

Interpreting the structure of Gailiūnai 2 and Varėnė 2: Two different cases of Late Mesolithic campsite organisation in southeast Lithuania

Lukas Gaižauskas

 ORCID ID: [0000-0002-7056-3998](https://orcid.org/0000-0002-7056-3998)

Lithuanian Institute of History, Tilto St. 17, 01101 Vilnius, Lithuania

Keywords

Intra-site structure, spatial analysis, Late Mesolithic, lithics, refitting, dugout structures, flint raw material

Abstract

This study examines the intra-site structure of two Late Mesolithic sites in southeast Lithuania: Gailiūnai 2 and Varėnė 2. Gailiūnai 2 presents a rare example of a single-period camp with a well-preserved spatial structure of discrete lithic scatters. In contrast, Varėnė 2 is a multi-period palimpsest site with mixed archaeological deposits but with documented Mesolithic features. Spatial analysis, characterisation and refitting of lithic artefacts as well as AMS ¹⁴C dating were carried out in order to identify the patterns in the internal organisation of both sites and define the nature of activities that resulted in the formation of their particular structure. The analyses have shown that three discrete lithic clusters at Gailiūnai 2 likely reflect remains of short-term task-specific encampments with the western cluster also displaying evidence of a surface dwelling. Refitting revealed prevalence of short reduction sequences and a technological organisation indicative of short-term stays. Varėnė 2 represents repeated, more substantial occupations involving habitation inside dugout dwellings as well as potential reuse of their pits as dumps. While individual lithic scatters are impossible to distinguish, three dugout structures with artefact-rich fills indicate more substantial habitation for longer periods. Radiocarbon dating has shown that dugouts were probably used between ca. 7170 and 4800 cal BC and in separate phases. The Late Mesolithic habitation at Varėnė 2 involved extensive usage of distinctive reddish-banded flint, which was used contemporaneously with the inhabitation and burial at one of the dugouts. The contrasting site structures highlight variability in Late Mesolithic settlement strategies. These results demonstrate the potential of unstratified sandy sites to reveal meaningful insights into lifeways of Stone Age hunter-gatherers in the southeast Baltic.

Introduction

The study of spatial organisation and lithic technology at Mesolithic campsites provides a crucial window onto the lifeways, mobility strategies and technological practices of hunter-gatherer communities that thrived throughout this period. In northern and eastern European plains and particularly in the southeastern Baltic, a large number of residential sites or campsites that preserved archaeological deposits minimally disturbed by agriculture are found in sandy soils. Analysis of unstratified open-air campsites formed in such soils frequently presents considerable methodological challenges due to the superimposition of material traces left by repeated episodes of occupation and activity, which complicates the isolation of remains attrib-

utable to a single period and thus hinders interpretations about the duration of occupation and nature of activities carried out at these campsites. This is very evident in the research into Stone Age campsites in Lithuania, as for a long time most efforts by the archaeologist were directed towards excavation and analysis of material from such sandy sites situated on river terraces or shores of lakes (Ostrauskas 1999b, p. 31; Rimantienė 1999; Piličiauskas 2004; Juodagalvis 2007; Marcinkevičiūtė 2010). A further difficulty lies in the limited availability of samples suitable for absolute dating, resulting from poor preservation conditions as well as the paucity of anthropogenic subsoil features. Examples of research on Mesolithic campsites in the sandy regions of the North European Plain have demonstrated that both discrete and overlapping lithic

* Corresponding author. E-mail: lukas.gaizauskas0@gmail.com

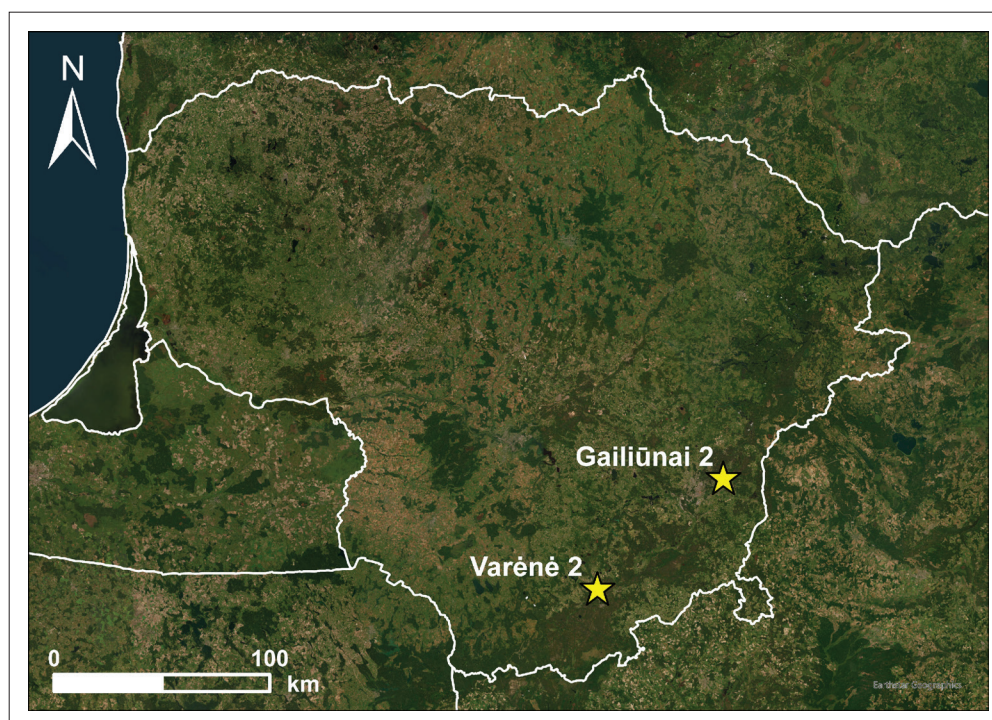


Figure 1. Locations of Gailiūnai 2 and Varėnė 2 sites (drawing by L. Gaižauskas).

scatters at open-air campsites retain traces of structured behaviour, reflecting repeated knapping events and task-specific activity zones, and allow for the reconstruction of latent structures and dwellings (e.g. Sergant et al. 2006; Osipowicz 2018; Vandendriessche 2022). More meaningful interpretations of such sites with poor preservation conditions can be achieved only through a combination of several techniques, such as analyses of spatial patterning, lithic refitting, radiocarbon dating and functional analysis (Osipowicz 2017; Vandendriessche et al. 2023).

This paper attempts to provide a glimpse into Late Mesolithic campsite variability by presenting the results of investigations of two open-air campsites in southeast Lithuania: Gailiūnai 2 and Varėnė 2 (Fig. 1). Both contain archaeological assemblages attributable to the Late Mesolithic period based on the presence of geometric microliths, including trapezes. Despite the fact that the archaeological deposits of the two archaeological sites have developed similarly in sandy unstratified soils with poor preservation conditions, they differ significantly in their archaeological formation processes and in the character of their preserved features. Gailiūnai 2 is a small campsite characterised by several discrete lithic scatters, but without any documented anthropogenic features. In contrast, Varėnė 2 represents a complex palimpsest site used repeatedly from the Final Palaeolithic through to the Early Iron Age yet preserving several substantial Late Mesolithic features that provide a rare opportunity to date the habitations and to examine spatial relationships between features and distribution of lithics.

The situation of both sites according to the context of the surrounding landscape differs. Gailiūnai 2 is situated on a sandy plain in the vicinity of the wetland complex that forms the headwaters of the small Veržuva River, a tributary of the Neris. The location for the campsite was probably chosen so as to be near the spring that flows from the slopes of an adjacent upland, ca. 150 m to the south-southeast of the site (Fig. 2.1). The nearest wetland, however, is situated at a substantial distance of ca. 500 m to the northeast. This contrasts with the ecological setting of Varėnė 2, which is located on the left bank of the Varėnė River. While the Varėnė itself is a larger river, it also flows through the extant Lake Varėnis. The campsite is situated approximately 300 m southwest of the point where the river flows out of the lake (Fig. 2.2). The two sites were excavated using slightly different excavation techniques. Gailiūnai 2 was excavated in 2022 and 2024 by the author of this paper (Gaižauskas 2023). A total area of 310 m² was investigated, reaching the boundaries of the artefact concentrations and thus encompassing nearly the entire campsite as inferred from the distribution of preserved archaeological material. The excavated area was divided into a grid of 50×50 cm squares and all excavated soil was sieved through a 5 mm mesh. The thickness of the archaeological layer was only up to 15 cm. It had formed directly beneath the surface vegetation in dark greyish-brown sand and at the upper part in yellowish-brown sand, above a gravelly horizon. The find assemblage from Gailiūnai 2 consists of 627 flint artefacts and 5 g of calcined bone

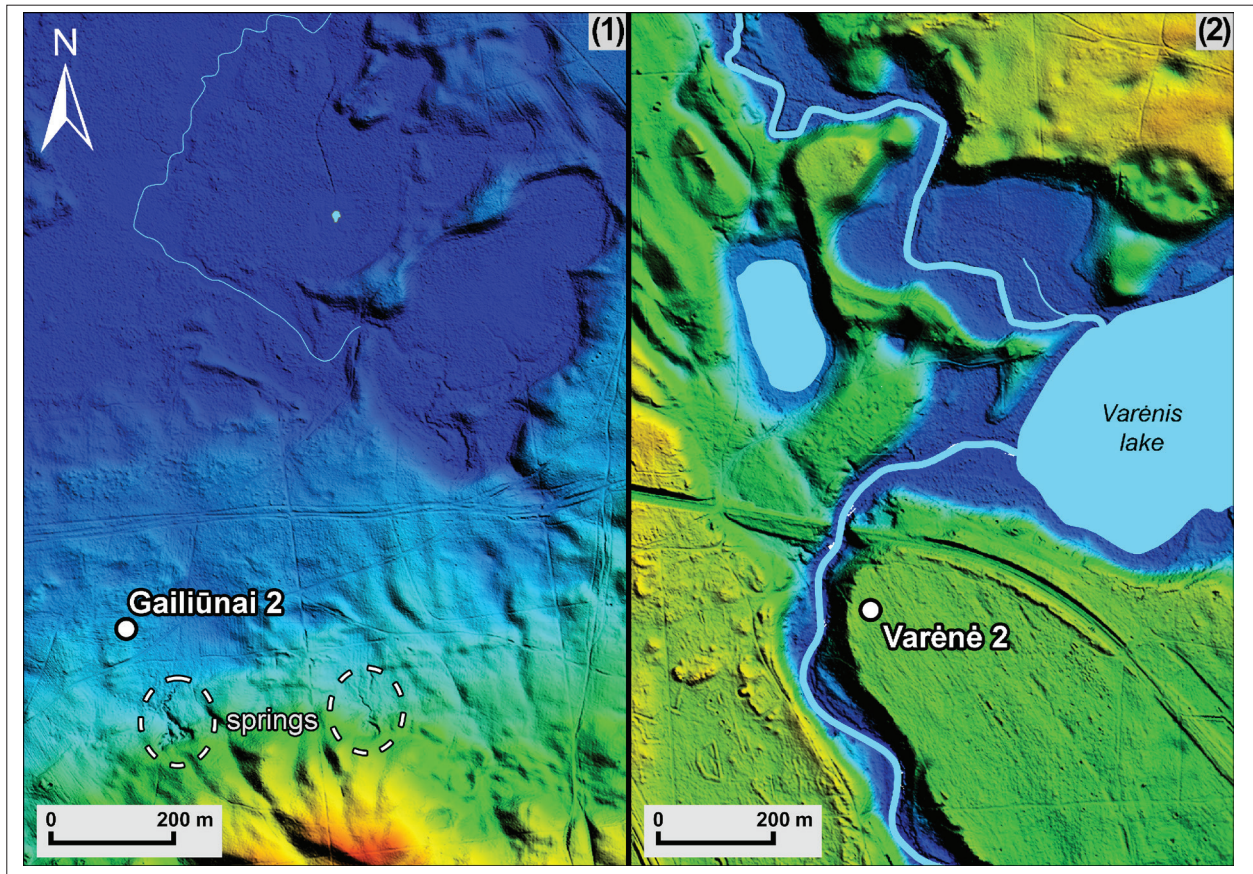


Figure 2. Topographic situation of Gailiūnai 2 (1) and Varėnė 2 (2) sites indicated on digital elevation models that were generated from Lidar data (drawing by L. Gaižauskas).

fragments. Technological and typological attributes of the flint assemblage, such as regular blades detached from single platform cores, microburins and geometric micro-liths, indicate that the site was used in the Late Mesolithic (Ostrauskas 1999a, pp. 13–15; 2001b, p. 212). The investigations at Varėnė 2 were carried out in 1996–1999 by Tomas Ostrauskas. Several large trenches were excavated, comprising a contiguous area of 335 m² (Ostrauskas 1998; 2000). The investigations revealed traces of occupation from various periods, ranging from the Late Palaeolithic to the Early Iron Age (Ostrauskas 2001a). A large component of Late Mesolithic flint artefacts was identified within the assemblage. The archaeological deposits at Varėnė 2 were 30–40 cm thick, consisting of a dark grey sandy topsoil underlain by a 10 cm layer of brownish gravelly sand or sandy gravel. Three large and deep anthropogenic features were identified within the investigated area and interpreted as Late Mesolithic dugout dwelling structures. Only the Mesolithic component, or phase, of Varėnė 2 will be considered further in this paper.

The two sites chosen for analysis appear to be situated at contrasting positions along the spectrum of formation processes between short-term and repeatedly occupied palimpsest-type campsites. This paper aims to compare both campsites according to patterns of site use, activ-

ity organisation and use of residential structures. This is achieved by integrating spatial analysis, lithic refitting and radiocarbon dating. Density distributions of lithic artefacts and characterisation of assemblages and features was used to identify discrete clusters, and to examine their internal structure and the spatial relationships between documented features. Radiocarbon dating was undertaken to establish the chronological framework for Mesolithic occupations at both sites and to reveal the previously uncertain chronology of features at Varėnė 2. The aim of the refit analysis was to assess the contemporaneity and relationships between different artefact clusters and areas, and to better understand the formation processes of both latent and subsoil features. Refitting has so far been applied only to a very limited extent in the study of Stone Age sites in Lithuania (Juodagalvis and Marcinkevičiūtė 2004, pp. 81–82, Fig. 4). This can be attributed to a perceived small prospect of success due to the uniformity of the raw material, which makes it difficult to distinguish between removals from different nodules or cores, and also due to the overall small sizes of debitage at Mesolithic sites. However, it is clear that refitting has been underutilised as a method even though it is particularly helpful in disentangling surface scatters (Cziesla 1990; De Bie 2007). Ultimately, this study seeks to demonstrate that even in the absence of organics and well-preserved features,

a combination of approaches can reveal structured patterns of behaviour, shedding light on the lifeways of Mesolithic hunter-gatherers in the southeast Baltic. Comparison of the two campsites is carried out as means to gain insight into the variability of settlement types and technological organisation which contribute to discussions on hunter-gatherer mobility, exploitation of landscape and the use of residential structures.

1. Spatial distribution of lithics and Mesolithic features

Since no anthropogenic features or remains of semi-permanent structures were recorded at Gailiūnai 2, the internal structure of the campsite can only be inferred from patterns in the spatial distribution of lithic materials. Point density representation of lithic finds showed that lithics were dispersed over three separate, non-overlapping scatters or clusters. The clusters were located in the western, eastern and northern parts of the investigated area and are thus correspondingly labelled (Fig. 3). The clusters differ in both the density of lithic materials and size of the area covered. The largest cluster in terms of the amount of lithics is the eastern one, followed by the western cluster, while the northern cluster is characterised by a markedly lower density of lithics (Table 1). Variations in the quantity and density of flint artefacts are likewise reflected in the differing sizes of the clusters. The eastern cluster extends over an area of approximately 4×6.5 m and the western cluster over ca. 3×5 m, whereas the northern cluster has a diameter of approximately 2–3 m and is more diffuse in form. The internal spatial organisation of lithics within these three clusters also varies. The northern cluster constitutes a relatively loose scatter lacking a clearly defined centre. The eastern cluster, which is the largest, comprises an outer zone of more widely dispersed flint pieces. Within its central area, however, two compact concentrations, each approximately 1 m in diameter, are clearly discernible. These may represent knapping spots formed either during two separate knapping episodes or as individual working positions of two people. The areas of the highest concentration for burnt pieces within the eastern cluster correspond to zones of increased artefact density, suggesting that these activities were undertaken in proximity to surface hearths. The spatial configuration of the western cluster differs once again. It possesses a distinctly defined central area characterised by the highest artefact density and a more regular, delineated shape. The majority of lithics derive from an oval area measuring approximately 3.5×2.5 m, beyond which artefact density decreases sharply. The distribution pattern of this cluster may have been influenced by activities undertaken within a hypothesised dwelling structure. Although the scatter of burnt flints is too diffuse to pinpoint the location of a hearth, it nonetheless provides evidence for the use of fire within the structure.

Table 1. Quantities of flint artefacts by category from different clusters at Gailiūnai 2.

| Category | Cluster | | | Total |
|--------------------------------------------------|---------|---------|----------|-------|
| | Western | Eastern | Northern | |
| Total pieces | 227 | 288 | 58 | 573 |
| Debitage | | | | |
| Blades | 129 | 21 | 11 | 161 |
| Regular blades | 68 | 6 | 6 | 80 |
| Microburins | 9 | - | - | 9 |
| Flakes | 89 | 239 | 47 | 375 |
| Cortical pieces | 3 | 41 | 1 | 45 |
| Burin spalls | - | 1 | 2 | 3 |
| Core adjustment and platform rejuvenation flakes | 8 | 7 | 7 | 22 |
| Tools | | | | |
| Blades with macroscopic edge damage | 19 | 6 | 6 | 31 |
| Scrapers | - | 15 | - | 15 |
| Retouched flakes | 6 | 12 | 3 | 21 |
| Microliths | 4 | - | - | 4 |
| Other | | | | |
| Burnt pieces | 83 | 58 | - | 141 |

The erratic Baltic flint used at Gailiūnai 2 was of high quality, especially the material used for blade production in the western cluster, which was very fine-grained and translucent. The overall lithic assemblage of the site is characterised by a high proportion of blades and blade fragments (Table 1). A total of 153 complete blades, blade fragments and tools produced on blade blanks were recovered. Blade fragmentation was frequent: only eight complete blades were found, and nearly half of the blade assemblage comprised proximal fragments. Debitage associated with the primary reduction of flint nodules or with core preparation was scarce. In addition to the differences already noted between the three clusters, there are marked variations in the composition of their individual lithic assemblages. Within the western cluster, blades and blade fragments overwhelmingly constitute the principal component of the debitage. Approximately one-fifth of all blades from this cluster exhibit retouch or macroscopic edge damage, likely resulting from use. The western cluster also contained nine microburins, two rectangular microliths and two fragments of triangular microliths. Neither microliths nor microburins were recovered from the other two clusters. All microburins and microliths were discovered in close proximity to one another, suggesting that retooling

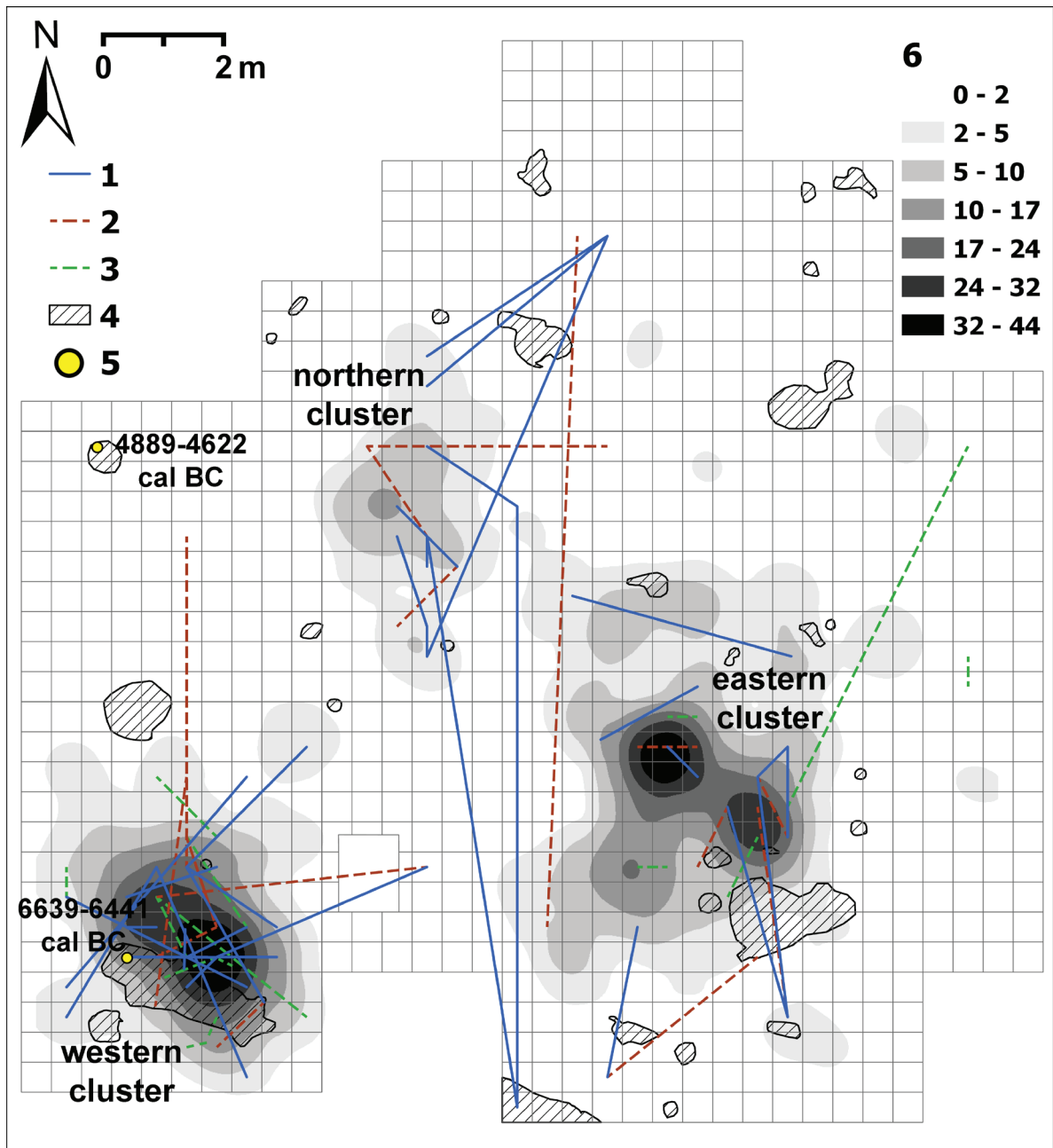


Figure 3. Spatial distribution of lithics and of refitted flint artefacts within Gailiūnai 2. 1. production sequence refits; 2. break refits, 3. thermic fracture refits; 4. natural features; 5. locations of AMS ¹⁴C dated calcined bone samples; 6. density of flint artefacts calculated by Kernel density tool in ArcGIS Pro software (drawing by L. Gaižauskas).

and microlith production took place within the hypothesised dwelling structure. The predominance of blades indicates that this part of the site was associated with blade production and activities requiring a high output of blades. Blades appear to have been detached in short sequences and subsequently fractured into segments. The northern cluster seems to have been associated with activities that required blades or blade fragments, as well as non-intensive reduction of flint material. By contrast, the eastern cluster differs markedly from the western cluster in terms of its assemblage composition. Only around 10% of the debitage from the eastern cluster consists of blades, with flakes being clearly predominant. This cluster also

yielded the majority of tools on flakes. Notably, all of the scrapers ($n = 15$) were found exclusively within this cluster. The eastern cluster further contains a greater number of cortical flakes. However, as will become clearer from the results of the refitting analysis, this cluster was unlikely to have formed as an outcome of a single or a few knapping episodes, nor did it involve substantial reduction sequences. Instead, it appears to represent an area where numerous short-term activities were repeatedly carried out over time. In contrast to the western cluster, activities within the eastern cluster do not appear to have been spatially delimited or anchored by any structural features.

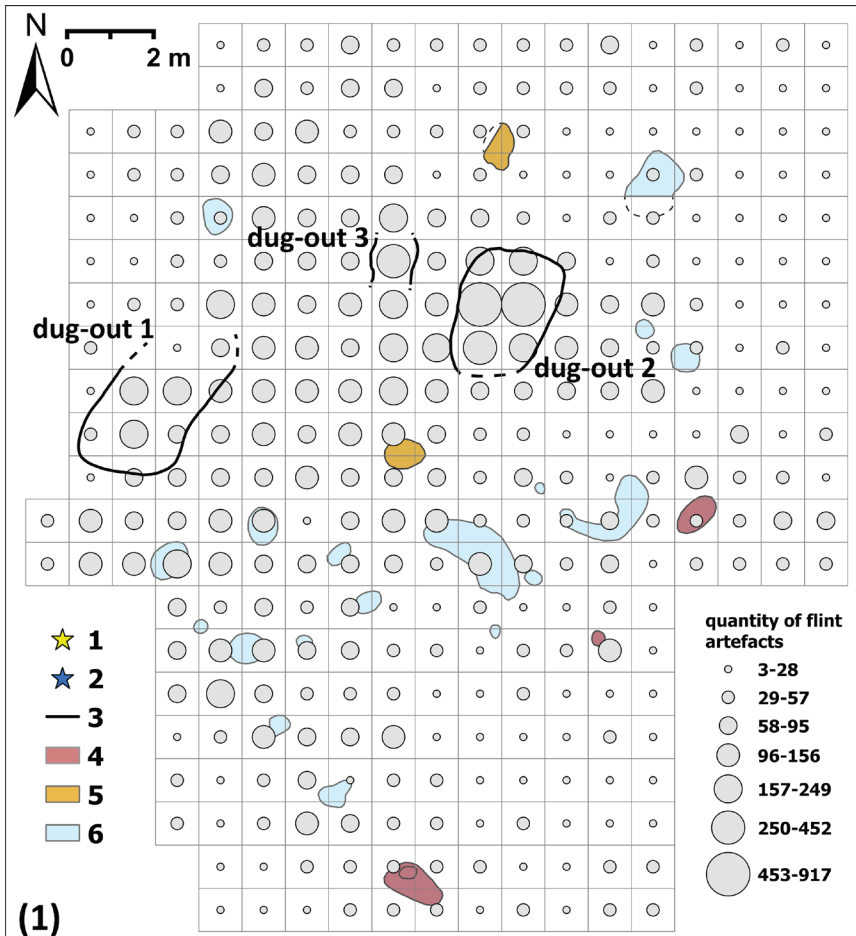
In contrast to Gailiūnai 2, which comprises small and discrete lithic scatters, the archaeological layer in Varėnė 2 represents a palimpsest as the site was reused throughout the Stone Age and later prehistory. The find assemblage at Varėnė 2 consists of around 21,000 artefacts, only a small part of which is constituted by finds other than flint. Flint finds amount to 20,479 pieces, 98% of the entire assemblage. Erratic Baltic flint, mostly of high quality, was used at the site. In total, 393 fragments of prehistoric pottery and around 50 calcined animal bone fragments were also found. Based solely on the typology of the finds, the site reveals settlement or activity horizons from the Final Palaeolithic, Late Mesolithic, Subneolithic, Neolithic, Bronze Age and possibly also Early Iron Age (Ostrauskas 2001a, pp. 180–181). While it is evident that some flint artefacts and debitage were produced and discarded at the site during all of the aforementioned periods, the Late Mesolithic habitation appears to be by far the most intense in comparison. This is primarily suggested by the composition of the flint assemblage, in which artefacts technologically and typologically consistent with activity in the Late Mesolithic, ca. 7500–4500 BC, are most numerous. Superimposition and overlap of multiple habitation episodes have blurred the spatial traces or clusters resulting from separate episodes. Nevertheless, one aspect that helps to distinguish traces of the spatial structure and character of the Late Mesolithic habitations at Varėnė 2 is the presence of preserved and datable archaeological features. Three large and deep features with numerous flint finds in their fill were discovered beneath the archaeological layer. These features have been identified as pits of dugout buildings, which could have served as winter dwellings (Ostrauskas 2001a, p. 180; Fig. 4.1). All three dugouts are characterised by the fact that their upper parts were not visually distinguishable from the natural soil of the archaeological layer and became evident only at depths of approximately 0.4–0.5 m. **Dugout 1**, located on the western periphery of the campsite, was the largest and most substantial of the features. Its reconstructed dimensions were approximately 3.5 m in length and 2.2 m in width, with its long axis oriented northeast to southwest. The southern end of the pit was rounded, implying an overall oval plan, while the northeastern end was less clearly defined. The pit reached a depth of 0.9–1.1 m in the central area, where an almost circular hearth feature (ca. 80×70 cm) of brown-grey sand was uncovered. Numerous flint artefacts, including burnt fragments, as well as fire-cracked granite boulders and several larger stones intentionally brought into the structure, were found within and above the hearth. **Dugout 2**, situated on the eastern margin of the group, was slightly smaller, measuring ca. 3×2.3 m at the upper levels, with a broadly rectangular outline and rounded corners, elongated along a north–south axis. At greater depth, the pit became more clearly defined, narrowing to an almost square

plan (ca. 1.7×1.9 m) at around 1.7 m, with the archaeological deposits disappearing below 2 m. The fill consisted of discrete patches of sand of varying colour, and in the centre, at the depth of 76 cm, an oval lens of dark greyish sand (ca. 70×40 cm) likely represented the remains of a hearth. **Dugout 3**, located just over a metre to the northwest of dugout 2, was the smallest. Measuring only ca. 1.6×1.1 m and slightly elongated along a north–south axis, it reached just over 1 m in depth. Its darker fill contrasted with the surrounding sterile sand; however, no traces of a hearth were recorded, and its function as a dwelling remains uncertain. Taken together, dugouts 1 and 2 appear to have been relatively substantial, equipped with hearths and associated with artefact-rich fills, whereas dugout 3, by virtue of its smaller size, limited depth and lack of internal features, is less convincing as a habitation structure.

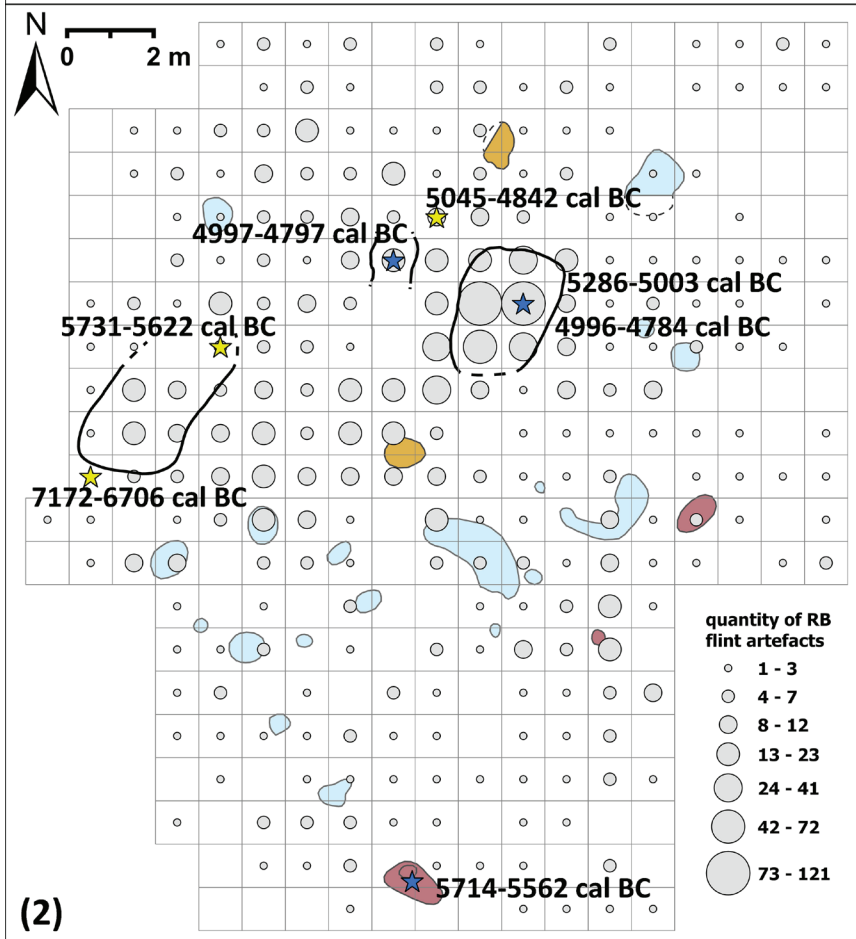
The preliminary attribution of all three features — dugouts — to the Late Mesolithic is based on the numerous finds of microliths and microburins discovered inside (Table 2). Very little can be inferred about the internal organisation of all three dugout structures. A clearly defined central hearth was identified in dugout 1 and possibly in dugout 2. Fire-cracked stones, associated with the hearth, were found only in the pit of dugout 1. Reconstructing structural elements, occupation surfaces or walls is also difficult and speculative. Since the soil conditions did not allow for the identification of floors or occupation surfaces, such reconstruction could only be attempted through an analysis of artefact distribution at different levels within the pits. Without a more detailed analysis, the preliminary impression is that the finds in the fill of all three pits were distributed at varying depths, without forming denser concentrations at a particular level that might indicate an occupation surface. Considering that many of the finds entered the fill as the buildings deteriorated and collapsed, or were introduced through the backfilling of artefact-rich soil and human activity such as dumping refuse into old pits, it is highly likely that the actual amount of flint that accumulated during the period of use of the dugouts was minimal.

Table 2. Quantities of flint artefacts found within the three dugout features at Varėnė 2.

| Artefact category | Dugout 1 | Dugout 2 | Dugout 3 |
|-----------------------|----------|----------|----------|
| Lanceolate points | 2 | 2 | - |
| Trapezes | 2 | - | 2 |
| Triangles | - | 3 | - |
| Insert bladelets | 1 | 2 | 1 |
| Microburins | - | 2 | 5 |
| Flint pieces total | 418 | 2036 | 392 |
| RB flint pieces total | 16 | 333 | 1 |



(1)



(2)

Figure 4. Quantities of all lithic artefacts (1) and RB flint artefacts (2) per excavation grid square at Varėnė 2 with indicated outlines of dugouts 1–3 and other archaeological features as well as distribution of AMS ¹⁴C dated samples. 1. AMS ¹⁴C dated samples from archaeological layer; 2. AMS ¹⁴C dated samples from the fill of archaeological features; 3. reconstructed outlines of Mesolithic dugout pits; 4. Mesolithic features; 5. Final Palaeolithic–Mesolithic features; 6. other features. Two AMS ¹⁴C dates have been obtained from the same grid square inside dugout 2 (drawing by L. Gaižauskas).

Due to the very long accumulation span of flint artefacts and the overlap of activities from different periods, it is nearly impossible to distinguish clusters of Late Mesolithic artefacts at Varėnė 2 by spatial analysis alone (Fig. 4.1). However, one particular type of flint raw material, which was relatively abundant at this campsite, can be associated specifically with the Late Mesolithic horizon. The matrix of this type of flint is characterised by matt grey or slightly brown colour and by the texture of reddish or brownish bands and speckles that vary in hue. It is referred to here as reddish-banded flint or **RB flint**. Artefacts made from this type of flint are proportionally most abundant at Stone Age sites along the middle reaches of the Merkys River and near the Varėnė River.¹ The connection between this raw material and the Late Mesolithic horizon at Varėnė 2 is further supported by the types of artefacts made from it — lanceolate points and geometric microliths produced using the microburin technique, microburins themselves, single-platform cores and a large number of blades struck from such cores. No artefacts characteristic of the Final Palaeolithic, Subneolithic, or Bronze Age were found at Varėnė 2 that would indicate the use of this raw material in these periods. The complete assemblage of RB flint at Varėnė 2 consists of 1,600 artefacts, representing approximately 8% of the total flint assemblage. Of these, blades make up 9% of the RB flint debitage, 88.5% consist of flakes and debris, and the remaining 2.5% include cores or core fragments, macrolithic tools and their blanks.

The assumption that the RB flint was used exclusively during the Late Mesolithic is supported by the spatial distribution of artefacts made from this raw material (Fig. 4.2). The highest concentration of this type of flint is observed in the area of dugout 2. Over 500 RB flint artefacts were collected from the archaeological layer directly above and within the pit of this structure. When comparing the distribution of RB flint to the distribution of all flint finds, there is some overlap between the areas of greatest density. The greatest cluster of RB flint artefacts is located in the western and northwestern parts of the investigated area, particularly around the dugout pits — and especially within dugout 2. One large cluster of flint artefacts that is not represented in the distribution of RB flint is found in the southwestern section of the excavated area. A comparison of quantity of all flint finds and the proportion of RB flint within the pits of the dugouts shows that dugout 2 stands out not only for having the highest overall number of artefacts but also for a significantly higher proportion of RB flint (Table 2). The pit of dugout 2 yielded about five times greater amounts of flint artefacts and debris than either of the other pits, while RB flint accounted for 16% of this total. This abundance may be explained by the size

and depth of dugout 2 — it was approximately four times larger than the pit of dugout 3 and deeper than both of the other dugouts. All microburins made from RB flint were also found in the vicinity of dugout 2.

2. Radiocarbon dating of Mesolithic occupations

In order to determine the absolute age of the Mesolithic occupation at Gailiūnai 2 and of the dugouts discovered at Varėnė 2, AMS ¹⁴C dating was carried out on a set of samples selected from both sites. A total of 12 samples were dated — five from Gailiūnai 2 and seven from Varėnė 2. The descriptions of the samples and the resulting dates are presented in Table 3. At Gailiūnai 2, no obvious hearths or features positively associated with Mesolithic human activity were found, therefore, calcined bone fragments were chosen for dating the find clusters. Additionally, pine charcoal samples from two natural features containing archaeological finds were dated. At Varėnė 2, calcined bone fragments selected for dating were collected from the pits of dugouts and from the archaeological layer in the vicinity of the pits or above them. The single dated charcoal sample from Varėnė 2 came from the presumably anthropogenic feature 21/22 — a sunken hearth or a pit (feature 21) with a charcoal-rich lens (feature 22) in the centre. The dates were calibrated with the OxCal 4.4.4 software (Bronk Ramsey 2009), using the atmospheric data by Reimer et al. (2020).

¹ Based on unpublished data collected by the author of this article during the examination of collections from Stone Age sites held at the National Museum of Lithuania.

Table 3. Summary of AMS ¹⁴C dated samples.

| Site | Context | Sample type | Lab code | Date BP | Date cal BC/ AD 95.4 % probability |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|---------|------------------------------------------|
| Gailiūnai 2 | Trench 2, square L-42, cluster of calcined bone fragments and burnt flint artefacts (surface hearth?). Depth of 5–17 cm below surface | calcined bone | Poz-160284 | 7690±50 | 6639–6441 BC |
| Gailiūnai 2 | Square K-25, cluster of calcined bone fragments. Depth of 10–30 cm below surface | calcined bone | Poz-18671–4 | 5890±40 | 4889–4622 BC |
| Gailiūnai 2 | Trench 3, square O-44, fill of feature 7 (tree throw). Depth of 62 cm below surface | charcoal | FTMC-SU60-1 | 2776±28 | 1003–835 BC |
| Gailiūnai 2 | Trench 3, square O-44, fill of feature 7 (tree throw). Depth of 28 cm below surface | charcoal | FTMC-UO39-1 | 2719±28 | 914–810 BC |
| Gailiūnai 2 | Trench 8, square F1-39, feature 10 (filled-in tree stump hollow). Depth of 20–30 cm below surface | charcoal | FTMC-SI53-1 | 2004±31 | 53 BC–116 AD |
| Varėnė 2 | Square B-48, archaeological layer above the SW corner of dugout pit 1. Depth of 20–50 cm below surface | calcined bone | Poz-167241 | 8050±50 | 7172–6706 BC |
| Varėnė 2 | Square E-51, archaeological layer above dugout pit 1. Depth of 20–40 cm below surface | calcined bone | Poz-158584 | 6770±40 | 5731–5622 BC |
| Varėnė 2 | Square I-39, fill of feature 22. Depth of 71–96 cm below surface | charcoal | FTMC-SU60-2 | 6718±32 | 5714–5562 BC |
| Varėnė 2 | Square L-52, fill of the dugout pit 2. Depth of 40–170 cm below surface | calcined bone | Poz-167239 | 6180±40 | 5286–5003 BC |
| Varėnė 2 | Square J-54, cluster of calcined bone fragments from archaeological layer in proximity to dugout pits 2 and 3. Depth of 20–40 cm below surface | calcined bone | Poz-167240 | 6050±35 | 5045–4842 BC |
| Varėnė 2 | Square I-53, fill of dugout pit 3. Depth of 40–100 cm below surface | calcined bone | Poz-167238 | 6010±35 | 4997–4797 BC |
| Varėnė 2 | Square L-52, fill of dugout pit 2. Depth of 40–170 cm below surface | calcined bone | Poz-158583 | 5990±40 | 4996–4784 BC |

The plot of obtained radiocarbon dates is given in Figure 5. Two dates obtained from calcined bone fragments in Gailiūnai 2 differ significantly. The older calcined bone date — 6639–6441 cal BC — from the western cluster of flint artefacts should be considered contemporaneous with the surrounding flint finds. The much younger date — 4889–4622 cal BC — was obtained from a bone fragment found in a small concentration of calcined bones in the northwestern corner of the investigated area. The three charcoal dates from natural features in Gailiūnai 2 indicate a relatively late formation period for these features — the beginning of the 1st millennium BC and the 1st century BC to 1st century AD. One of these features was formed from a tree throw and the other from a burned or decayed tree stump.

All dates obtained from Varėnė 2 fall within the Middle and Late Mesolithic periods, ranging from 7172 cal BC to 4784 cal BC (Fig. 4.2). The earliest date of 7172–6706 cal BC from a concentration of calcined bones southwest of dugout 1 cannot be reliably used to date the feature itself. However, the date of 5731–5622 cal BC from a bone fragment found in the archaeological layer above the pit of dugout 1 indicates that the dugout was already abandoned and had decayed before this date. The second date also overlaps with the date of feature 21/22, uncovered in the southern part of the excavated area — 5714–5562 cal BC. The other four dates from Varėnė 2 are associated with the pits of dugouts 2 and 3. Three of these dates almost completely overlap, while one date is slightly earlier — 5286–

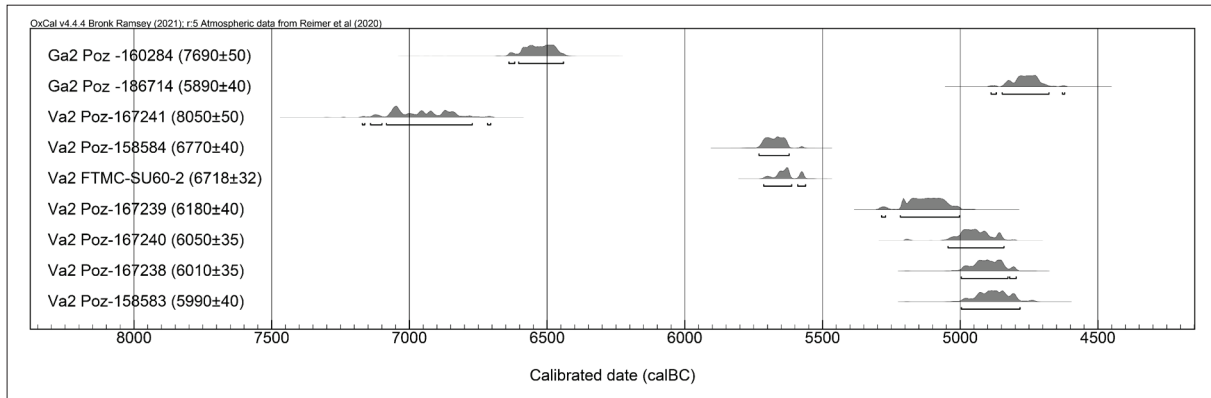


Figure 5. Calibration plot of AMS ^{14}C dates from Gailiūnai 2 (Ga2) and Varėnė 2 (Va2). Significantly younger outliers from natural features at Gailiūnai 2 are omitted (created by L. Gaižauskas).

5003 cal BC — and obtained data from the fill of dugout 2. The overlapping dates are from the fill of dugout 2 (4996–4784 cal BC) and the adjacent archaeological layer above it (5045–4842 cal BC) as well as from the fill of dugout 3 (4997–4797 cal BC). The obtained dates viewed together suggest that the two dugouts with more prominent and larger pits, namely dugouts 1 and 2, were not contemporaneous; at least a 400-year interval separates them. Dugout 3 may also be non-contemporaneous with and younger than dugout 2, but the available number of dates is too limited to confirm this conclusively.

3. Refitting of flint artefacts

The aim of the refitting analysis was to determine spatial and chronological relationships, if such were present, between the flint artefact clusters at Gailiūnai 2, and to isolate Mesolithic activity areas at Varėnė 2 based on connections between artefacts of RB flint. At Varėnė 2, only finds of RB flint were considered in order to narrow down the very abundant flint material sample and based on the assumption that this particular raw material is associated with the Late Mesolithic horizon of the campsite. The artefacts selected for refitting comprised pieces larger than 1 cm from Gailiūnai 2 ($n = 497$) and pieces larger than 2 cm from Varėnė 2 ($n = 803$). Refits were categorised into production sequence (debitage) refits, breakage refits and thermic refits (Cziesla 1990, pp. 15–16). For graphic representation of the spatial distribution of refits, the connections between refitted pieces were represented by lines in the chronological order of the knapping sequence, beginning from the chronologically earliest removal toward the next refitted fragment and drawn only between proximal fragments of broken or fractured pieces (De Bie 2007, p. 39; Vandendriessche 2022, p. 26).

A total of 41 refit sets were identified at Gailiūnai 2, amounting to 109 pieces. Of these, 21 sets (66 artefacts) represent production sequences, 6 sets consist of joined broken pieces (13 artefacts), and 14 sets include fragments

broken or shattered due to the thermic impact (Table 4). The highest number of refits in a single refit set is eight (set 3). Five sets contain four or more pieces, eight sets contain three pieces, and the remaining 28 sets consist of just two pieces (Fig. 6). Most refit connections were found within the limits of flint artefact clusters and no connections were found linking any two different clusters. The distribution of refits among the three find clusters is uneven (Fig. 3). The northern cluster, characterised by the lowest density of finds, also had the fewest successful refit sets — only five. However, some of the larger sets, namely sets 26 and 37, were located within this cluster (Fig. 7). The refits from the northern cluster do not reflect a well-defined knapping area, though most knapping activity seems to have taken place in the southern part of the cluster. In total, 15 refit sets were identified in the eastern cluster, but only six of them were debitage sequences. All of these sets comprised only two fragments, except for the largest, set 3, which included eight pieces. The removals in this set were concentrated within a 2 m diameter area in the central part of the eastern cluster (Fig. 7.R3). The majority of the successful refits — 24 sets — were found in the western cluster. Half of those sets are production sequences. The sets discovered here did not contain many pieces; the biggest, set 17, consists of five fragments — proximal parts of blades removed one after another (Fig. 7.R17). In the western cluster, refits very clearly aggregate within a 3 m long by 2 m wide area around the central zone of highest find density.

Table 4. Documented refit types at Gailiūnai 2.

| Refit type | No. | % | No. of sets |
|------------|-----|------|-------------|
| Debitage | 66 | 60.5 | 21 |
| Break | 13 | 12 | 6 |
| Thermic | 30 | 27.5 | 14 |
| Total | 109 | 100 | 41 |

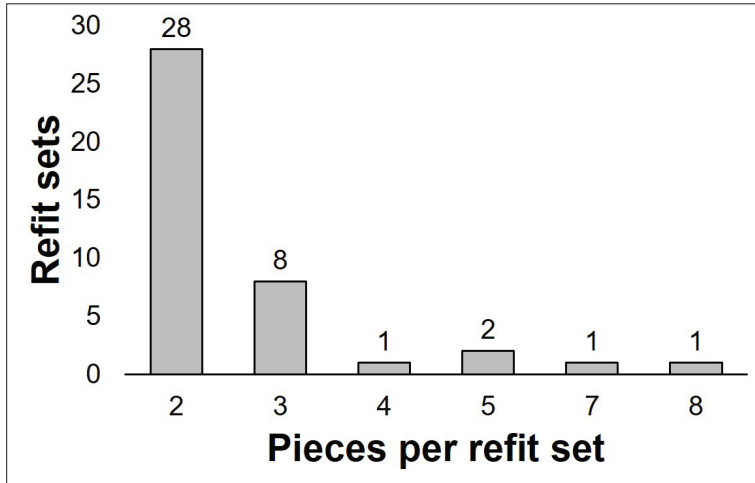


Figure 6. Distribution of the amount of lithic artefacts per refit set at Gailiūnai 2 (diagram by L. Gaižauskas).

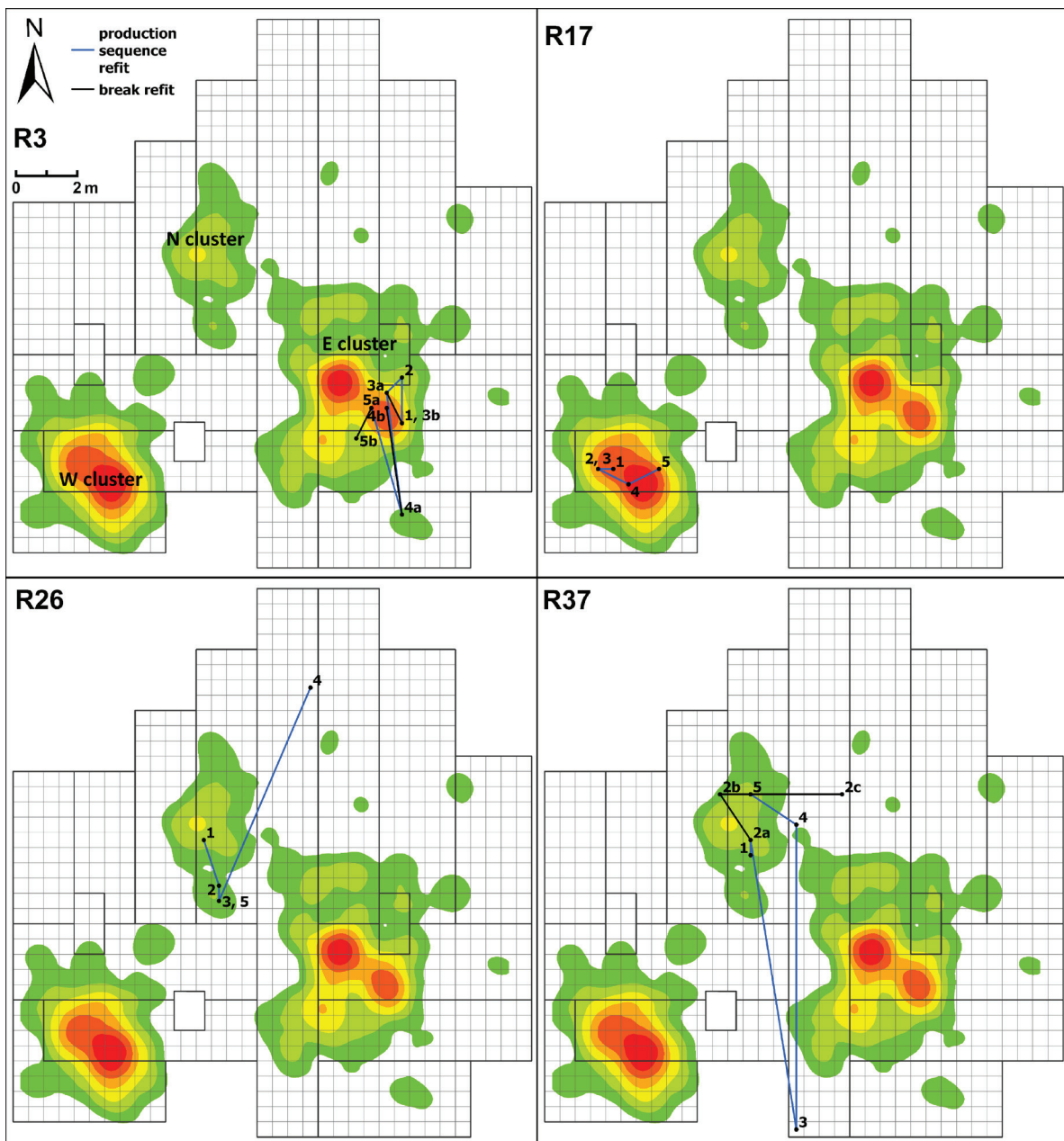


Figure 7. Spatial distributions of refit sets (R) 3, 17, 26 and 37 at Gailiūnai 2 (drawing by L. Gaižauskas).

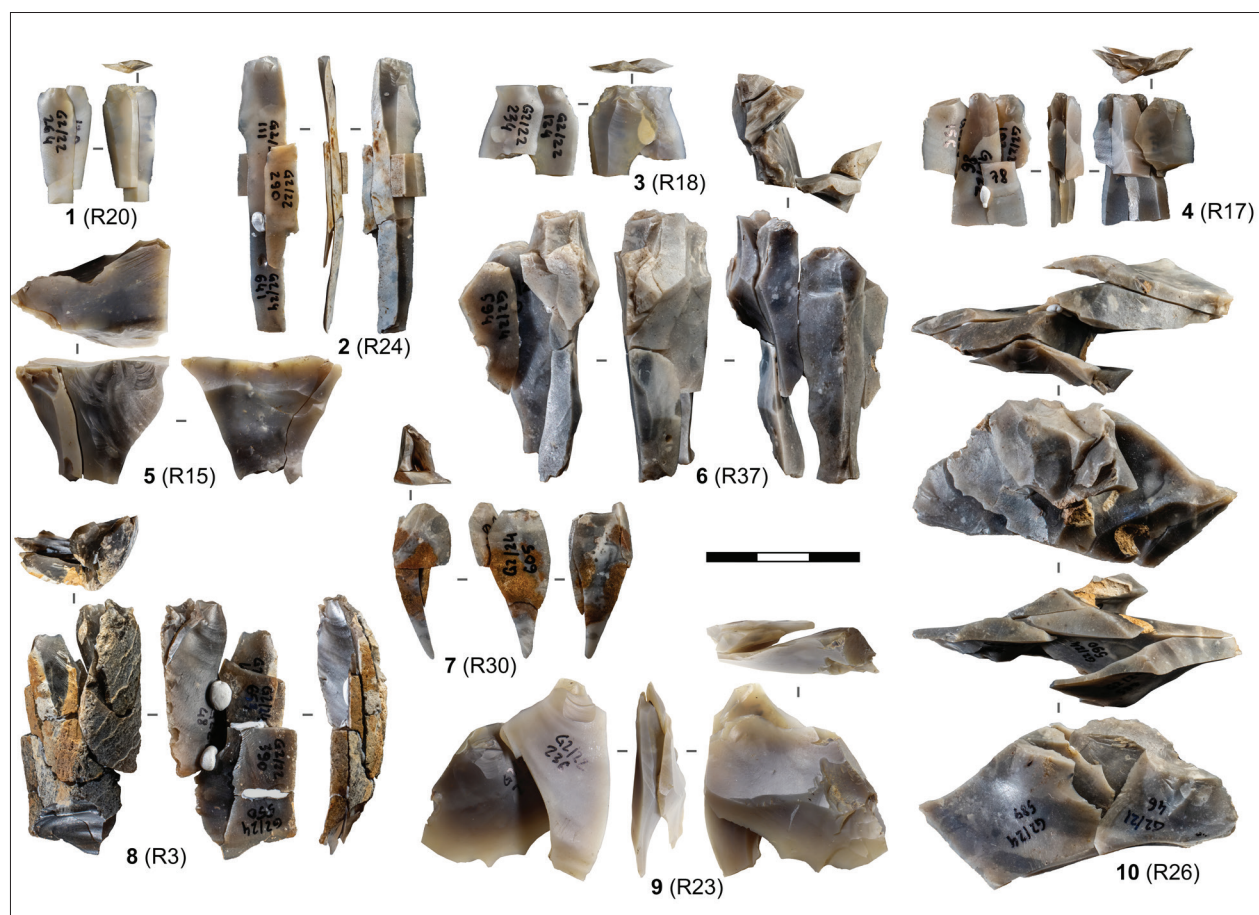


Figure 8. A selection of refit sets from Gailiūnai 2. 1 (set 20), 2 (set 24), 3 (set 18) and 4 (set 17) — sequences of removals of blades and bladelets, 5 (set 15), 7 (set 30), 9 (set 23) and 10 (set 26) — sequences of flake removals, 6 (set 37) — sequence of flake and irregular blade removals, 8 (set 3) — sequence of cortical flakes and subsequent blade removals (photograph by L. Gaižauskas).

Looking at the distances between joined fragments, several refits stand out due to their considerable distance from the spread of the other pieces of the same set. For instance, in set 37, a flake located in the middle of the knapping sequence was discarded approximately 9.5 m south of the cluster of the remaining pieces (Fig. 7.R37). This flake was retouched and may have been used near the spot where it was eventually discarded. Another flake, broken into two parts, had its fragments discovered about 11 m apart: the proximal part was found at the edge of the eastern cluster, while the distal part was discarded north of the cluster. Neither fragment exhibited signs of secondary modification or use-wear.

The predominance of small fragment counts within the refitted sets suggests that flint knapping activities at the campsite were conducted in brief episodes, with each event resulting in only short debitage sequences. Although a considerable number of refit sets were identified within the western cluster, sequences composed of just two fragments are predominant. This pattern is indicative of short, discrete knapping episodes, as exemplified by refit sets 17, 18, 20 and 24, which consist of blade fragments (Fig. 8.1–4). No evidence of other knapping activities was observed

within the western cluster, aside from minimal core repair or adjustments. A possible case of core preparation or adjustment is represented by refit set 23 (Fig. 8.9). The spatial distribution of the refit lines indicates that part of the knapping process — blade production and fragmentation — occurred in situ, and the associated fragments were subsequently utilised and discarded within a radius of 3–4 m from the likely knapping spot. The small number

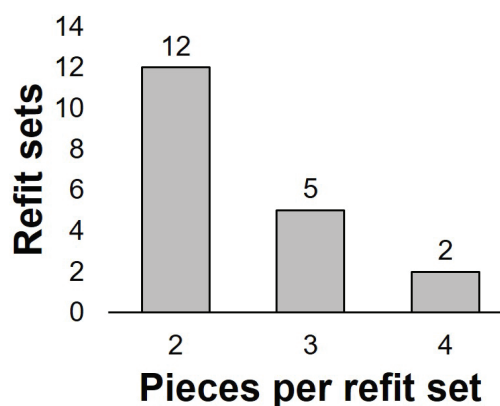


Figure 9. Distribution of the amount of lithic artefacts per refit set at Varėnė 2 (diagram by L. Gaižauskas).

of successful joins per refit set may be interpreted in two ways: either only a small number of blades were detached sequentially in each episode or a substantial number of the produced blades was removed from the site. The latter scenario would account for the absence of intermediary elements in the reduction sequences.

While the western cluster is primarily associated with the production and use of blades, the eastern cluster is characterised by a predominance of flakes (debitage) and a relatively low number of successful refits. Given the overall quantity of flint artefacts recovered from this area, the number of successfully refitted sequences appears notably low in comparison to the western cluster. Again, this may reflect brief and limited knapping episodes, during which only short reduction sequences were produced. Nevertheless, the largest refit set recovered from the entire campsite — set 3, consisting of eight fragments — was found in the eastern cluster. This set comprises three primary flakes detached from the previously unmodified face of a flint nodule, as well as several irregular blades removed subsequently, retaining significant portions of cortical surface (Fig. 8.8).

At Varėnė 2, a total of 41 refits from RB flint were identified, forming 19 refit sets (Table 5). Five sets consisted of broken or fractured fragments, twelve sets comprised debitage sequences, and in two cases fragments of flakes fractured due to thermic impact were refitted. The successfully refitted debitage refit sets are characterised by a small number of refits: eight sets comprised only two fragments, three fragments have been conjoined in two sets, and four fragments have been conjoined in two sets (Fig. 9).

Table 5. Documented refit types at Varėnė 2.

| Refit type | No. | % | No. of sets |
|------------|-----|-----|-------------|
| Debitage | 26 | 63 | 12 |
| Break | 11 | 27 | 5 |
| Thermic | 4 | 10 | 2 |
| Total | 41 | 100 | 19 |

The majority of refits at Varėnė 2 are concentrated within and around dugout 2, predominantly to the southwest and south of it (Fig. 10). The fact that a significant proportion of the debitage sequences fall within the area of dugout 2 implies one of two possibilities: either knapping took place inside the structure, with part of the debitage being discarded outside, or knapping occurred on the periphery of the pit, with the pit itself used for the disposal of accumulated knapping waste.

Refit sets 2 and 4, each comprising three refits, were located in different parts of the site. Set 2 represents a se-

quence of large flakes detached successively, most likely during the production of an axe (Fig. 12.2). All refits of sequence 2 were recovered from the area of dugout 2, within adjacent excavation squares (Fig. 11.R2). The final refit of the sequence was found below the depth of the surrounding archaeological layer, within the fill of the dugout. Set 4 consists of an exhausted single-platform core and two unsuccessful final removals — a plunging flake and a hinged flake (Fig. 12.1). The refits of set 4 were found at considerable distances from each other, indicating that part of the set was clearly dispersed beyond the original knapping location (Fig. 11.R4). The distance between the first and second refits is approximately 5.5 m, while the distance from the second to the last refit is about 10 m. The first two refits were found in the northwestern periphery of the excavated area, whereas the core was located to the southwest of dugout 2. The greatest distance recorded between two successfully refitted artefacts was in set 5, which consists of just two fragments separated by approximately 13 m (Fig. 11.R5). The two largest refit sets, 7 and 19, were distributed within the area of dugout 2 (Fig. 11. R7, R19). Set 7 represents a debitage sequence associated with production of an axe (Fig. 12.4). The final part of the set — a bifacially flaked axe blank — appears to have been discarded unused near the edge of the dugout. Two of the refits from this set were recovered from within the fill of the dugout, at a depth of more than 40 cm below the present ground surface. The second element in the sequence was found outside the dugout, approximately 4.5 m away from the first element located within the pit of the dugout. Set 19 comprises debitage from the initial reduction of a flint nodule — large cortical flakes (Fig. 12.6). A similar pattern of spatial distribution is evident in this set: three refits from the sequence were recovered from the pit of the dugout, while one piece was found in the same square as the furthest flake from set 7. The distribution patterns of these two sets suggest that the knapping area was situated to the southwest of the dugout, while debitage was discarded into the pit of the (former?) structure.

The small number of refitted fragments at Varėnė 2 corresponds closely with the refitting results from Gailiūnai 2. It is evident that extensive reduction sequences are absent at both sites, as flint knapping in these Mesolithic camps occurred in relatively small episodes and comprised only parts of the operational sequence in flint reduction. There is very limited evidence of initial working of flint nodules and preparation of cores. Knapping episodes consisted mainly of short reduction sequences, core adjustments and tool maintenance, and seemingly also included the production of macrolithic tools (e.g. axes) at Varėnė 2. This interpretation is further supported by the low quantities of large cortical flakes recovered, as such flakes are typically associated with primary reduction areas.

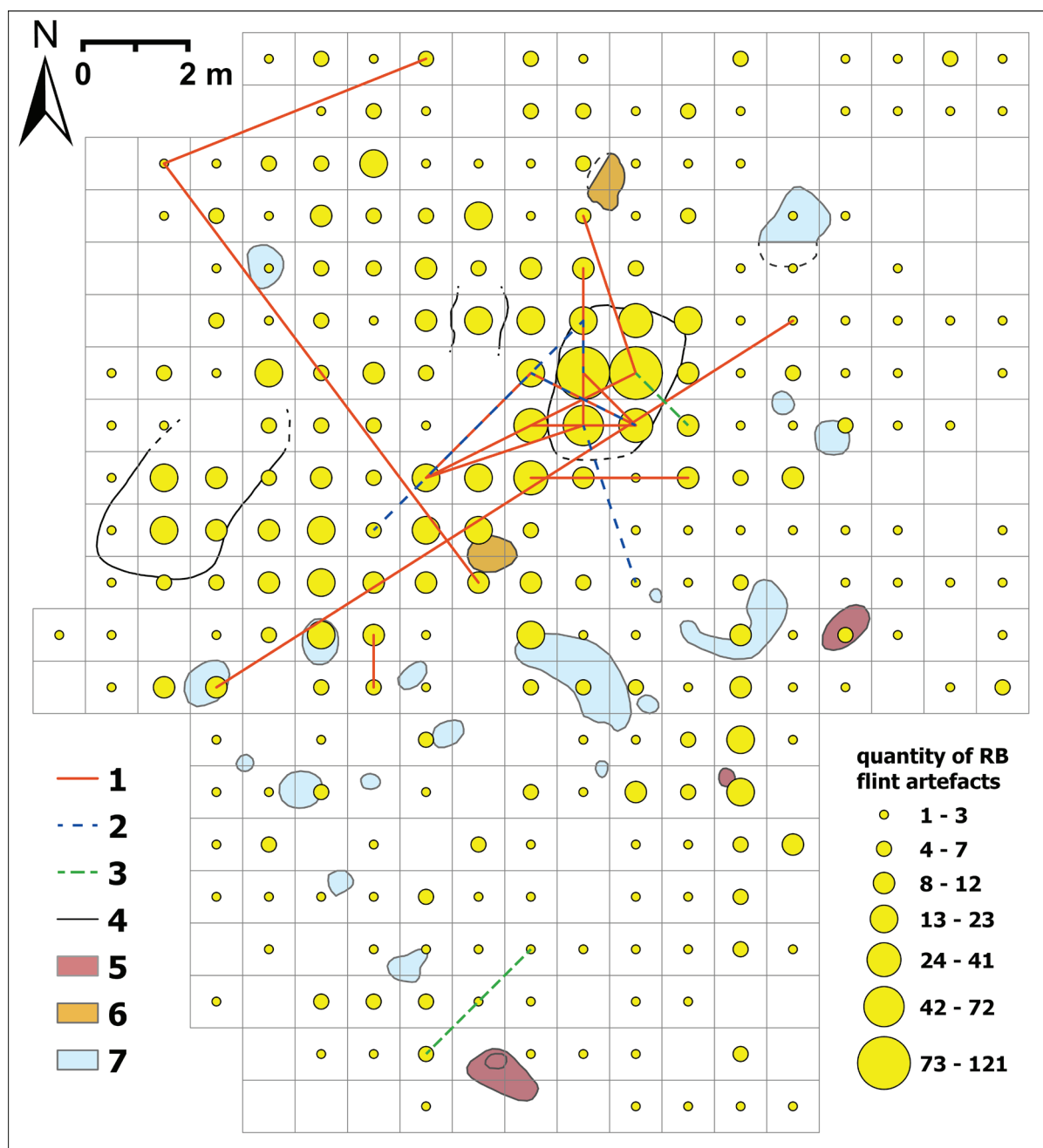


Figure 10. Spatial distribution of refitted RB flint artefacts against the background of RB flint artefact quantities per excavation grid square at Varėnė 2. 1. production sequence refits; 2. break refits; 3. thermal fracture refits; 4. reconstructed outlines of Mesolithic dugout pits; 5. Mesolithic features; 6. Final Palaeolithic–Mesolithic features; 7. other features (drawing by L. Gaižauskas).

4. Discussion

One of the main questions arising about the structures documented at both sites is their contemporaneity. The differences in the structure and artefact assemblages between separate clusters at Gailiūnai 2 suggest different formation mechanisms and chronologies. The presence of empty or nearly empty zones devoid of artefacts between the clusters supports the hypothesis that the clusters reflect distinct activity areas separated in time. These clusters may not necessarily have originated during the same episode of habitation; rather, they could be the result of

separate stays in the camp by the same group. Considering the location of the campsite and the fact that the three clusters form a tight group without traces of habitation in any other direction, they are not separated by a large time difference. Furthermore, the spatial distribution of the refits does not provide any evidence that different artefact clusters were contemporaneous. In a similar way to the lithic clusters at Gailiūnai, the dugouts at Varėnė 2 were probably not contemporaneous. It is not possible to draw definite conclusions about the precise dating of the dugouts and the exact duration of their use due to the nature and number of the samples that were available and were

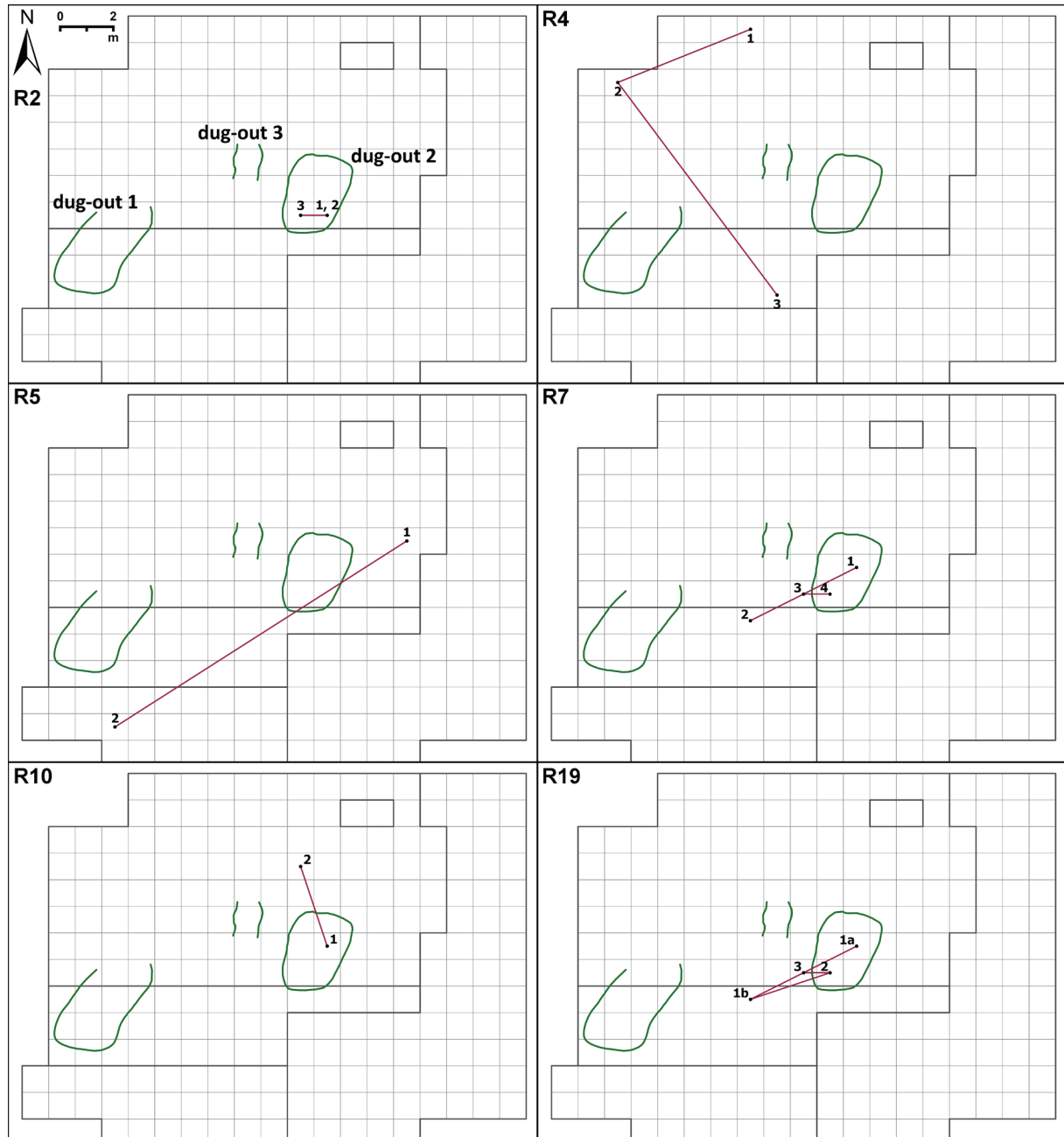


Figure 11. Spatial distributions of refit sets (R) 2, 4, 5, 7, 10 and 19 at Varėnė 2 (drawing by L. Gaižauskas).

used in this study. However, the obtained dates reveal that habitation in the dugouts and taphonomic processes related with their subsequent burial took place from around 7000 cal BC to 4800 cal BC. The broad range of dates indicates that there was more than one phase of occupation at the site during the Late Mesolithic. Therefore, the Mesolithic material at Varėnė 2 should be viewed as a palimpsest of chronologically separate camps. It is also evident that only a single dugout was in use during a single occupation event. Based on the obtained dates, it appears

that all three dugout structures at Varėnė 2 had decayed and were filled in by the end of the Late Mesolithic, before around 4700 cal BC. This is further supported by the fact that no typologically younger finds — such as pottery or bifacially retouched projectile points — were discovered in the fills of the dugouts, not even in their upper parts slightly below the archaeological layer, about 0.4–0.5 m from the ground surface. The spatial distribution of RB flint artefacts and refits supports the assumption that the exploitation of RB flint at Varėnė 2 is chronologically associated with either the use of dugout 2 or the period during which the pit became infilled, ca. 5300–4800 cal BC. This implies different use of flint resources during

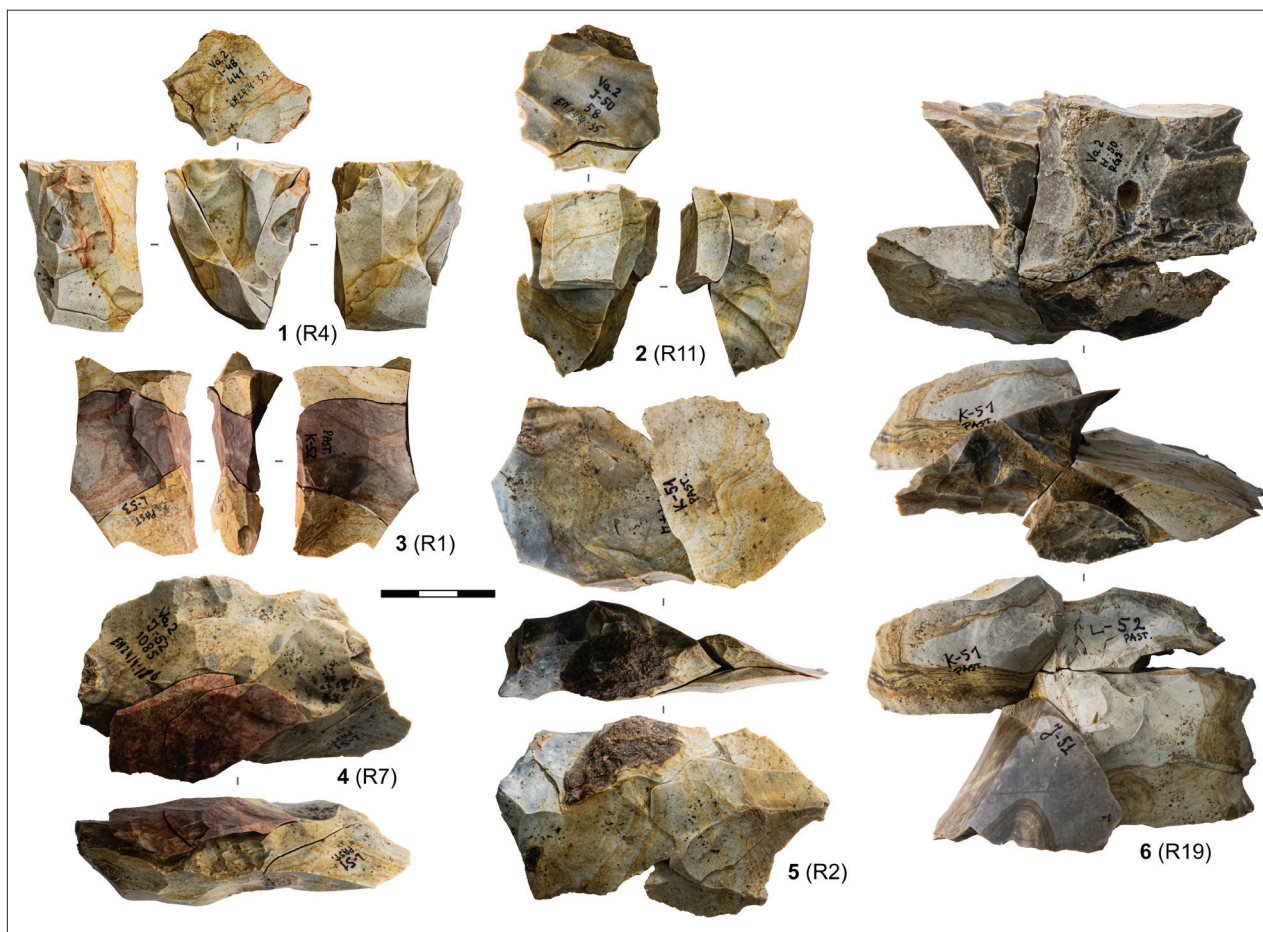


Figure 12. A selection of refit sets from Varėnė 2. 1 (set 4) and 2 (set 11) — exhausted cores with final flake removals, 3 (set 1) — flake fractured into 3 fragments, 4 (set 7) — axe preform with flake removals, 5 (set 2) — sequence of flake removals, 6 (set 19) — sequence of cortical flakes (photograph by L. Gaižauskas).

separate habitation events. Radiocarbon dating shows that Gailiūnai 2 probably predates most intensive Mesolithic activity at Varėnė 2 by about 700 years. Two dates from Gailiūnai 2 are conflicting due to the much younger calcined bone date, which is slightly more recent than the latest dates of the dugouts at Varėnė 2. However, the later date from Gailiūnai 2 has little spatial affiliation with the major concentrations of flint artefacts. The older of the dated fragments was found within the major western cluster and therefore should be contemporaneous with its assemblage. The younger calcined bone date obtained from the periphery of the excavated area may represent a brief episode of activity that left no other tangible remains.

The described structures of the assemblages and refit results attest to the mobility of groups inhabiting both sites. At Gailiūnai 2, the scarcity of knapping debris, the absence of structural features and small refit groups reveal that individual episodes of activity or stays at the camp were short. What is more, a significant part of the lithic material is made up of tools — pieces with secondary modification and macroscopic use-wear constitute 19% of the flint assemblage. However, none of the tools or utilised blades were successfully refitted into production

or modification sequences with other removals. This indicates that tools were not produced locally or were exported out of the campsite. Conversely, this means that the majority of the tools found within the campsite were produced elsewhere and imported. Considering the small number of successful refits at Gailiūnai 2, the amount of refitted pieces at Varėnė 2 looks extremely small given the size of its assemblage. Of course, the number of successful refits should not be regarded as definitive and final, as it depends on factors such as the time invested in the analysis and the quality of artefact recovery during excavation. Nevertheless, the number of refits, while approximate, reflects genuine trends — particularly considering that the refitting process at Varėnė 2 was facilitated by the generally larger size of the flint artefacts and by the texture of the raw material, compared with Gailiūnai 2. The low number of refits at Varėnė 2 can be attributed to two more straightforward explanations: either knapping occurred predominantly as short, discrete episodes, leaving behind only brief reduction sequences, or many intermediate fragments are missing from the recovered assemblage. The absence of these fragments might be the result of several factors, including the disposal of

debitage beyond the excavated area and incomplete recovery during fieldwork.

The use of dugout dwellings for habitation at Varėnė 2 potentially reveals a more residential purpose for the site. However, the interpretation of the exact dimensions and internal organisation within the dugouts is more problematic. At the current level of analysis, it is difficult to establish which of the artefacts found in the pits are the remains of habitation, and which are the result of taphonomic processes. The vertical spread of artefacts throughout the fill of the pits indicates that a significant part of the assemblages entered the context of the pits after their abandonment as dwellings. This could have happened asdebitage from flint knapping activities was discarded into the pits of collapsed or semi-buried structures. The increased usage of RB flint for tool production during the Late Mesolithic at Varėnė 2 is unlikely to be due to different knapping qualities of this raw material type. Higher quality flint raw material was available locally and also used at the site throughout this period. While artefacts produced from RB flint are found in southeast and east Lithuania, most of the finds of this raw material type were recovered at Stone Age sites around the confluence of the Varėnė and Merkys Rivers. It is likely that RB flint was extensively used at Varėnė 2 because of the site's proximity to the source of this flint. A hypothetical explanation about the different patterns of flint exploitation across separate periods could be that access to the same sources of flint might have changed due to geomorphological processes, e.g. formation of outcrops near rivers.

The parallel investigation of the two sites demonstrates the as yet little explored diversity of Late Mesolithic open-air settlements in the southeast Baltic. Both types of site are so far little attested in the regional archaeological record. Gailiūnai 2 exemplifies a locus of short-term campsites where diverse activities were carried out on a recurring basis by a small hunter-gatherer group, possibly a nuclear family. The environmental setting of the camp and refitting results suggest that a settlement system of such a group would likely include more substantial residential as well as task-specific sites actively used during the yearly cycle. The interpretation of Gailiūnai 2 would benefit from the results of use-wear analysis, which are going to be presented in a separate publication.

Conclusions

The combined evidence from spatial characterisation of lithics together with refitting and radiocarbon dating from the two sandy sites Gailiūnai 2 and Varėnė 2 have provided valuable insights into the variation in Late Mesolithic settlement organisation. The Mesolithic components of the two sites present structurally different outcomes that

stem from the differences in exploitation and modes of habitation at both camps. At Gailiūnai 2, the presence of three discrete clusters of lithic artefacts indicates either spatially restricted activity areas or remains from different episodes of habitation. Despite the successful refitting of many pieces within each cluster, the absence of any links between separate clusters supports the assumption that the scatters most likely represent a series of non-contemporaneous, task-specific occupation episodes. The different nature of the formation of each cluster is reinforced by the structural differences of the assemblages. The western cluster is dominated bydebitage fragments that suggest blade production and retooling of hunting or butchering kit were key activities in this area. The density and organisation of lithics here, along with the presence of tool-production debris, imply that some of these tasks were conducted within or adjacent to a lightweight structure. By contrast, the eastern cluster contained mostly flakes and tools on flakes as well as all of the discovered scrapers, suggesting a different type of tasks were undertaken in this area. Refitting analysis has revealed mostly short reduction sequences. This pattern, combined with the scarcity ofdebitage from core preparation or manufacture of different tools, implies that finished blades or blade fragments were frequently removed from the site for use elsewhere, while many of the found tools were imported.

The evidence from Varėnė 2 indicates a more substantial, spatially anchored use of a campsite that is manifested through the use of the same general location for repeated habitation and particularly through the use of more complex dwelling structures. The documented multiple dugouts provide evidence that the settlement character at Varėnė 2 was different from the campsites that only preserve latent structures of lithic scatters. It is evident that during at least certain periods of its use, the site was chosen for longer-term occupation, during the cold months in particular, which required investment into building such features. Radiocarbon dating confirmed the original assumptions that the dugout structures date to the Late Mesolithic. However, it also showed that repeated Late Mesolithic occupation episodes at Varėnė 2 spanned almost two millennia and that the dugouts were not contemporaneous. Dugout 1 had been abandoned by ca. 5700 cal BC, whereas dugout 2 and possibly dugout 3 were used between ca. 5300 and 4800 cal BC. These results indicate at least two distinct phases of occupation, separated by several centuries. The formation processes that involved the burial of the dugout pits demonstrate that the site was potentially used after the active habitation in these features had ceased. The spatial association of RB flint artefacts and refits with dugout 2, along with radiocarbon dating, has helped to establish that the use of this raw material is attributable to the Late Mesolithic.

The study of these cases together highlights the variability in Mesolithic settlement strategies as well as the potential of unstratified sites with predominantly lithic assemblages to provide meaningful data about Mesolithic lifeways. Granted, the extraction of such data requires suitable objects — extensively excavated sites with adequate recording techniques. The integration of refitting with spatial analysis can help shed light on the possible contemporaneity of scatters and clusters that are difficult to date due to scarcity of features and organic materials. The value of Stone Age sites in sandy environments is frequently overlooked due to their tendency to present superimposed materials from multiple periods, but there is hope that archaeological exploration of different landscape settings could yield many more short-term sites with preserved latent structures, such as at Gailiūnai 2.

Acknowledgements

I would like to express my sincere gratitude to the Lithuanian Archaeology Society and the Vilnius Radiocarbon Laboratory for enabling the AMS ¹⁴C dating of two samples free of charge under the initiative *Modern Technologies for the Archaeology of Lithuania*. I am deeply indebted to the staff of the Archaeology Department at the Lithuanian National Museum, particularly to curator Dalia Ostrauskienė, for providing excellent conditions for the study of the find collections from Varėnė 2. I am also grateful to the Lithuanian National Museum for granting permission to use samples of calcined bone from Varėnė 2 for radiocarbon dating.

Abbreviations

ATL – Archeologiniai tyrinėjimai Lietuvoje / Archaeological Investigations in Lithuania, Vilnius

Lietuvos arch. – Lietuvos archeologija / *Lithuanian Archaeology*, Vilnius

J Archaeol Method Theory – Journal of Archaeological Method and Theory

J. Archaeol. Sci. – Journal of Archaeological Science

J. Archaeol. Sci. Rep. – Journal of Archaeological Science: Reports

References

Bronk Ramsey, C., 2009. Bayesian analysis of radiocarbon dates. *Radiocarbon*, 51(1), 337–360. doi:[10.1017/S0033822200033865](https://doi.org/10.1017/S0033822200033865)

Cziesla, E., 1990a. On refitting of stone artefacts. In: E. Cziesla, S. Eickhoff, N. Arts and D. Winter, eds. *The Big Puzzle: international symposium on refitting stone artefacts*. Studies in modern archaeology, Vol. 1. Bonn: Holos-Verlag, pp. 9–44.

Cziesla, E., 1990b. *Siedlungsdynamik auf steinzeitlichen Fundplätzen. Methodische Aspekte zur Analyse latenter Strukturen*. Studies in Modern Archaeology, Vol. 2. Bonn: Holos-Verlag.

De Bie, M., 2007. Benefitting from refitting in intra-site analysis: lessons from Rekem (Belgium). In: U. Schurmans, M. De Bie, eds. *Fitting rocks: Lithic refitting examined*, BAR International Series 1596. Oxford: Archaeopress, pp. 31–44.

Gaižauskas, L., 2023. Gailiūnų 2 mezolito radimvietė. In: *ATL 2022 metais*. Vilnius: Kultūros paveldo departamentas, Lietuvos archeologijos draugija, pp. 23–26.

Juodagalvis, V., Marcinkevičiūtė, E., 2004. Varėnės upės 10-oji senovės gyvenvietė. *Lietuvos arch.*, 25, 79–108.

Juodagalvis, V., 2007. Zapsės upės 1-oji gyvenvietė. *Lietuvos arch.*, 31, 165–190.

Marcinkevičiūtė, E., 2010. Daugiasluoksnių archeologinių objektų erdvinė analizė. *Lietuvos arch.*, 36, 87–102.

Osipowicz, G., 2017. *Spolecznosci mezolityczne Pojezierza Chełmińskiego-Dobrzyńskiego*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.

Osipowicz, G., 2018. Ludowice 6 site, western habitation: A silica plant processing female gatherer campsite? *J. Archaeol. Sci. Rep.*, 18, 960–972. <https://doi.org/10.1016/j.jas-rep.2017.08.019>.

Ostrauskas, T., 1998. Varėnės 2-oji senovės gyvenvietė. In: *ATL 1996 ir 1997 metais*. Vilnius: Lietuvos istorijos institutas, pp. 37–40.

Ostrauskas, T., 1999a. Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje. *Lietuvos arch.*, 16, 7–17.

Ostrauskas, T., 1999b. Kabelių akmens amžiaus 2-oji gyvenvietė. *Lietuvos arch.*, 16, 31–66.

Ostrauskas, T., 2000. Tyrinėjimai Varėnės 2-ojoje gyvenvietėje 1999 m. In: *ATL 1998 ir 1999 metais*. Vilnius: Lietuvos istorijos institutas, Kultūros vertybių apsaugos departamentas Kultūros paveldo centras, pp. 52–53.

Ostrauskas, T., 2001a. Pietų Lietuvos akmens amžiaus archeologinių paminklų detalių tyrimų rezultatai: Glūko ir Varėnio ežerų apylinkės. In: V. Baltrūnas, ed. *Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis)*. Vilnius: Geologijos institutas, pp. 179–182.

Ostrauskas, T., 2001b. Pietų Lietuvos apgyvendinimo chronologija. In: V. Baltrūnas, ed. *Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis)*. Vilnius: Geologijos institutas, pp. 209–213.

Piličiauskas, G., 2004. Akmens ir bronzos amžiaus stovyklos Karaviškėse (Karaviškių 6-oji gyvenvietė, plotai II ir IV). *Lietuvos arch.*, 25, 157–186.

Rimantienė, R. 1999. Margių 1-oji gyvenvietė. *Lietuvos arch.*, 16, 109–170.

Reimer, P.J., Austin William E.N., Bard, E., Bayliss, A., Blackwell P.G., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, L.R., Friedrich, M., M Grootes, P., Guilderson, T.P., Hajdas, I., Heaton T.J., Hogg, A.G., Hughen, A.K., Kromer, B., Manning, S.W., Muscheler, R., Palmer, J.G., Pearson, C., van der Plicht, J., Reimer, R.W., Richards, D.A., Scott, M.E., Southon, J.R., Turney, C.S.M., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S.M., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A., Talamo, S., 2020. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP). *Radiocarbon*, 62(4), 725–757. doi:[10.1017/RDC.2020.41](https://doi.org/10.1017/RDC.2020.41)

Sergant, J., Crombé, P. and Perdaen, Y., 2006. The ‘invisible’ hearths: a contribution to the discernment of Mesolithic non-structured surface hearths. *J. Archaeol. Sci.*, 33(7), 999–1007. <https://doi.org/10.1016/j.jas.2005.11.011>

Vandendriessche, H., 2022. *Flintknapping from the Late glacial to the Early Holocene: The Belgian Scheldt valley sites of Ruijen and Kerkhove*. Leiden: Sidestone Press.

Vandendriessche, H., Van Maldegem, E. and Crombé, P., 2023. Catching a Glimpse of Mesolithic Settlement Patterns and Site Re-occupation Through Lithic Refitting, Raw Material Characterizations and Absolute Dating. *J Archaeol Method Theory*, 30, 239–267. <https://doi.org/10.1007/s10816-022-09560-y>

Gailiūnų 2 ir Varėnės 2 stovyklaviečių struktūrų interpretacija: du skirtingos sandaros vėlyvojo mezolito stovyklų atvejai PR Lietuvoje

Lukas Gaižauskas

Santrauka

Straipsnyje nagrinėjama dviejų vėlyvojo mezolito stovyklaviečių Pietryčių Lietuvoje – Gailiūnų 2 ir Varėnės 2 (1, 2 pav.) – vidinė struktūra. Siekiant nustatyti abiejų gyvenviečių vidinės organizacijos dėsninumus, buvo tiriama erdvinis titnago radinių paplitimas, atlikta titnago radinių refitingo analizė. Mezolito stovyklaviečių ir įgilintų struktūrų chronologijai nustatyti atliktas AMS ¹⁴C datavimas.

Gailiūnai 2 yra retas vieno laikotarpio stovyklavietės pavyzdys, išlaikęs atskirų titnago radinių sancaupų erdvinę struktūrą. Tuo tarpu Varėnė 2 yra daugiasluoksnis, arba „maišytas“, objektas, su viena kitą dengiančiomis įvairių laikotarpių stovyklaviečių liekanomis. Erdvinis titnago radinių pasiskirstymas Gailiūnuose 2 leido išskirti tris erdvėje apibrėžtas sancaupas, kurios rodo funkciškai skirtingas stovyklavietės zonas arba kelių skirtingų apsisistojimo epizodų liekanas. Nepaisant kiekvienoje sancaupoje aptiktų refitų rinkinių, nerasta jas tarpusavyje jungiančių titnago skaldymo sekos elementų, todėl daroma išvada, kad radinių sancaupos atspindi skirtingus apsisistojimo ar veiklos etapus (3, 6–8 pav.). Šią prielaidą sustiprina kiekvienos sancaupos radinių rinkinio struktūros skirtumai (1 lent.). Vakarinė titnago radinių sancaupa Gailiūnuose 2 buvo datuota 6639–6441 cal BC (3 lent.; 5 pav.). Titnago medžiaga ir įgilintos struktūros Varėnėje 2 liudija kitokį apgyvendinimo pobūdį. Nors atskirų apgyvendinimo laikotarpių metu susiformavusių titnago sancaupų išskirti beveik neįmanoma, trijų įgilintų pastatų liekanos rodo Varėnėje 2 buvus stovyklavietę, kurioje buvo kuriamasi ilgesniems metų laikotarpiams (4 pav.). AMS ¹⁴C metodu datuojant bandinius iš archeologinio sluoksnio ir struktūrų užpildo nustatyta, kad įgilinti pastatai yra nevienalaikiai, o jų apgyvendinimo etapai patenka

į maždaug 7170–4800 cal BC laikotarpį (3 lent.; 5 pav.). Vėlyvojo mezolito laikotarpiu Varėnėje 2 plačiai naudota specifinė titnago žaliava – rausvai juostuotas matinis titnagas, kurio intensyviausio naudojimo epizodas sutapo su įgilinto pastato nr. 2 apgyvenimu arba pastato palaidojimą lydėjusiais tafonominiais procesais (2 lent.; 4 pav.: 2). Refitingas atskleidė, kad abiejose stovyklavietėse vyravo nedideli skaldymo epizodai (4, 5 lent.; 9–12 pav.), taigi jas palikusios bendruomenės pasižymėjo dideliu mobilumu.

Lygiagretus dviejų objektų tyrimas atskleidžia vėlyvojo mezolito stovyklaviečių tipų įvairovę, kurią būtų sunku įvertinti, nepažinus palyginti švarios atskiro laikotarpio stovyklaviečių kaip Gailiūnuose 2 liekanų. Tai suteikia pagrindą manyti, kad smėlinės stovyklavietės turi galimybę būti išsamesni mezolito bendruomenių gyvenamos pažinimo šaltiniai. Iki šiol Lietuvoje mažai taikytas refitingo metodas gali padėti sprendžiant titnago radinių sancaupų vienalaikiškumo klausimus, kai tiesiogiai datuoti absoliučiaisiais metodais neįmanoma. Nestratifikuotos akmens amžiaus stovyklavietės smėlžemiuose laikomos neperspektyviomis dėl jose dažnai pasitaikančių viena kitą dengiančių įvairių laikotarpių medžiagos sancaupų, tačiau tikėtina, kad, išsiplėtus archeologinių žvalgymų geografijai, būtų rasta ir daugiau trumpo laikotarpio stovyklaviečių su aiškiai išskiriamais atskirų apgyvendinimo epizodų pėdsakais.