OLD OSWESTRY HILLFORT

Geophysical Investigations 2021

ASW
Archaeological Survey West

Document published by Archaeological Survey West LLP
2022

Cover image: 1999 Google Earth Aerial image of Old Oswestry

Old Oswestry Hillfort

Geophysical Investigations 2021

C M Matthews MRes BSc

2021

Produced on behalf of

The Oswestry Heritage Gateway Community Group

Version 2.01

Abstract

This report describes the results of an archaeological geophysical investigation undertaken at the site of Old Oswestry Hillfort near Oswestry, Shropshire. The investigations were conducted by Archaeological Survey West LLP (ASW) and consisted of high resolution magnetic gradiometry undertaken within the interior of the enclosure. The objective of the survey was to identify features of potential archaeological interest. The results have identified extensive WW1 trenching, rectangular structures and possible ring gullies associated with Iron Age roundhouses.

Contents

Figures

Maps

1. Introduction

This report describes the results of an archaeological geophysical investigation undertaken by Archaeological Survey West on the scheduled site of Old Oswestry Hillfort, located to the north of Oswestry, Shropshire (SAM 27556). The work was carried out as part of investigations by the Oswestry Heritage Gateway Community Group, under the direction of Tim Malim. The survey was requested by Mr Malim and Hampton Heritage, who engaged Archaeological Survey West to carry out the fieldwork and produce this report. The aim of the survey was to identify any archaeological features associated with the scheduled site in order to inform ongoing research.

The method of survey employed during this investigation comprised of high resolution magnetometry (Map 1). The results from this were combined with LiDAR data modelling (Map 2), as well as aerial photography, in order to maximise the interpretation of potential features.

The survey was carried out in accordance with national standards, as laid out by 'Geophysical survey in archaeological field evaluation by David A, Linford N (2008)'and the Chartered Institute for Archaeology's (CIfA) 'Standard and guidance for archaeological geophysical survey' (2014). As stipulated by CIfA guidelines, this report and its associated archive will be deposited with the relevant local and national curators, and an electronic record of the project details will be deposited with the Shropshire County Historic Environment Record.

2. Site background

Geology and Topology

The site is situated on a glacial mound set at the western edge of the relatively flat land of northwest Shropshire, bordering the mountains of northeast Powys (SJ 29574 31019). The interior of the Hillfort is set within a wire fenced enclosure accessed from the eastern entrance.

The bedrock geology consists of Etruria Formation mudstone, sandstone and conglomerateformedapproximately 308-319 million years ago in the Carboniferous period. The superficial geology consists of glaciofluvial deposits of sand and gravel formed up to 2 million years ago in the Quaternary period(BGS, 2018).

This form of geology is known to produce mixed results in geophysical survey, with the magnetic susceptibility of sand and gravel tending to be low. This may reduce the clarity of some cut features but serve to enhance formations of organic or burnt materials.

Historical background

Old Oswestry hillfort, a Scheduled Monument under the Ancient Monuments and Archaeological Areas Act 1979 (SAM 27556), is a well defined muiltivallate hillfort enclosing an area of 5.5 hectares, with a total footprint of 18 hectares. The site dates to the IronAge and is believed to have been in use between the 6th century BC and mid 1st century AD.

The only intrusive investigations conducted on the hillfort were in 1939 and 1940, consisting of seven trenches excavated across the ramparts and within the interior by William Jones Varley and Brian St. John O'Niel. This was followed in 1974 by a small and pioneering geophysical investigation

by Arnold Aspinall comprising Electrical Resistance testing over a suspected rectangular structure and a transect between the entrances, but has not been subsequently followed up by further investigation (Malim & Nash, 2020).

During WW1, the Hillfort was used to train soldiers based at Park Hall camp, located less than 1Km to the east. The renowned local poet Wilfred Owen, who was from Oswestry, is also known to have trained at Park Hall. The remnants of crenulated practice trenching are still visible on the surface as well as in aerial photography, and span the width and length of the hillfort's interior. It is highly likely that the WW1 activity will have been responsible for considerable damage to earlier occupation, as it now forms the dominant archaeological presence within the interior.

3. Survey methodology

The purpose of geophysical survey is to identify the archaeological potential of an area of land in a non-intrusive, quick and relatively inexpensive way. To achieve all three aims and still produce the highest standard of data possible, which also identifies the widest range of past human activity, the survey method of magnetometry was chosen.

Magnetometry measures and maps the background magnetic field and any local anomalies. These anomalies can be caused by the presence of features containing greater or lesser magnetic properties than the soils around them. This can be due to the natural magnetic properties of a material, as well as, a range of processes that can alter magnetic properties. As a broad example, buried walls and built-up features which generally comprise of low magnetic materials, such as stone, appear as weak negative magnetic anomalies, where as a ditch would often appear as a weak positive anomaly due to a collection of more magnetic material. These can be distinguished from responses caused by high ferrous materials such as iron and ceramic or areas of intense burning (thermoremnance), based on the strength and gradient of the magnetic response. The strength of the magnetic field is measured in nano Tesla (nT), a unit of measurement of magnetic flux density, equal to one billionth of a Tesla [T] (1T = 1000000000 nT) (Milsom & Eriksen, 2011).

The equipment used for the survey was a dual sensor Bartington Instrument Grad 601-2 fluxgate gradiometer. This instrument consists of two sets of sensors, each mounted with a vertical separation of 1m, one set at each end of a 1m long horizontal bar. This provides two sets of parallel readings and, under normal operating conditions, is capable of surveying to a depth of between 0.5m to 1m, although, materials with higher magnetic properties can be detected at a greater depth.

To set out the survey grids, a Trimble R4 GPS run with a VRS correction was used, operating at an accuracy of 0.014m to 0.03m. The survey areas were plotted with a temporary grid of 20mx20m. Each grid was then walked using a zig-zag traverse with a sample interval of **0.25m** (4 points per meter) and an overlapping traverse interval of **0.5m**.

Processing and interpretation

Data collected in the field was downloaded and processed using TerraSurveyor software version 3.0.37.3. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies. Full survey and processing metadata can be seen in the appendix with additional plots available on request.

The results of this survey have been presented as a combination of greyscale plots and interpretations published through GIS (see Maps 1, 3 and 4).

The types of features have been classified using established typologies based on Gafney and Gater (2003), as well as the standardised interpretation key used by Archaeological Survey West.

4. Survey analysis

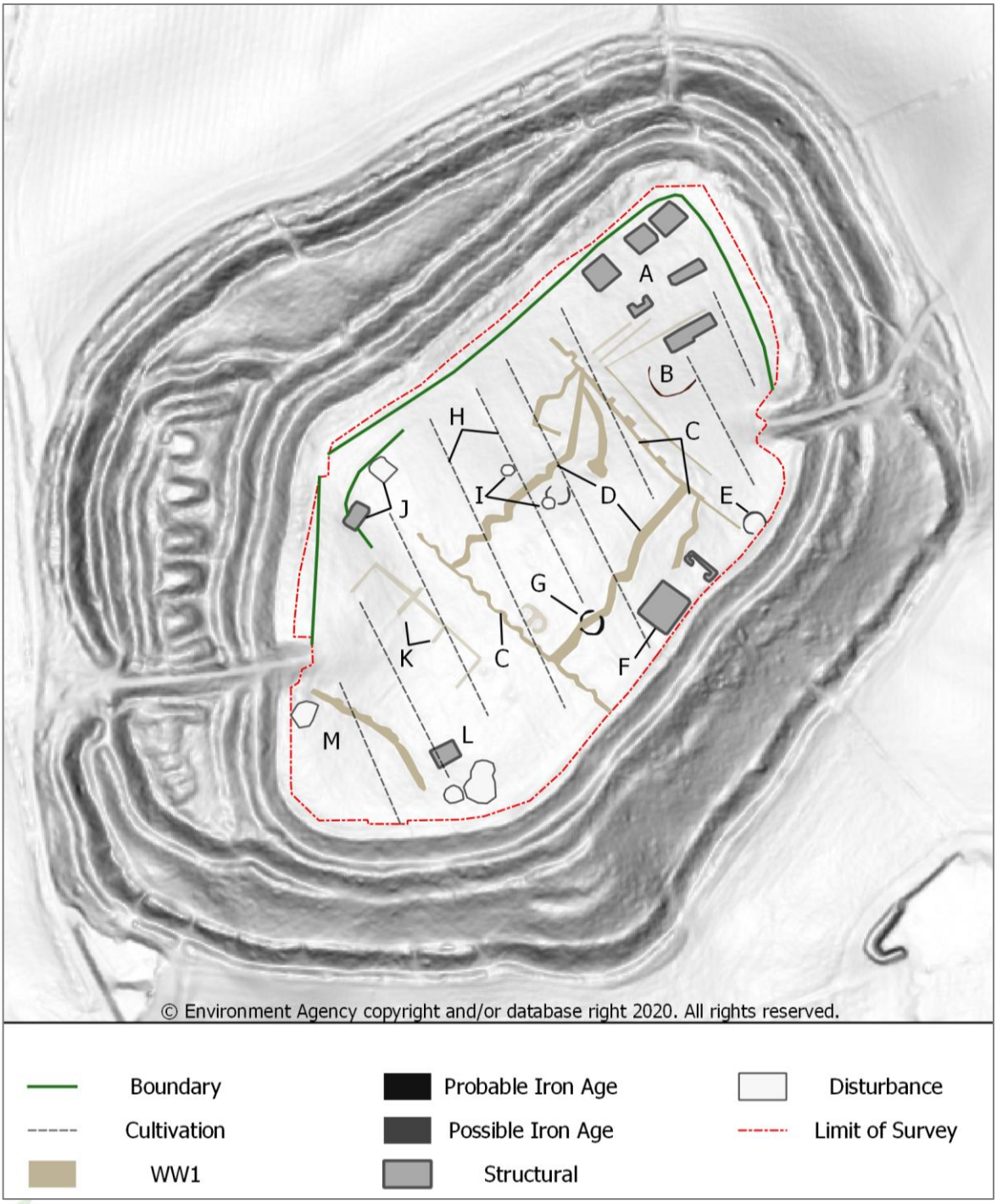


Figure 1: Archaeological Interpretation plot

Summary

The survey data covers an area of 5.5 hectares situated within the enclosure of Old Oswestry hillfort. Conditions during the survey were predominantly wet with intervals of heavy rain and mild temperatures.

The following feature analysis is based on observed anomalies from the combined magnetic survey and LiDAR modelling (Maps 1 and 2). Each feature group shown in figure 1is given a letter code (e.g. A, B, C…) with sub features both numbered and depicted separately (e.g. A1, A2, A3…).

A/ This group consists of prominent structural disturbances, visible as concentrated areas of strong magnetic noise located within the northern corner of the interior (Figure 2). Features A1, 2 and 3 consist of rectangular strong magnetic disturbances with A3 showing a rectilinear sharply defined outline, possibly consistent with a wall. Feature 1 is approximately 15m by 11m, feature 2 is approximately 12m by 8m and feature 3 is approximately 14m by 11m. Features A4 and 6 are sharply defined rectangular features with possible subdivisions, A4 measuring 19m by 6m and A6 measuring 21m by 6m. A5 forms a linear structural disturbance that measures approximately 11m by 7m and bears a resemblance to part of Feature F. Feature A7 consists of weak linear striations running on the same alignment as the possible structures and may connect to feature C. The readings for the structures suggest highly magnetised material likely associated with burning and therefore could indicate an event of burning or the presence of fired building materials such as brick or mortar. All of these features are visible as weak anomalies on the LiDAR survey (Map 2). The anomalies are likely to be structural in origin and may be associated with the World War One activity on site, but also bear a resemblance to industrial features such as kilns.

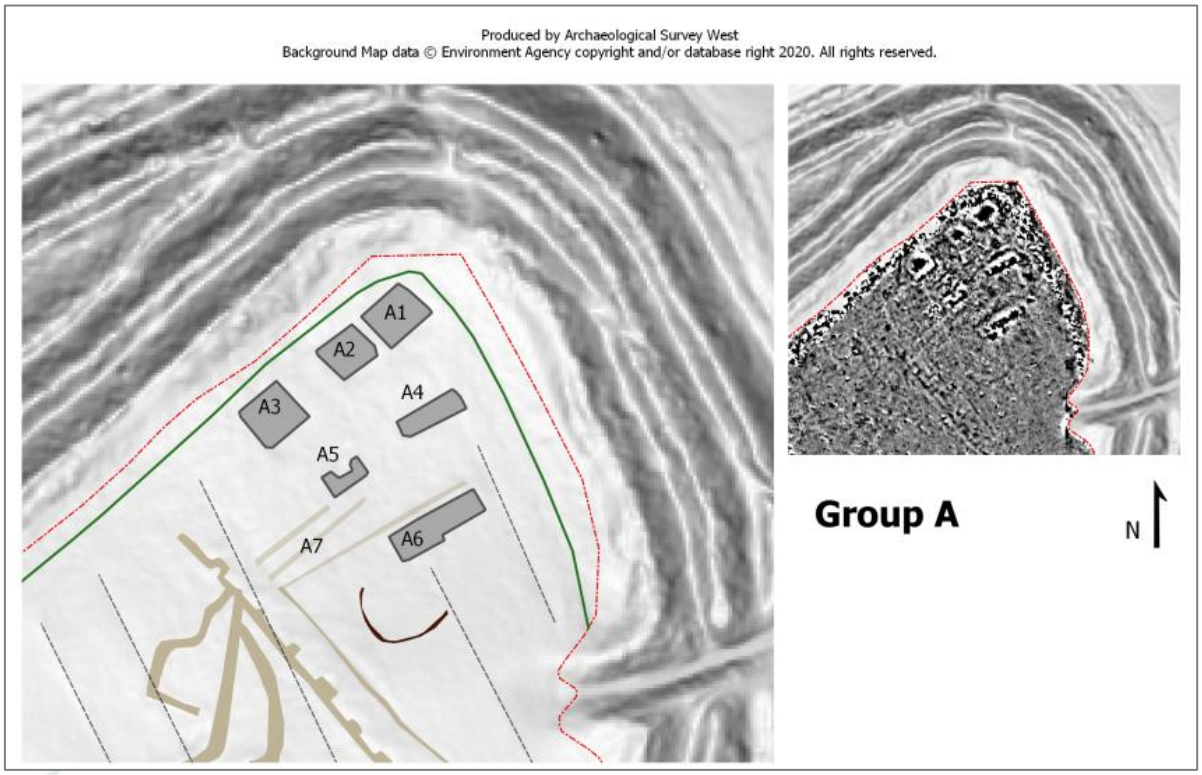


Figure 2: Group A, feature plot

B/ This feature consists of a weak curving linear possibly associated with a boundary, however it may be geomorphic in origin (Figure 2).

C/ This group consist of two sets of First World War crenulated trenching visible as a clear depression in the LiDAR data and as a combination of positive and negative linear features in the magnetic survey (Figure 1). The north-eastern line appears to be the best presented in both the magnetic and LiDAR survey data with the south-western line appearing shallower and much less pronounced in the magnetic data.

D/ These linear features consist of First World War communication trenches with a mixed straight and zigzag pattern, connecting the forward and rear crenulated trenches (feature C). These features appear with more clarity in the LiDAR survey with the exception of the south-eastern zigzag section that crossed feature G and adjacent to feature F (Figure 3). The clarity here may be the result of greater quantities of magnetic material due to the proximity of features G and F, or greater survival of the feature in this area.

E/ This feature consist of a weak curvilinear forming part of a circle measuring 9.5m in diameter. The anomaly may represent the drip gully of a roundhouse, however, the weakness of the anomaly as well as its position near to the fence line, could suggest that it is the result of modern disturbance or geomorphic in origin.

F/ This group consists of two distinctive areas of structural magnetic disturbance situated within a large depression visible in the LiDAR data (Figure 3 and Map 2). The anomalies consist of strong magnetic readings often attributed to industrial anomalies, but could indicate a collection of metal or fired material such as brick. These anomalies appear to be connected to the First World War trenching by a small zigzag communication trench, suggesting that they are likely contemporary.

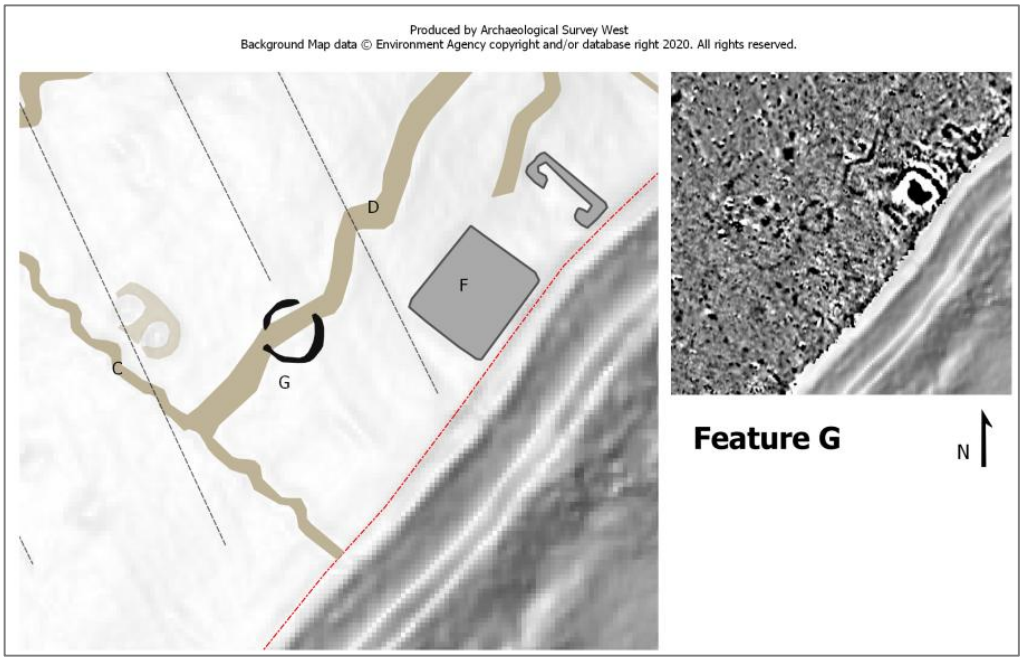


Figure 3: Group G, feature plot

G/ This feature consists of a strong sharply defined circular feature that is often attributed to the drip gulley of a round house (Figure 3). The feature is 10m in diameter and is dissected by feature D. It is possible that this anomaly is contemporary with the First World War communication trenching; however, its form is more consistent with that of Iron Age occupation.

H/ These features consist of regular cultivation marks running northwest to southeast and appear to be truncated by the First World War activity, and therefore are earlier in date (Figure 1).

I/ These features consist of magnetic spikes that correspond with circular depressions in the LiDAR data and are likely associated with First World War activity in the form of explosion craters (Figure 1 and Map2).

J/ This feature group consists of two disturbances, feature J1 is a possible structural anomaly that isvisible as a rectangular depression in the LiDAR data and as a combined magnetic disturbance and ferrous spike in the magnetic survey (Figure 4). This feature is likely to be the structure surveyed in the 1970s. J2 consists of a rectangular concentration of metallic noise that likely indicates a concentration of debris or possibly material associated with a structure. This feature does not appear in the LiDAR data.

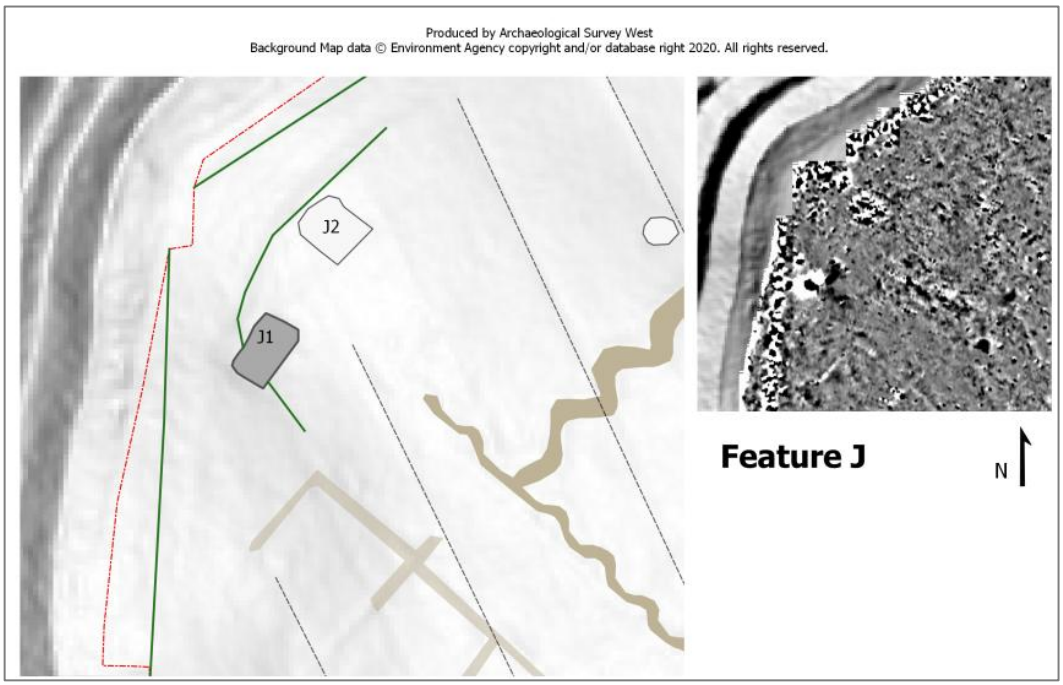


Figure 4: Group J, Feature plot

K/ This feature consists of a group of linear anomalies forming part of a gridded pattern and are possibly associated with First World War trenching (Figure 1). The feature appears as a sharply defined negative anomaly in the magnetic data and as a linear depression in the LiDAR that runs parallel to the crenulated trenching (feature C) to the northeast.

L/ This feature group consists of two disturbances, feature L1 is a possible structural anomaly that is visible as an irregular depression in the LiDAR data and as a magnetic disturbance with sharply

defined linear elements (Figure 5). Feature L2 consists of mixed ferrous spikes, magnetic noise and sharply defined linear anomalies that correspond with craters visible in the LiDAR data.

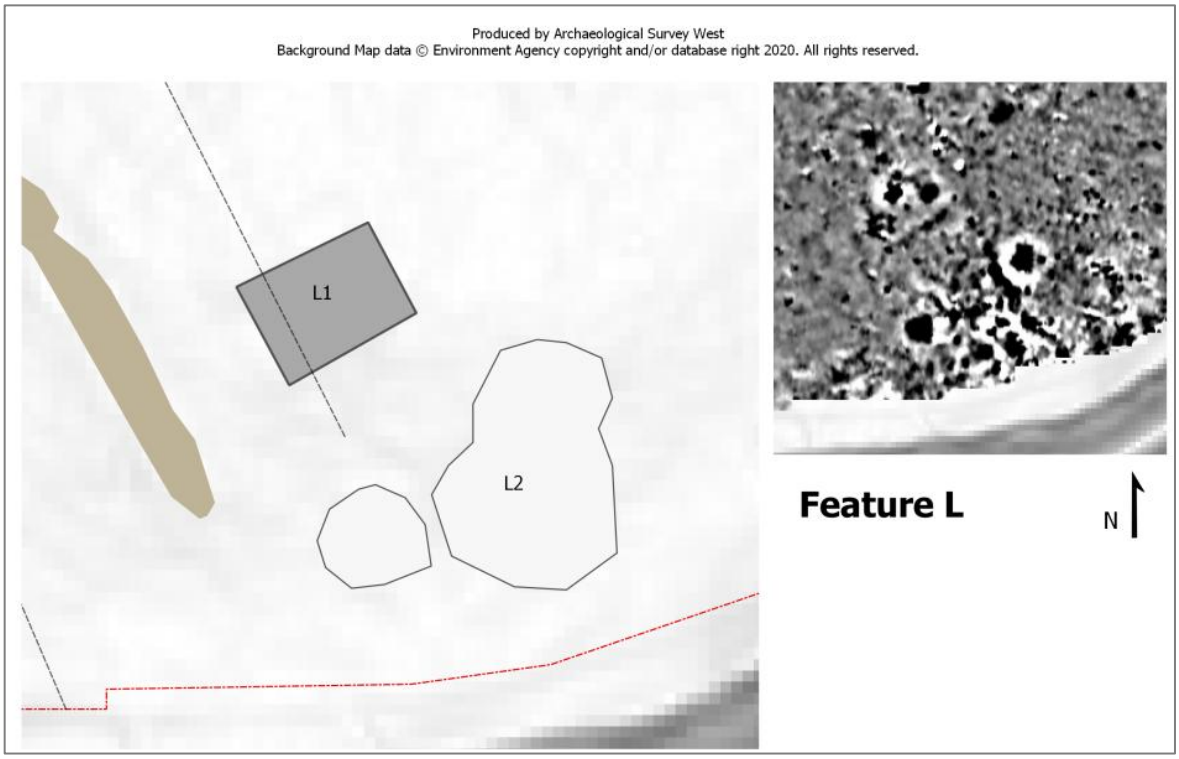


Figure 5: Group L, feature plot

M/ This feature consist of a third set of crenulated trenching visible in the LiDAR data running on a slightly different northwest to southeast alignment to feature C, andis situated in the south-western corner of the enclosure (Figure 1). The feature only shows as a very weak linear disturbance in the magnetic data.

5. Discussion and Conclusion

Figure 6: 3D render of magnetic survey data

In 2021, a geophysical investigation was undertaken on the site ofOld Oswestry Hillfort near Oswestry, Shropshire. The objective of the survey was to identify any archaeological features associated with the scheduled site in order to inform ongoing research undertaken by the Oswestry Heritage Gateway Community Group. The survey consisted of 5.5 hectares of high resolution magnetometry, conducted within the main enclosure.

The most prominent findings of this survey have been the extent of First World War activity. This consists of three sets of crenulated trenching interconnected by zigzag communication trenches (Maps 3 and 4). Additional tributaries connect the main trenching to features that are likely to be military installations, such as bunkers, artillery sets or structures, with a notable group at the northern end of the enclosure. This northern group consist of several structures that may represent command posts or surface structures such as billet blocks, munitions stores etc.

Whilst it's known that the Regiment at the Park Hall encampment used the site as a training facility for British Army soldiers, the extent of permanent facilities associated with the Hillfort is not known, with very little documented material mapping the First World War activity. There is a possibility that in addition to trench based training undertaken on the Hillfort, there may also be the presence of a fixed barracks or encampment, as represented by the grouped northern structures. However, whilst these structural anomalies are most likely First World War in date, there is the possibility that they may represent earlier occupation or industrial activity and therefore warrant further investigation.

The survey also identified two possible Iron Age anomalies; the most prominent is a 10m diameter ring (G) that may represent the drip gulley of a large roundhouse. This feature appears to have been truncated by a First World War communication trench which has likely significantly disturbed the

internal features, but is worthy of further investigation. The second anomaly is much weaker, and comprised of a 9m diameter ring (E) located near to the eastern boundary.

Other than the two features identified above, there are no definitive anomalies within the centre of the enclosure that are likely to be Iron Age. An important consideration based on the locations of round houses identified by Varley (Hughes, 1996) as well as the anomalies identified in this survey, is that the majority of Iron Age structures may be located around the periphery of the enclosure's interior. If this is the case, then the presence of the metallic fence in addition to the First World War activity, has likely significantly limited our ability to identify these structures through magnetic survey. The often low magnetic susceptibility of sand and gravel geologies are also a factor in reducing the potential identification of Iron Age features on this site, with reliance placed heavily on events of burning or organic deposits.

Other features include regular northwest to southeast cultivation marks that appear to predate the First World War trenching. These anomalies have been previously identified through aerial survey and proposed to be Medieval in date (Shropshire Council HER, 1981). Scatters of ferrous spikes and surface debris are also present throughout the magnetic data and are likely associated with modern agricultural debris and First World War activity. An earlier boundary is also visible, inset from the modern north western, north and north eastern fence boundary and may be associated with the First World War activity as it appears to respect the northern group of structures.

Works Cited

BGS. (2018). *British Geological Survey Open Geoscience*. Retrieved May 2019, from www.bgs.ac.uk/opengeoscience

CIFA. (2014). *Standard and Guidance: for archaeological geophysical survey.* Chartered Institute for Archaeology.

Gaffney, C., & Gater, J. (2003). *Revealing the buried past: geophysiscs for archaeologists.* Stroud: Tempus.

Hughes, G. (1996). Old Oswestry Hillfort: excavations by WJ Varley 1939–40. *Archaeologia Cambrensis, 143* , 46–91.

Malim, T., & Nash, G. (2020). *Old Oswestry Hillfort and its Landscape: Ancient Past, Uncertain Future.* Oxford: Archaeopress Publishing LTD.

Matthews, C. (2019). *NESSCLIFFE HILLFORT Geophysical Investigations 2019.* Wrexham: Archaeological Survey West.

Milsom, J., & Eriksen, A. (2011). *Field Geophysiscs* (4th ed.). Oxford: Wiley & Sons Ltd.

Shropshire Council HER. (1981). *Old Oswestry Hillfort.* Discovering Shropshire's History.

Appendices

Glossary of terms

Industrial: This consists of anomalies with a strong positive to negative magnetic gradient that can be distinguished as separate from surface ferrous spikes. These readings indicate a thermoremanence where the action of heating has altered the magnetic properties within the ground or a structure and are usually associated with features such as kilns or furnaces.

Strong Positive linear: This is a linear feature defined by strong positive readings that are not of a gradient associated with ferrous but stronger than a weak positive anomaly. This can indicate fired materials such as ceramic and is often associated with field drains.

Wall (positive): This is a sharply defined positive linear feature that occurs when the wall materials have higher magnetic properties than the surrounding soils.

Wall (negative): This is a sharply defined negative linear feature that occurs when the building materials have lower magnetic properties than the surrounding soils.

Disturbed area (Structural): This is a feature associated with structural remains but where the footprint of the building cannot be determined. The depth and survival of an archaeological structure can often result in an area of magnetic noise as oppose to a clear rectilinear feature. This can be due to a number oftophonomic processes including demolition and the extraction of materials (robbing).

Disturbed area: This is an area of increased noise that cannot be associated with modern activity and therefore is of potential archaeological interest.

Modern service: This is a feature defined by a strong positive-negative linear that regularly alternates between positive and negative polarity and is caused by modern piping and cables. Electricity cables tend to create a very broad area of disturbance.

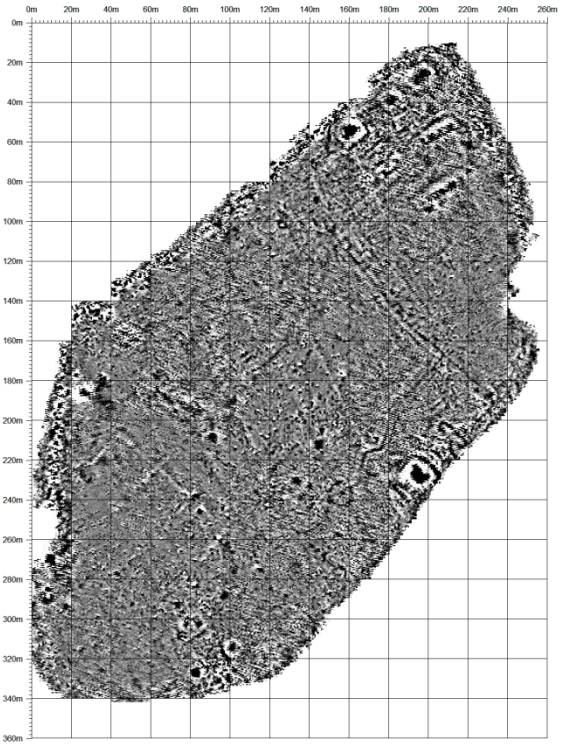
Modern disturbance: This is a feature of disturbance generated by modern surface activity, often in the form of ferrous anomalies.

Geological: These include features believed to be of a geomophological origin.

Raw data

Instrument Type: *Bartington (Gradiometer)*
Units: *nT*
Direction of 1st Traverse: *270 deg*
Collection Method: *ZigZag*
Sensors: *2 @ 1 m spacing.*
Dummy Value: *2047.5*

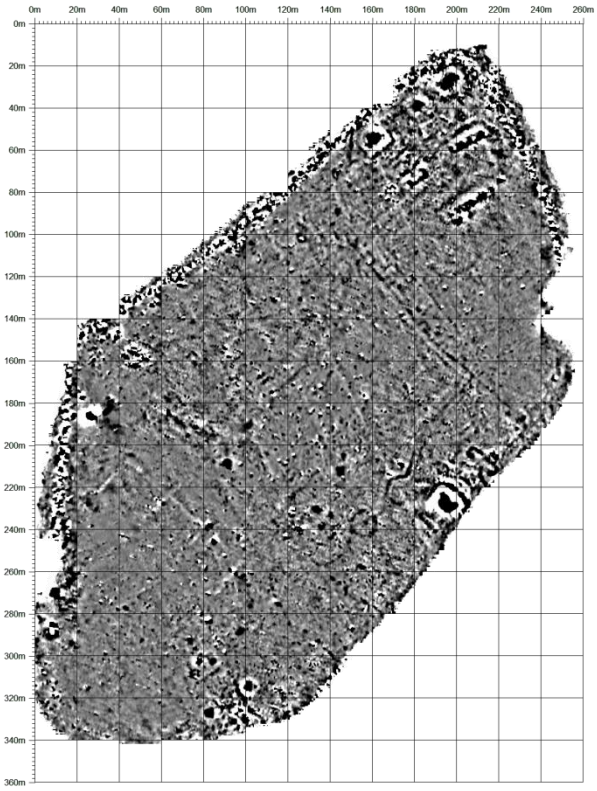
Raw dataset (-3 – 3nT clip)



Dimensions
Composite Size (readings): *1040 x 720*
Survey Size (meters): *260 m x 360 m*
Grid Size: *20 m x 20 m*
X Interval: *0.25 m*
Y Interval: *0.5 m*

Stats
Max: *3.00*
Min: *-3.00*
Std Dev: *1.82*
Mean: *0.04*
Median: *0.00*
Composite Area: *9.36 ha*
Surveyed Area: *5.4715 ha*

Processed dataset (-3 – 3nT clip)

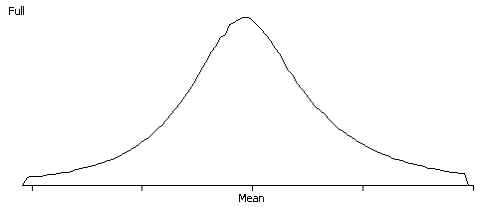


Stats

Max:	*3.00*
Min:	*-3.00*
Std Dev:	*1.47*
Mean:	*0.06*
Median:	*0.03*
Composite Area:	*9.36 ha*
Surveyed Area:	*5.4715 ha*

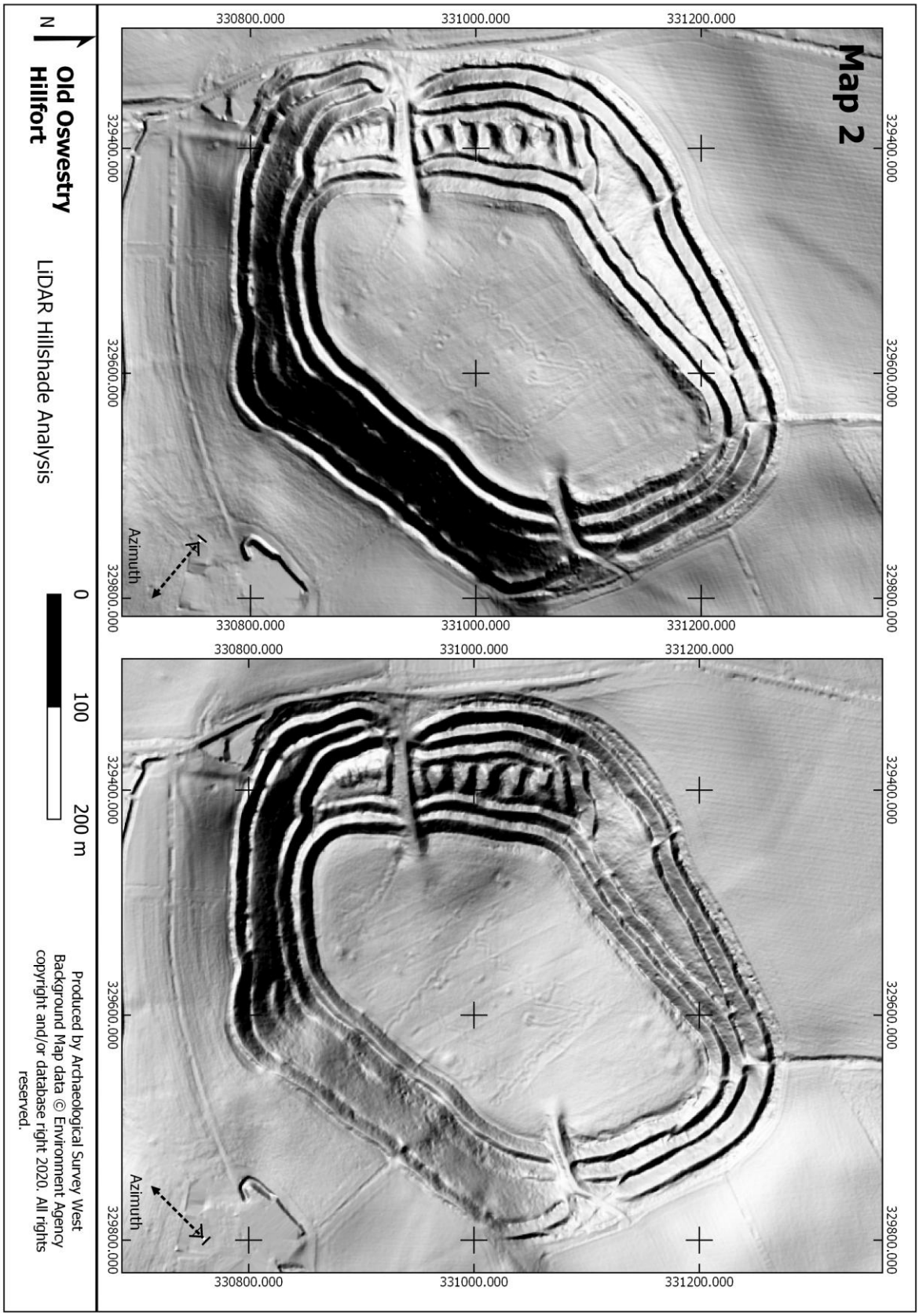
Processes: 6

1. *Base Layer*
2. *DeStripe Median Traverse: Grids: All*
3. *Despike Threshold: 1 Window size: 3x3*
4. *Low pass Gaussian filter: Window: 3 x 3*
5. *Interpolate: X & Y Doubled.*
6. *Clip from -3.00 to 3.00 nT*



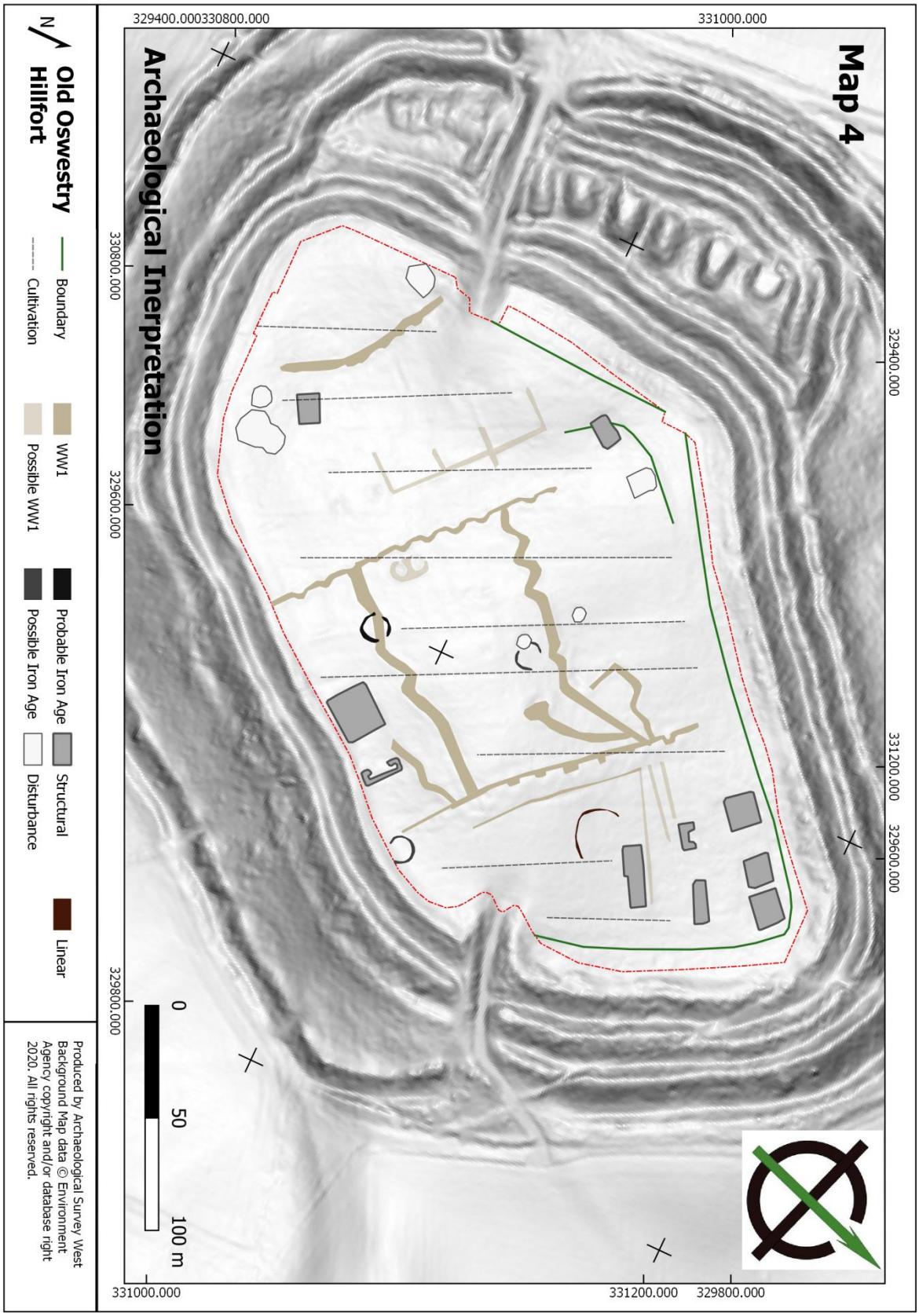
Maps

Map 1: Magnetic survey grey scale plot



Map 2: LiDAR hillshade analysis

Map 3: Magnetic survey feature plot



Map 4: Archaeological interpretation