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Medieval moated site west of St Oswald's Church, Kirkoswald

Archaeological Survey Report

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Fellfoot Forward Landscape Partnership Scheme

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Purpose of document

This document has been prepared as a survey report for an archaeological geophysical and earthwork survey undertaken at a medieval moated site located to the west of St Oswald's Church, Kirkoswald in Cumbria. The survey and subsequent report have been undertaken on behalf of the Fellfoot Forward Landscape Partnership Scheme as part of a community archaeology project to gain a better understanding of the prominent earthworks at the site. The purpose of this document is to provide a comprehensive account of the geophysical survey and measured earthwork survey, with specialist assessment of the geophysical results and recommendations for further investigation.

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Project summary

OASIS ID:	digventu1-515643
DV project code and type:	FFF22 – KIR23 – Archaeological Survey
National Grid Reference:	NY 55428 40793
Designation:	List Entry no. 1007088
Section 42 Licence:	Case No: SL00234442 Ref: AA/AA
County:	Cumbria
Title:	Medieval moated site west of St Oswald's Church, Kirkoswald: Archaeological Survey Report
Author(s):	Kimberley Teale BSc ACIfA ISAP
Origination date:	13/05/2023
Circulation:	Fellfoot Forward Landscape Partnership Historic England
Project team:	Kimberley Teale, Jodie Hannis, Andrew Pierce
Reviewed by:	Jodie Hannis
Approval:	Brendon Wilkins BSc MSc MIAI MCIfA

Acknowledgements

We'd like to begin with a thank you to the team at the Fellfoot Forward Landscape Partnership Scheme for facilitating the survey as part of the community archaeology engagement programme, specifically to Fiona Knox and Lizzy Benn for their support throughout the project, aiding with site visits and landowner permissions. We would also like to extend our gratitude to Tim Featherstonhaugh (landowner) and family, for allowing us to conduct the investigations and for their support and interest in the research.

Thanks are also extended to Andrew Davidson, Inspector of Ancient Monuments for the North West Region at Historic England for granting us permission and a Section 42 Licence to undertake the survey. Thanks are also due to our team of volunteers who assembled on our community survey day.

The geophysical survey was managed and undertaken by Kimberley Teale and Jodie Hannis. The topographic survey was led by Jodie Hannis, and the earthwork survey was managed and led by Andrew Pierce.

Non-technical summary

DigVentures was invited to undertake a community-based archaeological research project at a medieval moated site located to the west of St Oswald's Church, Kirkoswald, by the North Pennines AONB Partnership's *Fellfoot Forward Landscape Partnership Scheme*, through Cumbria County Council and the National Lottery Heritage Fund. This report details the results of a geophysical magnetometer and earth resistance survey undertaken across 0.5Ha of the site, which focused upon the inner enclosure of the moated site. It also details the results of a topographical survey and a measured earthwork survey undertaken across the entire moated site. The report provides an assessment of potential and any recommendations for further work at the site.

This report conforms with current best practice and to the guidance outlined the Management of Archaeological Research Projects in the Historic Environment (Historic England 2015), the Chartered Institute for Archaeologists (2014), and the Europae Archaeologiae Consilium (EAC) Guidelines for the Use of Geophysics in Archaeology (Schmidt et al. 2016).

A community survey was undertaken on the 24th and 25th of April 2023 across prominent earthworks comprising a medieval moated site.

The geophysical survey discovered details pertaining to an inner raised platform, possible buildings and walls and a possible avenue or entranceway upon the innermost moated mound of the complex. The moat ditches were also found to have drains or walls running through and alongside them, which could either have aided in water collection for the ditches or been some kind of ornamental feature. The earthwork survey identified a plethora of previously unknown features of the moated site, and confirmed that the scheduled area should extend further south than it currently does.

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1 INTRODUCTION

1.1 Project background

1.1.1 DigVentures was invited to undertake a community-based archaeological research project at a scheduled medieval moated site in Kirkoswald, Cumbria (hereafter "the site"; Figure 1) by the North Pennines AONB *Fellfoot Forward Landscape Partnership Scheme*. The site is a Scheduled Monument under List Entry No. 1007088 and permission to undertake a geophysical survey was granted on the 20th of March 2023 (Case No. SL00234442). This project sits within the Fellfoot Forward project *Uncovering the Past* which has involved building three community-researched Village Atlases, an ongoing oral history project, community geophysical surveys and community excavations at Carlatton Cairn and Long Meg and her Daughters Stone Circle.

1.1.2 This report details an assessment of the results of a community archaeology project undertaken at the moated site on the 24th and 25th of April 2023, comprising geophysical magnetometry and earth resistance survey, topographical survey and a measured earthwork survey. The report conforms with current best practice and to the guidance outlined the Management of Archaeological Research Projects in the Historic Environment (Historic England 2015), the Chartered Institute for Archaeologists (2014), and the Europae Archaeologiae Consilium (EAC) Guidelines for the Use of Geophysics in Archaeology (Schmidt et al. 2016).

1.2 Fellfoot Forward Landscape Partnership Scheme

1.2.1 The Fellfoot Forward Landscape Partnership Scheme, developed with local communities and organisations and led by the North Pennines AONB Partnership, is a major scheme to conserve, enhance and celebrate the natural and cultural heritage of a special part of the north-west of England. The scheme was awarded funding from the National Lottery Heritage Fund in 2020.

1.2.2 The works encompassing the scheme intend to forge creative connections between people and the landscape, conserve habitats and key species, and celebrate this beautiful area with its communities. The projects have involved citizen science; community archaeology; woodland creation and management; protecting grassland and meadows; restoring peat; conserving historic buildings; new and revitalised walking, cycling and riding routes; enhanced interpretation and information for the local community and visitors; opportunities for local schools and youth groups to engage with their local heritage; and a host of public events and learning.

1.2.3 It is intended that the scheme will provide a huge boost for the area, allowing greater access to restored heritage sites and promoting a deep understanding of the Fellfoot landscape's special cultural history. Working with partners and local communities, the ultimate aim of the scheme is to strengthen the visitor economy, providing a better future for residents and businesses.

1.3 Site location, topography and geology

1.3.1 The site is situated just to the south west of the Parish Church of St Oswald and its associated graveyard, in the village of Kirkoswald, Cumbria, 11km north-west of Penrith (NGR NY 55428 40793; Figure 1). The site is approximately 200 meters to the south of the heart of the modern village centre of Kirkoswald on the south side of the Raven Beck. The current course of the Eden River lies approximately 150 meters to the west and as such, the site is low lying and prone to flooding over winters and during periods of heavy rain.

1.3.2 The earthworks that comprise the visible site are extremely apparent even from ground level. Though the extent and depth of the ditched enclosures is emphasised in periods of flooding, frost, and low light, even in regular conditions the scale and regularity of the site is notable. From the elevated position of the Bell Tower just north of the church, site is particularly impressive.

1.3.3 The surveys focused on one field containing prominent earthworks relating to the moat, measuring approximately 3.8Ha in size. The site comprised grazed pasture with several large mature trees and was bounded by the church wall to the north, the road to the west, and open grassland to the east and south. The site was delineated by several agricultural fence lines, one of which ran NNE-SW through the moated site. The general elevation of the site sits around 72m above Ordnance Datum (aOD), and slopes gently down towards the west towards the River Eden and to the east.

1.3.4 The site geology consists of alluvial deposits of clay, silt, and gravel formed in the Quaternary Period with underlying bedrock of the Penrith Sandstone Formation from the Cisuralian Period (British Geological Survey, 2023) which is visible through the village as a primary building material (including St Oswald's Church, the Bell Tower, and the remains of Kirkoswald Castle). The soils of the site comprised freely draining floodplain soils in the southern half and freely draining slightly acid loamy soils in the north (Soilscapes, 2023).

1.3.5 Gradiometer survey typically provides a good to average result over sedimentary deposits and results can be variable (David et al. 2008). The gradiometer survey results presented in this report had not been affected in a detrimental way by the local geology, but were instead affected by detritus in the topsoil from historical flood events.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Archaeological background

2.1.1 The site is one of approximately 6,000 moated sites known in England. Consisting of wide ditches, the monuments are often or seasonally water filled, and partly or completely enclose one or more islands of dry ground upon which stood domestic or religious buildings (Historic England, 2023).

2.1.2 The site was listed as a Scheduled Monument in 1978, under List Entry No. 1007088 as 'medieval moated site west of St Oswald's Church, Kirkoswald'. The listing for the site reads;

> *"…the remains of a moated site of medieval date, situated on level ground just east of the River Eden, immediately adjacent to St Oswald's Church. The monument includes a central rectangular enclosure measuring 50m by 20m surrounded by a 5m to 8m wide ditch. This in turn is surrounded by double ditches enclosing a trapezoidal area measuring approximately 250m by 175m, with the ditches being flat-bottomed, 4m wide and spaced 15m apart…*
>
> *…is preserved as an earthwork and will contain archaeological deposits relating to its construction, use and abandonment. The monument provides insight into settlement patterns during the medieval period and its significance is increased by its proximity to the remains of Kirkoswald Castle"* (Historic England, 2016).

2.1.3 Although St Oswald's Church, the Bell Tower, and the remains of Kirkoswald Castle all appear on the earliest Ordnance Survey maps of the area, the moated site is not marked or indicated in any way. Given the obviousness of the site even from ground level, it is surprising that the site is not identified in these earliest surveys of the area.

2.1.4 Despite increasingly sophisticated survey techniques revealing further detail about the site, the moated complex is otherwise absent in the historical record. Historic England's designation of the earthworks as a medieval moated site notes that similar sites (around 6000) can be found across England which typically dating from around 1250 to 1350 AD. The ditched enclosure system, while impressive in scale, would likely not provide a useful defense and instead indicates the exercising of wealth and status within the landscape by powerful landowners.

2.1.5 The HE listing further speculates that the site could be a precursor to the nearby ruined remains of Kirkoswald Castle as historic documents indicate that a license to crenellate was granted in 1201 to Sir Hugh de Marville by King John, but the surviving remains of Kirkoswald Castle date to later to the 14th century. No particular evidence, either historical or archaeological, exists to support this suggestion, however.

2.1.6 The moated site is most usefully understood as existing within the wider context of medieval Kirkoswald. Aerial images show clearly that the northern edge of the ditch system is truncated by St Oswald's cemetery boundary and therefore the site must predate this phase of the church and its grounds. Similarly, the later dates of Kirkoswald Castle, and Bell Tower to the north-east of the church (mid-18th century), suggest that the moated site represents a much earlier phase of substantial activity in the area.

2.1.7 Across the road to the north of the site, the College is a complex of buildings owned as a private residence by the Featherstonhaugh family since the end of the 16th century. Prior to that, it was formerly a College of Vicars, and elements of the tower house, which still remains, indicate a late 15th century date. It is perhaps likely that the moated site has some association with a manorial complex situated in the village, having links with the Dacres and the College complex nearby.

3 PROJECT AIMS & OBJECTIVES

3.1 Project aims

3.1.1 The overarching aim of the community survey was to better understand the extents and below ground remains relating to the medieval moated site, and to investigate whether built remains could be identified within the innermost enclosure of the moat.

3.1.2 A full non-invasive magnetometer and earth resistance survey, topographical survey and measured earthwork survey were planned as part of a community led survey experience day. The results of the survey will furnish the HER and add to what little is already known about the site and to aid in better establishing the extents of the scheduled area compared to the larger extents of the earthworks (Figure 2).

4 METHODOLOGY

4.1 Introduction

4.1.1 An archaeological geophysical magnetometer and earth resistance survey was undertaken across 0.5Ha across the inner enclosure of the moated monument. The survey was led by an accredited geophysical surveyor from DigVentures and was undertaken by volunteers from the Fellfoot community. A topographical survey and a measured earthwork survey were also undertaken across the whole site across approximately 4Ha, which were led by DigVentures and Andrew Pierce and was undertaken by volunteers from the Fellfoot community.

4.1.2 The weather was sunny and bright throughout the two days of survey, though the moat was waterlogged in places following previous bouts of heavy rainfall. Agricultural fencing delineating the site provided some obstructions to the surveys, as did the presence of numerous large mature trees.

4.2 Magnetometer survey methodology

4.2.1 Magnetometer survey is generally considered as the quickest and most widely used geophysical survey technique for the detection of buried archaeological remains. It is efficient for detecting features that have been thermoremanently magnetised, such as kilns, as well as ditches and pits that have been backfilled, due to the relative presence or absence of enhanced magnetic material due to human activity.

4.2.2 The magnetometer survey was undertaken using a Bartington Grad601-2 magnetic gradiometer. The Bartington Grad601-2 is a dual sensor instrument, incorporating two Grad-01-1000 sensors set at 1m apart. The site was surveyed east-west in a grid-like pattern within 20m-by-20m grid squares, with readings taken every 0.25m along traverses set 1m apart in a zig-zag patterning. The gradiometer was zeroed on a magnetically quiet point within the site before survey commenced and again before the afternoon's survey. If significant drift occurred, the machine was re-balanced.

4.2.3 The survey grids were set out across the site following a pre-determined 20m grid array using a Trimble R10 dGPS utilizing VRS now corrections with an accuracy of <0.10m. The survey grid and intermediary survey guidelines were demarcated using

bamboo canes as temporary markers which were removed following completion of the survey. Landmarks and reference points were surveyed with the GPS by way of control points.

4.3 Earth Resistance survey methodology

4.3.1 The survey was conducted using an RM15 Resistance Meter utilizing a multiplexor (Geoscan Research). The set-up comprised of three probes in a parallel twin electrode configuration, which are capable of detecting archaeological remains to a depth of 1m below the surface. The survey was conducted along an east-west alignment in a zig-zag fashion across pre-determined 20m by 20m grid squares, utilising a sample interval of 0.5m with a traverse interval of 0.5m. This aimed to provide a high-resolution dataset in order to clarify the extent and nature of any archaeological remains (suitable for detection by earth resistance) which had been detected through the magnetometer survey.

4.3.2 The earth resistance data was downloaded and processed using Geoplot v4.0 (Geoscan Research) in order to produce greyscale plots of the data. The data was georeferenced in QGIS and presented in this report alongside interpretations of the data, created as lines and polygons in QGIS.

4.4 Data processing – magnetometer data

4.4.1 The magnetometer data was downloaded using Bartington's Grad601 download software and then imported into Geoplot v4.0 (Geoscan Research) for data processing. For the raw data plot, no processes were applied, and the data was exported at a scale of -1nT to 2nT. An XY trace plot of the raw data was also exported to aid in identifying anomalies for the interpretation, in particular the locations of pit like anomalies which could suggest the presence of stone sockets.

4.4.2 For the minimally processed data plot, a zero mean traverse was applied followed by de-staggering of the data to bring anomalies into alignment. The data was also exported at a scale of -1nT to 2nT.

4.4.3 For the processed and filtered data plot, a low pass filter was applied, followed by an interpolation along the X and then the Y axis. The data was also exported at a scale of -1nT to 2nT.

4.4.4 The gradiometer data was combined with the geolocation points and georeferenced in QGIS and is presented in this report as greyscale data plots. An XY trace plot of the data has also been provided. Interpretations of the data have also been created in QGIS as line and polygon data and these interpretive figures are also presented in this report.

4.5 Data processing – earth resistance data

4.5.1 The earth resistance data was downloaded and processed using Geoplot v4.0 (Geoscan Research). For the raw data plot, no processes were applied, and the data was exported at a scale of 28.84 to 84.61 ohms.

4.5.2 For the processed and filtered data plot, the data was de-spiked, and a high pass filter was applied, followed by an interpolation along the X and then the Y axis. The data was exported at a scale of -9.6 to 9.54 ohms.

4.5.3 The data was combined with the geolocation points and georeferenced in QGIS and is presented in this report as greyscale data plots. Interpretations of the data have also been created in QGIS as line and polygon data and these interpretive figures are also presented in this report.

4.6 Topographic survey methodology

4.6.1 The topographic survey was undertaken as part of a skills training exercise. The survey was undertaken using a Trimble R10 dGPS using VRS now corrections to an accuracy of <0.10m. Topographic measurements were taken at regular readings around the 'base of feature' – ie the base of the moat, using a tailored feature code library to record the points. The intention of the survey was to also measure the 'top of feature' to provide a topographic diagram of the monument, however the survey team ran out of time.

4.6.2 The survey data was exported as a .csv file and manipulated in QGIS to provide a figure of the extents of the moat ditches, which has been presented in this report.

4.7 Earthwork survey methodology

4.7.1 The earthwork survey was undertaken using an offset methodology, which involves the setting of one or more baselines within the site using tapes. The participants then measured the 'offset' of the mounds, banks and ditches of the moated site using ranging poles and tapes to produce a scale plan of the various earthworks. Notes were added to the plan detailing the directions of slopes, the intensity of slopes and any convex or concave nature to any of the features.

4.7.2 Following the survey, the plan was furnished with detailed hachures to provide an earthwork diagram, which has been presented in this report.

4.8 Health and safety

4.8.1 All work was carried out in accordance with its company Health and Safety Policy, to standards defined in The Health and Safety at Work etc. Act 1974, and The Management of Health and Safety Regulations 1992, and in accordance with the SCAUM (Standing Conference of Archaeological Unit Managers) health and safety manual Health and Safety in Field Archaeology (1996), and DigVentures Health and Safety Policy.

5 SURVEY RESULTS AND DISCUSSION

5.1 Data presentation

5.1.1 The gradiometer data has been presented as a raw data plot and a minimally processed greyscale plot (Figure 3) and a processed and filtered data plot (Figure 4). An interpretation of the data has been created alongside the processed data plot and

key anomalies have been given a unique 'anomaly ID' in the illustrations and report text for the purpose of the discussion.

5.1.2 The earth resistance data has been presented as a processed data plot alongside an interpretation of the data (Figure 6). Key anomalies have been given a unique 'anomaly ID' in the illustrations and report text for the purpose of the discussion.

5.1.3 The topographical survey has been presented as a plan of the measured points and can be seen as an illustration with the geophysical magnetometer interpretation (Figure 5).

5.1.4 The measured earthwork survey has been provided by Andrew Pierce and can be seen in Figure 7. Two LIDAR visualizations have also been created, detailing the earthworks across the site, which was derived from freely available Environment Agency data, and can be seen in Figure 8 and Figure 9.

5.2 Results – Magnetometer survey (Figures 3 – 4)

5.2.1 Unfortunately, during the community training survey, a couple of volunteers unknowingly had metallic items upon their person which skewed both the calibration of the machine and caused some of the grids of data to appear magnetically enhanced. Archaeological anomalies are still visible despite this, but the data is not as high a quality as the group aimed for.

5.2.2 The magnetometer survey data contains numerous areas of enhanced magnetism which are likely to relate to magnetic detritus in the topsoil from historic flooding events. This is particularly noticeable in the moat ditches, which have been identified in the dataset as two parallel trends running north-east to south-west either side of the survey area [A]. The locations of these trends correspond nicely to the topographical survey data which measured the bottom of the moat ditches throughout the site.

5.2.3 A large spread of magnetically enhanced material is visible in the centre of the dataset [B]. This part of the site was raised and given the very magnetic appearance of the trends, the anomalies could relate to buried materials or rubble relating to former buildings, structures or features upon the mound.

5.2.4 Curvilinear positive trends are visible across the mound and on either side of the moat ditches. Some are slightly pit-like in appearance [C] and could relate to built features in between the inner moated enclosure and the next moat ditch. Some of the trends are amorphous in appearance [D] and it is not clear what they could relate to.

5.2.5 In the west of the dataset, a group of positive sub-rectangular and ephemeral curvilinear trends have been identified [E]. These trends correspond with a notable dip in the topography, which gave the appearance of an avenue or pathway up onto the central mound. It is possible they could relate to built features around this avenue or pathway.

5.3 Results – Earth Resistance survey (Figures 5 – 6)

5.3.1 The earth resistance survey worked well, and the results clearly display features of the medieval moated site.

5.3.2 The inner ditch of the moated site, visible in the extant earthworks and satellite imagery, presents in the earth resistance data as a linear band of low resistance running north-east to south-west and north-west to south-east [1]. Thin high resistance trends can be seen running outside and within the ditch and likely relate to drains. It is possible the drains are contemporary with the moat ditches, by way of lining the ditches or channeling water. The features could also represent an ornamental aspect of the ditches, perhaps relating to walls or subdivisions. It is also possible the drains are not contemporary and are more modern in date.

5.3.3 A rectangular demarcation is visible in the data within the inner area of the moated mound [2]. Within this area, a mixture of high and low resistance areas and trends can be seen, some of which are rectilinear and hint at the possibility of buildings [7] and others which are circular and are suggestive of garden features. The trends on the mound are poorly defined compared to the ditch anomalies, suggesting they are in a more ruinous state or are more ephemeral.

5.3.4 An amorphous area of very high resistance in the south-west of the dataset [3] corresponds with features identified in the magnetometer survey data [E]. If this area were an avenue or entranceway to the mound, there could be enhancement such as compacted ground or a surface which is presenting as a very high resistance anomaly.

5.3.5 To the north-west of this area, a thin linear band of low and high resistance [4] relates to a former field boundary, extant as a very low earthwork in the field and now marked by a modern wood and wire fence. Over in the east, a large area of low resistance [5] corresponds with a tree and ground moisture content from its roots.

5.3.6 A pattern of herringbone field drains shows up well in the dataset [6] running east-west, north-east to south-west and north-west to south-east. The ground around these high resistance anomalies appears to be low resistance, suggesting it is waterlogged.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1.1 The archaeological surveys at the medieval moated manor in Kirkoswald were successful and have revealed some interesting features in and around the inner most platform of the moated site. A spread of magnetically enhanced material on top of the inner mound, as well as magnetic trends, suggest the presence of possible buildings or structures. The earth resistance data confirmed this, revealing a further inner rectangular area on top of the mound and trends possibly relating to built remains. These trends correspond to an area on the earthwork survey described as an inner moat / ditch, atop of a raised primary platform. The remains could relate to ecclesiastical buildings, or garden features such as walls or flower beds. The only way to ascertain the nature of the trends would be to further investigate, either through more targeted geophysical survey or intrusive investigations.

6.1.2 A possible avenue or entranceway to the left of the mound corresponded with a topographical dip in the mound, which alongside further curvilinear magnetic trends and an area of high resistance, suggest that archaeological remains could be present. This corresponds with the edge of the inner moat/ditch and could be the entranceway up onto the raised primary platform.

6.1.3 The main aim of the geophysical surveys was to engage the Fellfoot volunteers and local community in collecting a variety of geophysical survey data, as well as topographical and measured earthwork data, and to learn about different aspects of archaeology. The surveys were a success with the community participants and the data collected will provide the HER and Historic England with new information about the monument, showing that the remains extend far outside of the scheduled area.

7 BIBLIOGRAPHY

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Figure 1. Site location

Figure 2: Proposed Survey Area

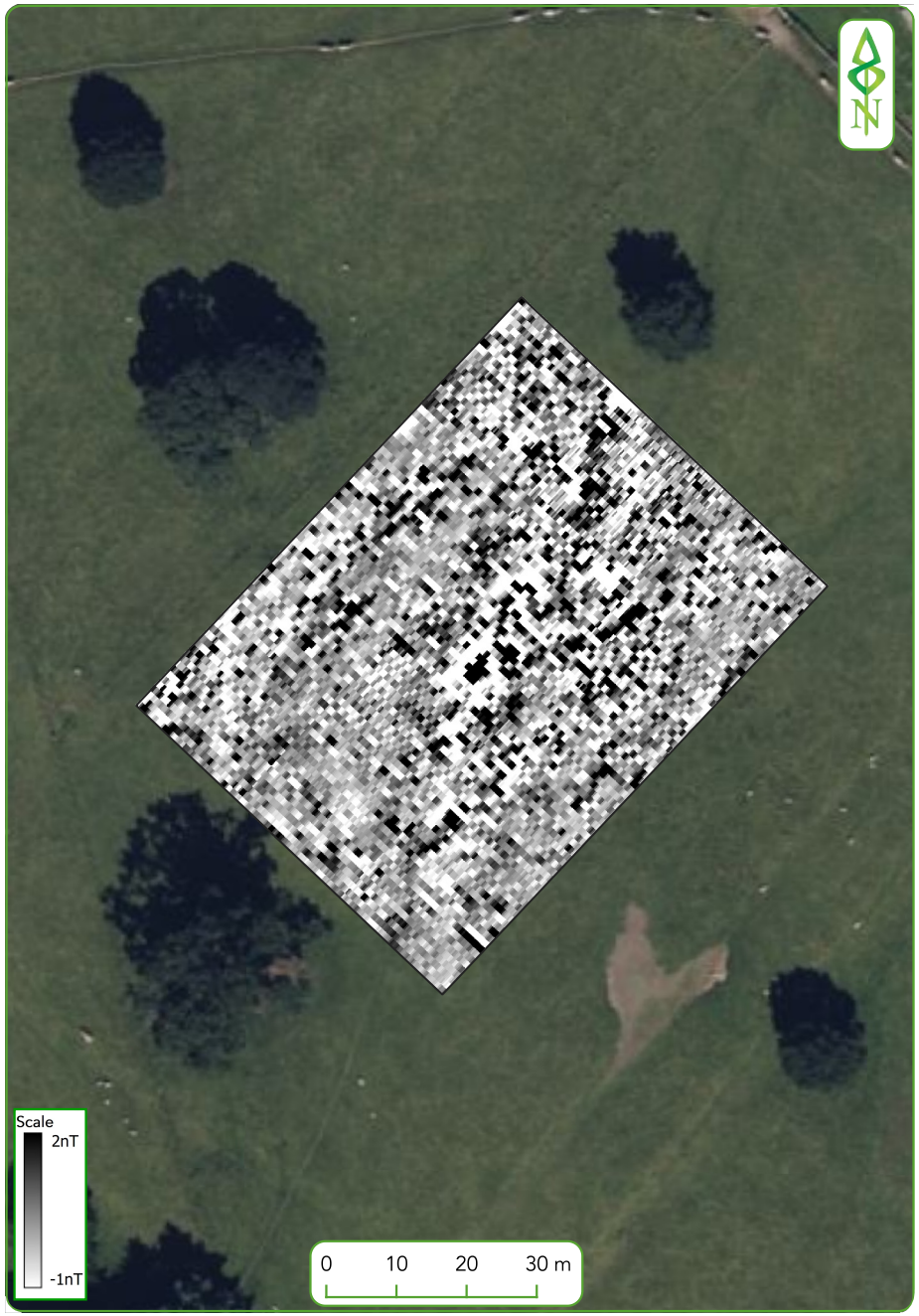
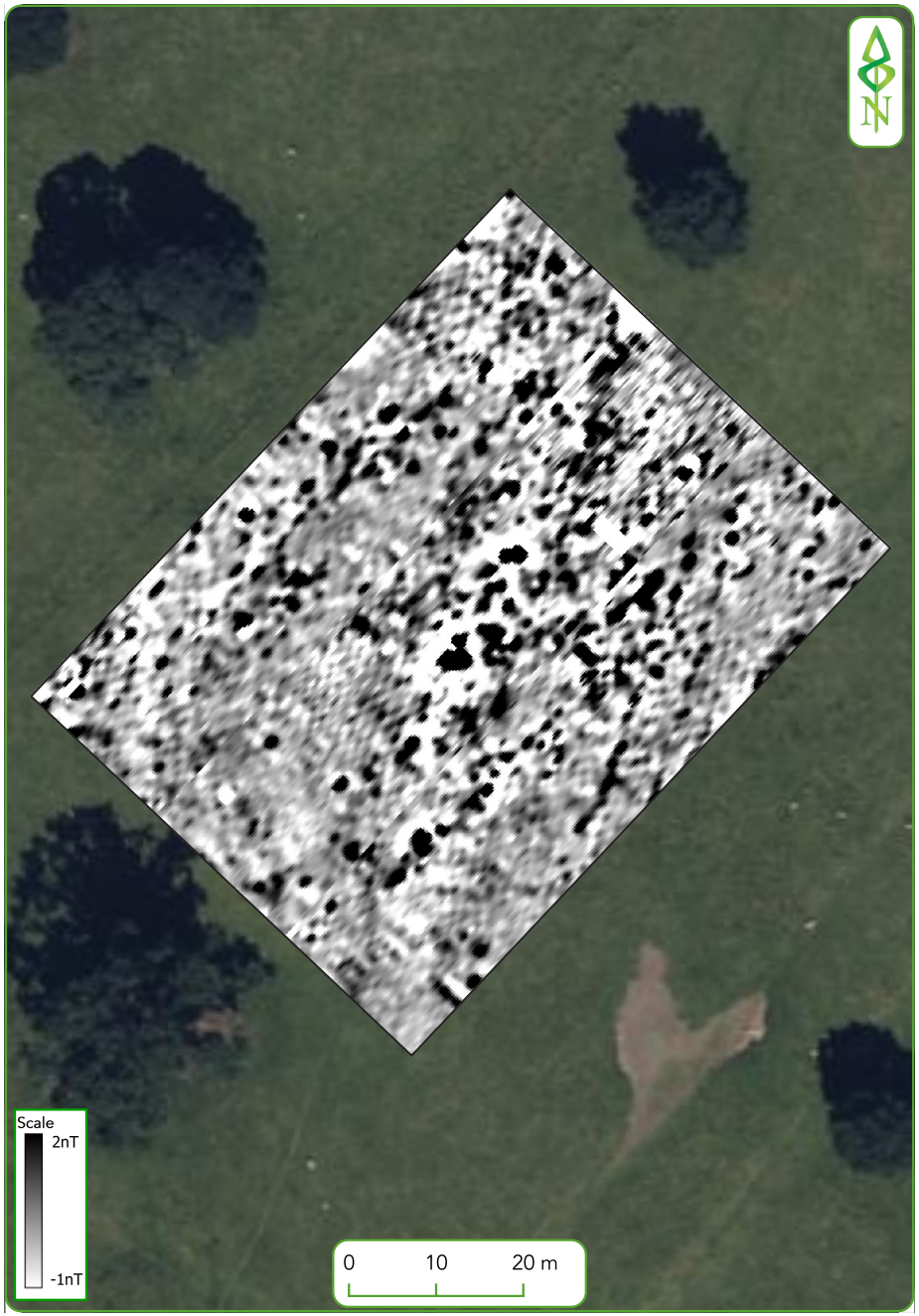


Figure 3. Raw and minimally processed gradiometer survey data - greyscale plot



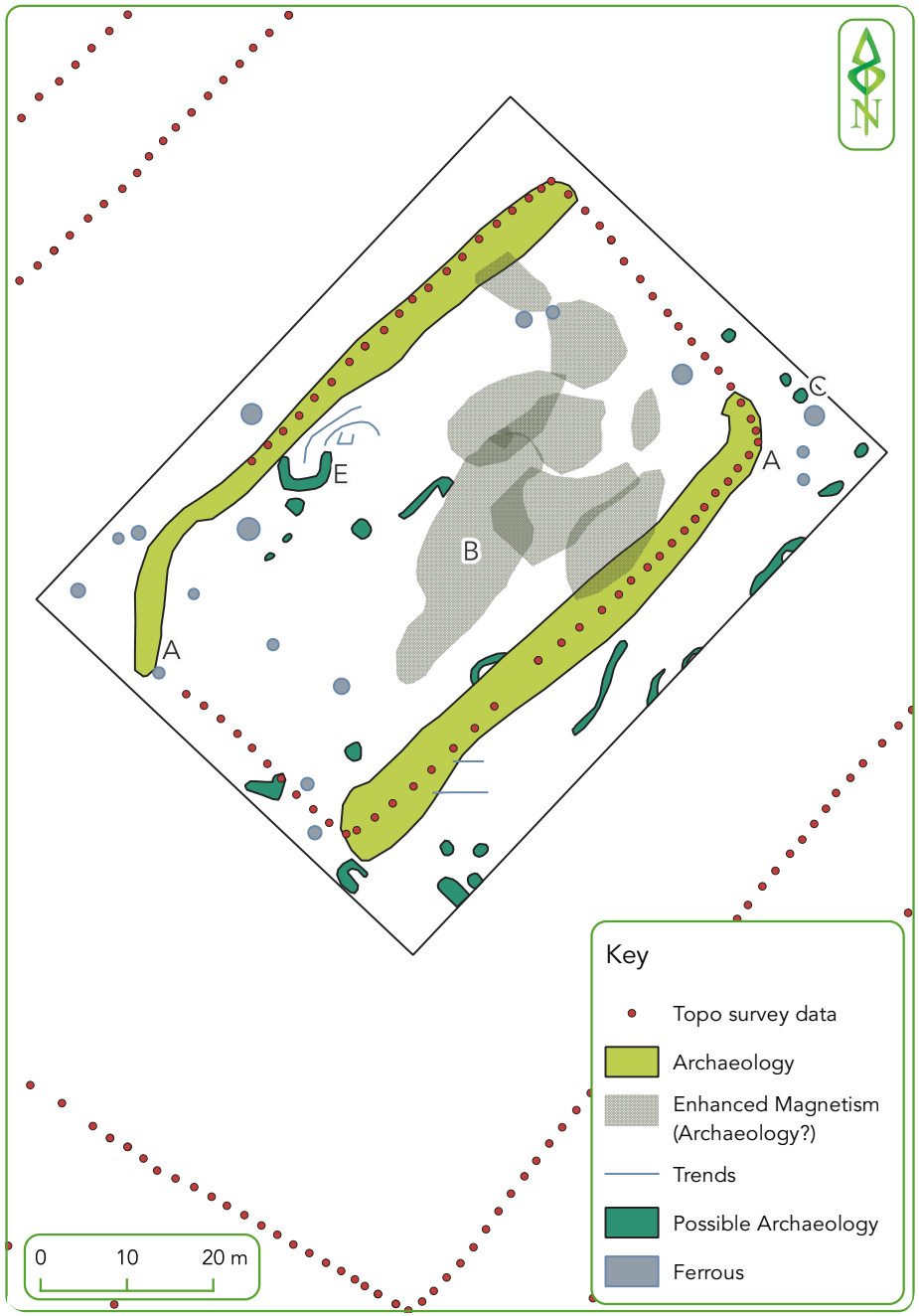


Figure 4. Processed and filtered gradiometer survey data - greyscale plot, and an interpretation of the data

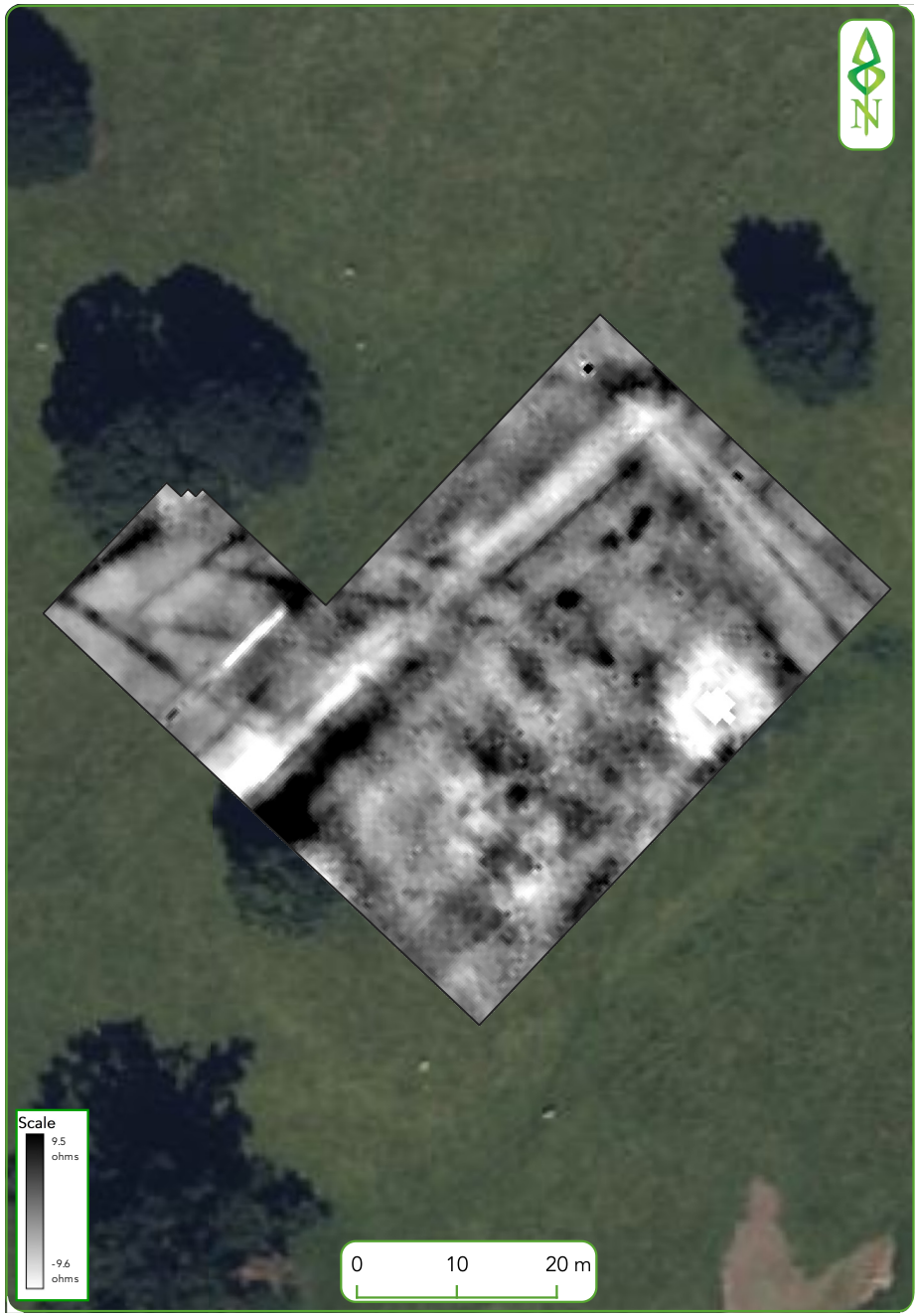
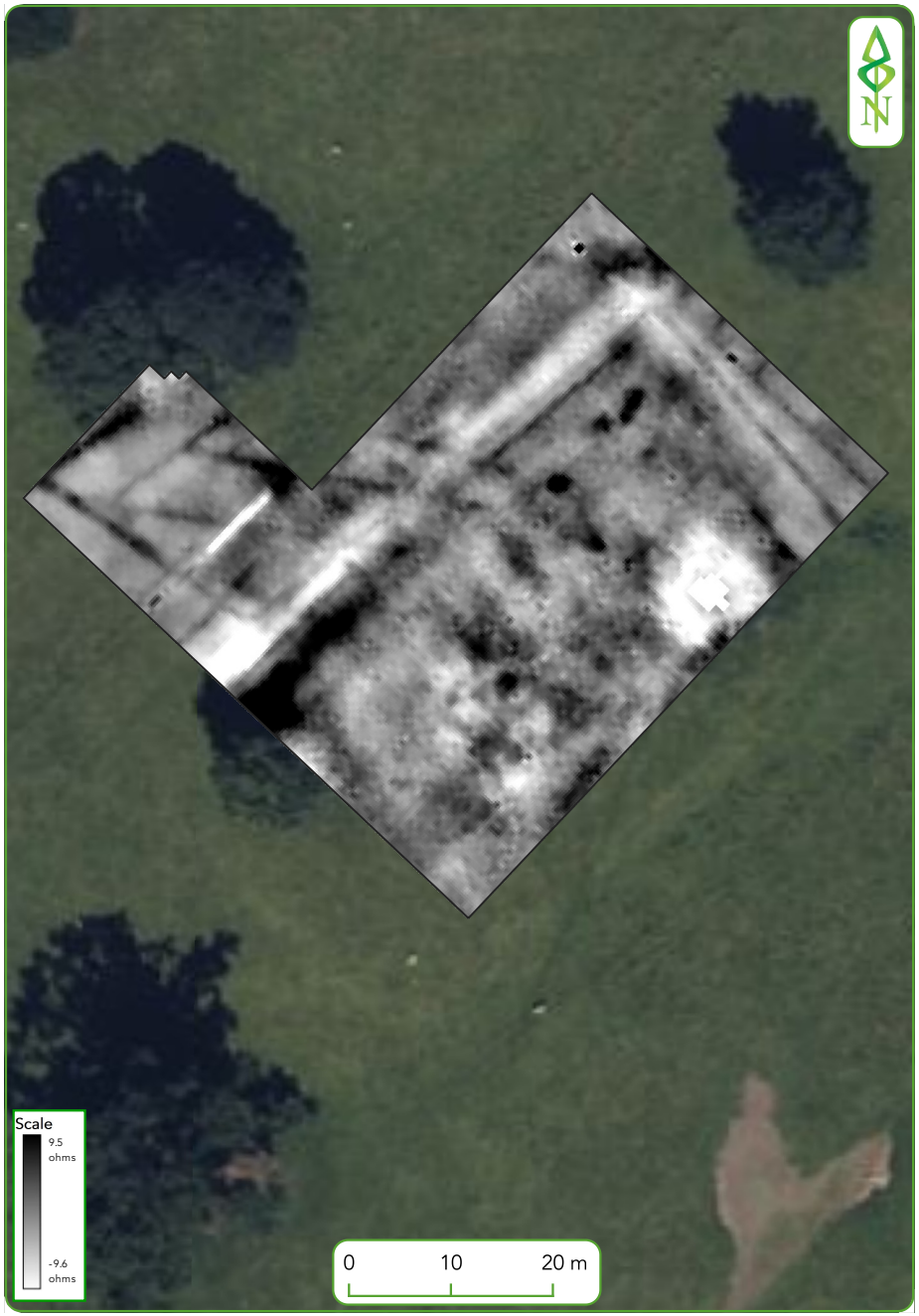


Figure 5. Raw earth resistance survey data - greyscale plot, and processed and filtered earth resistance survey data - greyscale plot



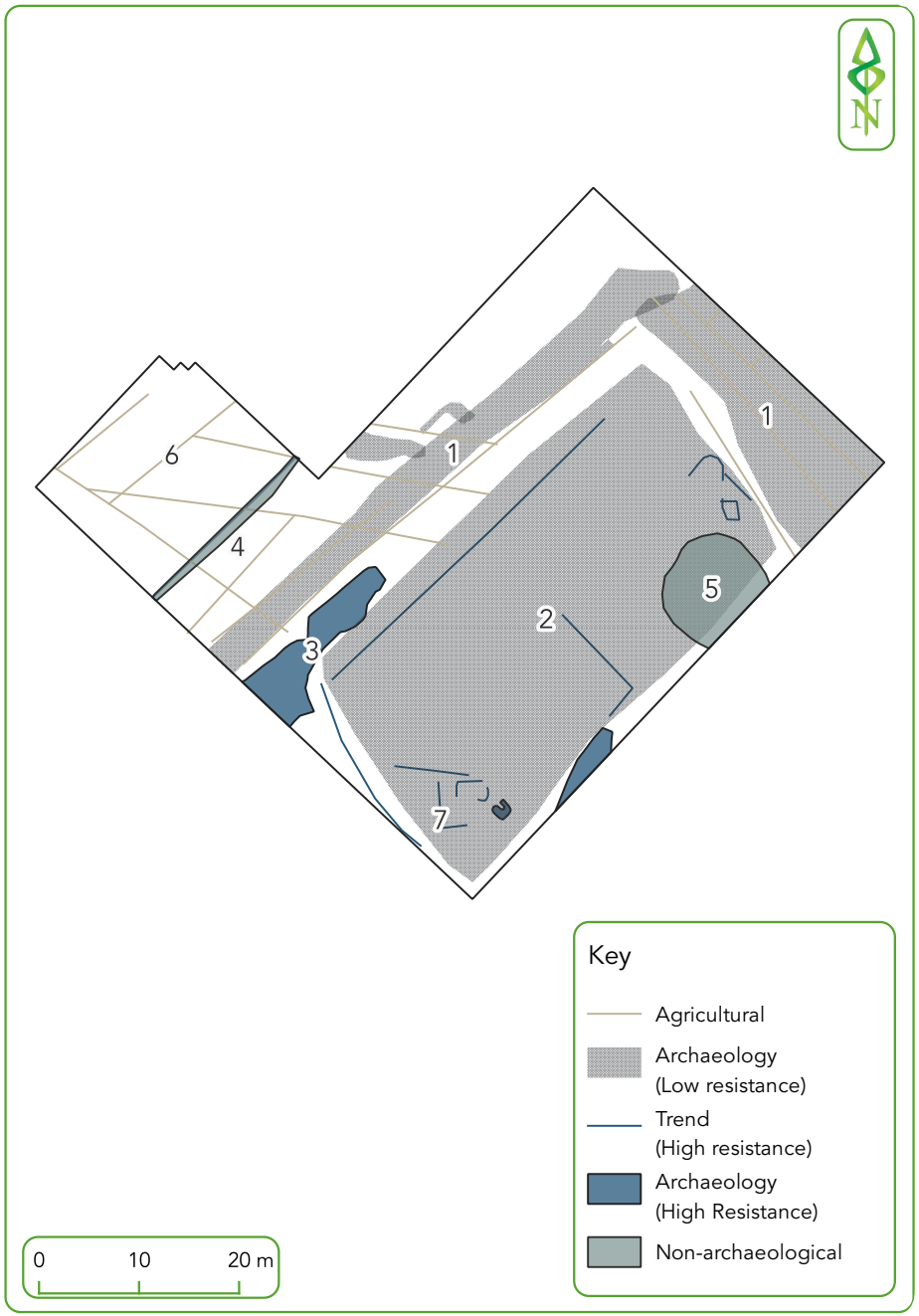


Figure 6. Processed and filtered earth resistance survey data - greyscale plot and an interpretation of the data

Medieval Moated Site

Kirkoswald, Cumbria (NY 55433 40833) / Earthwork survey by offset (24-25 April, 2023) / © Andrew Pierce

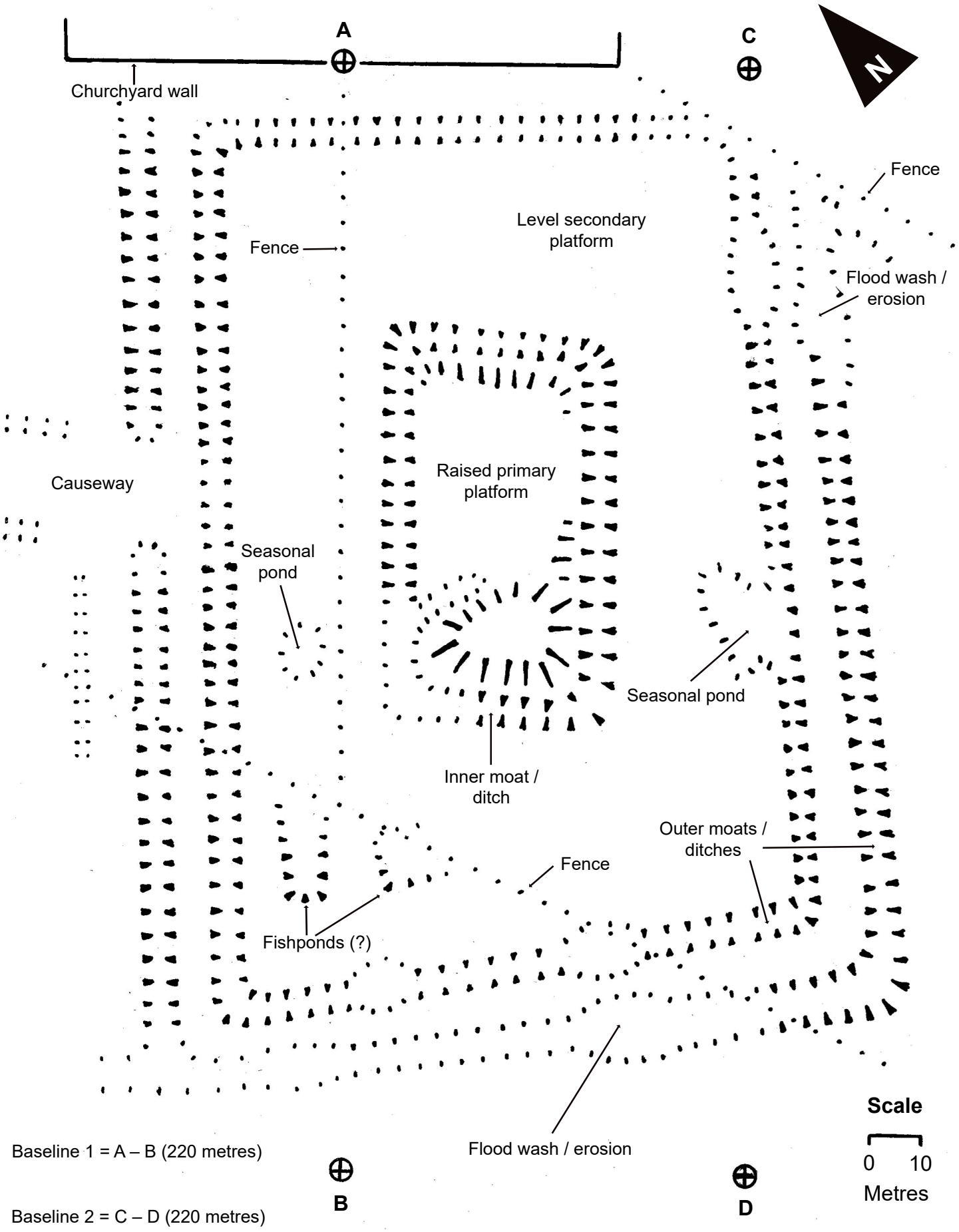
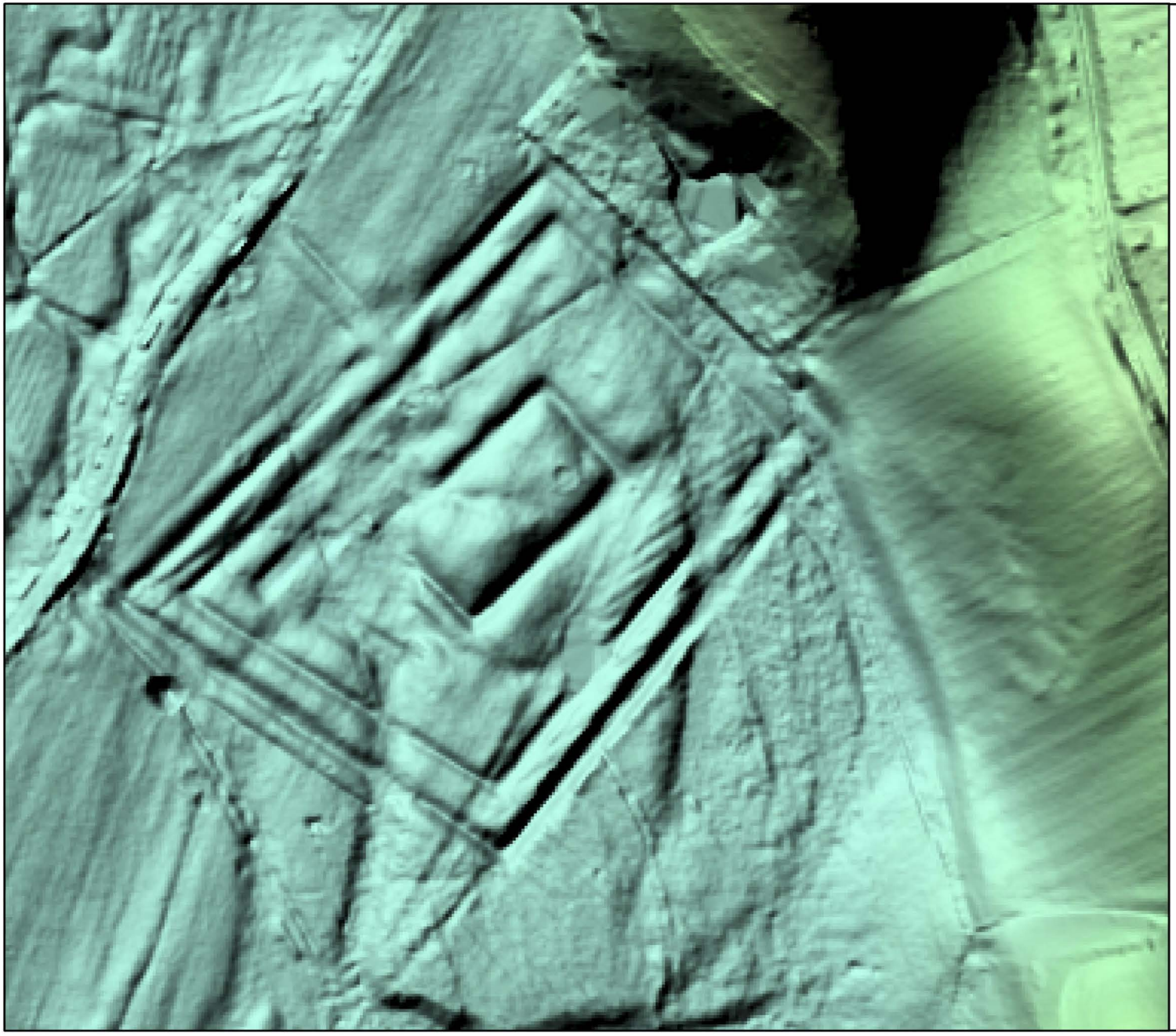


Figure 7. Earthwork Plan



Kirkoswald Moated Site
2023

1-metre Resolution LiDAR (2022)
DTM (Digital Terrain Model)
Hillshade applied
Vertical scale exaggerated 10-fold

N

0 25 50 75 100

Metres

Figure 8

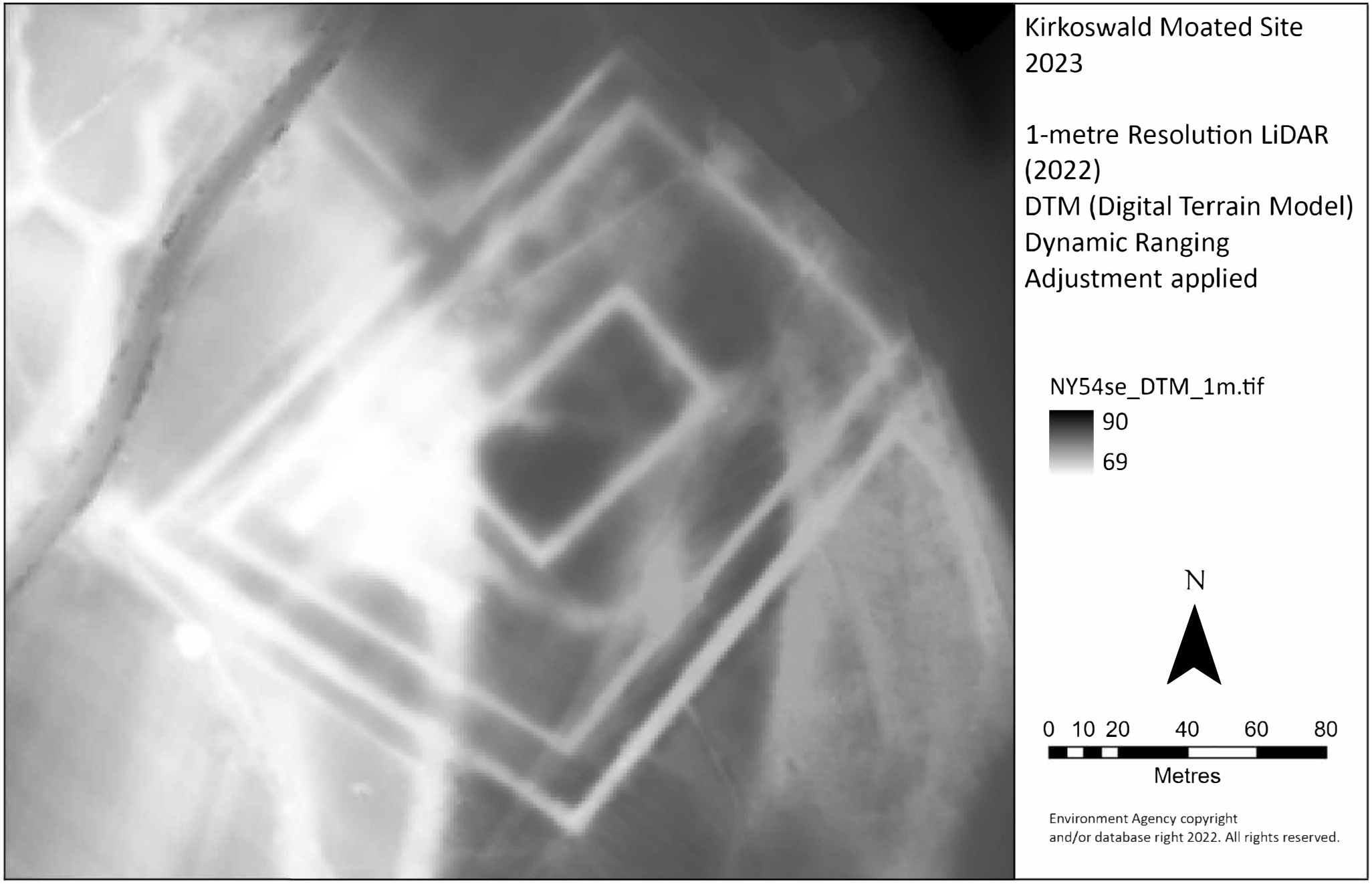

Kirkoswald Moated Site
2023
1-metre Resolution LiDAR
(2022)
DTM (Digital Terrain Model)
Dynamic Ranging
Adjustment applied
NY54se_DTM_1m.tif
90
69
N
0 10 20 40 60 80
Metres
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Figure 9