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THE ENSEMBLE OF FORTIFICATIONS FROM COSTEȘTI- BLIDARU: A VISIBILITY STUDY

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Abstract: The aim of the following study was to analyse the components of the fortification ensemble from Costești-Blidaru (the fortress with enclosures I and II, and the 17 isolated towers), by performing viewshed type visibility simulations, based on the LAKI II Digital Terrain Model. In an effort to establish the functionality of each component, the following aspects were taken into consideration: (1) the surrounding landscape's level of visibility, (2) the visibility of the other fortified positions, of terraces, roads and cisterns from the vicinity. The results show that visibility from the fortress is good in general, but imperfect. A large section of today's access paths leading to the fortress, as well as the presumably ancient roads from the vicinity, should theoretically be visible, but not the same can be said of the other potential access paths, the unconventional ones, and normally practicable to a lesser extent. The majority of ancient terraces from within the region should likewise be visible from the fortress, but likely not all. With these shortcomings in mind, the majority of isolated towers may have supported the fortress to a greater or lesser extent however, by providing visibility input from their respective positions. The towers, which were located in various key-positions, may have played a role in surveillance, by watching over those terraces that can be impossible to see from the fortress, or by monitoring the unconventional access paths. The towers may have played signalling roles too, given the theoretical possibility of there having been direct visual links between the fortress and at least the majority of towers, but also in-between them. In some cases, the fortified positions may have also played an important role in controlling and defending the conventional access paths, as they were located in their close proximity. The towers may also have been symbols of power and prestige, just like the fortress, but on a smaller scale. On the other hand, functionally speaking, these fortified positions appear very much like potentially interdependent outposts, built in support of the fortress, and they seem to have formed together its defensive system. It is a complex system, apparently well conceived, adapted to the local terrain conditions, and it seems to reflect the importance Costești-Blidaru fortress would have had, in close relation to Costești-Cetățuia and, especially, to Grădiștea de Munte (Sarmizegetusa Regia).

Keywords: *Dacian fortresses, isolated towers, defensive system, visibility, Costești-Blidaru.*

INTRODUCTION

Located in the Orăștie Mountains, south of the modern-day village of Costești (Orăștioara de Sus commune, Hunedoara County), the Dacian fortress from atop Blidaru hill strategically dominates the Apa Orașului valley (Fig. 1–2). Despite being in the southern vicinity of the Costești-Cetățuia Dacian fortress, which started receiving attention from the more experienced

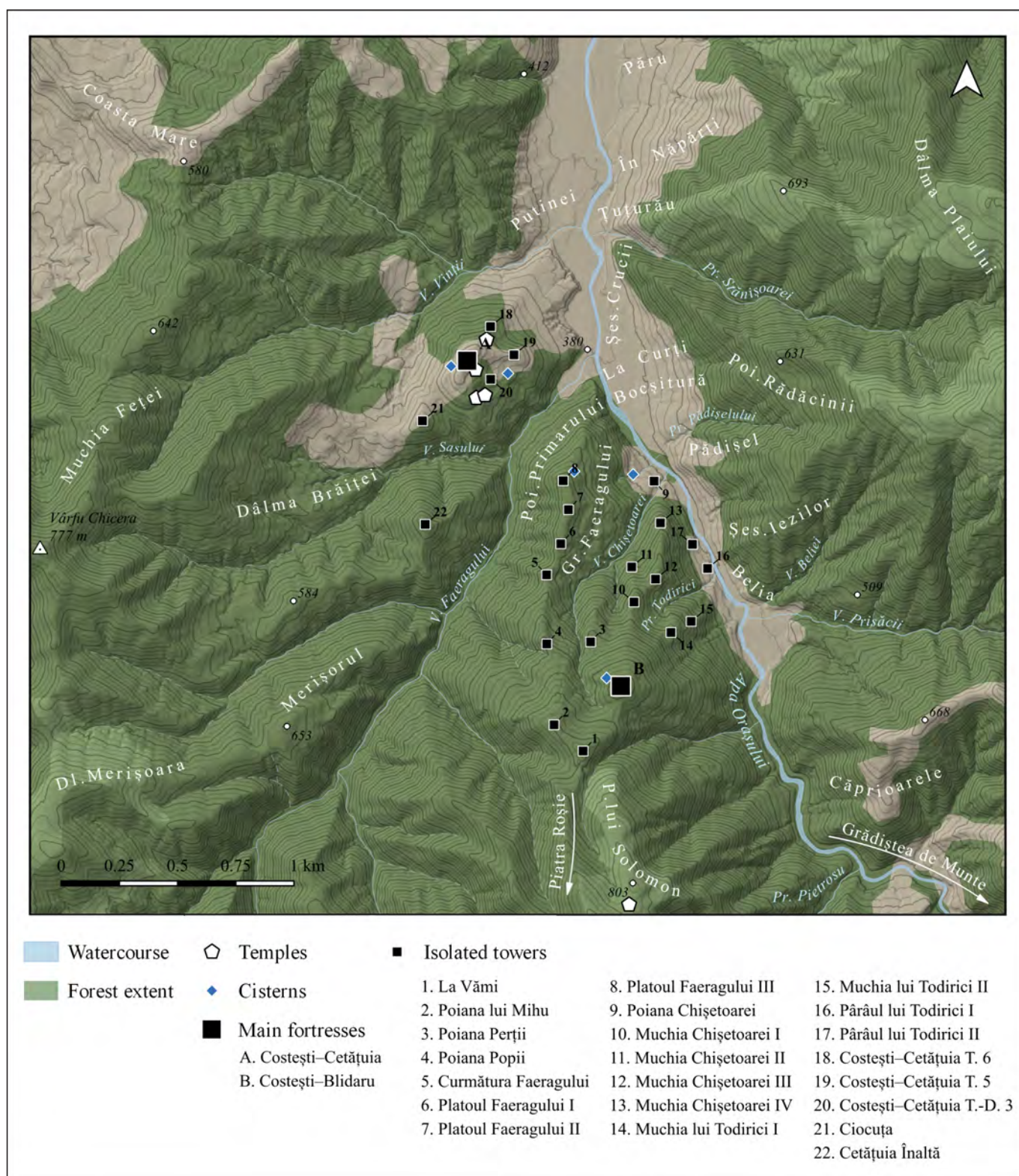


Fig. 1. Costești-Blidaru fortress area (sources: LAKI II DTM, Corine Land Cover 2000, Topographic Military Map 1:25.000, DAICOVICIU/FERENCZI 1951, DAICOVICIU/GLODARIU/FERENCZI 1989, PESCARU *et alii* 2014).

researchers beginning with G. Finály's field survey in 1910, the Costești-Blidaru fortress was to a lesser degree known at that time.¹

The existence of this fortress, and of the numerous ancient fieldworks from the surrounding area, was for the first time confirmed by D. M. Teodorescu during the interwar period.²

¹ DAICOVICIU/GLODARIU/FERENCZI 1989, 134–135.

² TEODORESCU 1923, 10–12; TEODORESCU 1930, 267.

The findings of the subsequent field surveys and test-diggings were published by C. Daicoviciu and Al. Ferenczi in the early 50s, in the premier topographic study of Dacian settlements from the Orăștie Mountains. On that occasion, it was mentioned that beneath the Blidaru hilltop, or in its vicinity, there were numerous well-leveled terraces, some with stone blocks scattered on their ground surface, or with tower looking ruins standing on them. The existence of small

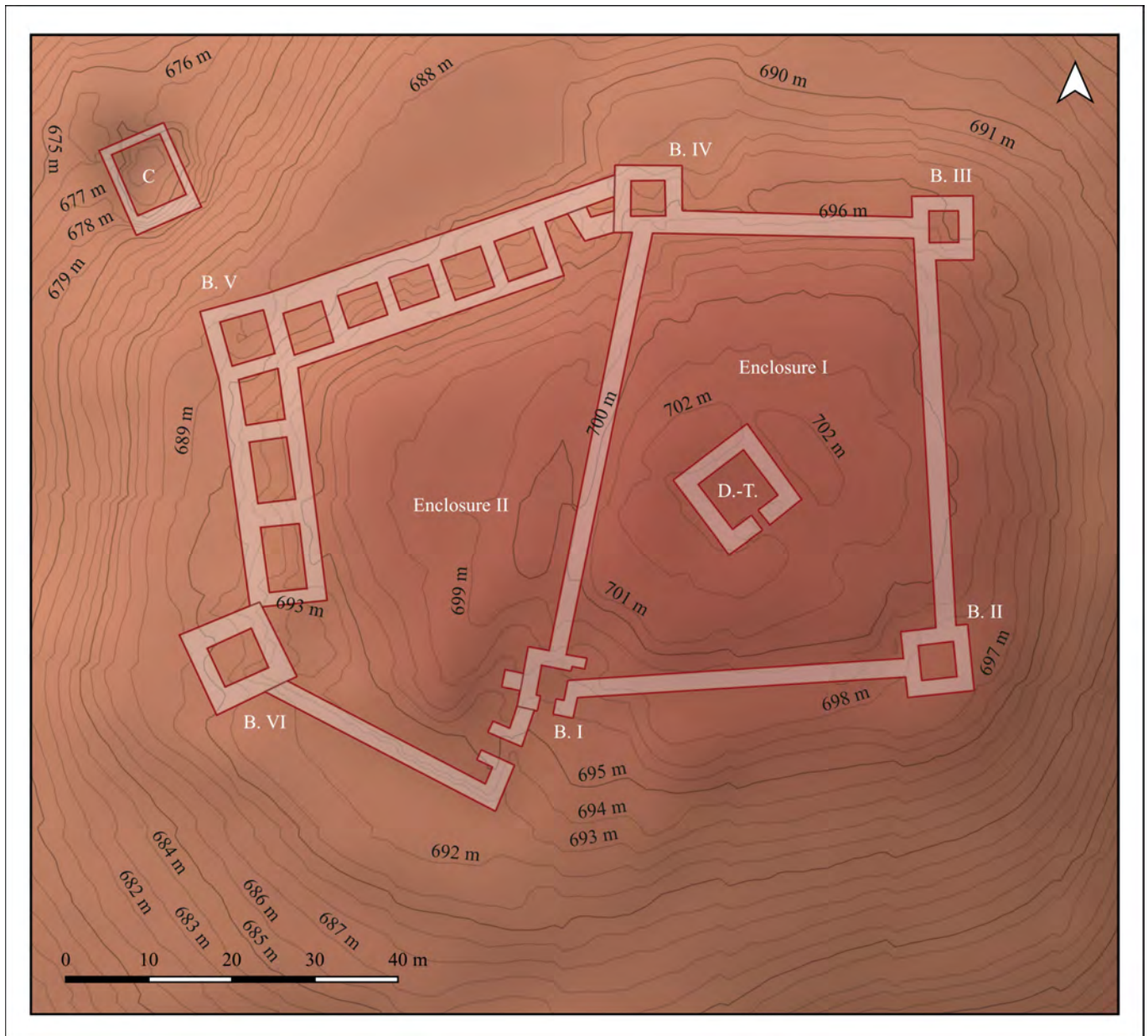


Fig. 2. The Costești-Blidaru fortress (source: Pescaru *et alii* 2014).

settlements was presumed on other terraces (in the *Grădina Faeragului* spot), and apart from that, it was also mentioned the discovery of water pipe fragments in one place (in the proximity of *Curmătura Faeragului* and *Poiana Perții* spots), the remains of a timber-framed cistern, and the ruins of a structure with mortar in its masonry, this being the cistern from right beneath Blidaru hilltop more exactly.³

The systematic archaeological excavations at Costești-Blidaru started in the 1950s, and continued until the beginning of the next decade, providing new knowledge regarding the building characteristics and the evolution of the hilltop fortress.⁴ Simultaneously, in 1953, the isolated tower from *Poiana Perții* was partially investigated,⁵ two terraces from

Muchia Chișetoarei were likewise the following year,⁶ and a decade later, the full excavation of the previously mentioned tower was completed.⁷

From as early as the 50s, researchers were aware that the fortress must have had strategic importance in antiquity, as it had long visual range from atop the hill. Moreover, the high number of isolated towers from its vicinity, numbering 18–20 according to estimates from that time, and the fact that they were all guarding the access to the hilltop, suggested that here must have functioned and important fortress.⁸ Later, in a study from the 80s concerning the Geto-Dacian systems of fortifications, H. Daicoviciu was of the opinion that the Costești-Blidaru fortress, together with the ones from Costești-Cetățuia and Piatra Roșie, was part of a defensive system. According to him, this system was

³ DAICOVICIU/ FERENCZI 1951, 21–28; DAICOVICIU *et alii* 1954, 140–143.

⁴ DAICOVICIU *et alii* 1954, 124–147; DAICOVICIU *et alii* 1955, 219–227; DAICOVICIU *et alii* 1957, 264–271; DAICOVICIU *et alii* 1962, 463–466; DAICOVICIU *et alii* 1973, 70–73.

⁵ DAICOVICIU *et alii* 1954, 144–146.

⁶ DAICOVICIU *et alii* 1955, 227–228.

⁷ DAICOVICIU *et alii* 1973, 73–74.

⁸ DAICOVICIU *et alii* 1954, 124–125.

conceived with a particular objective in mind, but extended and strengthened over the course of time, with the intent of blocking the roads leading to the great settlement of Grădiştea de Munte (Sarmizegetusa Regia). Daicoviciu considered that the Costeşti–Blidaru and Costeşti–Cetăţuia fortresses each fulfilled an identical role in this system, given the fact that they were both contemporary in the final phase of their existence, and the short distance between them might also suggest a potential unity of command.⁹

The next important moment in the research history of the fortress represented the appearance of the Dacian settlements and fortresses monography, in 1989. The findings from the previous years, concerning the Costeşti–Blidaru ruins and the sites from the surrounding land, were published on that occasion.¹⁰ Some of it includes the discovery of two temples, of the column-alignment type, in the *Pietroasa lui Solomon* spot, but it should be specified that the presence of plinths in that area had been mentioned already in the topographic study from the 50s.¹¹

Most recently, in 2014, the latest findings resulting from the archaeological and topographical research carried out at Costeşti–Blidaru over the previous two decades were published. The study made important contributions concerning the ancient topography, stating that in the vicinity of the fortress over 50 artificial terraces had been made in antiquity, mostly on the eastern slopes of the hill, the ones that are sunnier, but also more accessible. A new potential cistern was also mentioned (near *Platoul Faeragului*), and the knowledge regarding the local water supply in antiquity updated with new information. At the same time, the new findings from the *Pietroasa lui Solomon* temples, as well as the *La Vămi*, *Poiana lui Miha* and *Platoul Faeragului* towers were presented. From the field research results published in this study it became evident that actually, 17 isolated towers had existed in the vicinity of the Costeşti–Blidaru fortress, and that these had not been erected randomly. The constructions were often placed in the close vicinity of access roads leading to the fortress or the temples, on defensible heights surrounded by steep slopes, in spots offering good visibility over the landscape, sometimes up to 20 km distance.¹²

FORTIFICATIONS AND VISIBILITY – OBJECTIVES AND METHODOLOGY

Visibility is undoubtedly a key factor in the effective defence of settlements or fortresses, but also of their territories, a fact emphasized since antiquity in the Greco-Roman world.¹³ Visual contact is necessary for the sake of security, and it has been recommended ever since the stationing of seasoned observers on heights that offer as wide visibility as possible, from where they should be capable of exchanging signals if required.¹⁴ Visually, using fire, it was in the-

ory possible to send pre-established messages,¹⁵ but at the same time it was recommended in certain situations, in the absence of intervisibility, to use audio signals instead.¹⁶

In the rugged areas of the Classical or Hellenistic worlds, there are plenty examples of small fortifications or isolated towers built in the vicinity of settlements or fortresses, or on their territories, with potential surveillance or signalling roles.¹⁷ For the possibility of fulfilling those roles, the placement and the elevation of the buildings were crucial. The placement was first of all dependent on the local topography, whereas the elevation on the nature of the building materials accessible, on the construction technique used by and known to the builders, but also on the hands-on experience available. In the context in which very few towers from the Classical or Hellenistic worlds had their elevation fully preserved over the years, in the majority of cases their height estimations can only be hypothetical.¹⁸ The elevations of the Costeşti–Blidaru fortresses' towers, but also of those from the vicinity, are no different in this matter.

The ensemble of fortifications

Regarding the isolated towers located in the vicinity of the fortress, the ones that were sufficiently well-preserved, it has been observed that they were built in a Hellenistic inspiration technique. The stonework consisted of two wall-faces, with ashlar limestone blocks laid as stretchers, with transversal wooden beams joining the two wall-faces together from place to place, the space in-between being filled with a mixture of earth and local rocks, and rarely limestone fragments. The walls of the *Poiana lui Miha*, *La Vămi* and *Platoul Faeragului* towers, together with some of the walls from *Costeşti–Cetăţuia*, most closely resembled the Hellenistic technique, as in these cases the wall-faces also included from place to place limestone blocks laid as headers. In terms of construction technique, Histria's Hellenistic enclosure presents the closest analogy in the geographical sense to these walls.¹⁹ The walls raised in this technique measured around 3 m in total thickness, and over 5 m in elevation, but the isolated towers were different, in the sense that their walls consisted of no more than a few courses of limestone blocks, which would mean that their elevation

¹⁵ CAMPBELL 2004, 152, 154; SHUCKBURGH 1889, 41–46.

¹⁶ CAMPBELL 2004, 40–41.

¹⁷ To name a few examples, the small fortifications near Sagalassos (LOOTS/NACKAERTS/WAELKENS 1999, 82–89), Kallithea (CHYKERDA/HAAGSMA/KARAPANOU 2015, 10–23), or the ones from Thyreatis region (BALANDIER/GUINTRAND 2019, 425–445).

¹⁸ A square watchtower from Megara region, measuring 5.3 m in width, probably from the Classical period, had its height almost fully preserved, and it would have been approx. 10 m tall (TILLYARD 1906, 101–104); by taking into consideration the dimensions of this tower and those of a few others as examples, J. Young estimated the elevation of certain south-Attican towers from the Classical period based on a 1:2–2.5 ratio, depending on the diameter/width of the buildings and the thickness of their foundations (YOUNG 1956, 135); based on the same principle, the elevation of a Classical-Hellenistic tower from Kokkaloi, measuring 5.9 × 6.7 m at the base, was estimated to have been 12–17 m tall (CHATZIDIMITRIOU/CHIDIROGLOU 2014, 313); for the elevations of certain Hellenistic guard towers from Molossia, measuring 11 × 7 and 9 × 7 m at the base, more moderate elevations were proposed, between 10–11 m (NAKAS 2016, 452); the elevation of another Classical-Hellenistic square tower from Hvar island, with 7.5 m width, was estimated to have been 10–12 m (KIRIGIN 2022, 98–103, 106).

¹⁹ GLODARIU 1983, 123–124; PESCARU *et alii* 2014, 6–10.

⁹ DAICOVICIU 1978, 5.

¹⁰ DAICOVICIU/GLODARIU/FERENCZI 1989, 181–185, 196–197.

¹¹ DAICOVICIU/ FERENCZI 1951, 48; DAICOVICIU/GLODARIU/FERENCZI 1989, 197.

¹² PESCARU *et alii* 2014, 3–10.

¹³ REEVE 1998, 200.

¹⁴ CAMPBELL 2004, 150.

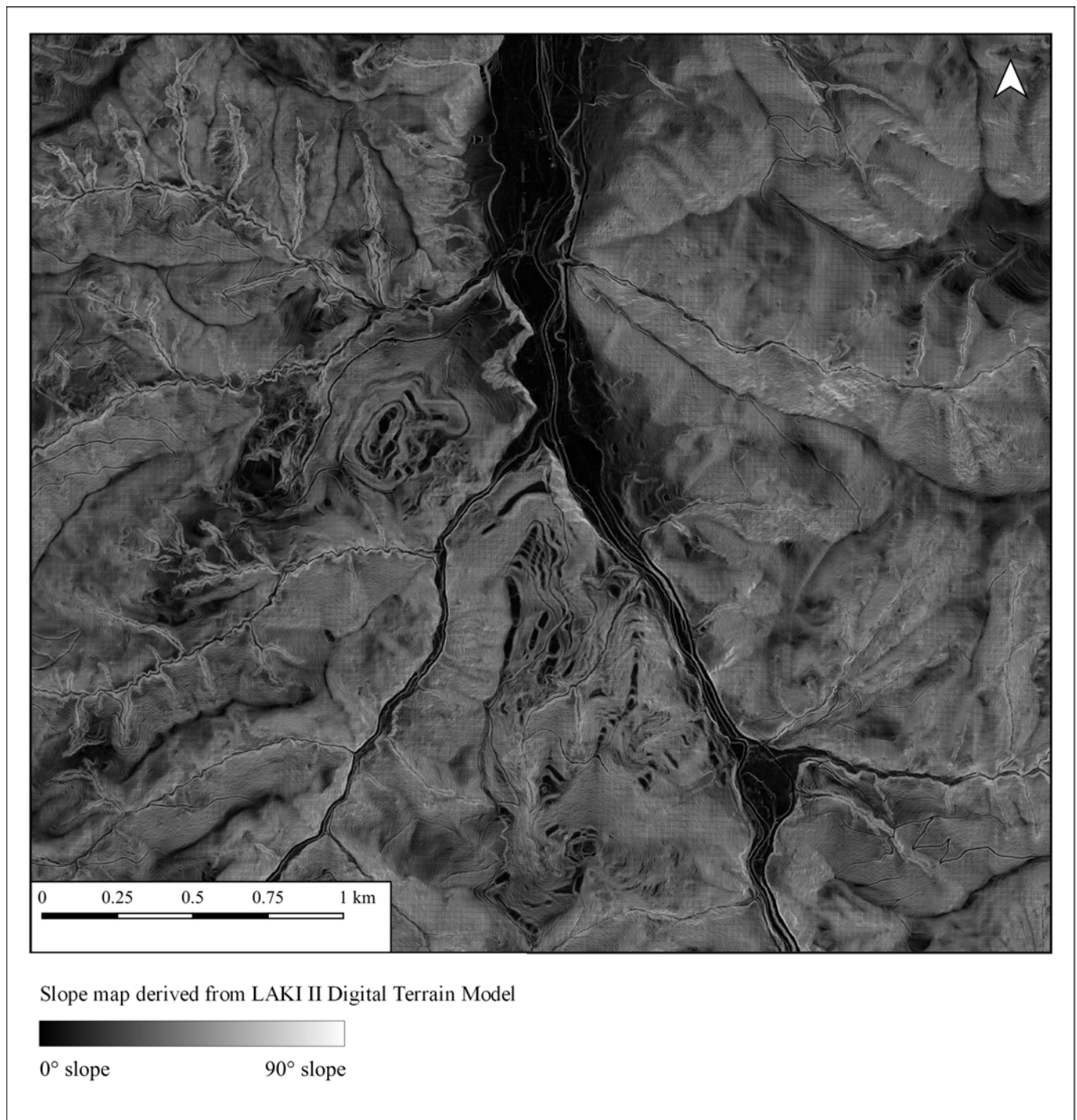


Fig. 3. Slope map.

was no taller than 1.5–2 m.²⁰ These elements preserved to this day likely represented only the elevation of the stone base of the buildings, the upper parts being made of timber (*Poiana lui Mișu*, *Poiana Perții*, probably *Platoul Faeragului*) or bricks (*Curmătura Faeragului*).²¹ The exterior dimensions of the isolated towers were variable wherever known, approx. 11.5 × 11.5 m (*Platoul Faeragului*), 11.75 × 11.75 m (*Poiana lui Mișu*), 11.9 × 11.9 m (*La Vămi*), approx. 11 × 13 m (*Muchia Chișetoarei*), 12.70 × 13.35 m (*Poiana Perții*) and 15 × 15 m

(*Curmătura Faeragului*).²² The buildings were covered with wooden shingles (*Curmătura Faeragului*), or with clay tiles of Greek type, over a hipped roof probably (*Poiana lui Mișu*). Both the tile types and the bricks are building elements that were present in Hellenistic architecture.²³

The defensive elements of the Costești–Blidaru fortress were built in the same technique in general, but it should be noted that the limestone block headers were missing here, at

²⁰ PUPEZĂ 2010, 160–163; MATEESCU/ PUPEZĂ 2016, 221–226.

²¹ DAICOVICIU *et alii* 1973, 73–74; DAICOVICIU/GLODARIU/FERENCZI 1989, 184; PESCARU *et alii* 2014, 8.

²² DAICOVICIU *et alii* 1954, 145–146; DAICOVICIU *et alii* 1955, 227–228; DAICOVICIU/GLODARIU/FERENCZI 1989, 184; PESCARU *et alii* 2014, 6–7.

²³ GLODARIU 1983, 125.

both towers, and the enclosures.²⁴ It can also be mentioned that for some elements, the wall-faces displayed a composition particularity which may have been related to a construction or repairing activity carried out at the fortress in its later phase of existence.²⁵ More specifically, inside certain wall-faces, local stone fragments bonded with earth or clay had been placed in-between the limestone blocks, in a manner that alternates more or less regularly with aforementioned blocks. This masonry technique has been observed for the parallel or perpendicular walls which together form the rooms behind the wall of enclosure II, at bastion V (at the foundation and mostly in the lower parts of the interior wall-face), at bastion I (in the lower part of the interior wall-face on the northern and eastern side), and at the wall of enclosure I (in the exterior wall-face between bastions I and II, and at both wall-faces between bastions II and III – in both cases on the whole length of the walls).²⁶ At least in the case of enclosure II's wall, the 3–4 m elevation of the parallel wall from behind it, belonging to the mentioned rooms, would suggest around 5–6 m for its height.²⁷ It is impossible to estimate the elevations of the bastions or those of the dwelling-tower, but bastion VI presumably had at least 2–3 sections vertically speaking, bastion V at least one storey, and on top of the above-mentioned rooms was one storey also.²⁸ It is unclear whether these towers were also built of bricks or timber in the upper parts, but the enclosure wall on the other hand, seems to have had a wooden superstructure on certain segments (between bastions I and IV, and between IV and V).²⁹ Both the dwelling-tower from within the enclosure and the bastions were covered with ridge tiles and roof tiles of the same type.³⁰ Although the fortress was remarkable because of the atypical masonry, overall it seems to have been of Hellenistic inspiration due to having had a quadrilateral irregular shape (both enclosure I and II), with bastions on the corners or along the enclosure wall, and an entrance-tower (bastion I), in the *à chicane* style.³¹

The ensemble of fortifications from Costești–Blidaru, namely the fortress and the isolated towers from the vicinity, at first sight appear to have represented together a complex defensive system. Although the neighboring towers were isolated, being unconnected with walls or earth ramparts, they nevertheless formed a dense network of constructions. Their placement seems to suggest that they may have had one or more of the following functions: surveillance over the land and danger signalling, movement control, or defence. The tower network's density implies that these constructions

were interdependent despite their isolation, that they were designed, or at least developed over time, in order to function in cooperation, in order to defend the fortress, which would presume unity of command and some degree of planning. However, the relatively low elevation of the stone bases of the towers, which could have represented a vulnerability when facing a siege, as well as the isolational character of these structures, should call into question their defensive efficiency. Fire traces resulting from potential armed conflicts at very few of these towers (*Poiana Perții*) have been found.³² The Dacian fortresses were not designed in general for withstanding prolonged sieges, because the majority did not have permanent sources of water supply in their interior. Actually, a good example is precisely the cistern from the close vicinity of the Costești–Blidaru fortress, located just outside the enclosure, at levels below the nearby spring, in order for water-flow into it to become theoretically feasible.³³ Neither have been found any significant fire traces at Blidaru hill's fortress, and the destruction of the fortress might have occurred following its abandonment.³⁴ In the given context, it is possible that the fortress and the isolated towers, the latter having also been inhabited actually, may have had a more complex functionality, which was only partly military in nature. The fortifications may have represented at the same time a manifestation of the local elites' ideology, in other words symbols of power and prestige, a means to declare and consolidate the authority of the local ruler, by visual means.³⁵ In this case, particular relevance should have had the visibility of these constructions when viewed from the ancient roads or the inhabited areas.

Objectives and methodology

The idea concerning the functionality of the isolated towers, the existence of a complex defensive system to which they may or may not have belonged to, requires careful investigation. This means analyzing the ensemble of fortifications from Costești–Blidaru (enclosure I, enclosure II, and the 17 isolated towers), or more precisely the geographical placement of each component, in order to establish the following: (1) the surrounding landscape's level of visibility, (2) the visibility of the other fortified positions, of terraces, roads and cisterns from the vicinity.

With this objective in mind, the QGIS³⁶ geographic information system was used for digitally mapping the findspots from the study area, the components of the fortified ensemble, the roads and the ancient terraces, as well as for executing the spatial analysis. Because the Costești–Blidaru area is nowadays heavily forested, especially useful for the possibility of performing the analysis was the topographic data survey conducted via LiDAR scanning technology in the previous years. In the period 2017–2018, following the LiDAR survey, ANCPI (Cadastre and Land Registration Office) had created the LAKI II Digital Terrain Model, a spatial dataset with 1 × 1 m resolution, 0.2 m planimetric precision, and 0.3 m altimetric precision. The model represents with good

²⁴ GLODARIU 1983, 123–124.

²⁵ For the construction of enclosure II during the Roman wars see DAICOVICIU/ GLODARIU 1976, 74; for its construction before the Roman wars see FLOREA 1989–93, 35.

²⁶ DAICOVICIU *et alii* 1954, 134–135; DAICOVICIU *et alii* 1955, 226–227; DAICOVICIU *et alii* 1957, 264–265;

DAICOVICIU *et alii* 1973, 70–71. On the southern and eastern side of enclosure I, more exactly between bastions I–III, as well as on the sides of bastion II, the wall was presumed to have been demolished completely or partially, without it being rebuilt in the original manner on the whole length (see DAICOVICIU/ GLODARIU 1976, 74).

²⁷ DAICOVICIU/ GLODARIU/ FERENCZI 1989, 182.

²⁸ DAICOVICIU *et alii* 1955, 225; DAICOVICIU *et alii* 1957, 267, 270.

²⁹ DAICOVICIU *et alii* 1954, 134.

³⁰ DAICOVICIU *et alii* 1954, 128, 130, 133–134.

³¹ DAICOVICIU *et alii* 1954, 130; GLODARIU 1983, 125–126.

³² DAICOVICIU *et alii* 1954, 145–146; PUPEZĂ 2010, 163.

³³ GLODARIU 1983, 37, 60, 133.

³⁴ DAICOVICIU *et alii* 1955, 227; FLOREA 1989–93, 35.

³⁵ PUPEZĂ 2010, 164–166; PUPEZĂ 2012, 81–85.

³⁶ QGIS 2024.

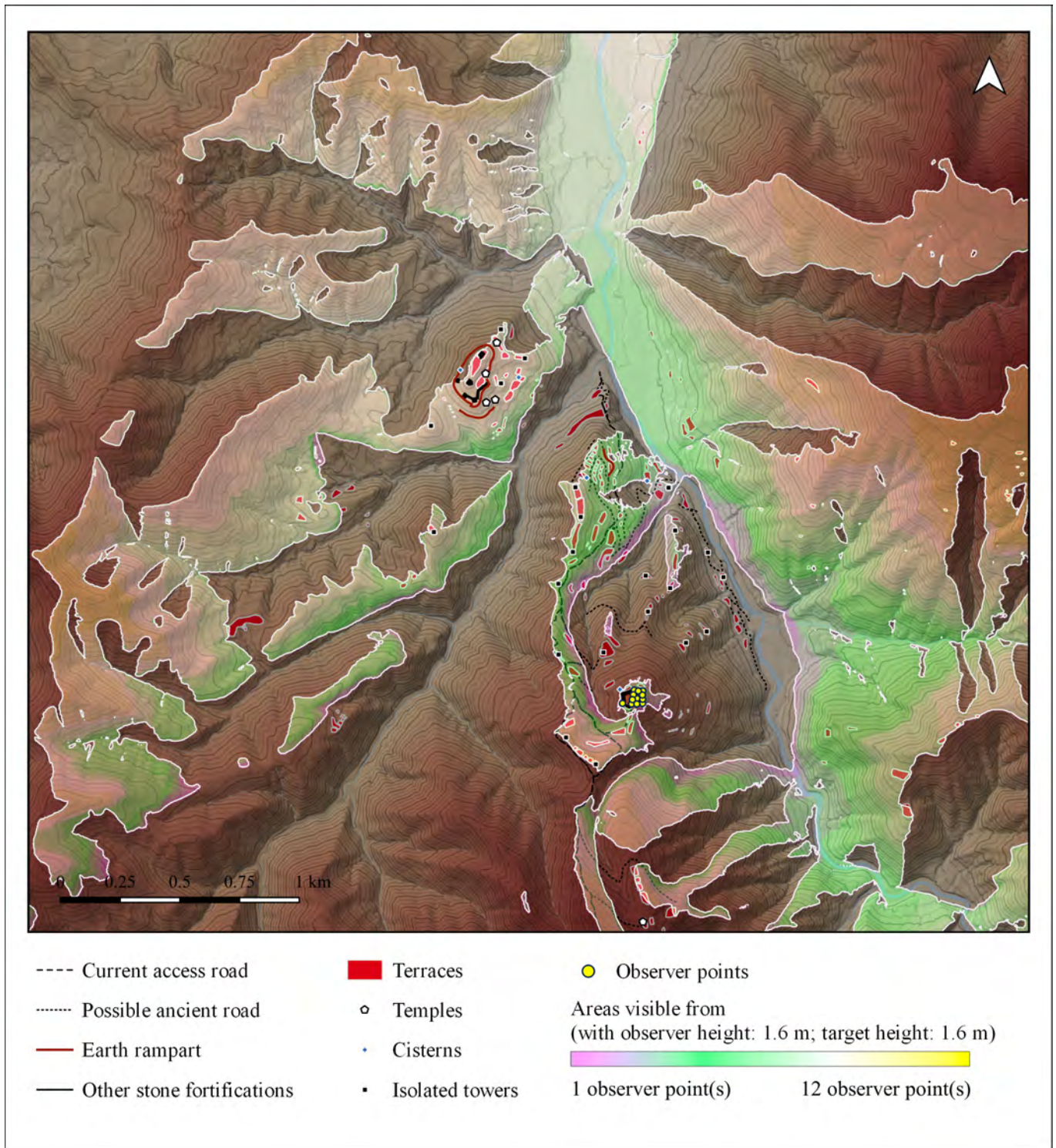


Fig. 4. The visibility from enclosure I (a).

approximation the local altimetric variations in digital format, and it is openly available for research purposes.³⁷ It was possible to map the majority of ancient terraces, roads, but also some of the fortification elements, by using the LAKI II DTM (Fig. 3). The visibility simulations (viewshed) were performed using the LAKI II DTM, with the Visibility Analysis³⁸ plugin for QGIS. These simulations allowed the possibility

for a theoretical evaluation, by means of which I was able to estimate the level of visibility from a certain place, from variable heights above-ground, in an idealizing manner, in the context of forest vegetation absence.

THE VISIBILITY SIMULATIONS

The Costești–Blidaru fortress

The fortress from atop Blidaru hill consisted of two enclosures with a slight altitudinal difference between them. The

³⁷ ANCPi 2024.
³⁸ VAP 2024.

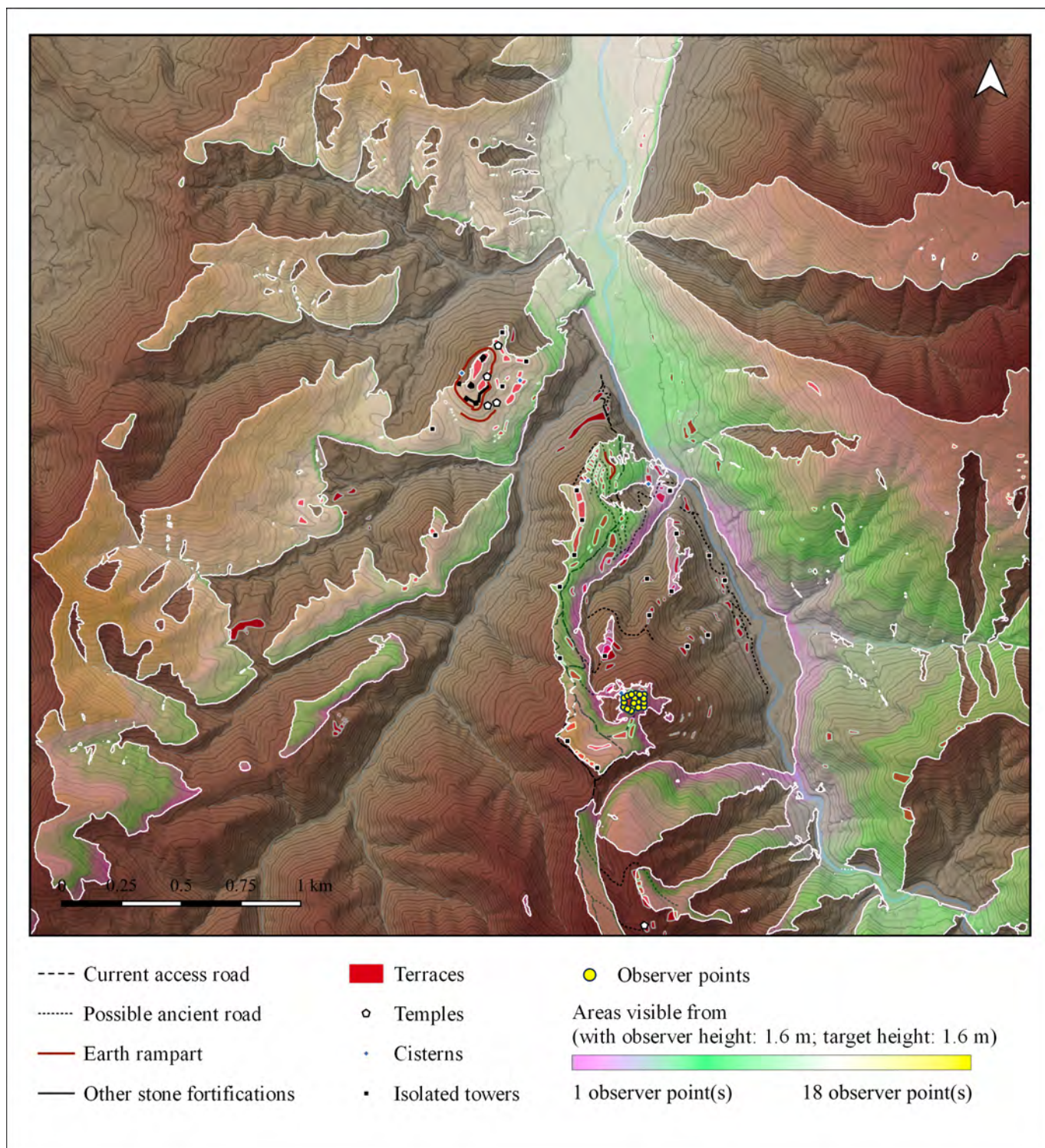


Fig. 5. The visibility from enclosure II (a).

superior level one is enclosure I and it represents the first phase of the fortress, which included bastions I–IV and the walls between them. In the same phase was built the square dwelling–tower from the interior, measuring around 7.6×7.6 m, and another outside the enclosure, namely tower VI, measuring approx. 10.8×10 m. Enclosure II, from the lower level, was built subsequently, after further adjusting the hilltop terrain, by enlarging westwards the enclosure of the original fortress, without completely demolishing the separating wall between I and II, only its upper part. On this

occasion, tower VI was incorporated into the new enclosure, and was converted from dwelling–tower into bastion, while on the north-western corner of the enclosure bastion V was raised, probably with defence of the nearby cistern in mind. To the same building phase belonged the construction of the rooms from behind the new enclosure.³⁹

³⁹ DAICOVICIU *et alii* 1954, 127–134; DAICOVICIU *et alii* 1955, 227; DAICOVICIU *et alii* 1957, 264–271; DAICOVICIU *et alii* 1962, 463–466; DAICOVICIU *et alii* 1973, 70–71; DAICOVICIU/GLODARIU/FERENCZI 1989, 181–183.

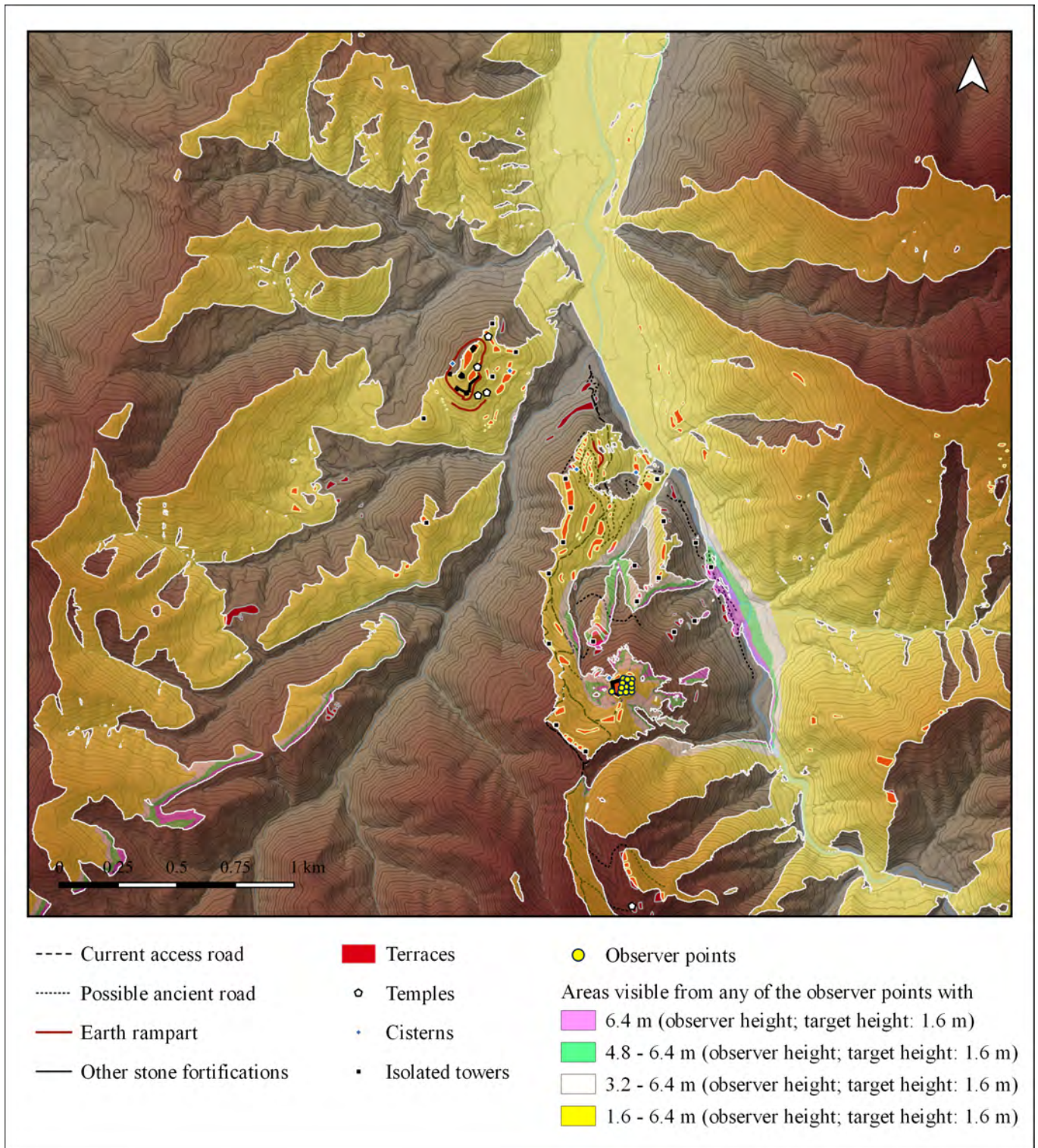


Fig. 6. The visibility from enclosure I (b).

From a series of positions corresponding to the first phase of the fortress, namely from the positions of the dwelling-tower, of bastions I-IV and VI, but also from along the course of enclosure I, from 1.6 m elevation above-ground, the distant parts of the Apa Oraşului valley can theoretically be seen (Fig. 4). The respective parts, and some of the surrounding heights even more so, are visible from the majority of the observer points. On the other hand, the distant parts of the Apa Oraşului valley, and in general the lower portions of the valley, can only

be seen from a limited number of points, from the edge of the hilltop in principle. Even from such a modest elevation, from the average height of an individual, the majority of the isolated towers from the fortresses' vicinity (the ones from *La Vămi*, *Poiana lui Mihu*, *Poiana Popii*, *Curmătura Faeragului*, *Platoul Faeragului I-III*, *Poiana Chişetoarei* and *Muchia Chişetoarei III-IV* spots), namely 10 out of 17, are visible from one observer point or another. More distant targets, such as the *Costeşti-Cetăţuia* fortress, its nearby isolated towers (including the one from *Ciocuţa* spot), but

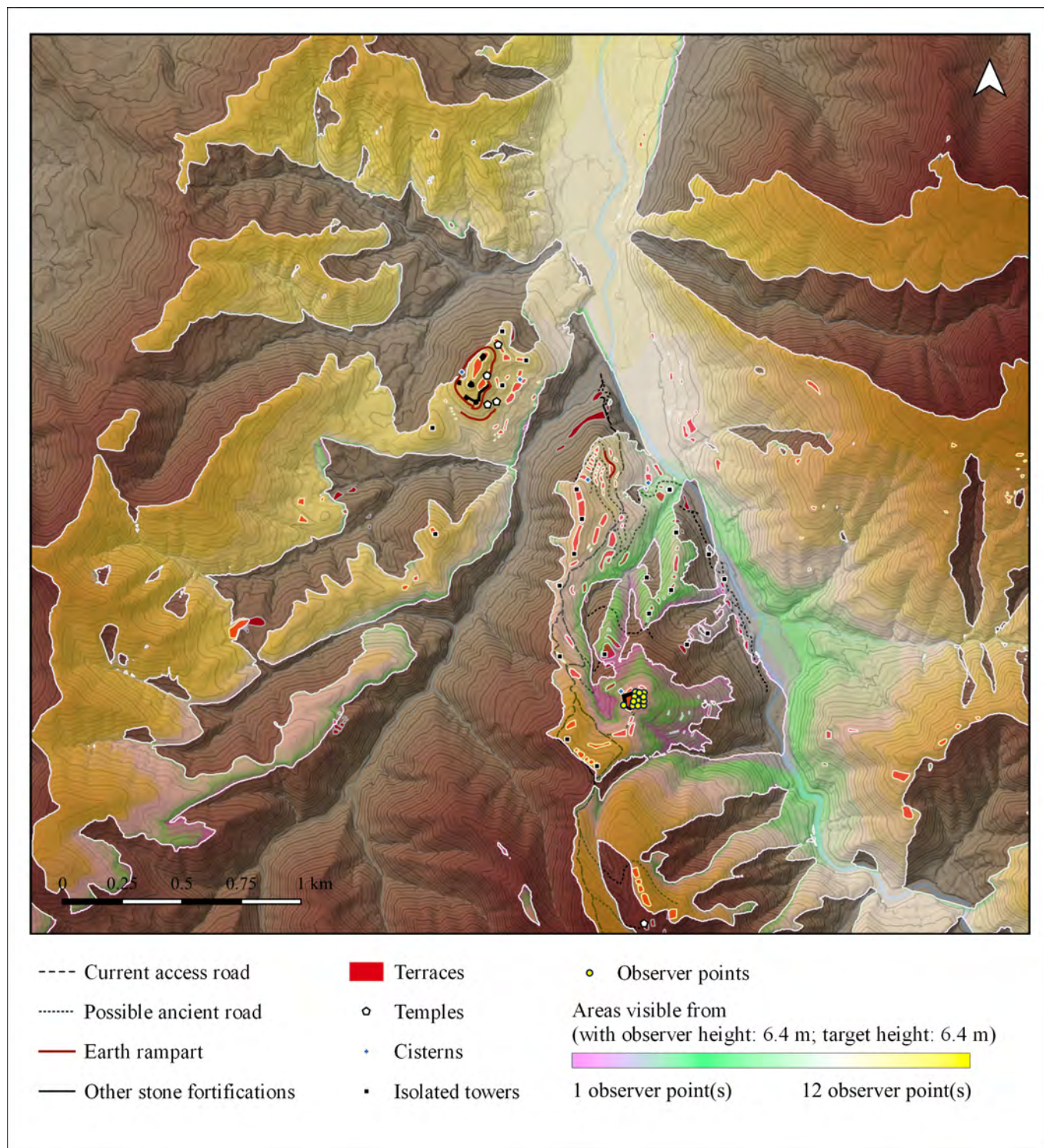


Fig. 7. The visibility from enclosure I (c).

also the fortified position from atop *Cetățuia Înaltă*,⁴⁰ are likewise visible.

In the vicinity of the Costești–Blidaru fortress, more precisely in the land between the Faeragului valley and the Apa Orașului valley, and between the confluence of these two streams and the *La Vămi* spot, approx. 113 ancient terraces (+ 2 with the fortress) can be recorded. The functional area of these terraces is variable between 15⁴¹ and 3952 m², and

their total sum measures around 6.48 ha. Of these 113 terraces from the fortresses' vicinity, approx. 70 (4.1 ha) are visible from the positions corresponding to the first phase of the fortress, from 1.6 m elevation. Of those terraces that are visible, many are located on the eastern slopes of the Faeragului, below the plateau with the same name. The great terrace called *Grădina Faeragului*⁴² is one among these. The terraces found on this slope appear lined-up in more or less

⁴⁰ DAICOVICIU 1979, 103–114.

⁴¹ It is likely that the areas of all terraces may have shrank more or less since

antiquity due to landslides and erosion.

⁴² DAICOVICIU/GLODARIU/FERENCZI 1989, 186.

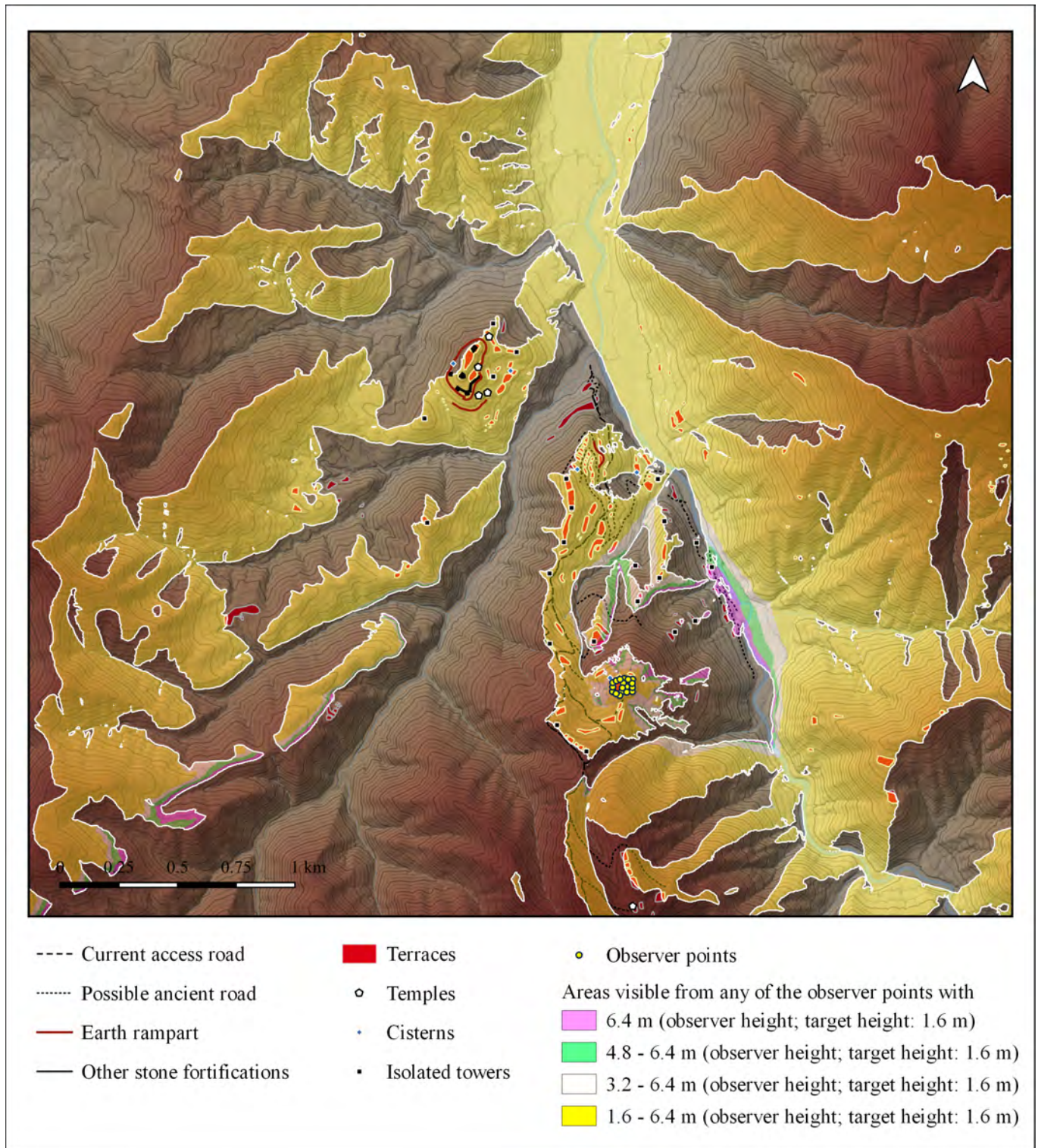


Fig. 8. The visibility from enclosure II (b).

cohesive groups, they may have formed together a sort of household district (only future archaeological research can reveal their former true purpose). Also visible are the more or less distant terraces from the opposing side of the Apa Oraşului valley, where Dacian artifacts or diverse traces have been found in various places (for example: *Căprioarele, Belia, Şesul Iezilor, Pârâul Pădişelului, Poiana Rădăcinii, Bocşitură, La Curţi, Şesul Crucii Ruşilor, Țuțurău, În Năpărți* and *Păru*)⁴³. On

the left side of Apa Oraşului, but in more distant spots, a few terraces or Dacian artifact discovery sites are likewise visible (*Dâlma Brăiței, Putinei*)⁴⁴. Only that these, and the findspots located closer to Costeşti–Cetățuia in general, should rather be regarded as potential settlements belonging to that fortress, especially if intervisibility had existed between them too. Also on the left side of the valley and in a more distant place, in the *Pietroasa lui Solomon* spot, the ensemble of

⁴³ DAICOVICIU/GLODARIU/FERENCZI 1989, 187–189.

⁴⁴ DAICOVICIU/GLODARIU/FERENCZI 1989, 185–186.

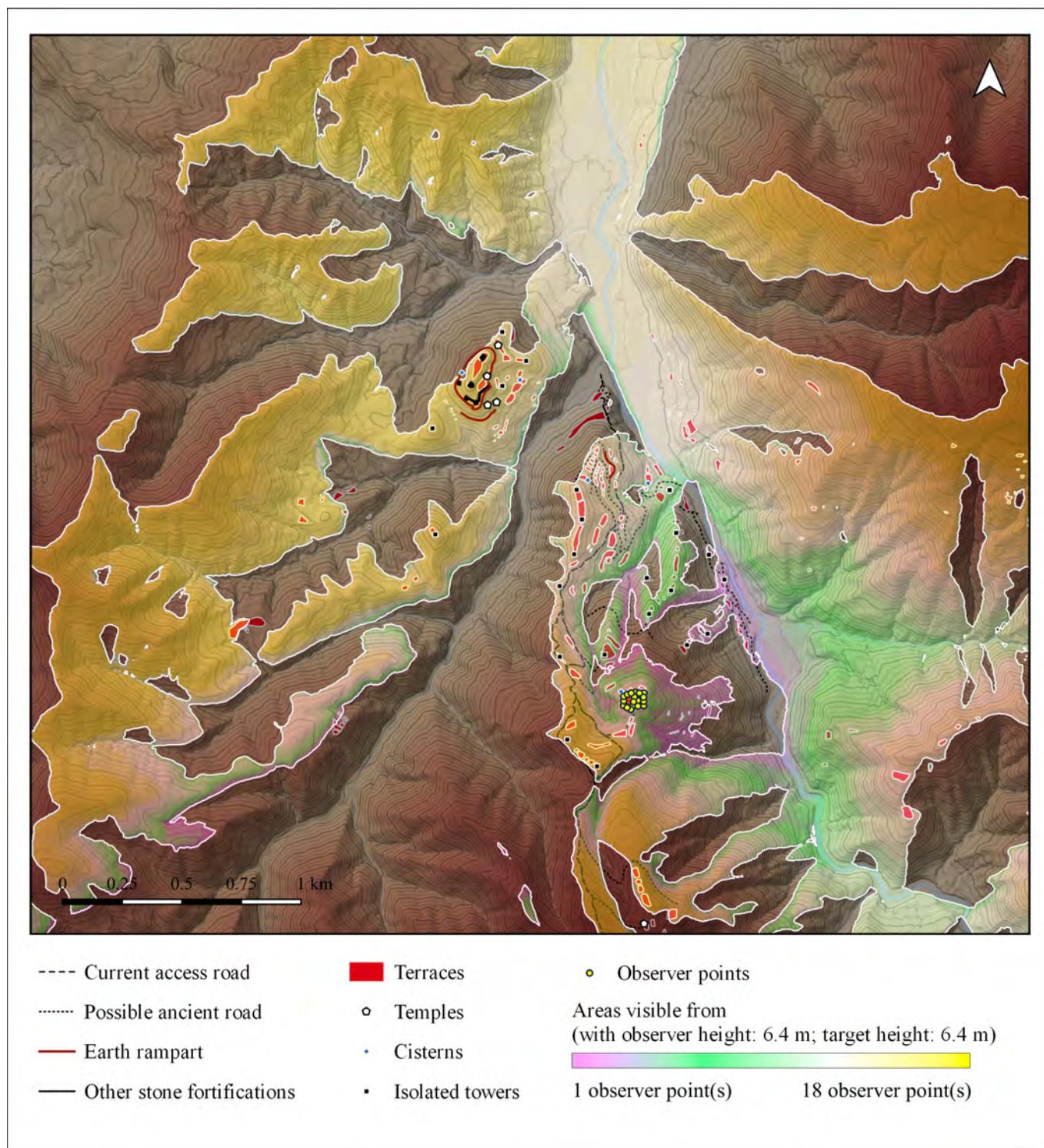


Fig. 9. The visibility from enclosure II (c).

terraces from there is also partially visible, but the terrace on which the temples stood is not. It is worth noting that in the surroundings of the Costești–Blidaru fortress, below the hilltop, partially on Muchia Chișetoarei, integrally on Muchia lui Todirici, and especially in the lower parts of the Apa Orașului valley, namely in the vicinity of the Pârâul lui Todirici confluence, there are approx. 43 terraces (1.8 ha), which, likewise are not visible from 1.6 m elevation.

From the modern-day village of Costești, the current access path leading to the fortress starts off near the Faeragul valley's confluence with the Apa Orașului, and ascends to the

destination by traversing the eastern slope of the Faeragul, below the plateau with the same name. From the northern end of this elongated plateau, along some lined-up terraces, descends a presumably ancient road. It then merges with another ancient road, which traverses the eastern slope of the Faeragul, right above the access path, runs parallel with it as far as the *Grădina Faeragului* spot, from where it then descends on the slopes of the Valea Chișetoarei.⁴⁵ Actually, this road starts ascending from near the Valea Chișetoarei

⁴⁵ DAICOVICIU/ FERENCZI 1951, 21.

confluence with the Apa Oraşului, not far from the *Poiana Chişetoarei* spot, and it is likewise presumably ancient.⁴⁶ Nowadays, one can also reach the fortress with ease from the south, following the ridgeway, by passing through the La Vămi spot. Both the access paths, as well as the presumably ancient roads are largely visible, even from 1.6 m elevation.

If to the observer points corresponding to the first phase of the fortress, a few additional points are appended, in places corresponding to the position of bastion V and along the course of enclosure II, from the same 1.6 m elevation above-ground, the visibility is generally the same (Fig. 5). The visibility of the access paths or ancient roads improves only a little. Actually, only the access path coming from Costeşti can be somewhat better seen from the fortress, more exactly the nearer segment. Regarding the visibility of terraces, a few additional terraces from beneath the fortress can now be seen. Some of them is the one called *Poiana Perţii*, with the remains of the isolated tower. The cistern from the close proximity of the fortress is now also visible, just like the other two more distant cisterns from the vicinity (one near *Pârâul Chişetoarei*, the other beneath *Platoul Faeragului*). The two latter cisterns can also be seen from the observer points corresponding to the first phase of the fortress, from 1.6 m height.

If these visibility simulations are repeated from taller levels, from the estimated elevation of the fortifications, and not from the average height of an individual, it can be noted that visibility steadily improves in the vicinity of the fortress. The meadows of the Apa Oraşului from the base of Blidaru hill, the high slopes, some of the hill's ridges, as well as some of the smaller surrounding valleys are more visible from higher elevations from within the fortress. Particularly relevant is the greater visibility of neighboring terraces, of the isolated towers, and of the Apa Oraşului valley, through which the main road leading to Grădiştea de Munte (*Sarmizegetusa Regia*) probably ran. The isolated towers from the *Pârâul lui Todirici I-II* spots were built on the lower terraces of the valley, on the left bank, in a place where the valley is narrowing. Nearby, but also in other places on the left side of the watercourse, traces of a presumably ancient road⁴⁷ have been found, but which surely was together with the respective towers damaged by the construction work for making the embankment of the now-defunct forest railway. Apart from the isolated towers which from 1.6 m height are visible from the fortress anyway, from higher elevations, including the ones from the *Pârâul lui Todirici* spot can be seen, but also many others.

From 3.2 m elevation above-ground, from positions corresponding to the first phase of the fortress, the isolated tower from the *Muchia Chişetoarei I* spot is visible, if it has a minimal height of 1.6 m. From the same positions, but from 4.8 m elevation, the *Poiana Perţii* and *Pârâul lui Todirici I* towers are visible, if their minimal height is 1.6 m⁴⁸ (Fig. 6). From the same observer points, but from 6.4 m elevation,

⁴⁶ DAICOVICIU/GLODARIU/FERENCZI 1989, 184–185.

⁴⁷ DAICOVICIU/ FERENCZI 1951, 27; DAICOVICIU/GLODARIU/FERENCZI 1989, 89–90.

⁴⁸ It should be noted that when the isolated tower from *Poiana Perţii* was investigated, it was discovered that the stone base of the construction consisted of 5 courses of limestone blocks, the first two courses belonging to the foundation, it measured 2.7 m in total height, and 1.65 m was the visible elevation above the surface ground (DAICOVICIU *et alii* 1955, 145, fig. 21).

the *Muchia Chişetoarei II*, *Pârâul lui Todirici II* and *Muchia lui Todirici I-II* towers are visible only if their minimal height is also around 6.4 m (Fig. 7). From positions corresponding to the second phase of the fortress, from 3.2 m the *Muchia Chişetoarei I* and *Poiana Perţii* towers can be seen if they are at least 1.6 m tall. From the same positions, but from 4.8 m elevation, the *Pârâul lui Todirici I* tower is visible if its minimal height is 1.6 m (Fig. 8). From the same observer points, but from 6.4 m elevation, the *Muchia Chişetoarei II*, *Pârâul lui Todirici II* and *Muchia lui Todirici I-II* towers are visible only if their minimal height is also around 6.4 m (Fig. 9).

The presented findings indicate that from the fortress, from elevations ranging between approx. 1.5–3 m above-ground, slightly over half the number of isolated towers from the vicinity (10 or 11 out of 17) are visible, or around two-thirds (11 or 12 out of 17). From approx. 5 m elevation, three-quarters (13 out of 17) are visible, and from around 6.5 m all of them, on condition that their minimal height is also around 6.5 m. It cannot be ascertained how tall these isolated towers were, but they must have had at least one level each. At the fortress, the bastions presumably had at least one level each, and the elevation of the enclosure wall was estimated at 5–6 m. In these conditions, a large number of isolated towers from the fortresses' vicinity, if not all of them, very likely may have been visible. The extension of the enclosure in the second phase of the fortresses' existence seems it may have not had a major impact on the number of visible towers. By extending the fortifications, only a few towers (*Poiana Perţii*) should become visible, as long as the viewing is performed from a modest height. But from higher elevations above-ground, those towers are visible anyway, both from within enclosure I, and enclosure II. Because the chronological relationship between the isolated towers and the phases of the fortress still is not exactly clear, the visual relationship is not a reliable argument in favour of associating the towers with one phase or another. It is rather the construction technique of the isolated towers which suggests that they may have been built roughly in the same period as enclosure I (in the I century B.C.) Moreover, all observations referring to visibility are actually derived from the present-day configuration of the hilltop, and current the lack of data does not allow for the reconstruction of its old form. Nevertheless, based on the current configuration of terrain and on the estimated elevations, it can be specified that at least the majority of neighboring isolated towers may very likely have been visible in the final phase of the fortresses' existence. In the case of neighboring terraces, it can be said that the majority of these may also have been visible. Even from approx. 6.5 m elevation from example, only around 88 terraces (4.5 ha) out of 113 are visible from the fortress, the other 25 (1.4 ha) being impossible to observe from said place. For the possibility of 'making' those terraces visible one would have to test even higher elevations for the fortification elements of the fortress, without further seeking an explanation for the high number of isolated towers from the vicinity of the fortress.

The isolated towers from the vicinity of the fortress

In at least a few cases, the neighboring isolated towers can significantly complement the visibility from the fortress.

From elevations ranging between 1.6 and 6.4 m above-ground, certain portions of the landscape are visible from the positions of these towers, the very same which when viewed from the fortress are actually not, or at least not from heights below 6.4 m. Precise examples in this sense can offer the towers from *Platoul Faeragului III*, *Poiana Chișetoarei* and *Muchia lui Todirici II* spots.

Poiana Primarului is the great terrace located beneath the *Platoul Faeragului III* tower.⁴⁹ From the position of the respective tower, from 1.6 m elevation above-ground, the aforementioned terrace is not visible, and it neither is from the fortress. From 3.2 m height however, from the tower's location, some parts of this terrace already start to be visible (Fig. 10). From the *Poiana Chișetoarei* tower's position, from 1.6 m elevation, a few terraces from close proximity of the structure can be seen, terraces which from the fortress are not visible at all. From the same location, but from 6.4 m height, the meadows of the Apa Orașului from the nearby Valea Chișetoarei confluence can also be seen much better than from the fortress (Fig. 11). From the *Muchia lui Todirici II* tower's position, from 1.6 m elevation, relatively few terraces from close proximity of the building are visible, but from 4.8 m almost all of them are, and also the ones from the lower parts of the Apa Orașului valley, from near the Pârâul lui Todirici confluence (Fig. 12). From the fortress however, only some of these terraces are visible from 6.4 m, and the ones located on *Muchia lui Todirici* are even less so (see Fig. 8).

With visibility from the fortress being complemented by these handful of isolated towers, only a few terraces from the vicinity of the fortress should still remain unobservable, more exactly around 7 (0.24 ha). Also in the case of more distant terraces or recorded findspots, which cannot be seen from the fortress, some isolated towers are however in more favorable position to do so. An example in this sense represents the ensemble of terraces from atop Merișorul, a hill where Dacian artifacts have once been found on one of its spurs, but without now knowing the exact location.⁵⁰ This hill is partially visible from within the fortress (see Fig. 8), the ensemble of terraces without it being however, but the latter can actually be seen from the position of the *La Vămi* (Fig. 13) or *Poiana lui Mișu* (Fig. 14) towers. Similarly, the terrace from the *Pietroasa lui Solomon* spot, on which the temples stood, is not visible from the fortress, but from the *Poiana lui Mișu* tower it is however.

Even though certain targets are not visible from the fortress in the simulated conditions, some isolated towers from its vicinity are therefore in the position to address these shortcomings. But only just a few of these towers should normally be needed for the observation of terraces or of recorded findspots, which are not visible from the fortress. Because more towers are known to have existed, one can presume that the surveillance of the inhabited places, or of those associated with human activity, may not have been the sole reason for the construction of these structures. The visibility of the entire territory surrounding a fortified position is necessary from a defensive standpoint, as it would enable the monitoring of all possible access paths to it, including those less

apparent. Although the placement of the fortress is suitable for allowing the surveillance of a large segment of the current access paths, but also of the presumably ancient roads from the vicinity, for example even from 6.4 m elevation (see Fig. 8), some of the surrounding valleys are only partially visible (Valea Chișetoarei), or not at all (Valea Faeragului and Pârâul lui Todirici). The defensive rationale, together with the topographic argument, can perhaps justify the presence of such high number of towers in the vicinity of the fortress, which is higher than it seems necessary at first sight. In such a scenario, some towers located in key-positions, serving as outposts, probably may have been specially created to watch over certain portions of territory (Fig. 15–18), over areas that are essential for the safety of the fortress or of certain towers, but which are not visible from any of the other fortified positions. In the following lines, it is presented with examples why such a scenario may have been plausible.

South and south-west from the hilltop on which the fortress stands, at short distance across the linking saddle, is where the *La Vămi* and *Poiana lui Mișu* towers are located, at levels above the fortress. The ridgeway coming from the south, along the elongated crest, past Pietroasa lui Solomon, goes by the former tower. Both towers are ideally positioned for observing the respective crest, and the ridgeway implicitly, but the slope on either side is variably visible from the locations of the two towers. The eastern slope, the one facing the Apa Orașului valley, but also the crest with the ridgeway, are both largely visible from the fortress as well (see Fig. 8), not only from the positions of these two towers. The opposing slope however, is visible only from the two towers, somewhere only from the former tower, elsewhere only from the latter. The *La Vămi* tower, the one in the best position for controlling and defending the access road coming from the south towards the fortress, may have also had an observational role, but functioning in much better way with extra visibility input coming from the *Poiana lui Mișu* tower (see Fig. 15–18).

The hill upon which the *La Vămi* and *Poiana lui Mișu* towers stand is an elongated one, which steadily slopes down towards north, to the Valea Faeragului confluence with the Apa Orașului, being flanked by the Valea Chișetoarei to the east, then by the Apa Orașului, and by the Valea Faeragului to the west. The latter valley, together with the entire western slope of the respective hill, are not visible from the fortress, only its ridge and its eastern slope (see Fig. 8). However, a series of isolated towers line-up along the entire ridge of the hill (*Poiana Popii*, *Curmătura Faeragului*, *Platoul Faeragului I–III*), in positions favorable for surveilling together the Valea Faeragului, on almost its entire length, but also a sizeable portion of the western slope. Some of these towers (*Poiana Popii*, *Curmătura Faeragului*, *Platoul Faeragului III*, plus *Poiana lui Mișu* if its minimal elevation is 4.8 m) are remarkable in the fact that they can see certain portions from Valea Faeragului or the western slope of the hill, which are not visible at all from the position of any other tower (see Fig. 15–18).

The landform on which the fortress stands is a hill with multiple ramifications and small separating valleys, which descend into Valea Chișetoarei to the west and north-west, or Apa Orașului to the east. The hill's main ramifications are

⁴⁹ DAICOVICIU / FERENCZI 1951, 21.

⁵⁰ DAICOVICIU *et alii* 1973, 83–84.

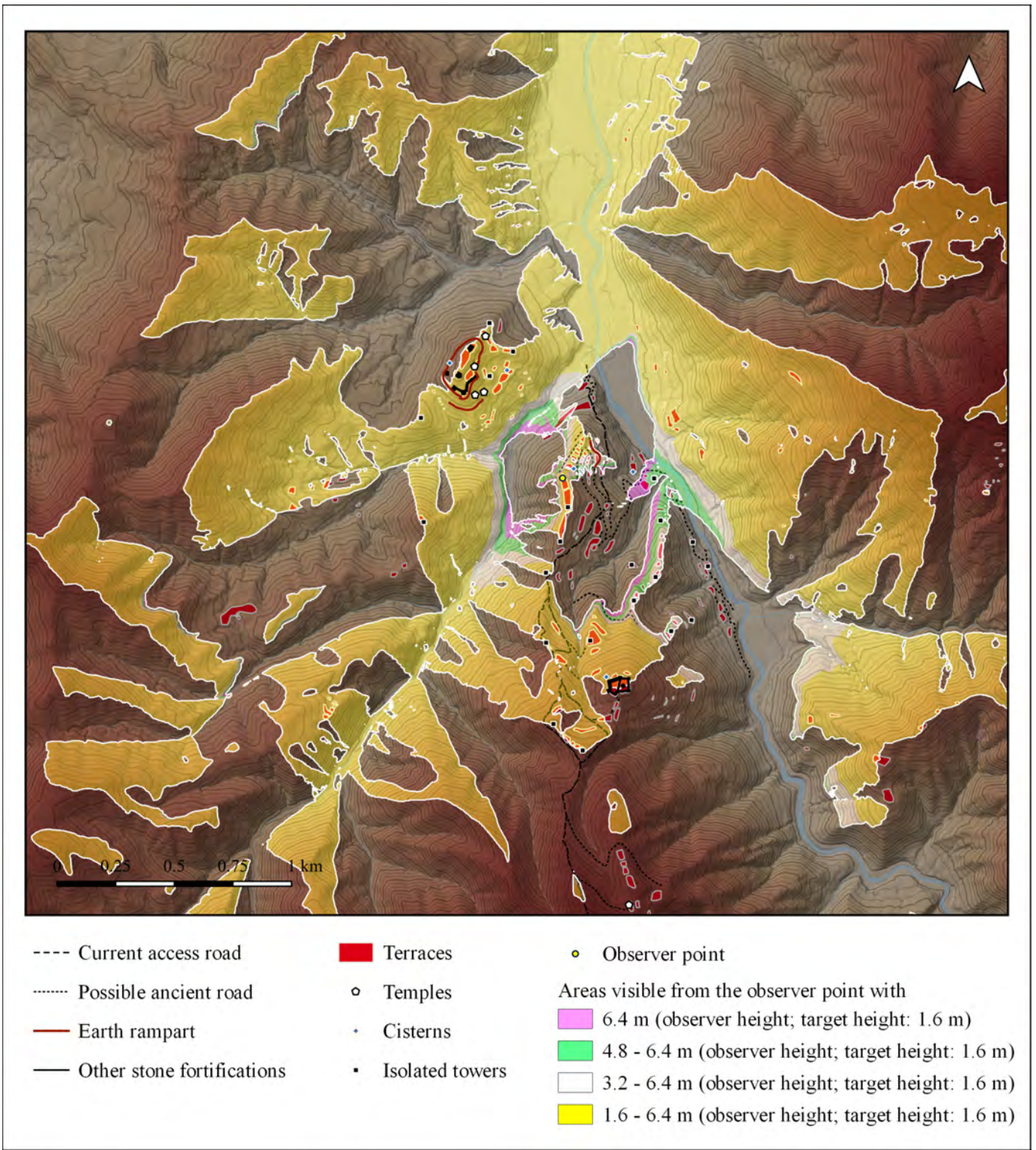


Fig. 10. The visibility from *Platoul Faeragului III* tower's position.

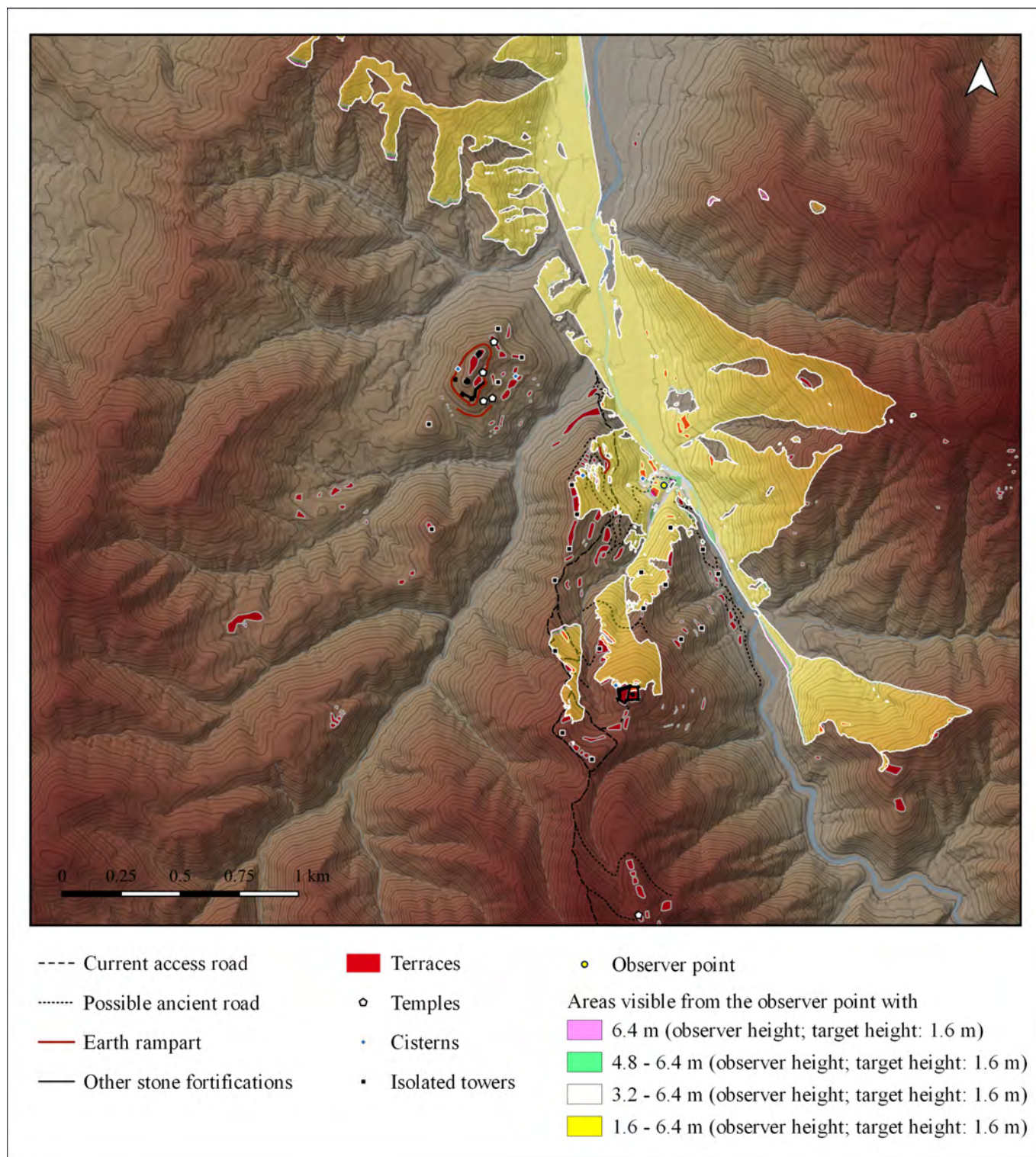


Fig. 11. The visibility from *Poiana Chișetoarei* tower's position.

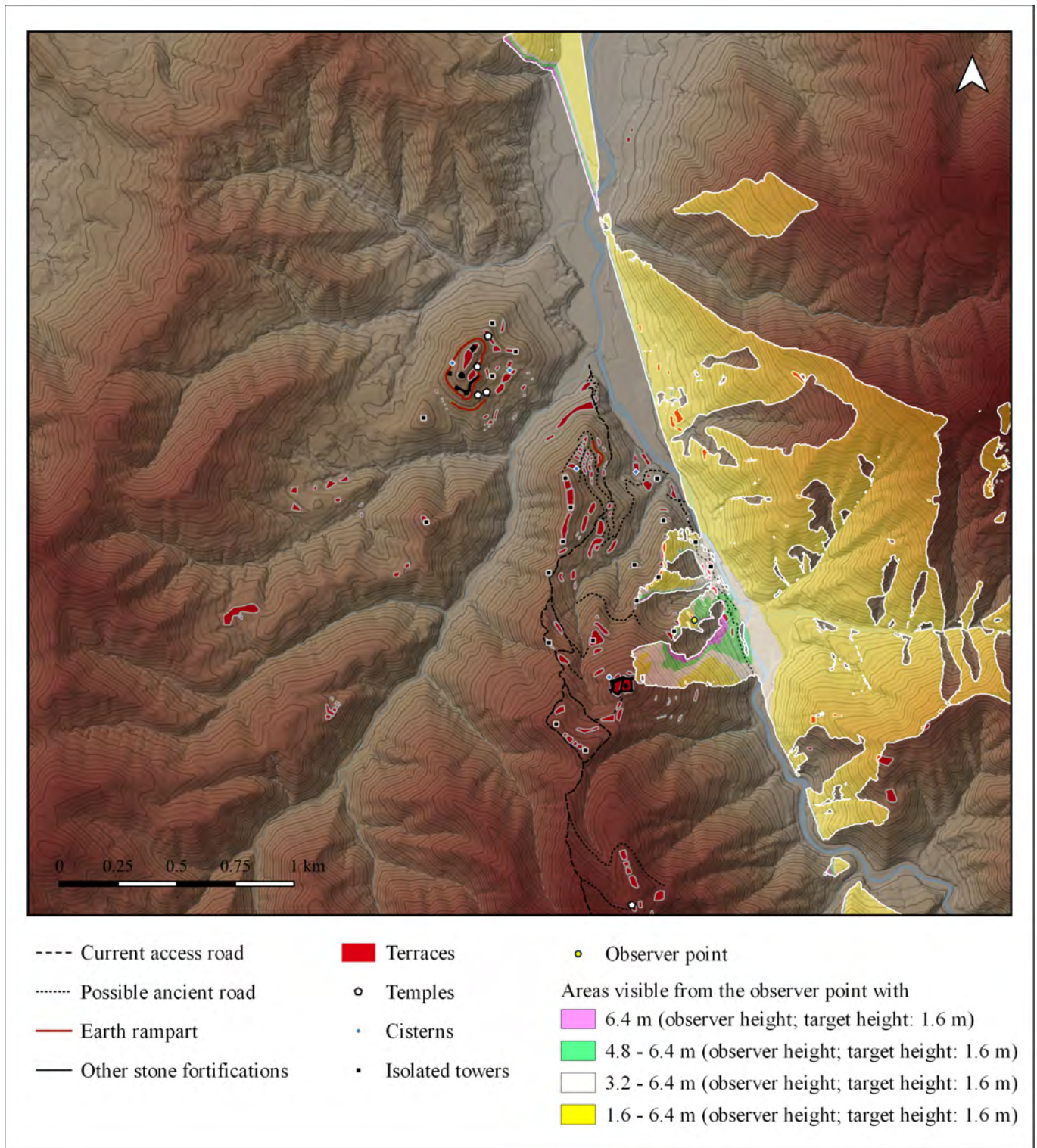


Fig. 12. The visibility from *Muchia lui Todirici II* tower's position.

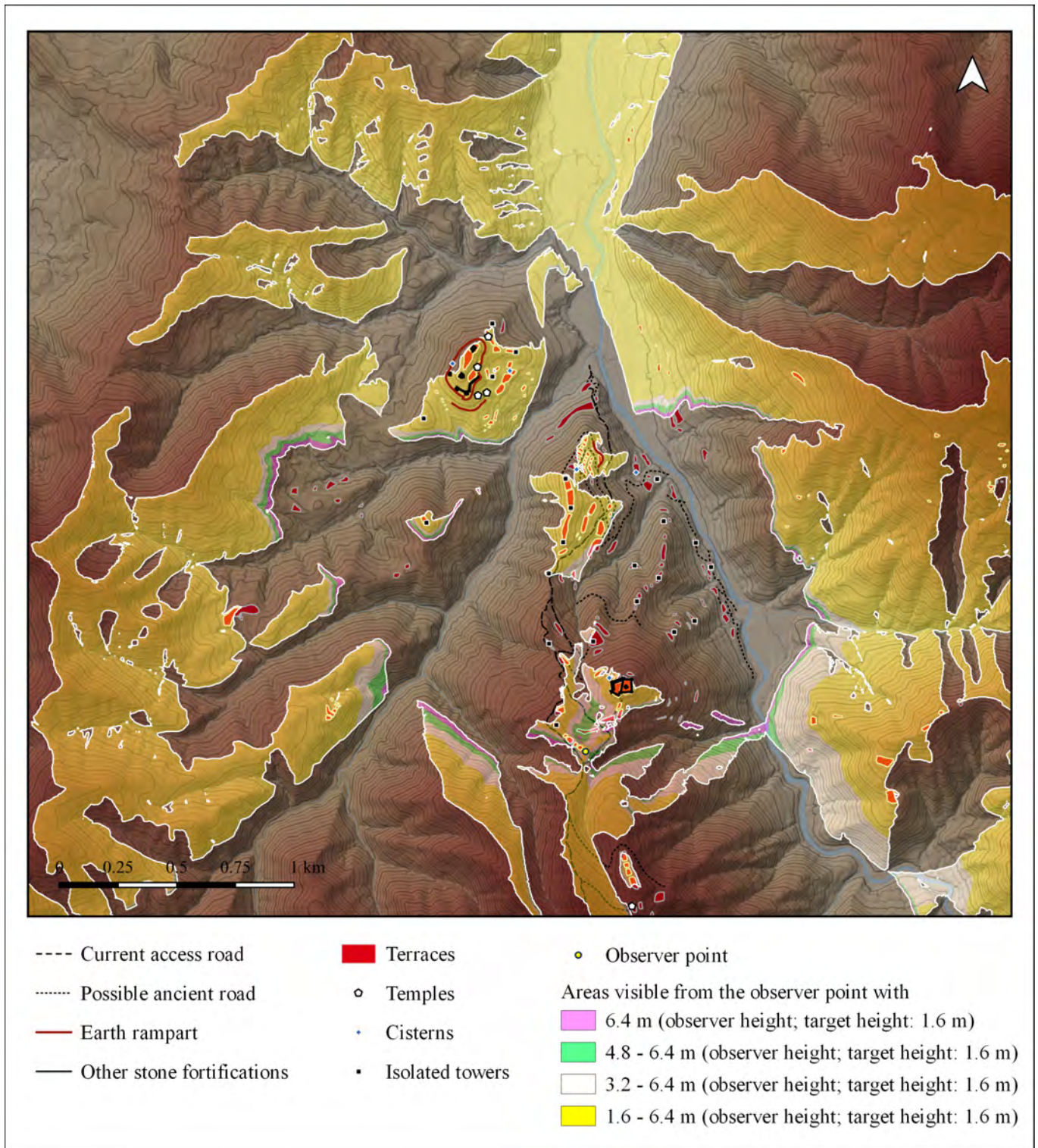


Fig. 13. The visibility from *La Vāmi* tower's position.

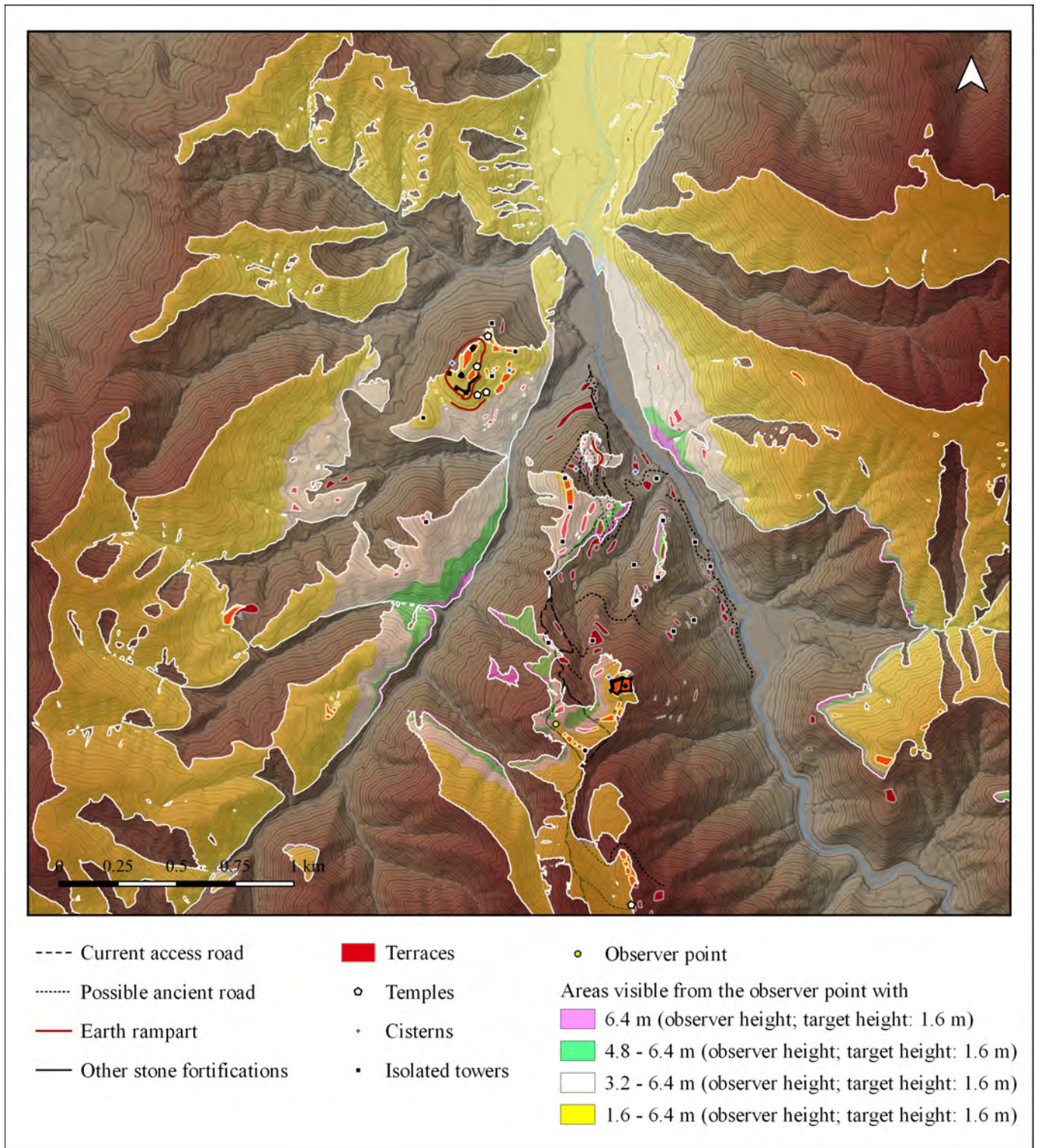


Fig. 14. The visibility from *Poiana lui Mihu* tower's position.

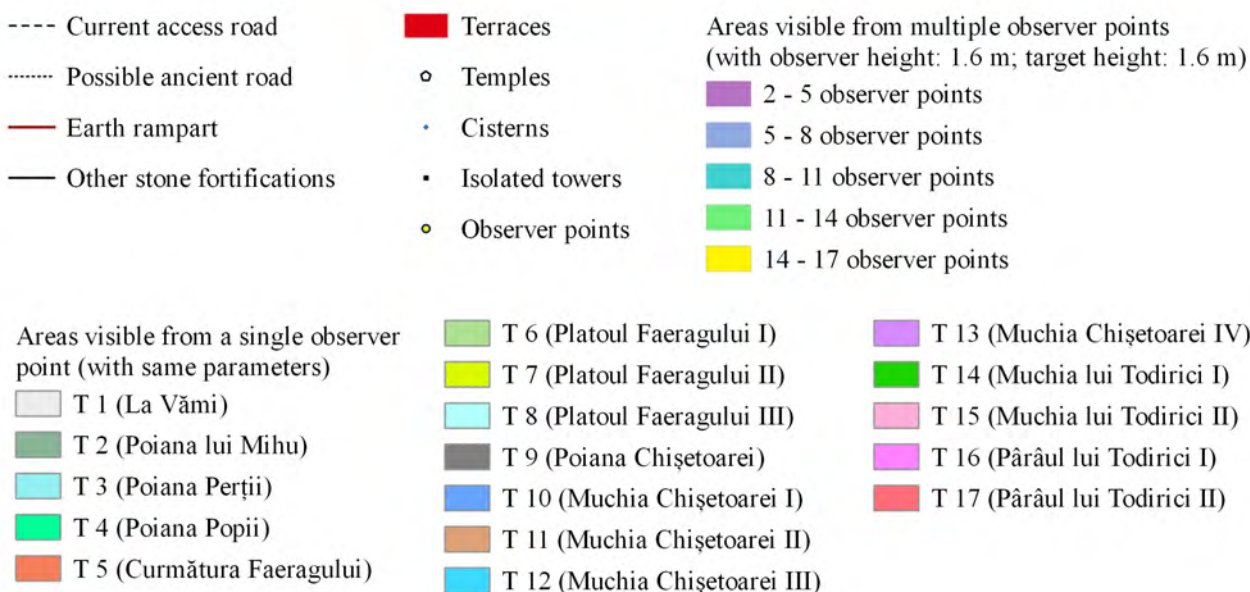
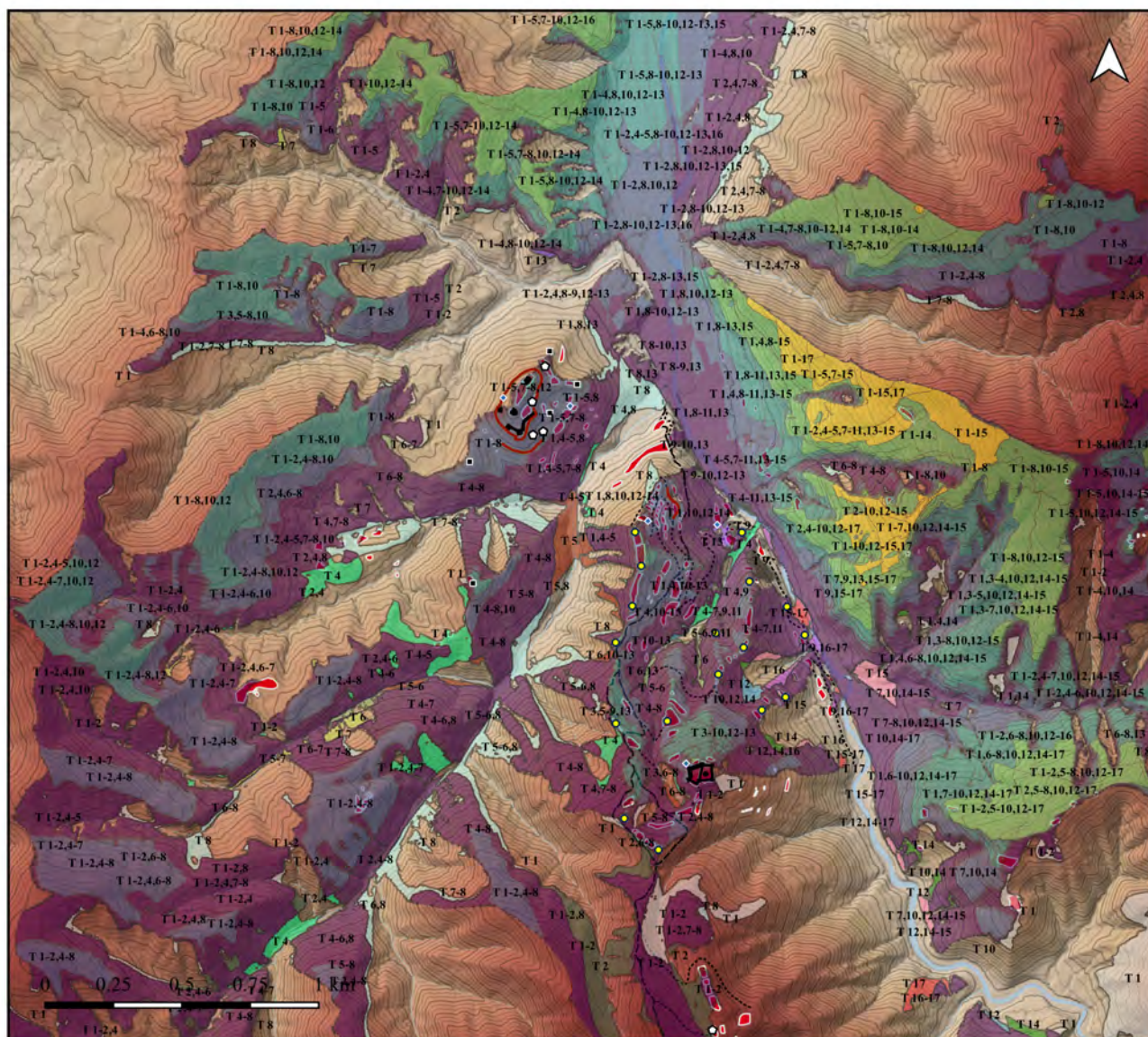


Fig. 15. The visibility from the position of the 17 isolated towers located near the fortress (a).

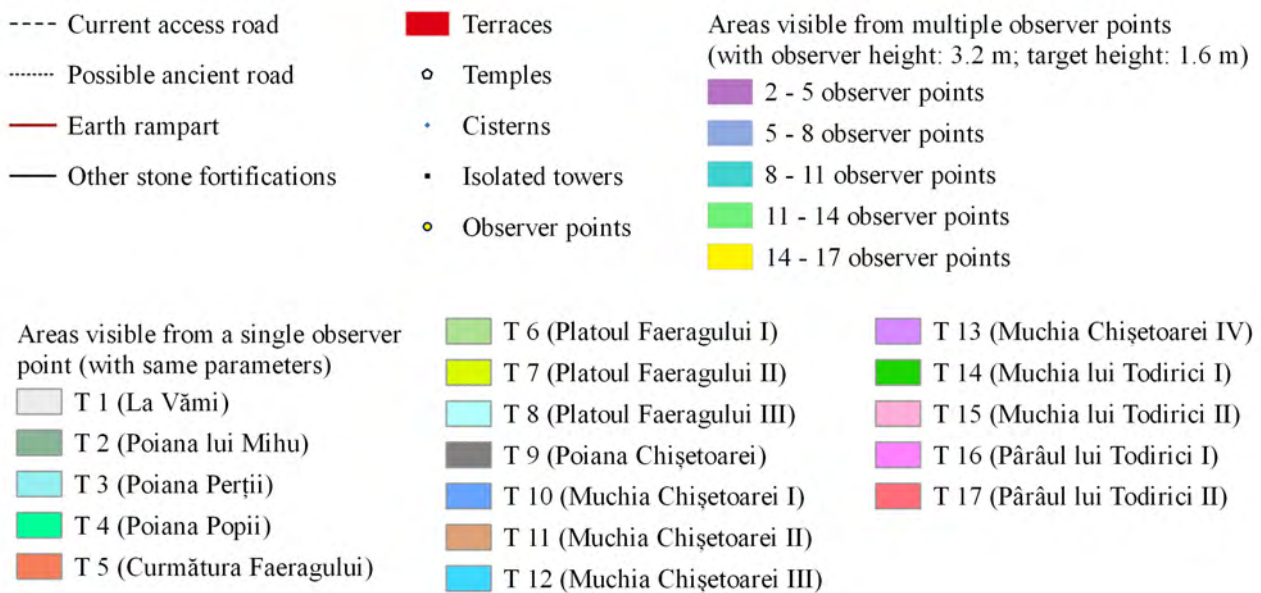
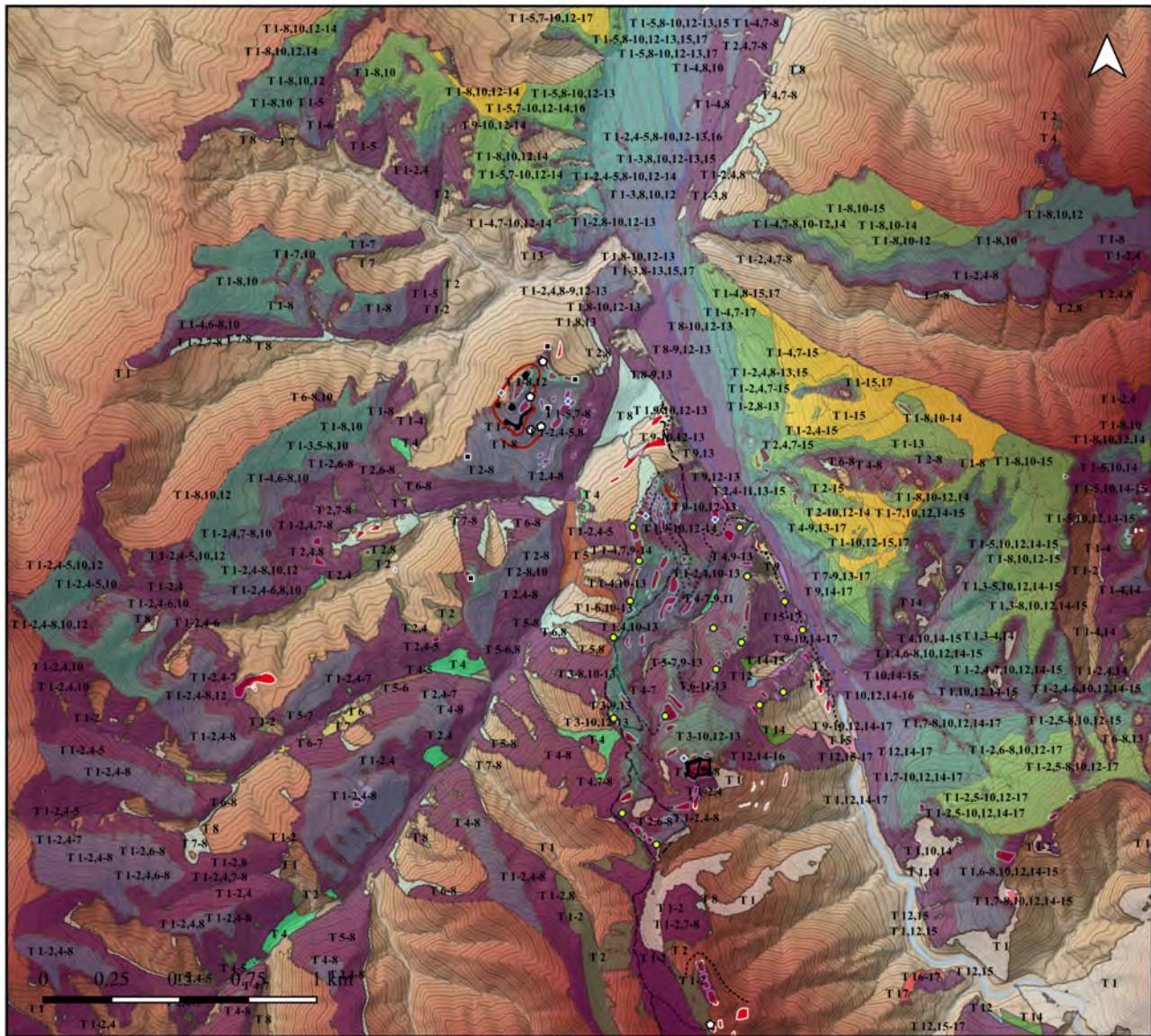
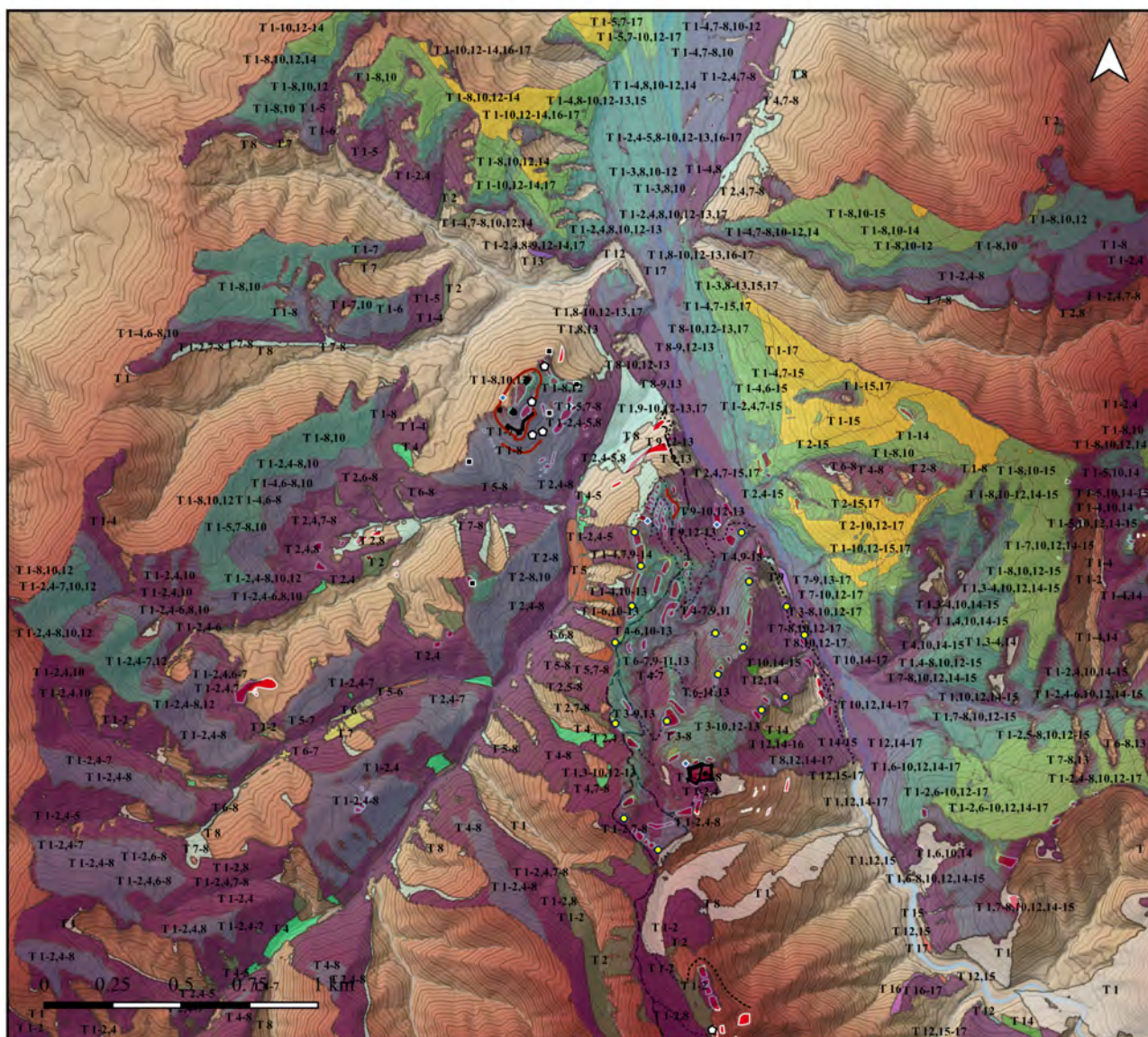


Fig. 16. The visibility from the position of the 17 isolated towers located near the fortress (b).



- Current access road
- Possible ancient road
- Earth rampart
- Other stone fortifications
- Terraces
- Temples
- Cisterns
- Isolated towers
- Observer points
- Areas visible from multiple observer points (with observer height: 4.8 m; target height: 1.6 m)
- 2 - 5 observer points
- 5 - 8 observer points
- 8 - 11 observer points
- 11 - 14 observer points
- 14 - 17 observer points

- Areas visible from a single observer point (with same parameters)
- | | | |
|------------------------------|---------------------------------|---------------------------------|
| ■ T 1 (La Vămi) | ■ T 6 (Platoul Faeragului I) | ■ T 13 (Muchia Chișetoarei IV) |
| ■ T 2 (Poiana lui Mihu) | ■ T 7 (Platoul Faeragului II) | ■ T 14 (Muchia lui Todirici I) |
| ■ T 3 (Poiana Perții) | ■ T 8 (Platoul Faeragului III) | ■ T 15 (Muchia lui Todirici II) |
| ■ T 4 (Poiana Popii) | ■ T 9 (Poiana Chișetoarei) | ■ T 16 (Pârâul lui Todirici I) |
| ■ T 5 (Curmătura Faeragului) | ■ T 10 (Muchia Chișetoarei I) | ■ T 17 (Pârâul lui Todirici II) |
| | ■ T 11 (Muchia Chișetoarei II) | |
| | ■ T 12 (Muchia Chișetoarei III) | |

Fig. 17. The visibility from the position of the 17 isolated towers located near the fortress (c).

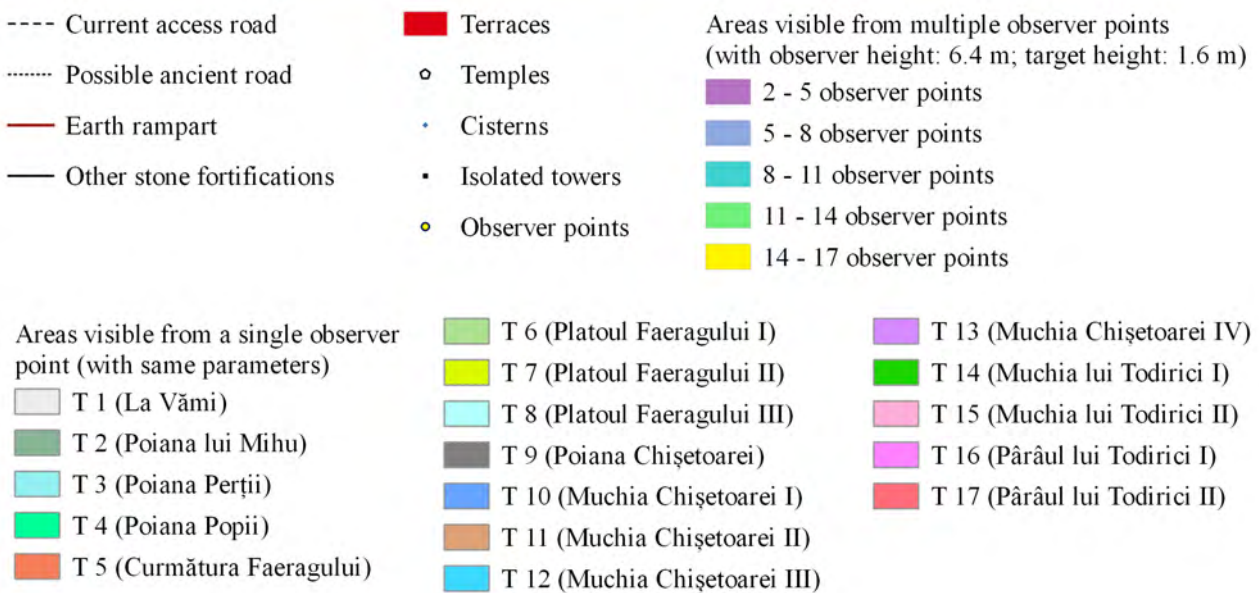
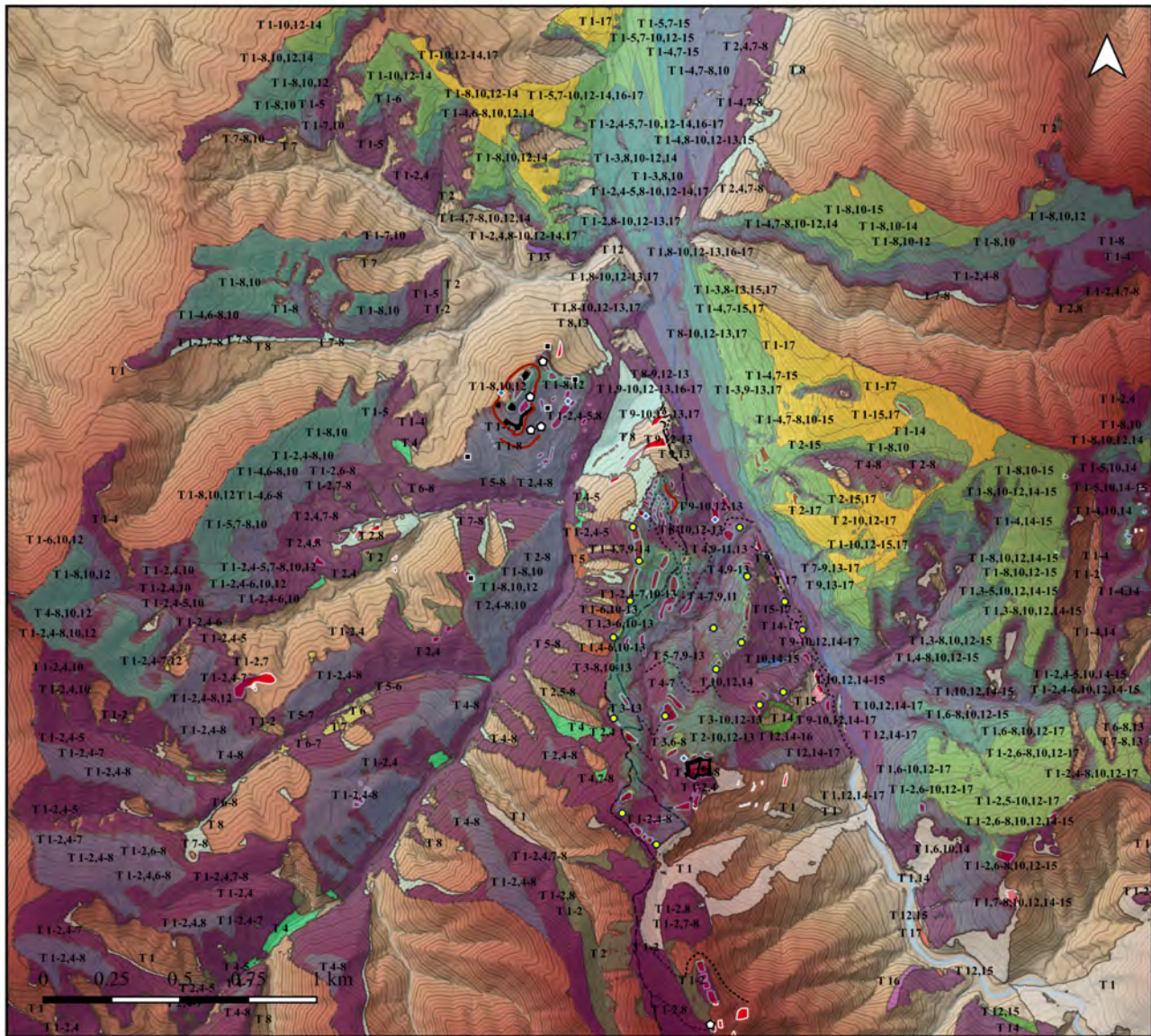


Fig. 18. The visibility from the position of the 17 isolated towers located near the fortress (d).

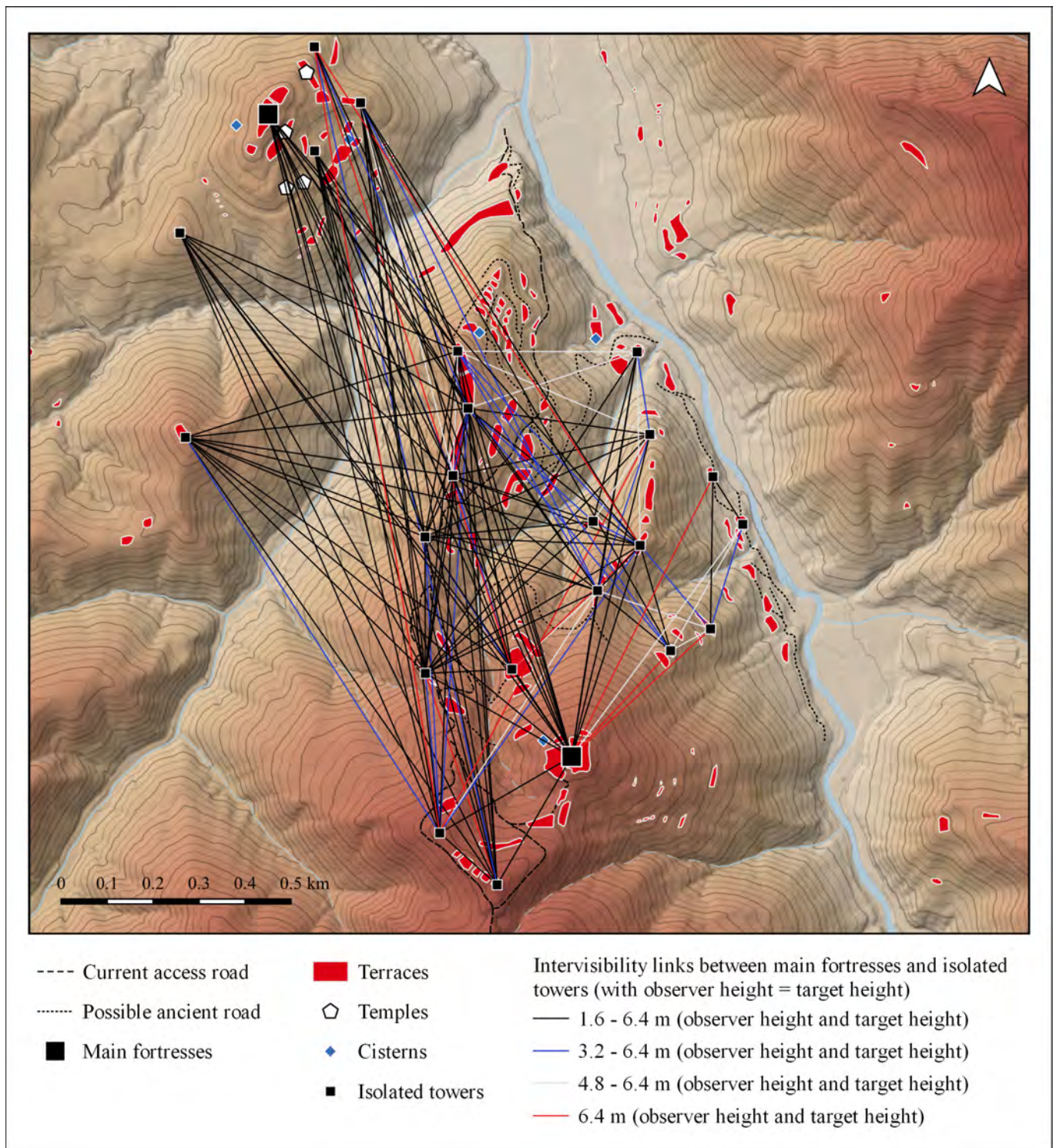


Fig. 19. The visibility links between the fortress and the isolated towers.

Muchia Chișetoarei and Muchia lui Todirici, on both which a series of towers line-up. The mouth of Valea Chișetoarei and the lower course of the respective valley is visible from the fortress, but the upper course and its small secondary valleys are not. The Pârâul lui Todirici forms a small separating valley between Muchia Chișetoarei and Muchia lui Todirici, which likewise is not visible from the fortress (see Fig. 8). The placement of these two series of towers on the main ramifications of the hill provides the possibility of observing the small valleys below the fortress hilltop, which are not visible

from up there. With visibility input from the position of one (*Poiana Popii*, *Platoul Faeragului I*, *Muchia Chișetoarei III–IV*, *Curmătura Faeragului*, plus *La Vămi* and *Poiana lui Mihi* if their minimal elevation is 3.2 m) or more towers from one side (*Poiana Popii*, *Curmătura Faeragului*, *Platoul Faeragului I–III*, plus *La Vămi* and *Poiana lui Mihi*) or the other (*Poiana Perții*, *Muchia Chișetoarei I–IV*) of the Valea Chișetoarei, the respective valley and its small secondary valleys are completely visible. Similarly, with visibility input from the position of one (*Muchia lui Todirici II*, *Muchia Chișetoarei III*, plus

Muchia lui Todirici I if its minimal elevation is 3.2 m, plus *Muchia Chișetoarei I* if its minimal height is 4.8 m) or more towers from one side (*Muchia Chișetoarei I* and *III*) or the other (*Muchia lui Todirici I–II*) of the Pârâul lui Todirici, this small valley too is completely visible (see Fig. 15–18).

The isolated towers are therefore suitably positioned to observe together almost all potential access paths leading to the fortress, not only the conventional ones. The current access paths, together with the presumably ancient roads from the vicinity, are largely visible from the fortress anyhow, while being also from the positions of many isolated towers. But it can more reliably be said about the towers located in close proximity to the access paths or the presumably ancient roads (*La Vămi*, *Curmătura Faeragului*, *Poiana Chișetoarei*, *Pârâul lui Todirici I–II* towers, possibly *Poiana Popii* and *Poiana lui Mihai*), that these may have played an important role in controlling the access, and in defending the conventional routes. At the same time, all of these towers are favorably positioned for also monitoring those portions of territory, which are visible neither from the fortress, nor from any other towers. From the locations of the other isolated towers (except for the ones from *Poiana Perții* and *Muchia Chișetoarei II*) distinct parts of territory are similarly visible, areas which from other fortified positions are not, but in these cases, the structures themselves may have rather played a surveillance role only. The *Poiana Perții* and *Muchia Chișetoarei II* towers stand apart, because they can view from their positions only such areas that can also be seen from other towers. These two buildings seem to not have necessarily had an observational role, or if they may have had, they likely would have doubled the watch over Valea Chișetoarei especially. At least as far as the *Poiana Perții* tower goes, the result presented here supports C. Daicoviciu's hypothesis, which presumes that the tower's role may have been to guard the access from Valea Chișetoarei to the spring and the nearby cistern, and to the fortress.⁵¹

The above-mentioned observations and the possibility for visibility links to have existed between the fortress and the majority of isolated towers at the very least, but also in-between the towers (Fig. 19), sheds new light on the nature of the fortified ensemble from Costești–Blidaru.

CONCLUSIONS

The simulations reveal that visibility from the fortress atop Blidaru hill is good in general. From 1.6 m elevation above-ground, the surrounding hills and the distant portions of the Apa Orașului valley, which runs past the fortress at the base of Blidaru hill, and through which the main road leading to Grădiștea de Munte (*Sarmizegetusa Regia*) probably ran, are visible. At the same time, a large section of the access roads leading to the fortress, as well as the presumably ancient roads, can also be seen from up there. All of the cisterns from the vicinity of the fortress are likewise visible, and, so are the majority of terraces that dot the surrounding heights.

From higher elevations, the visibility from the fortress improves gradually. From approx. 6.5 m, a figure that is not

too far removed from the estimated height of certain fortification elements, the neighboring portions of the Apa Orașului valley, from the base of the fortress hill, can be seen, but the smaller surrounding valleys are only partially visible (Valea Chișetoarei), or not at all (Valea Faeragului and Valea Pârâului Todirici). Also, some of the surrounding terraces cannot be seen even from such high elevation. The necessity to observe all potential access paths leading to the fortress, not only the conventional ones, but also the remainder of the terraces, may justify the presence of isolated towers from the fortresses' vicinity. Of particular relevance in this sense is the placement of towers in various key-positions, suitable for allowing the surveillance of areas around the fortress, which are not visible from the main fortification, but which perhaps should be so for reasons of safety. At the same time, some towers are well-positioned as to observe certain areas that cannot be seen from any of the other towers. With visibility input coming from the positions of the 17 isolated towers from the vicinity of the fortress, the surrounding territory may be more efficiently monitored in theory, and almost all terraces should this way be visible from some fortified place or another.

The majority of towers therefore, may have been built for surveillance. Some of these may have been observing the areas of permanent habitation or sporadic human activities, which the fortress would have been unable to do so directly. In some cases, the towers may have been symbols of power and prestige, just like the fortress, but on a smaller scale. If there were any inhabited places in their visual range, other towers may have represented the same too, but in those cases together with the fortress. However, the more likely role of certain fortified positions may have been to closely control and guard the conventional access paths, as these were in near proximity to them, or they may have watched over other potential access paths, unconventional ones, less practicable normally, and signalled any incoming danger. Because direct visibility links may have theoretically existed between the fortress and at least the majority of the isolated towers, but also in-between the towers, these structures may have been outposts built in order to support the fortress. It is obvious that the ensemble from Costești–Blidaru is a dense network of fortification elements, consisting of potentially interdependent structures. It has the appearance of a complex system, apparently designed based on basic defensive principles, with adaptation to the local terrain conditions, for the purpose of defending the Costești–Blidaru fortress. It is a seemingly well-conceived system, developed probably over time, not randomly, which reflects the importance the fortress would have had, in close relation to Costești–Cetățuia and, especially, to Grădiștea de Munte (*Sarmizegetusa Regia*).

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⁵¹ DAICOVICIU *et alii* 1954, 146.

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