other shown high dense area.

## Conclusion

The heatmaps clearly show the distribution of artefacts in the area around the central hearth. In this, the distribution of all artefacts as well as the distribution of the tools do show a clear picture of higher dense areas inside the features interpreted as postholes surrounding the central hearth. Combined with height data, this supports an interpretation of a possible tent or tent-like structure. Possible activity zones outside this structure can be identified in the south-west and north-east of the area. Both are visible not only in the tool distribution, but also in the distribution of cores and artefacts of core-preparation. The third activity zone which is not so clearly visible in the heatmaps is south-east of feature 15 and contains most of all core-fragments. And reviewing other artefact types shows that most debris can be found here. Even though the main feature is the central hearth, only a few artefacts are thermally altered and do show some kind of distribution. There are way too few artefacts to interpret an intended alteration in these artefacts. Summarizing the results, it can be said, that the data supports an interpretation of a tent-like structure and three different activity zones outside the structure and none inside.

J. Richter / T. Uthmeier / A. Maier (Hrsg.), Der Magdalénien-Fundplatz Bad Kösen-Lengefeld an der Saale. Die Funde aus dem nördlichen und südlichen Siedlungsbereich. Veröffentlichungen des Landesamtes für Archäologie - Landesmuseum für Vorgeschichte Sachsen-Anhalt, Band 82 (Halle (Saale) 2021).