Survey Commissioned

By

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Surveyed

by

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N° 2869678

Halfway House,
Geophysical survey

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Contents

List of Illustrations

NGR

Centred on SJ 15489 59847

Location and Topography (Figure 1)

The site lies approximately 1 km ENE of the church at Llanbedr-Dyffryn-Clwyd on the western flanks of the Clwydian Range. Located just below the point where Bwlch Penbarras passes in front of Halfway House the site slopes to the west and south and is just above a dry coomb, to the south. To the north is a green lane leading to Rhiw-lâs.

The survey took place on 23rd - 24th July 2012.

Archaeological Background

Also known as Moel Fenlli enclosure (west) (PRN106043) (http://www.cofiadurcahcymru.org.uk/arch/cpat/english/cpat_interface.html) the enclosure at Halfway House would appear to be a relatively small enclosure on the flanks of the Clwydian Hills. It is only 1.0 km from the hillfort of Moel Fenlli and 1.9 km from the hillfort of Moel y Gaer Llanbedr. The survey was undertaken by as part of a programme of research on the Iron Age enclosures of the Clwydian Range and Llantysillio Mountain undertaken by I. Brown and R. Karl.

Aims of Survey

To investigate the enclosure below Halfway House, on the flanks of the Clwydian Hills.

SUMMARY OF RESULTS

A small enclosure approximately 38 x 25 m in size has been defined, the southern and western edges, of which, appears to have been truncated. From the Fluxgate Gradiometer survey and the Magnetic Susceptibility samples it would appear that there was a level of human activity within the enclosure.

METHODS

Topographic Survey

The topographic survey was undertaken using a Geodolite 506 Total Station. Initial stations were defined by using a Garmin GPSmap 62S hand held GPS system. Features and breaks of slope were defined at a resolution of less than five meters between readings, whilst the general ground form was recorded by a series of ground levels taken on an approximate 10 m grid. The survey was processed using NRG Engineering Surveying System for Windows 2011. This not only allowed for the compiling of the survey drawing, but also calculated the contours.

Fluxgate Gradiometer Surveys

The Fluxgate Gradiometer surveys were undertaken based on a series of 20 x 20 m grids laid out as in Figures 3. Readings were taken at 0.5 m intervals along transects 0.5 m apart. These transects were walked in a zigzag pattern.

The surveys were carried out using a Geoscan FM 36 Fluxgate Gradiometer with an "ST1" sample trigger. Grey Scale plots were produced using Geoscan Research "Geoplot" v.3.00x and X - Y Plots using Golden Software "Surfer" v. 10.2.601.

Magnetic Susceptibility

A series of small soil samples were taken from each of the grid squares. Within Grids 1 and 2 (Figure 3) samples were taken from both within and outside the enclosure for comparison. The samples were dried in a heated cabinet and analyzed using a Bartington MS2 Magnetic Susceptibility Meter.

RESULTS

Area

The Fluxgate Gradiometer survey covered an area of approximately 1200 m^2

Display

The results of the topographic Survey are shown in Figures 3 and 4.

The results of the Fluxgate Gradiometer Survey are displayed as a grey scale image (Figure 5) and an X-Y trace plots (Figure 6). They are also summarized in Figure 8.

Topographic Survey (Figures 3 and 4)

The topographic survey defined a low bank defining the northern and eastern extent of the enclosure. This was between 3 and 3.5 m wide and stood up to).42 m high. The western end of this bank appears to be truncated by a large hollow 15 x12 m which is up to 0.80 m deep. This is assumed to be the result of localised quarrying in this area. The southern end of the bank also appears to be truncated where it enters the dry coomb, possibly suggesting the southern side of the enclosure has also been lost. A slight scarp was also recorded running along the southern edge, above the dry coomb, which may mark the position of a dividing bank.

Fluxgate Gradiometer Survey

The interpretation of the Fluxgate Gradiometer survey is shown on Figure 7. The defining bank of the enclosure has a marked magnetic signature giving rise to Anomaly A. This closely follows the results of the topographic survey also suggesting the southern end of the bank has been truncated and originally extended into the dry coomb.

Anomaly B, not only covers the slight scarp along the southern edge of the enclosure, but extends the line beyond the physical remains and possibly marks a sub-division within the enclosure. Within the enclosure a series of indistinct linear anomalies (Anomaly C) appear to suggest a series of, at least three,

intercutting, possible circular feature. The size of each of these anomalies is approximately 5.5 m in diameter which may represent possible hut circles.

The hollow to the south western end of the survey has a slightly mixed magnetic signature (Anomaly D) and it appears to truncate the line of Anomaly A. Along the north western sector of the survey area Anomaly E corresponds with some of the disturbance associated with the green lane leading to Rhiw-lâs.

Two areas of ferromagnetic responses have been defined and are shown in blue on Figure 7. Whilst Anomaly F can be associated with a modern drain, Anomaly G does not appear to relate to any obvious modern disturbance. Whilst this may be the result of modern ferrous objects in the topsoil, its position near to the bank may be significant.

Magnetic Susceptibility

Soil samples were taken from the area of detailed survey in order to assess the magnetic susceptibility of the soils. For Grids 1 and 2 (Figure 3) samples were taken from both inside and outside the enclosure for comparison. It was not possible to obtain a subsoil sample for comparison.

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 1 in	107	108.1
Grid 2 out	51	58.0
Grid 2 in	123	132.3
Grid 2 out	18	16.8
Grid 3	149	153.6
Grid 4	161	167.7

The readings from within the enclosure are significantly higher than those outside. This would suggest an increased level of human activity took place inside the enclosure.

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.

The Fluxgate Gradiometer survey, topographic survey and magnetic susceptibility samples all appear to suggest that the enclosure below Halfway House has a level of human activity probably including .occupation. The enclosure appears to be truncated, both along its western and southern edge. The western edge has been removed by a large hollow which is probably an informal quarry, whilst the southern edge appears to have run into the dry coomb along the southern side of the survey.

Anomaly B possibly defines a linear feature (possibly a bank or ditch) which may have been a division within the original enclosure, or a replacement for the southern bank.

References

http://www.cofiadurcahcymru.org.uk/arch/cpat/english/cpat_interface.html.

Acknowledgements

The survey was commissioned by Ian Brown who also helped with the fieldwork for these surveys

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 RM15

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:

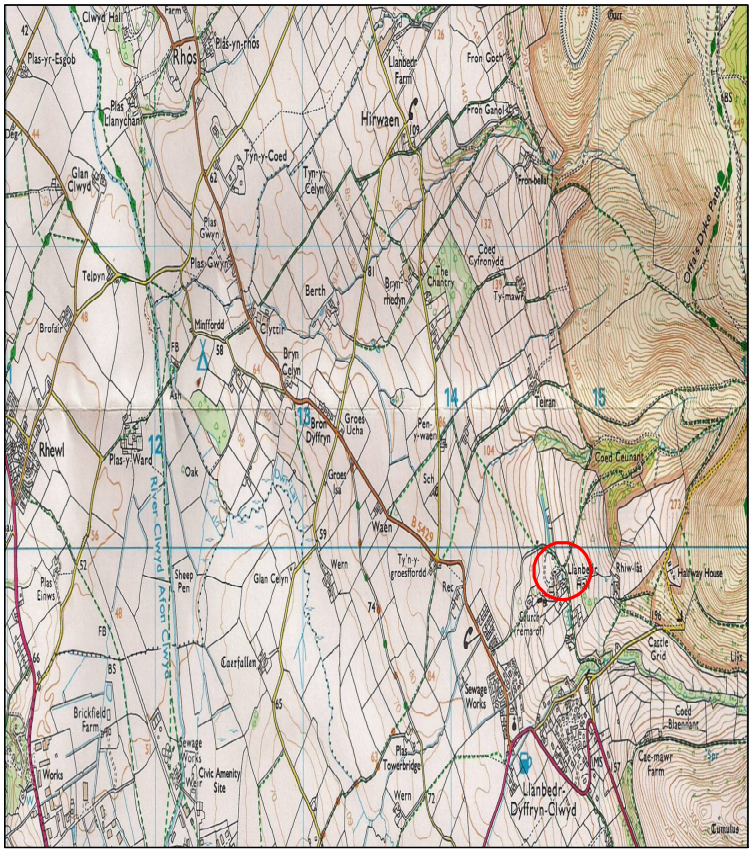

Figure 1: Location
Scale 1:25,000

0 50 m

Figure 2: Location of the Survey
Based on image from Google Earth
Scale 1:1,000

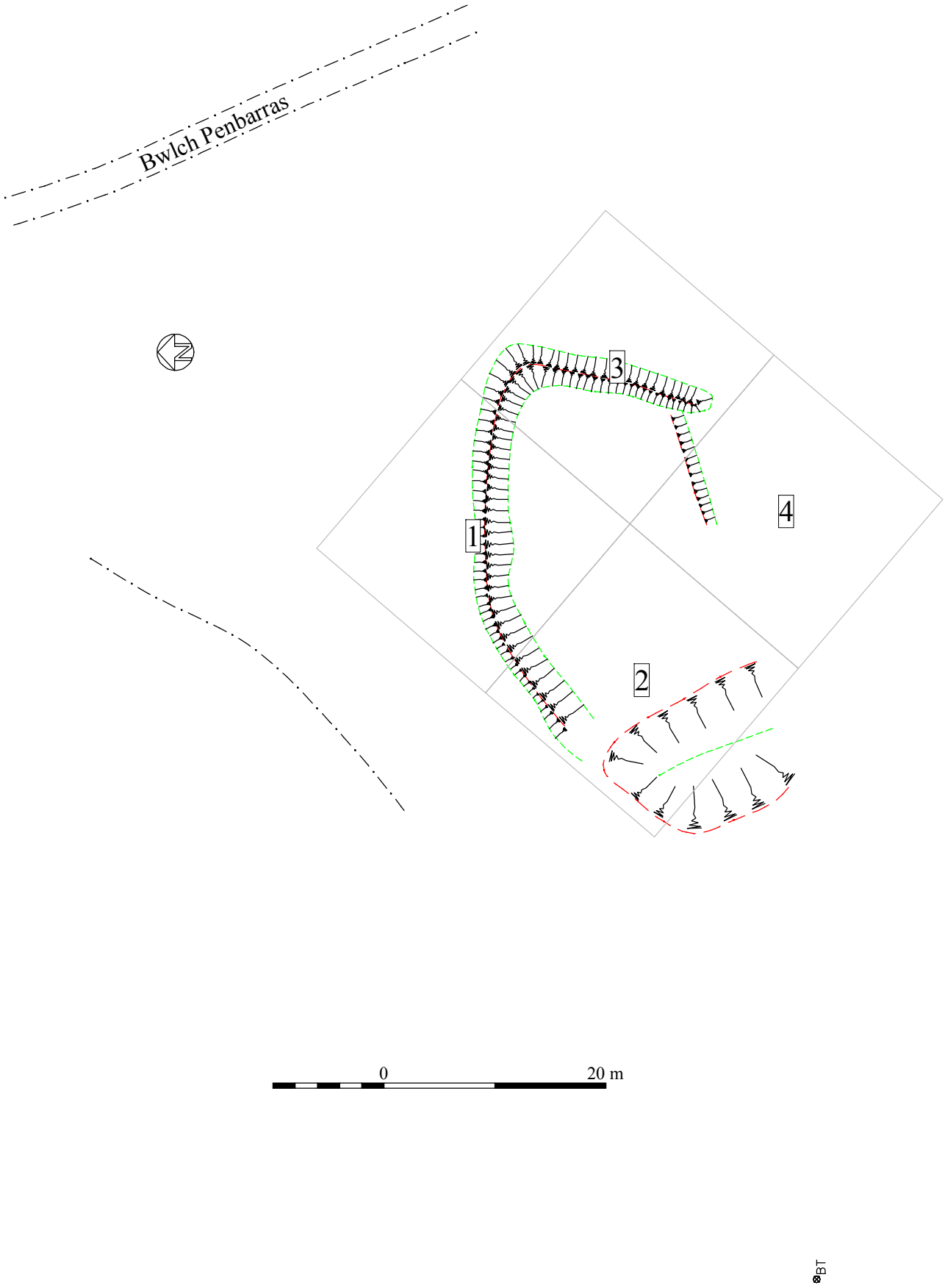

Figure 3: Hachure Survey
Scale 1:500

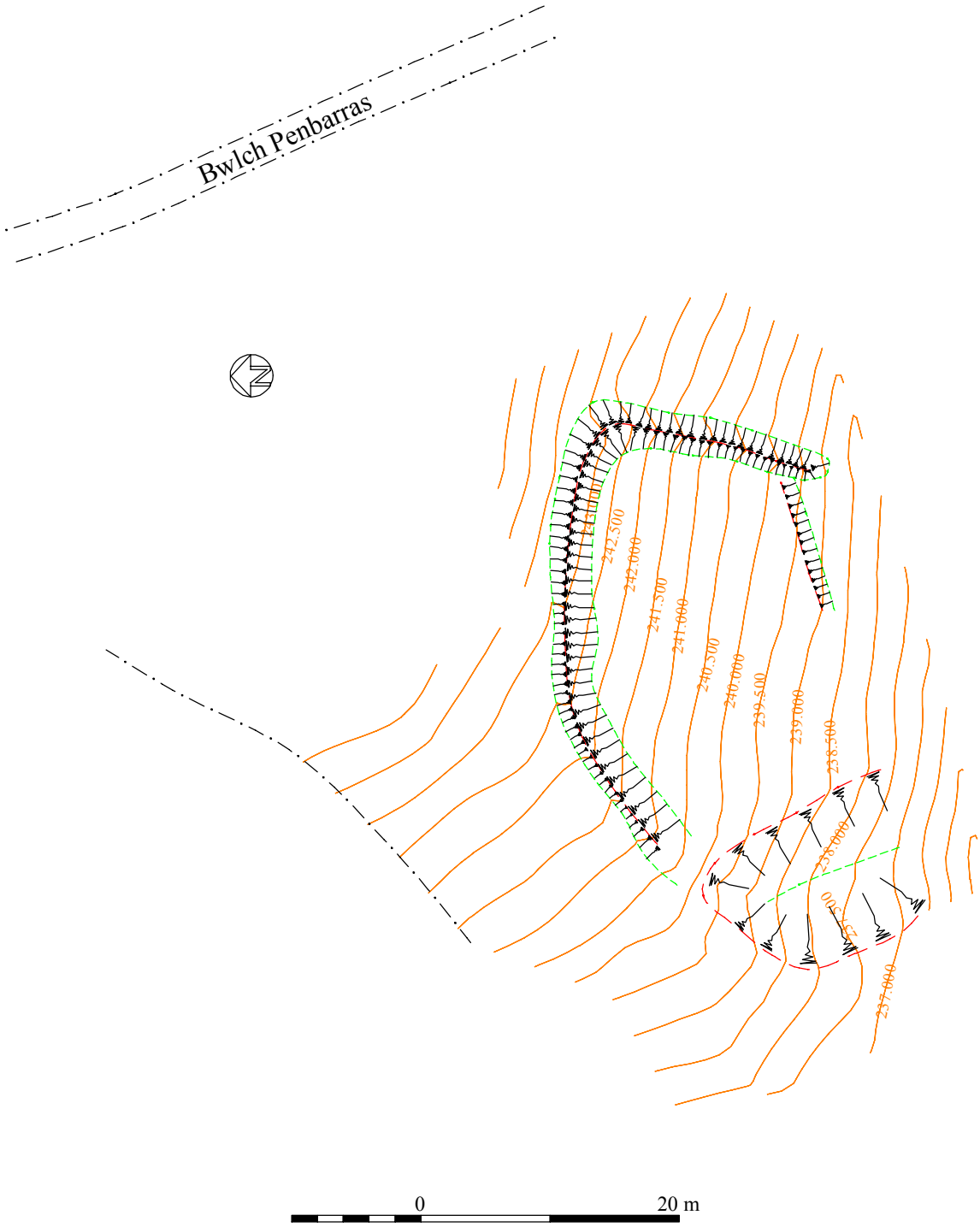

Figure 4: Contour Survey
Scale 1:500

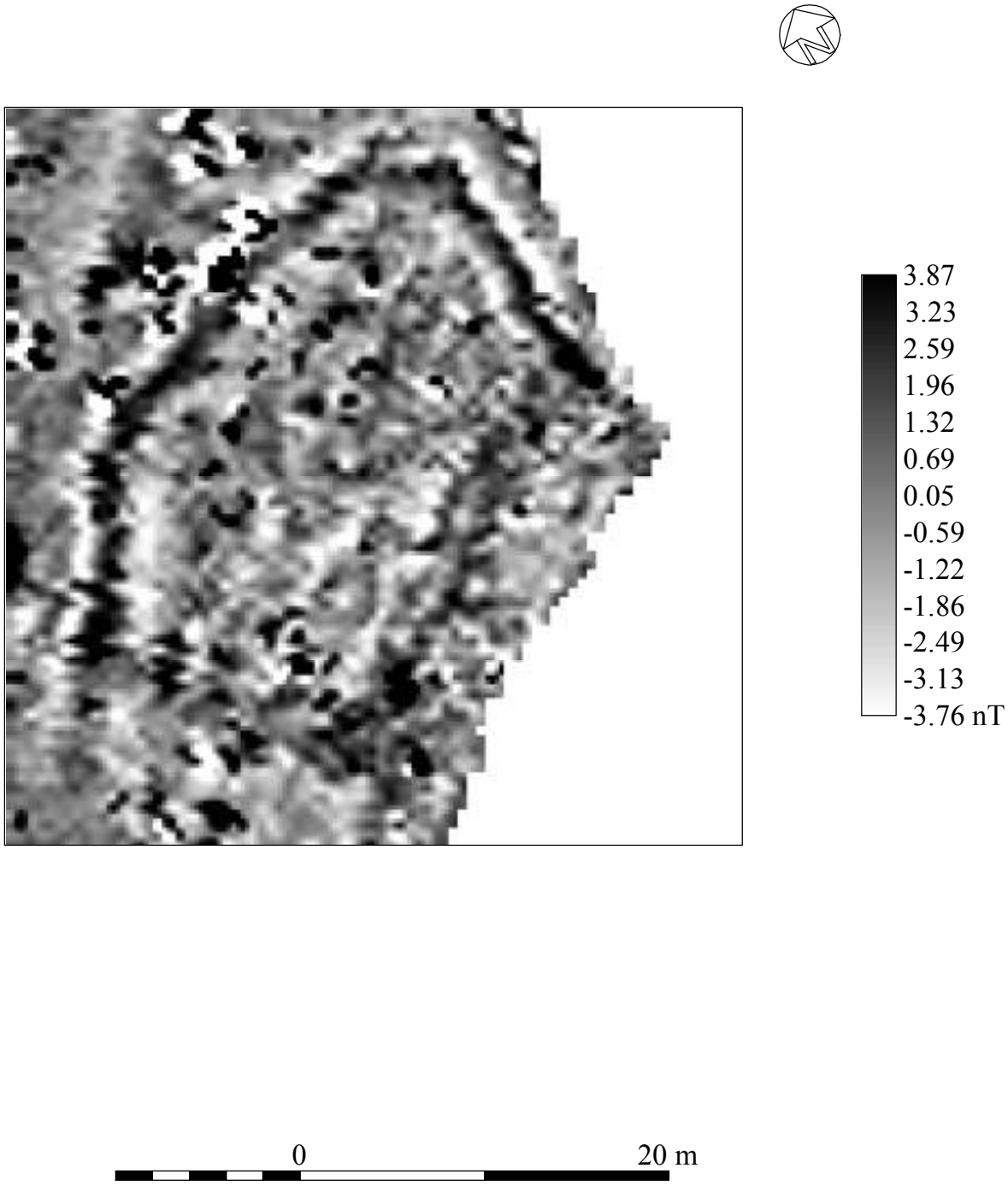

Figure 5: Grey Scale Plot
Scale 1:350

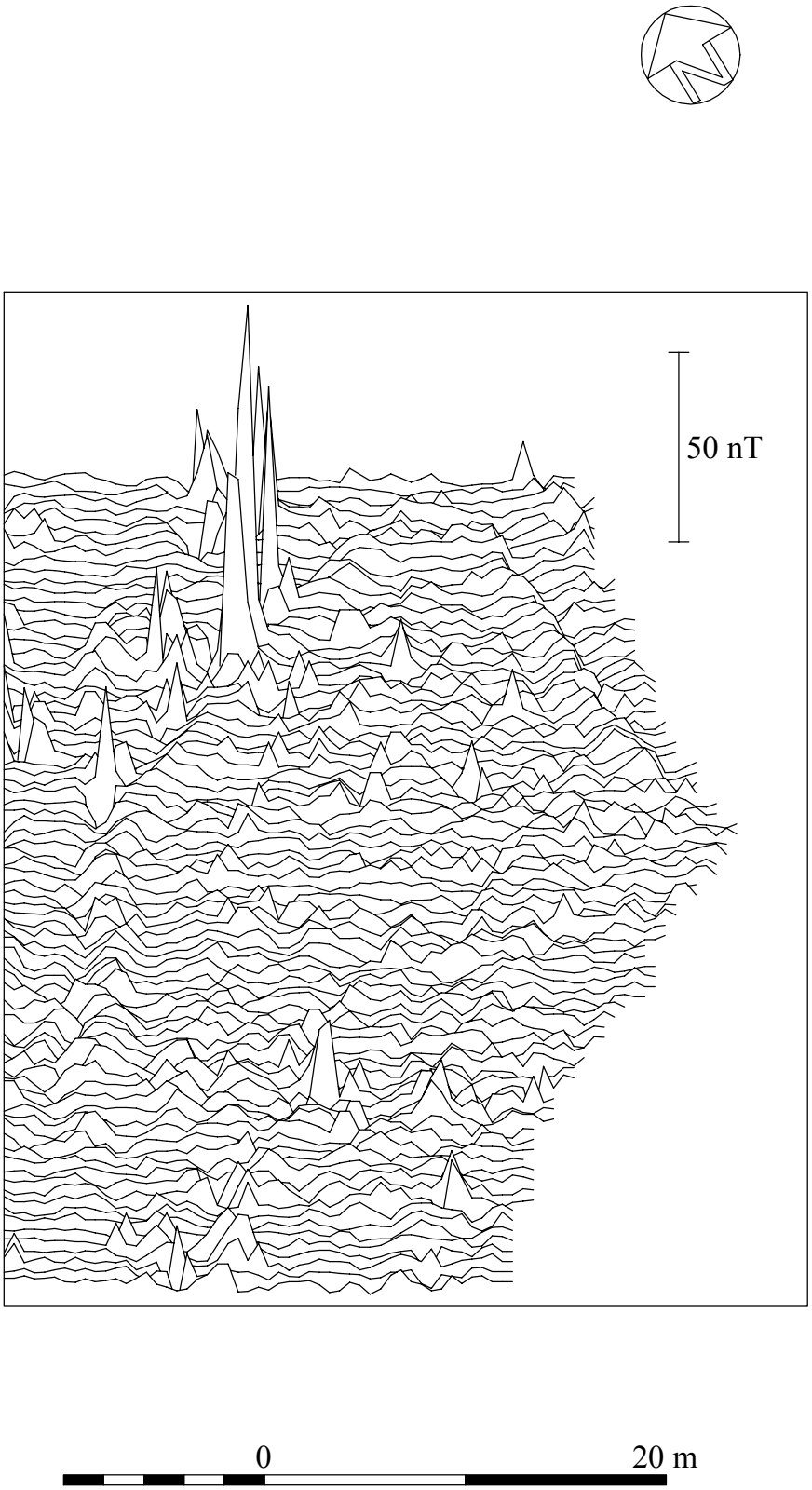

Figure 6: X - Y Plot
Scale 1:350

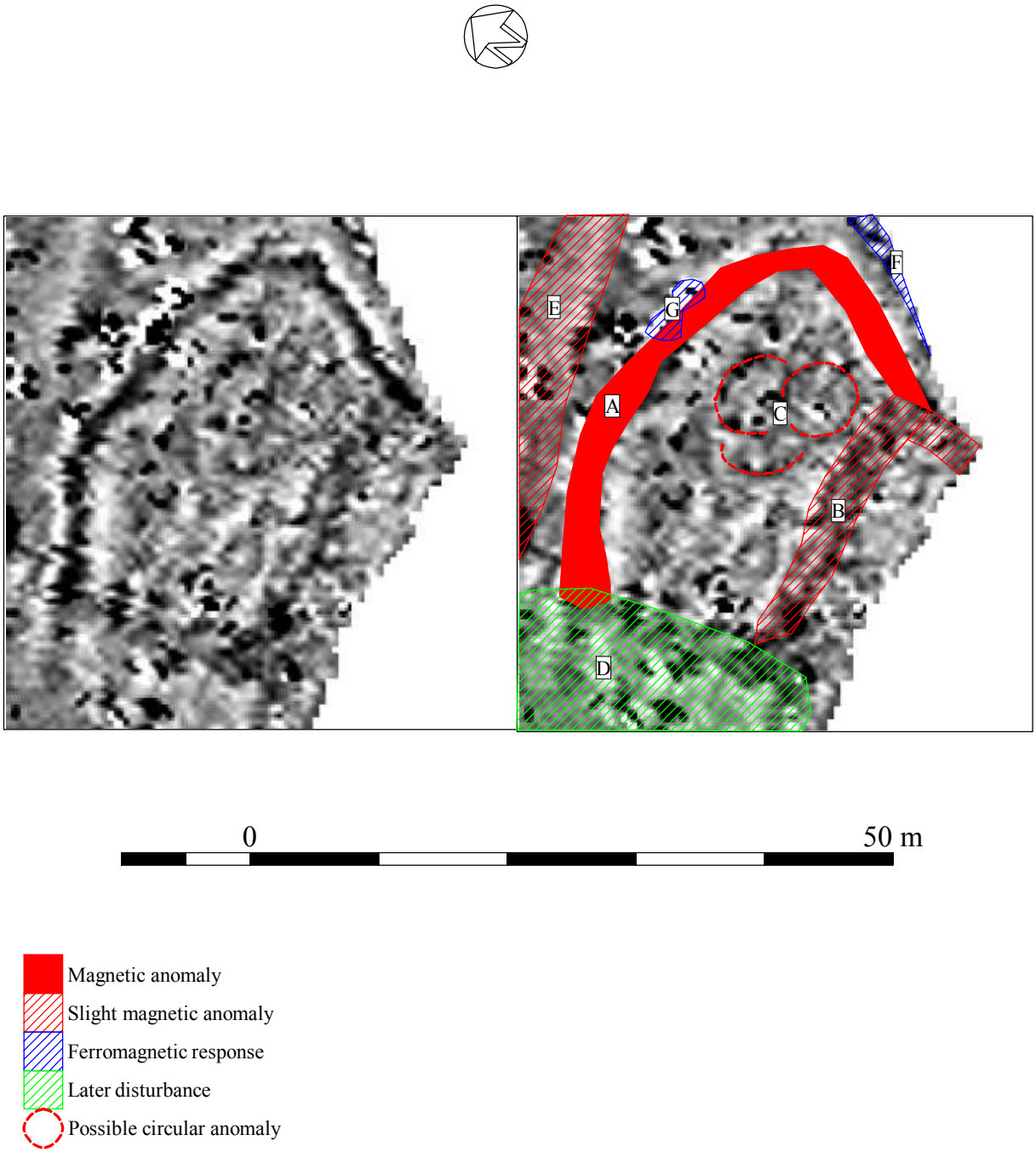

Figure 7: Interpretation
Scale 1:500

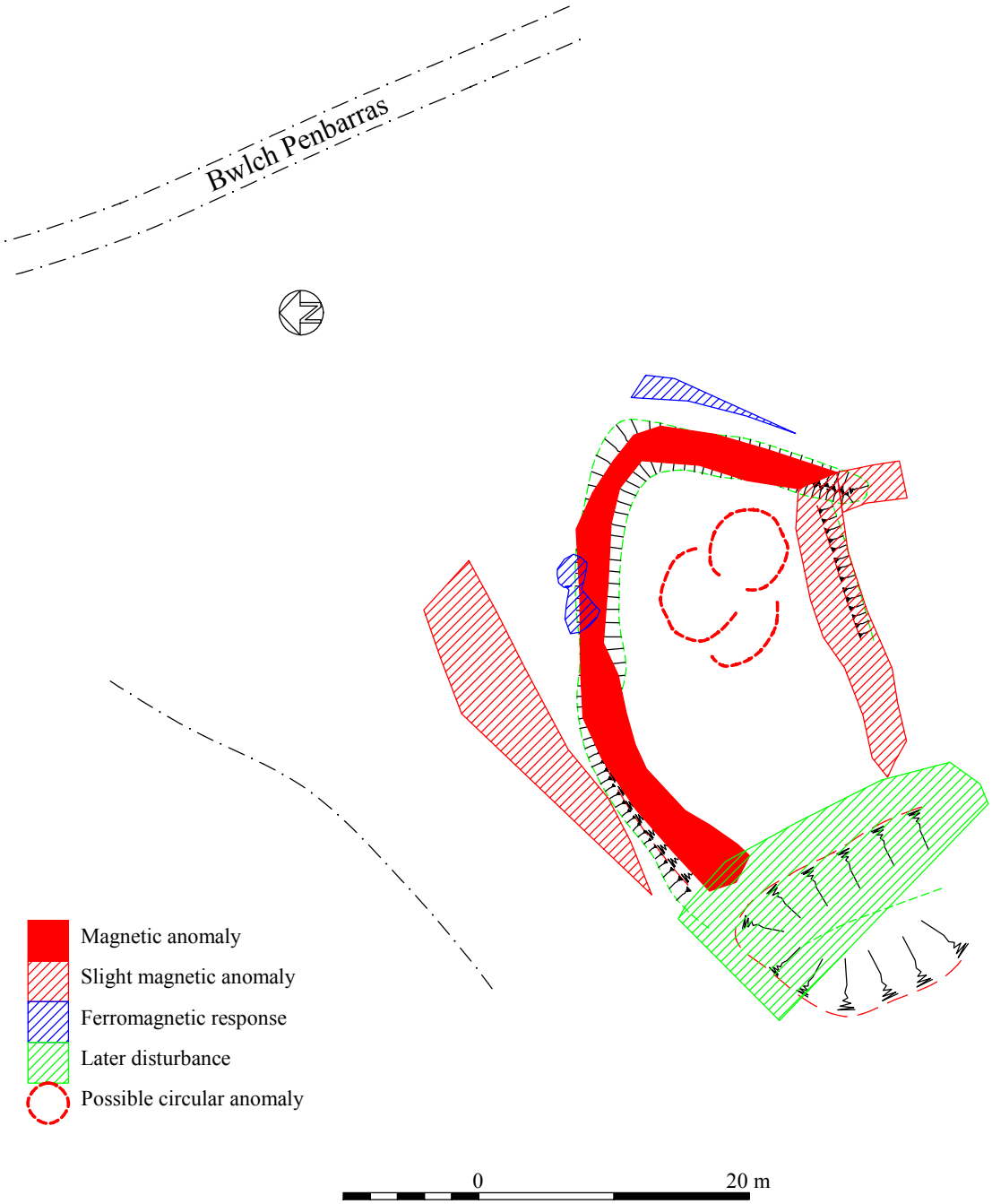

Figure 8: Summary
Scale 1:500