GILFACH GOCH, FISHGUARD, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2019



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GILFACH GOCH, FISHGUARD, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2019

By

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GILFACH GOCH, FISHGUARD, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2019

SUMMARY

DAT Archaeological Services were commissioned by the Pembrokeshire Coast National Park Authority (PCNPA) to undertake a geophysical survey in a parcel of land at Gilfach Goch, Fishguard. The purpose of the survey was to investigate the site of a circular feature noted in a pasture field, identified as the potential site of a round barrow or roundhouse. The survey was requested so that it could provide a better indication of the archaeological potential of the site enabling management plans to be put in place.

Throughout the survey area large concentrations of magnetic spikes were seen that probably reflect geological background noise (from the igneous geology). The area of the possible circular feature itself is surrounded by a cluster of magnetic responses, but interestingly the interior is very magnetically quiet, possibly a result of stone clearance from the area. No associated ditches or pits were observed with archaeological characteristics. This makes it difficult to determine whether the possible circular feature does have an archaeological origin or not. Unfortunately, the results in this instance have been inconclusive and intrusive evaluation would be required to provide any definitive results.

CRYNODEB

Comisiynwyd Gwasanaethau Archeolegol YAD gan Awdurdod Parc Cenedlaethol Arfordir Penfro (PCAP) i ymgymryd arolwg geoffisegol mewn darn o dir yn Gilfach Goch, Abergwaun. Y pwrpas yr arolwg oedd ymchwilio i safle nodwedd gylchol a nodwyd mewn cae porfa, a nodwyd fel safle posib crug crwn neu dŷ crwn. Gofynnwyd am yr arolwg fel y gallai roi gwell arwydd o botensial archeolegol y safle gan alluogi rhoi cynlluniau rheoli ar waith.

Trwy gydol ardal yr arolwg gwelwyd crynodiadau mawr o sbigyn magnetig sy'n adlewyrchu sŵn cefndir daearegol yn ôl pob tebyg (o'r ddaeareg igneaidd). Mae ardal y nodwedd gylchol bosibl ei hun wedi'i hamgylchynu gan glwstwr o ymatebion magnetig, ond yn ddiddorol mae'r tu mewn yn dawel iawn yn magnetig, o bosibl o ganlyniad i glirio cerrig o'r ardal. Ni welwyd unrhyw ffosydd na phyllau cysylltiedig â nodweddion archeolegol. Mae hyn yn ei gwneud hi'n anodd penderfynu a oes gan y nodwedd gylchol bosibl darddiad archeolegol ai peidio. Yn anffodus, mae'r canlyniadau yn yr achos hwn wedi bod yn amhendant a byddai angen gwerthuso ymwthiol i ddarparu unrhyw ganlyniadau diffiniol.

1. INTRODUCTION

1.1 Project Commission

- 1.1.1 DAT Archaeological Services were commissioned by the Pembrokeshire Coast National Park Authority (PCNPA) community archaeologist, Tomos Jones, to undertake a geophysical survey of a parcel of land at Gilfach Goch, Fishguard, Pembrokeshire (NGR SM 98148 37216; figure 1).
- 1.1.2 PCNPA requested the survey to investigate the site of a possible circular feature which could represent the site of a ring ditch associated with a round barrow or round house. A possible series of standing stones have been noted in the surrounding fields.
- 1.1.3 The geophysical survey was undertaken using a fluxgate gradiometer which detects subtle variations in the earth's magnetic field, which can indicate the presence of buried features such as ditches, pits, walls or postholes, which are not visible on the ground surface. The purpose of the geophysical survey was to provide a better indication of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. This will enable management plans to be put in place for the features.
- 1.1.4 A Written Scheme of Investigation (WSI) was prepared by DAT prior to the works commencing which was sent for approval to the PCNPA Archaeologist. The WSI details the methodology for the watching brief and has been prepared in accordance with the relevant Chartered Institute for Archaeologists (CIfA) standards and guidance (CIfA 2014).

1.2. Scope of the Project

- 1.2.1 The aim of the project was:
 - To identify the presence/absence of any potential archaeological deposits through an initial gradiometer survey;
 - To establish the character and extent of any potential archaeological remains within the site area that could be affected by the proposed works;
 - To prepare a report and archive on the results of the geophysical survey.

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the archaeological evaluation and its results and puts those results within their regional and national context.

1.4 Abbreviations

1.4.1 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). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monument (SM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

1.5.1 Printed map extracts are not necessarily produced to their original scale.

1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Period	Approximate date	
Palaeolithic -	<i>c</i> .450,000 – 10,000 BC	
Mesolithic –	<i>c</i> . 10,000 – 4400 BC	Pre
Neolithic –	<i>c</i> .4400 – 2300 BC	hist
Bronze Age –	<i>c</i> .2300 – 700 BC	orio
Iron Age –	<i>c</i> .700 BC – AD 43	n
Roman (Romano-British) Period –	AD 43 - <i>c.</i> AD 410	
Post-Roman / Early Medieval Period -	<i>c</i> . AD 410 – AD 1086	
Medieval Period –	1086 - 1536	Hist
Post-Medieval Period ¹ –	1536 - 1750	tori
Industrial Period –	1750 - 1899	n
Modern –	20 th century onwards	

Table 1: Archaeological and Historical Timeline for Wales.

¹ The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust



Figure 1: Location map of survey area (indicated by red box).

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2. THE SITE

2.1 Site Location and Topography

- 2.1.1 The sub rectangular field is located approximately 1.4km east of Fishguard and sits at an elevation of approximately 95mOD.
- 2.1.2 No obvious earthworks are visible in the field but a circular area demarcated by igneous rock is situated towards the southern boundary of the field.
- 2.1.3 The underlying bedrock geology consists of an unnamed igneous intrusion. The igneous bedrock formed approximately 444 to 485 million years ago in the Ordovician Period in environments previously dominated by intrusions of silica-poor magma. The overlying superficial deposits consist of Till (Irish sea ice), formed up to 3 million years ago during the quaternary period in environments dominated by ice age conditions (British Geological survey online [Accessed 02/08/19]).
- 2.1.4 No archaeological features are recorded on the Historic Environment Record (HER) or the National Monuments Record (NMR) in the area of the possible circular feature. Nor are two possible standing stones situated in the field to the west currently recorded.
- 2.1.5 Most archaeological assets recorded on the HER in the surrounding area of the possible circular feature have a post medieval origin. This includes a milestone (PRN 108,250) to the west, a dwelling (PRN 20,332) to the south and Garn-Gelli quarry (PRN 18,118) to the northeast. At approximately 460m to the east of the possible circular feature a Bronze Age standing stone has been recorded at Park Maen Dewy (PRN 2,529), and at 400m east Penwaun Stone (PRN 46,792) is recorded as an Early Medieval inscribed stone.

3. GEOPHYSICAL SURVEY

3.1 Methodology

- 3.1.1 A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed geophysical survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 0.5m wide traverses across 20m x 20m grids using the zigzag traverse method of collecting data. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.
- 3.1.2 The survey grid was tied in to the local Ordnance Survey grid using a Trimble 5600 electronic distance measuring total station and theodolite (TST).
- 3.1.3 The data was processed using *Terrasurveyor 3.0.35.10* and is presented with a minimum of processing. The presence of high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, have been 'clipped' to remove the extreme values allowing the finer details to show through.
- 3.1.4 The processed data has been presented as a grey-scale plot, overlaid on local topographical features. The main magnetic anomalies have been identified and an interpretation of those results is also given.
- 3.1.5 The resulting survey results and interpretation diagrams should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer. In interpreting those features that are recorded the shape is the principal diagnostic tool, along with comparison with known features from other surveys. The intensity of the magnetic response could provide further information, a strong response for example indicates burning, high ferric content or thermoremnancy in geology. The context may provide further clues but the interpretation of many of these features is still largely subjective.
- 3.1.6 All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of identified features can be affected by its relative depth and magnetic strength.

4. **RESULTS**

- 4.1 The geophysical survey results are presented as a greyscale plot in Figure 2 with an interpretation of the results provided in Figure 3. In total an area of 0.44ha was surveyed.
- 4.2 Across the survey area large concentrations of strong positive and negative anomalies have been observed, often occurring as a dipole response or a single polarity (positive or negative).
- 4.3 The dipole (an anomaly consisting of a single positive response with an associated negative response forming a 'halo effect') responses may reflect archaeological artefacts but are more likely to be the response of modern ferrous objects such as brick and tile fragments as well as horse shoes and plough shares, which lie just below the surface.
- 4.4 The single polarity responses are likely to be a result of geological background noise caused by the igneous rock formations close to the surface. It is possible that some of the positive responses may represent a pit-"like" feature of archaeological origin, but it also just as likely to be the result of a natural feature of the geology or a tree throw (former root bole of a tree or shrub).
- 4.5 A "chain linked" positive/negative response crosses the northern half of the field, roughly east to west. This is the response from the line of a known gas pipe. The geophysical survey response from it is often diffused along its course, possibly because of the large number of magnetic-"spikes" within its vicinity.
- 4.6 The area of the putative ring ditch is void of background noise but there is no evidence of any associated ditches.

5. CONCLUSION

- 5.1 Throughout the survey area large concentrations of magnetic spikes can be seen that probably reflect geological background noise.
- 5.2 Interestingly the area of the suggested ring ditch is surrounded by a large cluster of magnetic responses and the interior is devoid of the magnetic responses seen elsewhere. It is possible that the area has been cleared of stone as a number of stones were noted around the putative ring ditch area which was how it was identified. Could this mean a stone cairn was present which has been totally cleared leaving a roughly circular blank area? Or was there a stone kerb around a former barrow? Typically if it had been the remains of a Bronze Age round barrow burial mound, then a circular ditch surrounding the feature would be present. If a roundhouse of Iron Age date, it is typical that a penannular eaves drip gully would be present (a drain around the perimeter of the house), as often these are the only features that might survive along with a couple of postholes forming the entrance doorway.
- 5.3 With the lack of any associated ditches or pits with archaeological characteristics determining whether this apparent ring ditch is a result of anthropological activity or a natural geological formation is beyond the scope of a geophysical survey and further intrusive works would need to be conducted to confirm which.
- 5.4 Overall the results of the geophysical survey are inconclusive and it has not been possible to characterize specific features that may shed light on the feature to determine if it does indeed represent the remains of a possible ring ditch.



DAT Archaeological Services

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6. SOURCES

Publications

- CIFA, 2014 Chartered Institute of Field Archaeologists Standards and Guidance for Archaeological Field Evaluation.
- National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales 2017. <u>http://www.welshmuseumsfederation.org/en/news-</u> <u>archive/resources-landing/Collections/national-standard-and-</u> <u>guidance-for-collecting-and-depositing-archaeological-archives-in-</u> <u>wales-2017.html</u>

Database

Dyfed Archaeological Trust Historic Environment Record

Online resources

British Geological Survey [online]. Accessed 02/08/19. Available at: <u>www.bgs.ac.uk.</u>

7. Glossary	
Ring ditch	Circular or near circular ditches, usually seen as cropmarks. The term is typically used when the function is unknown. Ring ditches may be the remains of ploughed out round barrows or round houses.
Fluxgate Gradiometer	An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with sub surface archaeological features.
nanoTesla (nT)	A unit of measurement of a magnetic field.
Ferrous Objects	Metals and alloys that contain iron.`
Dipole Anomalies	An anomaly consisting of a single positive response with an associated negative response forming a 'halo effect'. The negative and positive response is of equal magnitude but opposite polarity and are caused by the same feature. Dipole anomalies are very commonly observed across a range of sites, particularly agricultural land. Generally, unless the dipoles form part of a larger pattern or feature they are regarded as not significant. They are usually the result of modern ferrous rich debris such as brick and tile fragments as well as objects such as horse shoes or broken plough shares, which lie withint he topsoil.
Polarity	An attribute with two possible values, positive or negative.

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

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