Geophysical surveys of a rectangular enclosure and stone setting on Challacombe Common, Exmoor National Park

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Overview

A series of geophysical surveys were undertaken during March 2014 on two sites on Challacombe Common in Exmoor National Park (figure 1). In summary earth resistance and magnetometry surveys were conducted on a rectangular enclosure (MDE12830 ENP HER) and a stone setting (MDE1044 ENP HER) known as a quincunx. The work was undertaken by volunteers from the Parracombe Archaeology and History Society and the University of Leicester. The results have shed further light on two unusual sites, both in national and regional perspectives, and demonstrate the value of geophysical prospection in upland environments.

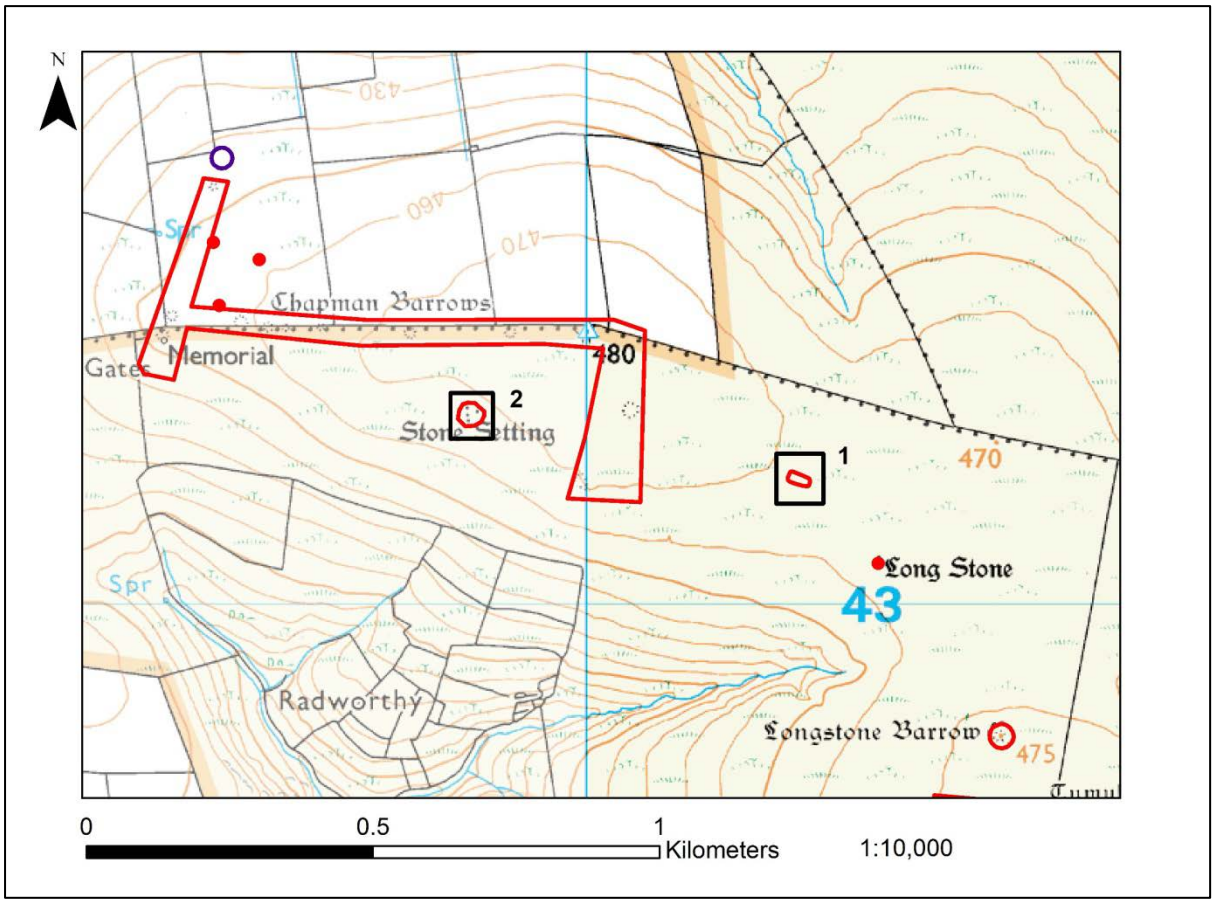

Figure 1: General location of surveys at the rectangular enclosure (1) and stone setting (2). Produced by the author using data from ENPA HER and Ordnance Survey. (© Crown Copyright/database right 2014. An Ordnance Survey/EDINA supplied service)

Introduction and background

The geophysical surveys targeted an embanked rectangular enclosure and a stone setting (figure 2 and Mitcham 2013 unpublished). The intention behind the former was to build on geophysical prospection work done previously at the enclosure in 2009 (Pullen, unpublished). This earth resistance survey suggested a potentially complex multi-phase site (ibid 2009: 25). Interpretation has been the subject of some debate, ranging from a Neolithic mortuary enclosure to a misinterpretation of an area of former turf cutting (Wilmot 1983: 23; Sainsbury 1995 cited in HER record MDE12830). Subsequently an earthwork survey undertaken by English Heritage along with Pullen's work have confirmed the feature to consist of a stone and earthen bank with an external ditch (ibid 2009). The resistance survey suggested nearby potential features to the north which ran out of the surveyed area (ibid: 18). The landscape history of the area and surrounding archaeological features were discussed and synthesised in detail by Pullen (2009: 11-17) and will not be repeated here. The intention behind re-surveying the enclosure was to utilise a higher sampling interval and larger survey area to clarify the presence of any internal and external features to the earthworks. Magnetometry had not been attempted previously at the site. The survey focused on an area of 80m x 40m.

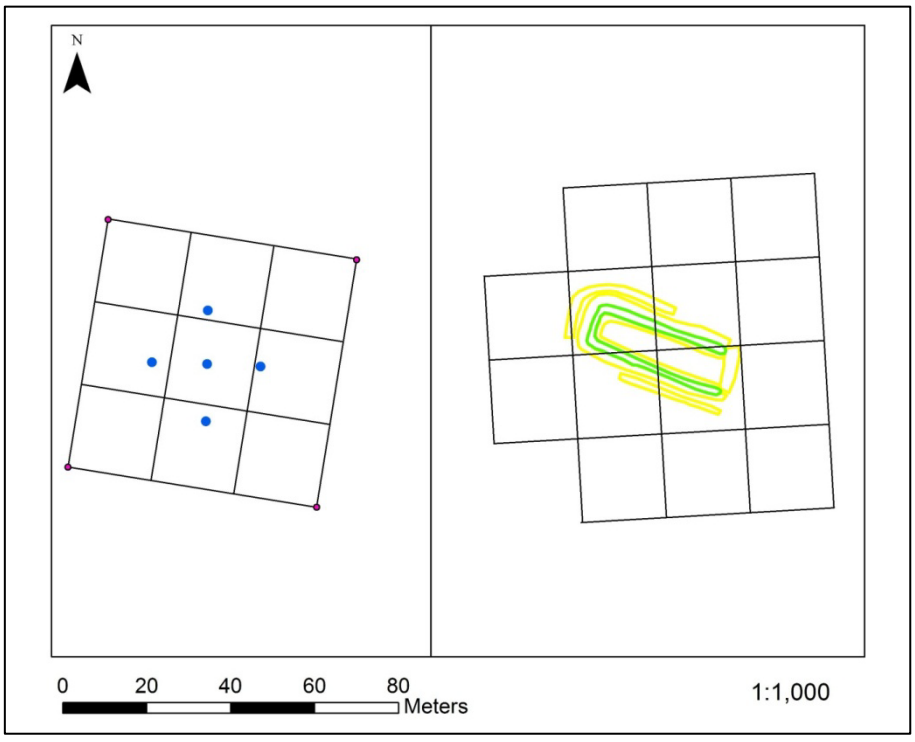

Figure 2: Survey grid locations at the stone setting (left) and rectangular enclosure (right). Produced by the author with the enclosure redrawn from Pullen 2009. (Figure reduced from original scale).

The stone setting (MDE1044 ENPA HER) was chosen due to its unusual siting close to a major barrow group, known as the Chapman Barrows. Whilst a small number of Exmoor's unique stone settings have been subject to geophysical prospection (Gillings *et al.* 2010; Gillings and Taylor 2011a; Gillings and Taylor 2011b) none of the highly geometric quincunx form had yet been investigated. This form consists of stones arranged on the points of a diamond or kite shape, with one in an imaginary centre (1905: 387-388: 1906). The close proximity of the quincunx to the barrow group was unusual as was the fact it was an apparently isolated feature. This was an important question to investigate, as many of Exmoor's stone settings have associations with small cairns (Eardley-Wilmot 1983: 23; Riley and Wilson North 2001: 31 and 32). The geophysical surveys at other stone settings on Exmoor have suggested that some are associated with other features which include cairns, stone spreads, rectilinear boundaries and semi-circular activity structures (Gillings *et al.* 2010; Gillings and Taylor 2011a; Gillings and Taylor 2011b; Gillings 2013). With this in mind an area of 60m x 60m centred on the quincunx was chosen for geophysical survey. This would investigate the presence of any nearby features, and allow close ground inspection for surface features.

In addition to the geophysical surveys the author undertook stone recording and photographic survey of the quincunx and the Long Stone (MDE1280 ENP HER). The stone recording logged the height, width and thickness of the component stones as part of the authors PhD research. The location of the component stones of the quincunx was also surveyed with DGPS, along with several small surface features in the vicinity. The photographic recording was also extended to the surface features identified in the area. The newly identified features are discussed with a full catalogue and ID photographs in appendix 1.

Methods

All the surveys were based on a 20m grid laid out using trilateration with fabric tapes, from base lines established in respect to the monuments themselves. The base lines were oriented on magnetic north using a compass, and laid out with ranging poles and tapes. The equipment used to undertake the soil resistance was a Geoscan RM15 multiplexed Resistance meter. A Bartington Grad 601 fluxgate Gradiometer was used for the magnetometry. A sample interval of 0.5 x 1 m was used for the resistance survey, and magnetometer readings were taken at 0.25 x 1m intervals. In common with all work carried out on Exmoor by the University of Leicester the grids were geo-referenced to sub-centimetre level precision using a survey grade Topcon GPS+ (DGPS) system. The survey

data is therefore fully transformed and fixed onto the OS National Grid. The project also used a hand held Garmin 62s navigation grade GPS for recording initial point locations of features. The photographic recording was done using a Fujifilm AC650 16 megapixel digital camera, set on automatic scene detection mode. Finally the processing of the geophysical survey data was done using the Geoplot and Archaeosurveyer software tools. Interpretation drawings were done using Adobe Illustrator CS4, after the survey data was processed and georeferenced using ArcGIS 10 GIS software.

Resistance Results

Area 1 – Rectangular enclosure, Challacombe Common (HER MDE12830)

The results here are limited by the fact that, they only cover part of the actual survey area due to equipment problems. The resistance survey did not therefore provide the complete clarification of features to the north of the enclosure. However the previous resistance survey at least partially covers some of the area missing from the current survey grid. Geophysics results in this report are shown after basic processing to remove anomalous spikes and trends in the data.

Despite the missing parts of the grid, the survey has clarified the details of the enclosure considerably (figure 3 and 13a). Distinct bands of high resistance along the outer edge of the enclosure banks could suggest stone facing, or perhaps surviving areas of displaced orthostats (figure 4). These are in two distinct areas at the south west, and north west corners. Generally speaking the results match quite closely that of the previous resistance survey, whilst the higher resolution has revealed new information. This could suggest that a number of the subtle features which were detected by both projects are more likely to be real archaeological features, as opposed to localised wet areas or changes in vegetation. The enclosure banks are clearly visible as distinct but discontinuous high resistance anomalies in places which are quite varied. This is perhaps consistent with a stone and earth built bank, which has a varied matrix along its length. The surrounding ditch shows as a faint but varied anomaly, with a low resistance signature in places, and a high resistance signature elsewhere. These high resistance readings could reflect the slumping of stone from the bank into the ditch. In places the outer ditch slope appears as a high resistance reading, perhaps defining such concentrations of stone. There could have been a stony surface or slight bank on the outside of the ditch, which has slumped into the edge of the ditch. The base of the ditch appears as a low resistance feature where it is definable on the plot.

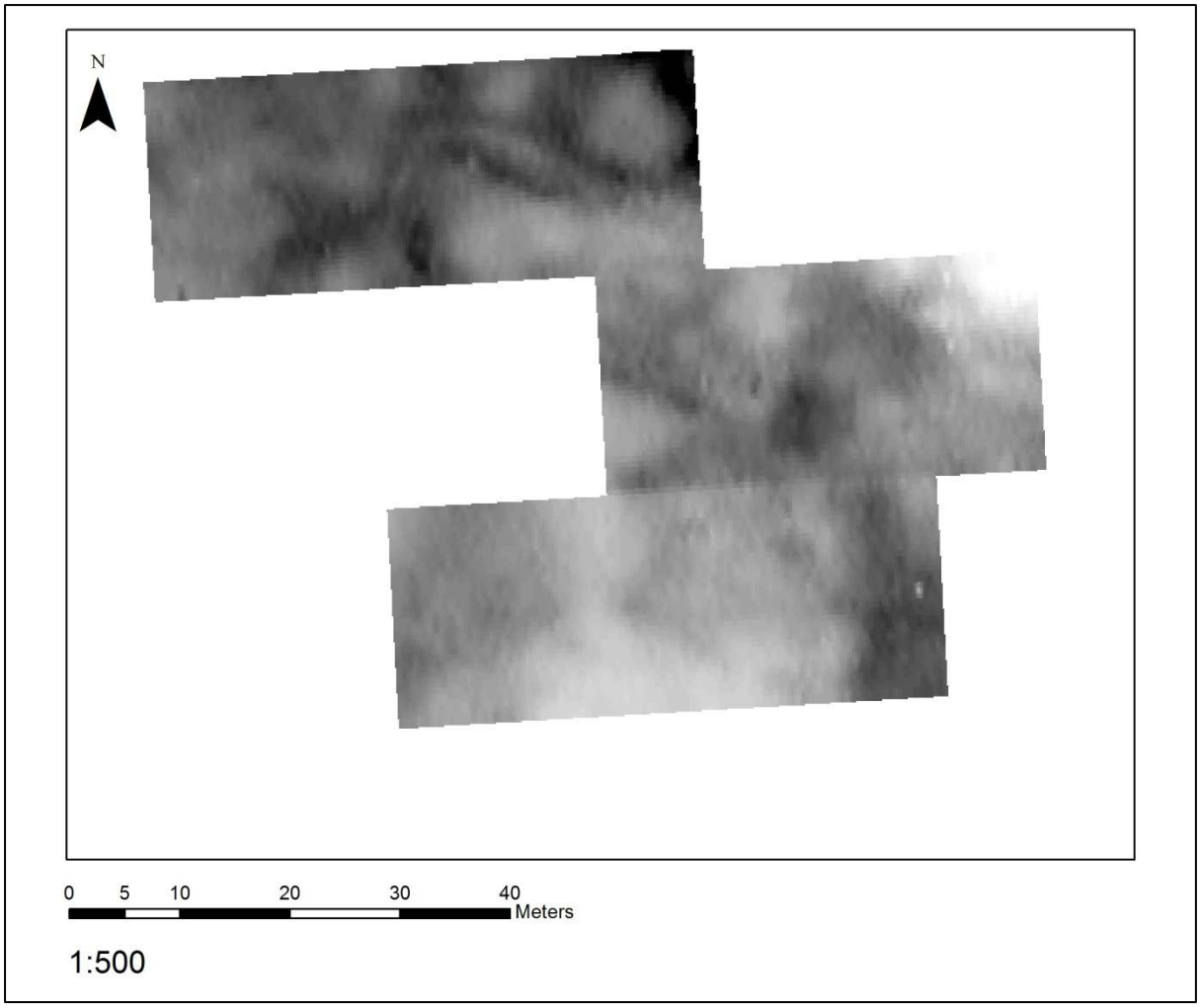

Figure 3: Earth resistance results of rectangular enclosure after processing with the clip, despike and interpolation functions. Produced by the author.

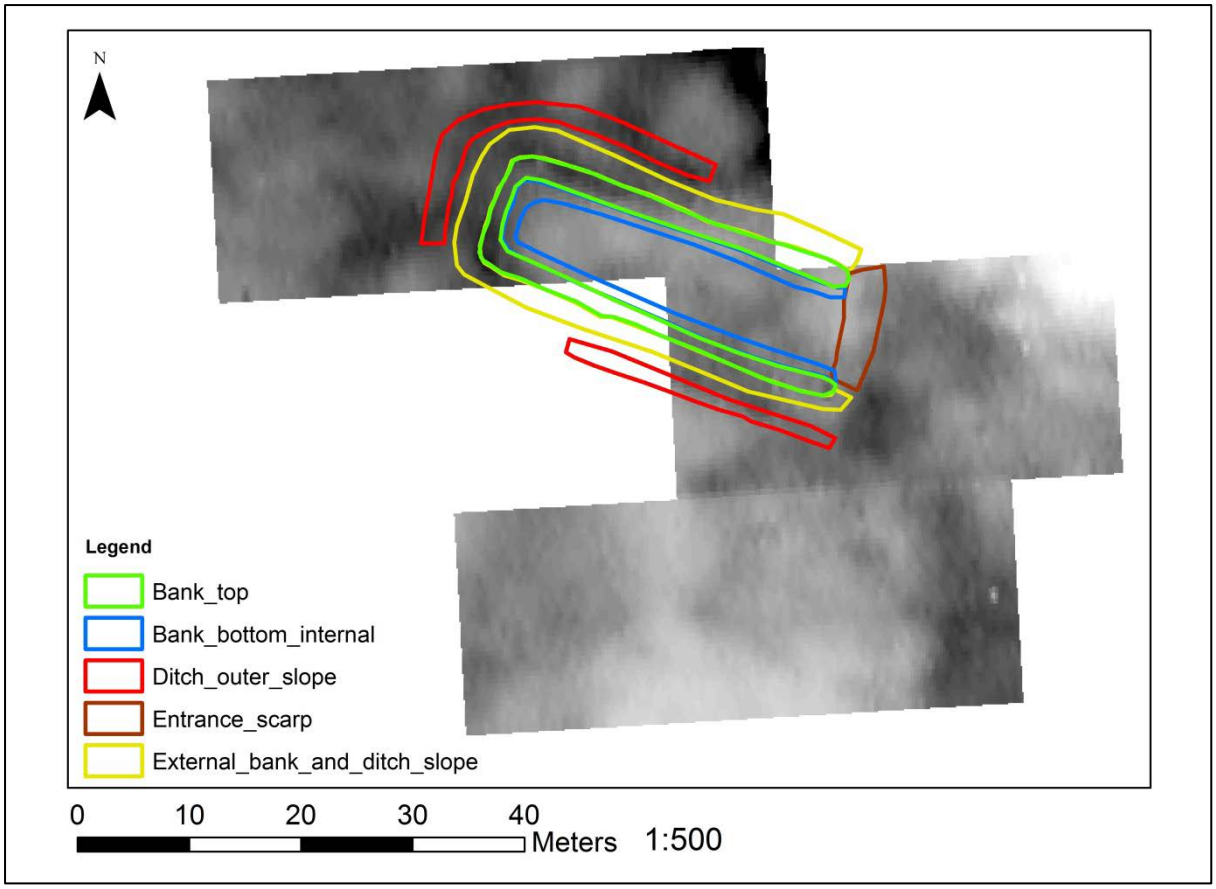

Figure 4: Earth resistance results of enclosure with earthworks shown. Produced by the author, with earthworks redrawn from Pullen 2009.

The survey has demonstrated the potential presence of internal features, supporting what was detected in the previous survey (Pullen 2009). However it should be noted that most of the anomalies in figure 5 could be geological in origin, and none are certain archaeological features. The tentative interpretations here could only be confirmed by excavation and an expansion of the survey area. A diffuse low resistance anomaly in the south west corner of the enclosure may represent a pit feature or hollow (Figure 5, A). A second similar anomaly is present in the central area of the monument (B). Immediately south of this a faint high resistance anomaly is present, disappearing out of the survey area (C). Other possible internal features include several faint high resistance anomalies in the south eastern area of the monument (D-I). It is difficult to interpret these on the basis of the geophysics alone, but E and G could be a cairns or cists, whilst some of the rather amorphous shapes might be associated with either internal division of space, or control of the entrance of the feature (F, H and I). Features such as small post or stake holes or are not normally detectable by geophysics, so their presence within the enclosure could only be investigated by excavation. Beyond the open end of the monument the survey detected faint (I) and medium high

resistance (h) features. Response I may be a subtle platform or constructed surface outside the enclosure, perhaps resulting from the clearance of stony material from an area. This is likely to be an ephemeral stony spread, rather than a dense concentration of larger stonework. A broad low resistance anomaly is present at the enclosures entrance (J) although this could be the result of a wetter area of ground. One extreme low resistance anomaly present (K) is more likely to be an area of very wet ground. The area to the east of the monument was very wet and this patch reflects the edge of this very wet boggy area.

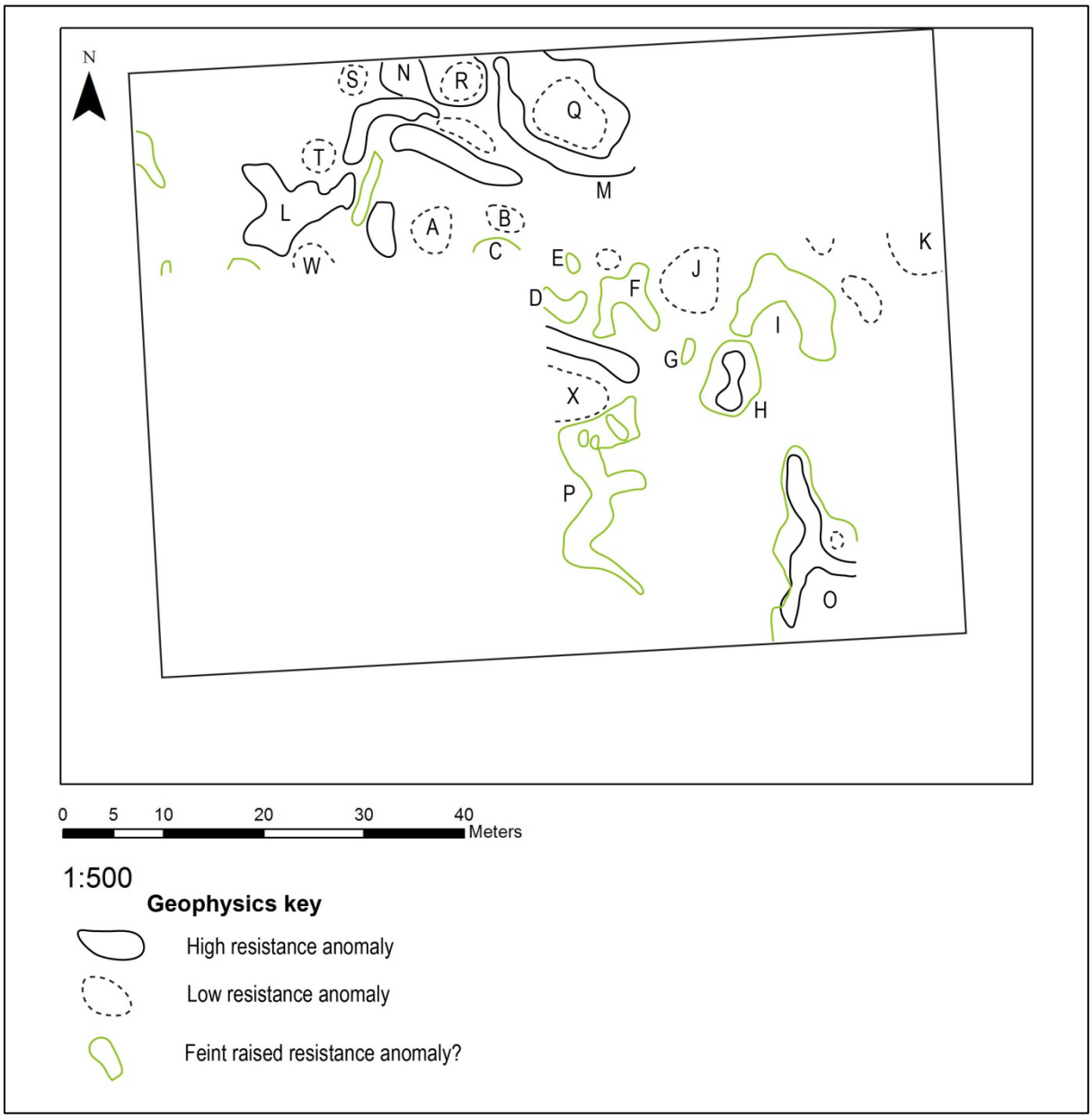

Figure 5: Interpretation of resistivity at the enclosure. Produced by the author.

Another broad high resistance anomaly was detected to the west of the enclosure and it is not clear as to what this represents (L). The signature is diffuse and similar to those at the open end of the monument. Several interesting high resistance anomalies were detected to the north of the enclosure, partially surrounding areas of low resistance (M and N). The high resistance signature would suggest that these are less likely to be ditches and more likely to be concentrations of stone. It is interesting to note that these particular anomalies partially coincide with a large curvilinear anomaly in the magnetometry survey (see figure 9). The same series of diffuse rounded low resistance anomalies detected in 2009 (Pullen: 23) are also present around the enclosure in the current dataset. Finally a large high resistance anomaly is located in the bottom right hand corner of the surveyed grids, with a small low resistance anomaly within (O). There are a few very faint raised resistance responses in the central southern area of the survey (P), showing a similar series of vague right angles which are also present in the magnetometry survey. On the basis of the plots here it is difficult to tell if they reflect real archaeological features or fortuitous areas of slightly stonier ground. The slight right angles do appear different in their form to the general background changes in resistance, so these responses could be archaeological in origin.

Area 2 – Stone setting, quincunx above the River Bray (MDE 1044)

The resistance survey revealed a striking v-shaped high resistance anomaly (Figure 6 and 7, A) immediately to the east of stone C, the south-east line of which continues beyond the surveyed area. The resistance anomaly is very clear, and could be defined by a concentrated band of stone. The internal point of the v-shaped feature shows an area of raised resistance (figure 6), with some suggestion of variation between high and low readings. This may be a result of disturbance and spreading out of material. This contrasts with the concentrated blanket high resistance readings which make up the V shaped band. The position of the V seems to respect the location of the stone setting, although whether the two features are certainly related cannot be revealed by the geophysics. A number of small high resistance anomalies run through the centre of the survey area broadly speaking (figure 7, C-M), which sit within more diffuse and broader areas of slightly raised resistance. These rather amorphous high resistance anomalies may represent areas of outcropping rock, which are covered by a thinner area of soil. This could be interesting, given the relationship between outcropping rock and upright stones suggested at East Pinford (Gillings *et al.* 2010). Together this creates an unusual, almost boat or canoe shaped anomaly which runs from the outer edges of the V, through the stone setting. This part of the survey is difficult to

interpret, and it is not clear whether it represents geological trending or any kind of archaeological feature. The fact that a slight reversal of this pattern is present across the northern end of the survey grid, partially defined by diffuse areas of low resistance, may suggest a geological explanation is more likely. However, there does seem to be a direct link between the location of the quincunx and this potentially geological pattern, the monument itself sitting within a slight area of raised resistance. Such a pattern is not present in the southern part of the survey area, although the background readings in this area seem to be trending along the same SSE-WNW alignment.

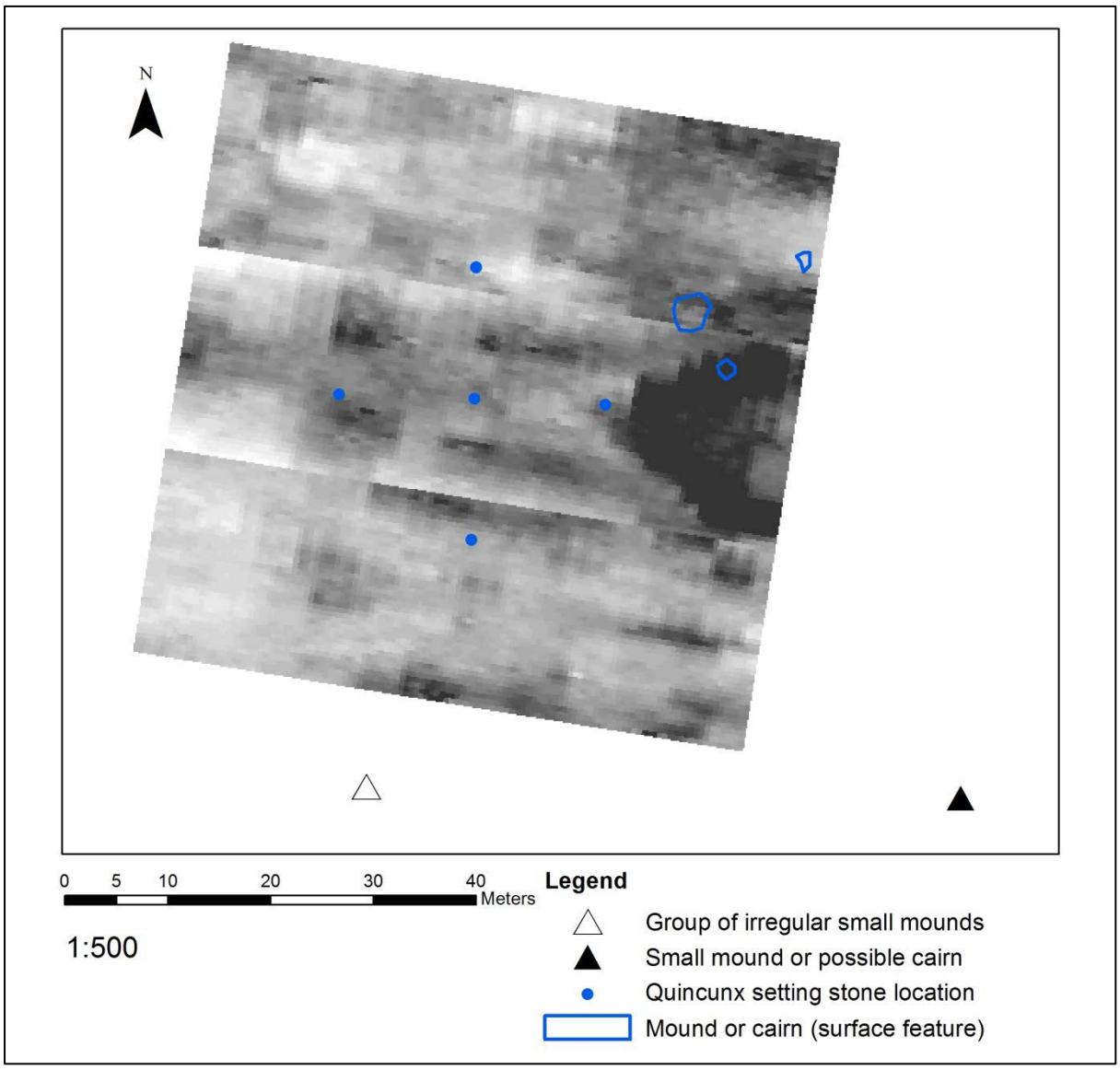

Figure 6: Earth resistance survey of the quincunx stone setting. The stones and surface features are shown in blue. Produced by the author.

A number of high resistance anomalies are present within the north east corner of the survey area (Figure 7: N, O, K and L). ‘K’ extends across the northern end of a low round mound visible at the surface. Whilst this feature seemed a likely candidate for a low cairn based on its surface appearance, it does not closely match with the resistance plot. One explanation for this could be the spreading out or destruction of a feature, although this remains unclear. The other very slight high resistance features in the area (N and O) are rather irregular in shape, and it is difficult to say whether these are archaeological features. The four low resistance anomalies (P, Q, R and S) may simply reflect either areas of slightly wetter ground, or geological background trends. However, no especially wet or boggy areas were present at the time of the survey, so some of these could be archaeological features. There diffuse shapes might suggest irregular scoops rather than discreet pit features.

Several amorphous areas of raised resistance are present across the area (light brown), which may reflect variation in soil depth or geological trending rather than being archaeological features. Some of this may also be explained by variation in the surface vegetation, which varied from larger open areas of lush short cropped grass, to some isolated patches of reeds. Two very subtle linear features are present in the centre of the survey area, partially within the stone setting on a north west-south east alignment (figure 7, T and U). These are extremely subtle responses, but seem to be running on a different alignment to the geological trending. Whether these are real archaeological features it is extremely difficult to say. They are not easily interpretable as such.

The final thing to note in area B is that there are a number of extremely subtle raised resistance anomalies, especially in the northern end of the survey area (Figure 7, in green). The most convincing is ‘V’, an extremely faint semi-circular shape (figure 7). The amorphous and irregular response immediately north east of ‘V’ is highly irregular, and not obviously interpretable as archaeological. Whilst these subtle responses may not correspond to real archaeological features, caution must be exercised before totally dismissing them. Previous surveys on Exmoor have revealed extremely subtle raised resistance anomalies, which upon excavation have been proven as discreet and complex archaeological features (e.g. Gillings 2013).

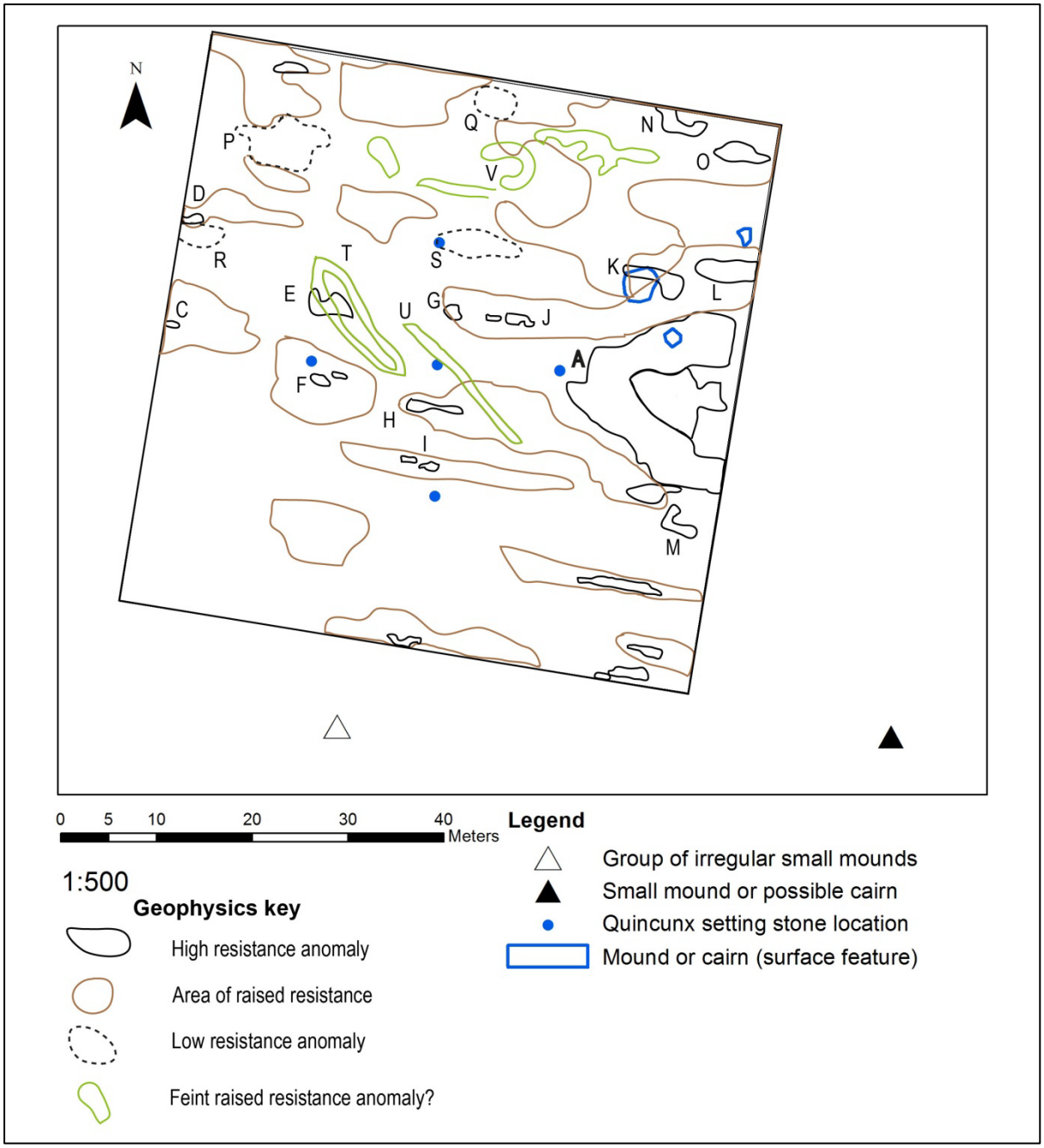

Figure 7: Interpretation of earth resistance results from the quincunx. Produced by the author.

Magnetometry results

Area 1 – Rectangular enclosure, Challacombe Common (HER MDE12830)

The rectangular enclosure had not been previously surveyed with a gradiometer and the results are interesting (figure 8). The enclosure clearly shows as a rectangular response, the shape of which closely matches the existing earthwork survey (See Pullen 2009) and the nature of the visible earthwork in the field. The enclosure banks have a medium to high

magnetic response, consisting of a discontinuous pattern of high magnetic anomalies, interspersed with lower readings. This pattern suggests the banks are made up of a mixture of stone, and earth or turfs. The lack of stone in certain areas suggests either a combined matrix or different materials, or the fact that some material has been lost to erosion. The external ditch of the enclosure shows partially as a wide band of low magnetic values surrounding the outside of the bank. These readings co-inside with the outer slope of the bank which drops into the ditch.

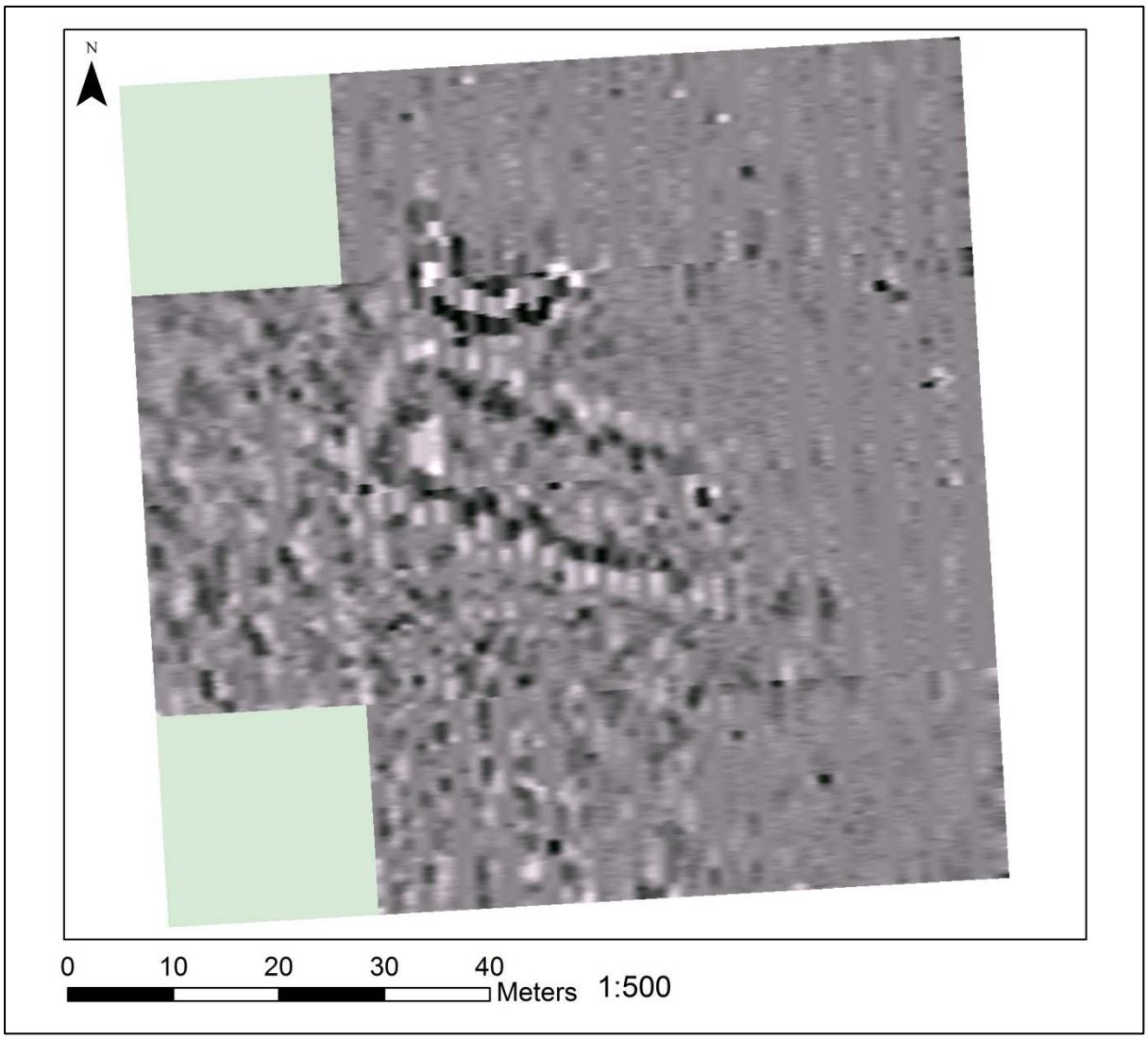

Figure 8: Magnetometry survey of rectangular enclosure. Results processed using the clip, despike, and destripe functions. Produced by the author.

A number of potentially interesting responses are located within the enclosure. A distinct area with a low magnetic response is visible in the south west corner, abutting the southern bank (Figure 9, 1). A very faint magnetic anomaly is present immediately to the east of the

former, but it is difficult to interpret as a certain feature (2). A positive magnetic anomaly near to the bank (19) is difficult to interpret, as this feature could be from the slumping of bank material. A small high magnetic response south east of the centre is an isolated reading and unlikely to be of any significance (4). Several very faint responses are also visible within the enclosure; most notable is a semi-circular anomaly (6). It is difficult to distinguish some of these from the background noise generally in the plot. Response (5) is not obviously interpretable as archaeological, and (3) could be upcast from the field drain. A distinct high magnetic anomaly with a partial halo a short distance from the northern enclosure bank (7), could represent an archaeological feature. It appears as a slight dipole, and could potentially be a heating event. It cannot be ruled out that this could also be a fragment of modern iron, although the response is not characteristic of a large dipole caused by such material. Overall anomalies 1, 6 and 7 are the most likely candidates for features of archaeological origin, and are interpreted as possible but uncertain features.

The most interesting feature outside the enclosure is a large 'C' shaped anomaly of positive and negative values (8). The anomaly is defined by discontinuous high readings, with a core of low readings. This is highly likely to be an archaeological feature. The response is considerably stronger than the enclosure itself. It does correspond with the suggestion of features in the resistance survey, although they are weaker in the area of the 'C'. This suggests it is not defined by a dense concentration of stone. The feature could represent a number of things which might include burning and disturbance of the earth. It is also interesting to note that on arrival at the site, it was felt there might be a very slight lump or raised area, in a similar location on the ground. This lump was not easily definable as a surface feature, and was difficult to distinguish from the uneven nature of the ground and vegetation. The general feeling was that it was not a distinct earthwork like the enclosure, and it was dismissed. Immediately south east of the 'C' shaped anomaly is a series of small very slight magnetic responses (13, 14) which occur in an area where the resistivity survey showed potential features. These magnetic features could simply be background noise, but it is interesting that they are within an area of more definite resistance results.

Finally there are a number of very subtle magnetic responses (in blue and orange) which are uncertain, but could be archaeological. Some of this could be background noise, but several anomalies are more distinct from the former (e.g. 35, 36, 25, 23, and 13). Some of these partially correspond to anomalies in the resistance survey. Some of these form faint shapes with some quite distinct right angles (35 and 25) and seem different to the general background magnetic readings in their form. These cannot be confidently interpreted as archaeological features, but they cannot be entirely dismissed. There are also several very weak linear and curving trends in the results (26-29, 34). These responses are of uncertain origin, and may be geological. It cannot entirely be ruled out that 34, 25 and 26 are

archaeological, these are interpreted here as possible but uncertain features. 34 is the most interesting of these, a faint curving arc with a subtle but varied signal. A second possible arc appears next to the first (see fig?). These could represent a pair of enclosures, perhaps marked by posts in a shallow slot. It is possible that 29 may be a field drain. However the earthworks of the enclosure would appear to be in a good state of preservation, without any obvious truncation or damage to the site. Anomaly 28 may represent the position of a former path.

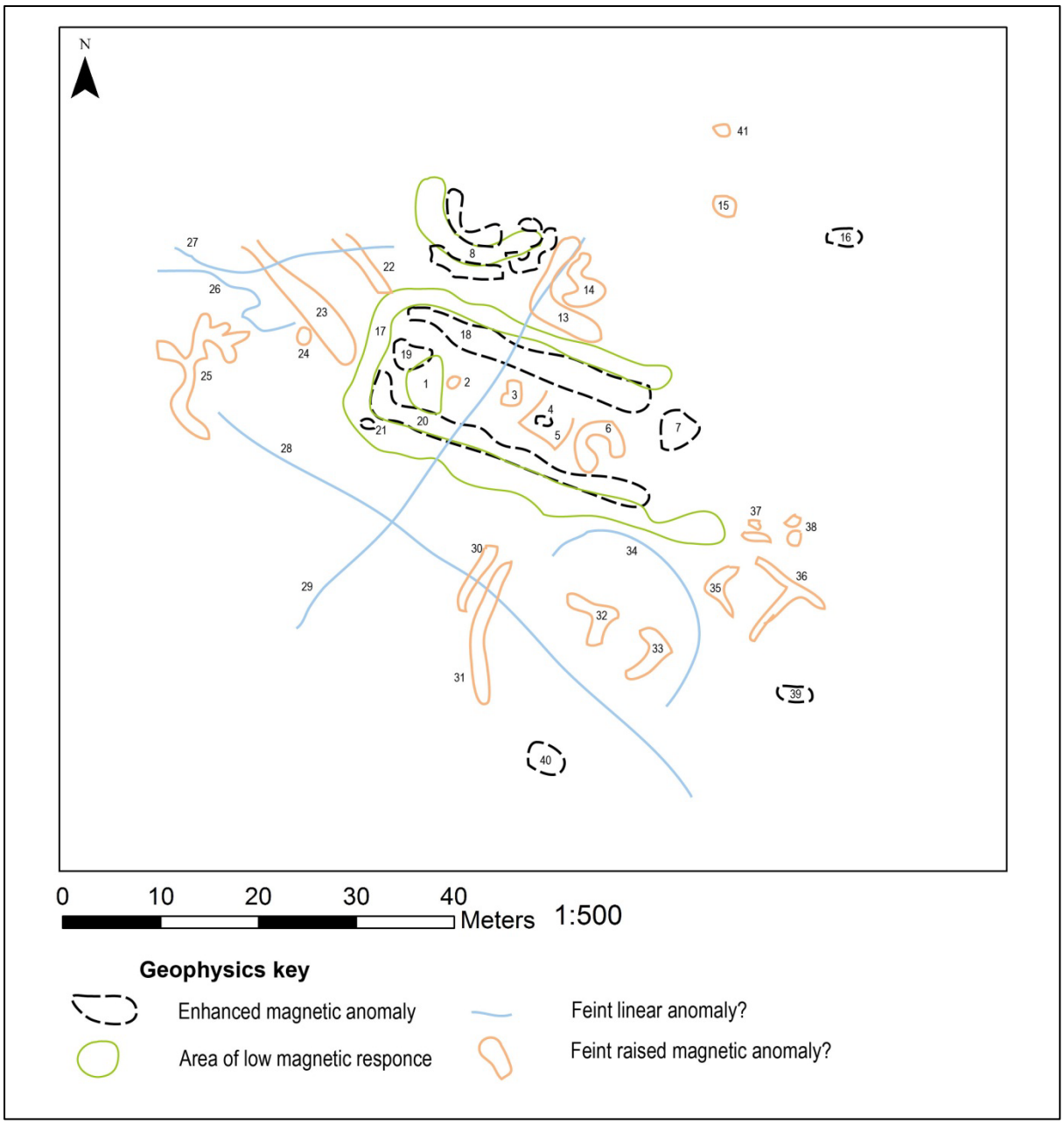

Figure 9: Interpretation of magnetometry results from the enclosure. Produced by the author.

Area 2 – Stone setting, quincunx above the River Bray (MDE 1044)

The magnetometry survey of the stone setting revealed little in the way of definable features or anomalies. The results are characterised by a rather noisy area of high and low responses scattered in a random manner (figure 10). Only one possible anomaly was revealed, an oval feature with a core defined by a high magnetic response in the south eastern corner of area B. The anomaly appears to have a very slight partial halo of lower magnetism. It did not correspond to an obvious surface feature and there is no high resistance anomaly at this point which might indicate a concentration of stone. It is not a dipole and therefore unlikely to be an in situ heating event or intrusive iron fragment. This is unlikely to be an archaeological feature, and there is nothing of clear archaeological origin within the results.

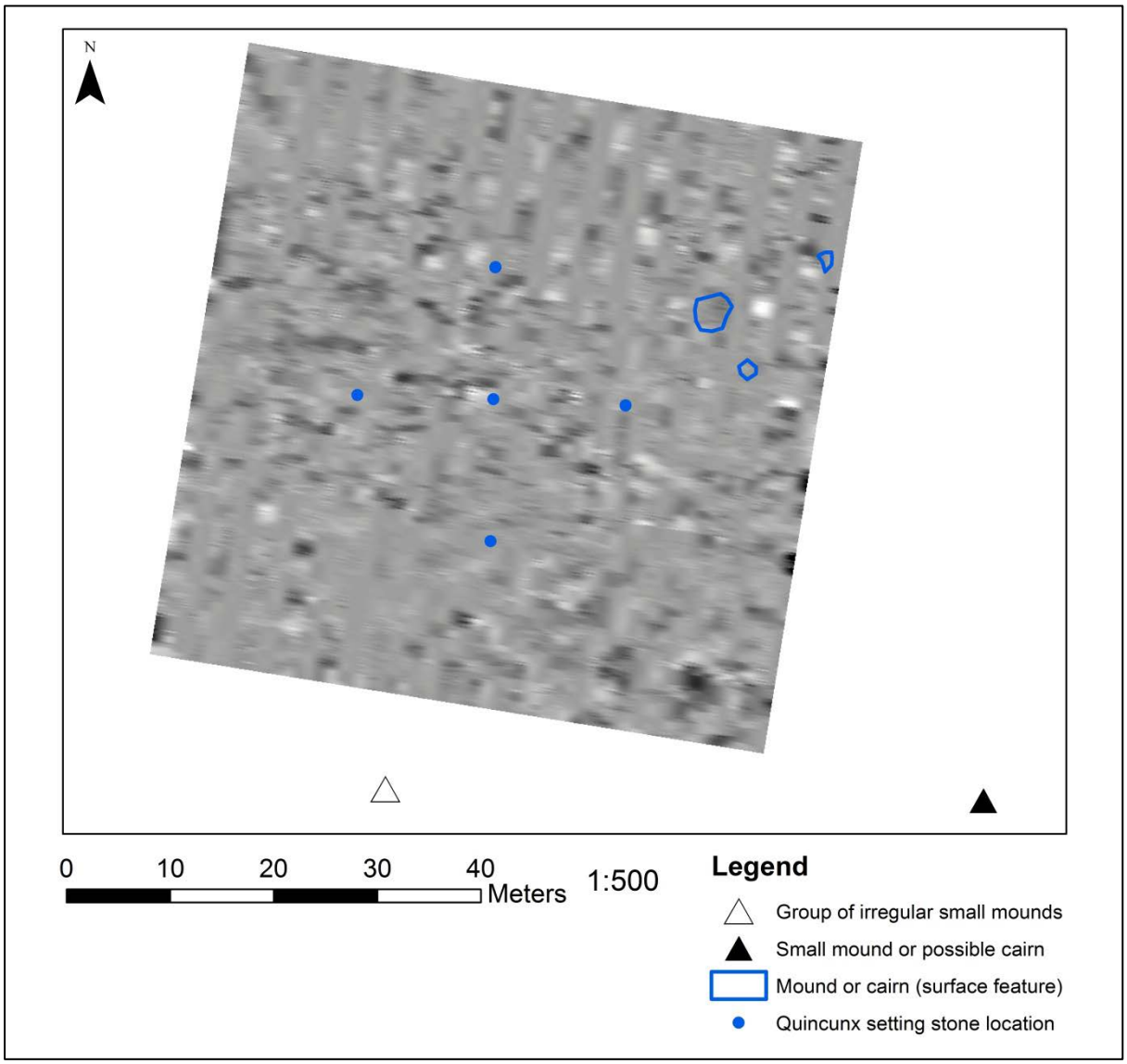

Figure 10: Magnetometry survey of the quincunx stone setting. Produced by the author.

Discussion

The surveys at both sites have suggested the presence of further archaeological features, most of which do not have obvious surface expressions. The following section discusses in detail the potential implications of the results and outlines some possible interpretations.

The quincunx and its wider context

The resistivity results strongly suggest that the quincunx may not be an isolated feature (figure 11). A simplified interpretation of the features is presented in figure 11a. Whilst the geophysics results do not confirm the nature of the V- shaped anomaly, the strength of the response would make it likely to be archaeological in origin. The strength of the anomaly (very high resistance) would suggest a dense concentration of stone. This anomaly has no real parallel in previous geophysical surveys of stone settings on Exmoor. The closest signature being a number of faint, but neatly defined semi-circular high resistance features, which at Lanacombe III turned out to be an ephemeral stone ring and stake built structure (Gillings 2013). The quincunx feature is quite different to the latter however, being less even in definition, a much stronger signal, and a distinct V shape. The suggested interpretation here is that the V represents a dense spread of stone, possibly the result of the spreading out of a number of small cairns. This could only be confirmed by extending the survey area to the east and by carrying out excavation to define and characterise the anomaly. This idea is supported however by the fact that one small mound was present as a surface feature, directly on top of the V shaped anomaly. Another possible small cairn was also present to the north of this. The locations and details of these surface features are given in appendix 1, along with photographs.

Whilst the results cannot provide a date for this feature, or prove its contemporaneity with the stone setting, its position is suggestive. Whatever the date of the V- shaped anomaly its location seems to carefully respect the position of the setting, the point stopping just short of the settings eastern most stone (stone c). Whilst this could be fortuitous, it seems more likely that it carefully respects the location of the setting, or vice versa. The setting stones were upright and in situ until recently, recorded as such by the RCHME survey in 1989 (Quinnell and Dunn 1992, unpublished). Stone C measures 39cm in length, and could easily have been hidden by vegetation when upright. This makes it all the more likely that the V shaped anomaly carefully respected it, and that whoever constructed the latter knew of the location of the settings component stones. The results here cannot conclusively prove this, but they do provide a strong argument that this might well be the case. Of course however, the stone setting could also have been placed to respect the V shaped anomaly.

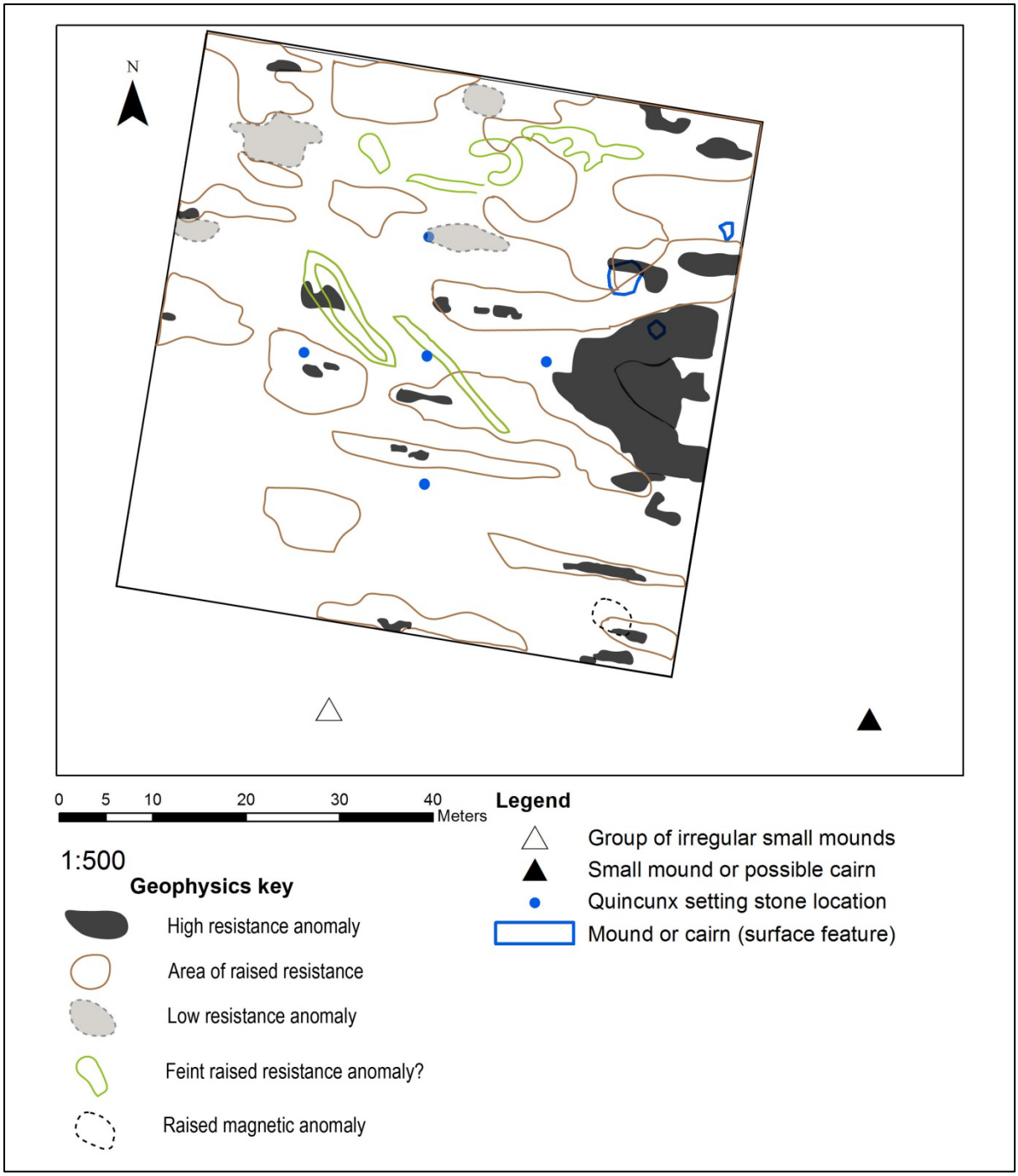

Figure 11: Combined resistance and magnetometry results at the quincunx. Component stones and surface features are shown in blue. Produced by the author.

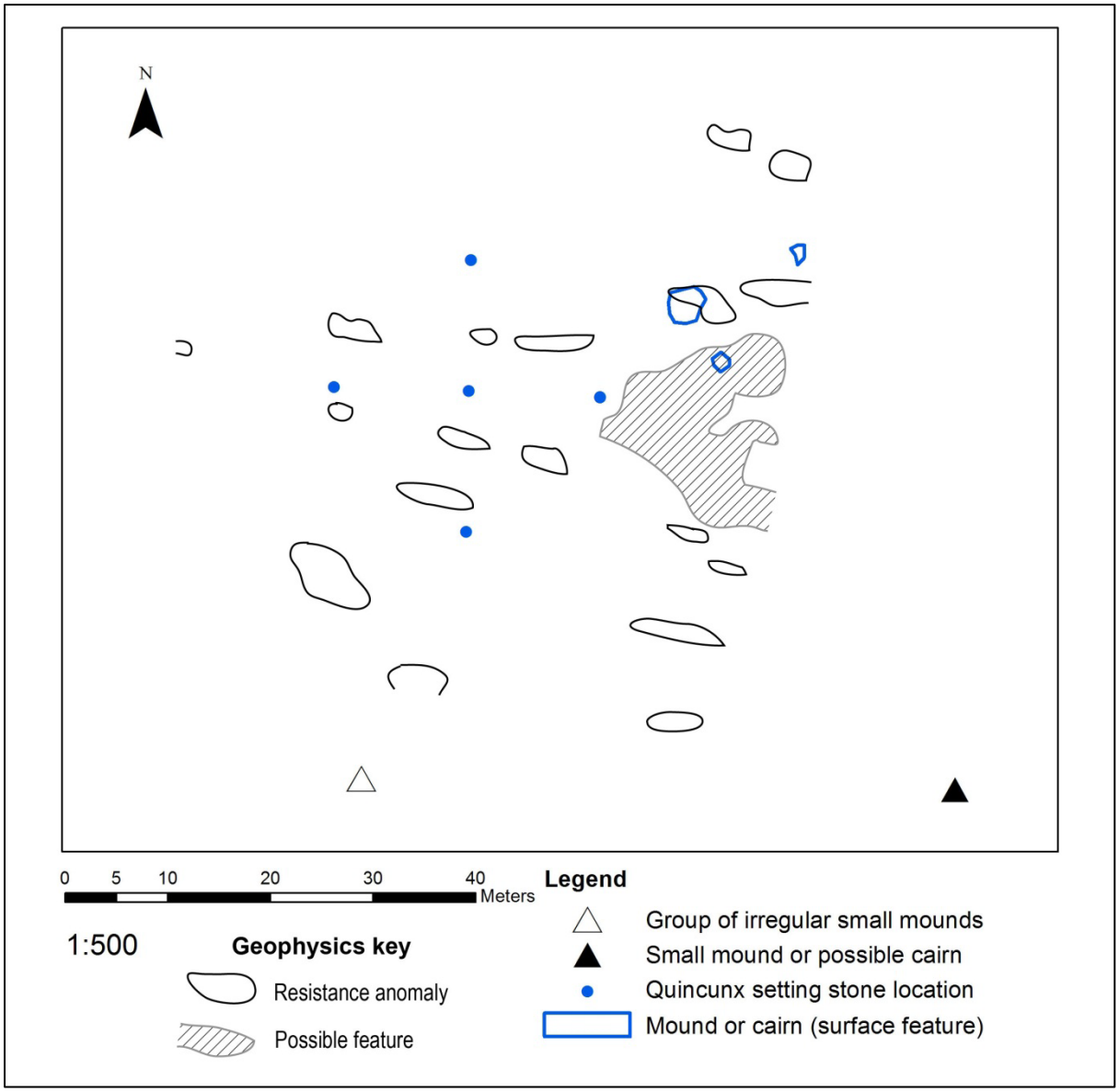

Figure 11a: Simplified interpretation of potential features. Produced by the author.

Another interesting point to note is that the northern most end of the V would appear to stop just before the edge of the survey, whilst the southernmost extent seems to continue beyond the surveyed area. Analysis of LiDAR data for the area suggests that a series of subtle but discontinuous linear anomalies extend for some distance to the east (circa 300m towards the barrow). These share the same E-W alignment as the resistance anomalies and the orientation of the V (figure 12). This is interesting given the rigid alignment of the quincunx's orientation on cardinal points (E-W, N-S). This anomaly would benefit from close inspection of the ground in the area, as it is not clear whether it is of archaeological interest. It appears to consist of lines of very slight discontinuous high spots and low spots, which demonstrate a slight stepping down the slope. Whether this steeping is natural is not clear, but the fact the anomalies cross, and do not follow the contours is a suggestion it may be

artificial. There are a few hints of a rectilinear pattern, most clearly an interesting anomaly running NE-SW circa 50m west of the barrow top right of centre in figure 12. If this feature is a subtle trace of some kind of cultivation or field system it could date anywhere from prehistory to the post medieval period, especially considering its close proximity to the abandoned settlement of Radworthy. The LiDAR data here was processed to reduce its native 0.5m resolution to 1m, to try and clarify these linear trends. At 0.5m resolution the data was very noisy in this area. A much larger area of geophysical survey to the east of the quincunx would need to be undertaken to investigate this potential feature, along with some targeted excavation to characterise what is giving the resistance signals.

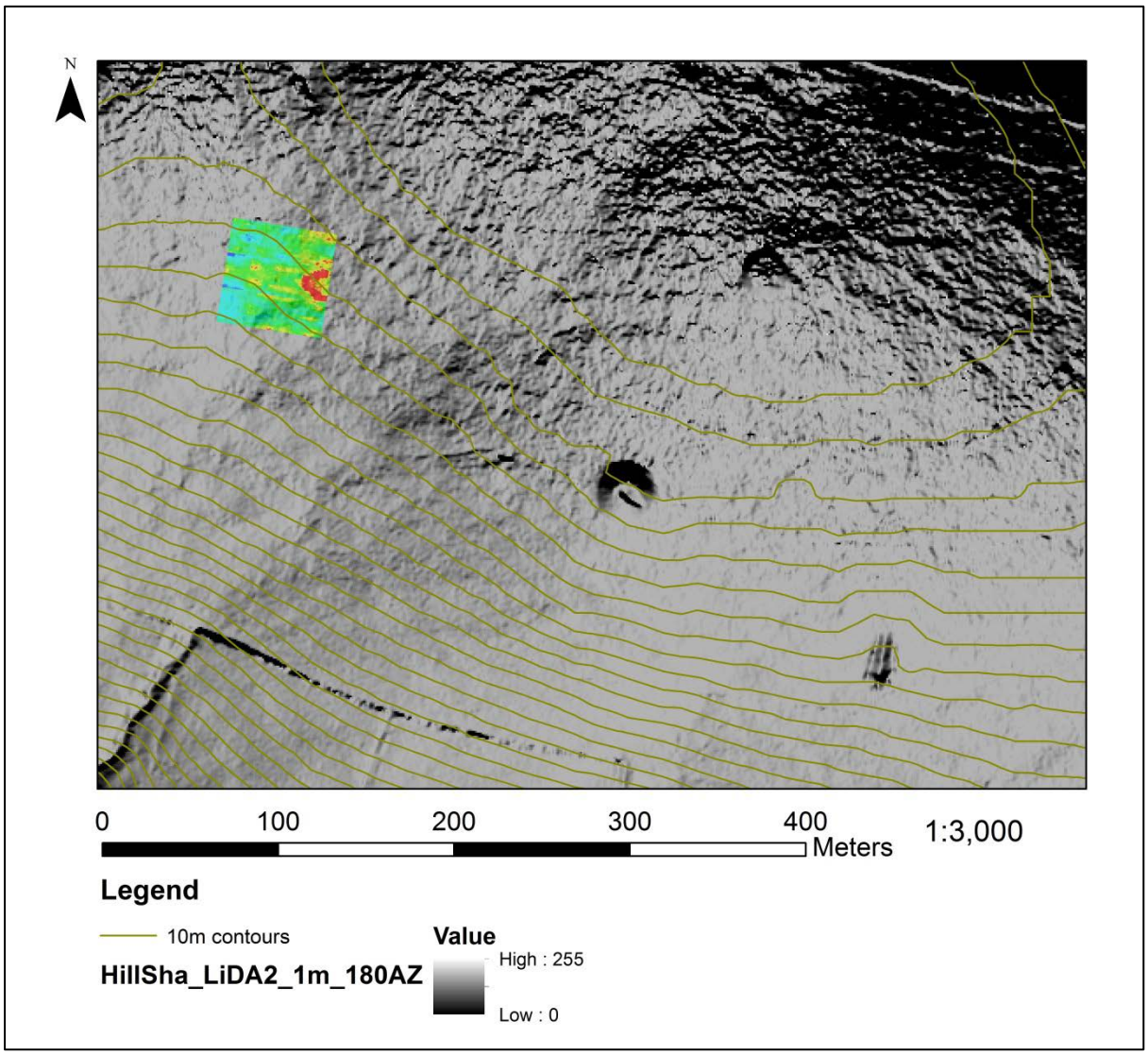

Figure 12: Hillshade analysis of LiDAR data resampled to 1m resolution, overlain with resistivity results and 10m contours. Produced by the author with the contours derived from Ordnance Survey DEM data (© Crown Copyright/database right 2014. An Ordnance Survey/EDINA supplied service). **LiDAR data obtained from the Environment Agency** (© Geomatics).

Some of the more subtle anomalies which appear to form a canoe shaped discontinuous raised resistance anomaly running east west through the setting from the V shaped feature could be significant. This might be fortuitous perhaps caused by some areas of buried stones, but would benefit from excavation. It is not clear at all what this might be. The resistivity plot also suffers somewhat from an imbalance in the background readings across the survey, which the author could not completely remove in post processing. The subtle anomaly (T) which is north-west, south-east in alignment is reminiscent of slightly irregular petal like features detected on Exmoor at Porlock stone circle (Gillings *et al.* 2012). The feature here is less well defined especially at its south-eastern extent, but it is similarly difficult to explain, either in archaeological or geomorphological terms. Similarly the subtle semi-circular feature (v), a faint raised resistance anomaly, is potentially of interest. It has a neatly defined shape, but its weak response is quite different to the stone ring structure detected at Lanacombe III (Gillings 2010). The latter had a diffuse response, of fairly high resistance readings (ibid 2010). The origin of V is therefore uncertain, and it cannot be completely ruled out that it could represent an archaeological feature.

Rectangular enclosure – A Neolithic mortuary enclosure?

Despite the partial coverage of the resistance data, the results clarify greatly the details of the site. Taken together with the magnetometry results, they suggest a number of intriguing possibilities (Figure 13). A simplified interpretation of the key features is presented in figure 13a. Firstly the enclosure may have had stone facing or orthostats around some areas of the outer edge of the bank. A short area defining neatly the south west outer bank corner is the most convincing area of this. If this was constructed of the smaller stone so typical of Exmoor, it could easily be buried under the turf. The fact this pattern is not present all the way around the bank might suggest robbing of stone from the site, or that this was never completed. Such an idea would have to be investigated by excavation, and can only be suggested as a possibility here. The enclosure on Exmoor at Little Hangman, interpreted as a tor enclosure, is a known local example of a site with some surviving areas of edge set stone within an earthwork (Wilson-North pers. comm. cited in HER record MMO1635). It is interesting to note that the outer slope of the ditch is defined by a diffuse band of raised resistance. This might suggest a build-up of a fill with a higher stone content, or an area with

very little soil build up, close to the bedrock. It may also be a trace of a slight stony bank on the outside, which has slumped into the ditch. The ditch bottom for the most part shows as a well-defined low resistance linear, with a few raised resistance patches. This might suggest the ditch is partially filled predominantly with peaty soil, rather than indicating large scale slumping of stone from the earthwork itself. All of this serves to completely dismiss the idea the earthwork was a fortuitous result of peat cutting (cf Pullen 2009).

The combined magnetometry and resistivity results strongly suggest there are features inside the enclosure. The responses are subtle and quite diffuse, but nonetheless are potentially archaeological in origin. A subtle low resistance area in the south west corner, coinciding with a broad low magnetic anomaly, might suggest a shallow pit or scoop in this area. There are two other possible examples elsewhere within the earthwork. These are very diffuse, and their nature would need to be confirmed by excavation. The magnetometry results, which revealed nothing to suggest there is a hearth within the enclosure, may be very significant. However it cannot be ruled out that (7) is a small heating event. The idea the site could be a kind of dwelling or long house type structure was suggested as an alternative interpretation by Pullen (2009). It is also possible that two dipoles within the C shaped feature to the north are heating events, although whether the former has anything to do with the enclosure is not yet clear. The exposed location of the site at circa 470m above sea level however would seem to preclude the idea that the feature is a large building (cf Pullen 2009). It seems an unlikely location for a dwelling, but any such structure could have had a very different purpose.

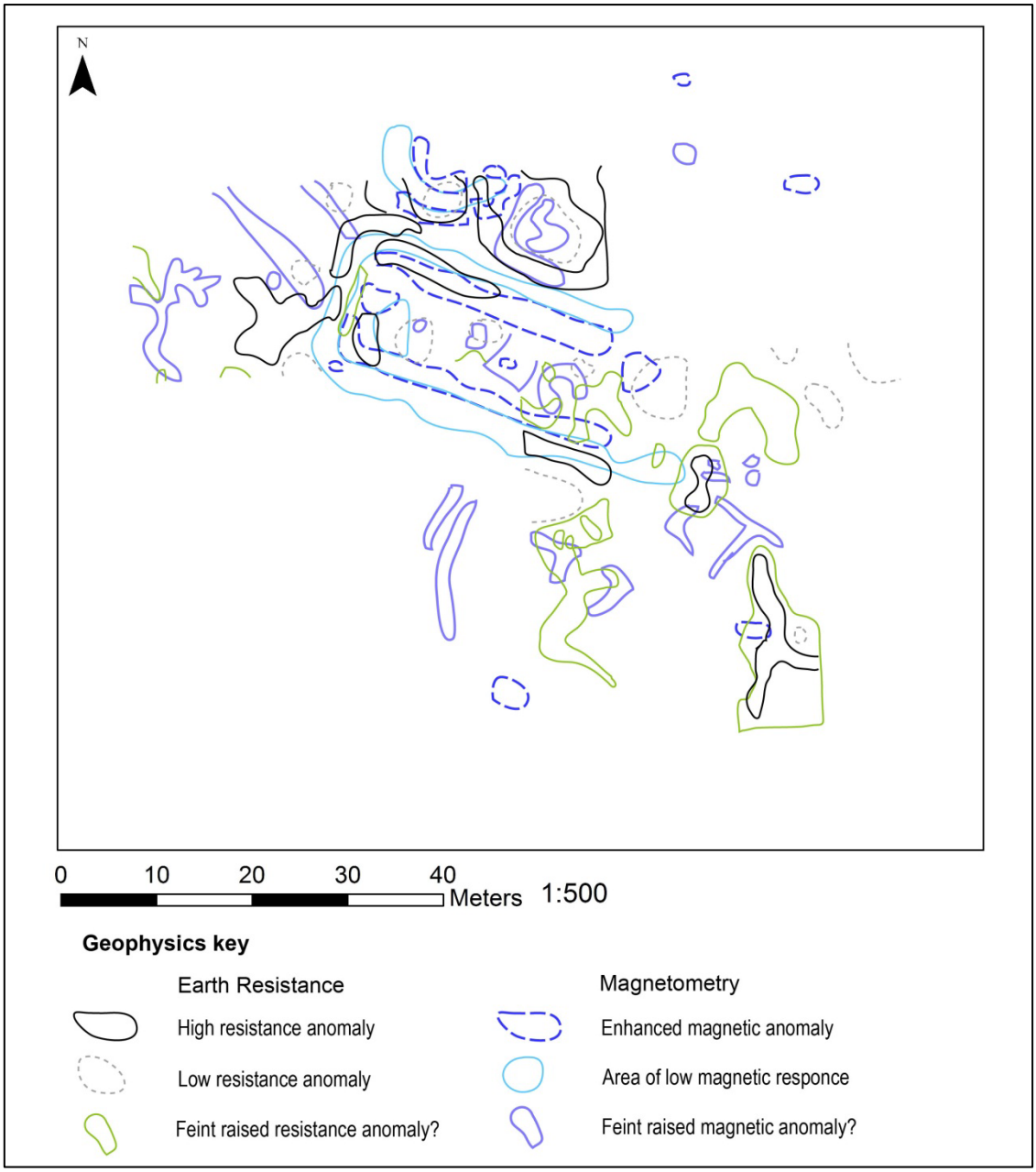

Figure 13: Combined magnetometry and resistance results at the enclosure. Produced by the author.

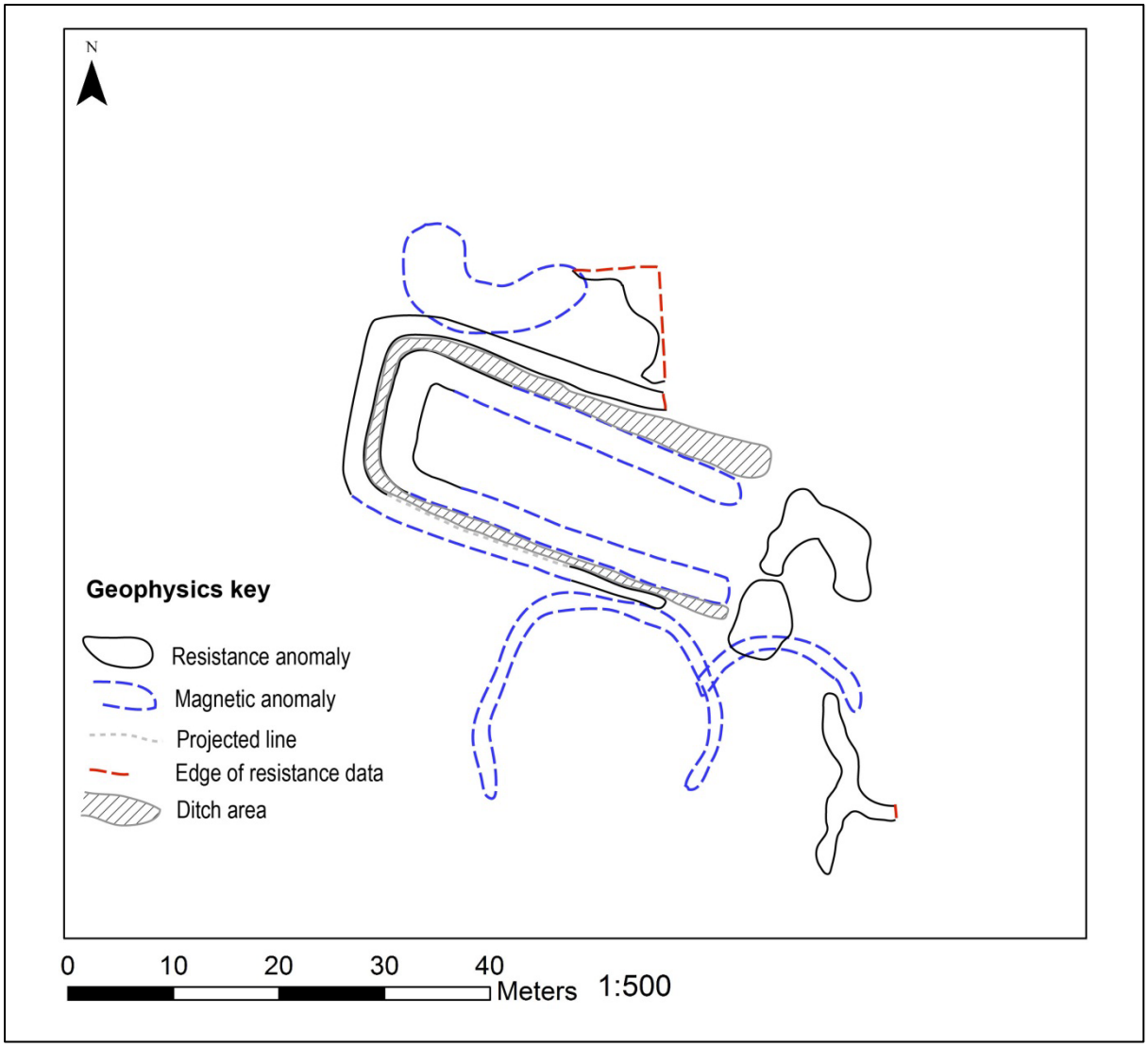

Figure 13a: Simplified interpretation of key features from both resistivity and magnetometry. Produced by the author.

Indeed, all of the evidence points towards the site being a mortuary enclosure of Neolithic date. The layout of the site and form of the earthworks fit closely the class description of this monument type summarised by English Heritage (MPP class description; http://www.eng-h.gov.uk/mpp/mcd/lme.htm). At present with no certainly dated Neolithic monuments on Exmoor the site remains difficult to identify definitively. That is despite indications from the lithic evidence that people are present on Exmoor at this time. Given that the enclosure is currently unique on Exmoor, and that long barrow's or chambered tombs do not occur in the area, it is tempting to attribute a function of funerary or mortuary activity to the site. Whilst this remains the most likely interpretation, the only way to examine this issue further is by excavation. Whilst the stone banks may well have been

reduced over time by slumping into the ditch and robbing them for stone, the site does not seem to have been intended as a defensive structure. Whilst there could have been some kind of timber palisade, there is no indication in the geophysics of large stone packed post holes which might have supported such a structure. The fact that the feature has an open end, with low banks which finish with neat rounded terminals, would argue against it being intended as defensible in any way. Overall the evidence still points towards the site having a mortuary function or an association with death or funerary activity, although another purpose cannot be ruled out.

The results suggest that there is significant and extensive preservation of archaeological deposits around the enclosure, and that the site may fit into a much larger set of features that are not visible at the surface. The relationship between them and the enclosure cannot be revealed by the geophysics. However, the possibility exists that features around it (especially L, P, and O) may be traces of rectilinear boundary systems, defined by subtle spreads of stone. Certainly the shapes of these anomalies are suggestive, and may be consistent with derelict boundaries which are partially spread out, once defined by small cairns and potentially timber stakes, perhaps similar to those detected at Lanacombe (Gillings 2013). These may not be contemporary with the enclosure, and could reflect further evidence of the layout of embryonic boundaries and small fieldsystems in the Early to Middle Bronze Age period. Given the exposed location and potential mortuary activity, such boundaries could also have had a totally different purpose to delineating field plots or pens, if they were broadly contemporary with the enclosure. Again, however, it is not yet known if the site had a funerary or other purpose. P could also be interpreted as potential evidence of internal features with the larger possible circular enclosure. There are subtle responses in the magnetometry which could represent evidence of internal features within the possible circular enclosure, although these could also be geological. If the two faint circular features detected to the south are enclosures, then a key question is to resolve which structure came first. It is not clear from the results here, but it is possible that the larger circular anomaly may have a direct relationship to the rectangular enclosure which can be examined by excavation. It suggests that whatever the relationship, this part of the landscape remained a focus for activity over a long period of time.

The C shaped feature

The most striking feature was revealed to the north of the enclosure by magnetometry, a large and complex anomaly. It is unfortunate that the resistivity results do not extend further north in this area, which would allow clarification of, exactly what is detected by each technique. However, both techniques seem to be detecting activity in this area, although they do not exactly match in terms of spatial extent. The feature is best defined by the magnetometry results, a partial 'C' shape with an internal area of low magnetic readings. The external part of the southern arc is defined by an almost continuous area of high magnetic readings; with the internal arc to the north defend by some high partially discontinuous readings. The internal low readings are slightly stronger than the low readings given by the mortuary enclosure's external ditch. Given the similarity of the two, it is suggested that the feature consists of an internal curvilinear ditch or cut feature. The external and internal part of the arc may be defined by discontinuous concentrations of stone. A dipole, on the western side, and two others at the eastern end of the feature could be from heating events, and might represent in situ hearths or fires.

The features geophysical signature and form is quite different to a burnt mound recently discovered and investigated on Brendon Common (Wilson North and Carey 2011). The latter was a much smaller U shaped earthwork circa 10m across, with a heating event in the centre of the U, and one outside the feature to the north (ibid: 13, 15). It was also located in a coombe bottom, close to a stream (ibid: 11). The C shaped feature here is located high up on the edge of a plateau, and is some distance from a stream. It would require a great deal of effort to move a substantial quantity of water up from the streams in the surrounding coombe bottoms, so this interpretation does not seem likely. However, the feature could have been intended to collect rainwater, or have been filled by collecting water from a spring or mire. The area today is extremely wet to the north east of the site, covered by peat and small mires. It is difficult to say how wet this specific area may have been in the Neolithic/Bronze Age. The possibility that the feature is an unusual form of burnt mound cannot be ruled out, although its location does seem to argue against that interpretation. Alternatively, given its location adjacent the enclosure, the feature could be associated with its as yet unknown purpose. Whether or not the feature is contemporary with the enclosure is unclear, although it is situated just outside the enclosure ditch. This might suggest contemporaneity or that it is a later feature. The feature is unusual, and therefore would need excavation to investigate the site further.

Future work

The results have revealed a number of interesting features and have helped to place the sites into a wider context. However, the geophysical anomalies would need to be confirmed and investigated in detail by excavation to further our understanding of two highly unusual sites. An excavation in the area is being planned by the author for late summer/autumn 2014. The excavation strategy is yet to be defined in detail, but intends to use small trenches targeted at specific anomalies on both sites. If possible in the future, further geophysical survey work at the quincunx, extending the survey eastwards to cover an area of the possible linear anomalies would be very useful. This would show if this feature has a geophysical signature, which it appears to have in the existing survey area. It would also be desirable to do further resistivity survey at the enclosure, to better define the details of the monument missing from the current survey data. It would also be useful to conduct resistivity just to the north of the site, to better define how the features present in the resistivity relate to the large magnetic anomaly in the area. One could argue that because of the unusual configuration of monuments in the area, a much bigger area of geophysics should be conducted encompassing both monuments as a single block. Such large scale work could be undertaken as part of a longer term project in this highly important area. Given the unknown date and purpose of the enclosure, along with its apparent uniqueness on Exmoor, only excavation at the site will be able to investigate further the sites true purpose and identity.

Acknowledgements

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Appendix 1 – Surface features identified

The following table outlines surface features identified during the work. Most were fully surveyed with DGPS, however some were only located with a navigation grade GPS due to time constraints. This is indicated in the table below.

Feature No	Description	Nav GPS	DGPS	NGR	Easting*	Northing*	Photo No
QF1001	Group of small irregular mounds, south of quincunx. Probably natural.		x	SS69788 43292	269788.720000	143292.745000	0114-116
QF1002	Small mound, stone felt under the turf.		x	SS69846 43291	269846.500000	143291.617000	0117-118
QF1003	Possible cairn. Felt solid under foot, stone present.		x	SS69831 43343	269831.339700	143343.831900	0119-120
QF1004	Larger cairn, felt stony under foot. Very low in height, and fairly flat. Likely disturbed.		x	SS69820 43338	269820.358400	143338.819500	0121-123
QF1005	Small mound or cairn.		x	SS69823 43333	269823.760800	143333.224000	0124-125
QF1006	Location of two hollows one circular and another t shaped.	x		SS69934 43235	-	-	0126-127

*note = Co-ordinates shown are in metres in the format used by ArcGIS 10. The first digit of each column is a number code representing the letters used in a standard NGR.

All of these features are located close to the quincunx (figure 14 and 15) with the exception of QF1006, which is located circa 165m south east of the quincunx to the west of the barrow. These two hollows appeared to be dug in features, one which had a T shape in plan. These may well be quite recent features, to do with prospection, or even inquisitive diggings by Chanter who excavated a trench through the nearby barrow (Riley and Wilson North 2001: 10-11). Such activity could also explain some of the questionable responses on the geophysical survey plots. Whilst the site is outside the former artillery range, it also cannot be ruled out that some military training involving digging may have taken place in the area.

The group of irregular mounds (QF1001) to the south of the quincunx would appear to be natural, potentially the result of erosion of the peaty soil by water, leaving lumps of peaty turf upstanding (photo 0114). One of these mounds is just partially inside the edge of the survey grid, and has a slight raised resistance signature. These mounds may well be natural in origin, but an anthropogenic origin cannot be entirely ruled out. They would benefit from further investigation and systematic probing. There irregular shape and close spacing would make it highly unlikely that these features are cairns, although some kind of clearance heaps is a possibility. Another area of small mounds was recorded with a navigational grade GPS (Figure 14) but was not investigated further. Again these could well be natural features.

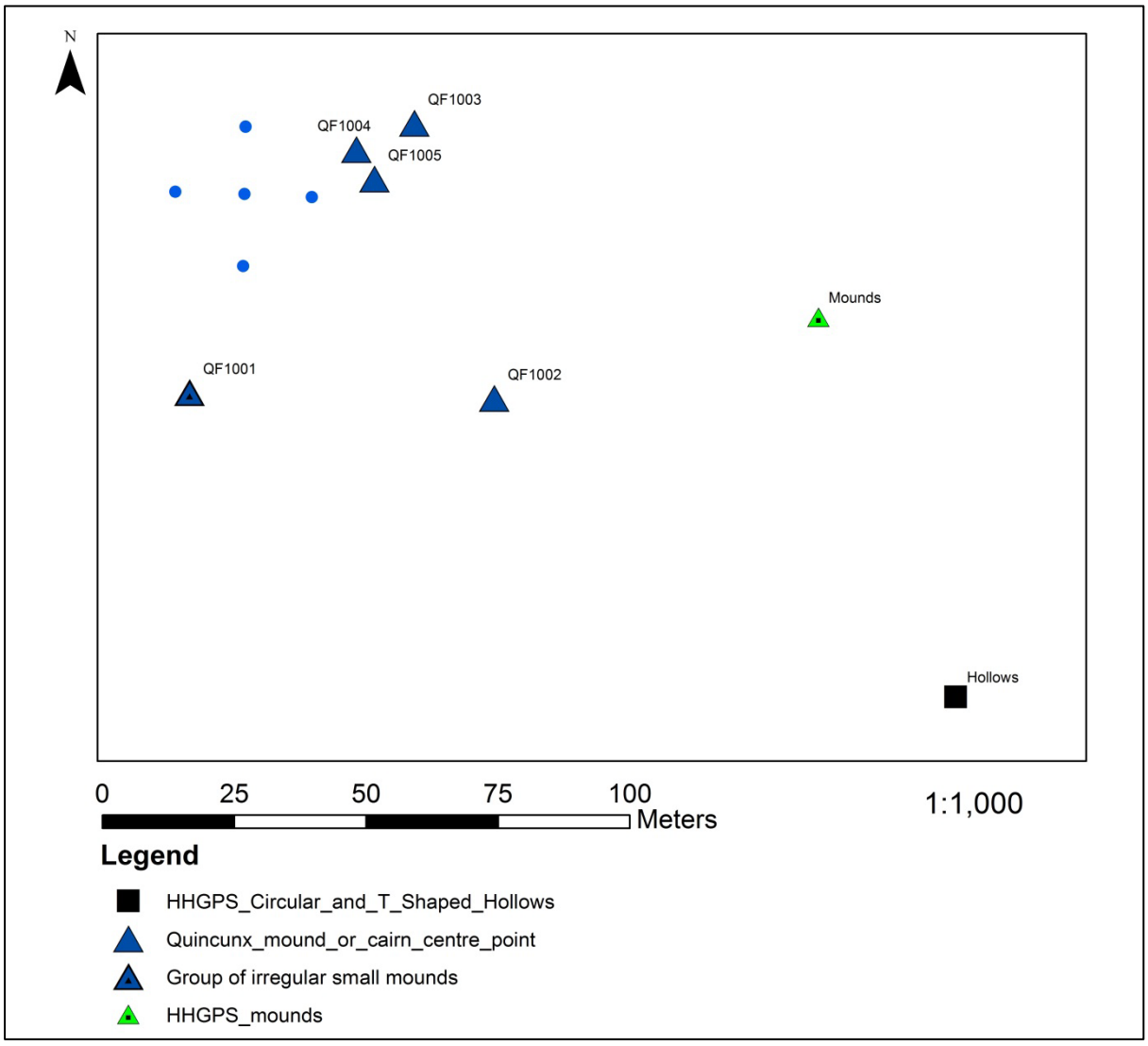

Figure 14: Location of surface features at the quincunx. Produced by the author.

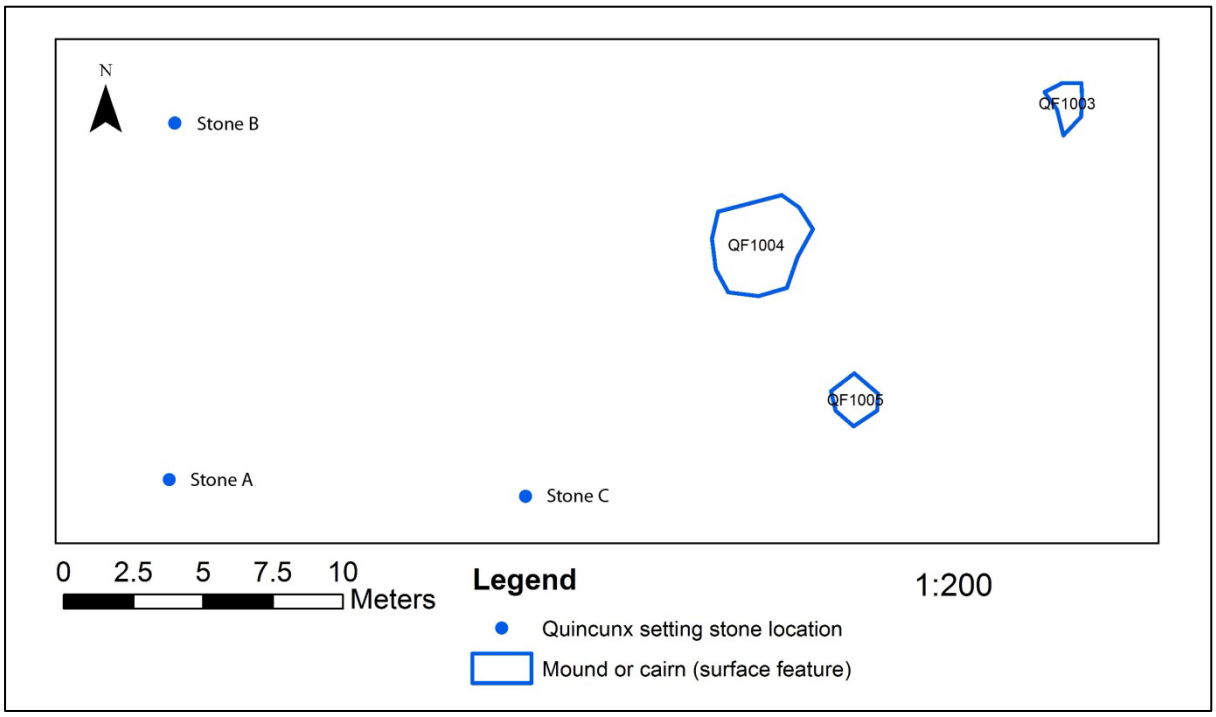

Figure 15: DGPS survey of possible features near to quincunx. Stones of the setting are labelled as per the RCHME plan (Quinnell and Dunn 1992). Produced by the author.

QF1002 is a neatly defined, but small circular mound (photo 0117). Stone could be felt under the turf, and it is potentially a cairn of very low height. This feature was outside the geophysics grid. QF1003 was another small stony mound, with an irregular shape, and defined by a patch of mossy grass (photo 0120). This was interpreted as another potential small cairn or clearance heap, although it is located in an area of low resistance on the geophysics, suggesting that it may actually be a fortuitous peaty lump. QF1004 was a larger feature, defined by a roughly circular rise in the ground, which felt stony under foot (photo 0121). The presence of reeds around the outer extent of the feature is interesting, and might indicate a slight ditch or quarrying scoops. The grass on the feature is also noticeably greener than the surrounding area. This feature could be another low cairn, and its close proximity to the quincunx fits the wider pattern at other Exmoor stone settings. It may well be a spread out and disturbed feature, with a high resistance anomaly sprawling next to it. QF1005 was another neatly defined rounded small mound, with a slight change in vegetation to mossy grass noticeable (photo 0124). This again could be a small cairn or clearance heap. This sits on top of the high resistance V shaped anomaly (A) and is more likely to be a cairn or heap of stone.

It should be noted that none of these features can be identified with certainty here based on surface evidence alone, and that some test excavations would be needed to identify them definitively. Most of the features are very subtle and do not show up well in the following photographs.

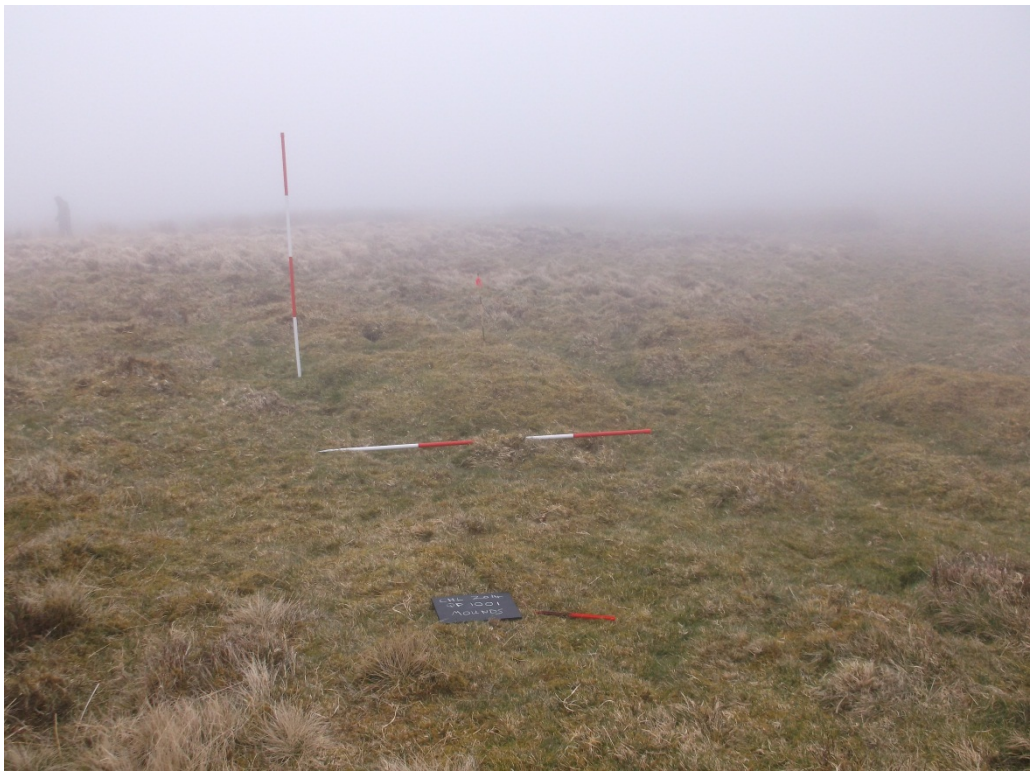

Photo 0114: Group of irregular mounds.

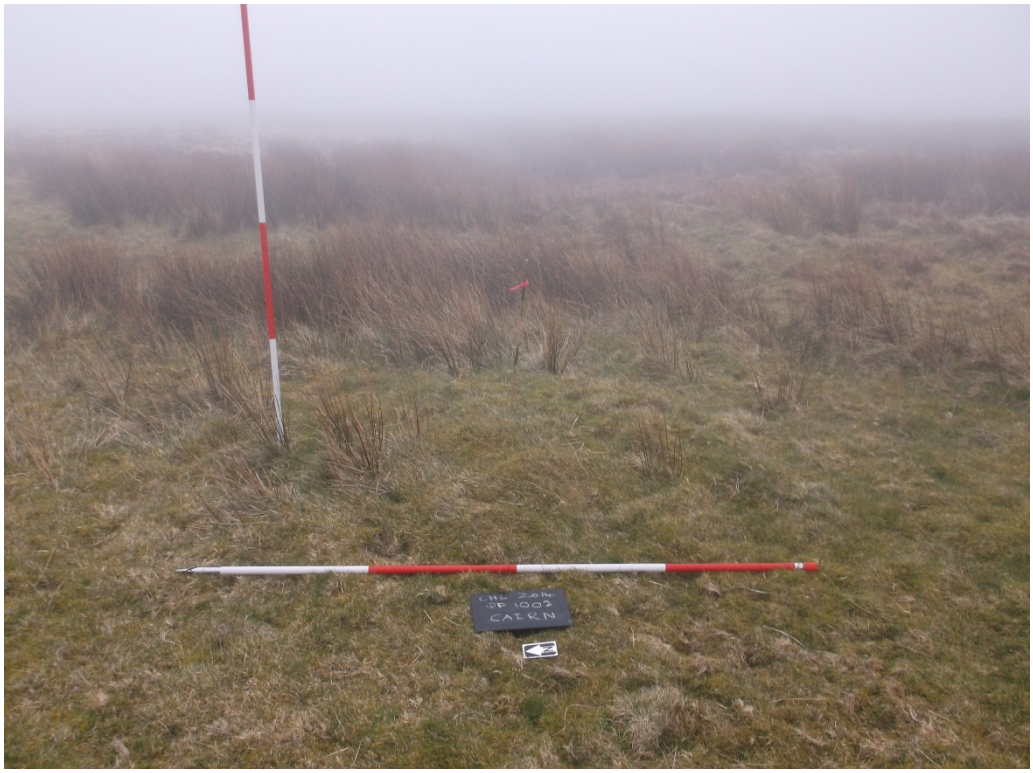

Photo 0117: Small cairn or mound.

Photo 0120: Small cairn or clearance heap.

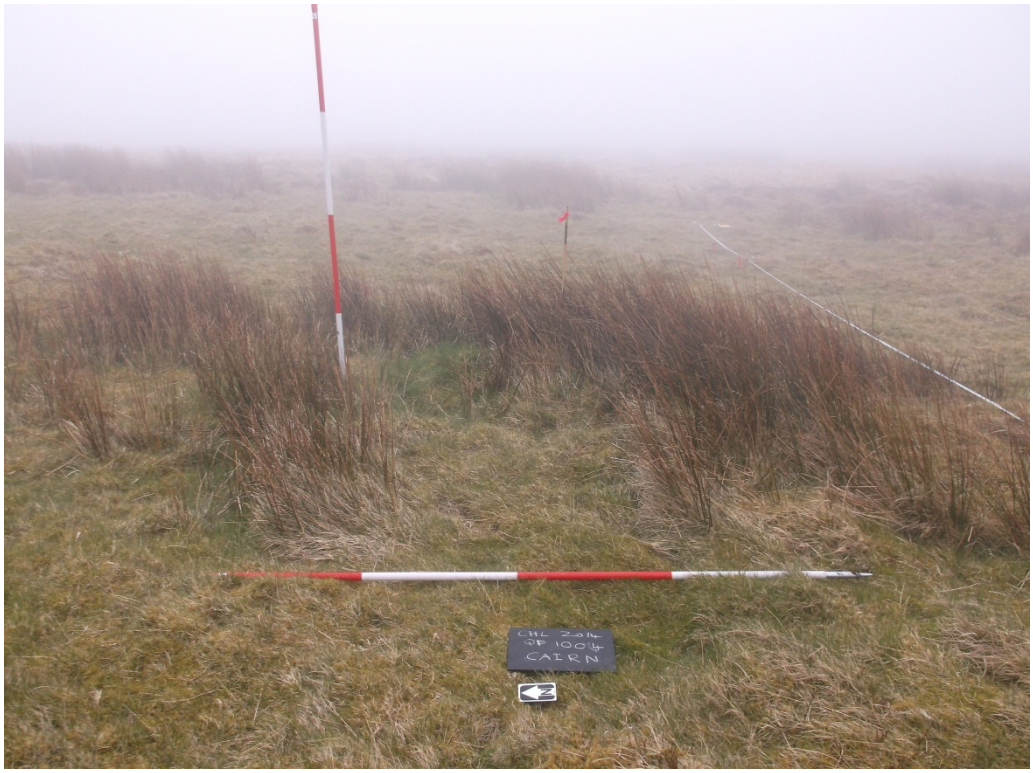

Photo 0121: Larger cairn or disturbed feature.

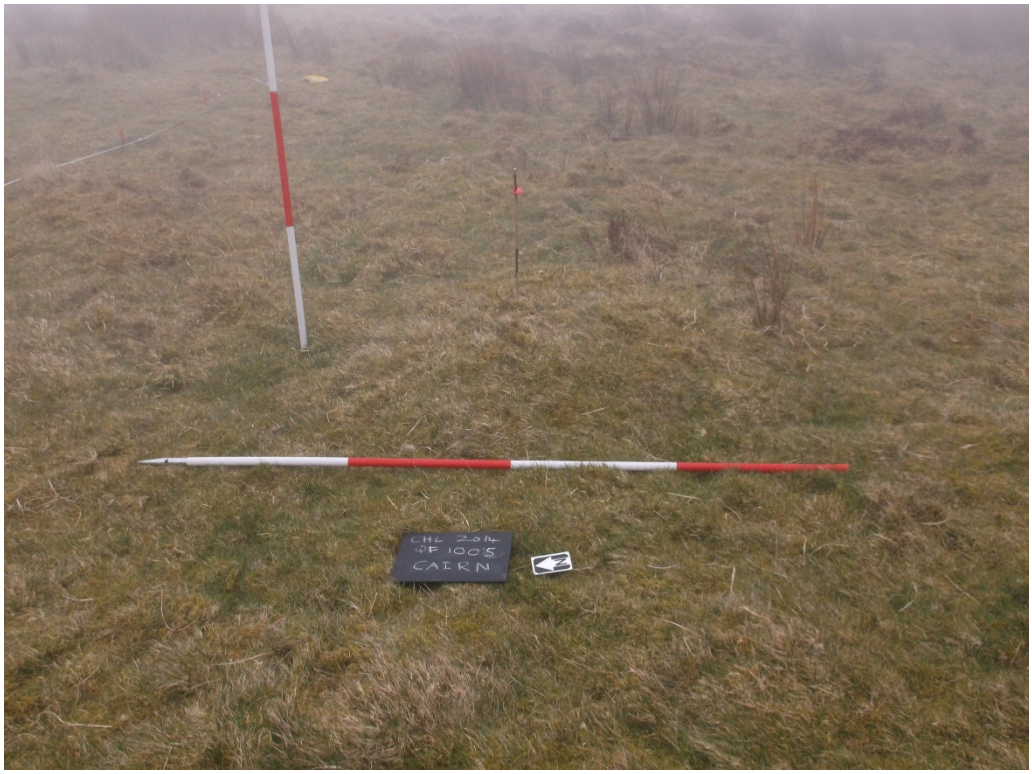

Photo 0124: Small cairn or mound.

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