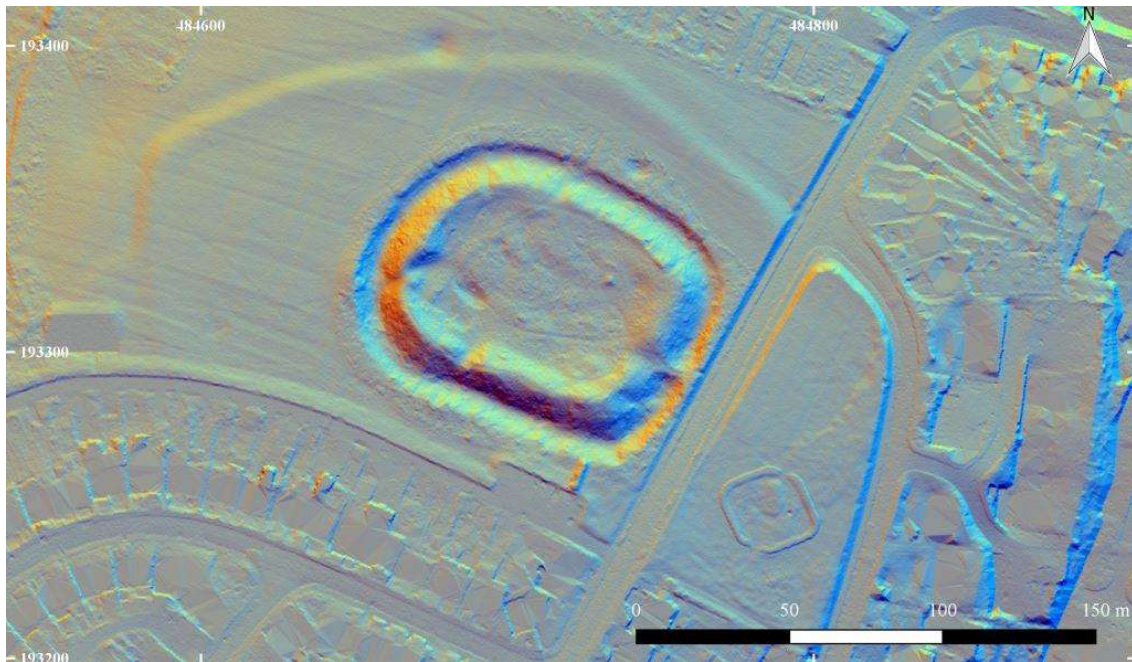


**Geophysical Survey at Desborough Castle,
High Wycombe, Buckinghamshire,
July 2019.**

**William Wintle and Wendy Morrison
August 2019**



Lidar Image of Desborough Castle, High Wycombe, Buckinghamshire
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Introduction

In 2017 the Chilterns Conservation Board was awarded a £695,600 grant by the Heritage Lottery Fund towards a four year £895,866 project to discover and conserve the hillforts of the Chilterns. The project is entitled “Beacons of the Past: Hillforts in the Chiltern Landscapes” and it aims to engage and inspire a large, diverse range of people to discover, conserve and enjoy the Chilterns' Iron Age hillforts and their prehistoric chalk landscapes. The nineteen Iron Age hillforts form one of the densest concentrations of hillforts in the country. The project is managed by Dr Wendy Morrison, supported by Dr Edward Peveler.

A central component of the project is a detailed Lidar survey which will cover about 1400 km² of the Chiltern Hills to provide new archaeological information, particularly for those areas covered by woodland. Important also is geophysical survey to investigate areas within and adjacent to a selected number of hillforts. Desborough Castle, situated within a large housing estate at High Wycombe, Buckinghamshire, is one of the hillforts (or possible hillforts) selected for geophysical survey. A magnetometer (gradiometer) survey was conducted over areas of open grassland at and adjacent to Desborough Castle in early July with the aim of detecting archaeological features which might confirm an Iron Age date of certain earthworks and identifying potential locations for future limited trial excavation.

Desborough Castle is a Scheduled Ancient Monument and this report describes the results obtained and is submitted in compliance with the Section 42 Licence issued under the 1979 Ancient Monument and Archaeological Areas Act (as amended), dated 19th June 2019 (Ref: AA/60742, Case No: SL00215409). The various Historic England reference numbers to the monument are listed below in tables 1 and 2, and the scheduled area is illustrated in figure 1. Table 3 contains a list of relevant entries from the Buckinghamshire HER.

National Heritage List for England	1020863
Historic England Monument Number	248824
Historic England NMR Number	SU 89 SW 2

Table 1 – Historic England Reference Numbers for Desborough Castle

Reference	Year	Period and Monument Type	Grid Reference
EHNMR-641399	1968	Iron Age Hillfort	SU 84710 93320
EHNMR-650360	1987	Iron Age Hillfort, Medieval Castle	SU 84710 93320

Table 2 – NMR Excavation Index Reference Numbers for Desborough Castle

Both excavations are recorded with the same grid reference – the centre of the medieval ringwork - and therefore do not provide precise locations of the two excavations.

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

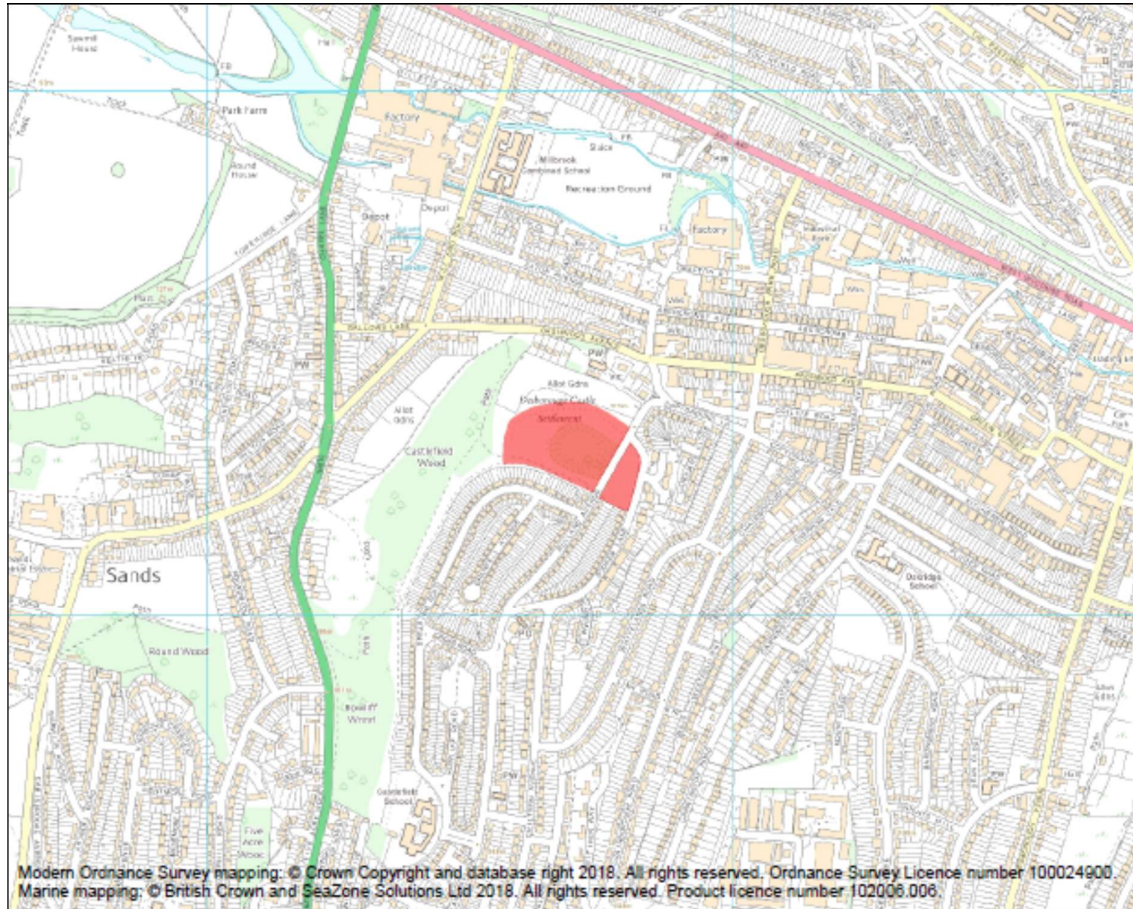


Figure 1 – The Scheduled Area at Desborough Castle, High Wycombe, Buckinghamshire

HER PRN	Description	Type	Location
0001800000	Medieval ringwork known as Desborough Castle surviving as earthworks and known from historic records	Monument	SU 8471 9331
0001800001	Medieval roof tiles found in tree roots	Find Spot	SU 84710 93320
0001800002	Medieval building foundations seen at Desborough Castle	Find Spot	SU 84710 93320
0001801000	Possible late prehistoric hillfort pre-dating Desborough Castle	Monument	SU 8468 9329
0001801001	Possible medieval bailey earthworks at Desborough Castle	Monument	SU 8468 9326
0001802000	Possible Bronze Age round barrow under Desborough Castle ditch recorded in field survey	Monument	SU 84648 93326
0001802001	Possible Saxon moot mound under Desborough Castle ditch recorded in field survey	Monument	SU 84648 93326
0001803000	Roman roof tiles found around Desborough Castle	Find Spot	SU 84710 93320
0001803001	Iron Age to Roman brooch found at Desborough Castle	Find Spot	SU 84710 93320
0001803002	Iron Age and Roman pottery found in excavation	Find Spot	SU 84710 93320
0001804000	Iron Age coins found at or near Desborough Castle	Find Spot	SU 84710 93320
0001804001	Mesolithic flint axe found at Desborough Castle	Find Spot	SU 84710 93320
0001804002	Late prehistoric flint artefacts found on the ground surface and in excavation at Desborough Castle	Find Spot	SU 84712 93320
0119500000	Iron Age metalwork found at or near Desborough Castle	Find Spot	SU 84460 93140
0119700001	Roman coin found at or near Desborough Castle	Find Spot	SU 84740 93420
0119700002	Roman metalwork found at or near Desborough Castle	Find Spot	SU 84740 93420

Table 3 – Buckinghamshire HER Reference Numbers for Desborough Castle

Desborough Castle is recorded as site EN3452 in the *Atlas of Hillforts of Britain and Ireland* (Lock and Ralston 2017).

Desborough Castle

The name Desborough Castle covers two or more archaeological features. The most visible is a medieval ringwork known as ‘The Roundabout’, which may be the site of a castle at West Wycombe mentioned in the Winchester Pipe Roll of 1210-11 (Collard 1988, 39). Although the ringwork is covered by trees its banks and ditches are visible in the Lidar image in figure 3. It forms an approximately rectangular enclosure cut into the hill to create a level interior about 0.5ha in area. The outer ditch is about 2.6m deep on the higher south-west side, decreasing to 1.6m on the lower north-east side. Similarly, the inner rampart is higher on the south-west, reaching a height above the ditch bottom of 3.6m, reducing to 2.9m in the north.

Beyond the area covered by trees is an outer enclosure, visible as a slight escarpment or lynchet on the west and north. Although this could represent an associated medieval bailey, it has been argued that its form suggests an earlier date than the main ringwork enclosure and that it may represent a univallate hillfort dating to the Late Bronze Age or Early Iron Age (Collard 1988, 15; Farley 2009, 235). In addition to the two enclosures there is a third feature situated on the west side of the ringwork. This is a segment of a probably once circular mound which has been cut through by the construction of the ringwork ditch. About 24m across and 0.7m high, it is believed to represent the surviving portion of a bowl barrow.

Figure 2 shows the location of Desborough Castle on a north-east facing downward slope, descending from 130m OD to 115m OD. Neither the medieval castle nor the postulated Iron Age hillfort are on the highest point. Instead, the chosen location provides good views to the north, west and east but is overlooked from the south.



Figure 2 – Topography of Desborough Castle and Surrounding Area
Ordnance Survey Contour data overlain on Google Earth Image

Figure 3 illustrates the same local topography using Lidar data. Higher ground is denoted by an orange colour and lower ground by green. The Lidar image shows clearly the ditch and bank enclosing the flat interior. Also visible is the escarpment or lynchet to the north and west of the

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

castle. The eastern end of this lynchet, at Rutland Avenue, aligns well with Booker Lane and it has been suggested this lane represents the eastern bank and ditch of the postulated hillfort.



Figure 3 – Lidar image of Desborough Castle and Surrounding Area

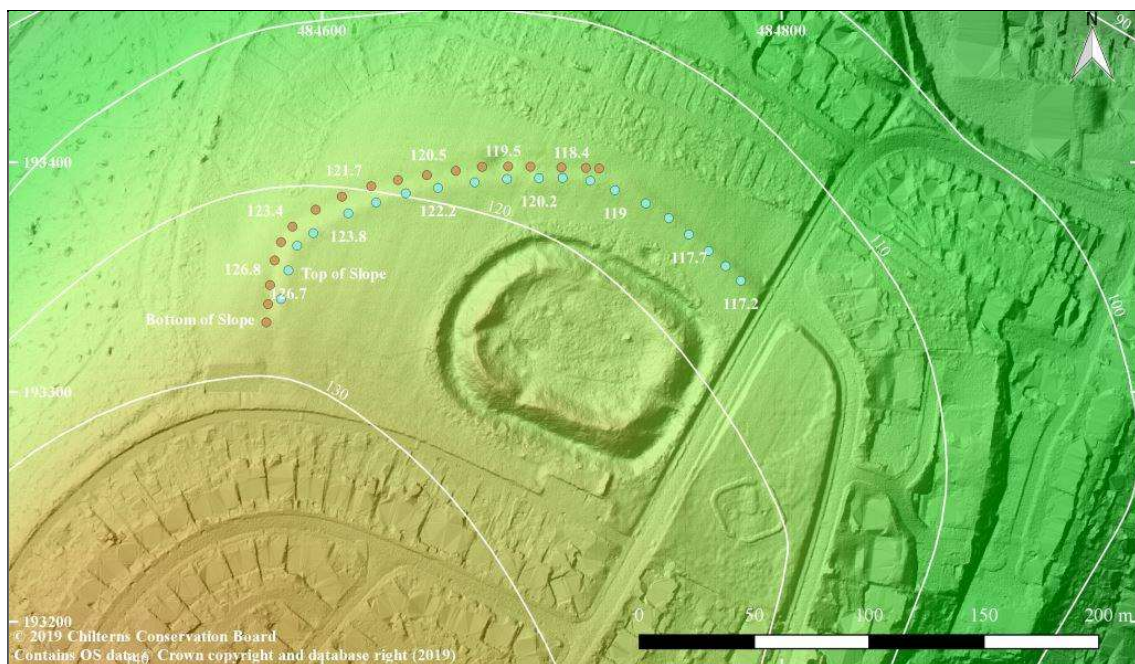


Figure 4 – Lidar image of Desborough Castle and Surrounding Area

Only in the north-east does the lynchet follow the contour. In the west, and probably also further east, it rises from north to south. This can be seen in figure 4, where a Leica survey grade GPS was used to record the top-of-slope (blue dots) and bottom-of-slope (brown dots) of the lynchet. The lynchet rises from about 117m OD near Rutland Avenue to over 128m

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OD in the south-west. The increasing elevation from north to south, and the profile of the lynchet are illustrated in figure 5. About 30m along this profile is a short, relatively flat length before the increased steepness of the lynchet between 30m and 35m. Between 35m and 60m the rise in elevation is much the same as between 0m and 30m.

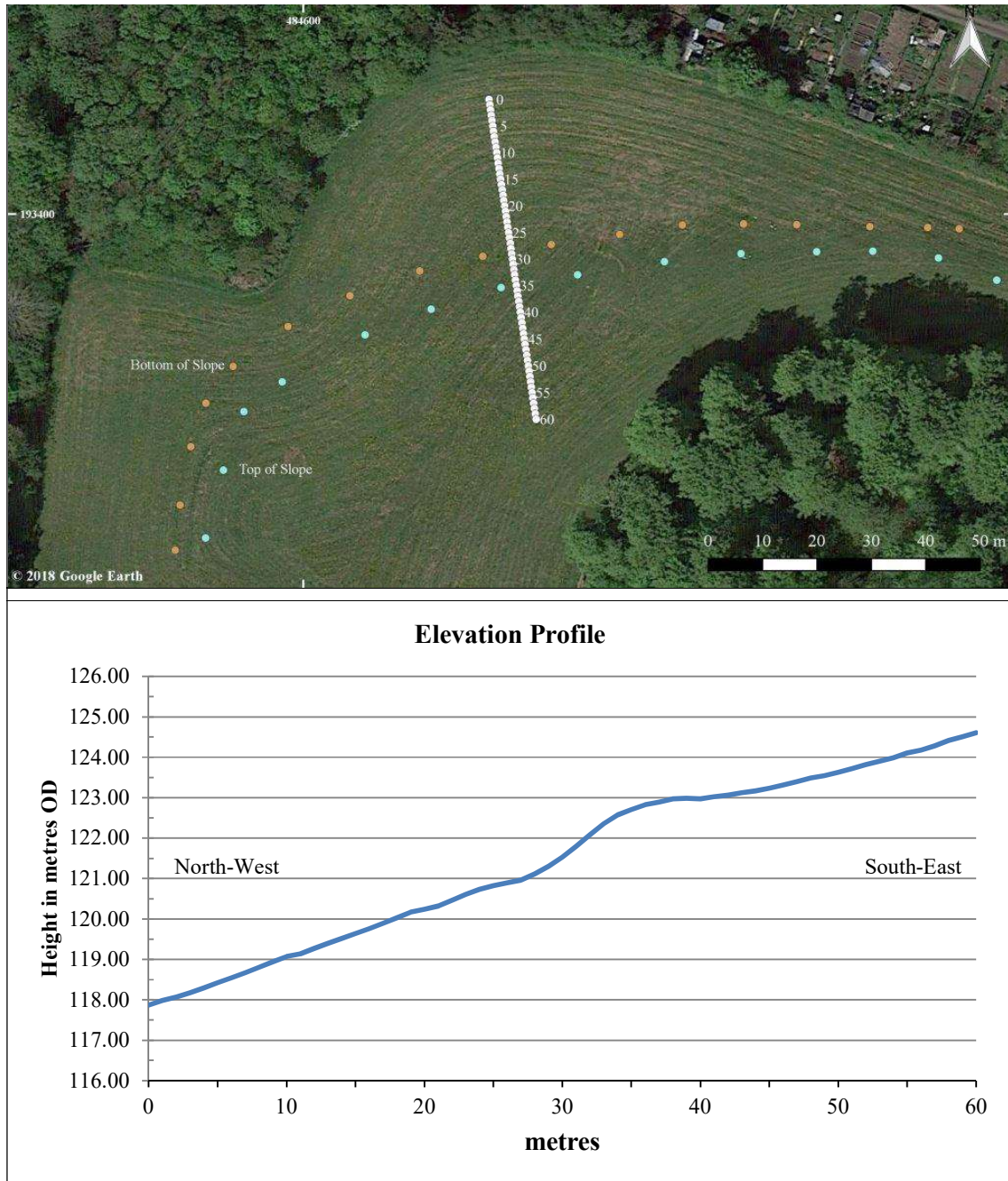


Figure 5 – Sixty metre elevation profile over lynchet (potential bank and ditch)

The solid geology is Upper Chalk (Lewes Nodular Chalk Formation). Excavation in 1987 showed a drift deposit of clay-with-flints which varied in depth from 0.10m to over 1.75m (Collard 1988, 19).

Magnetometer Survey

The magnetometer survey was undertaken to determine whether additional archaeological features could be detected in addition to the earthworks visible on the ground. The survey was performed by William Wintle, assisted by three volunteers a day, using both a single-sensor and dual-sensor Bartington Instruments GRAD601 gradiometer. The grids were thirty-metre squares and were walked in a clockwise “zig-zag” pattern with traverses one metre apart and readings taken four times a metre along each traverse. The magnetometer was set to a scale of 100nT with a sensitivity of 0.1 nT. The results have been processed by TerraSurveyor v3 and are presented as block-shaded images using a grey scale. The survey locations were recorded using a survey grade Leica GPS.

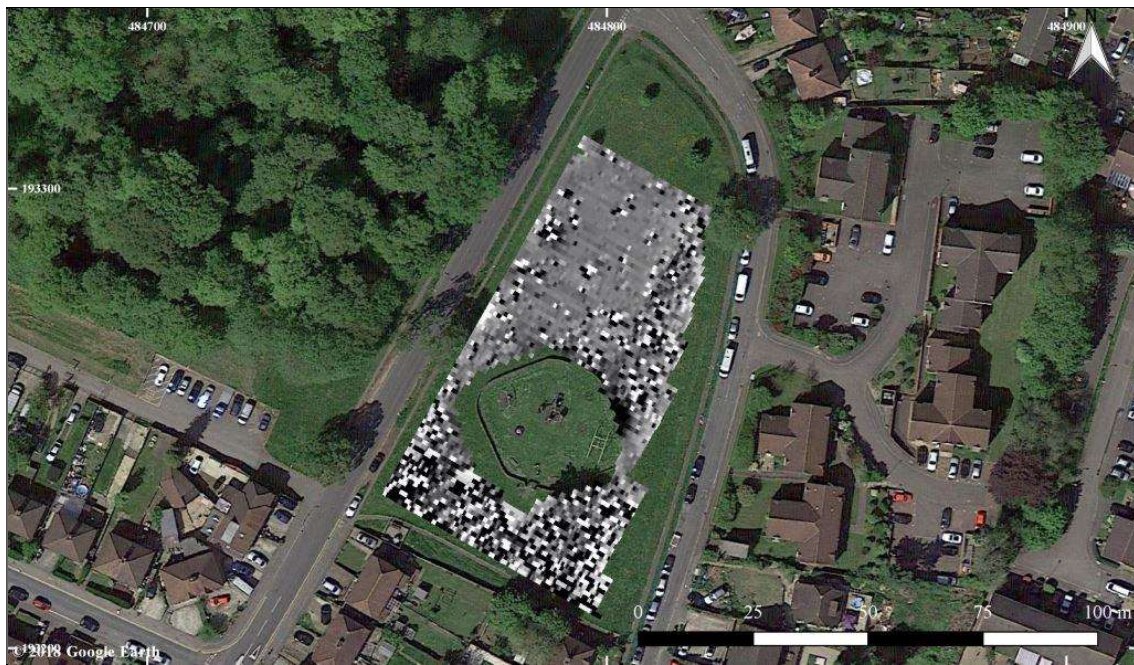
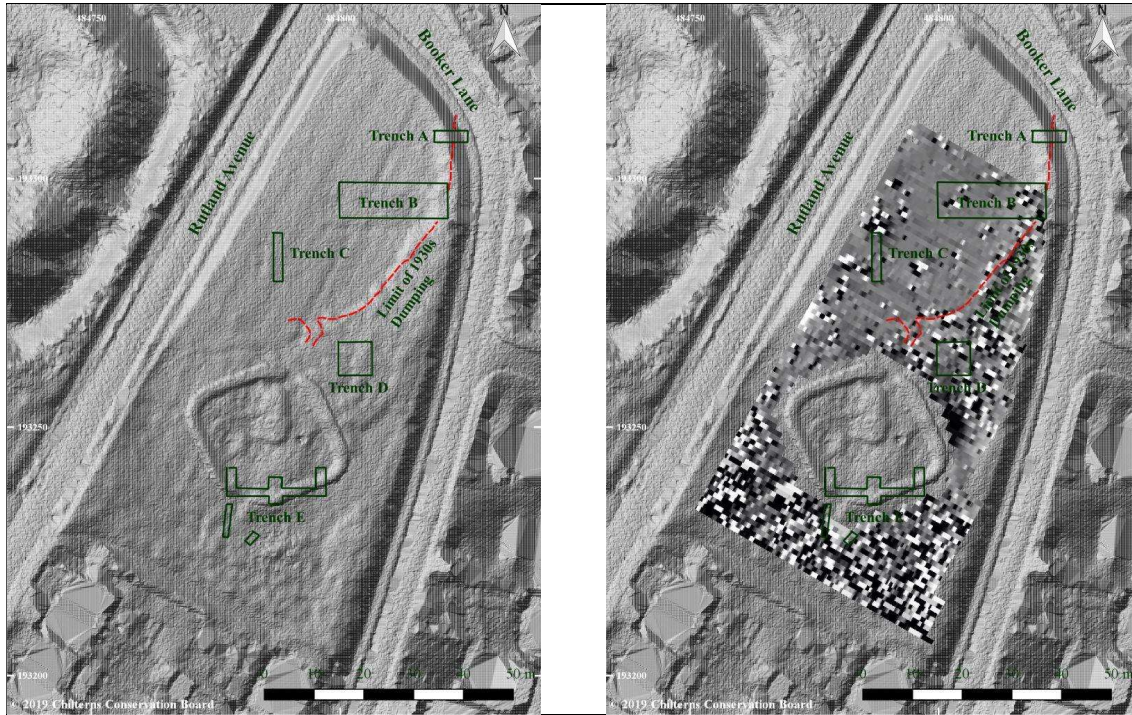


Figure 6 – Magnetometer Survey – Area 1

The first area surveyed, Area 1 on the 2nd July, lies to the east of the medieval ringwork, between Rutland Avenue on the west and Booker Lane on the east. The survey area contains a small number of trees and also a centrally located children’s playground. The survey results are shown in figure 6 and indicate very strong magnetic signals, particularly in the south and east. The south of the area is adjacent to Castlefield housing estate and the strong magnetic signals are probably caused by twentieth-century ground disturbance during the construction of the housing estate. The east of the survey area is above Booker Lane, which sits in a depression and may represent the north-eastern ditch of the postulated hillfort. The strong signals adjacent to Booker Lane may be due to supporting material holding the bank in place, and/or the interference from cars parked in the lane. The northern segment of the area is magnetically relatively quiet but there are no visible archaeological features.

Five trenches were excavated in this area in 1987 in advance of a proposed housing development (Collard 1988) and their location is shown in figure 7. Also shown is an indication of the limit of material dumped in the 1930s during construction of the Castlefield estate. It can be seen that this boundary corresponds closely to the ‘noisy’ and ‘quiet’ areas of the magnetometer survey. Table 4 below summarises the main features of the five trenches.



**Figure 7 – 1987 Excavations and Magnetometer Survey – Area 1
(Trenches and dumping limit based on Collard 1988, Fig. 5, 20)**

Trench Description

- A A series of modern layers dumped over the 1930 turf line. The ploughsoil deepens from west to east. The underlying clay-with-flint surface slopes down to the east. Abraded medieval pottery.
- B Below modern turf was a ploughsoil overlying clay-with-flints. The ploughsoil deepens from west to east. No archaeological features.
- C A single large ditch about 5m wide ran east then north, parallel to castle defences. Only medieval finds.
- D A 0.3m deep deposit of modern rubbish sealed the postholes of a farm building shown on 1925 OS map, Below the ploughsoil was a single posthole with no finds.
- E An approximately east-west linear feature about 12m wide and 2.75 deep. This was probably a large ditch forming an external defence to the castle. Mostly medieval pottery with a small amount of Iron Age and Roman material.

Table 4 – 1987 Trench Descriptions (Collard 1988, 19-23)

Trench B, in the ‘quiet’ area contained no archaeological features. Although the geophysical survey also failed to detect any archaeological features in this area this does not prove there are no features. Trenches C and E contained large ditches which a magnetic survey would expect to detect. The large amount of 1930s rubble dumped in the area around trench E, together with the subsequent construction of the playground probably explains the failure to detect a ditch here. It appears that even in the magnetically ‘quieter’ area of Trench C it is still not possible to detect a substantial ditch.

The 1987 excavations produced both features and artefacts associated with the medieval ringwork. Only in trenches A and B was some indirect evidence found for a lynchet (or bank and ditch). Collard argues that some feature (bank) was required to account for the build-up of ploughsoil in the east, where the underlying natural surface of clay-with-flints falls away. A small layer of clay-with-flints at the eastern end of Trench A may represent part of a bank built of material dug from an external ditch (Collard 1988, 19).

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

Area 2, to the north and west of the medieval ringwork, was surveyed from the 3rd to 5th of July and the results are shown in figure 8. It is also an area of strong magnetic signals, although weaker than Area 1. There are strong signals along the northern boundary which are probably associated with a wire-netting fence. Distributed across most of the area are strong magnetic dipole signals which are most probably caused by small pieces of ferrous metal. Much of this is likely to be modern, twentieth-century material, but some may be medieval or older. Unfortunately, it is not possible to distinguish between the two.



Figure 8 – Magnetometer Survey – Area 2

Despite this random noise there are some potential archaeological features and these are highlighted in figure 9. There is one large pit-like feature [1] to the west of the medieval ringwork. To the south-east and south-west of this feature are two smaller features [2] and [3], although with a potential metal signal in the middle. Two similar possible features [4] and [5] lie further south. Of these five features the most likely to be a pit with archaeological interest is [1]. There may also be a partially circular feature in the extreme north-west [6]. This is approximately 10m in diameter which is in the range of a drip gully or foundation trench of a roundhouse. Such a feature might have been expected to be found within rather than outside the lynchet and its interpretation as a roundhouse must be viewed as very speculative. The survey has found only limited evidence for a ditch associated with the lynchet or escarpment - the most likely feature is [7] in the north and less certain is [8] in the west. Both are discussed later.

Two trenches were excavated in this area in 1968 (Saunders 1971; Collard 1988) and their location is shown in figure 10. The main trench was positioned to provide a section over the lynchet to seek evidence for a possible bank and ditch. This section is illustrated in figure 11 and suggests the trench (or at least the drawn section) was about 13m long. The section is interpreted as showing the ploughed-out remains of a primary bank and ditch (Bank A, Ditch A) which was subsequently replaced by a new bank and ditch (Bank B, Ditch B) after ditch A had silted up. The only piece of dating evidence was a single sherd of flint-gritted pottery assigned a 'probably Iron Age' date (Collard 1998, 15).

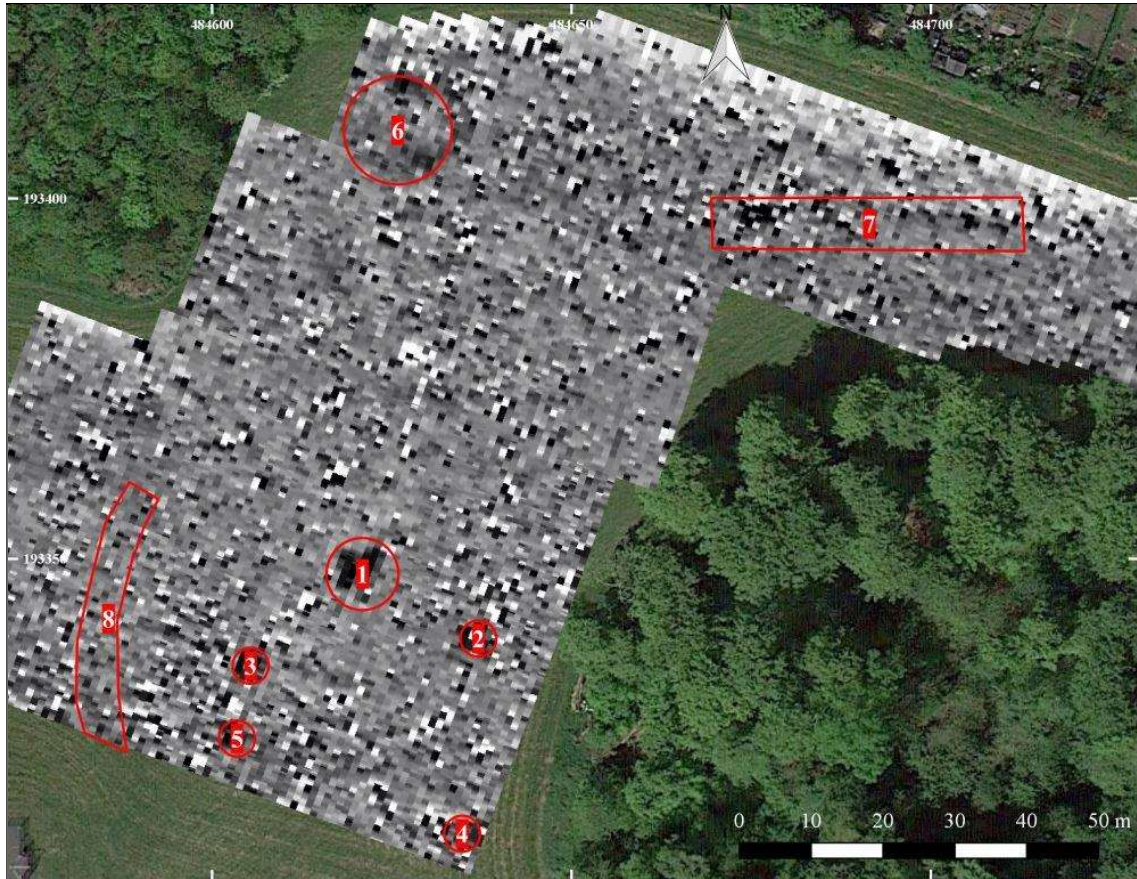


Figure 9 – Magnetometer Survey – Area 2 Possible Features

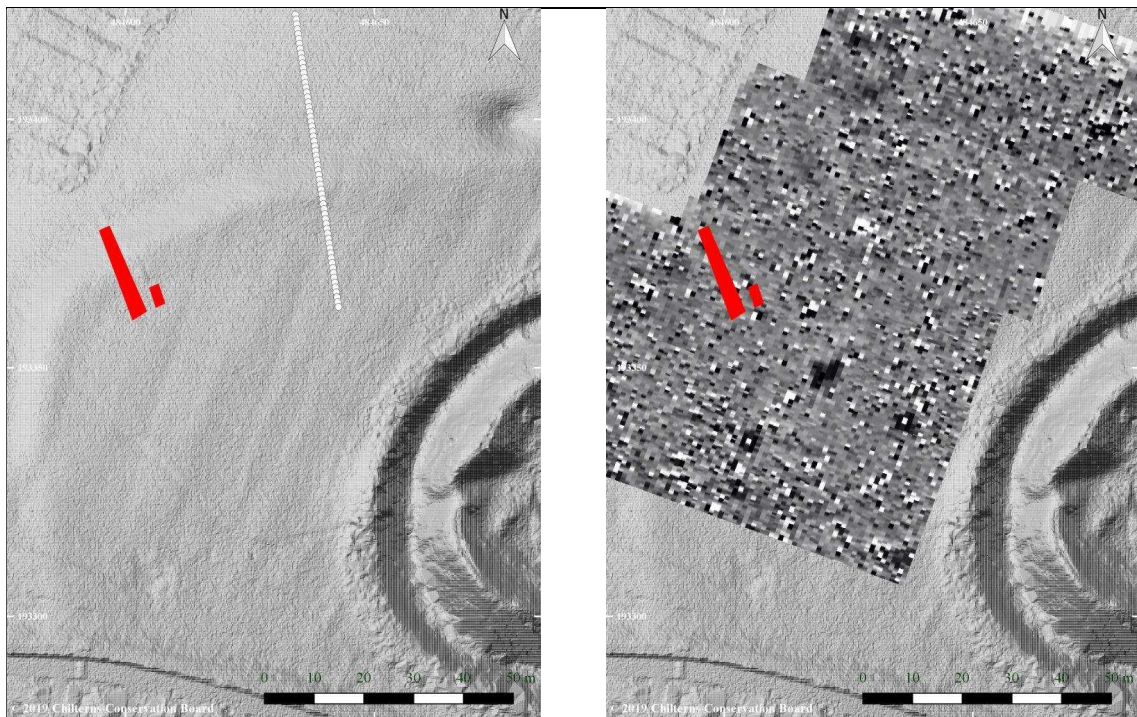
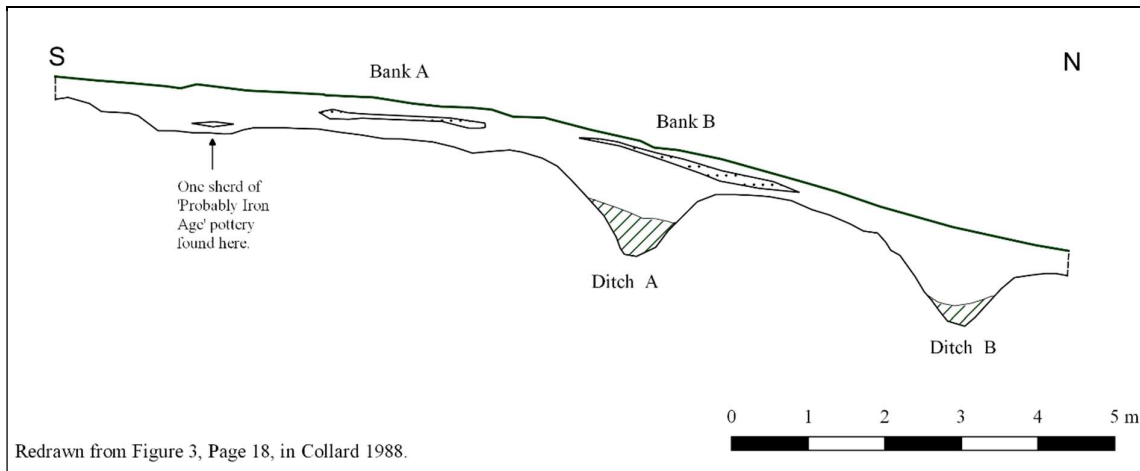


Figure 10 – 1968 Excavations and Magnetometer Survey – Area 2
(Trenches based on Collard 1988, Fig. 2, 17)

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

Figure 11 suggests the ditches are between 1 and 1.5m deep, about 1.25m across and about 4m apart. The magnetometer survey features [7] in the north and [8] in the west might represent one or both of these ditches.



**Figure 11 – 1968 Excavations - Area 2
(Based on Collard 1988, Fig. 3, 18)**

The lynchet profile can be usefully compared in figures 5 and 11. In figure 5 the lynchet is clearly indicated by a steeper slope over a distance of about 5m. Above (south) and below (north) the lynchet the slope is similar but less steep than the lynchet. In contrast, in figure 11 the lynchet is only apparent as a break of slope between a slightly steeper slope below the lynchet (north) and a slightly shallower slope above the lynchet (south). The excavated trench lies about 45m to the west of the GPS profile (see figure 10).

In figure 12 the possible features [1] to [8] are shown in relationship to the Lidar data and also to the top-of-slope and bottom-of-slope as recorded by the GPS survey. It can be seen that feature [7] in the north does correspond to the lynchet and it seems probable that [7] represents a ditch, possibly Ditch A. In the west feature [8] lies above the lynchet and is therefore unlikely to represent a ditch. It may therefore simply be noise rather than an archaeological feature. The lynchet ditches (Ditch A and Ditch B) have therefore only been detected along a relatively short length in the north. There is no indication in the magnetic survey of two distinct ditches. Features [1] to [6] do not appear to have any topographic representation.

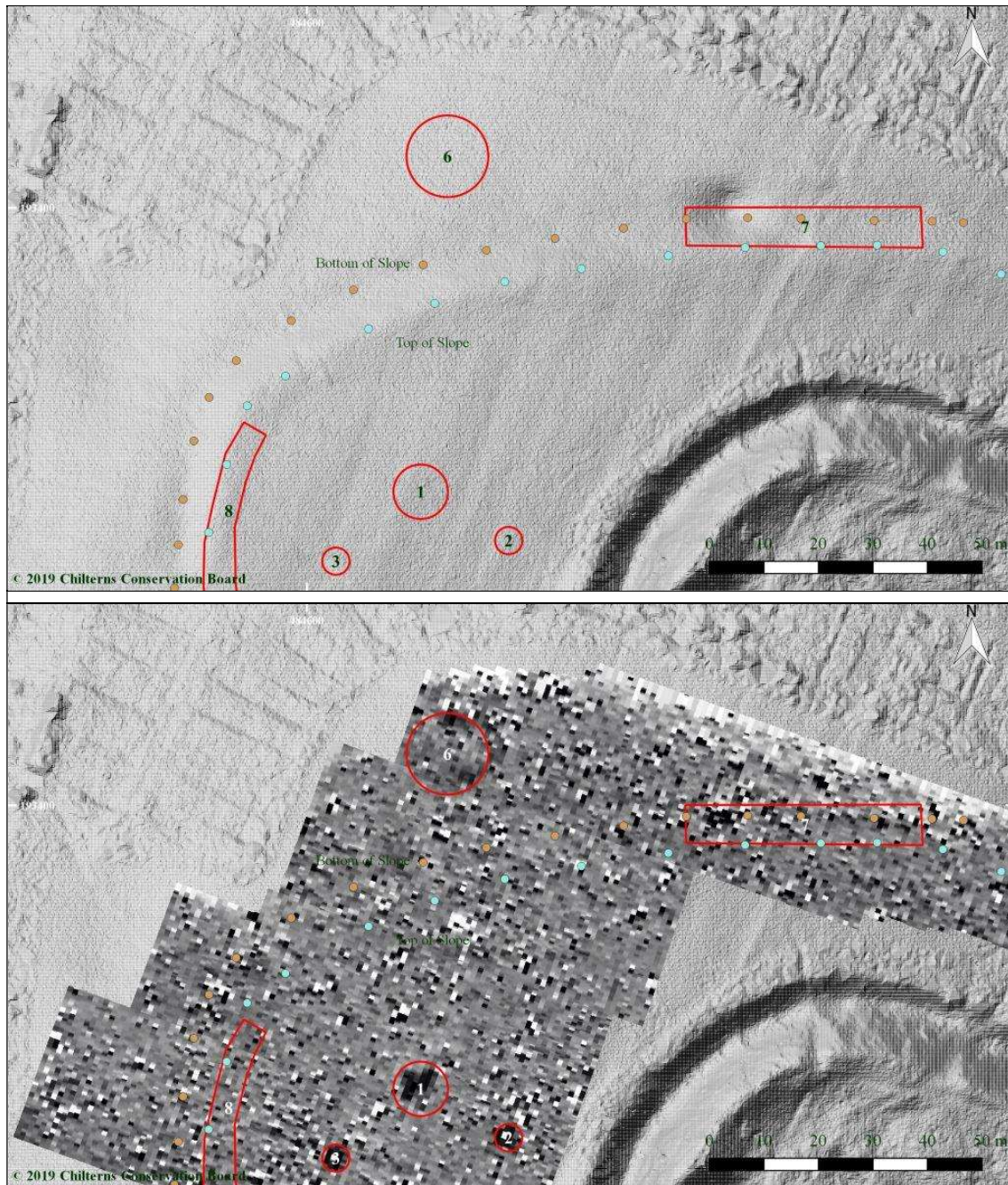


Figure 12 – Relationship of Lynchet to features from Magnetic Survey

Conclusions

An overview of Areas 1 and 2 is illustrated in figure 13. The magnetometer survey has detected a range of strong magnetic signals which have limited its ability to detect archaeological features. This is most apparent in Area 1 to the east of the medieval ringwork where the 1987 excavations detected both medieval features and material dumped on the site from the construction of Castlefield estate in 1930s. The magnetometer survey detected only the latter. The disturbed state of the site, particularly in Area 1, is likely to effect other types

of geophysical survey such as resistivity or ground penetrating radar (GPR) and limit their ability to identify and resolve archaeological features.



Figure 13 – Magnetometer Survey – Areas 1 (east) and 2 (north-west)

The magnetic survey has not identified any archaeological features in Area 1. Parts of this area were excavated in 1987 and Collard (1988, 21) has suggested that the possible eastern bank and ditch might be found in a location to the south of Trench A. However, placing an excavation trench on the steep slope onto Booker Lane, adjacent to the pavement and parked cars would be challenging.

Eight potential archaeological features have been identified in Area 2 but possibly only two might be worth investigating in a trial excavation. These are the pit-like feature [1] and the possible circular feature in the north-west [6]. Should the features be identifiable in excavation, they could be modern, medieval or prehistoric. It would also be possible to place a trench across the lynchet and repeat the 1968 excavation with more modern excavation and recording techniques. Only part of the ditch known to be associated with the lynchet has been identified in the magnetic survey [7] and there is no indication that there are two ditches.

Acknowledgements

The authors are very grateful to the nine volunteers who assisted in the survey work (see Appendix 2) and to Mr David Wilkinson of Historic England who gave permission for this survey to take place on a Scheduled Ancient Monument.

The Ordnance Survey data used in the figures is the freely available OS Open Map Local and OS Terrain 50. The Lidar data used in figures 3, 4, 7, 10 and 12 has been provided by the Chilterns Conservation Board. All figures have been produced using the freely available QGIS version 2.16.

Appendix 1 – Survey Details and Data Processing

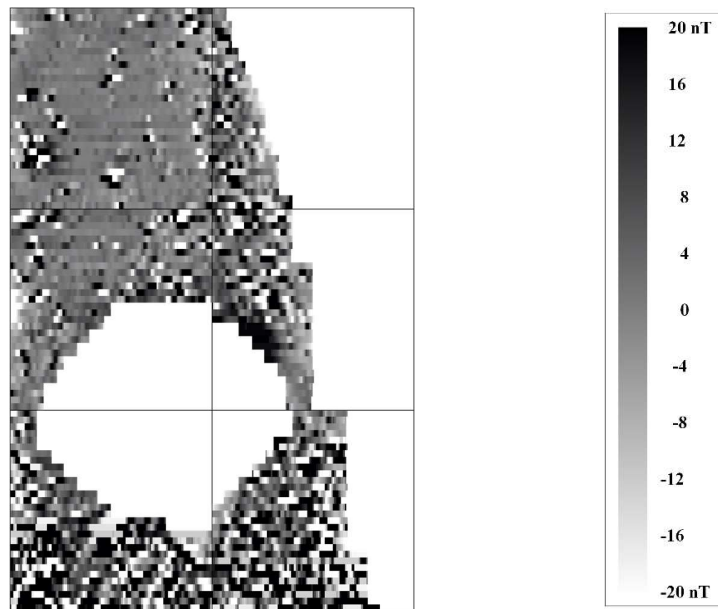
Magnetometer Survey (Areas 1 and 2)

Grid Size: 30 m x 30 m
Traverse Separation: 1 m
Sample Interval: 0.25 m (4 readings/m)

TerraSurveyor Processing (Area 1)

Clip at 1 SD (-29nT to 26nT)
Destripe Mean Traverse
Clip at -20nT to 20nT

Area 1 was surveyed using a single-sensor Bartington GRAD-601/



**Figure A1 –Magnetometer Survey of Area 1
(North approximately at top - Grids are 30-metre squares)**

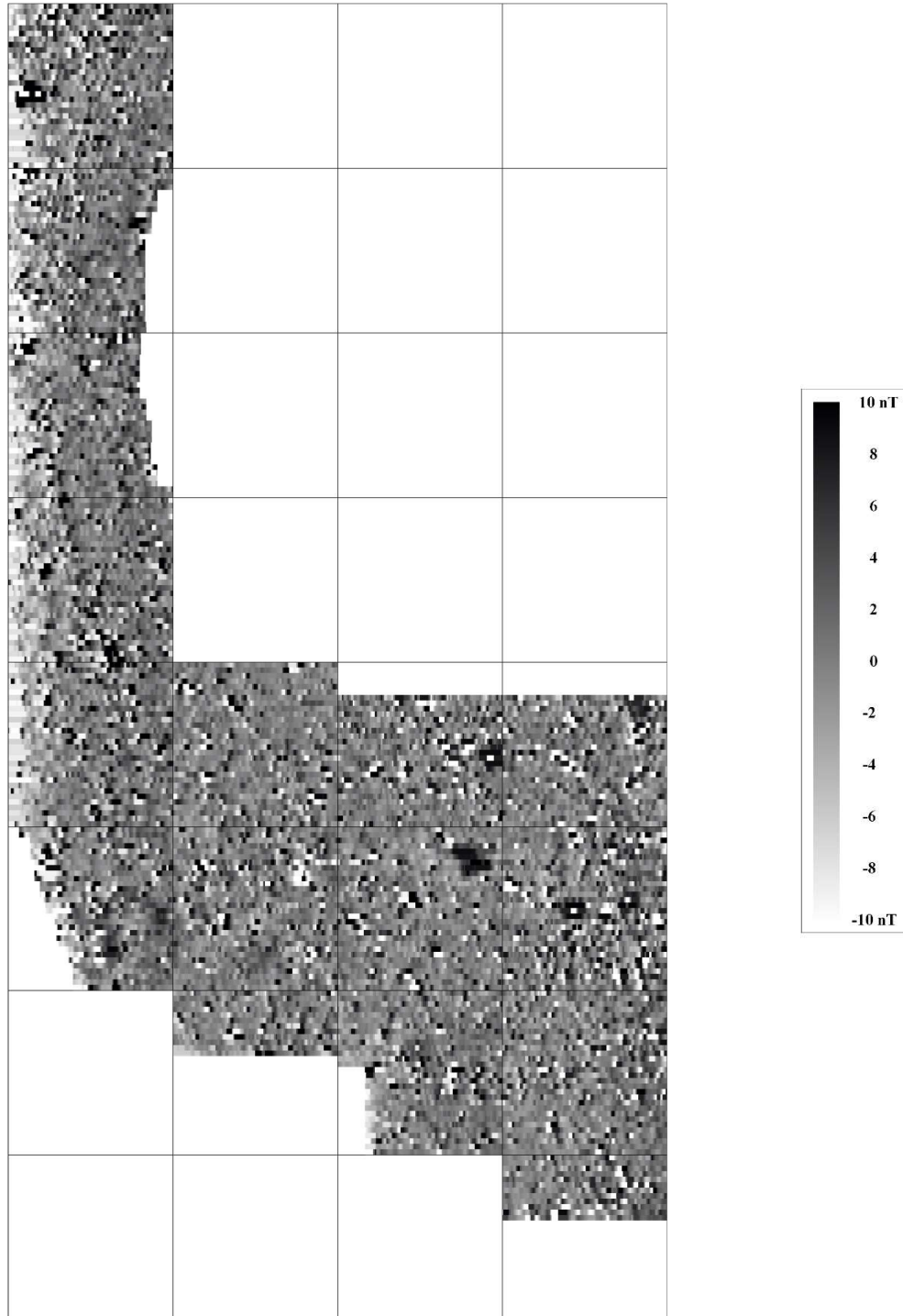


Figure A2 – Area 1 looking north

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

TerraSurveyor Processing (Area 2)

Clip at -10nT to 10nT
Destripe Mean Traverse
Clip at -10nT to 10nT



**Figure A3 –Magnetometer Survey of Area 2
(North approximately on left - Grids are 30-metre squares)**

Geophysical Survey at Desborough Castle, High Wycombe, Buckinghamshire, 2019.

Area 2 was surveyed using a dual-sensor Bartington GRAD-601/



Figure A4 – Area 2 looking east

Appendix 2 – Volunteers

Nigel Rothwell	2 nd July
Toby Lucas	2 nd July
Andy Godley	2 nd July
Stephen Ramsey	3 rd July
Matthew Phillips	3 rd July
Kate Paterson	3 rd July
Abigail Lloyd	4 th July
Robert Boot	4 th July
Sarah Miles	4 th July

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