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*by*
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# *Ravensburgh Hillfort*
# *Geophysical Survey*

*May 2015*

**EAS Client Report 2015/10**

## *CONTENTS*



## *List of Illustrations*

## *NGR*

## *Centred on TL 09961 29363*

## *Location and Topography (Figures 1 and 2)*

The survey area was located in the south eastern corner of the hillfort of Ravensburgh Castle, which is approximately 1.2 km SW of the village of Hexton, Hertfordshire. This forms the one area within the hillfort which is open, the rest being covered by mature and semi-mature woodland.

The area had been cleared of scrub for the survey and the tree stumps had largely been ground to restrict regrowth. The site slopes gently to the east and is defined to the south and west by the inner rampart of the hillfort. The northern and eastern extent of the survey was defined by the edge of the woodland

## *Archaeological Background*

Ravensburgh Castle was investigated by James Dyer between 1964 and 1975, unfortunately he did not manage to publish his results before he died in 2013. Ian Brown has taken on the task of collating the records and publishing the excavations, in order to support this publication this survey has been commissioned in order to place the excavations in context. The extra work also includes a topographic survey of the hillfort.

## *Aims of Survey*

To investigate the available internal area of Ravensburgh Castle Hillfort.

## *SUMMARY OF RESULTS*

Although the magnetic responses are slight, there appears to be a series of magnetic anomalies that appear to represent a level of archaeological activity within the southern end of the hillfort. Of particular note is a possible enclosure with an in-turned entrance which appears to block the south eastern gate of the hillfort and is therefore of a different date. Two circular anomalies were also located, the size of which possibly suggest the presence of ring ditches. A few other linear and discrete anomalies were also located.

## *Methods*

The Fluxgate Gradiometer survey was undertaken using parts of ten 30 x 30 m grid squares laid out as in Figure 2. Readings were taken at 0.5 m intervals along transects 1 m apart. These transects were walked in a zigzag pattern. In addition two 30 x 30 m squares (Figure 3) were subjected to a high resolution survey with readings taken at 0.25 m intervals along transects 0.5 m apart.

The survey was carried out using a Geoscan FM 36 Fluxgate Gradiometer with a ST 1 sample trigger. Grey Scale and X - Y Plots were produced using Geoscan Research "Geoplot" v.3.00v and X - Y plots using Golden Software "Surfer" v. 10.7.973.

## *Survey Results:*

## *Area*

The total area of survey was approximately 0.62 Ha. In addition 0.18 Ha were subject to high resolution survey.

### *Display*

The results are displayed as Grey Scale Images and as X-Y Trace Plots (Figures 4 - 7). An interpretation is shown on Figure 8 and the results are summarised on Figure 11

## *Results:*

The anomalies recorded in the fluxgate gradiometer surveys tend to be rather slight, however they appear to form a series of coherent anomalies suggesting archaeological activity. The exception is a series of ferromagnetic responses (Figure 8, Anomalies A – D). These are probably the effect of relatively modern disturbance possibly including the burning of debris from the clearance of the site. If this is so, then this clearance took place in 1990 as no burning took place on site for the current clearance (Patrick Cooper *pers. comm.)*.

Along the eastern side of the survey area Anomalies E and F relate to the rampart long this side of the site. It is not certain whether these anomalies are the response to the remnants of the inner slope of the rampart or possibly the presence of a quarry hollow. Within the hillfort Anomaly G appear to define an enclosure approximately 38 x 32 m in size with an in-turned entrance to the south and west. The magnetic signature of the possible enclosure is approximately 4.25 m wide possibly suggesting that the feature giving rise to this anomaly may be of considerable size. Two discrete anomalies (Anomalies H and I) appear to mark either side of the possible entrance and may therefore mark the position of possible post-holes within the entrance. The in-turned is best defined in the high resolution survey (Figure 6), although the rest of the enclosure is better defined in the general survey. Within the enclosure is a circular anomaly (Anomaly J) which may mark the position of a round house. This anomaly is approximately 7.5 m in diameter.

Two other circular anomalies were also recorded (Anomalies K and L). These are approximately 16.65 m and 15.8 m in diameter. Whilst these may also mark the position of possible roundhouses, these diameter appear to be rather large and it is therefore possible that they represent possible ring ditches from Bronze Age barrows.

There is little evidence for possible pits within the survey area. The exception, however, are two discrete anomalies in the middle of the survey (Anomalies M and N). These are both in the order of 1.5 m in diameter and are distinct from the rest of the survey.

The other anomalies within the survey (Anomalies P – S) are a series of linear anomalies which do not appear to form a coherent pattern, although it is possible to interpret anomalies S, Q and R as forming a track-way from the south eastern gateway of the hillfort, however this remains highly speculative.

### *Magnetic Susceptibility*

It was possible to take soil samples in order to assess the magnetic susceptibility of the soils. It was not possible, however, to obtain a subsoil sample for comparison. Both volume susceptibility (direct reading of the samples) and mass susceptibility (reading compensated for the varying mass of the samples) is given below. The location of the samples is shown on Figure 9 and the results on Figure 10

| **Sample** | **Volume susceptibility $\chi_v$** | **Mass susceptibility $\chi_m$** |
|---|---|---|
| Grid 1 | 25 | 31.6 |
| Grid 2 | 32 | 36.4 |
| Grid 3 | 38 | 44.2 |
| Grid 4 | 39 | 43.3 |

| Sample | Volume susceptibility $\chi_v$ | Mass susceptibility $\chi_m$ |
|---|---|---|
| Grid 5 | 31 | 34.1 |
| Grid 6 | 31 | 41.3 |
| Grid 7 | 43 | 47.8 |
| Grid 8 | 30 | 34.9 |
| Grid 9 | 22 | 29.3 |
| Grid 10 | 28 | 32.6 |

The samples as measured are generally of moderate values suggesting that, although not ideal, the conditions were suitable for magnetic survey.

Assuming a consistent geological regime across the survey area the magnetic susceptibility can be used as a proxy for the level of archaeological activity. In general the values, as measured seem to follow that recorded in the Fluxgate gradiometer survey with increased readings along inside of the ramparts and in the grid square where Anomaly L is located, however the increased value in Grid 7 (Figure 9) cannot be explained unless there are features just outside the area it was possible to survey.

### *Conclusions*

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

Although the magnetic responses are generally rather faint it is possible to define a range of magnetic anomalies which appear to form a series of coherent patterns suggestive of archaeological activity. Of particular note is the possible enclosure (Anomaly G) which has an in-turned entrance to the south-west. This blocks the access to the south eastern gateway to the hillfort and therefore cannot be contemporary. It also contains a circular anomaly (Anomaly J) which is assumed to mark the position of a round house.

The size of the two, other, circular anomalies (Anomalies K and L) is rather large for a possible roundhouse and therefore it is possible that they represent possible Bronze Age barrows predating the construction of the hillfort.

Few of the anomalies recorded appear to be contemporary with the hillfort phase of the site. Two possible pits (Anomalies M and N) are probably related to the Iron Age activity as is he speculative track way formed by Anomalies Q, R and S.

The magnetic susceptibility samples appear to generally correspond with the results of the Fluxgate Gradiometer survey, however the increased value obtained from Grid 7 may suggest an increased level of archaeological activity in this area of the hillfort.

## *Acknowledgements*

The work was commissioned by Ian Brown who helped with the fieldwork for the surveys. Help was also given by Joshua Murphy. Permission to carry out the survey was given by the landowner Patrick Ashley Cooper. The work was supported with a grant from Historic England.

## *Techniques of Geophysical Survey:*

### *Magnetometry:*

This relies on variations in soil magnetic susceptibility and magnetic remenance which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

### *Resistivity:*

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

### *Resistance Tomography*

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings.

### *Magnetic Susceptibility:*

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

### *Instrumentation:*

### *1. Fluxgate Gradiometer - Geoscan FM36*

### *2. Resistance Meter - Geoscan RM4/DL10*

### *3. Magnetic Susceptibility Meter - Bartington MS2*

### *4. Geopulse Imager 25 - Campus*

### *Methodology:*

For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

### *Copyright:*

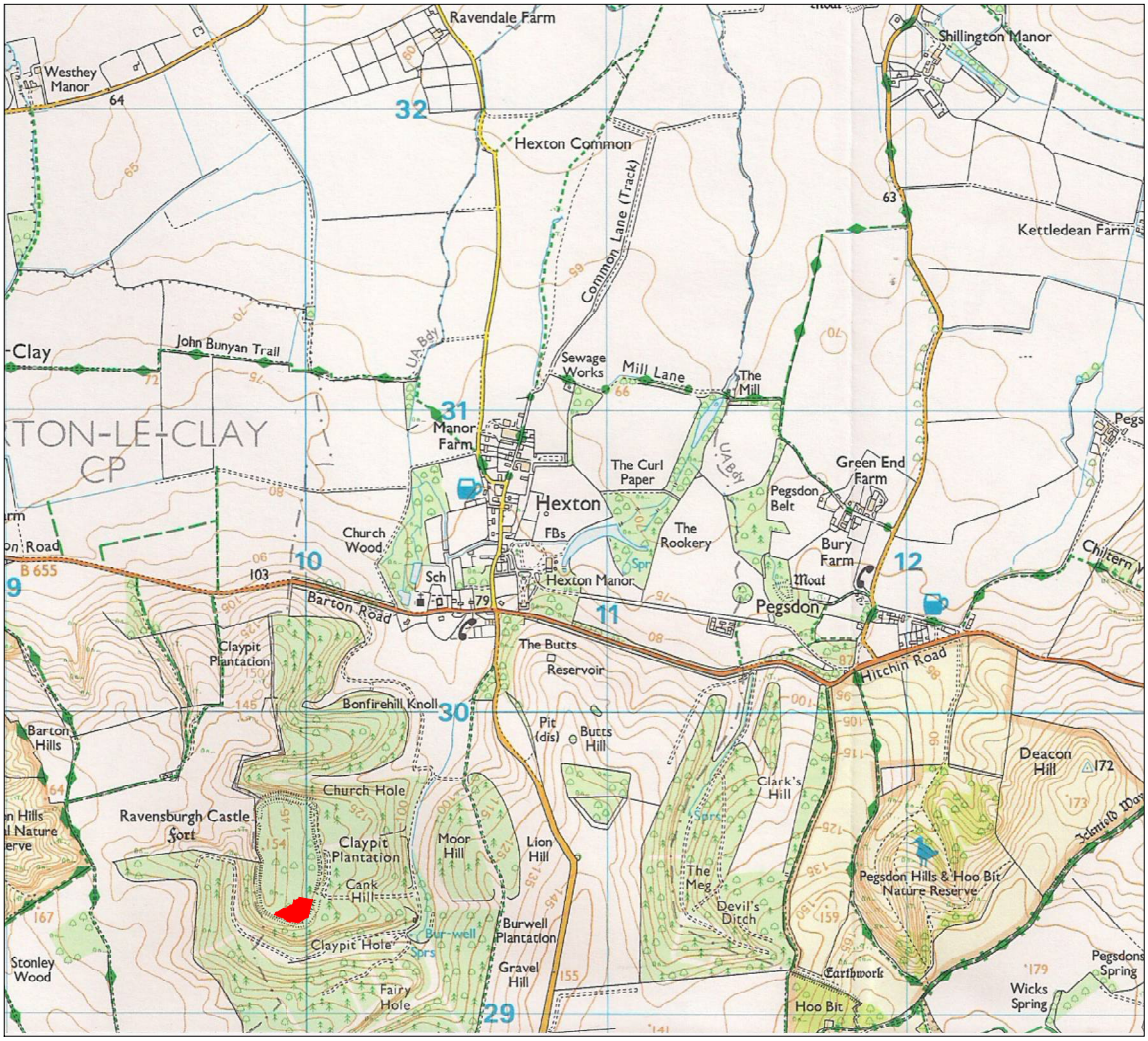



Figure 1: Location
Scale 1:25,000

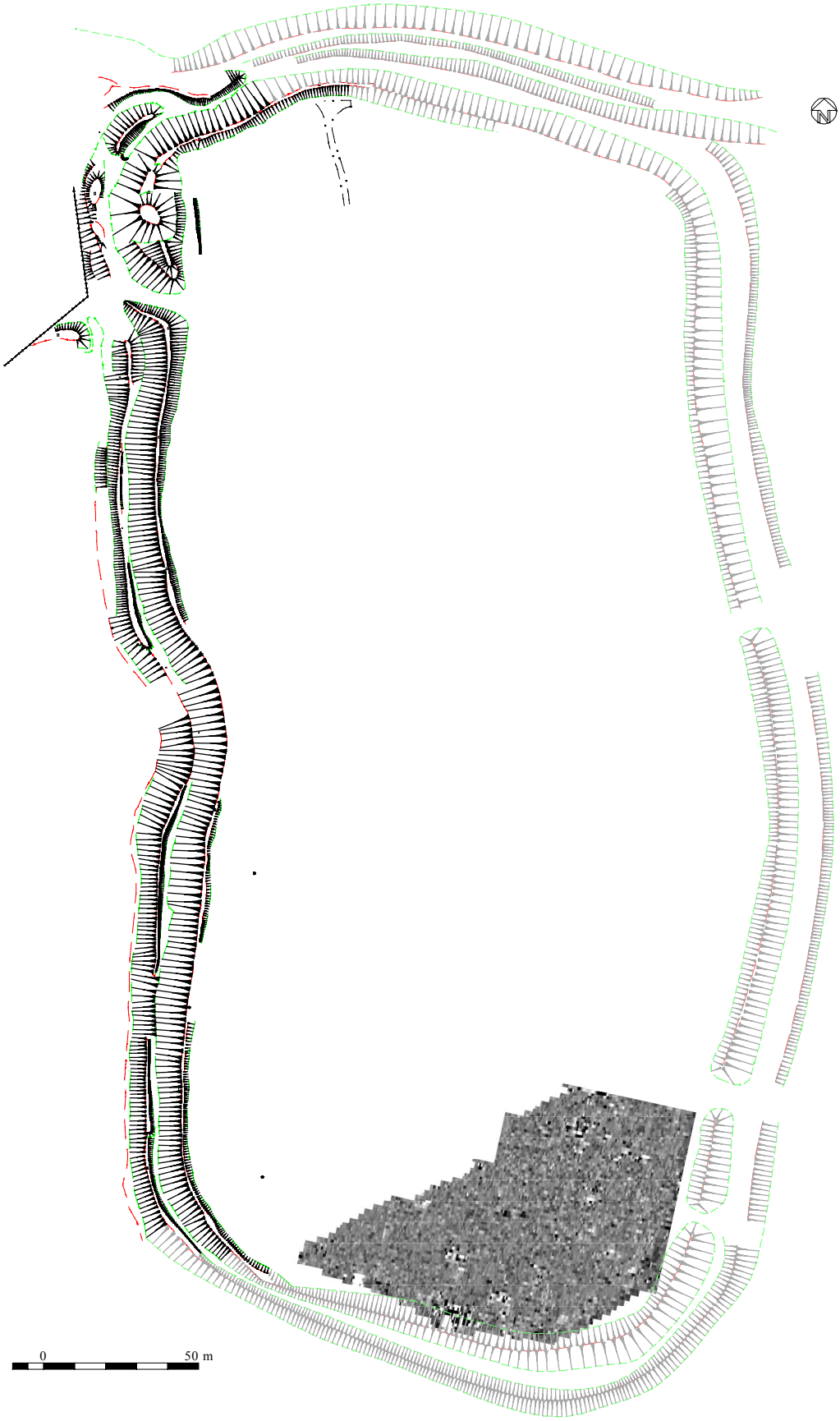



Figure 2: Location of the Fluxgate Gradiometer Survey
Scale 1:2000

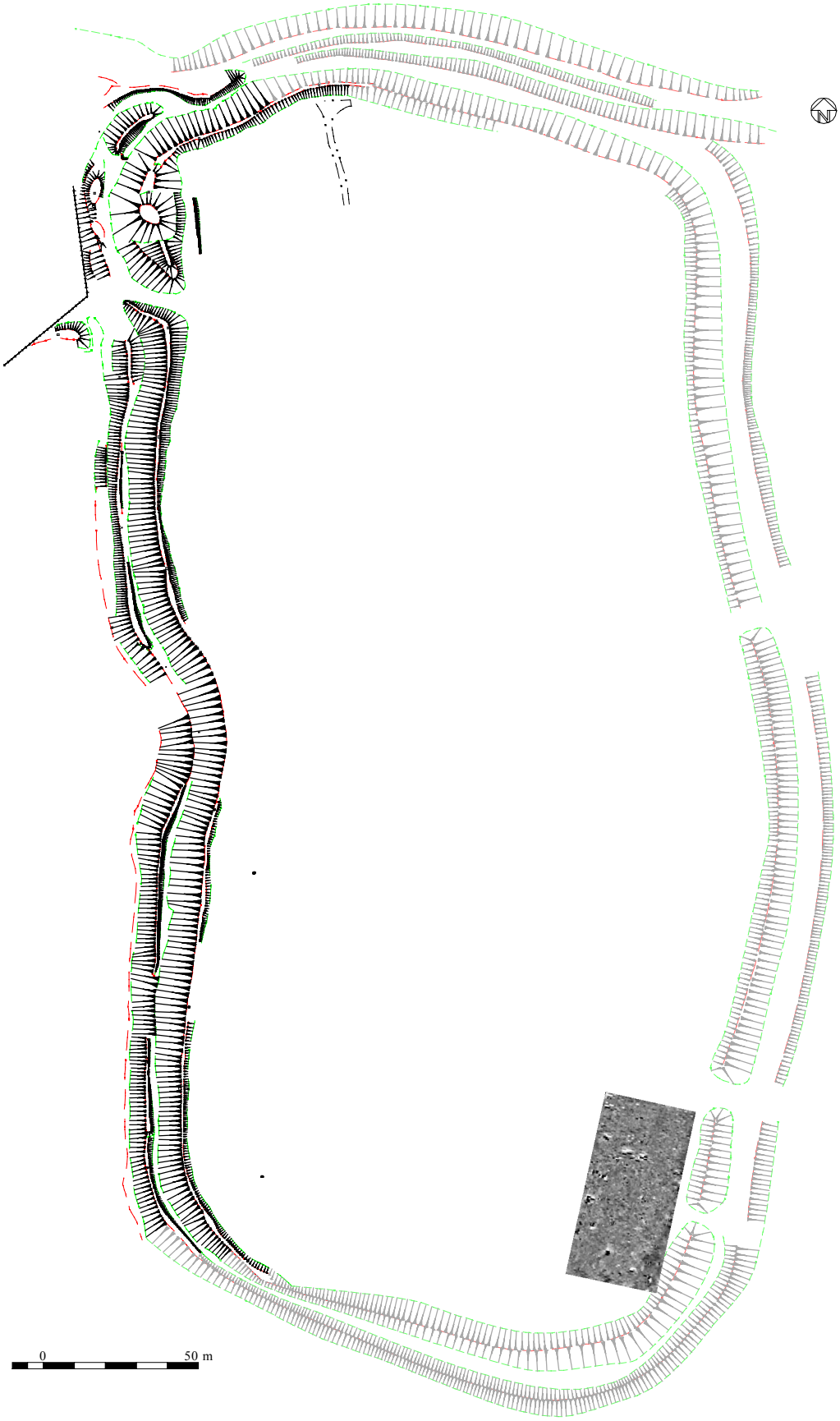



Figure 3: Location odf the High Resolution Fluxgate Gradiometer Survey
Scale 1:2000

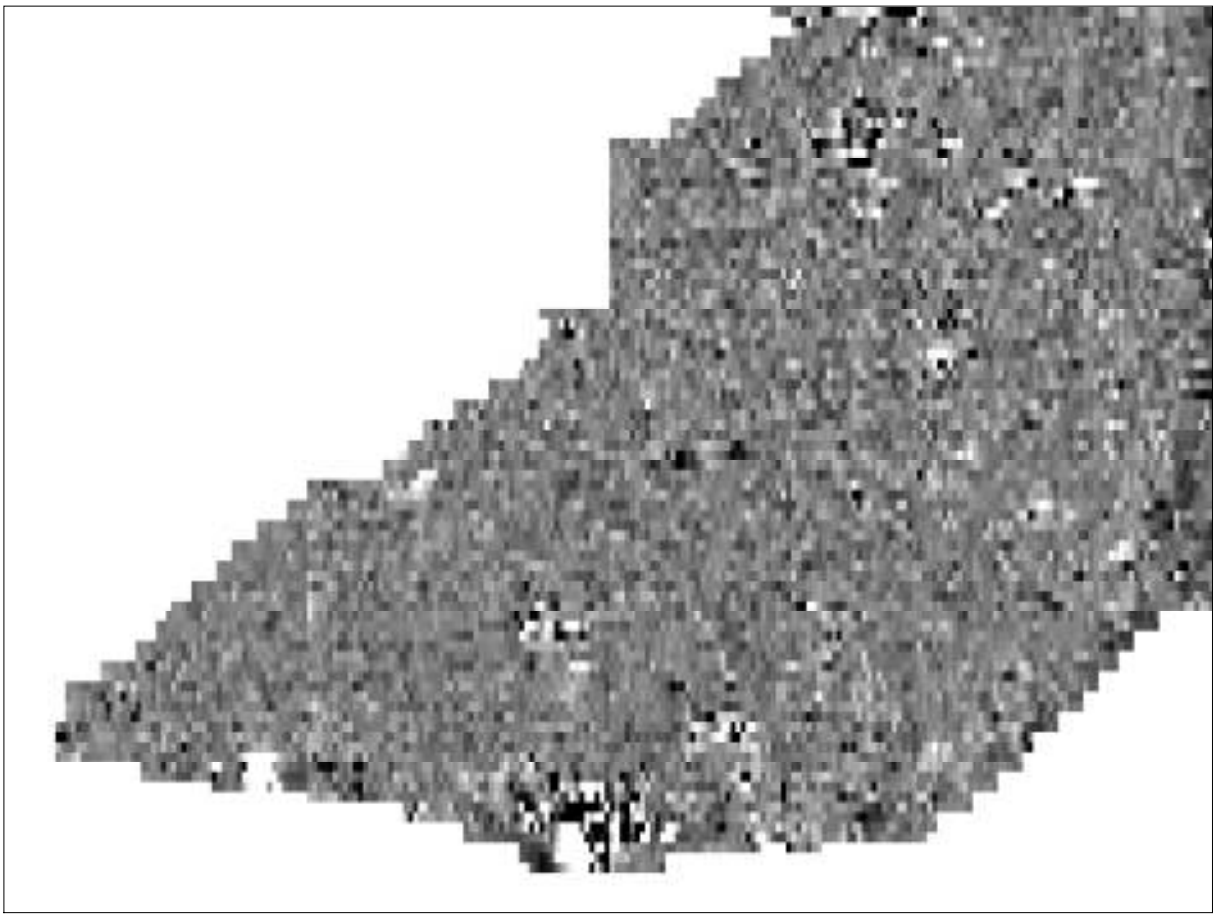



Figure 4: Grey Scale Plot of the General Survey
Scale 1:750

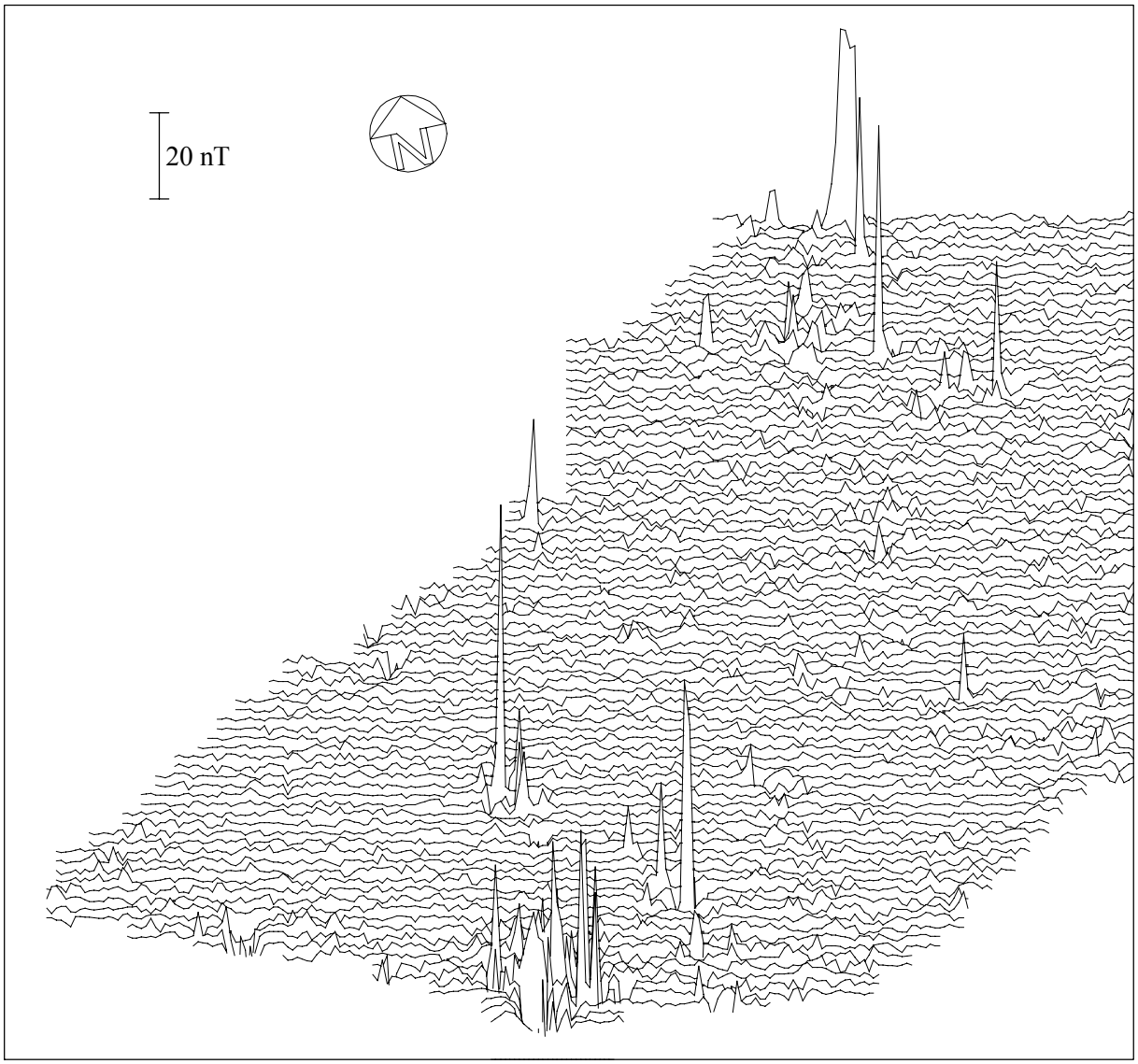



Figure 5: X - Y Plot of the General Survey
Scale 1:750

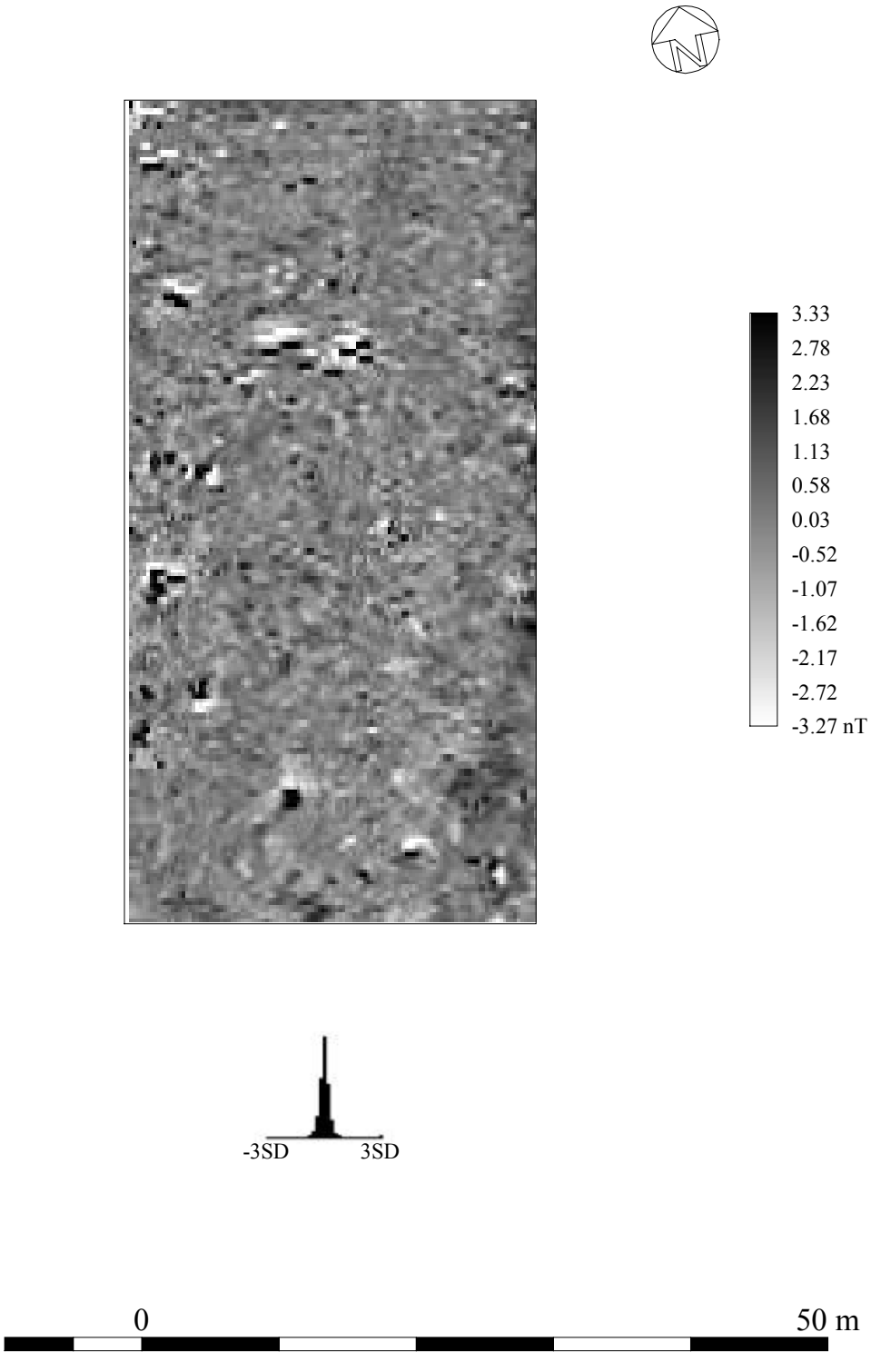



Figure 6: Grey Scale Plot of the High Resolution Survey
Scale 1:500

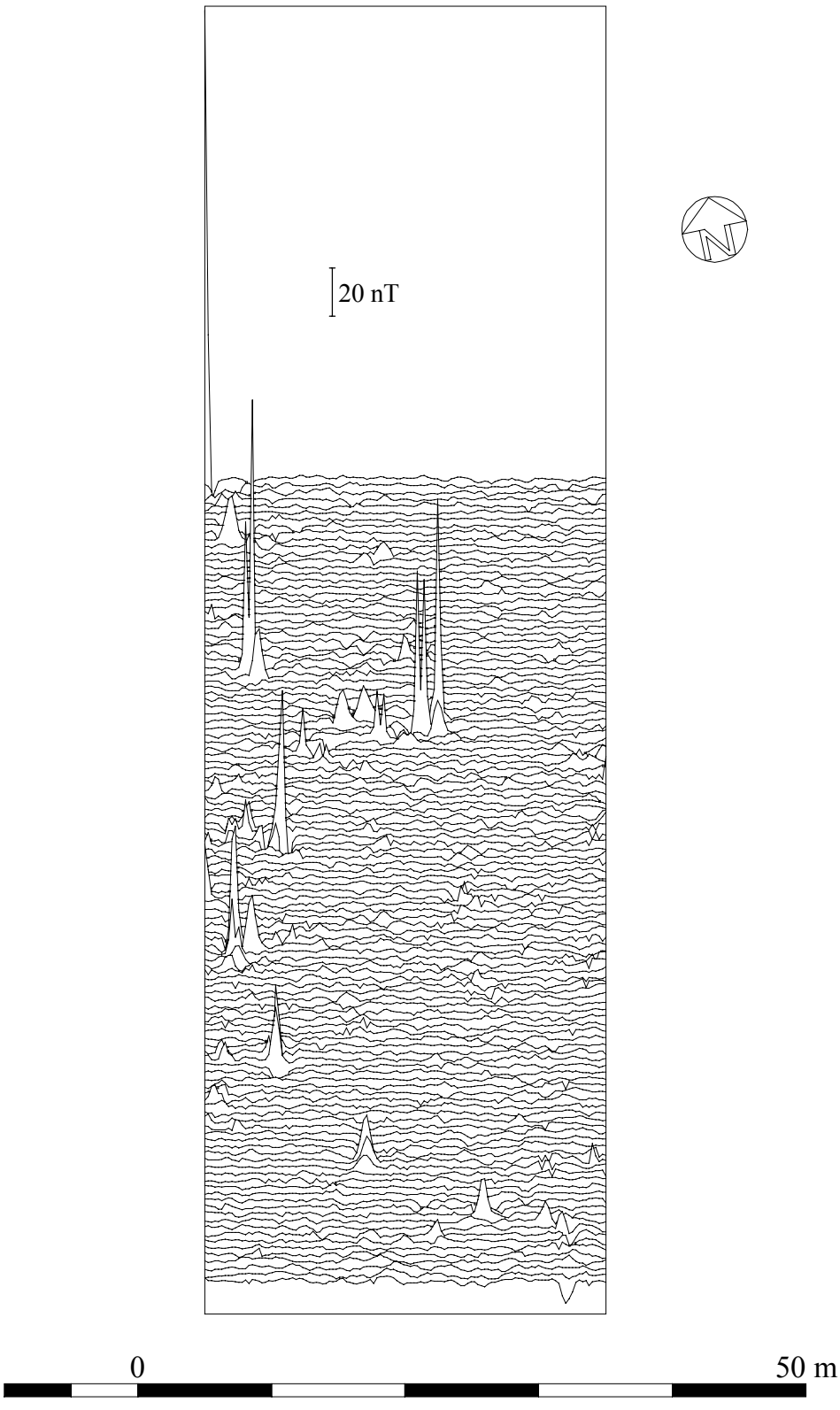
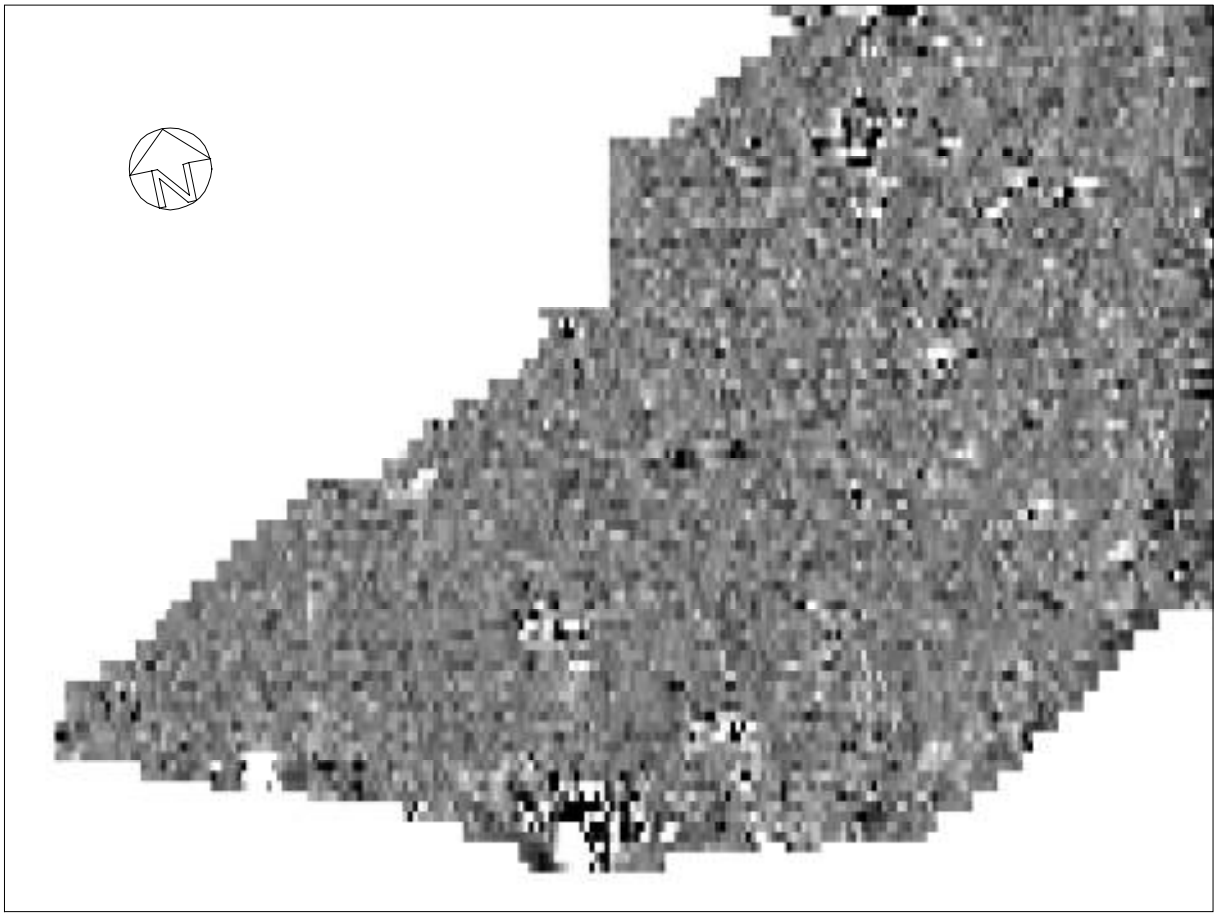
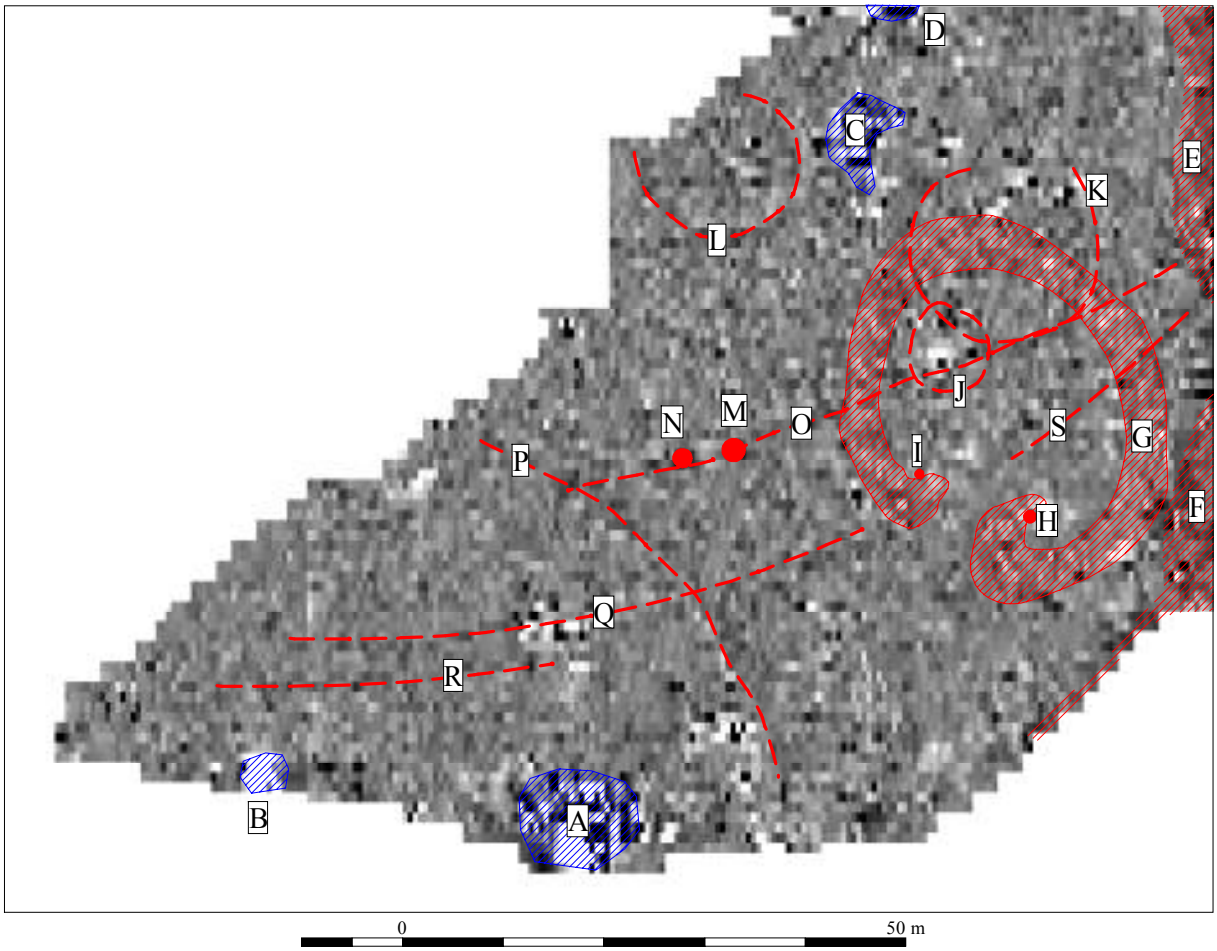



Figure 7: X - Y Plot of the High Resolution Survey
Scale 1:500






Ferromagnetic response  Possible archaeology  Possible linear anomaly  Discrete anomaly

Figure 8: Interpretation
Scale 1:750

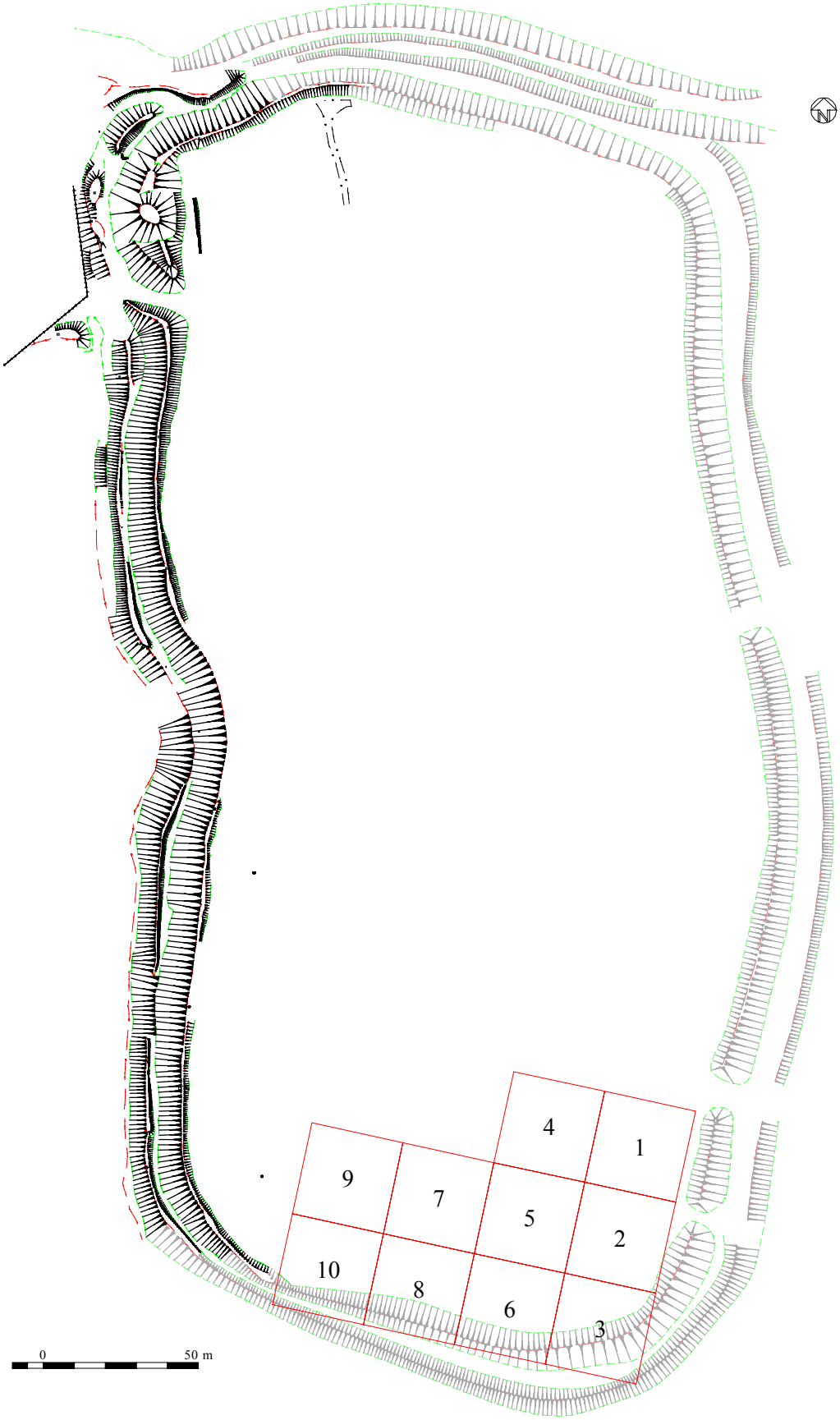



Figure 9: Location of the Magnetic Susceptibility Samples
Scale 1:2000

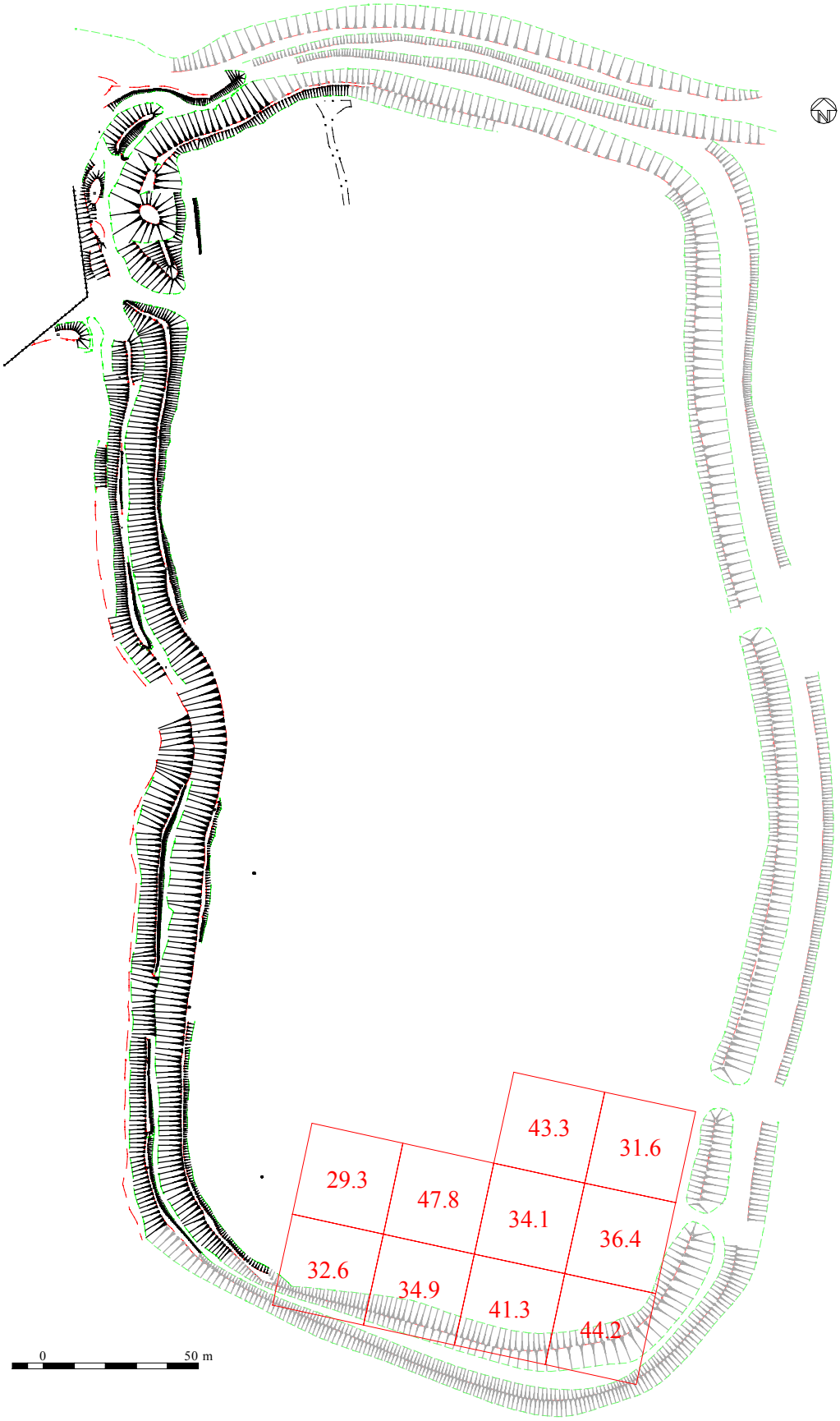



Figure 10: Results of the Magnetic Susceptibility Survey
Scale 1:2000

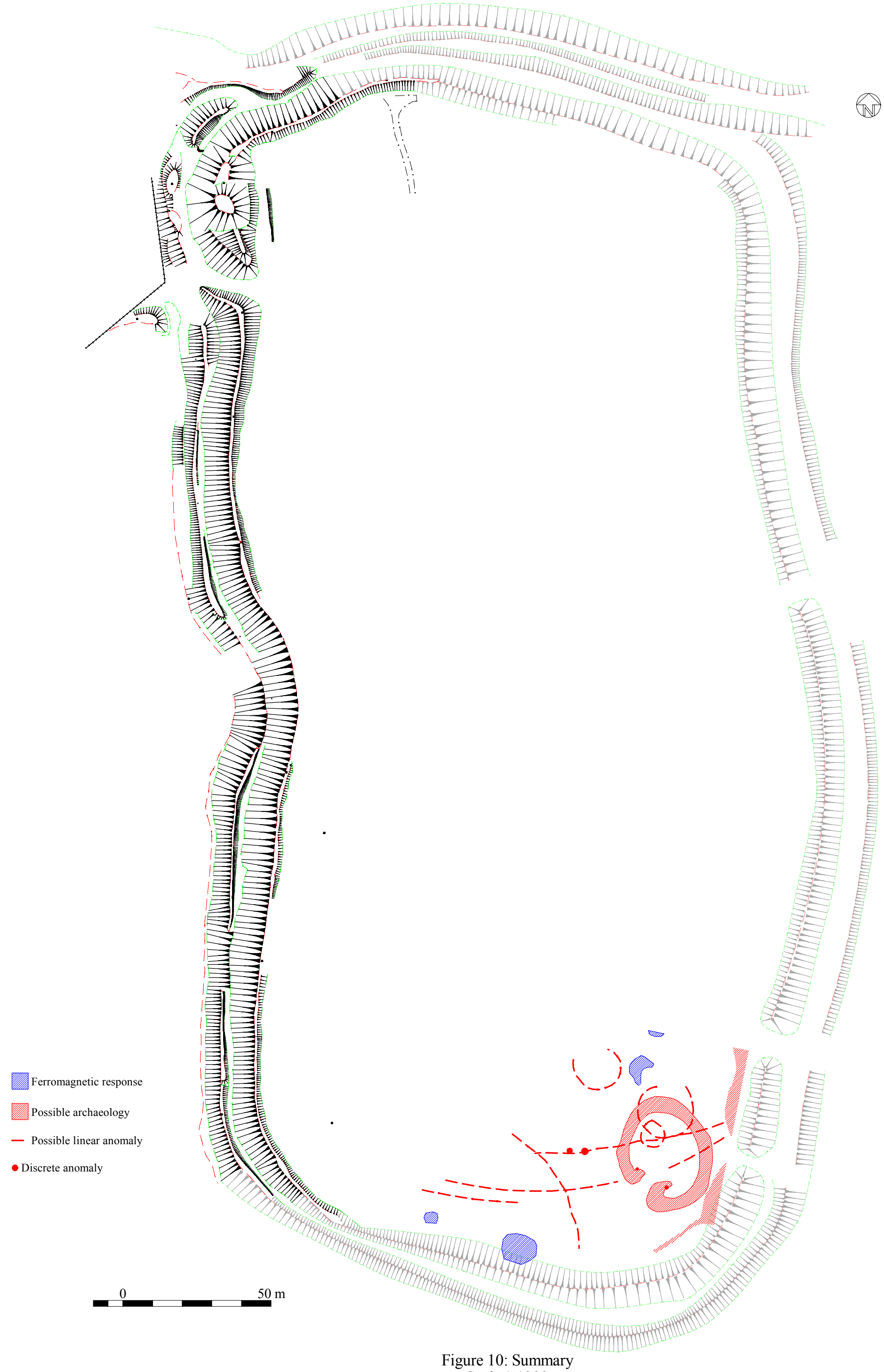



Figure 10: Summary
Scale 1:1200