FAN ROUND BARROW, TALSARN, CEREDIGION CD 078 GEOPHYSICAL SURVEY

Prepared by Dyfed Archaeological Trust
For Cadw

ymddiriedolaeth archaeolegol DYFED archaeological trust

Report No. 2010/8

DYFED ARCHAEOLOGICAL TRUST

RHIF YR ADRODDIAD / REPORT NO. 2010/8
RHIF Y PROSIECT / PROJECT RECORD NO. 98684

Ionawr 2010
January 2010

FAN ROUND BARROW, TALSARN, CEREDIGION CD078 GEOPHYSICAL SURVEY

Gan / By

PHILIP POUCHER

Cadw

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Ymddiriedolaeth Archaeolegol Dyfed Cyf
Neuadd y Sir, Stryd Caerfyrddin, Llandeilo, Sir Gaerfyrddin SA19 6AF
Ffon: Ymholiadau Cyffredinol 01558 823121
Adran Rheoli Treftadaeth 01558 823131
Ffacs: 01558 823133
Ebost: info@dyfedarchaeology.org.uk
Gwefan: www.archaeolegdyfed.org.uk

Dyfed Archaeological Trust Limited
The Shire Hall, Carmarthen Street, Llandeilo, Carmarthenshire SA19 6AF
Tel: General Enquiries 01558 823121
Heritage Management Section 01558 823131
Fax: 01558 823133
Email: info@dyfedarchaeology.org.uk
*Website: www.*dyfedarchaeology*.org.uk*

FAN ROUND BARROW, TALSARN, CEREDIGION GEOPHYSICAL SURVEY

CONTENTS **PAGE**

SUMMARY

Following the substantial destruction of a scheduled round barrow (SAM CD078, PRN 4788) near Talsarn, Ceredigion (SN56475870) in the late 1990s Cadw wished to investigate the site to assess if further remains survived prior to consideration for de-scheduling. Cadw therefore commissioned Dyfed Archaeological Trust Field Services to undertake a geophysical survey of the site and its immediate surroundings. The survey was undertaken in December 2009 using a fluxgate magnetometer (gradiometer).

The survey results demonstrated clear remains of the round barrow still survive below ground, consisting of a sub-circular ditch enclosing a possible inner bank and mound remnants, within which was evidence of possible further funerary features.

Further sites of possible archaeological interest were also revealed in the immediate area around the round barrow. To the northwest lay a curving line of 10 or more possible sub-circular pits up to 2m in diameter. To the north a series of three possible ditched and banked enclosures straddled to crest of the ridge, varying in size from c.40m by c.20m, to c.38m x c.12m and c.27m x c.10m, all aligned in the same direction. To the south of the round barrow lay a scattering of possible pits, some large, that may be a combination of both archaeological features and more natural irregular geological depressions or tree bowls. A small curvilinear ditch was also revealed to the south, enclosing an area c.6m in diameter whilst nearby linear features might represent ploughing scars in the underlying geology. Several long linear features were also recorded but as these appeared to respect a modern field boundary it is assumed these features were also modern. Numerous other discrete pits and magnetic anomalies were also revealed across the site but it is difficult to distinguish if these represent archaeological features or natural changes in the geology.

All interpretation at this stage is speculative and further archaeological investigation would be required in order to obtain a better understanding of the function and date of these archaeological features and their relationships. Clearly despite above-ground destruction archaeological features do still survive below-ground, however, continued ploughing, ground-breaking activity and possible future quarrying is likely to pose a continued threat to their survival.

INTRODUCTION

Project commission

A scheduled Bronze Age round barrow (NGR SN 5647 5870), in the form of a cairn, had been substantially destroyed in the late 1990s (Scheduled Ancient Monument no. CD078, Dyfed Historic Environment Record no. 4788). Cadw wished to investigate the site to assess if further remains survived prior to consideration for de-scheduling. Subsequently Cadw commissioned Dyfed Archaeological Trust Field Services to undertake a geophysical survey of the site and its immediate surroundings in April 2009. The fieldwork was undertaken in December 2009.

Scope of the project

The project was designed to detect archaeological features associated with Fan round barrow by geophysical survey, using a gradiometer.

Report outline

Because of the limited nature of this project this report is restricted solely to the results of the geophysical survey.

Abbreviations

Sites recorded on the Dyfed Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Some sites have also been registered as a Scheduled Ancient Monument (SAM). Gradiometer readings are measured in nanoTesla (nT).

THE SITE

Location and Archaeological Potential

The round barrow is located on a ridge of high ground known locally as Fan, between the Afon Aeron and Nant Rhiw-afallen. The site has extensive views across mainly undulating high ground cut by stream valleys but also looks into the Aeron valley to the southeast towards Ystrad Aeron. Several prehistoric hillforts, standing stones and round barrows are located on many of the hilltops in the local area.

The site appears to have been partially excavated in the 19th century by Mr Rogers of Abermeurig, recovering the Abermeurig Cup and a bronze spearhead (see below) that were subsequently sent to the National Museum Wales. A note appears in the 1879 edition of *Archaeologia Cambrensis* which records a bronze paalstab, an ancient British cup, a lance-head and a wooden finial that were 'all dug up near Abermeurig', possibly all from this site at an unknown date by the then owner's (Mr J.E. Rogers of Abermeurig) father. The function of such funerary cups is still debatable but often accompanied a cremation during the Bronze Age, although seeming to go out of use as a practice in the later Bronze Age.

The site itself was previously described during a visit as part of the Prehistoric Funerary and Ritual Site Project in 2004, and was described thus:

Previously described as a cairn, *c*.20m in diameter and 1.5m high, situated on a small knoll on a ridge called Fan, at the top of a crest. The site had been partially excavated. During the excavation a pigmy cup (known as the Abermeurig Cup) and a leaf-shaped, socketed bronze spearhead were found. By the time of the last Cadw visit in 1999 the cairn had been virtually ploughed out, with only a little trace of it to be seen as a slightly stonier area. By the time of the visit in 2004 there were no surface indications of the monument whatsoever. Helen Burnham notes for Cadw in 1999 that the cairn has obviously been destroyed since the May 1996 air photo, and suggests that the site was ploughed in the spring of 1998 or earlier. The site has clearly been ploughed since then again, as no slightly stonier area was detected during the PFRS visit in 2004.

The site still lies under improved pasture with no surface indications visible, lying in an area used as a stock feeding station. A currently disused quarry lies *c*.5-10m to the south of the site.

The underlying geology comprises slate of the Llandovery group overlain by a mix of brown earths and brown podzolic soils.

METHODOLOGY

A fluxgate gradiometer was used for the survey. This detects variations in the earth's magnetic field (full specifications are in Appendix 1). Readings were taken on traverses 1m wide and every 0.25m within a 20m x 20m grid across the whole site. In total an area of *c*.2ha was surveyed. Some eastern areas marked on the original project design survey area were left un-surveyed due to the presence of a quarry and marshy ground.

RESULTS

Limitations

The survey was undertaken over a total of 3 days in December 2009. Weather conditions were dry and cold. The majority of the site was under fairly short grass and was relatively level with sloping ground to the northwest and east, guidelines were also used enabling consistent readings. The area surveyed was bisected by a post and wire fence, alongside which lay a metal animal feeder, readings from which may have obscured finer details in their immediate vicinity. A quarry lay to the southeast, and marshy ground with high reeds lay to the northeast and southeast, all preventing readings being taken in these areas.

The underlying geology was slate of the Llandovery group; this did not appear to cause any geological distortions of the geophysical survey results.

Processing and presentation

Processing was performed using *ArchaeoSurveyor 2*, detailed explanation of the processes involved are described in Appendix 1. The data is presented with a minimum of processing but the presence of high values caused by ferrous objects and wire fencing tends to hide fine details and obscure archaeological features, thus the values were 'clipped' to a range from 15nT to –15nT to remove the extreme values allowing the finer details to show through. During the survey various processes such as changes to instrument set-up, instrument drift, variations in orientation amongst others cause directional effects that are inherent to magnetometers that can produce 'striping' in the processed data, thus much of the survey was 'destriped'.

The processed data is presented as grey-scale plots overlaid on local topographical features. The main magnetic anomalies have been identified and plotted onto the grey-scale plots as a level of interpretation.

Geophysical interpretation

(Results Figure 2 and interpretation Figure 3)

The geophysical survey clearly shows a complex range of archaeological activity throughout the surveyed area, therefore only the major features are discussed. Any interpretation from these geophysical results is by its nature speculative and precise details about the context, function, state of preservation and date of any archaeological features would require further intrusive investigation.

As can be seen in Figures 2 and 3 the site of the round barrow is still visible below ground level (Fig.3, No.1). Positive responses indicate a curvilinear feature, likely to represent a buried ditch up to 1.5m wide, enclosing a sub-circular feature *c*.24m in diameter representing the site of the barrow. There is also small but fairly distinct bulge in the line of the ditch to the northeast, although this may be caused by later (or early) intercutting features. There is no clear evidence of an entranceway in the ditch circuit although the southern section of the ditch lies underneath the line of a modern post and wire fence that prevented readings being taken in this area.
Negative responses along the inner side of this ditch suggest a possible internal bank running the full circuit, although the strength of these responses would suggest the bank is clearly denuded and may just be part of an internal mound. The magnetic responses from within the confines of the ditch are generally more negative than the surrounding subsoil, suggesting remnants of an internal mound do survive. Internally, just to the southeast of the centre point, positive linear responses suggest a small ditch marking a sub-rectangular feature measuring *c*.4m by *c*.6m (Fig.3, No.2). In the north-western part of the enclosure area several small areas of positive responses clustered in a small group (Fig.3, No.3). These responses would suggest possible pits, and similar examples also appear across the barrow enclosure.

To the northwest of the barrow are a series of sub-circular positive anomalies up to 2.5m across, typical of a series of pits (Fig.3, No.4). Around 10 of these pits are visible, fairly evenly spaced and running in a curving line *c*.40m long. Further possible outliers are also visible in this area. The regularity of this arrangement would indicate these are archaeological features rather than naturally formed depressions or tree bowls.

To the north of this, positive responses indicate an L-shaped linear feature, typical of a buried ditch (Fig.3, No.5). The northern side runs for *c*.30m in a straight line, turning south and forming a curved line *c*.18m long. Running adjacent to these ditches are further possible negative linear features that appear to continue to the west with a return to the south. These negative features are typical of buried banks. These form three sides of a sub-rectangular enclosure *c*.40m by *c*.20m with the suggestion of a southern side, but these results are less clear. There would also appear to be a series of stronger positive and negative responses from within this possible enclosure that could be indicative of further archaeological activity. However, these stronger responses may also be in response to changes in the underlying geology across this area.

To the north of this are a series of faint negative linear anomalies that could be indicative of two further embanked enclosures running along the summit of the ridge (Fig.3, Nos. 6 & 7). Both these possible enclosures are aligned on the same axis as the larger enclosure (Fig.3, No.5), the southern one measuring *c*.38m x *c*.12m and the northern one *c*.27m x *c*.10m, both also appear to be overlain by a later linear feature (Fig.3, No.13).

To the south of the barrow site lie several discrete areas of positive responses. To the southwest these responses form large irregular features that would appear more natural in origin (Fig.3, No.10). However, immediately south of the barrow smaller, more regular, areas of positive responses may be representative of archaeological features such as pits. A small curvilinear positive anomaly is also recorded nearby, often typical of a buried ditch (Fig.3, No.9). This curvilinear may be the remnants of a sub-circular enclosure *c*.6m across.

Close by are a series of three narrow positive linear anomalies, again typical of small buried ditches or gullies (Fig.3, No.8). The two westernmost linears run for *c*.15m curving slightly eastward and lying almost parallel to each other. To the east a shorter linear runs for *c*.5m curving in the opposite direction. It is possible these anomalies could represent archaeological features although it was noted that topsoil was thin in this area, as can be seen in the section of the nearby quarry, and therefore these features could represent ploughing scars in the underlying bedrock.

The surveyed area is crossed by a series of both negative and positive linear anomalies (Fig.3, Nos.11-13). These linears are perpendicular to, and do not appear to extend beyond, the modern fenceline crossing the site and are therefore likely to be modern features, possibly agricultural drainage.

It is possible to identify several other anomalies spread throughout the survey area, however it is difficult to distinguish definite archaeological features from natural features, especially given the limited depth of topsoil and subsoil across the upper part of the ridge.

CONCLUSIONS

It is clear from the survey results that although surface traces of Fan round barrow have now gone remnants of the feature do still survive below ground. This would appear to consist of a surrounding ditch with a possible accompanying inner bank and remnants of mound material, and several features within the limits of the ditch indicate funerary features also survive below ground.

Several archaeological features appear to have been picked up by the geophysical survey in the surrounding landscape. A curving row of possible pits lie adjacent to the round barrow, and a series of sub-rectangular enclosures appear to extend to the north with the possibility of further uncategorised features to the south. The identification of these features is not immediately obvious, and it cannot be clearly ascertained from the geophysical survey results if these are genuine archaeological features rather than more recent agricultural features. Their ridge-top location in an agricultural landscape is likely also to have lead to some degradation of these features.

Due to the limited depth of topsoil across this ridge top continued ploughing and ground-breaking activity poses a clear threat to the continued survival of any identified archaeological features in this area. The presence of a nearby quarry that has clearly been extended at some point in the 1990s is also a threat to the continued survival of this archaeology. However, further intrusive archaeological work would be required in order to fully categorise both the state of preservation of Fan round barrow and the nature and condition of surrounding features identified during this survey.

ACKNOWLEDGEMENTS

The survey was undertaken by Mike Ings and Phil Poucher. I am indebted to the landowner Mr & Mrs Wright for allowing access to the fields.

ARCHIVE DEPOSITION

The archive will initially be held by DAT, before being passed to the National Monument Record, Aberystwyth.

SOURCES

British Geological Survey 1994 *The Rocks of Wales* 1:250,000

Clark A J 1996 *Seeing Beneath the Soil* (2nd edition). Batsford, London

Parker Pearson M 2005 *Bronze Age Britain*. Batsford, London

APPENDIX 1: METHODOLOGY AND INSTRUMENTATION

Geophysical Survey Instrumentation

A fluxgate gradiometer survey provides a relatively swift and completely non-invasive method of surveying large areas.

The survey was carried out using a Bartington Grad601-2 dual Fluxgate Gradiometer, which uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies.

The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetised iron oxides, which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil therefore contain greater amounts of iron and can therefore be detected with the gradiometer. There are, however, other processes and materials that can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Archaeological features such as hearths or kilns also produce strong readings because fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the surrounding soil leading to a more generalised magnetic enhancement around settlement sites.

Not all surveys produce good results as anomalies can also be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material within the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in features being un-detectable. It must therefore be stressed that a lack of detectable anomalies cannot be taken to mean that that there are no below ground archaeological features.

The Bartington Grad601 is a hand-held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 1.0m apart. Their Mumetal cores are driven in and out of magnetic saturation by an alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output (Clark 1996).

The gradiometer can detect anomalies down to a depth of approximately one metre. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT; typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The instrument is capable of detecting changes as low as 0.1nT.

Geophysical Survey Data Collection

The gradiometer includes an on-board data-logger. Readings in the surveys were taken along parallel traverses of one axis of a grid made up of 20m x 20m squares. The traverse intervals were either 0.5m or 1.0m apart. Readings were logged at intervals of 0.25m along each traverse giving 3200 readings per grid

square (medium resolution on 0.5m traverses), or 1600 readings per grid square (low resolution on 1.0m traverses).

Geophysical Survey Data presentation

The data was transferred from the data-logger to a computer where it was compiled and processed using ArchaeoSurveyor 2 software. The data is presented as grey-scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. A separate grey-scale plot with interpretation of the main features is also included as necessary.

Geophysical Survey Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. High readings caused by stray pieces of iron, fences, etc are usually modified on the grey scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. The data on some noisy or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of low pass filtering can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

Reliability

Geophysical survey is an immensely useful tool but it should be realised that while a survey will detect a wide range of features, it may not detect *all* buried features. A gradiometer survey detects changes in magnetic flux density and relies on there being a detectable difference between the archaeology and the substrate. This may not occur for many reasons (e.g. a cut feature being backfilled with subsoil). It must therefore be stressed that a lack of archaeological responses from a geophysical survey does not prove that there is no archaeology present.

Grid locations

The survey grids were located by measurements to fixed points such as known field boundaries located during the survey.

Bibliography

Clark A J 1996 *Seeing Beneath the Soil* (2nd edition). Batsford, London

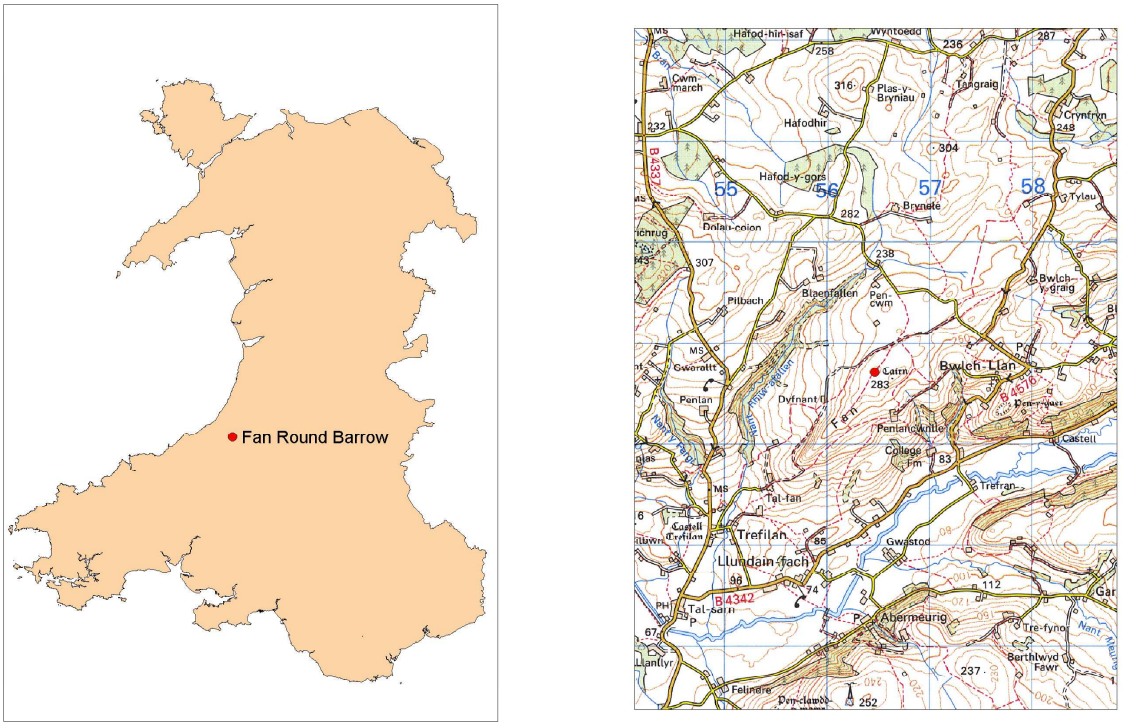

Figure 1: Location map, based on the Ordnance Survey.

Reproduced from the 1995 Ordnance Survey 1:50,000 scale Landranger Map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright Cambria Archaeology, The Shire Hall, Carmarthen Street, Llandeilo, Carmarthenshire SA19 6AF. Licence No AL51842A

Photo 1: Aerial photograph of the site taken from the south in 1989.

Photo 2: Aerial photograph of the site taken from the north in 1992.

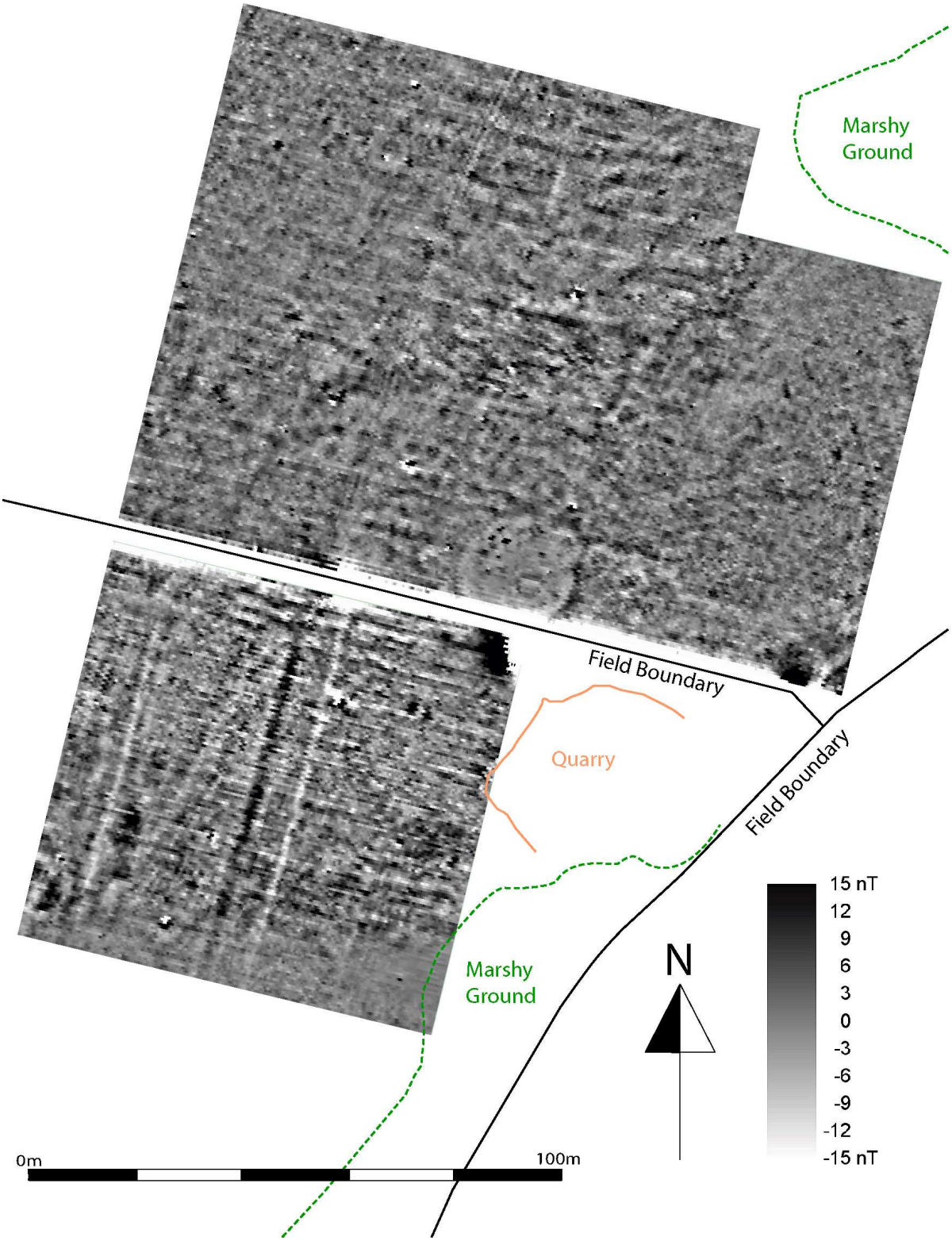

Figure 2: Processed gradiometer survey, grey-scale, overlaid on local geographical features.

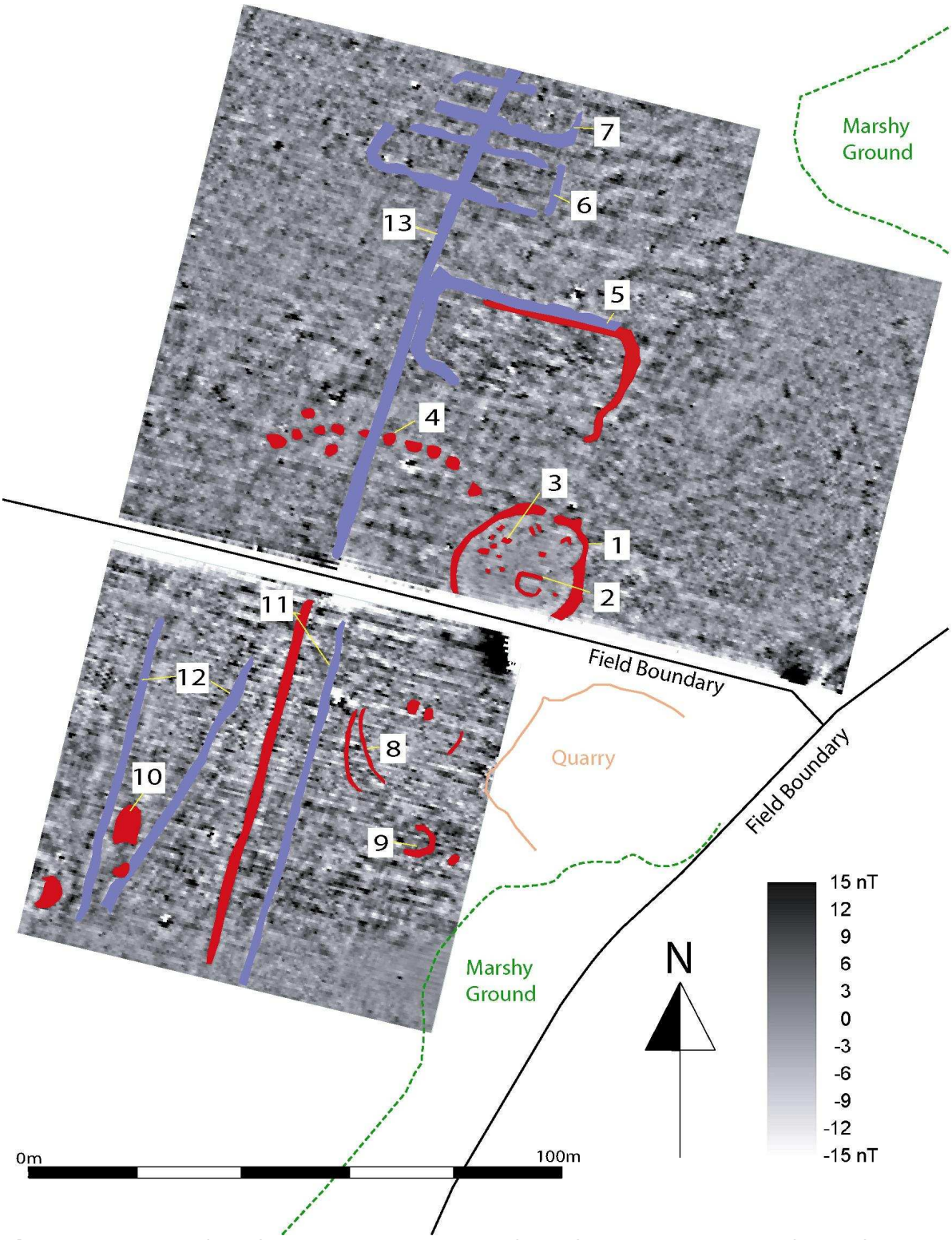

Figure 3: Processed gradiometer survey, grey-scale, with interpretation. Numbers relate to 'Geophysical Interpretation' section in the main text, red highlights the main positive anomalies, blue highlights the main negative anomalies.

FAN ROUND BARROW, TALSARN, CEREDIGION
CD 078
GEOPHYSICAL SURVEY

RHIF YR ADRODDIAD / REPORT NUMBER 2010/8

Ionawr 2010
January 2010

Paratowyd yr adroddiad hwn gan / This report has been prepared by

Philip Poucher

Swydd / Position: Archaeologist

Llofnod / Signature  Dyddiad / Date 12.03.2010

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.

This report has been checked and approved by
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Director

Llofnod / Signature  Dyddiad / Date 12.03.2010

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any comments you may have on the content or presentation of this report

INVESTOR IN PEOPLE
BUDDSODDWR MEWN POBL