



## **Geophysical Survey Report No. 13**

**Cornashee  
Co. Fermanagh**

**Season 2: Magnetometry survey**

Dr Steven Trick



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## **1 Introduction**

- 1.1 This report describes a geophysical survey carried out at Cornashee Co. Fermanagh using magnetometry techniques. The mound at Cornashee is regarded as a medieval Gaelic royal inauguration site. However, the origins of the mound and its relationship with its surrounding enclosure are uncertain. This survey follows up topographic survey of the site in 2005 by Queen's University Belfast staff and students, and geophysical (earth resistance) survey by CAF staff in January 2006 (CAF GSR007). This report should be read in conjunction with CAF GSR 007.

## **5 Survey strategy**

- 5.1 The aim of the survey was to further our understanding of the complex of monuments at Cornashee, specifically focusing on the relationships between visible features, and identifying hidden subsurface archaeological features. The survey aimed to cover the interior of the circular enclosure.
- 5.2 Focus areas included the perimeter of the mound, the elliptical enclosure, and the possible 'satellite tombs' suggested in the SM7 file. Neither of these latter features were visually apparent when the geophysical team first visited the site in January 2006, but one of the aims of the survey was to attempt to locate them and define their geophysical characteristics. A small part of the field to the east, featuring possible eastern extension to the elliptical enclosure was included in the survey area. This is referred to as Area 2, with the main circular enclosure being Area 1.

## **6 Method**

- 6.1 A series of 20m x 20m geophysical grids were set out using a total station (see Figure 4). A large proportion of these were 'partial' grids due to the confined nature of the survey area. The grids were aligned on magnetic north using a compass and were tied into the Irish Grid using a hand-held GPS. The survey took place between 21<sup>st</sup> and 27<sup>th</sup> of August 2006.
- 6.3 *Magnetometry*
- 6.3.1 The magnetometry equipment comprised a Bartington Grad601-2 fluxgate gradiometer. The traverse interval was 1m and the sample interval was 0.25m. Grids were surveyed in a zig-zag pattern. Figure 4 shows the grids surveyed with this technique.

- 6.3.2 The magnetometry data were downloaded using the Bartington Grad601 application. These were then exported to Geoplot for processing. The data were clipped from -50 nT to +50 nT to remove excessive iron spiking. The Zero Mean Traverse and Zero Mean Grid functions were applied to remove inconsistencies in the survey responses. The data were finally interpolated twice in the direction of traverse to bring symmetry to each unit of data.
- 6.3.3 Figure 5 shows a Trace plot of the data, where the magnetic responses are depicted as stacked line graphs. This shows more clearly the differentiation between the areas of increased magnetic response and background level. Figure 6 shows a traditional Shade plot of the data. Figure 7 shows the Shade plot overlaid on a large scale map of Cornashee.

## **7 Results**

- 7.1 Overall the magnetic response from the site was 'quiet' with a general background level of between -3 and +3 nT. Few anomalies of obvious archaeological potential were identified. The shade plot contains many small dipolar anomalies which are highly suggestive of ferrous rubbish. During the survey foil sweet wrappers and other material (e.g. bucket handles) were noted on the surface, which would cause such a characteristic response. The circular earthwork ring around the site accommodates a barbed wire fence which is augmented in places with corrugated iron sheeting. These objects are responsible for strong magnetic responses around the periphery of the site. All anomalies caused by this fencing or thought to be the result of ferrous rubbish are marked on the interpretive plan in green patterning, and are not discussed further. Figure 8 is a graphical summary of the anomalies discussed below.
- 7.2 Anomaly m1 is the very slight positive signal given by the elliptical ditch and bank east of the central cairn. The fact that the ditch has not accumulated enhanced material suggests that the cutting and silting of the ditch was not contemporary to a settlement on the hill.
- 7.3 Anomaly m2 is a positive linear anomaly c. 1m wide, directed in a northwest-southeast alignment. Its positive response suggests it is a ditch or gully.
- 7.4 At the northwestern terminus of m2 are two adjacent magnetic 'spots', m3 and m4. The dipolar response suggests ferrous objects, and the medium signal strength suggests some depth. Alternatively they may represent burnt ceramic material such

as a hearth or kiln. These anomalies may be related to the linear at m2. They are just on the inside of the elliptical bank, depicted by Anomaly m1.

- 7.5 Anomaly m5 is a concentration of strong and above average magnetic responses, in a curving pattern. Whether this is a true concentration of archaeological deposits or a concentration of ferrous rubbish is unclear. Certainly at the western end of the deposits the strength of the signal (+3000nT) suggests ferrous rubbish near the surface; perhaps debris of farming activities. The proximity to the central mound may forward a more archaeological interpretation, perhaps a deposit of metalwork in the liminal zone around of the mound.
- 7.6 The pattern at m6 is similar to that of m5 except that the maximum signal strength here is only 98nT. Again the nature of the response suggests ferrous material, buried at some depth, with the most obvious suggestion being farm debris. However what is interesting about this anomaly is that it occurs where there is a flatter façade to the mound slope hinting at a possible entrance. The possibility arises that it could be a structured deposition of metalwork at the entrance to the monument.
- 7.7 In Area 2, there is an area of increased magnetic response marked at m7. The spatially contained and dipolar response suggests a ferrous object beneath the surface. However this anomaly may also be representative of a hearth or kiln or dump of brick and tile.
- 7.8 Just southeast of m7 is Anomaly m8, which is a tapering linear anomaly, heading on a northeast-southwest bearing. It is 3m wide at its north-eastern end and 0.5m wide at its south-western. The positive response suggests it is a ditch or a gully. The hachure plan in the SM7 file indicates curvilinear earthworks in this field; it is possible that these anomalies are related to these works.

## **8 Conclusions and recommendations for further work**

### **8.1 *The Magnetometry Survey***

- 8.1.1 The magnetometry survey at Cornashee was successful in covering the entirety of the circular enclosure and part of the field to the east incorporating related earthworks. However few magnetic anomalies of archaeological potential were identified. Most of the responses are the result of ferrous rubbish on the surface or peripheral fencing, or larger ferrous objects buried at some depth. Unfortunately there was no correspondence with the anomalies highlighted by the resistivity survey (CAF

GSR 007), bar that of the obvious topographic feature of the ditch of the elliptical enclosure.

8.1.2 The most interesting results are the linear anomalies m2 and m8. That these are both internal to the elliptical enclosure may be significant. Indeed the concentration of magnetic responses in the small area surveyed in the east field and the spatial coincidence with the eastern extension of the elliptical enclosure may be worthy of further investigation.

8.1.3 The larger concentrations of magnetic disturbance at m5 and m6 are made more intriguing by their proximity to the central mound. They are most likely to be the result of buried modern ferrous objects, but the possibility exists that they are an archaeological deposit at the periphery of the ceremonial mound.

## 8.2 *Recommendations for further work*

8.2.1 The recommendations outlined in CAF GSR007 for further work at Cornashee are reiterated here bar the need for a full scale magnetometry survey which has now been completed. These recommendation centre on the need for detailed topographic survey, high resolution resistivity survey, and trial excavation.

8.2.2 In follow up to the survey carried out by Queen's staff and students at the site in 2005, a further, more detailed survey of the site and its immediate periphery should be carried out. This would further our understanding of the interrelationships of the various earthwork on the site and hopefully reveal some of the 'lost' features postulated in the SM7 report such as the satellite tombs, and possible entrances to the potential Neolithic passage grave. Such a survey would also aid in the interpretation of the geophysical anomalies highlighted so far.

8.2.3 The earth resistivity survey carried out in January 2006 (CAF GSR007) used a fairly coarse resolution of investigation, and did not cover the entire site. A future survey should be carried out at high resolution and encompass the entire circular enclosure and part of the east field.

8.2.4 Limited, investigatory excavations should be carried out at the site to gauge some basic facts regarding dating of the monument and phasing of individual features. The site is a Scheduled Monument and, as such, any such work would require Scheduled Monument Consent from EHS: Built Heritage. An initial trench should encompass the edge of the cairn and the elliptical enclosure to determine phasing of these features and chronology.

## Acknowledgements

The following people are thanked for their help in the organisation and implementation of the survey, and the writing of this report. Dr Eileen Murphy, Ronan McHugh, Barrie Hartwell, John Patterson, Mrs Patterson, Philip MacDonald, John Reihill, Rachel McAllister, Elizabeth FitzPatrick.

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Figure 1. Location plan showing position of the site in relation to Lisnaskea, Co. Fermanagh. Map: OS 1906 (1957 revision).



Plate 1. Aerial photograph of Cornashee, from the north. (Cambridge University Committee for Aerial Photography).

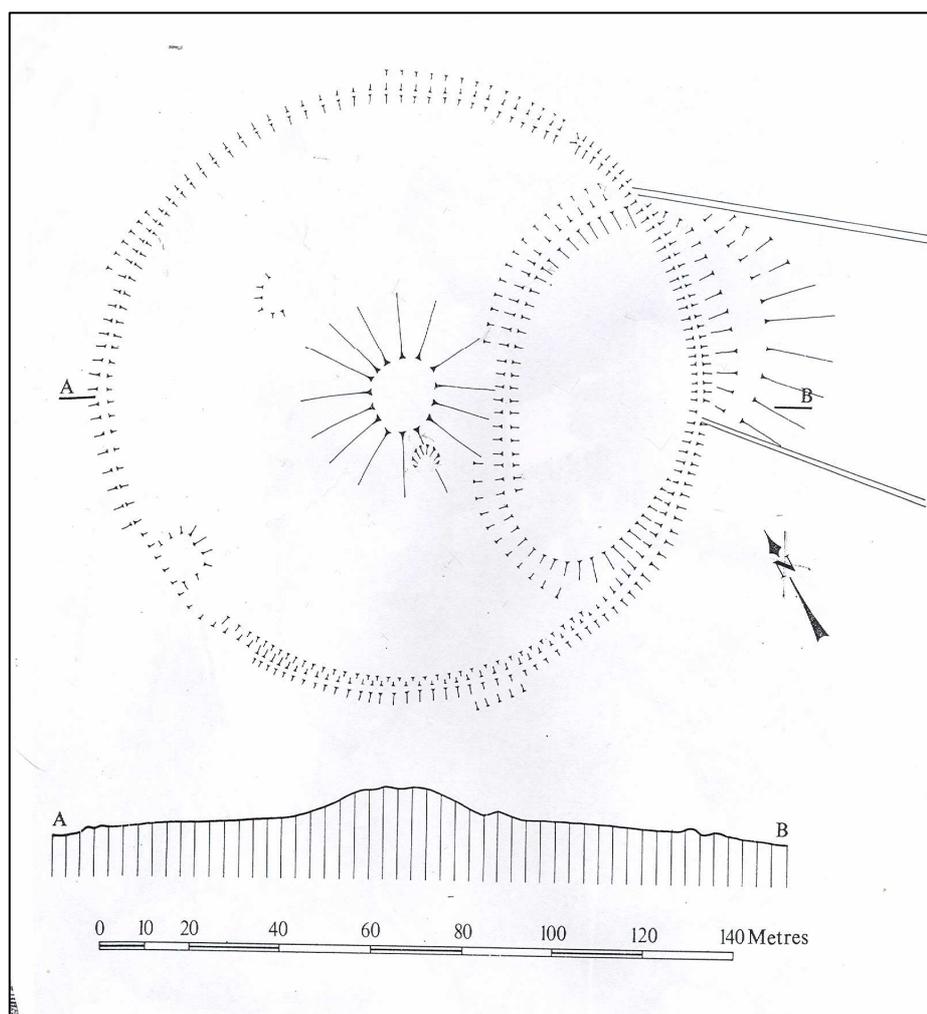
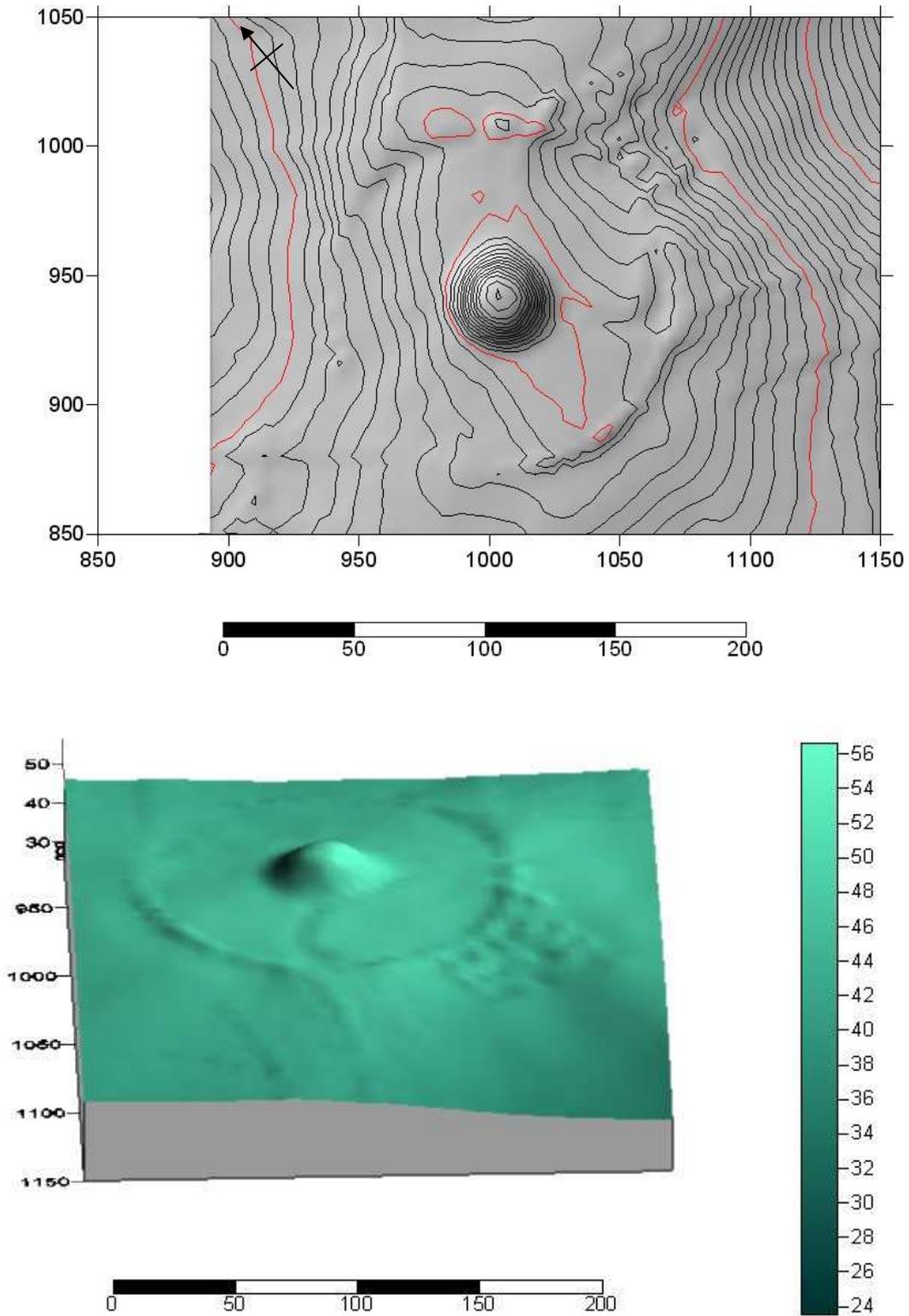
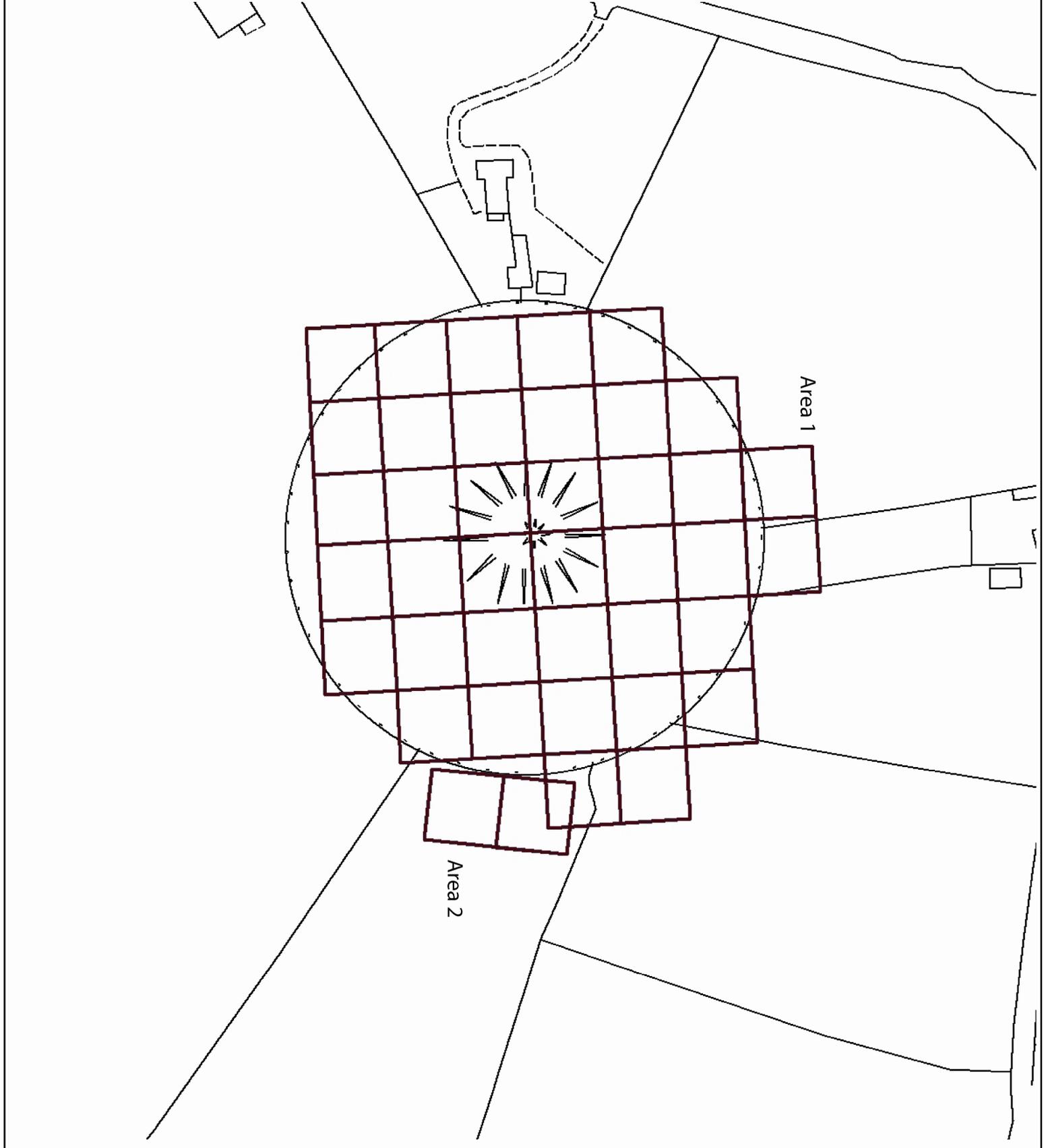


Figure 2. Hachure plan and profile of Cornashee, from the SM7 file held by EHS (dated February 1977).



**Figure 3.** Topographic survey of Cornashee. Top image is a contour plan (red contour every 5m). Bottom image is a 3D visualisation (vertical exaggeration x2). Heights are relative rather than absolute. Both plots created with Surfer 8. Images supplied by Ronan McHugh, CAF, and based on data captured by QUB students and staff during the 2005 Surveying module.



 Survey grids



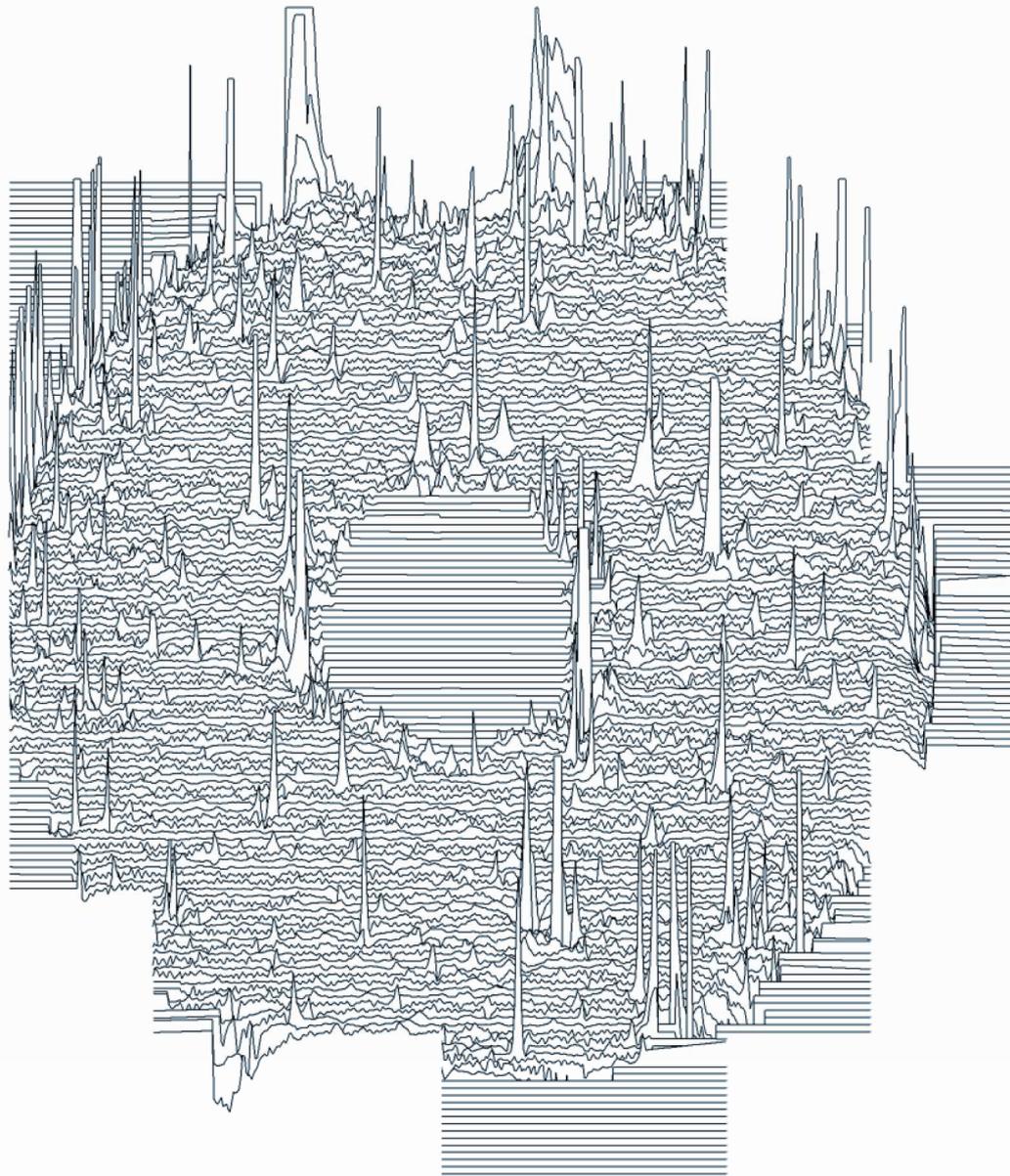
**Centre for  
Archaeological  
Fieldwork**

**PROJECT:**  
Cornashree, Co. Fermanagh  
Magnetometry survey

**TITLE:**  
Grid layout (Areas 1 and 2)

**CLIENT:**  
 **Environment  
Heritage  
Service**

**FIGURE:**  
Figure 4



20.38nT/cm



0 50m



Centre for  
Archaeological  
Fieldwork

PROJECT:

Cornashee, Co. Fermanagh  
Magnetometry survey

CLIENT:



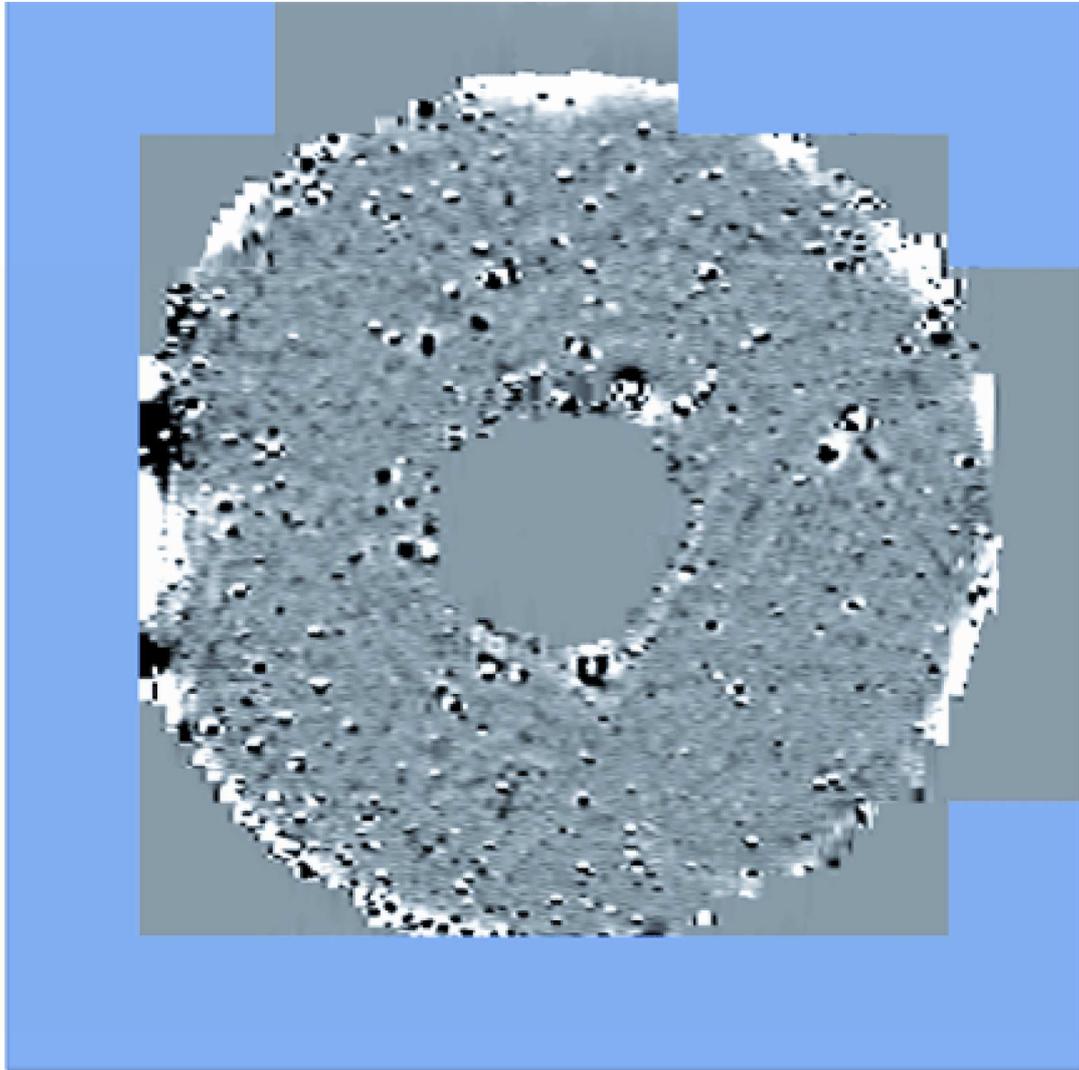
Environment  
Heritage  
Service

TITLE:

Area 1 Trace plot (clipped  $\pm 50$ nT)

FIGURE:

Figure 5



Centre for  
Archaeological  
Fieldwork

CLIENT:



Environment  
Heritage  
Service

PROJECT:

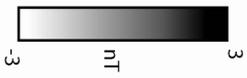
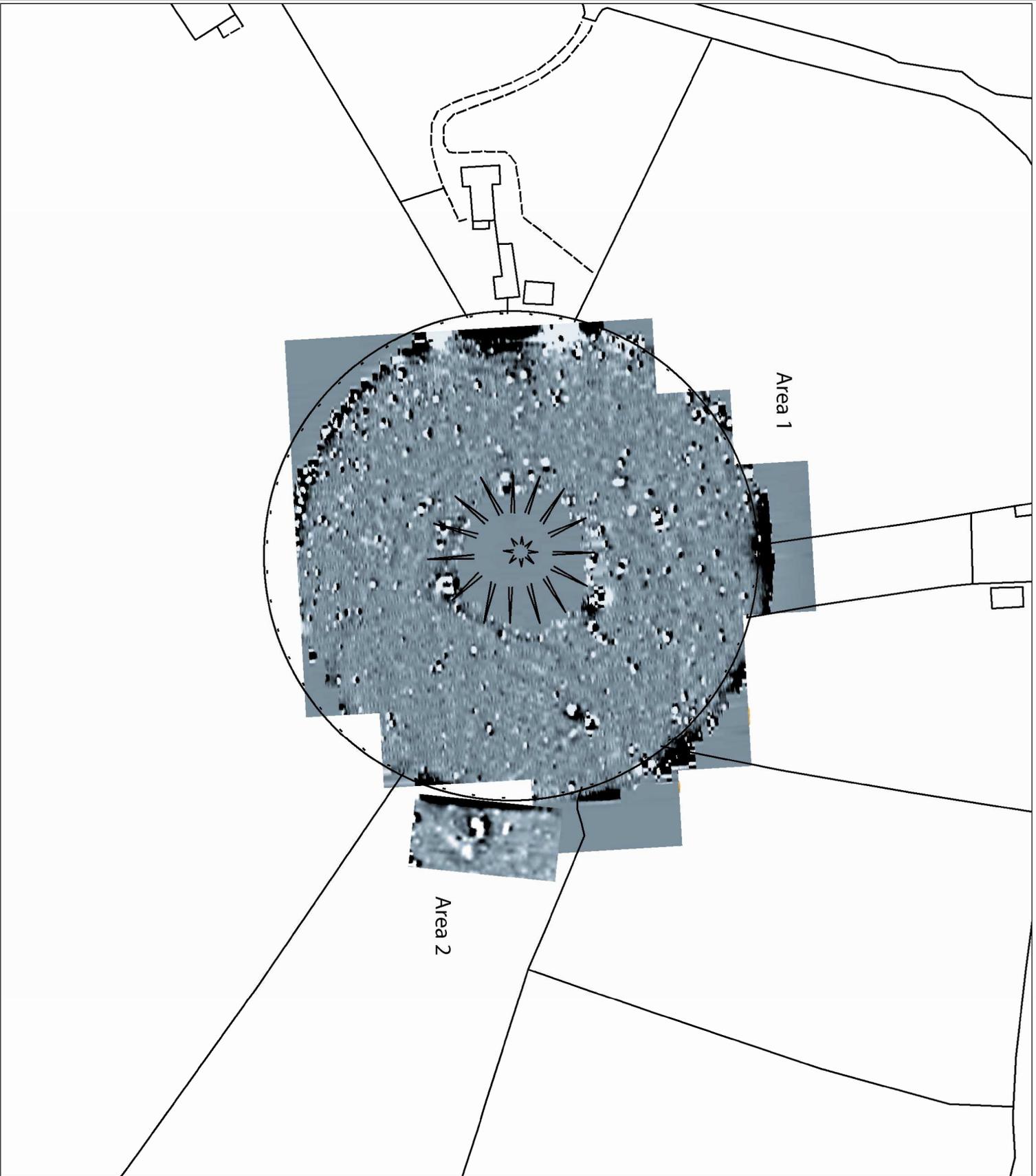
Cornashee magnetometry survey

TITLE:

Shade plot

FIGURE:

Figure 6



**Centre for  
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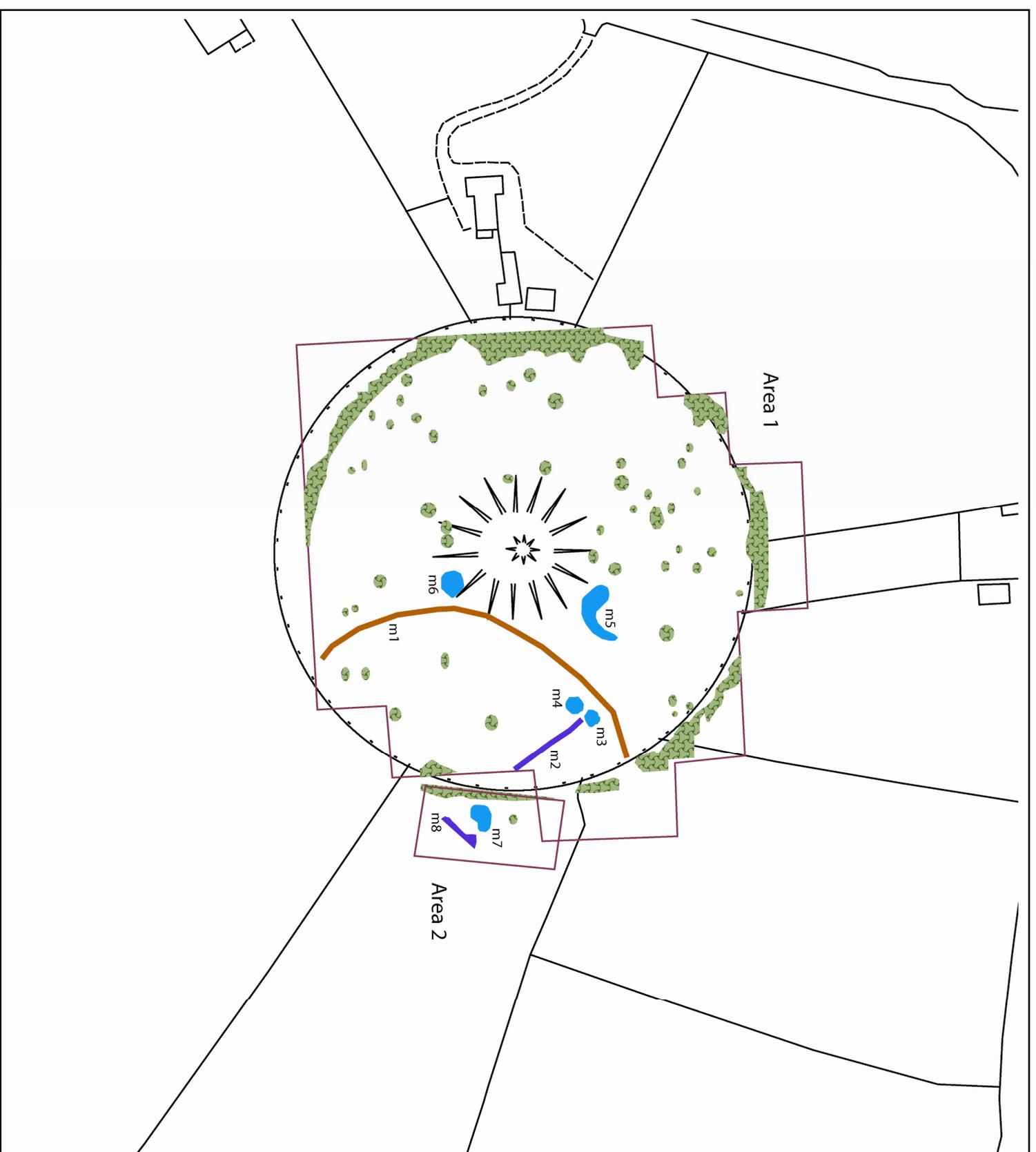
**PROJECT:**  
Cormashree, Co. Fermanagh  
Magnetometry survey

**TITLE:**  
Shade plot on base map  
(Areas 1 and 2)

**CLIENT:**  

**Environment  
Heritage  
Service**

**FIGURE:**  
Figure 7



Grid outline

Linear anomalies

Ferrous object/  
archaeological deposit

Ferrous rubbish/  
modern fencing

Elliptical ditch



Centre for  
Archaeological  
Fieldwork

PROJECT:  
Cornashree Co. Ferranagh  
Magnetometry survey

TITLE:  
Interpretation  
(Areas 1 and 2)

CLIENT:  
Environment  
Heritage  
Service

FIGURE:  
Figure 8