

ARCHAEOLOGICAL SERVICES

DURHAM UNIVERSITY

on behalf of
Altogether Archaeology



and



Bradley Green DMV
near Bardon Mill
Northumberland

geophysical surveys

report 3785
November 2015

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1. Summary

The project

- 1.1 This report presents the results of geophysical surveys conducted over parts of the deserted medieval village at Bradley Green, Bardon Mill, Northumberland. The surveys were conducted as part of the 'Altogether Archaeology' community project, Theme 8 '*North of the Wall*'. The works comprised geomagnetic and resistance surveys over two parts of the site.
- 1.2 The works were commissioned by the North Pennines AONB Partnership (NP AONB) and the Northumberland National Park Authority (NNPA), and were conducted by Archaeological Services Durham University in conjunction with local volunteers.

Results

- 1.3 Many anomalies were recorded with both techniques, typically either in linear arrangements or as broader spreads. Many of the strong positive and dipolar magnetic anomalies correspond to earthwork features noted on the ground and reflect a magnetic component of the stone used here. This phenomenon has been noted during previous geomagnetic surveys at other nearby sites.
- 1.4 Many of the resistance anomalies also correspond to the remains of walls or banks noted on the ground and previously recorded in an earthwork survey. However, some of the anomalies detected by both techniques almost certainly reflect sub-surface wall or bank remains which have not previously been recorded. These include another enclosure in Area 1, separated from the known enclosure by an access route, and several other possible walls or banks to the north and a number of smaller structures to the east of the enclosures, possibly houses or other buildings.
- 1.5 The survey grid was designed to enable repeat visits over successive years, to extend contiguous survey coverage.
- 1.6 Targeted excavation has the potential to provide information on dating of the settlement, the state of preservation of remains, artefactual, economic and palaeoenvironmental information.

2. Project background

Location (Figure 1)

2.1 The study area comprised the scheduled monument of Bradley Green, a deserted medieval village (DMV) in Bardon Mill parish, Northumberland (NGR centre: NZ 77900 67600). The geophysical surveys targeted two areas of the site with upstanding earthworks, each area measuring 0.48ha.

2.2 The site is bounded to the north by the B6318 'Military Road'. Hadrian's Wall lies approximately 800m to the north at Hotbank Crag, just west of Housesteads fort. Bradley Hall and Bradley Burn lie to the south and south-west of the site; a minor road forms the site's eastern boundary.

Objective

2.3 The surveys were undertaken as part of the North Pennines AONB Partnership's 'Altogether Archaeology' project, Theme 8 *North of the Wall*, Fieldwork module 8b, Bradley Green DMV Targeted Walkover & Geophysical Survey.

2.4 Specific aims of the project were:

- To undertake a rapid walkover survey of the unrecorded features identified during the 11th November 2014 site visit and thereby to train volunteers in quick feature identification, how to identify stratigraphic relationships between earthworks, and the principles of sketch mapping
- To undertake geophysical survey of targeted areas to identify any traces of sub-surface remains
- To evaluate any anomalies identified in the geophysical survey to determine what features they represent within the medieval settlement
- To engage many volunteers in the survey and excavation of these areas as part of the Altogether Archaeology programme and provide high-quality training in archaeological skills and principles
- In achieving the above, to make a genuine contribution to our understanding of the medieval land-use of Bradley Green and Bardon Mill, to communicate the results to a wide audience, and where appropriate to suggest further work to build on the results of this project.

2.5 Further, the research aims to contribute to the research themes and priorities identified in the *Northumberland National Park Regional Research Framework* (Young *et al.* 2004). The potential and relevance of this project to those themes and priorities is presented in detail in the Project Design, which is appended to this report.

2.6 The research also aims to contribute to the research priorities identified in the *North East Regional Research Framework* (Petts & Gerrard 2006). Again, the potential and relevance of this project to those priorities is presented in detail in the Project Design.

Methods statement

- 2.7 The surveys have been undertaken in accordance with a Project Design prepared by Krissy Moore (the then Community Archaeologist for the NNPA), a methods statement provided by Archaeological Services Durham University (ref. DH14.481), and national standards and guidance (see para. 5.1 below).
- 2.8 The geophysical surveys were also undertaken in accordance with a 'Section 42' licence granted by English Heritage under the Ancient Monuments and Archaeological Areas Act 1979 (as amended by the National Heritage Act 1983).

Dates

- 2.9 A preliminary site visit was undertaken on 11th November 2014. Fieldwork was undertaken on 20th-22nd February 2015. This report was prepared for November 2015.

Personnel

- 2.10 Fieldwork was conducted by volunteers from the North Pennines AONB Altogether Archaeology project, with Paul Frodsham (Historic Environment Officer/Altogether Archaeology Project Officer at NP AONB) and Chris Jones (Historic Environment Officer at NNPA).
- 2.11 Volunteers were trained and supervised by Natalie Swann, Hannah Woodrow and Duncan Hale (Archaeological Services). Geophysical data processing and report preparation was by Duncan Hale (Senior Archaeologist), with illustrations by David Graham.
- 2.12 Overall project management and coordination was provided by Krissy Moore and Chris Jones at NNPA, and Paul Frodsham at NP AONB.

Archive/OASIS

- 2.13 The site code is **NBG15**, for **N**orthumberland **B**radley **G**reen **2015**. The survey archive will be retained at Archaeological Services Durham University and a copy supplied on CD to the client for deposition with the project archive. Archaeological Services Durham University is registered with the **Online AccesS** to the **Index of archaeological investigationS** project (**OASIS**). The OASIS ID number for this project is **archaeol3-228191**.

Acknowledgements

- 2.14 The project team is grateful for the support of Julian Acton (Bradley Farm), the National Trust and Historic England in facilitating this research.

3. Historical and archaeological background

- 3.1 The following information is taken from the Project Design.
- 3.2 The medieval settlement remains at Bradley Green are particularly well-preserved and are known to have been occupied in the 13th century as it is mentioned in records of Edward I's journey to Carlisle in 1306. The settlement is a Scheduled Monument (1233910) and has been included in several studies of settlement patterns north of Hadrian's Wall (eg Woodside & Crow 1999). It is historically and

archaeologically significant because of its connections with the visit by Edward I in 1306 and as a well-preserved 13th-century site.

- 3.3 Bradley Green contains the most significant evidence of medieval settlement within the National Trust's Hadrian's Wall Estate. The area contains the remains of medieval fields and traces of a settlement, which was almost certainly associated with Bradley Hall, a 14th-century hall immediately south of the present study area on the south side of the Bradley Burn. The present-day farm of Bradley Hall dates to the 19th century and incorporates the foundations of a 16th-century bastle house.
- 3.4 A search of the Northumberland Historic Environment Record (HER) returned 22 features within 700m of the centre of Bradley Green, the majority of which are post-medieval. The *vallum* of Hadrian's Wall intersects with the corner of the medieval settlement on Bradley Green and would have been an obvious physical feature at the time the medieval settlement and field system were in use.
- 3.5 A 1:2500 scale topographic survey had previously been undertaken (by B Williams, in Woodside & Crow 1999) but it was at a time when the area was more overgrown and so more subtle topographic features were hidden (Julian Acton, pers. comm. 11th November 2014). No geophysical survey has previously been undertaken. As the exact nature of the settlement is unknown (Frodsham 2004, 83), identification of more subtle features could help to identify the function of different parts of the settlement.
- 3.6 The site visit in 2014 noted that previously unrecorded archaeological features were present and that additional survey of the area could provide new information. A combination of rapid walkover and geophysical survey to target areas identified in the preliminary site visit could (a) quickly record previously unknown surface archaeological features and (b) identify any sub-surface archaeological features via geophysical survey. It was hoped that the surveys would add value to the existing survey by capturing unrecorded surface features and perhaps help to identify the use of certain enclosures within the target areas by identifying sub-surface remains such as hearths or walls. A greater understanding of the settlement at Bradley Green would improve our knowledge of the medieval period north of Hadrian's Wall and would inform proposals for targeted excavations in future.

4. Landuse, topography and geology

- 4.1 At the time of fieldwork the survey area and surrounding land comprised pasture. The land was predominantly short grass, with occasional boggy patches and hummocky reeds. Earthworks were present across much of the area, typically in the form of low stone banks.
- 4.2 The northern part of the site was generally level with a mean elevation of approximately 235m OD. The land sloped away to the south and south-west, down to approximately 225m OD.
- 4.3 The underlying solid geology of the area comprises Visean-Namurian strata of Alston Formation limestone, sandstone, siltstone and mudstone, as well as the Five Yard Limestone Member in the east and south. A small area of till is recorded at the northern edge of the site.

5. Geophysical survey Standards

- 5.1 The surveys and reporting were conducted in accordance with English Heritage guidelines, *Geophysical survey in archaeological field evaluation* (David, Linford & Linford 2008); the Chartered Institute for Archaeologists (CIfA) *Standard and Guidance for archaeological geophysical survey* (2014); the CIfA Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service & Digital Antiquity *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2013).

Technique selection

- 5.2 Geophysical survey enables the relatively rapid and non-invasive identification of sub-surface features of potential archaeological significance and can involve a suite of complementary techniques such as magnetometry, earth electrical resistance, ground-penetrating radar, electromagnetic survey and topsoil magnetic susceptibility survey. Some techniques are more suitable than others in particular situations, depending on site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift.
- 5.3 In this instance, it was considered likely that cut features such as ditches and pits might be present on the site, and that other types of feature such as trackways, wall foundations and fired structures (for example kilns and hearths) would also be present.
- 5.4 Given the anticipated nature and depth of targets, two complementary geophysical survey techniques were considered appropriate: geomagnetic and earth electrical resistance survey. The selected geomagnetic technique, fluxgate gradiometry, involves the use of hand-held magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect archaeological features. Given the likely presence of wall-footings and tracks, an electrical resistance survey was also considered appropriate. Earth electrical resistance survey can be particularly useful for mapping stone and brick features. When a small electrical current is injected through the earth it encounters resistance which can be measured. Since resistance is linked to moisture content and porosity, stone and brick features will give relatively high resistance values while soil-filled features, which retain more moisture, will provide relatively low resistance values.

Field methods

- 5.5 Since it was intended that the project might continue for several years with volunteers from the North Pennines community, a local grid was designed which covered the whole of the Scheduled Area and some further land to the north-east. It was envisaged that different parts of the site would be surveyed each year, but all would be located on the same grid to provide contiguous cover without overlap.
- 5.6 A 20m grid was therefore established across the site and related to the Ordnance Survey National Grid using a Leica GS15 global navigation satellite system (GNSS) with real-time kinematic (RTK) corrections typically providing 10mm accuracy.

- 5.7 Site notes from the rapid walkover earthwork surveys conducted by the volunteers are retained with the NNPA.
- 5.8 Measurements of vertical geomagnetic field gradient were determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was nominally 0.03nT, the sample interval was 0.25m and the traverse interval was 1m, thus providing 1,600 sample measurements per 20m grid unit.
- 5.9 Measurements of earth electrical resistance were determined using Geoscan RM15D Advanced resistance meters and MPX15 multiplexers with a mobile twin probe separation of 0.5m. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was 0.1ohm, the sample interval was 1m and the traverse interval was 1m, thus providing 400 sample measurements per 20m grid unit.
- 5.10 Data were downloaded on site into a laptop computer for initial processing and storage and subsequently transferred to a desktop computer for processing, interpretation and archiving.

Data processing

- 5.11 Geoplot v.3 software was used to process the geophysical data and to produce both continuous tone greyscale images and trace plots of the raw (minimally processed) data. The greyscale images and interpretations are presented in Figures 2-6; the trace plots are provided in Figures 7 and 8. In the greyscale images, positive magnetic/high resistance anomalies are displayed as dark grey while negative magnetic/low resistance anomalies are displayed as light grey. Palette bars relate the greyscale intensities to anomaly values in nanoTesla/ohm, as appropriate.
- 5.12 The following basic processing functions have been applied to the geomagnetic data:

<i>clip</i>	clips data to specified maximum or minimum values; to eliminate large noise spikes; also generally makes statistical calculations more realistic
<i>zero mean traverse</i>	sets the background mean of each traverse within a grid to zero; for removing striping effects in the traverse direction and removing grid edge discontinuities
<i>de-stagger</i>	corrects for displacement of geomagnetic anomalies caused by alternate zig-zag traverses
<i>interpolate</i>	increases the number of data points in a survey to match sample and traverse intervals; in this instance the data have been interpolated to 0.25m x 0.25m intervals
- 5.13 The following basic processing functions have been applied to the resistance data:

<i>add</i>	adds or subtracts a positive or negative constant value to defined blocks of data; used to reduce discontinuity at grid edges
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<i>de-spike</i>	locates and suppresses spikes in data due to poor contact resistance
<i>interpolate</i>	increases the number of data points in a survey to match sample and traverse intervals; in this instance the data have been interpolated to 0.25m x 0.25m intervals

Interpretation: anomaly types

- 5.14 Colour-coded geophysical interpretation plans are provided.
- 5.15 In this instance all the recorded geomagnetic anomalies are either small strong positive magnetic anomalies or discrete dipolar magnetic anomalies. Positive magnetic anomalies typically reflect materials with enhanced magnetic susceptibility, often sediments within cut archaeological features such as ditches and pits, however, in this instance, many of the strong positive and dipolar magnetic anomalies correspond to earthwork features noted on the ground and reflect a magnetic component of the stone used here. This phenomenon has also been noted during previous geomagnetic surveys at nearby Whitley Castle, Gossipgate and Gilderdale Burn, where small strong geomagnetic anomalies were often densely concentrated along the remains of stone walls or rubble spreads (Archaeological Services 2009, 2012 & 2014, respectively).
- 5.16 Two types of resistance anomaly have been distinguished in the data:
- | | |
|------------------------|---|
| <i>high resistance</i> | regions of anomalously high resistance, which may reflect wall-footings, tracks, paths, surfaces and other concentrations of stone rubble |
| <i>low resistance</i> | regions of anomalously low resistance, which may be associated with soil-filled features such as pits and ditches |

Interpretation: features

General comments

- 5.17 A colour-coded archaeological interpretation plan is provided.
- 5.18 The concentrations of small geomagnetic anomalies detected in both areas almost certainly reflect the remains of stone or earth-and-stone features. The variation within the concentrations may reflect the finer detail of former structures, but it is assumed that there will be a certain amount of tumble over and around *in situ* features and that much of the subtle geomagnetic variation will reflect this haphazard rubble material.
- 5.19 The resistance survey has been very effective and recorded marked variation in resistance values, which almost certainly reflect the degree to which near-surface stone is present or absent. The bands of high resistance reflect concentrations of stone. Some of these correspond well with the earthworks previously surveyed, while others appear to reflect previously unrecorded features, sub-surface features with no surface expression. Some of the high resistance areas may reflect surfaces, such as yards or floors, and others will almost certainly reflect tumble and rubble, though it is likely that wall footings may be preserved beneath some of these. Both geophysical interpretation plots show the broader areas of stone, whilst an attempt

has been made at showing possible former walls on the archaeological interpretation plan.

- 5.20 There are several discrete dipolar magnetic anomalies in both areas with a strong positive component to the south and a negative 'shadow' component to the north, any of which could reflect materials which were fired *in situ* or, similarly, could simply reflect individual pieces of ferrous debris or magnetised rock with a particular orientation. It has not been possible to identify likely hearths amongst these anomalies.
- 5.21 The majority of discrete geomagnetic anomalies will almost certainly reflect individual stones or items of near-surface ferrous debris, such as horseshoes. In most cases these small, individual anomalies will have little or no archaeological significance. A sample of these is shown on the geophysical interpretation plan, however, they have been omitted from the archaeological interpretation.

Area 1

- 5.22 The most prominent feature detected in Area 1 is a rectilinear walled or stone-banked enclosure measuring approximately 30m square; this enclosure is evident on the ground as a slight earthwork. The interior of this enclosure is relatively clear of anomalies, with an area of possible hard surface in the north but no evidence for buildings. This area appears to have been used as a yard or garth. Approximately 4m west of the enclosure's western wall there appears to be another parallel wall which is not evident on the surface. This wall is probably part of another enclosure to the west, leaving an access route between the two enclosures.
- 5.23 There are indications of possible stone footings for walls or banks to the north of these two enclosures and indications of smaller rectilinear structures to the east; some of the latter could be the remains of houses or other buildings, with dimensions between 5m and 10m.
- 5.24 Strong resistance and magnetic anomalies in the north-east corner of this area reflect wall remains evident on the surface.

Area 2

- 5.25 The resistance technique has been more useful in this area, though there is a good general correspondence with the geomagnetic survey.
- 5.26 The most prominent anomalies reflect the remains of a stone wall evident on the ground aligned north-north-west/south-south-east turning to north-north-east in the north. The northern part of this wall appears to be a replacement for an earlier course of the wall, which continued to the north then east, and which has been detected in the geophysics and is evident on the ground as a slight bank.
- 5.27 A rectilinear high resistance anomaly has been detected between these two phases of wall. The anomaly measures approximately 5m by 4m and could reflect the remains of a small stone-founded structure. Other linear and perpendicular resistance anomalies in the north of this area could possibly also reflect stone footings.

- 5.28 The remains of a small stone-walled enclosure survive, to the east of the main boundary wall, as a slight earthwork. Stone footings for a small building survive within the enclosure. The enclosure is more evident in the resistance data, while the house remains are more evident in the geomagnetic data. No other features of likely archaeological interest have been detected in the enclosure, however, a weak rectilinear resistance anomaly has been detected to the south of the enclosure which possibly reflects stone footings.
- 5.29 A small area of high resistance in the south-west corner of the area corresponds to a mound noted on the ground.

6. Conclusions

- 6.1 Geomagnetic and earth resistance surveys have been undertaken with Altogether Archaeology volunteers over two parts of Bradley Green deserted medieval village, near Bardon Mill in Northumberland.
- 6.2 Many anomalies were recorded with both techniques, typically either in linear arrangements or as broader spreads. Many of the strong positive and dipolar magnetic anomalies correspond to earthwork features noted on the ground and reflect a magnetic component of the stone used here. This phenomenon has been noted during previous geomagnetic surveys at other nearby sites.
- 6.3 Many of the resistance anomalies also correspond to the remains of walls or banks noted on the ground and previously recorded in an earthwork survey. However, some of the anomalies detected by both techniques almost certainly reflect sub-surface wall or bank remains which have not previously been recorded. These include another enclosure in Area 1, separated from the known enclosure by an access route, and several other possible walls or banks to the north and a number of smaller structures to the east of the enclosures, possibly houses or other buildings.
- 6.4 The survey grid was designed to enable repeat visits over successive years, to extend contiguous survey coverage.
- 6.5 Targeted excavation has the potential to provide information on dating of the settlement, the state of preservation of remains, artefactual, economic and environmental information.

7. Sources

- Archaeological Services 2009 *Whitley Castle, Tynedale, Northumberland: geophysical surveys*. Unpublished report **2149**, Archaeological Services Durham University
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- Young, R, Frodsham, P, Hedley I & Speak, S, 2004 *An Archaeological Research Framework for Northumberland National Park: Resource Assessment, Research Agenda and Research Strategy – Section 4, Prehistory* [.pdf] URL: <<http://www.northumberlandnationalpark.org.uk/understanding/historyarchaeology/archaeologicalresearchframework> > Accessed 8th October 2014

Appendix: Project design

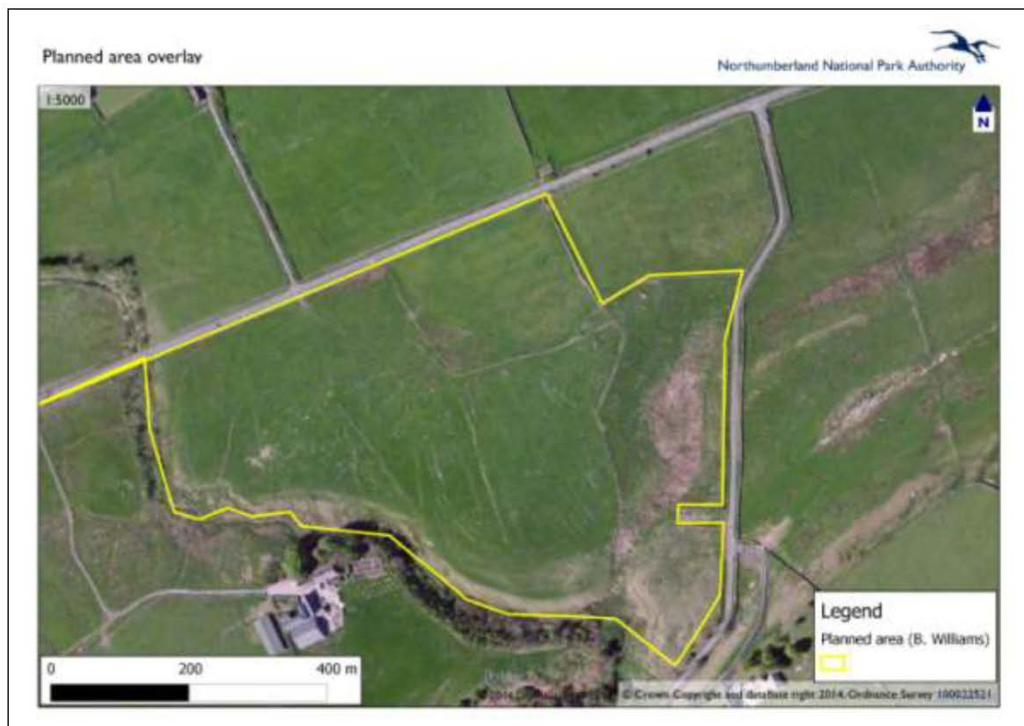


Northumberland National Park Authority



Altogether Archaeology Theme 8 '*North of the Wall*' Fieldwork module 8b

Bradley Green DMV Targeted Walkover & Geophysical Survey: Project Design



Bradley Green DMV Targeted Walkover & Geophysical Survey Module | 2014

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Bradley Green DMV Targeted Walkover & Geophysical Survey Module **2014**

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Appendices (bound as separate documents)

Appendix 1. Altogether Archaeology Generic Risk Assessment

Appendix 2. Module 8 Project Specific Risk Assessment

Appendix 3. Risk Log

Cover Illustration: The area of Bradley Green DMV subjected to 1:2500 topographic survey is outlined in yellow and overlaid onto an aerial photograph from Bing (QGIS).

1. General Introduction

1.1 Altogether Archaeology, largely funded by the Heritage Lottery Fund, is the North Pennines AONB Partnership's community archaeology project. Some project work, including this module, is being delivered in partnership with the Northumberland National Park Authority. The project enables volunteers to undertake practical archaeological projects with appropriate professional supervision and training. As well as raising the capacity of local groups to undertake research, the project makes a genuine contribution to our understanding of the local historic environment, thus contributing to future landscape management.

1.2 Over an initial 18 month period ending in December 2011, the project attracted 400 volunteers and completed a range of fieldwork modules including survey and excavation of prehistoric, Roman, mediaeval and post-medieval sites, and the survey of complex multi-period archaeological landscapes. Details of work completed during the pilot phase can be found on the North Pennines AONB website.

1.3 The current Altogether Archaeology programme runs from September 2012 – September 2015. It involves a range of professional and academic partners, and participation is open to all. Work is arranged according to ten themes, ranging from Early Farmers to 20th-Century Industrial Archaeology. Further information, including details of how to register as a volunteer, are available on the AONB website.

1.4 As part of the Altogether Archaeology project, Northumberland National Park Authority has provided funding to enable volunteers to undertake practical archaeological projects within the National Park. The aim of the project is to provide appropriate professional supervision and training in order to build the capacity of local groups to actively research little studied or poorly understood elements of the archaeology of the National Park.

1.5 The programme of field survey proposed in this project design is being delivered as part of Altogether Archaeology, Module 8 "North of the Wall", which includes all of the fieldwork within the National Park.

1.6 This particular project will examine areas of the Bradley Green medieval settlement in order to further our knowledge of the nature and extent of the medieval settlement. We have chosen this area as, as a site visit on 11 November 2014 has revealed that unrecorded archaeological features are clearly present and therefore that additional survey of the area will provide new information. A 1:2500 scale topographic survey has been undertaken (Crow and Woodside 1999) but it was during a time when the area was more overgrown so more subtle topographic features were hidden (Julian Acton, personal communication 11 November 2014). No geophysical survey has been undertaken. We hope to use a combination of rapid walkover and geophysical survey to target up to 4 areas identified in the preliminary site visit, to (a) quickly record previously unknown surface archaeological features and (b) identify any subsurface archaeological features via geophysical survey. As the exact nature of the settlement is unknown (Frodsham 2004:83), identification of more

subtle features may help us to identify the function of different parts of the settlement. The proposed work will add value to the existing survey by capturing unrecorded surface features and may help us to identify the use of certain enclosures within the target areas by identifying subsurface remains such as hearths or walls. A greater understanding of the settlement at Bradley Green would improve our knowledge of the medieval period north of Hadrian's Wall and address research questions in several regional and national research frameworks. The proposed work could then go on to inform proposals for targeted excavations in future.

2. Background

2.1 The medieval settlement remains at Bradley Green are particularly well-preserved and are known to have been occupied in the 13th century as it is mentioned in records of Edward I's journey to Carlisle in 1306. The settlement is a Scheduled Monument (1233910) and has been included in several studies of settlement patterns north of Hadrian's Wall (e.g. Crow and Woodside 1999). It is historically and archaeologically significant because of its connections with the visit by Edward 1 in 1306 and as a well-preserved 13th century site.

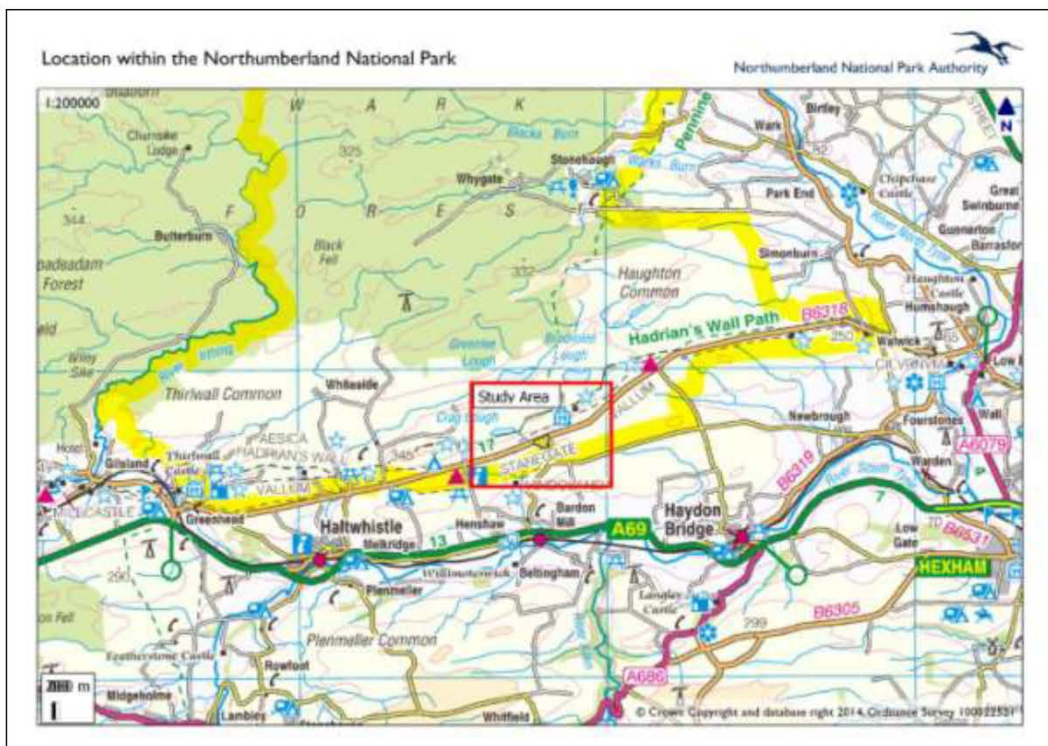


Figure 1: Study area within the Northumberland National Park

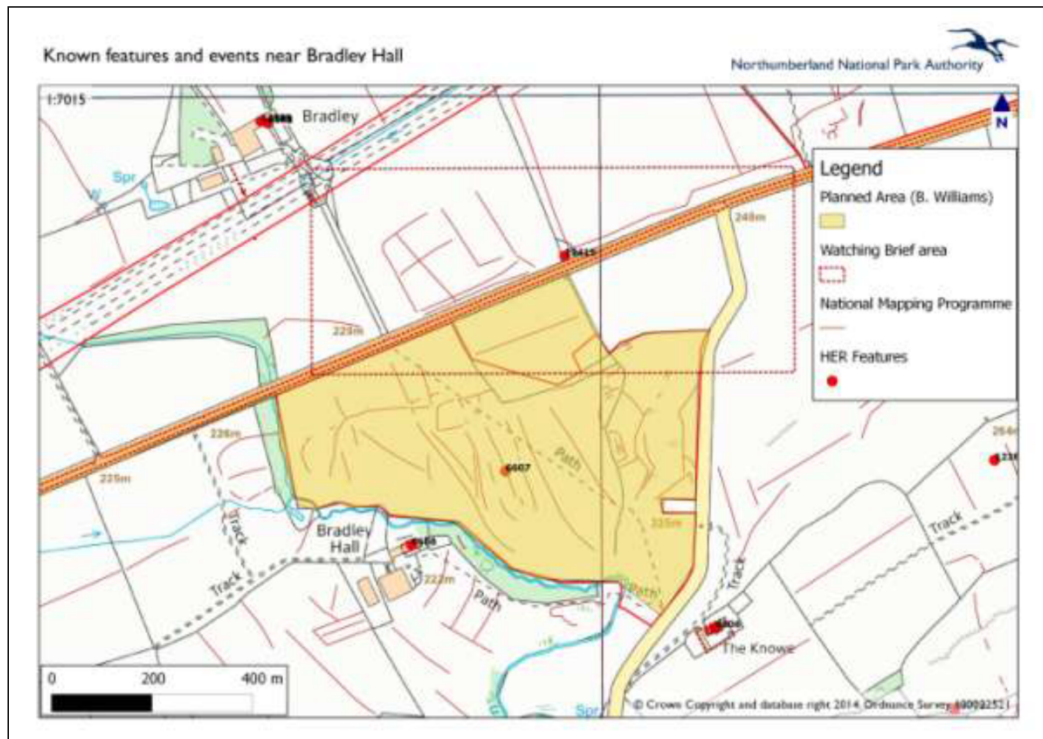


Figure 2: Study area and known archaeological features and investigations

2.2 This project proposes to undertake rapid walkover survey and geophysical survey of up to four targeted areas within the previously-surveyed deserted medieval settlement on Bradley Green. Bradley Green lies at NY 7783 6763.

2.3 Bradley Green contains the most significant evidence of medieval settlement within the National Trust Hadrian's Wall Estate. It lies in a small triangle of land, bordered by the Military Road to the north, on the east by the road down to Bardon Mill and on the west by the Bradley Burn. Bradley Hall, dated to at least the 14th century, lies on the south side of the Bradley Burn. In this area "lie the remains of medieval fields and traces of a settlement that never quite succeeded as a village" (Williams 1995b). It is almost certainly associated with Bradley Hall. The present-day farm of Bradley Hall dates to the 19th century and incorporates the foundations from a 16th century bastle house.

2.4 A review of the Northumberland Historic Environment Record within a 700m radius of the centre of Bradley Green (N6607) returned 22 features, the majority of which are post-medieval (see Table 1, below). The vallum of Hadrian's Wall (N6677) intersects with the corner of the medieval settlement (N6607) on Bradley Green and would have been an obvious physical feature at the time the medieval settlement and field system was in use.

Bradley Green DMV Targeted Walkover & Geophysical Survey Module **2014**

Table 1: Historic Environment Record features in the immediate vicinity of Bradley Green

HER NO	SITE_NAME	PERIOD
6631	Prehistoric Settlement, 230m north of Bradley	Prehistoric (500000 BC to 43 AD); Roman (43 to 410)
12381	Prehistoric hut circle settlement and field system	Prehistoric (500000 BC to 43 AD)
12382	Cord rig north of East Crindledykes	Prehistoric (500000 BC to 43 AD)
6587	Milking Gap native British settlement	Later Prehistoric (4000 BC to 43 AD); Roman (43 to 410)
6677	The vallum between the field boundary west of turret 37a and the road to Steel Rigg car park, in wall miles 37, 38 and 39	Roman (43 to 410)
6607	Medieval settlement and field system, two bastles and a corn drying kiln, immediately north-east of Bradley Hall	Medieval (1066 to 1540); Post Medieval (1540 to 1901)
6589	Bradley bastle (Henshaw)	Post Medieval (1540 to 1901)
6606	Grandy's Knowe bastle	Post Medieval (1540 to 1901)
6608	Bradley Hall Farmhouse, incorporating bastle remains	Post Medieval (1540 to 1901)
6624	Bradley lime kiln	Post Medieval (1540 to 1901)
6625	West Crindledikes lime kiln	Post Medieval (1540 to 1901)
6665	Post-medieval farmstead or shieling	Post Medieval (1540 to 1901)
13989	Bradley Farm	Post Medieval (1540 to 1901)
13990	Crindledykes Farmhouse	Post Medieval (1540 to 1901)
13991	Crindledykes farm buildings	Post Medieval (1540 to 1901)
19415	Bradley toll house	Post Medieval (1540 to 1901)
20368	Crindledikes Waggonway and tunnel	Post Medieval (1540 to 1901)
20538	Barcombe Colliery	Post Medieval (1540 to 1901)
22692	Quarry, Crindledykes	Post Medieval (1540 to 1901)
24778	West Crindledykes farmstead	Post Medieval (1540 to 1901)
24779	East Crindledykes sow kiln	Post Medieval (1540 to 1901)
24780	Stack stand	Post Medieval (1540 to 1901)

2.5 A review of Events on the HER also found that a section of the Military Road including the north-east corner of the Bradley Green area, was conducted by Archaeological Research Services (this report was unavailable the time of writing). The entire area has also been captured by the Hadrian's Wall Mapping Programme (2009).

2.6 Bradley Hall has potential to address several key regional and national research themes in Medieval archaeology because of several factors:

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- Bradley Hall is a dated example of a medieval settlement known to be occupied and connected with important political figures. Edward I and his retinue stopped at a place called Bradley Hall on the 5th and 6th of September 1306 en route to Carlisle via the Stanegate (Hodgson 1840: 326 in Williams 1995a: 45). Six years later cross-border hostilities resumed with invasions by Robert the Bruce in 1312 and 1314 (Crow and Woodside 1999: 62);
 - Bradley Hall is a dated example of medieval settlement and land use practices at the end of the Little Optimum, a period of warm conditions from 700 to 1300 which allowed agricultural expansion into marginal upland areas (such as the area where Bradley Green lies, between the uplands and the valley). The settlement may also have been occupied in the climatic downturn of 1315-1318 which heralded in the Little Ice Age which continued to 1850. A later disaster was the spread of plague in 1348 and beyond (Crow and Woodside 1999: 62).
 - Bradley Hall is known to have been abandoned by the time of the Border Survey of 1541 when it was found "lying waste and unplenished" (Williams 1995a). In the 1600s a bastle was constructed at Bradley Hall but this is not of itself evidence for continuous occupation (Young et al. 2004).
 - Although it is known that Bradley Hall and the settlement was occupied in 1306, the beginning, end and duration of this occupation is not known. Nor are any phases known from the development of the settlement.
 - Most recently, Bradley Hall, Bradley Green and the surrounding landscape were mapped during through aerial photograph analysis during by Tim Gates during an air photographic survey of the Hadrian's Wall Landscape from Chesters to Greenhead for the Northumberland National Park, English Heritage and the National Trust (Gates 2004) and the Hadrian's Wall National Mapping Programme of 2009 (as shown in Figure 2). Bradley Hall and the associated deserted medieval settlement have been mapped at the 1:2500 scale (Woodside 1995b, Crow and Woodside 1999) as shown in Figure 3 below. These surveys are estimated to have been done at English Heritage Level 2, producing mapping at 1:10,000 and plans at 1:2500 (English Heritage 2007).
 - No more detailed investigations of the area have been found. However, it appears that further investigation is warranted, as a site visit on 11th November 2014 identified several areas containing archaeological features not captured in the 1999 survey. This is due to the area being more overgrown at that time, preventing the discovery of these more subtle features (Julian Acton, personal communication 11/11/2014).
- 2.5 Further clarifying medieval land use and settlement design of the DMV at Bradley Green will help us to understand the function of this settlement, which is at present unknown (Frodsham 2004). At a larger scale, an improved understanding of the Bradley Green DMV will add to our knowledge of Northumberland's medieval settlement patterns. It will bring new information to the discussion of several key themes in regional and national medieval archaeology research frameworks (see Section 3).

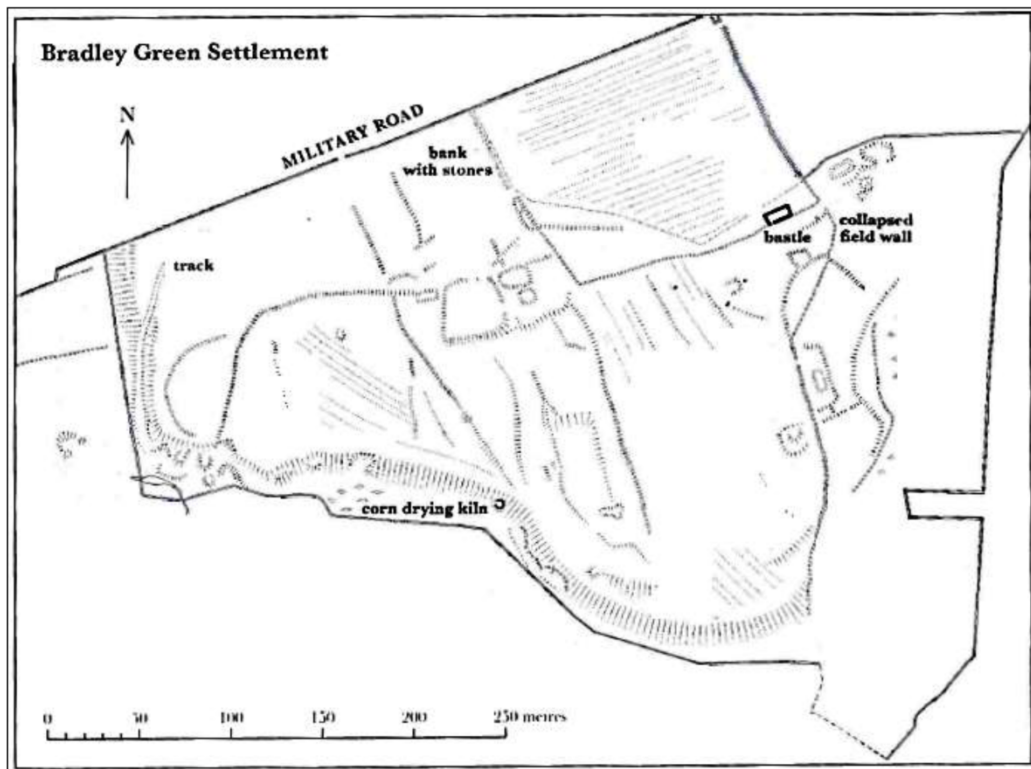


Figure 3: Extent of previous planning, reproduced from Crow and Woodside (1999: 62. Figure 26: Plan of Bradley Green deserted medieval village, by B. Williams).

The archaeological features within this area consist of house platforms of various sizes mostly aligned with a large bank which seems to divide the cultivated land to the south from the waste to the north. Additional features observed in the preliminary site visit of November 11th 2014 include at least two clusters of small enclosures and earthworks. Medieval inverted S-shaped ridge and furrow on the south facing slope leading to the ledge above the burn and a series of strip fields are indicative of medieval agriculture. Later remains on the site include two bastle houses and a possible corn drying kiln. A collapsed drystone wall divides the field east and west (Woodside 1995a: 44).

3. Research Aims and Objectives

3.1 The proposed research has the following aims and objectives:

- To undertake a rapid walkover survey of the unrecorded features identified in the November 11th 2014 site visit and thereby to train volunteers in quick feature identification, how to identify stratigraphic relationships between earthworks, and the principles of sketch mapping;

- To undertake geophysical survey of targeted areas to identify any traces of subsurface remains;
- To evaluate any anomalies identified in the geophysical survey to determine what features they represent within the medieval settlement;
- To engage many volunteers in the survey and excavation of these areas as part of the Altogether Archaeology programme and provide high-quality training in archaeological skills and principles;
- In achieving the above, to make a genuine contribution to our understanding of the medieval land use of Bradley Green and Bardon Mill, to communicate the results to a wide audience, and where appropriate to suggest further work to build on the results of this project.

3.2 Further, the proposed research aims to contribute to research priorities identified in the *Northumberland National Park Regional Research Framework* (Young et al. 2004).

3.2.1 The *Northumberland National Park Regional Research Framework* (Young et al. 2004) identifies a need for geophysical survey of village green and related areas, to increase our knowledge of the origins and development of medieval settlement. The development of deserted medieval settlements such as that associated with Bradley Hall is an under-researched area and the proposed research would generate new data for this discussion.

3.2.2 The *Northumberland National Park Regional Research Framework* (Young et al. 2004) also identifies a need for limited excavation in such areas, to inform the development of a chronology of desertion, form and evolution of these sites as well as their connection with the surrounding landscape, field systems and non-elite architecture (where present). Such work is beyond the scope of the present project design; however the results of the proposed work could inform the development of future excavation projects in this area.

3.2.3 The *Northumberland National Park Regional Research Framework* (Young et al. 2004) identifies the need for further research in the development of the manorial system and the origins and developments of castles and military sites. The bastle constructed at Bradley Hall in the 1600s has not been thoroughly investigated – it is not known whether the area was continuously occupied between the 1300s and the construction of the bastle. Clarifying the relationship between the earlier and later phases of use at Bradley Hall could shed new light on the continuity or otherwise of medieval landscapes and their incorporation into military settings.

3.2.4 Research at Bradley Hall also has the potential to tie in with several themes in the *Northumberland National Park Research Strategy* (Young et al. 2004): *Research Theme 7 (boundaries in the Landscape)*; *Research Theme 8: Bastles in context*; *Research Theme 11: Detailed Area-Specific Research Projects*. Locating Bradley Hall's settlement in its broader landscape context could improve our understanding of medieval settlement boundaries in Northumberland; consolidating our understanding of the development and abandonment of the medieval settlement could understand how the bastle related to earlier phases of occupation, if at all; and although potentially beyond the

scope of the research proposed in this document, a multi-period research project centred on Bradley Hall's landscape would address many of the abovementioned themes and further locate the settlement as a landmark in Northumberland's development from post-Roman to post-medieval times.

3.3 Further, the proposed research aims to contribute to research priorities identified in the *North East Regional Research Framework* (Petts & Gerrard 2006). The compilers of the NERRF noted that, while the basic economic, settlement and belief patterns for most of the North East are at least broadly understood, there remain gaps in knowledge which further research could address.

3.3.1 The *North East Regional Research Framework* (Petts & Gerrard 2006) states that there is a need for further work on rural settlements in northern or upland Northumberland, where Bradley Hall is located; this site offers potential to become a detailed local case study offering balance to the dominance of studies in South Durham and Cleveland.

3.3.2 The *North East Regional Research Framework* (Petts & Gerrard 2006) research priority MDii "Landscape" notes that there is potential for further research in identifying regional variations in land use and mapping out the relationships between fields and other elements of the medieval agrarian landscape. Bradley Hall's associated settlement contains several interesting elements including tracks, fish ponds and boundaries and is located within a broader landscape of surrounding medieval settlements, sheilings and transport routes. Establishing the relationship of Bradley Hall to sheilings in the surrounding landscape has potential to develop our understanding the chronology of upland transhumance.

3.3.3 The *North East Regional Research Framework* (Petts & Gerrard 2006) research priority MDiv: "Castles and defensive structures" notes there is a need for further research on the function of defensive structures in the landscape and their role as consumers. Identifying the chronology and continuity (or otherwise) of occupation at Bradley Hall prior to the construction of the bastle would contribute to this discussion.

3.3.4 The *North East Regional Research Framework* (Petts & Gerrard 2006) research priority MDx: "The fishing industry" notes that the fishing industry is economically important but as yet poorly understood. Whilst the NERRF does not mention fish ponds in its strategy, the ponds near Bradley Hall are of interest as an inland upland extension of an otherwise coastal and riverine economy. Clarifying the dating of these features and their relationship to other parts of the settlement would help to bring this discussion inland and locate Bradley Hall in the regional economy

3.3.5 The *North East Regional Research Framework* (Petts & Gerrard 2006) research priority MDxi: "The medieval to post-medieval transition". Any clarification of the chronology and development of Bradley Hall's settlement, the construction of the bastle and subsequent reuse of the farm would contribute to this research question.

3.4 The Northumberland County Council Historic Environment Record values additional research and review of sites recorded in its archives. Revisiting Bradley Hall and updating the HER archives would contribute to future research in the area and add value to the HER.

3.5 Further, the proposed research aims to contribute to research priorities identified in the *Medieval Settlement Research Group Policy Statement* (MSRG 2007).

3.5.1 The *Medieval Settlement Research Group Policy Statement* (MSRG 2007) advises that all studies should consider the territory attached to the larger settlement types to which the settlement belongs and to look to the wider region to consider transhumance and other economic and religious networks. Addressing the aims of the NERRF and the NNP RRF would therefore also contribute to the national discussion promoted by the MSRG.

3.5.2 The *Medieval Settlement Research Group Policy Statement* (MSRG 2007) emphasises the importance of adding value to the Historic Environment Record (see 3.4 above).

3.5.3 The *Medieval Settlement Research Group Policy Statement* (MSRG 2007) also recommends public awareness of medieval settlement through interesting engagement and exposition methods. A public-oriented project such as Altogether Archaeology merges well with this aim.

4. Business Case

This project should be undertaken now for the following reasons:

- Resources are available as part of the NNPA's partnership with the Altogether Archaeology project. This module will deliver the aim of providing volunteer engagement opportunities north of Hadrian's Wall.
- It has the potential to substantially increase our knowledge of the medieval development of Bradley Hall and of post-Roman landscape development north of Hadrian's' Wall, which is an under-researched area
- It meets the research aims of several regional and national research frameworks as outlined in detail in Section 3 above.

5. Methods Statement

The Aims and Objectives of this project will be achieved in three main phases:

- Phase 1. Preparation, desk-based assessment and start-up meeting.
- Phase 2. Geophysical survey.
- Phase 3. Reporting and dissemination of results.

Phase 1: Preparation, desk-based assessment, and start-up meeting.

5.1.1 Based on a preliminary desktop review and site visit by Krissy Moore (NNPA) and Duncan Hale (Durham University Archaeological Services), four areas within the previously-surveyed area of the deserted medieval village at Bradley Green have been identified as of interest for geophysical and walkover survey (see Figure 4). A review will be made of the available archaeological research literature to guide our interpretations and familiarise us with the current understanding of the many earthworks and other features present in this area. This work will be done by Krissy Moore, and an overview of the site will be presented to volunteers in the site induction talk at the beginning of each day of work. A full bibliography will be attached to the reports, so that project volunteers can study sites in further detail should they wish to do so.

5.1.2 The Bradley Hall settlement will be subjected to a desk-based assessment including map regression analysis to identify any past major land use impacts, underlying geology, and GIS-based review of known sites on the HER and the National Mapping Programme database. The settlement area may have undergone different levels of post-medieval land use, all factors which will influence the efficacy of geophysical survey.

5.1.3 As these areas will be partially within scheduled ancient monuments, it will be necessary for the Project Manager to obtain Section 42 licences under the terms of the Ancient Monuments and Archaeological Areas Act 1979 (as amended). These licences will be obtained at the earliest opportunity, as far as possible in advance of the commencement of fieldwork.

5.1.4 Each morning, prior to the commencement of fieldwork, there will be a start-up workshop to be attended by all participants. This will provide volunteers with an introduction to the Bardon Mill area, Bradley Green itself, and in particular to current understanding of how medieval settlement and land use has developed in Northumberland, north of Hadrian's Wall. It will also include a summary of the desk-based assessment for the area, and a brief introduction to walkover survey and geophysical survey techniques. These methods will then be practiced throughout the day.

Phase 2: Geophysical survey

5.2.1 Fieldwork will be undertaken by Altogether Archaeology volunteers, under professional supervision from experts from Archaeological Services Durham University, who will provide all necessary equipment. Each survey will be run as a training workshop, with techniques and methodology fully explained to all participants, all of whom will have the chance to participate in all aspects of the work. Decisions as to exactly how each survey is structured, and how many volunteers participate in each, will be made when we know how many volunteers wish to take part.

5.2.2 The approximate areas to be covered are shown in Figure 4, below. The proposed geophysical survey areas are shaded in purple, and the Scheduled Ancient Monument area in orange.

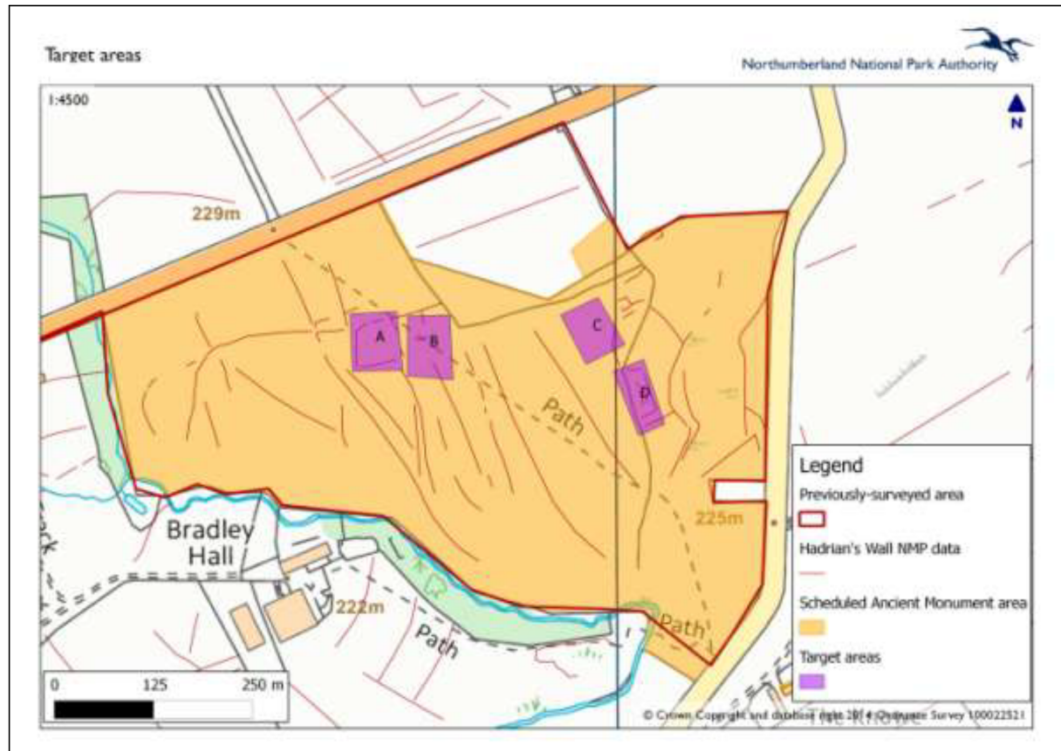


Figure 4: Provisional targeted areas for walkover and geophysical survey. The final shape/size of these areas will be laid out in the field to capture the unrecorded surface archaeological features. It is estimated that areas A, B and C will measure no more than 40m x 40m, and area D will measure no more than 20m x 60m.

5.2.3 Technique selection

Geophysical surveying enables the relatively rapid and non-invasive identification of potential archaeological features and can involve a variety of complementary techniques such as magnetometry, electrical resistivity, ground-penetrating radar and electromagnetic survey. Some techniques are more suitable than others in particular situations, depending on a variety of site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift. The underlying geology of the study area consists of limestone and other sedimentary rocks (BGS 2006?).

In this instance, it is possible that both built and cut features (for example track surfaces, buried or robbed stone walls, trenches, ditches, pits and instances of burning from hearths or destruction) might be present. Given the anticipated nature and depth of targets it is proposed that two complementary techniques are used: geomagnetic survey (fluxgate gradiometry) and earth electrical resistance survey.

Fluxgate gradiometry involves the use of hand-held magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field which are caused by variations in soil

magnetic susceptibility or permanent magnetisation; such anomalies can reflect, for example, ferrous, stone, brick and soil-filled features. Electrical resistance survey is ideal for detecting stone features such as walls, paths and culverts, but can also detect soil-filled features, depending on ground conditions at the time of survey. When a small electrical current is injected through the earth it encounters resistance which can be measured. Since resistance is linked to moisture content and porosity, stone and brick features will give relatively high resistance values while soil-filled features, which retain more moisture, will provide relatively low resistance values.

Fieldwork

5.2.4 A 20m survey grid will be established and tied-in to known mapped Ordnance Survey points using a Leica GS15 global navigation satellite system (GNSS) with real time kinematic corrections (RTK), typically providing accuracy of 10mm.

5.2.5 The field techniques involved in collection of the geophysical data will be taught to the local community volunteers who will then aid in the collection of data.

5.2.6 Measurements of vertical geomagnetic field gradient will be determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme will be employed and data logged in 20m grid units. The sample interval will be set to 0.25m and the traverse interval to 1m, thus providing 1600 measurements per 20m grid unit.

5.2.7 Measurements of earth electrical resistance will be determined using Geoscan RM15D Advanced resistance meters with twin probe arrays and MPX15 multiplexers. A zig-zag traverse scheme will be employed and data logged in 20m grid units. The sample interval will be set to 1m and the traverse interval to 1m thus providing 400 sample measurements per 20m grid unit.

5.2.8 Data will be downloaded on-site into laptop computers for verification, initial processing and storage and subsequently transferred to a desktop computer for further processing, interpretation and archiving. Geoplot software will be used to process and interpolate the data to form arrays of regularly-spaced values at 0.25m x 0.25m intervals and to produce continuous-tone greyscale images and trace plots of the raw (unfiltered) data, as appropriate.

Research

5.2.9 Research objectives are built into archaeological projects, as a result of the English Heritage national policy framework and its objectives, as outlined within Exploring Our Past (English Heritage 1991), Frameworks for our Past (English Heritage 1996), the Research Agenda (English Heritage 1997), and the Policy Statement on implementation (1999). Archaeological Services will complete works within the research priorities set out in North-East Regional Research Framework (NERRF). The specific research objectives which this project has the potential to address include:

- The *Northumberland National Park Research Framework* objectives (see Section 3.2 above)
- The *North East Regional Research Framework* objectives (see Section 3.3 above)

Reporting

5.2.10 The greyscale images generated from the recovered geophysical survey data will be presented by importing the images directly into digital plans of the areas at the largest available scale. Palette bars relating the greyscale/trace intensities to anomaly values in nanoTesla and Ohms will be included with each image. Other types of plots may also be provided, if they aid presentation or interpretation. Colour-coded geophysical and archaeological interpretation plans will be provided. The survey report will also include a detailed discussion and interpretation, explaining the likely nature of the anomalies, along with their implications. Modern services and other potential hazards will be clearly distinguished.

5.2.11 The geophysical survey results report will be based on the following format:

1. Executive summary
 - 1.1 The project
 - 1.2 Results
 - 1.3 Recommendations
2. Project background
 - 2.1 Location
 - 2.2 Development proposal
 - 2.3 Objective
 - 2.4 Specification summary
 - 2.5 Dates
 - 2.6 Personnel
 - 2.7 Acknowledgements
 - 2.8 Archive
3. Archaeological and historical background
4. Landuse, topography and geology
5. Geophysical survey
 - 5.1 Technique selection
 - 5.2 Field methods
 - 5.3 Data processing
 - 5.4 Interpretation: anomaly types
 - 5.5 Interpretation: features
6. Discussion, including recommendations for further work (see below)
7. References
- Appendix I: Trace plots of geomagnetic data

5.2.12 At the end of fieldwork a full report will be prepared suitable for use by the North Pennines AONB Partnership and NNPA. The report will be provided in pdf format; bound copies can be

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supplied as required. One hard copy and a digital version of the report will also be supplied both the County HER office and English Heritage. An OASIS form will also be submitted. A report will be made available via the AONB and NPA websites.

Archive

5.2.13 A survey archive will be produced on CD containing copies of the report, raw data files and metadata. This will be lodged with client for deposition with the project archive in due course.

Phase 3: Report writing and dissemination of results

5.2.14 The survey results will be presented in a report prepared by Archaeological Services Durham University.

5.2.15 The report will be summarised and disseminated by Krissy Moore. Copies will be provided to all participants, landowners and tenant farmers. A summary of the results will also be provided on social media (facebook, twitter, the Community Archaeology Blog and local radio) by Krissy Moore.

5.2.16 The final results of the excavation will also be presented by Paul Frodsham at the final Altogether Archaeology conference in September 2015.

5.2.17 If the results warrant it, the report will be used to inform a project design for additional survey or targeted excavation in future.

6. Stages, tasks and timetable

STAGE or Task No.	STAGE/Task	Person(s) responsible	Dates
DRAFT	DRAFT	DRAFT	DRAFT
S 1	PREPARATION		
T 1.1	Preliminary site meetings.	PF/DH	November 2014
T 1.2	Finalising of MORPHE compliant project design and EH approval.	PF/KM/MC/RV	November 2014
T 1.3	Obtain Section 42 licences	PF/KM/RV	November/December 2014
T 1.4	Produce risk assessment.	PF	November 2014
T 1.5	Put project live on AA sector of AONB website, inviting volunteers to register.	PF	December 2014
T 1.6	Closing date for volunteer registration	PF	December 2014

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T 1.7	Agree volunteer participation rota – inform volunteers.	PF	December 2014
T 1.8	Project start-up meeting	Volunteers/PF/KM/DH/CJ	November 2014
S 2	FIELDWORK		
T 2.1	Site set-up	Volunteers/DH/KM	
T 2.2	Three fieldwork days	All	
S 3	REPORT, ARCHIVE & PUBLICITY		
T 3.1	Production of report	DH/KM/CJ	
T 3.2	Discussion of follow-up fieldwork & drafting of Project Design(s) as appropriate.	DH/KM/PF/CJ	
T 3.3	Delivery of follow up fieldwork (as appropriate)	DH/KM/PF	
T 3.4	Presentation of final report to HEWG	DH/KM/PF	
T 3.5	Deposition of archive, dissemination of final report to HER & OASIS	DH/KM/PF	
T 3.6	Link to Project Report placed on AONB & NP websites.	KM/PF/CJ	May 2015
T 3.7	Contribution to <i>Altogether Archaeology</i> annual public conference.	KM/PF/CJ	September 2015

CJ = Chris Jones (Northumberland National Park Authority)

KM = Krissy Moore (Northumberland National Park Authority)

PF = Paul Frodsham (North Pennines AONB Partnership)

DH = Duncan Hale (Archaeological Services Durham University)

MC = Mike Collins (English Heritage)

RY = Rob Young (English Heritage)

AP = Andrew Poad (National Trust)

7. Project scope and links with other projects

7.1 This project will primarily focus on adding further detail to our understanding of the medieval landscape of Bradley Green. The data obtained will further our understanding of medieval land use in the Bardon Mill area. The current state of medieval land use research in the United Kingdom is disproportionately weighted towards sites in the south and centre of the country and therefore this work will produce useful comparative data to test models of land use developed in other parts of the country. It will contribute to clarifying whether these southern land use patterns are replicated in the area north of Hadrian's Wall.

7.2 This will link in with other projects including:

- Altogether Archaeology Module 8: North of the Wall. Geophysical survey will complement the other projects within the Northumberland National Park (the prehistoric landscape surveys at Ravensheugh and Standingstones Rigg, and the geophysical surveys seeking evidence of Roman roads approaching Hadrian's Wall Milecastles from the north). These surveys all aim to explore the vast under-researched archaeological resource of archaeology in the complex multi-period landscapes north of the wall. Investigation of the medieval landscape of Bradley Hall, especially as it is in such close proximity to Hadrian's Wall, will add another period of landscape history to those already investigated.
- The ongoing research aims of the Medieval Settlement Research Group, dedicated to developing understanding of settlement between the fifth and sixteenth centuries AD.
- For more detail on project links, see Section 3 of this document.

8. Project team structure and communications

8.1 In accordance with standard Altogether Archaeology practice, this project will be overseen by a Project Team, as follows:

Team member	Location	Role:
Paul Frodsham	North Pennines AONB Partnership Historic Environment Officer and Altogether Archaeology Project Manager	Project management/ coordination. Assistance with fieldwork.
Krissy Moore (Project manager)	Northumberland National Park Authority Community Archaeologist	Project management/ coordination. Assistance with fieldwork.
Chris Jones	Northumberland National Park Authority Historic Environment Officer / Supervisor	Project overview/ coordination. Assistance with research design, property access and reporting.

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Duncan Hale	Archaeological Services Durham University	Direction of project fieldwork, including delivery of volunteer training.
Mike Collins	Inspector of Ancient Monuments (Hadrian's Wall) English Heritage.	General liaison with English Heritage.
Paget Lazzari	Senior Ranger, Northumberland National Park	Advisor regarding farmer and landowner liaison.
Andrew Poad and Mark Newman	National Trust	General liaison with National Trust

8.2 Overall project management will be by Krissy Moore, assisted by Paul Frodsham and if appropriate also by other members of the North Pennines AONB Historic Environment Working Group (HEWG). The HEWG is the designated advisory group for the whole of the *Altogether Archaeology* project; it includes the Northumberland Archaeologist and English Heritage North-East Region Inspector of Ancient Monuments. Paul Frodsham will be responsible for co-ordinating volunteer involvement in the project. Krissy Moore will be responsible for preparatory work including liaison with the landowners and the provision of site facilities. The project is being delivered in partnership with the Department of Archaeology at Durham University. Various members of staff and students may become involved, but the key partner at the university is Duncan Hale.

8.3 Fieldwork will be undertaken by Altogether Archaeology volunteers with training and supervision provided by professional staff from Archaeological Services, who have extensive experience working on comparable projects with volunteers. Paul Frodsham and Krissy Moore will produce a risk assessment, and will be responsible for health and safety on site throughout fieldwork.

8.4 The *Altogether Archaeology* project has a pool of some 500 volunteers, of whom about 50 are expected to participate actively in this module. Although there must be some flexibility with regard to volunteer involvement, it is expected that the project will be structured with three groups (one for each milecastle) of up to a dozen volunteers. Paul Frodsham will draw up a rota showing which volunteers expect to be on site each day, with fieldwork planned accordingly. Some volunteers are more experienced than others, but all will receive an appropriate level of training and supervision.

8.5 Paul Frodsham maintains the Altogether Archaeology volunteer database, and information about the project will generally be disseminated by email or telephone using contact details contained within this database. For ease of communication, any local people wishing to take part in

the Bradley Green project who have not registered with the Altogether Archaeology project will be asked to do so, at least temporarily. All communication with volunteers will then be via the Altogether Archaeology volunteer database.

8.6 Paul Frodsham, Krissy Moore, Duncan Hale and other project staff will be in daily contact during the fieldwork phase, and will communicate as necessary by email, telephone and face to face meetings as necessary during project planning and post-excavation phases.

8.7 The North Pennines AONB Historic Environment Working Group (the advisory group for the Altogether Archaeology project) meets quarterly. A draft report on the results of this project will be presented by PF for discussion at the first meeting following completion of the project.

9. Land ownership and access

Contact details for the various owners and tenants of the study area are kept by NNPA. Part of the study area is privately owned and part lies on National Trust land. The study area lies within Bradley Farm and Julian Acton (Bradley Farm) and Andrew Poad (National Trust) have given their consent to the geophysical work going ahead, with the understanding that the work will not occur during lambing period (1st April to mid-May). With this in mind, it is hoped to conduct the work between January 2015 and the end of March 2015, sooner rather than later, with a provisional date in late February 2015. Copies of final reports will be provided to tenant farmers and landowners.

10. Health & Safety and Insurance

10.1 Full consideration will be given to matters of health and safety throughout this project. All work will be undertaken in accordance with the 1974 Health and Safety Act and its subsequent amendments, the 2007 Construction Design and Management Regulations, and the Standing Conference of Archaeological Unit Managers (SCAUM) Health and Safety Manual (2007). Work will also take place under the terms of the Durham University Health and Safety Policy and Code of Practice for Safety in Fieldwork.

10.2 A full Risk Assessment will be undertaken to assess all real and potential hazards prior to the commencement of fieldwork. A comprehensive health and safety induction will be given to all volunteers at project start-up, and all will be required to read a written statement on health and safety which will be kept on site and which all volunteers partaking in the project will be required to sign, stating that they have read and understood it and that they will abide by its terms. A generic Risk Assessment for Altogether Archaeology fieldwork is included herewith as Appendix 1, and a specific Risk Assessment for this module forms Appendix 2.

10.3 At least one qualified First-Aider and appropriate first aid supplies will be present on site at all times while fieldwork is in progress. Staff members will be supplied with appropriate safety clothing and equipment, and advice as to appropriate clothing and equipment will be provided to volunteers.

10.4 All aspects of the Altogether Archaeology project are covered by Durham County Council's comprehensive insurance policy. In addition, Archaeological Services staff are covered by their own insurance provided by Durham University.

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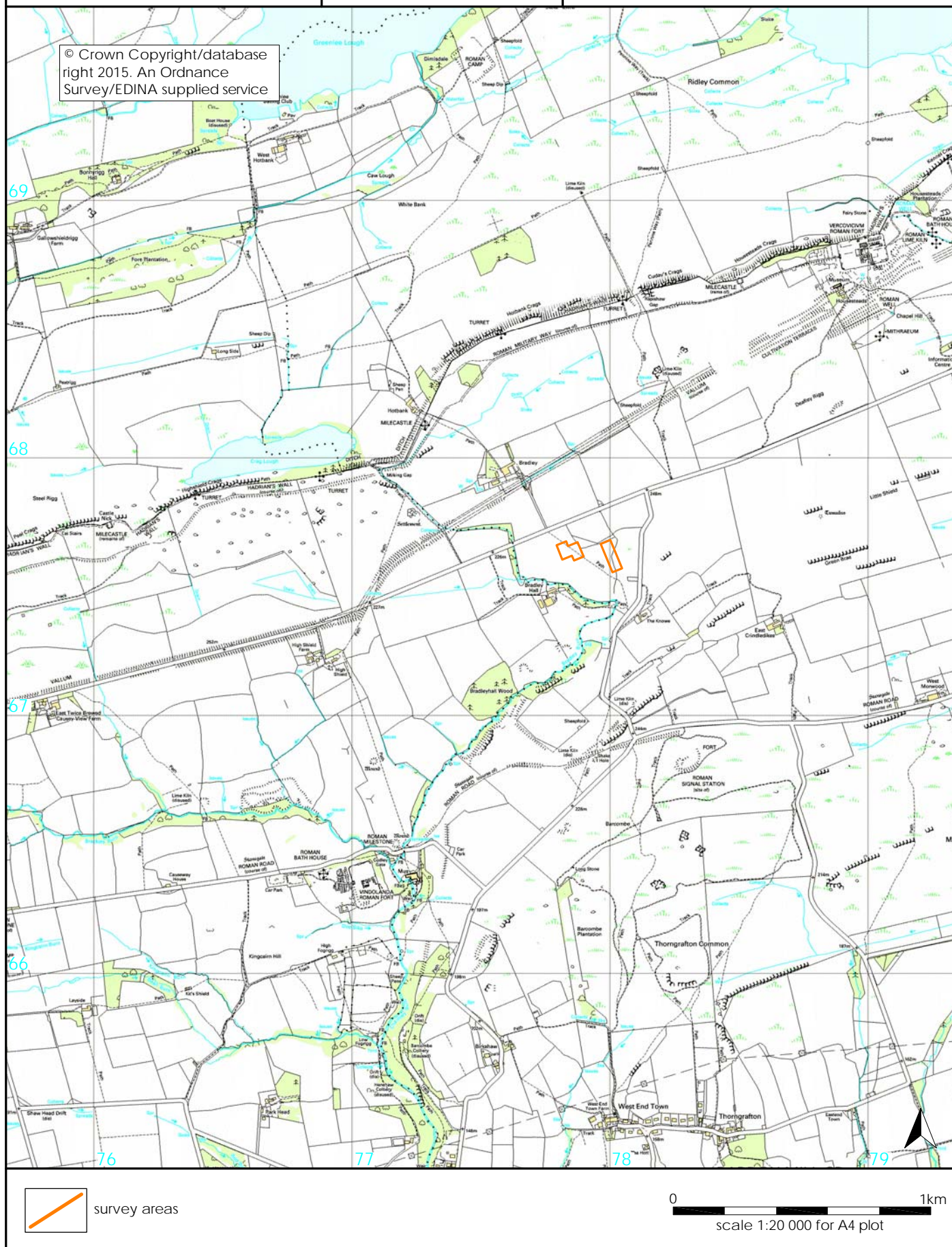
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Appendices

Appendix 1. Altogether Archaeology Generic Risk Assessment

Appendix 2. Module 8 Project Specific Risk Assessment

Appendix 3. Risk Log





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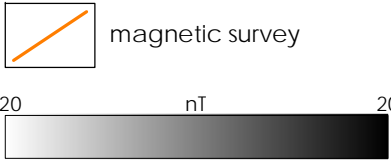
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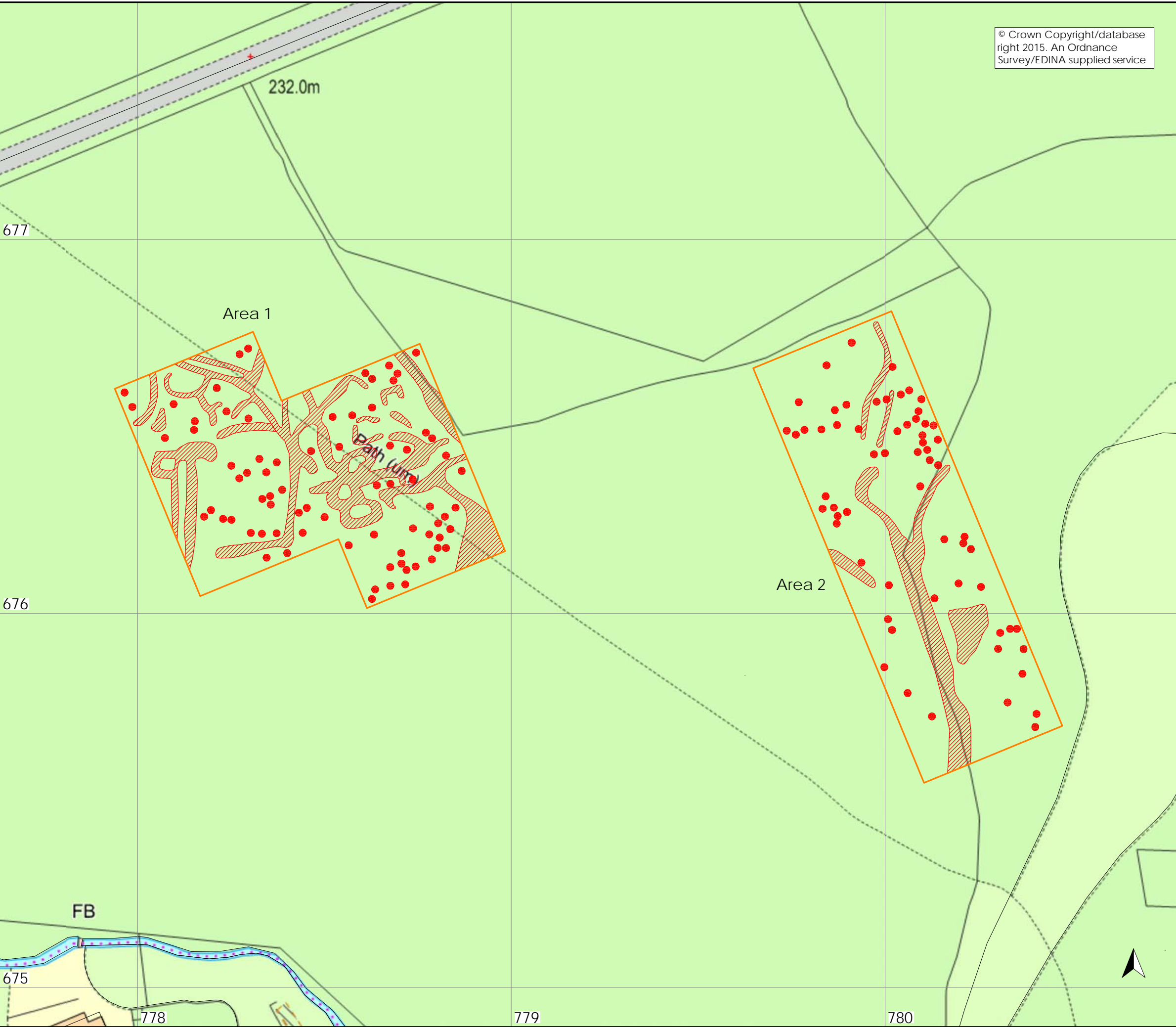


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Figure 2: Geomagnetic survey





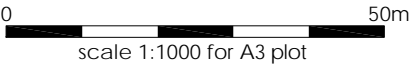
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



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Figure 3: Geophysical interpretation of
geomagnetic data



-  magnetic survey
-  dipolar magnetic anomaly



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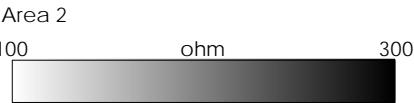
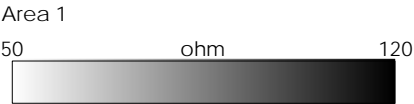
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Figure 4: Resistance survey



resistance survey





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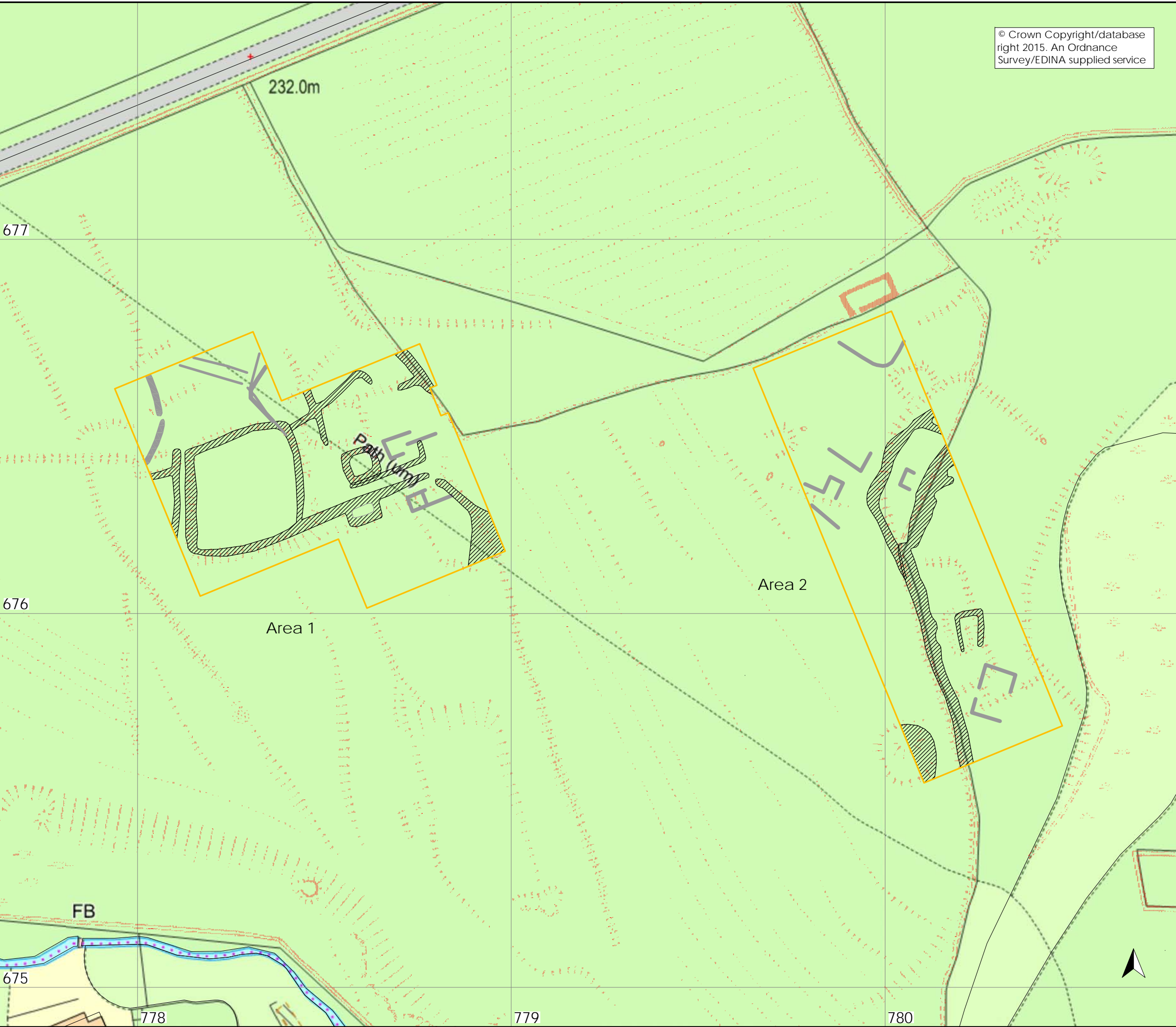
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Figure 5: Geophysical interpretation of
resistance data



-  resistance survey
-  high resistance anomaly
-  low resistance anomaly



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Figure 6: Archaeological interpretation



- survey area
- probable walls/banks
- possible walls/banks

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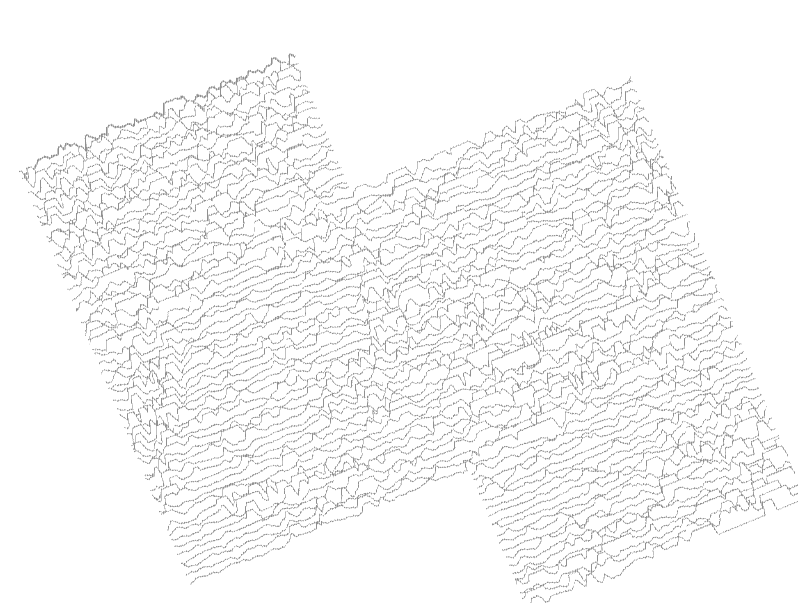


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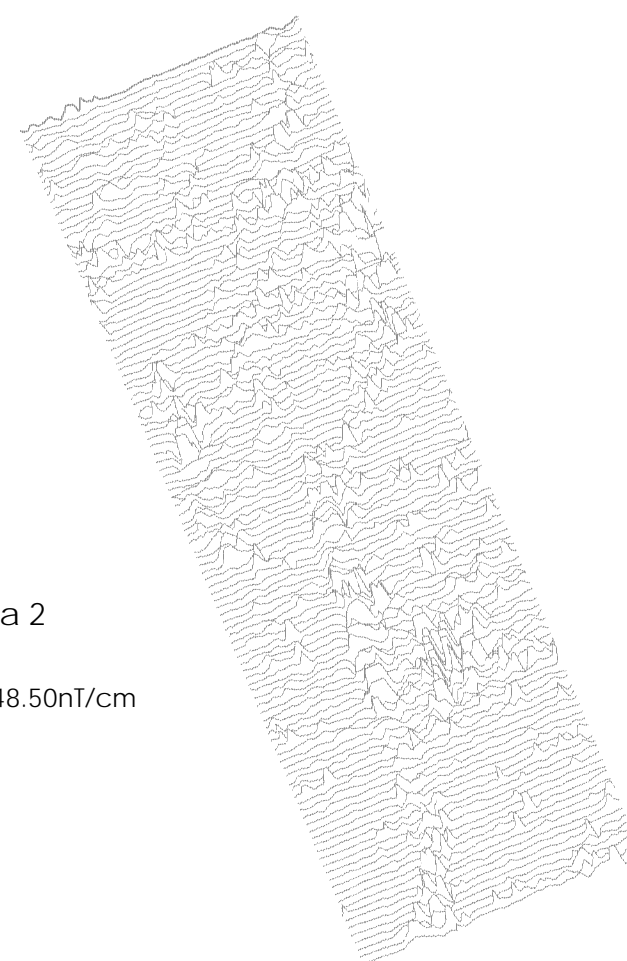
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Figure 7: Trace plots of geomagnetic data

0 50m
scale 1:1000 for A3 plot



Area 1
244.00nT/cm



Area 2
248.50nT/cm



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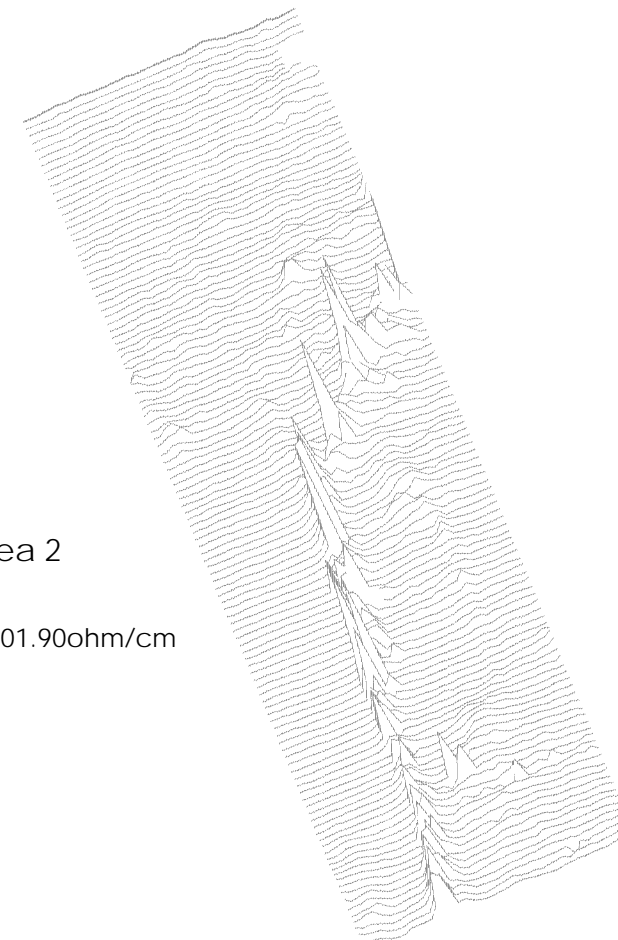
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Figure 8: Trace plots of resistance data



Area 1

183.80ohm/cm



Area 2

801.90ohm/cm

0 50m
scale 1:1000 for A3 plot

