

Lake Farm, Dorset

Preliminary Geophysical Survey Report

Paul Cheetham

Dave Stewart HND, MSc, PlfA

Aoife O'Reilly BSc

January 2018

Contents:	page
1. Summary	2
2. Background	2
3. Methodology	3
4. Results	4
5. References and Acknowledgements	7

Appendices:

- A. Site Location
- B. English Heritage Geophysical Survey Database questionnaires

Figures:

- 1. Bartington 601 gradiometer
- 2. Lake Farm gradiometry results
- 3. Eye Mead gradiometry results

1. Summary

Licensed by Historic England under Section 42 of the Ancient Monuments and Archaeological Areas Act 1979, a geophysical survey using magnetometry was carried out between August 2016 and August 2017 on the sites known as Lake Farm and Eye Mead .

2. Background

2.1 The Site

The scheduled area surrounding Lake Farm falls into two separate areas of protection, SAM1003803, and 1002418, and straddles the current administrative boundary between Dorset and Poole. It is situated on level and relatively low-lying land which forms the floodplain of and is bisected by several braided channels of the River Stour. Various excavations since 1959 have revealed a vexillation fortress and other associated features of varying date including Iron Age and Neolithic pits and medieval buildings and ovens. These are all preserved as entirely buried structures, deposits and features, with no visible surface remains. The site is divided into three sections by Wimborne Road and the Wimborne Bypass, the latter following the course of a disused railway line and spanned by a farm bridge. The fields are laid to pasture and were grazed by sheep during the surveys, except for the southwest corner of the site which was split into paddocks for horses. The roads and farmyard are excluded from the scheduled areas.

To the northwest of the main area, the monument includes a length of Roman road situated on the floodplain of the River Stour in an area known as Eye Mead. The road survives in places as a flat topped causeway across generally marshy land, which measures up to 4m wide and 0.4m high but which fades into a buried feature at either end. It is part of a road which ran from Badbury Rings to Hamworthy.

The course of the Roman road across Eye Mead is a separate Scheduled Ancient Monument (1002444).

2.2 Objectives

The surveys form part of a research project leading to the analysis and full publication of the largely unpublished excavations undertaken at the site by placing theses in the wider context of the site's hinterland.

The survey will resurvey and expand the coverage surveys undertaken by the Ancient Monuments Laboratory Geophysics Section 1976-83 (Reports 76/11; 21/80; 18/82; 21/83) – see areas previously surveyed on the map below. Not only will this work produce a more comprehensive coverage in terms of the area of the monument, it will allow a contemporary digital processing and presentation of the data in ways not available when the first surveys were undertaken.

3. Methodology

3.1 Grids

Grid points were positioned in each field using the Leica Viva GS15 Global Positioning System to record OSBG co-ordinates to +/- 2cm.

From these points 20m x 20m grids were laid out using tapes and ranging rods.

3.2 Magnetometry

Magnetometry measures the effect of buried objects on the Earth's magnetic field. It is most effective on negative features provided that the top-soil and sub-soil contain differing proportions of iron oxide, also hearths and objects containing iron or nickel. By measuring the difference in readings from two sensors mounted vertically, a gradiometer eliminates interference from local objects such as power lines and deep geology.

The equipment used was a Bartington 601 gradiometer (Figure 1.) which employs twin gradiometers one metre apart. The 1m vertical separation of sensors within each gradiometer on this instrument gives a theoretical detection depth of approximately one metre but may accentuate surface readings.



Figure 1: Bartington 601-2

The various fields comprising Lake Farm were sampled at various times between August and October 2016, and the road across Eye Mead was sampled in February 2017. A North – South traverse direction was adopted to accord with English Heritage's preferred format (English Heritage 2008:23).

The Bartington 601 was set for traverses one metre apart, and in parallel mode to eliminate stagger. Four readings per metre were taken along the traverse, i.e. the machine recorded the average magnetic variation for each 25cm section. This was considered the optimum setting to record small features without excessive surface noise (Payne *et al.*:26, Bartington 2008:10).

Range was set at +/- 100nT.

3.2.1 Data Handling

Results were downloaded in the evening to a PC running Terrasurveyor software for processing and image production.

Initial processing for image production comprised

- ◆ clipping to remove outlying extreme values,
- ◆ de-stripping using Zero Median Traverse on the X-axis to adjust for differences in readings between the two gradiometers caused by drift during the course of the survey.

4. Magnetometry Results & Interpretation:

4.1 Lake Farm

Linear anomalies form a rectangular enclosure with rounded corners, typical of a Roman military fortress, and can be interpreted as boundary ditches. A clear line immediately behind these ditches indicates the rampart, now levelled, while the multiple hearth-like anomalies behind the rampart are probably the troops' bread ovens. Breaches for gates appear in the circuit on the west and east; on the south side an apsidal protrubance appears where a gate might be expected and the corresponding position on the northern side has been destroyed by a field entrance. The northwest corner of the rectangle has been eroded by a water channel and the southwest corner lies beneath the Lake Gates roundabout.

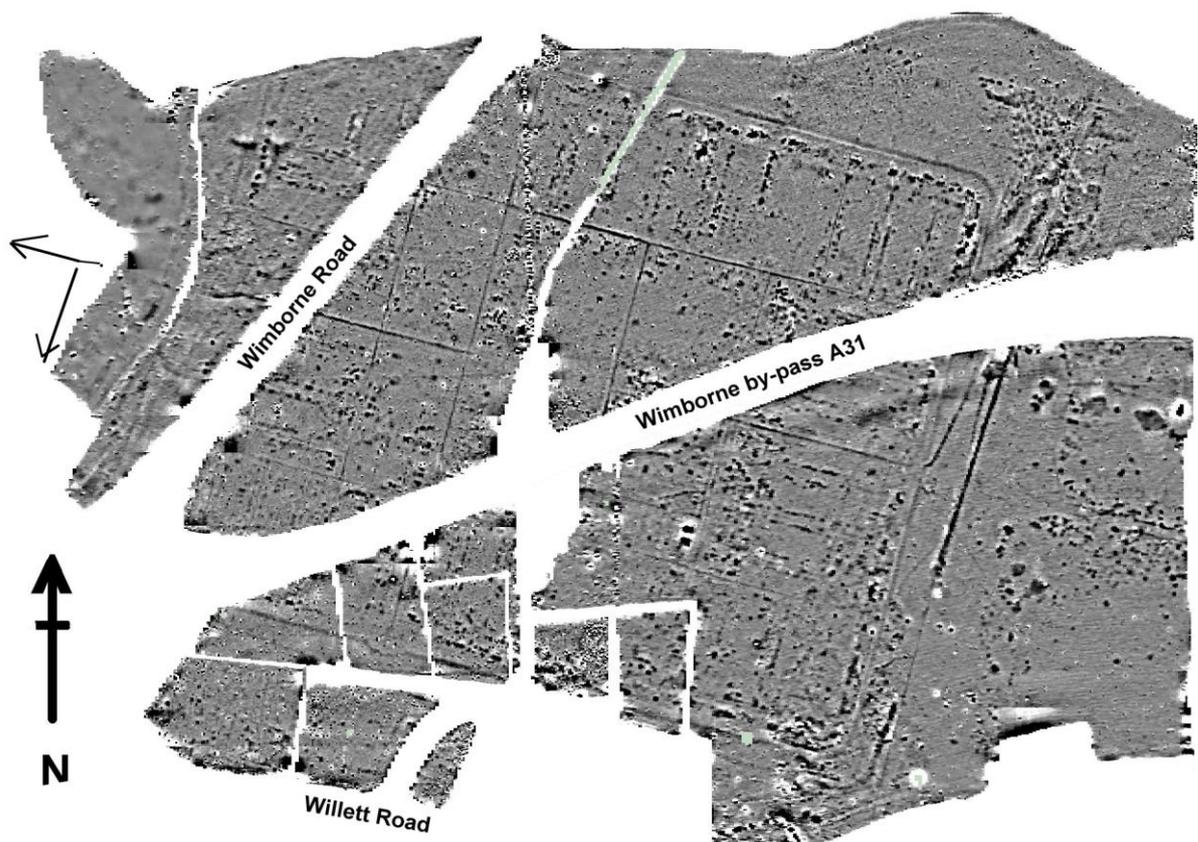


Figure 2. Lake Farm Gradiometry Results

The layout of the fort is marked by linear features which are apparently ditches running in the centre of internal trackways and forming a connected grid. At the eastern gateway (or *Porta Decumana*) one linear runs obliquely toward the low ground near the River Stour, probably as the outfall of the drainage system. At the western gate (or *Porta Praetoria*) the drainage channel steps sideways as it becomes a side ditch for the Roman road toward Badbury (See 4.2).

Rows of probable post holes marking the footprint of buildings appear to conform largely to examples known from excavation, such as Inchtuthil (Figure 2). Narrow buildings represent barrack blocks and are sited on each side. The traces of post hole continue toward the centre of the fort but the outline and nature of the buildings is obscured by the farm bridge and a water pipe that can be seen between the bridge and the northern farm gate.

To the east of the fort two parallel linears are probably the ditches flanking a roadway approximately 5 metres wide that forms a continuation of the *Via Decumana*. Numerous strong anomalies representing pits or hearths can be seen in this area; these respect the roadway and can be assumed to be contemporary, perhaps workshops or a *vicus* settlement.

A row of four large pits or areas of burning between the roadway and the A31 are of unknown age or purpose and may relate to road or railway construction.

A long linear outside and on a slightly different alignment to the western ditch of the fort has been suggested (Field 1992) to be the rampart of an earlier fort yet it appears to cut the roadway, suggesting that it may relate to later drainage works. Just west of that is a circular feature typical of an Iron Age round house showing that the indigenous population may also have occupied the site.

Further small anomalies south of the fort may be post holes but there is significant disturbance from fences and ferrous cast-off from the horses.

4.2 Eye Mead

The survey covered 0.6ha on the northern side of the meadow, close to the River Stour where there appeared to be a flattish area that could have housed structures beside the river crossing point. The results (Figure 3) do not show any anomalies that could betray structures. The strong response on the western border is from a metal fence and it appears that the wire fence of the field boundary lies buried across the field access. There are striations that were probably caused either by ploughing or tyre tracks in the waterlogged ground. The Roman road is believed to run through the field access but the ditches do not show on the magnetometry. Numerous small anomalies show the black-and-white characteristics of small ferrous objects.



Figure 3. Eye Mead Gradiometry Results

5. References and Acknowledgements

5.1 References:

Bartington 2008 *OM1800 Operation manual for grad601 magnetic gradiometer* (Issue 23).
Witney, Bartington.

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation* 2nd Edition.
(Authors: David, A., Linford, N. & Linford, P.). Swindon, English Heritage.

Field, N., 1992 *Dorset and the Second Legion: New Light on a Roman Campaign*. Tiverton:
Dorset Books.

Payne, A., Corney, M. & Cunliffe, B. 2006 *The Wessex Hillforts Project: extensive survey of
hillfort interiors in central Southern England*. London, English Heritage.

5.2 Acknowledgements:

The Authors would like to thank:

John George and the National Trust for granting permission to carry out the surveys on their
land.

School of Applied Sciences, Bournemouth University for making equipment available.

5.3 Software used:

Terrasurveyor	D.W. Consulting B.V., Barneveld, Netherlands.
PhotoStudio 2000	ArcSoft Inc., Fremont, California U.S.A.
Word 2007	Microsoft Corporation, Santa Rosa, California U.S.A.

Location of site

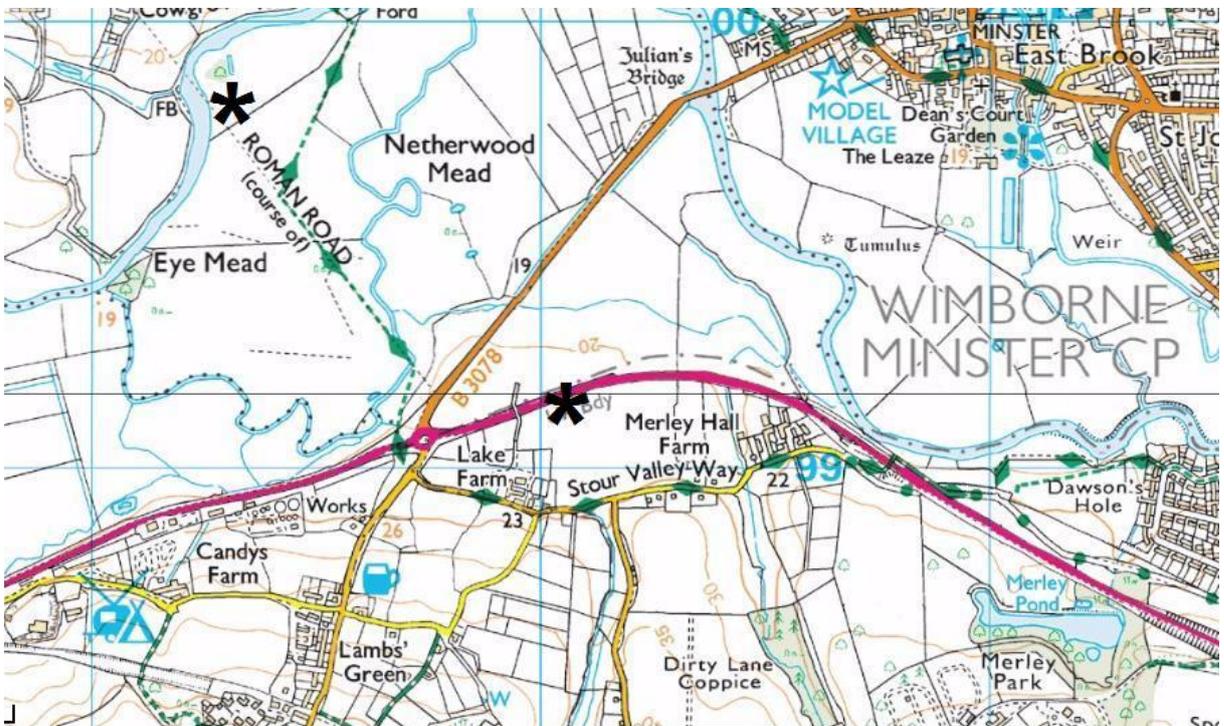


Image reproduced from Ordnance Survey map data with the permission of the Controller of Her Majesty's Stationery Office, © Crown Copyright NC/03/40227

English Heritage Geophysical Survey Database Questionnaire

Survey Details

Name of Site: Lake Farm

County: Dorset

NGR Grid Reference (Centre of survey to nearest 100m): SY997993

Start Date: 08/08/2016

End Date: 07/08/2017

Geology at site (Drift and Solid): Aluvium over Thames Group clay/gravel

Known archaeological Sites/Monuments covered by the survey

Scheduled Monument No. 1003803 and 1002418,

Archaeological Sites/Monument types detected by survey

(Type and Period if known. "?" where any doubt)

Roman fort

Surveyors: Paul Cheetham, Dave Stewart and Aoife O'Reilly

Purpose of Survey: Academic research

Location of:

a) Primary archive, i.e. raw data, electronic archive etc:

Surveyor/ Bournemouth University

b) Full Report:

Dorset HER

Technical Details

(Please fill out a separate sheet for each survey technique used)

Type of Survey (Use term from attached list or specify other):

Magnetometry

Area Surveyed, if applicable (In hectares to one decimal place): 26 ha

Traverse Separation, if regular: 1m

Reading/Sample Interval: 0.25m

Type, Make and model of Instrumentation: Dual-sensor gradiometer, Bartington 601-2

Land use at the time of the survey (Use term/terms from the attached list or specify other):

Grassland - Pasture

Additional Remarks (Please mention any other technical aspects of the survey that have not been covered by the above questions such as sampling strategy, non standard technique, problems with equipment etc.):

Survey mode = parallel