

ARCHAEOLOGICAL
SERVICES
DURHAM UNIVERSITY

on behalf of
The Woodland Trust

Low Burnhall Wood
County Durham

phase 2 geophysical surveys

report 2463
August 2010

Contents

1.	Summary	1
2.	Project background	2
3.	Historical and archaeological background	2
4.	Landuse, topography and geology	3
5.	Geophysical survey	4
6.	Conclusions	7
7.	Sources	7
Appendix: Project specification		8

Figures

Figure 1:	Site location
Figure 2:	Location of survey areas
Figure 3:	Geophysical survey results overview
Figure 4:	Geophysical surveys and interpretations
Figure 5:	Trace plots of geomagnetic data

1. Summary

The project

- 1.1 This report presents the results of a second phase of geophysical survey conducted in advance of a proposed woodland planting scheme on the north bank of the River Wear, County Durham. The phase 2 works comprised the geomagnetic survey of an additional three areas totalling 3ha.
- 1.2 The works were commissioned by The Woodland Trust and conducted by Archaeological Services Durham University.

Results

- 1.3 Former ridge and furrow cultivation was detected across all three of the survey areas.
- 1.4 The former Croxdale Pit waggonway was identified in the west of Area 41d.
- 1.5 Possible soil-filled features were identified in Areas 41c and 41d, but these are unlikely to be of archaeological origin.

2. Project background

Location (Figures 1 and 2)

- 2.1 The study area was located to the north of the River Wear, east of the A167 to the south-west of Durham City, County Durham (NGR centre: NZ 2709 3969). Three geophysical surveys totalling 3ha were conducted in three land parcels for this second phase of survey.

Development proposal

- 2.2 The development proposal is for tree planting and associated works, including some deep ploughing, to create a large, publicly accessible native woodland on the edge of Durham City. This second phase of survey follows a change in the planting proposal to include Areas 41b, 41c and 41d.

Objective

- 2.3 The principal aim of the surveys was to assess the nature and extent of any sub-surface features of potential archaeological significance within the survey area, so that an informed decision may be made regarding the nature and scope of any further scheme of archaeological works that may be required in relation to the development.

Methods statement

- 2.4 The surveys have been undertaken in accordance with the specification provided by Durham County Council Archaeology Section for the first phase of survey in 2009 (Appendix).

Dates

- 2.5 Fieldwork was undertaken on 3rd August 2010. This report was prepared for 13th August 2010.

Personnel

- 2.6 Fieldwork was conducted by Natalie Swann and Richie Villis (supervisor). The geophysical data were processed by Richie Villis. This report was prepared by Richie Villis with illustrations by Janine Watson and edited by Duncan Hale, the Project Manager.

Archive/OASIS

- 2.7 The site code is **DLB10**, for **Durham Low Burnhall 2010**. The survey archive will be supplied on CD to the client for deposition with the project archive in due course. 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 **archaeol3-80653**.

3. Historical and archaeological background

- 3.1 An archaeological desk-based assessment (Richardson 2009) and a geophysical survey of most of the site (Archaeological Services 2010a) were conducted in 2009, prior to an archaeological evaluation in 2010 (Archaeological Services 2010b). The desk-based assessment contains an account of the archaeology of the area, which is summarised here. It concluded that known medieval, post-medieval and industrial archaeological sites lie within the development area, including the remains of

Croxdale Pit, an engine house, a waggonway and a clay pit. There is also aerial photographic evidence of medieval or post-medieval ridge and furrow across the area and a medieval fish pond or mill site close to the site.

- 3.2 Prehistoric settlement and potential ritual sites are present in the immediate and wider area. Some examples are given here. Immediately northeast of the site boundary at Houghall Farm an oval enclosure (H6921) was identified from aerial photographs and is possibly prehistoric in origin. Several barrow sites have also been recorded close to the northeast and east boundary of the site. At High Houghall a Bronze Age sword (H4945) was found within a test pit excavated by University of Sunderland engineers (Archaeological Services 1997). A multi-period prehistoric site is located 1.5km northeast of the site at Mountjoy (H8620) where a series of large ditches define a promontory site with dating evidence extending from the Neolithic through to the Roman period. Geophysical survey at Mount Oswald golf course also identified features of potential prehistoric date (H15782).
- 3.3 The first phase of geophysical survey (Archaeological Services 2010a) identified possible soil-filled features such as pits and ditches in most of the survey areas. In Area 41e a possible sub-circular enclosure was identified. In Area 41k evidence of possible rectangular enclosures was identified; a number of possible ring-ditches were also identified. Former field boundaries and traces of ridge and furrow cultivation were also detected. In Area 41e the former Croxdale Pit waggonway and engine house were also identified.
- 3.4 Archaeological evaluation of 13 trenches, targeting the anomalies identified in the first phase of geophysical survey, confirmed the presence of a number of features (Archaeological Services 2010b). The features were typically shallow ditches and gullies, as well as a large pit. The majority of the features were undated, but the finds recovered and the palaeoenvironmental evidence indicate that features of both prehistoric and medieval date were present.

4. Landuse, topography and geology

- 4.1 At the time of survey the proposed development area comprised three fields of ungrazed pasture.
- 4.2 Area 41d occupied a south-east-facing slope between 60m and 85m OD. Area 41c was predominantly level with a mean elevation of approximately 60m OD. Area 41b was also predominantly level with a mean elevation of approximately 60m OD, before falling steeply towards Saltwell Gill to the east.
- 4.3 The underlying solid geology of the area comprises sandstone of the Pennine Middle Coal Measures Formation. This is overlain by Devensian till and glacio-fluvial deposits, with gravel, sand and silt river terrace deposits in the south-west corner of Area 41b.

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 Institute for Archaeologists Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2002).

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, based on previous work, 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) might also be present.
- 5.4 Given the anticipated shallowness of targets the non-igneous geological environment of the study area a geomagnetic technique, fluxgate gradiometry, was considered appropriate for detecting the types of feature mentioned above. This technique 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.

Field methods

- 5.5 A 30m grid was established across each survey area and tied-in to known, mapped Ordnance Survey points using a Trimble Pathfinder Pro XRS global positioning system with real-time correction.
- 5.6 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 30m grid units. The instrument sensitivity was nominally 0.03nT, the sample interval was 0.25m and the traverse interval was 1.0m, thus providing 3,600 sample measurements per 30m grid unit.
- 5.7 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

- 5.8 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 3-4; the

trace plots are provided in Figure 5. In the greyscale images, positive magnetic anomalies are displayed as dark grey and negative magnetic anomalies as light grey. Palette bars relate the greyscale intensities to anomaly values in nanoTesla.

5.9 The following basic processing functions have been applied to each dataset:

<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>destagger</i>	corrects for displacement of geomagnetic anomalies caused by alternate zig-zag traverses
<i>despike</i>	locates and suppresses iron spikes in gradiometer data
<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

5.10 Colour-coded geophysical interpretation plans are provided. Three types of geomagnetic anomaly have been distinguished in the data:

<i>positive magnetic</i>	regions of anomalously high or positive magnetic field gradient, which may be associated with high magnetic susceptibility soil-filled structures such as pits and ditches
<i>negative magnetic</i>	regions of anomalously low or negative magnetic field gradient, which may correspond to features of low magnetic susceptibility such as wall footings and other concentrations of sedimentary rock or voids
<i>dipolar magnetic</i>	paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials (including fences and service pipes) and/or fired structures such as kilns or hearths

Interpretation: features

General comments

5.11 Colour-coded archaeological interpretation plans are provided.

5.12 Small, discrete dipolar magnetic anomalies have been detected in all of the survey areas. These almost certainly reflect items of near-surface ferrous and/or fired debris, such as horseshoes and brick fragments, and in most cases have little or no archaeological significance. A sample of these is shown on the geophysical interpretation plans, however, they have been omitted from the archaeological interpretation plans and the following discussion.

- 5.13 Series of parallel, weak, positive magnetic anomalies which almost certainly reflect former ridge and furrow cultivation have been detected across each survey area.

Area 41b

- 5.14 The ridge and furrow is aligned broadly east/west across this area.
- 5.15 A linear positive magnetic anomaly has been detected near the east edge of the area. Its perpendicular alignment to the ridge and furrow and location on the brow of the natural slope down to Saltwell Gill suggest that this is a headland associated with the ridge and furrow.
- 5.16 A linear, weak positive magnetic anomaly has been detected along the length of the area. This could reflect a soil-filled feature. It is aligned parallel with three negative magnetic anomalies which almost certainly reflect land drains, and so may be associated with these.
- 5.17 A diffuse dipolar magnetic anomaly has been detected in the north corner of the area. This corresponds to a sunken area of the slope on the ground. This is likely to represent an area of disturbed ground, perhaps associated with the former mining works, or a geomorphological feature.
- 5.18 The relatively high concentration of dipolar magnetic anomalies detected in the west of the area is likely to reflect near surface ferrous material, perhaps mining waste.

Area 41c

- 5.19 The former ridge and furrow cultivation in this area exists as broadly east/west aligned earthworks on the ground.
- 5.20 An amorphous positive magnetic anomaly has been detected on the south edge of the area; this could reflect a soil-filled feature. Its location within a steep hollow on the edge of the brow of the river bank could have a geomorphological origin, such as land slip.

Area 41d

- 5.21 The former ridge and furrow cultivation in this area survives as north-west/south-east aligned earthworks.
- 5.22 A number of weak positive magnetic anomalies have been detected in this area. These may reflect soil-filled features but their location on the slope and weak nature may reflect soil-creep or some other geomorphological phenomenon.
- 5.23 The linear concentration of strong dipolar magnetic anomalies detected in the western corner of the area, aligned north/south, almost certainly reflects the former Croxdale Pit waggonway, as shown on the 1st edition OS map and detected by the first phase of geophysical survey in Area 41e to the north (Archaeological Services 2010a).
- 5.24 The large and strong dipolar magnetic anomaly detected in the east of the area is likely to reflect a large piece of near-surface ferrous material.

- 5.25 The curvilinear series of small dipolar and negative magnetic anomalies running across the centre of the area corresponds to the course of a public footpath and stile.

6. Conclusions

- 6.1 A second phase of geophysical survey, comprising 3ha of geomagnetic survey, has been undertaken at Low Burnhall, on land to the north of the River Wear, immediately south of Durham City, prior to proposed tree planting.
- 6.2 Former ridge and furrow cultivation was detected across all three of the survey areas.
- 6.3 The former Croxdale Pit waggonway was identified in the west of Area 41d.
- 6.4 Possible soil-filled features were identified in Areas 41c and 41d, but these are unlikely to be of archaeological origin.
- 6.5 The proposed tree planting areas are shown on the archaeological interpretation plan. Tree planting and subsequent root growth in Areas 41b(ii), 41c(ii) and 41d(iii)(iv)(v)(vi) is likely to have an adverse impact upon the former ridge and furrow cultivation in these areas.

7. Sources

- Archaeological Services 1997 *A late Bronze Age Sword from Houghall Farm*. Unpublished report **442**, Archaeological Services Durham University
- Archaeological Services 2010a *Low Burnhall Wood, County Durham; geophysical surveys*. Unpublished report **2336**, Archaeological Services Durham University
- Archaeological Services 2010b *Low Burnhall Wood, County Durham; archaeological evaluation*. Unpublished report **2361**, Archaeological Services Durham University
- David, A, Linford, N, & Linford, P, 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage
- Gaffney, C, Gater, J, & Ovenden, S, 2002 *The use of geophysical techniques in archaeological evaluations*. Technical Paper **6**, Institute of Field Archaeologists
- Richardson, D, 2009 *Low Burnhall, County Durham: archaeological desk-based assessment*. Unpublished report **1028**, Tyne and Wear Museums Archaeology
- Schmidt, A, 2002 *Geophysical Data in Archaeology: A Guide to Good Practice*. Archaeology Data Service, Arts and Humanities Data Service

Appendix: Project specification

Specification for GEOPHYSICAL SURVEY:

Low Burn Hall Woodland Trust Planting Scheme Near Croxdale County Durham

1.0 Site Location and background

1.1 This specification is for geophysical survey of a proposed large scale tree planting woodland development scheme on the north bank of the River Wear just north of Croxdale, Co. Durham. The site is centred on grid reference 426735539251

1.2 The Low Burn site is part of the Woodland Trust landholdings. They aim to develop a large publicly accessible wood on the edge of Durham City that will link into existing woodland which runs along the banks of the River Wear southwards from the city's centre.

1.3 The aim of this project will be to create a new native broadleaved wood by planting local provenance nursery stock across what is currently arable farming. These trees will be planted at a stocking density of 2250/ha. The pasture fields will also be planted but at a stocking density of 1100 trees/ha. Natural regeneration in some areas will also be encouraged. Archaeological remains are a finite, and non-renewable resource, in many cases highly fragile and vulnerable to destruction by inappropriate tree planting. Appropriate evaluation on this site is therefore essential to recover the maximum amount of evidence before ground preparation occurs.

2.0 The Development

2.1 The client for this work is the Woodland Trust. It is project managed by Gary Haley.

2.2 The client is proposing to create a large new woodland along the bank of the River Wear.

2.3 The total scheme covers some 67.62ha of arable, pasture and meadowland on the northern bank of the River Wear between Croxdale and Houghall.

2.4 The proposed planting scheme will only impact on approximately 46.86ha of site area as the other parts are either existing woodland, are not deemed suitable for planting, are to be left to regenerate naturally or are other habitats which are to be left as open areas within the scheme (see Figure 1 above for details).

3.0 Historical Background

3.1 An archaeological assessment has recently been conducted by T&WM (2009) and is available for consultation in the HER or from the client. The DBA should be referred to by the appointed geophysical surveyor.

3.2 The known archaeological sites within the curtilage of the development area consist of both Medieval and Post Medieval/Industrial sites which include the remains of Croxdale Pit, Brick and Tile Works, Engine House, Wagonway and a clay pit. There is also aerial photograph evidence for a polygonal enclosure, a medieval fish pond or a mill site and medieval/post medieval rig and furrow.

3.3 A high level of prehistoric settlement and ritual sites are present in the immediate and wider area. Also medieval farms, farm fields, post medieval/industrial sites and rig and furrow dating to the medieval/post medieval periods. It is likely that significant agricultural exploitation of the site has occurred on the site combined with mineral extraction in the 19th century in the area around Low Burnhall farm.

4.0 The Archaeological Brief

4.1. This brief sets out which archaeological works are required in order to assess and evaluate the site, and how they must be carried out. Any further works required to mitigate the impact of the proposed development may be dealt with under a separate brief as a condition of future detailed planning permission. The report on the current works must be submitted in support of the imminent planning application.

4.2. The brief must be read in conjunction with the recently issued *Yorkshire, The Humber and the North-East: Regional Statement of Good Practice for Archaeology in the Development Process* (2009). This is appended to the end of the specification document. *Geophysical Survey*

4.3. In order to evaluate the archaeological potential for remains of any period the site will be subject to a 30% (14ha) geophysical survey to provide archaeological evaluation data from within the proposed development area (PDA). The use of remote sensing geophysical techniques (magnetometry) will be required to help define the potential archaeological features that may exist on the site.

4.4. A contingency for a further 20% survey must be costed into the project. This will be used, if necessary, to help define the extent of potential archaeological anomalies which appear to extend beyond the original sample areas. It is more suitable in the long term to be able to answer questions of this nature whilst the survey team is still (technically speaking) in the field. The contingency budget can only be utilised after a consultation meeting between the client, the contractor and the Durham County Council Archaeology Section.

4.5. The sample areas must provide good coverage across the landscape so that all areas are sampled except where ground conditions, vegetation or water cover makes it impracticable. In addition a buffer zone around field boundaries and buildings may be needed to reduce interference from fences, footpaths and debris often associated with field boundaries. Partial grids may be excluded if they prove to be impractical. The archaeological contractor must liaise with the client over development layout and discuss the final survey sample with the DCC Assistant Archaeology Officer.

4.6. The overall purpose of the geophysical survey will be:

- to establish the presence/absence, and nature of any archaeological anomalies within the area specified so that they can be identified and utilised to plan the tree planting scheme (the aim is to use the geophysical survey results to inform avoidance of potential archaeological anomalies within the scheme)
- to define the extent of any such anomalies, and to characterise, if possible
- to establish the presence/absence, and nature of any known modern anomalies within the area of proposed development which may affect the results
- to determine if the further survey is required to help define the extent of possible archaeological anomalies.

4.7. Methodologies must be clearly costed in the tender document and information on how the contractor proposes to conduct the work clearly set out in the written scheme of investigation submitted by the appointed contractor to the DCC Assistant Archaeology Officer for approval.

4.8. A survey grid of 30m x 30m must be placed across the site and must be accurately tied in to local topographic features and overlaid onto an appropriate OS map base. The grid tie-in information should be made available in, or with, the final report so that the location plan can be related to the OS National Grid. Once the survey is complete any markers used must be removed

from site. The results, including archaeological interpretation of the data must be set out in a report format with maps and must be available to aid in the development of the tree planting scheme. Interpretation plans must include OS contour data.

4.9. Depending on the results of this evaluation phase, further works may be required to mitigate the impact of the development on any archaeological remains. This will be dealt with by a separate brief should this be required.

4.10. This brief does not constitute the “written scheme of investigation” which must be submitted by the appointed contractor for approval by Durham County Council Archaeology Section prior to work commencing.

5.0 OASIS

5.1 The Durham County Council Archaeology Section supports the Online Access to Index of Archaeological Investigations (OASIS) Project. The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large scale developer funded fieldwork.

5.2 The archaeological contractor must therefore complete the online OASIS form at <http://ads.ahds.ac.uk/project/oasis/> within 3 months of completion of the work. Contractors are advised to ensure that adequate time and costings are built into their tenders to allow the forms to be filled in.

5.3 Technical advice should be sought in the first instance from OASIS (oasis@ads.ahds.ac.uk) and not from Durham County Council Archaeology Section.

5.4 Once a report has become a public document by submission to or incorporation into the SMR, Durham County Council Archaeology Section will validate the OASIS form thus placing the information into the public domain on the OASIS website.

5.5 The archaeological consultant or contractor must indicate that they agree to this procedure within the specification/project design/written scheme of investigation submitted to Durham County Council Archaeology Section for approval

6.0 The Report

6.1 This report may be first stage of a phased programme of archaeological works. The client has commissioned it to for the purpose of identifying areas of potential archaeological remains so that impact to them by the planting scheme can be avoided where possible. Based on the results of the evaluation further archaeological works may be required.

6.2 The evaluation report must include the following:

- executive summary
- a site location plan with NGR references at an appropriate scale to show both the site location within the wider area and specifically/detailed site location
- OASIS reference number
- Unique Site code
- contractor’s details including dates work carried out
- nature and extent of the proposed development, including developer/client details
- description of the site location and geology
- suggestions regarding the need for, and scope of, any further archaeological work
- photographs, maps and plans to illustrate the report as necessary
- discussion of potential impacts of the development on known and potential archaeological sites
- geophysical technical and processing information
- geophysical results
- geophysical discussion and interpretation - this should be referenced to the previously produced DBA by T&WM (2009) to provide the contextual background to any potential archaeological anomalies
- OS contour data must also be displayed on the interpretation plots
- a plot of the raw geophysical data (to an appropriate scale)
- geophysical plots must show the location of modern intrusions (i.e. services etc)
- geophysical X-Y trace and greyscale and/or dot density plots (to an appropriate scale)
- geophysical interpretative feature map (to an appropriate scale)
- additional plans/map extracts to display noted and recorded archaeological features as appropriate
- suggestions regarding the need for, and scope of, any further archaeological work, including publication
- references
- bibliography

6.3 The report must be presented in an ordered state and contained within a protective cover/sleeve or bound in some fashion (loose-leaf presentation is unacceptable). The report must contain a title page listing site/development name, district and County together with a general NGR, the name of the archaeological contractor and the developer or commissioning agent, as well as the OASIS reference number. The report must be page numbered and supplemented with sections and paragraph numbering for ease of reference. All maps, figures and photographs must be cross referenced to the text.

7.0 Publication

7.1 All assessments, evaluations and watching briefs which do not progress to further excavation and research (with the relevant post-excavation and publication scheme and costs), should have a time and budget allocation identified for publication. This must be to a minimum standard to include a summary of the work, findings, dates, illustrations and photographs and references to where the archive is lodged.

7.2 Editors of regional journals, either the *Durham Archaeological Journal* or *Archaeologia Aeliana* should be contacted for information on outline publication costs, fuller figures may be worked out on completion of the watching brief. As the final note is largely unpredictable in advance a contingency sum should be set aside at the outset of work in the tender.

8.0 The Tender

8.1 Tenders for the work must include the following information set out in a clearly understood fashion.

8.2 Brief details of the organisation and the number of staff who are proposing to carry out the work including any relevant specialisms or experience.

8.3 The earliest date at which the work can be commenced and the amount of notice required to initiate the assessment and geophysical survey.

8.4 Statement agreeing to complete the OASIS forms on completion of the assessment.

8.5 An estimate of how long the work will take broken down by time and cost in terms of data collection and report production.

The tender should include a breakdown of costs attributable to:

- travelling and subsistence
- fieldwork – 30% survey sample

- report production
- administration
- archiving
- contingency for additional 20% survey sample
- other

9.0 Submission of Report

9.1 A final bound copy and a digital PDF copy of the report must be sent to the Archaeology Section, Durham County Council for inclusion into the County Durham Archaeological Archive (HER):

The County Archaeology Officer
Archaeology Section
Design & Historic Environment Team
Regeneration & Economic Development
Durham County Council
The Rivergreen Centre
Aykley Heads
Durham
DH1 5TS.

9.2 Additionally, at least three or more bound copies of the report must be submitted to the client for planning purposes (as required by client).

10.0 The Archive

10.1 The site archive comprising the original paper records and plans, photographs, negatives etc, must be deposited in the appropriate museum at the completion of post-excavation. This must be in accordance with the Durham County Council Archaeological Archive policy, a guidance note on which can be obtained from the Durham County Council Archaeology Service

11.0 Bibliography

Archaeological Archives Forum 2007 *Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation.*

Durham County Council 2008 *2008-09 HER Charging Scheme*

English Heritage 1991 *Management of Archaeological Projects 2*

2002 *Guidelines for Environmental Archaeology: a guide to the theory and practice of methods from sampling and recording to post-excavation*

2008 *Geophysical Survey in Archaeologica I Field Evaluation*

Institute of Field Archaeologists 1999 *Standard and Guidance: Archaeological Evaluation*

2001 *Standard and Guidance: Archaeological Desk-Based Assessment*

Petts, D and C Gerrard 2006 *Shared Visions: The North East Regional Research Framework for the Historic Environment.* Durham County Council, Durham.

United Kingdom Institute of Conservation 1990 *Guidelines for the Preparation of Excavation Archives for long-term storage*

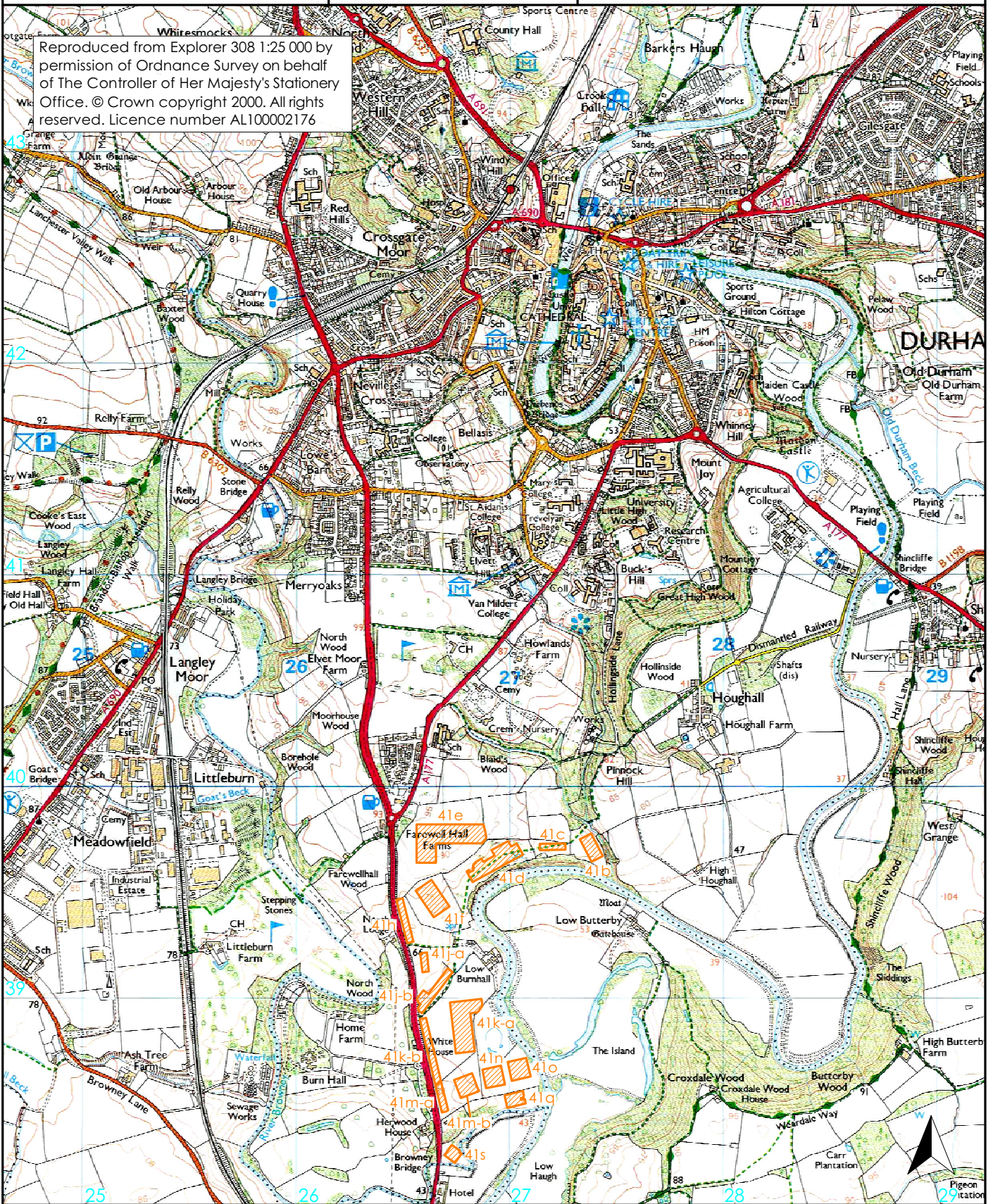
11th December 2009


L. White

Assistant Archaeology Officer

© Durham County Council

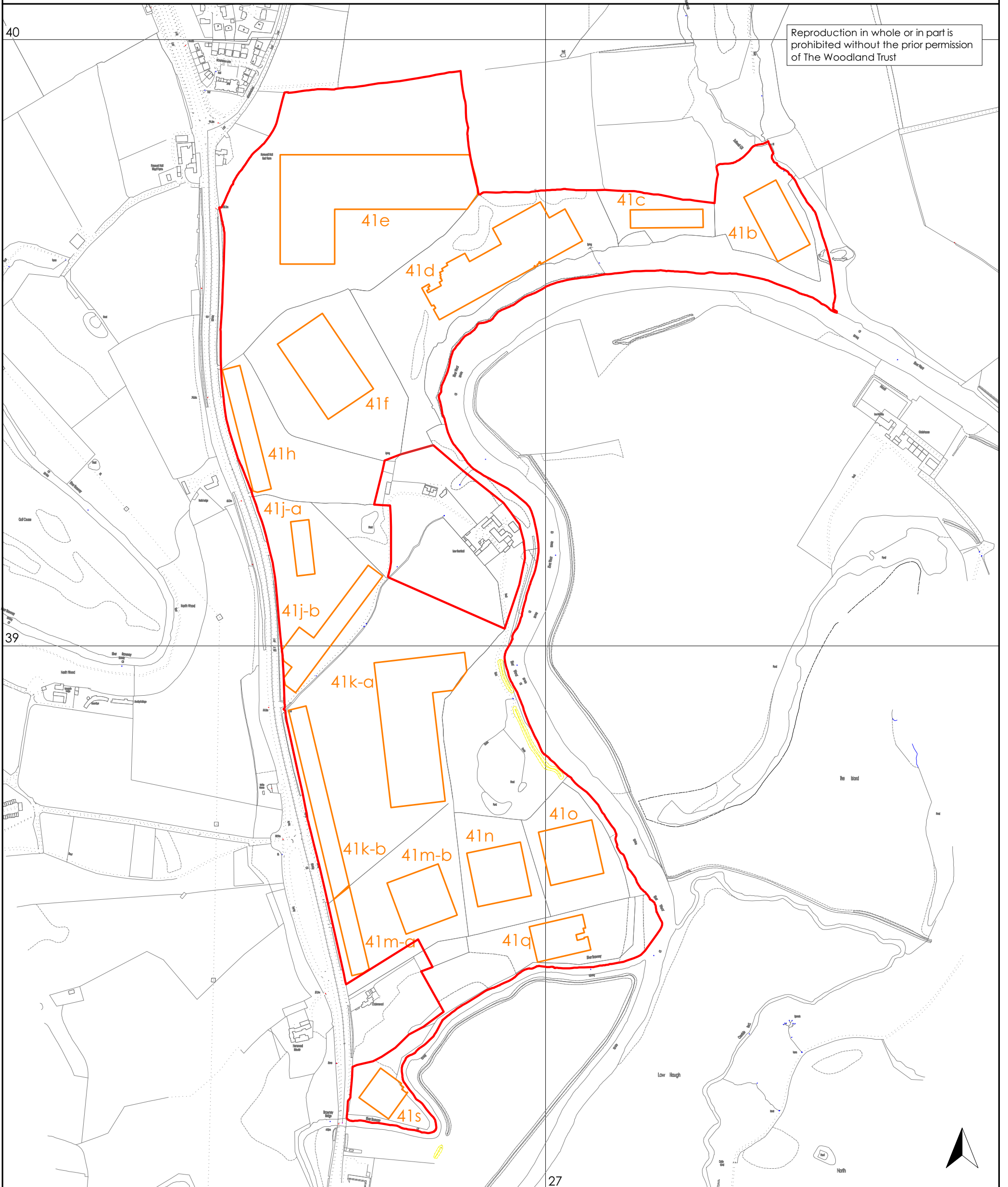
Reproduced from Explorer 308 1:25 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 2000. All rights reserved. Licence number AL100002176



 geophysical surveys

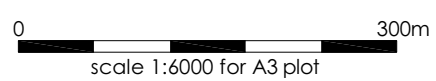
0 1km
scale 1:25 000 for A4 plot

-  development area
-  survey areas



ARCHAEOLOGICAL SERVICES
DURHAM UNIVERSITY

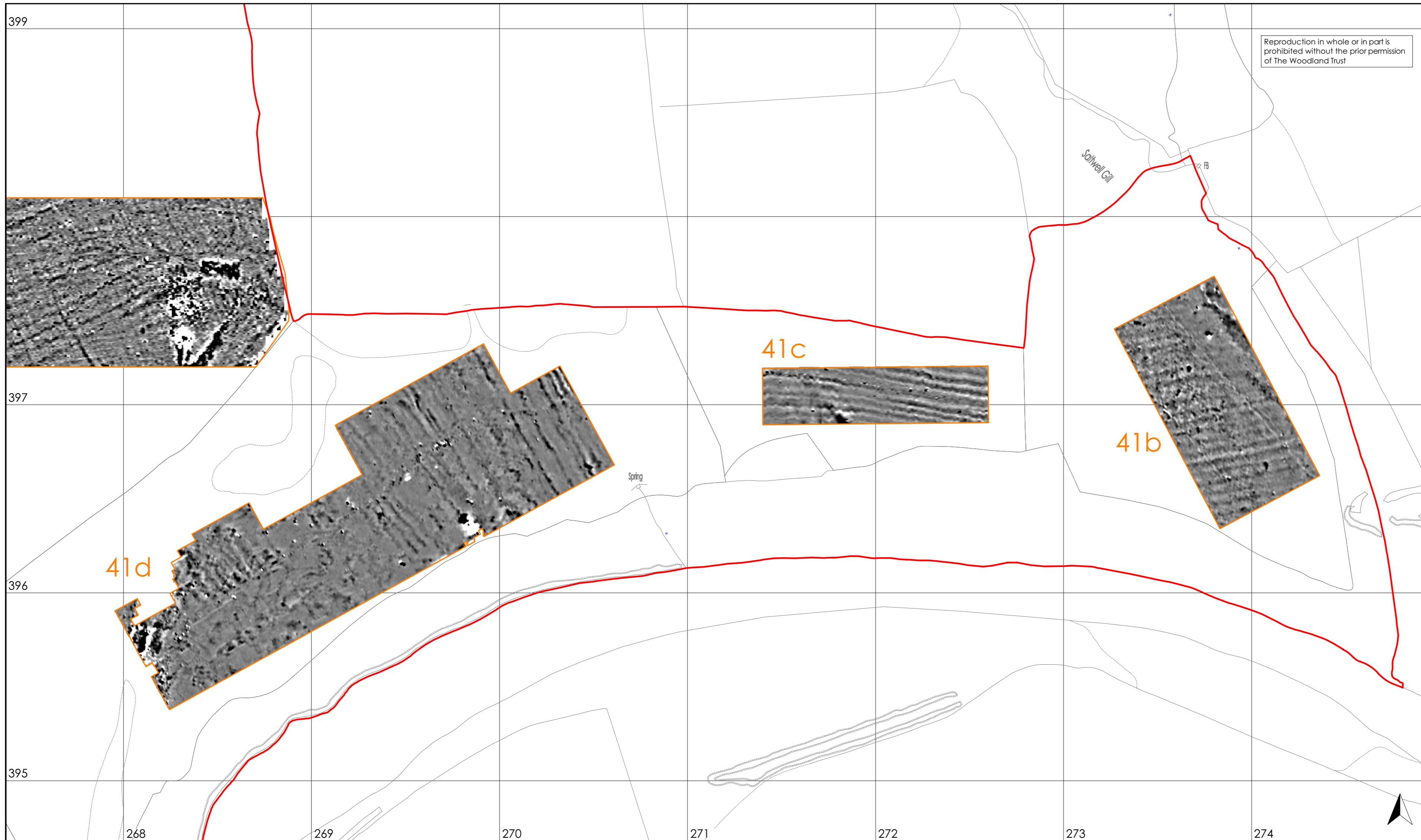
on behalf of
The Woodland Trust



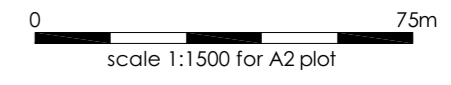
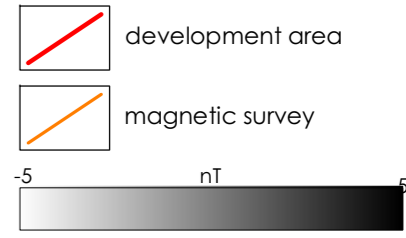
Low Burnhall Wood
County Durham

geophysical surveys
report 2463

Figure 2: location of survey areas



Reproduction in whole or in part is prohibited without the prior permission of The Woodland Trust



ARCHAEOLOGICAL SERVICES
 DURHAM UNIVERSITY

on behalf of
 The Woodland Trust

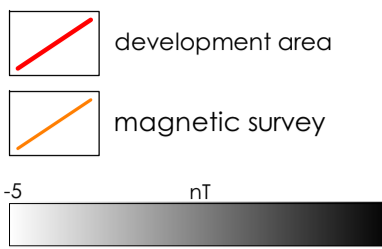
Low Burnhall Wood
 County Durham

geophysical surveys
 report 2463

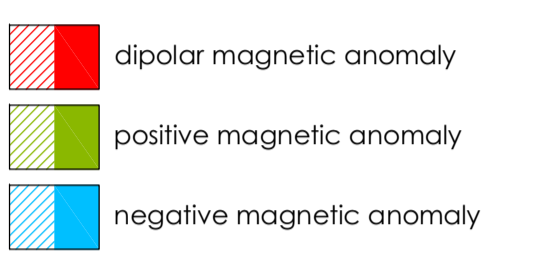
Figure 3: Geophysical survey results overview

A

A - geophysical survey



B - geophysical interpretation

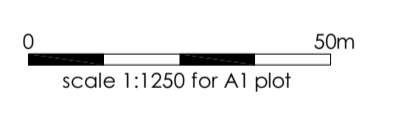


C - archaeological interpretation



B

C

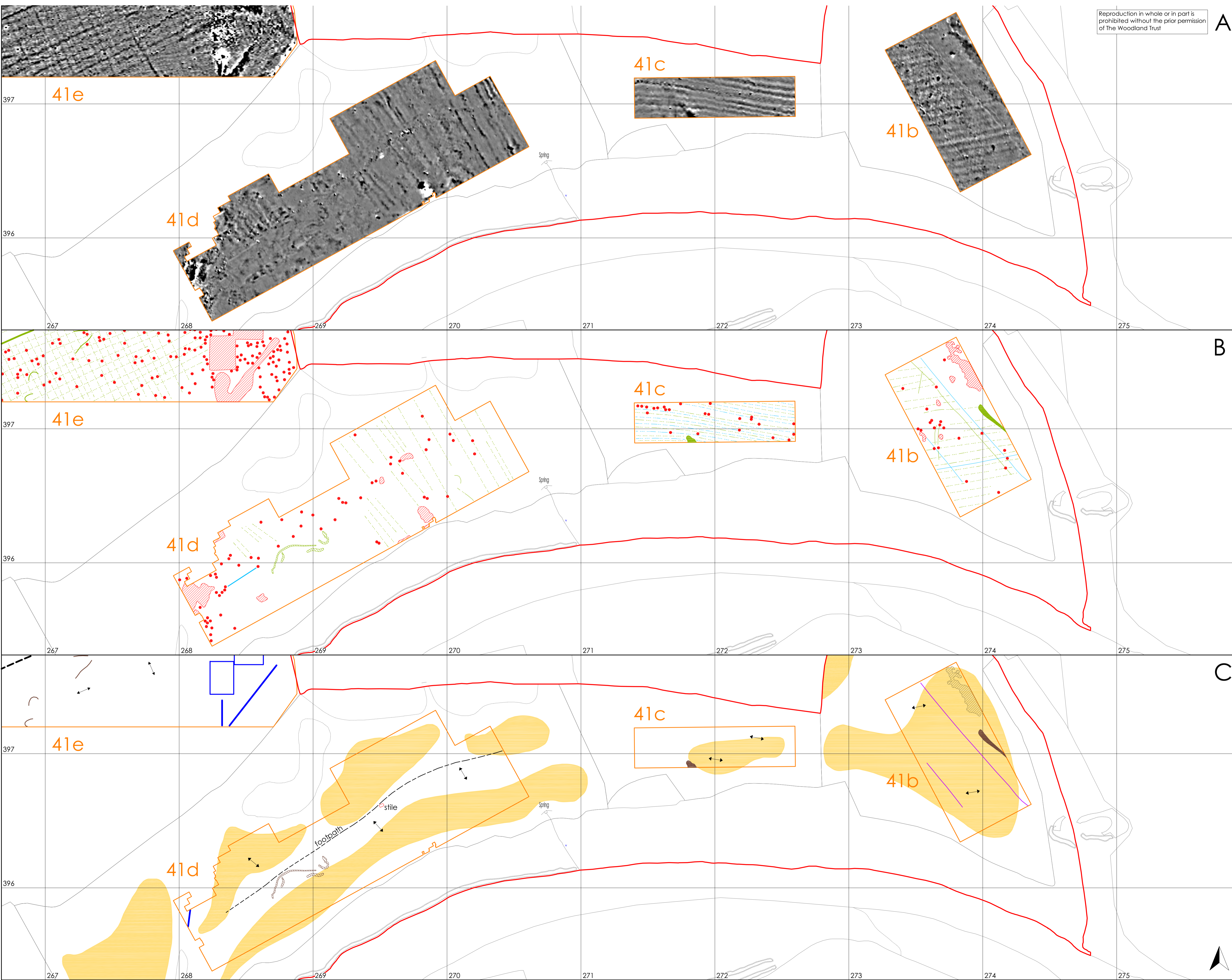
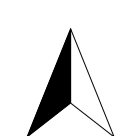


ARCHAEOLOGICAL SERVICES DURHAM UNIVERSITY

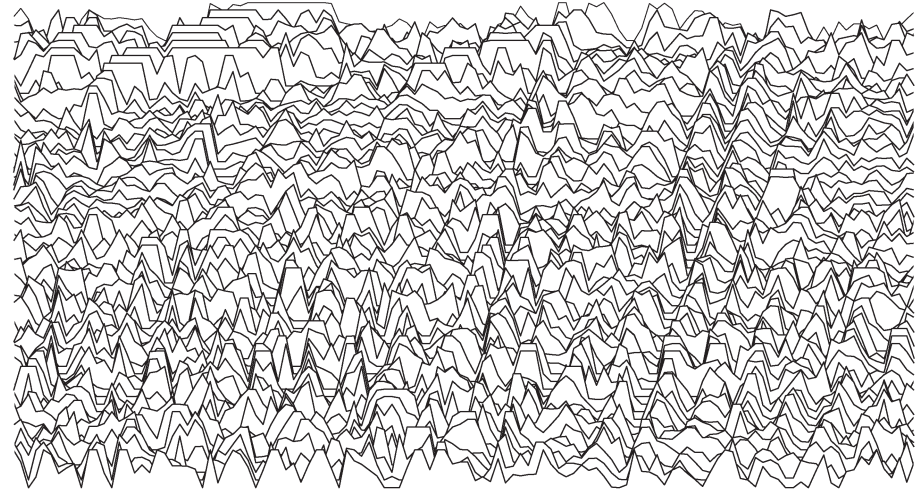
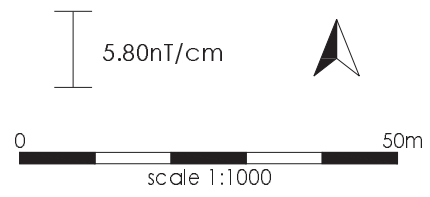
on behalf of The Woodland Trust

Low Burnhall Wood County Durham geophysical survey report 2463

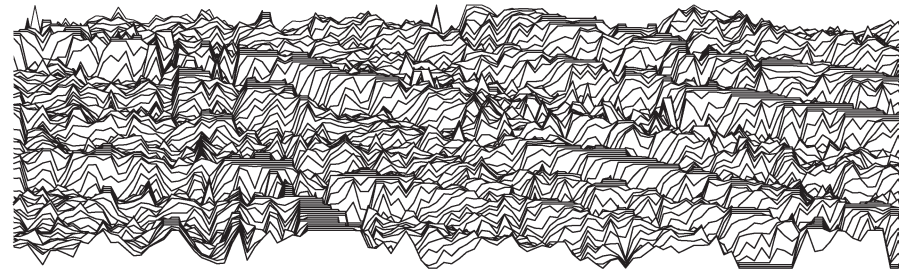
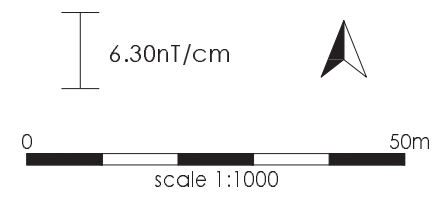
Figure 4: Geophysical survey and interpretations



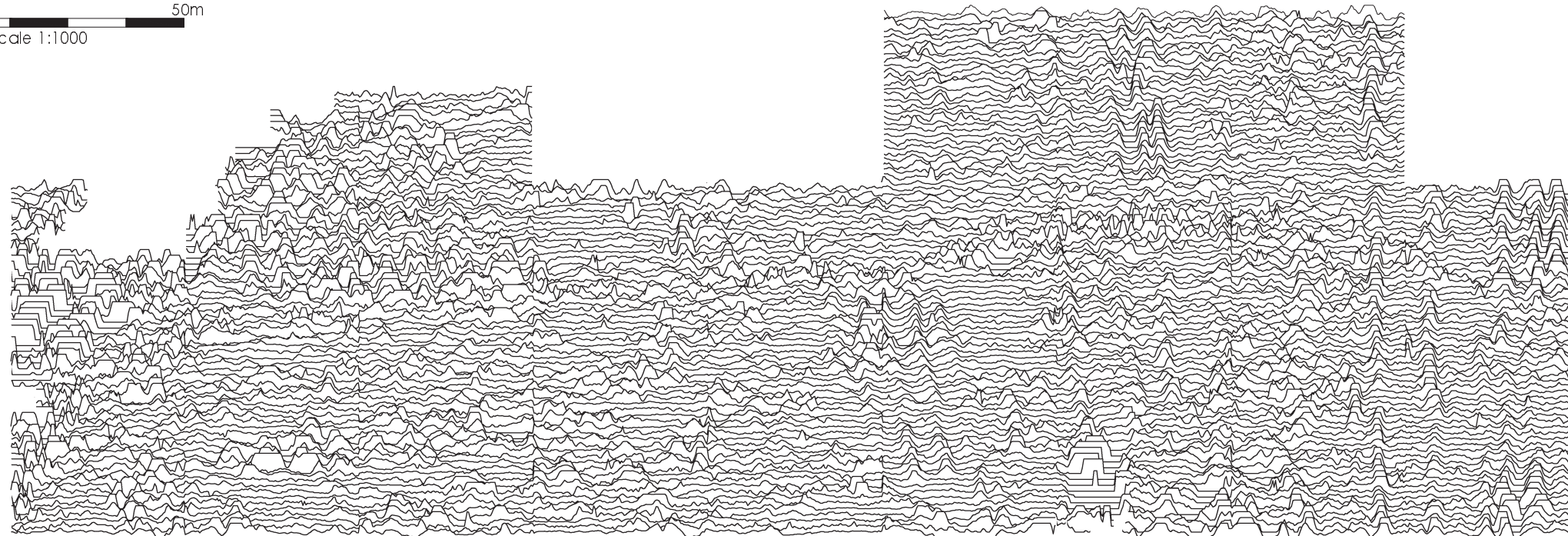
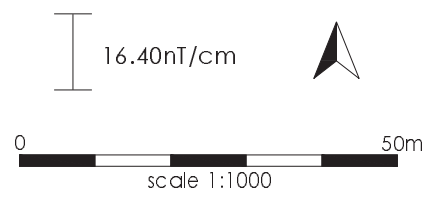
Area 41b



Area 41c



Area 41d



Low Burnhall Wood
County Durham

geophysical surveys
report 2463

Figure 5:
Trace plots of geomagnetic data