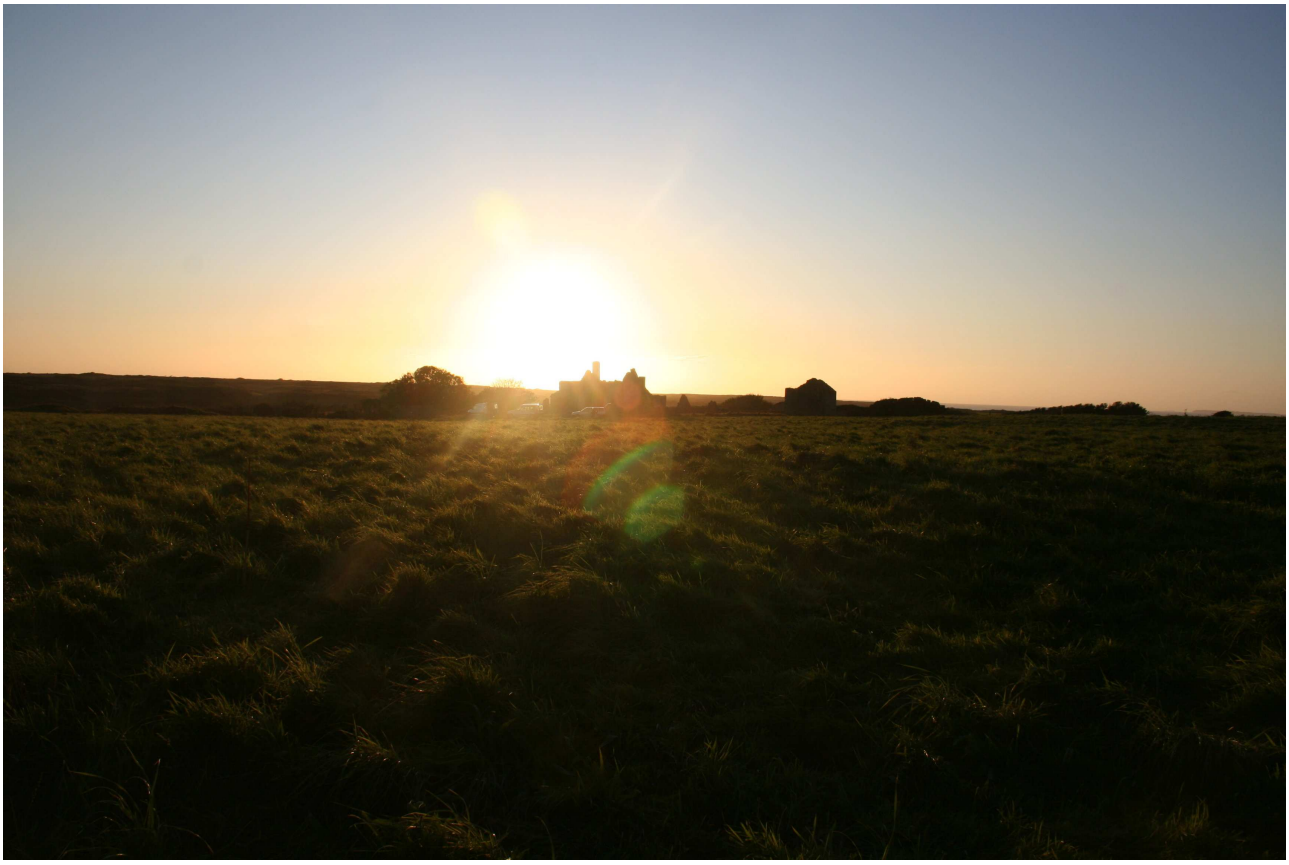
PRICASTON, CASTLEMARTIN PEMBROKESHIRE

GEOPHYSICAL SURVEY

REPORT NUMBER 2009/7



Prepared by Dyfed Archaeological Trust
For: Landmarc Support Services Limited

ymddiriedolaeth archaeolegol
DYFED
archaeological trust

DYFED ARCHAEOLOGICAL TRUST

RHIF YR ADRODDIAD / REPORT NO. 2009/7
RHIF Y PROSIECT / PROJECT RECORD NO. 94749

Ionawr 2009
January 2009

PRICASTON, CASTLEMARTIN
PEMBROKESHIRE
GEOPHYSICAL SURVEY

Gan / By

Pete Crane Ba Hons MIFA

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*

Cwmni cyfyngedig (1198990) ynghyd ag elusen gofrestredig (504616) yw'r Ymddiriedolaeth. The Trust is both a Limited Company (No. 1198990) and a Registered Charity (No. 504616)
CADEIRYDD *CHAIRMAN: C R MUSSON MBE B Arch FSA MIFA.* CYFARWYDDWR *DIRECTOR: K MURPHY BA MIFA*

CONTENTS

Cover: Pricaston at sunset

SUMMARY

A geophysical survey was undertaken on land to the east of Pricaston medieval farmhouse that now lies within the Castlemartin Firing Range, Pembrokeshire. A circular anomaly was recorded, possibly a prehistoric barrow or a medieval dovecote. There were also other features that may represent the remains of medieval or later buildings and enclosures. However, there is considerable evidence of twentieth century activity, associated with the firing range, which probably obscures any indications of earlier features in parts of the site.

INTRODUCTION

Project commission

Landmarc Support Services Limited contracted Dyfed Archaeological Trust to undertake a geophysical survey on to the east of Pricaston Farmhouse, Castlemartin Firing Range, Pembrokeshire (centred on NGR SR 91900 96500) (Fig 1). Dyfed Archaeological Trust was also commissioned to carry out standing building recording on the Farmhouse itself which has been reported on separately (Pyper and Wilson 2009).

Scope of the project

The project was designed to establish whether there are significant archaeological features to the east of the farmhouse: in particular was there any indication of a medieval village or settlement.

Report outline

Because of the limited nature of this project, together with the considerable archaeological evidence in the area, this report is restricted solely to the results of the geophysical survey.

Abbreviations

Sites recorded on the Regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR).

THE SITE

Location and Archaeological Potential

The area surveyed is located in the field immediately to the front (east) of the ruins of Pricaston Farmhouse and part of the field to the north. The survey is centred at NGR SR 91900 96500 and is 1.9km to the south of Castlemartin village. There is a north – south division within the survey area defined by an old sunken track running east – west (9 on Fig. 3), with the greater portion on the survey to the south of the track. The area is mostly long pasture, but it also has some clumps of thorn within it and along part of its eastern edge. The area is grazed but and is also part of the MOD training area.

Surface features consist of:

> The remains of a sunken trackway running approximately east-west, extending from one of the clumps of thorn. There is a deep sunken area to the south of the track, running roughly from north-east down the south-west, starting just south of the sunken trackway and extending to the southern edge of the field. There is one bump, approximately 0.5m high, towards the northwestern part of the main field that may be the remains of a small outbuilding shown on the first edition 0rdnace Survey Map 1865. There is a modern metalled trackway running north-south about 3m to 7m east of the post and wire fence in front of the ruins of the Farmhouse. Also between the trackway and the fence for much of its length there is a steep drop, possibly a former ditch. The ground slopes gently down southwards from the sunken track.

A brief history is included in the standing building report (Pyper and Wilson 2009). The first mention of Pricaston was in 1325 and, given its subsequent long occupation, it was suspected that there could have been adjacent settlement around the Farmhouse, and the most likely location would have been to the east.

METHODOLOGY

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 interval was 0.5m. Readings were logged at intervals of 0.25m along each traverse giving 3200 readings per grid square (medium resolution).

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 (Fig 2) 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 (Fig 3).

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 field boundaries.

RESULTS

Limitations

The survey was undertaken on the 4th and 5th October 2008. On the first day the weather was inclement, gale force winds with driving rain and drizzle with reduced visibility. The second day started with drizzle but soon turned into a fine and breezy day. The rough pasture was quite long, and there was one large depression and a former trackway that also reduced survey pace and would have introduced small unevenness in the data. The patches of thorn within the survey area were impenetrable. Sixty-one 20m by 20m squares or part squares were surveyed with a total area of about 2.25ha.

The underlying geology is limestone, with light sandy topsoil. This did not appear to cause any geological survey problems. However, there were a very large number of strong responses from ferrous debris and cables. These produce bipolar responses, adjacent black and white (Figs 2 and 3).

Geophysical interpretation
(Fig 3)

Only the major features are discussed below, as there are a large number of small anomalies. A lot of these are bipolar responses and are therefore likely, in this instance, to be ferrous debris, although some of these could be heat-affected features. There are a number of small negative anomalies that may be archaeological in origin but form no recognisable shape.

The most obvious anomaly is a circular response (1), about 10m diameter. Part of this circular feature is affected by ferrous material - bipolar response - on the southeast side. There may be an entrance just to the north of this. Within the circle there are two positive (black) features; the northern of these may be heat-affected or contain heat-affected material. The other to the south is too small and low a response to interpret. There are a few possible interpretations for this circular feature: the circular ditch around a Bronze Age barrow (there are a

number of barrows within the Castlemartin Firing Range area); the robbed out footing of a larger than normal (for Pembrokeshire) dovecote; the remains of a circular threshing floor, or other agricultural building that would require an animal to walk around a central post, such as a cider press; the drainage gully surrounding an Iron Age roundhouse.

There are two possible robbed buildings (2 and 3). The western of these is more distinct and appears to have a southern end. Both of these features are orientated in relationship to the probable boundaries ditches (7) and also to the linear hollow (10).

There are a number of adjoining faint linear anomalies (4). These may represent robbed out walls or be the remains of drainage ditches or small boundary gullies. These may continue further south, but are too vague to plot with any certainty.

It is possible that a fence line (5) exists, as there is a line of apparently evenly spaced small features. However, given the number of apparent random small anomalies this could be a false alignment.

There is an anomaly indicating a heat-affected area (6), c. 5m diameter, towards the southern area of the survey and just to the west of the linear anomaly. This could be also be a pit containing heat-affected material and may be the remains of a corn drier, furnace or kiln.

Linear anomalies (7) probably represent in-filled boundary ditches. These appear to be on the same alignment or at right angles, and therefore could well be contemporary. Their date is uncertain, but a medieval or post-medieval date is probable. On a similar alignment, in the southeastern part of the survey, there is an area of faint negative (lighter) and positive (darker) striping (8). This may be the result of ploughing.

The sunken trackway (9), mentioned in the description of the surface features, can also be seen as a slight geophysical anomaly, but is hidden to a great extent by modern cable or pipe trenches. The hollow appears to have been partly in-filled just to the east of the thorn patch.

The linear hollow, as also mentioned in the description of the surface features, again shows as a vague geophysical anomaly (10). The upper part, northeast, of this hollow starts where part of the sunken trackway has been filled in. This may be significant as the hollow could be the result of a borrow pit for the construction of the bunker, to the northeast of the survey, and the borrow pit extended to the southwest, enabling it to drain. If this is not a modern feature it is likely to be natural.

The metalled trackway does not show on the geophysical survey. However, the modern cable trenches are clearly visible as bipolar linear features. It is possible that some of these anomalies could be trenches with iron pipes.

DISCUSSION AND SUGGESTIONS FOR FURTHER WORK

Before any further work is considered in this area it is suggested that a quick topographic survey is made of the surface features and these are related to the geophysical survey to check any correlation of features.

The circular feature (1) is perhaps most likely to be the remains of a medieval dovecote. These were high status structures and would be positioned in a

prominent location, as here, in front of the Farmhouse. However, a prehistoric funerary site or roundhouse cannot be ruled out. This feature could be easily proved with a small trial trench without causing significant damage to the archaeology.

The possible buildings (2 and 3) will have to remain as a dubious interpretation unless tested by excavation. It would be advantageous to know whether the adjoining linear features (4) are robbed walls or gullies.

The heat-affected area or pit (6) could again be tested by a trial trench; it is likely to contain charcoal that could be radiocarbon dated.

The main surface feature on the site is the linear hollow (10). To determine if this feature is modern or natural is potentially most important for interpretation of the area as a whole. This question should be readily answered by a shallow machine-dug trench across it, possibly located adjacent to the heat-affected feature (6).

CONCLUSION

Even with the modern cable trenches and ferrous debris, a number of significant features have been revealed. However, these do not appear to represent a settlement adjacent to Pricaston Farmhouse and are more likely to represent ancillary buildings and other agricultural activity, with a possibility that some are prehistoric.

ACKNOWLEDGEMENTS

I would like to thank Anna Sutcliffe of Landmarc Support Services Limited for help with arranging this project. I would also like thank Hubert Wilson and Andrew Shobbrook help with this geophysical survey.

ARCHIVE DEPOSITION

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

SOURCES

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

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

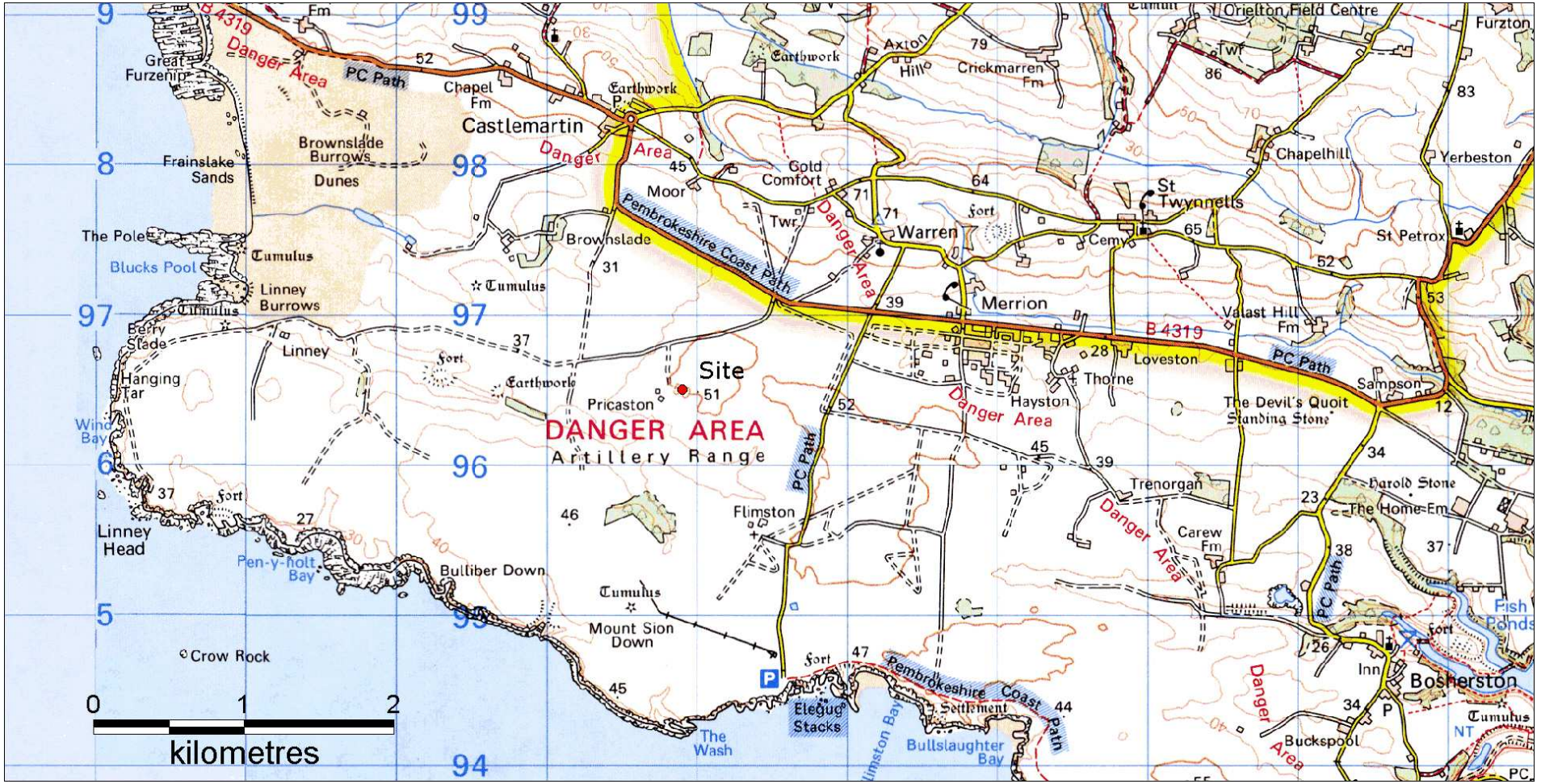
Ordnance Survey 1865 1st Edition. Pemb XLII.06

Ordnance Survey 1865 1st Edition. Pemb XLII.07

Ordnance Survey 1908 2nd Edition. Pemb XLII.06

Ordnance Survey 1908 2nd Edition. Pemb XLII.07

Pyper A and Wilson H 2009 Pricaston, Castlemartin, Standing building recording. Unpublished report, copy held by HER DAT report no 2009/4



Reproduced from the 1997 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.

Figure 1: Location

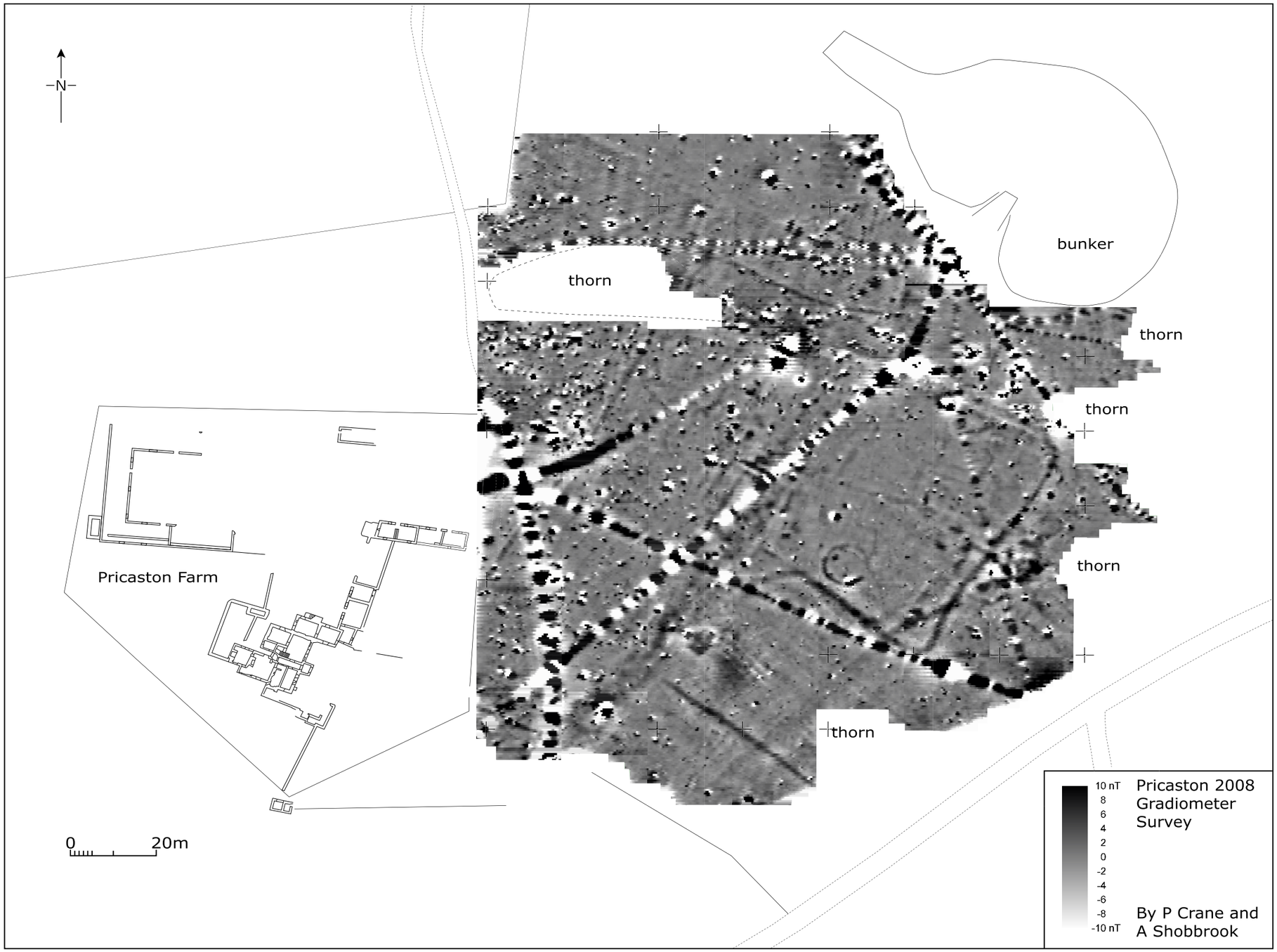


Figure 2: Gradiometer survey, grey-scale plot. Scale 1:1000 at A3

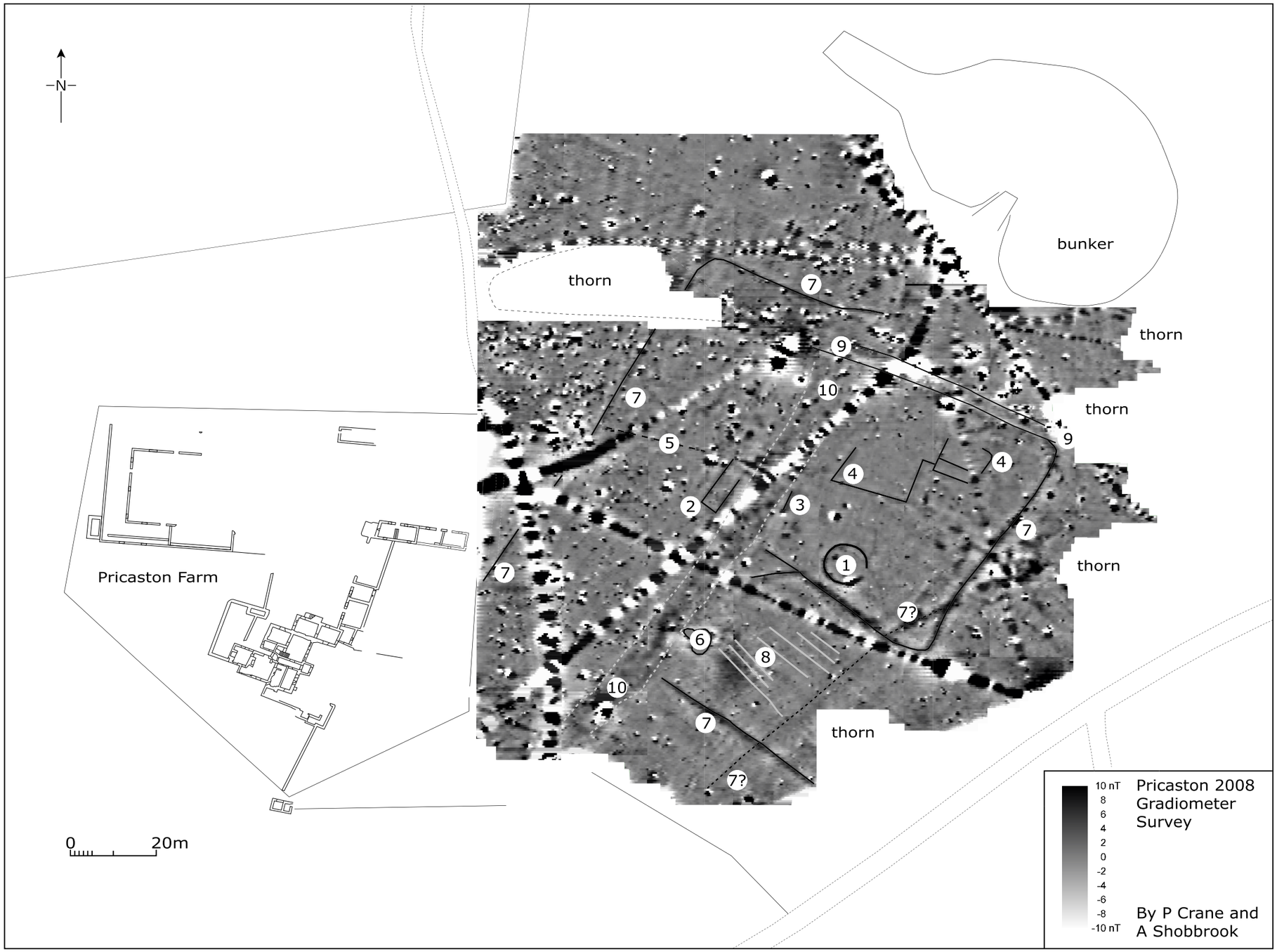


Figure 3: Gradiometer survey, grey-scale plot with interpretation. Scale 1:1000 at A3

PRICASTON, CASTLEMARTIN
PEMBROKESHIRE
GEOPHYSICAL SURVEY

RHIF YR ADRODDIAD / REPORT NUMBER 2009/7

Ionawr 2009
January 2009

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

Swydd / Position: Senior Archaeologist

Llofnod / Signature ..... Dyddiad / Date

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by Ken Murphy

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Trust Director

Llofnod / Signature ..... Dyddiad / Date

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