magnitude surveys

Aerial Survey Report

of

Loddon Garden Village

For

RPS GROUP Ltd

Magnitude Surveys Ref: MSSU1348

November 2022

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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 560ha area of land southeast of Reading, Berkshire. An aerial survey was successfully conducted across the majority of the survey area and multispectral, photogrammetric and Digital Surface Model datasets were produced. One c. 10Ha area was left unsurveyed due to a lack of access and c. 40ha of land was de-scoped from the survey due to ongoing development and construction. Cropmarks and earthworks identified throughout the survey area are suggestive of several *foci* of probable and possible archaeological activity dating from the prehistoric to the Roman period at least. These are indicative of a longevity of use across these landscapes and include possible settlements and former field systems, ring ditches, trackways and a possible farmstead or dwelling. The historical agricultural use of the survey area has also been identified and comprises former mapped field boundaries and possible ridge and furrow regimes. Probable paleochannels have been detected around the extant course of the river Loddon as well as cropmarks likely relating to natural variations in the superficial deposits. A number of cropmarks and topographical variations have been categorised as undetermined as they do not present a distinctive morphology and have little supporting context. Further cropmarks have been classified as not having archaeological significance and relate to extant agricultural features, extant vegetation, and modern features. Shadows from buildings and trees have also been included in this category and may have limited the detectability of some of the cropmarks.

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1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by RPS Group Ltd to undertake an aerial survey over a c. 560ha area of land south-east of Reading, Berkshire (SU 7569 6859).

1.2. The aerial survey comprised UAS-mounted multispectral imaging and visible-spectrum imaging. Plant health index maps, a digital surface model, and a photogrammetric orthomosaic were produced.

1.3. The survey was conducted in line with: CAP393 The Air Navigation Order 2016 and Regulations (CAA, 2021); CAP722 Unmanned Aircraft System Operations in UK Airspace – Guidance (CAA 2020); and the conditions of the Permission for Commercial Operation granted to MS by the CAA. MS' CAA Operator ID is GBR-OP-Q2VWCVV58QKR.

1.4. The survey was conducted in line with the current best practice guidelines produced by Historic England (Historic England, 2017).

1.5. It was conducted in line with a WSI produced by MS (Wilkinson, 2022).

1.6. The survey commenced on 01/08/2022 and took nine days to complete.

2. Quality Assurance

2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society for Archaeological Prospection).

2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and has served as the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London and a Member of CIfA, has been a member of the ISAP Management Committee since 2015, and is currently the Chair of the Archaeological Prospection Community of the European Archaeological Association.

2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology, geophysics or remote sensing and/or field experience.

3. Objectives

3.1. The objective of this aerial survey was to identify the surface remnants of earthworks, and cropmarks, which could be indicative of subsurface archaeological potential within the survey area.

3.2. Specifically, the results are intended to form a single contemporaneous aerial dataset, to be compared against a range of historic environment baseline data, the coverage and, density of which varies across the survey area.

4. Geographic Background

4.1. The survey area was located c. 6.5Km southeast from the centre of Reading (Figure 1). An aerial survey was undertaken across multiple fields under both arable cultivation and pasture. The survey area is enclosed by the B3270 to the north, Mole Road to the south-east, the A327/Arborfield road to the south-west and the Eastern Relief Road to the east. The M4 bisects the survey area from east to west, and the River Loddon bisects it from the southwest to northeast (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Weather Conditions	Further Notes
1	Flat arable land under maize crop.	Very sunny and hot.	Several trees and electrical poles were located within the area. The area was bordered to the west by the access road for the University Dairy Research Centre, to the north by further agricultural fields and to the south by trees and hedges.
2	Flat arable land under maize crop.	Very sunny and hot.	Several trees were located within the area. The area was bordered to the east and south by the access road for University Dairy Research Centre, to the north by a residential home and to the west by trees separating the area from the River Loddon.
3	Flat arable land under maize crop.	Very sunny and hot.	Several trees and electrical poles were located within the survey area. The area was bordered by roads to the north, west and east and by further agricultural fields to the south.
4	Pasture field that sloped down to a gully in the centre of the survey area from the northern and southern ends. Recent drought conditions had made the ground very dry and barren.	Sunny with cloudy spells.	The area was bordered by a farm to the south, by an access road to the east and by woodland to the west that separated the area from the River Loddon.
5	The northern half of the survey area was a flat arable field containing stubble. The	Sunny with cloudy spells.	The area contained several electrical poles and trees within the maize field to the

	southern half of the survey area was a field of maize crop.		south. The area was bordered by access roads to the south and west and by further agricultural fields to the north and east.
6	Flat arable field under barley crop.	Sunny with cloudy spells.	The area contained several electrical poles and pylons. The barley crop on the field was harvested the week after collecting photogrammetry and multi-spectral data. The area was bordered by further agricultural fields to the north and west by trees separating the area from residential housing to the south.
7	Arable stubble fields that sloped down the north.	Sunny, late in the day with shadows.	The area consisted of three wheat stubble fields. The fields were bordered by a road to the southwest and by further agricultural fields on all other sides. A pylon was located in the westernmost field of the trio.
8	Flat pasture fields that had been subdivided by fencing. Recent drought conditions had made the ground very dry and barren.	Sunny.	The area was bordered to the northwest by an access road leading to the Reading University Dairy Research Centre. The rest of the area was bordered by treelines and fences that separated the area from further agricultural fields
9	Arable stubble field that sloped down the north.	Sunny, late in the day with shadows.	The area was bordered by trees to the north and by fences on all other sides that separated the area from further agricultural fields.
10	Pasture field that sloped down the southeast with long grass in places.	Sunny.	The area was bordered to the south, west and east by a treeline that separated the area from further agricultural land. It was bordered to the north by a hedge.
11	Flat pasture field.	Sunny, late in the day with shadows.	The area was bordered by a road to the south and by

			further agricultural fields on all other sides.
12	Flat horse paddocks.	Sunny, late in the day with shadows.	The area was bordered by a road to the south and by further agricultural fields on all other sides.
13	Flat horse paddocks.	Sunny, late in the day with shadows.	The area was bordered by a road to the east and by further agricultural fields on all other sides.
14	Flat horse paddocks.	Sunny, late in the day with shadows.	The area was bordered by a treeline that separated the area from further agricultural fields to the west and north. The area was bordered by residential housing and further horse paddocks to the west and south.
15	Flat residential lawn	Sunny with overcast spells.	The area was bordered by a road to the southeast and by a residential residence to the west.
16	Arable stubble field that sloped down from the east to west.	Sunny.	The area was bordered by a road and residential housing to the east. The area was separated by treelines and hedges to further agricultural fields to the west and north.
17	An area of long grass that sloped down from the north to the south.	Sunny with overcast spells.	The area was bordered on all sides by trees that separated the area from further agricultural fields.
18	The area comprised a maize cropped field to the northwest and an area of fallow crop to the southwest. The area sloped down from the northwest to the southeast.	Sunny and very hot.	The area was bordered by a road the northwest, by a residential property to the north and southeast and by further agricultural fields to the west and south. An intermittent treeline ran down the centre field, demarking the boundary between maize and fallow crop.
19	Arable stubble field that sloped down to the northeast.	Sunny with overcast spells.	The area was bordered by fencing to the northwest, northeast and southeast that separated the area from further agricultural fields. Two large electrical

			pylons were located near the southeastern and northwestern boundaries.
20	Flat arable stubble field.	Sunny.	Bounded by hedges that separated the area from a bridleway to the north, south and west. A field boundary on the southern boundary separated the area from further agricultural fields. A large pylon was located in the centre of the survey area.
21	Arable stubble field that sloped down to a gully in the centre of the survey area.	Sunny and very hot.	The area was bordered on all sides by hedges that separated the area from roads.
22	Flat arable field under maize crop.	Sunny.	The area was bordered by hedges on all sides, separating the area from a road to the southwest, a residential property to the north and further agricultural fields to the south and east.
23	Flat arable stubble field.	Sunny and very hot.	The area was surrounded by hedges on all sides, separating the area from a road and residential property to the south and to further agricultural fields on all other sides.
24	Flat arable stubble field.	Sunny and very hot.	The area was surrounded by hedges on all sides, separating the area from a road to the south and east and further agricultural fields on all other sides.
25	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny with cloudy spells.	The area was separated from the road to the south by wire fencing. A copse of trees was located to west. A cattle track made of discarded astroturf bisected the area from northeast to southwest. Several water troughs and other agricultural apparatus were located within the two fields.

26	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny with overcast spells.	The area contained several fenced areas for alpaca farming. The area was bordered by a copse of trees to the north and west that separated the area from the River Loddon.
27	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The area was bordered by trees on all sides, separating the area from the River Loddon to the south and further agricultural fields on all other sides.
28	Flat fallow field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The area was bordered hedges on all sides that separated the area from further agricultural fields.
29	Flat pasture fields. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The area was bordered hedges on all sides that separated the area from further agricultural fields.
30	The area comprised a flat maize cropped field to the northwest and a flat pasture field to that wrapped around it to the south and east. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The two fields were separated by a wire fence. A solar powered mast was located in the centre of the pasture field. The area was surrounded on all sides by trees.
31	Two flat pasture fields. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The fields were surrounded on all sides by trees.
32	The area comprised a flat maize cropped field to the south and a flat pasture field to the north. The fields were bisected by a farm track.	Sunny and very hot.	The fields were bordered by trees on all sides, separating the areas from the River Loddon to the southeast.
33	Flat pasture fields.	Sunny and very hot.	The fields were bordered by hedges on all sides.
34	Flat pasture field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
35	Flat pasture field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
36	Flat pasture field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
37	Flat pasture field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
38	Flat pasture field. Recent drought conditions had	Sunny and very hot.	The field was bordered on all sides by hedgerow,

	made the ground very dry and barren.		separating the area from a copse of trees to the east.
39	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
40	Flat fallow field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
41	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The field was bordered on all sides by trees.
42	Flat fallow field.	Sunny and very hot.	The field was bordered on all sides by trees.
43	Flat arable maize field.	Sunny and very hot.	The field was bordered on all sides by trees.
44	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The field was bordered on all sides by trees.
45	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
46	Flat fallow field.	Sunny and very hot.	The field was bordered on all sides by hedgerow.
47	Flat area used for personal farming with greenhouses and scrubland.	Sunny and very hot.	The field was bordered on all sides by trees, which separated the area from farm tracks to the north and west.
48	Gardens and grounds	Sunny and very hot.	The area was bordered by trees separating the area from other commercial properties and buildings. The grounds were dotted with various trees and bushes.
49	Descoped from the survey area – industrial buildings.		
50	Descoped from the survey area – industrial buildings.		
51	Descoped from the survey area – industrial buildings.		
52	Descoped from the survey area – industrial buildings.		
53	Flat pasture fields.	Sunny and very hot.	The area was bordered by trees to the south and west and by an industrial park to the north and east. A farm

			track bisected the area from north to south.
54	Flat arable maize field.	Sunny and very hot.	The area was bordered by an industrial park to the north, east and west. A wire fence separated the area from further agricultural fields to the south.
55	Descoped from the survey area – industrial buildings.		
56	Flat fallow field.	Sunny and very hot.	The area was surrounded by trees on all sides.
57	Flat arable maize field.	Sunny and very hot.	The area was bordered by trees to the northeast and south. A road separated the area from an industrial park to the west. A farm trackway ran along the area's eastern extent.
58	Flat arable stubble field.	Sunny and very hot.	The area was bordered by hedges on all sides.
59	Flat arable stubble field.	Sunny and very hot.	The area was bordered by hedges on all sides.
60	Flat fallow field.	Sunny and very hot.	The area was bordered by hedges to the west and south, separating the area from a farm track. A copse of trees was located along its eastern boundary.
61	Flat arable maize field.	Sunny and very hot.	The area was bordered by hedges on all sides. A farm track ran along the northern and western boundaries.
62	Flat pasture fields.	Sunny and very hot.	The area was bordered by hedges to the east, south and west. Bordered by a screen of trees that separated the area from the M4. A line of trees separated two fields of pasture on a northwest to southeast alignment.
63	Flat arable maize field.	Sunny and very hot.	The area was bordered by hedges on all sides, separating the area from a farm track to the north and east. A large electrical pylons was located in the centre-east of the survey area.

64	Flat pasture field.	Sunny and very hot.	The area was bordered by hedges and a line of trees to the north and west. A copse of trees was located past the southern boundary. Two large electrical pylons were located in the centre of the area.
65	Flat pasture field.	Sunny and very hot.	The area was bordered by hedges to the east, south and west. Bordered by a screen of trees that separated the area from the M4. An electrical pylon was located in the north western corner of the area.
66	Flat field with young trees and overgrown grasses.	Sunny and very hot.	The area was bordered by trees and hedges on all sides.
67	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	The area was bordered by hedges and trees on all sides.
68	Flat fallow field.	Sunny.	The area was bordered the River Loddon to the northwest and hedges on all other sides.
69	Flat fallow field.	Sunny.	The area was bordered by the River Loddon to the northwest, the M4 to the north and trees on all other sides.
70	Flat pasture field.	Sunny.	The area was bordered by hedges and trees on all other sides.
71	Flat pasture field.	Sunny.	The area was bordered by hedges and trees on all other sides.
72	Flat pasture fields, separated by fencing.	Sunny.	The area was bordered by a farm trackway to the south and by fencing on all other sides. Several large feeding troughs were located throughout the area. Two large electrical pylons were located near the eastern boundary.
73	Flat pasture field.	Sunny.	The area was bordered by a farm track way to the south and by hedges on all other sides.

74	Flat stubble field.	Sunny.	Bordered by trees on all sides except to the north, where the field continued.
75	Flat stubble field.	Sunny.	Bordered by hedges on all sides and an embankment to the north, separating the area from the M4. A large electrical pylon was located in the centre-west of the survey area.
76	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	Bordered on all sides by hedges and trees. The M4 lay beyond the northern boundary.
77	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	Bordered on all sides by hedges and trees.
78	Flat pasture field. Recent drought conditions had made the ground very dry and barren.	Sunny and very hot.	Bordered on all sides by hedges.
79	Flat arable maize field.	Sunny and very hot.	Bordered to the north by a hedge that separated the area from a track. The southern boundary was a path that split Area 79 from Area 80.
80	Flat arable maize field.	Sunny and very hot.	Bordered to the south, west and east by treelines. Bordered to the north by a path that split the area from Area 80.
81	Flat fallow field.	Sunny and very hot.	Bordered on all sides by hedges and trees. A public footbath bisected the area from east to west.
82	Flat grassland area with fly-tipping and construction rubble.	Sunny and very hot.	Bordered on all sides by trees and hedges, separating the area from residential areas to the north and east.
83	Flat pasture field.	Sunny and very hot.	Bordered on all sides by trees and hedges.
84	Gardens and paddocks.	Sunny.	Bordered on all sides by trees and hedges.
85	Large area of divided horse paddocks that sloped down to the north.	Sunny, late in the day and affected by shadows.	Bordered on all sides by trees. An embankment to the north separated the area from the M4 Motorway.

86	Small area of divided horse paddocks that sloped down to the north.	Sunny, late in the day and affected by shadows.	Bordered to the southwest and northeast by hedges and trees. Bordered to the south by fencing that separated the area from a horse-riding school. An embankment to the north separated the area from the M4 Motorway.
87	Residential gardens.	Sunny, late in the day and affected by shadows.	Bordered on all sides by hedges and fencing.
88	Residential gardens.	Sunny, late in the day and affected by shadows.	Bordered on all sides by hedges and fencing.
89	Managed grassland area of artificially raised earth, likely from the nearby road projects to the south and north.	Sunny and hot.	Bordered to the west and south by treelines. Two large roads ran to the north and south of the area.
90	Residential gardens.	Sunny and very hot.	Bordered on all sides by hedges and fencing.
91	Memorial garden with overgrown grass.	Sunny.	Bordered on all sides by thick hedges and trees. Several new growth trees were located throughout the memorial garden.
92	Flat overgrown grassland.	Sunny.	Bordered on all sides by thick hedges and trees.
93	Flat dirt trackway	Sunny.	A large pylon was located in the centre of this area.
94	Flat grassland area.	Sunny.	A large pylon and a car park were located within this area.
95	Flat overgrown scrubland.	Sunny.	A large pylon was located in the centre of this area.
96	Flat pasture field.	Sunny.	Bordered on all sides by thick hedges and trees. The River Loddon ran along the southern boundary.
97	Flat pasture field.	Sunny.	Bordered to the north by the River Loddon and to the south by a small tributary.
98	Flat pasture field.	Sunny and very hot.	Bordered to the north by trees and to the south by an embankment which separated the area from the M4 Motorway.
99	Flat pasture field.	Sunny and very hot.	Bordered on all sides by trees and hedges.

100	Flat pasture field.	Sunny and very hot.	Bordered to the north, south and east by trees. Bordered to the west by a farm track. The River Loddon ran along the northern boundary.

4.3. The underlying geology comprises a mix of clay, silt, sand, and gravel from the London Clay Formation. Superficial deposits consist of alluvial deposits in the vicinity of the River Loddon (British Geological Survey, 2022).

4.4. The soils consist of freely draining slightly acid loamy soils (Soilscapes, 2022).

5. Archaeological Background

5.1. The following is a summary of a desk based assessment produced by RPS Group Ltd (Parker, 2022). HER Monument and Event references are included when applicable.

5.2. The survey area has been subject to multiple archaeological evaluations including desk-based assessments, field walking, geophysical surveys, and trial trenching.

5.3. Prehistoric activity has been identified within the southwestern corner of the survey area, mostly as various findspots of flints and other recorded-finds (MWK15161, MWK15221, MWK15162, MWK15163, MWK15165, MWK15164, MWK15166, MWK6811). A possible ring feature (MWK1847) was identified in a gravel sequence in Area 32. Further finds in the north-eastern quadrant of the survey area include a tranchet axe (MWK8966) and flints (MWK15141, MWK15142) within Area 77, close to cropmarks identified as a possible late Neolithic to early Bronze Age ring ditch (MWK1127) and associated linear feature (MWK1128).

5.4. A possible Roman Road (MWK4818) is theorised to cross the west of the study site in a north-south orientation, although its presence has not yet been confirmed despite targeted archaeological investigations. A small, roughly rectangular, possibly later-Prehistoric ditched enclosure is visible in the west of the survey area on aerial photographs taken in 2009 by English Heritage. This may correspond to three linear cropmarks which are visible defining an enclosure aligned roughly northwest to southeast within Area 43 (NMR 1614682). Various pits and discontinuous ditches have been identified in aerial photography over Area 32 (MWK15685) which may be indicative of Iron Age/Romano-British settlement or other land use. A Roman artefact scatter (MSWK15329, MWK15330) was found in Area 24 in close proximity to cropmarks identified by aerial photography (MWK1154).

5.5. There are no HER / NMR records for Anglo-Saxon / Early Medieval activity within the survey area. However, the village of Shinfield (*Selingefelle)* is listed in Domesday Book and Arborfield is included in the book relating to estates belonging to the Bishop of Sonning. It is likely that, whilst settled, the area was largely used for agricultural purposes or was woodland.

5.6. St. Bartholomew's Church (DBF80), which dates from the 13th century, is the only statutorily designated asset of Medieval date within the study site. The possible remains of Arborfield's Medieval village and later buildings have been identified through geophysical survey by the

Berkshire Archaeological Society in 2019 (ERM2442). Though a number of localised settlement *foci* are recorded it is probable that land use continued to be largely agricultural or woodland.

5.7. Knowledge of Post-Medieval and modern activities is enhanced by cartographic sources, which indicate that most of the study area consisted of "reorganised fields" together with several farms and areas of woodland. By 1965 most of the area came into the ownership of the University of Reading as part of their agricultural landholding. The M4 was constructed across the north of the survey area between 1965 and 1975.

5.8. Numerous crop marks have been identified across the survey area which, without corroboration, remain undated but probably indicate the changing partition of the landscape over time.

5.9.Data Collection

5.9.1. A UAS multispectral survey was employed to produce a combined high-resolution aerial-photographic, near-visible light spectrum, and terrain model of the site**.** For this site no factors precluded the recommendation of an aerial multispectral survey. Aerial survey therefore comprised the multispectral method as described in the following section.

5.9.2.Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Aerial Multispectral	MicaSense Altum Multispectral Sensor with DLS-2	Overlap: 75% sideways 75% frontal	5cm/pixel at 120m ASL

5.9.3.The aerial multispectral data were collected using a MicaSense Altum camera.

5.9.3.1. The MicaSense Altum camera was attached to a DJI Matrice M200 GNSS-controlled UAS. The platform was flown at 120m above surface level (ASL) to provide a pixel size of 5cm/px.

5.9.3.2. The MicaSense Altum camera was connected to a Micasense DLS 2 light sensor and GPS unit, which injects GPS coordinates and values for light intensity and angle into the EXIF data of each image. The GPS unit in the Micasense DLS 2 is accurate to within 2-3m.

5.9.3.3. Photographs were collected at timed intervals to provide 75% frontal overlap and 75% side overlap.

5.9.3.4. A calibrated reflectance panel supplied with the MicaSense Altum camera was photographed at the start and end of the flight to record reflectance values for use in the radiometric calibration.

5.9.4. Ground control points were placed prior to both surveys and their position logged using a Carlson BRx7 RTK GPS, accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

5.9.4. Ground control points were placed prior to both surveys and their position logged using a Carlson BRx7 RTK GPS, accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

5.10. Data Processing

5.10.1. Aerial multispectral data were processed in Pix4D Fields and Reality Capture software to produce an orthomosaic, a digital surface model and index maps for each band of the electromagnetic (light) spectrum. The following steps were followed to create index maps using Pix4D Fields:

Radiometric Calibration – Sun irradiance information in the EXIF data from the DLS 2 for each image is used, along with values from a calibrated reflectance panel

Sun Angle Correction – If a flight was conducted in clear-sky conditions with direct sunlight, sun angle information in the EXIF data from the DLS 2 for each image is used to correct reflectance values.

Histogram Equalisation – Contrast is enhanced by stretching out the most frequent intensity values in the histogram.

Clipping and stretching – The histogram is clipped at its upper and lower ends, enhancing contrast by narrowing the range of the visual palette.

The following steps were followed to create a RGB orthomosaic using Reality Capture:

Ground Control Point Calibration – Prior to densification of the photogrammetric point cloud, estimated camera positions were corrected using ground control point information. This corrects for errors in tie points that were created from the UAV's GNSS module and the photogrammetric calibration.

Noise Filtering – Noise filtering corrects the altitude of erroneous points with the median altitude of the neighbouring points.

Surface Smoothing – Surface smoothing corrects outlying geometry resulting from erroneous points that remain after noise filtering.

Downsampling – While the ground resolution from the camera was 2cm/px, the DSM was processed to a target resolution of 3cm/px to further smooth the surface model, while preserving a high level of topographic detail.

All sets of output images were then georeferenced in a GIS environment using the ground control points collected during the survey.

5.11. Data Visualisation and Interpretation

5.11.1. The multispectral results were visualised as greyscale and colour-palette images in a GIS environment. Multiple plant health indices were calculated, and the most representative was selected for presentation in the report.

5.11.2. The aerial survey data have been interpreted using multiple visualisations a in layered environment, overlaid against open OS maps, satellite imagery, historical maps and soil and geology maps. Historical aerial imagery and Google Earth (2022) were also consulted, to compare the results with former and recent land use.

5.11.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

6. Results

6.1.Qualification

6.1.1. Multispectral data are not a direct measurement of subsurface properties; they are an indicator of plant health, stress and vigour at the time of the survey, which can in turn be used as a proxy for subsurface variations, including (but not limited to) soil moisture, depth, drainage and nutrient or mineral content. Being a measure of plant health, the results can vary when repeated, being influenced by a number of seasonal and local factors, such as plant species, time of year, growth phase and recent weather.

6.1.2. RGB (Red-Green-Blue) Orthomosaics are a combination of aerial photos called "orthophotos" that have been corrected for lens distorsion, camera tilt, perspective, and topographic relief. RGB orthomosaics are indicators of the ground coverage at the time of the survey and can be used as proxy to provide evidence of subsurface variations in the form of cropmarks or parchmarks.

6.1.3. Digital Surface Models are not a direct measurement of heights and distances. They are a computed reconstruction based on "structure from motion" (SfM) calculations which match keypoints using overlapping images and camera metadata. Unlike LiDAR data, photogrammetric techniques cannot reconstruct surfaces beneath vegetation, and accuracy of the reconstruction is more dependent on ground control points.

6.1.4. The only way to improve the interpretation of results is through a process of comparing excavated results with survey reports. MS actively seek feedback on their reports, as well as reports from further work, in order to constantly improve our knowledge and service.

6.2.Discussion

6.2.1. An aerial photogrammetric and multispectral survey was successfully completed over a c. 560ha survey area. Some interruptions in the dataset have been identified. These were mostly limited to areas overshadowed by trees and overgrown vegetation, or pylons, and to areas characterised by high vigour values. Although limited, these interruptions within the dataset may have the potential to limit the detectability of some of the cropmarks. Despite this, a range of cropmarks and topographic changes suggestive of archaeological, agricultural, natural and undetermined features have been identified.

6.2.2. The interpretation of the multispectral, orthomosaic, and DSM results are presented in combination with historical maps (Figures 6, 11, 16, 21, 26, 31, 36,41, 46, 51 & 56).

6.2.3. Annular and penannular cropmarks have been identified within Areas 35, 77 and 99 (Figures 23-27; 38-42; 48-52). The distinctive morphology of these cropmarks are indicative of partial and complete ring ditches. These can date from the Bronze Age to the late Iron Age, although some Neolithic examples

are known as well. The possible ring ditches identified in the survey area range between c. 10m and c. 24m in diameter, with some appearing continuous and others exhibiting discontinuities which may be suggestive of access points. It is however difficult, based on the aerial data alone, to assign a more precise date to these possible ring ditches or to speculate over whether they may have had a funerary or domestic function.

6.2.4. A linear earthwork identified immediately south of the aforementioned possible ring ditches in Area 35 (Figure 26) has been interpreted as possibly relating to a former land division. Considering the close proximity to the ring ditches, it is possible this is related to them. Linear cropmarks surrounding the possible ring ditch in Area 77 are also considered likely to correspond to former field divisions. A linear cropmark cutting through it may be suggestive of a possible trackway or a further land division, though it is difficult to assess its relative dating to the ring ditch. The cropmarks identified in Area 77 had already been seen on historical aerial imagery and had been interpreted as a possible late Neolithic to early Bronze Age ring ditch with associated linear feature (see section 5.5.3). Compared to that older dataset, both the possible ring ditch and the linear cropmark cutting through it are visible with even more details in the multispectral dataset.

6.2.5. Linear cropmarks possibly suggestive of an unmapped field system have been identified in Area 33, about 100m south-east of the possible ring ditch in Area 35 (Figures 23-27).

6.2.6. Three *foci* of probable archaeological activity have been identified in the northwest of the survey area, across Areas 57, 61 and 64 (Figures 28-37). Despite these being located in close proximity to one other, it is difficult to establish any relationship between them given the lack of physical continuity. The complex of cropmarks identified in the east of Area 61 appears to relate to a rectangular enclosure surrounded by a double ditch to its north and west and by multiple ditches to the east (Figures 35-36). To its immediate west, crosscutting linear and curvilinear cropmarks have been detected which may relate to further enclosures and land divisions, and further west a possible unmapped field system with a possibly associated ploughing regime has been identified. Cropmarks of possible archaeological origin as well as earthworks have been identified to the east, south (Area 64) and west of these *foci* and may correspond to further land divisions.

6.2.7. Rectilinear cropmarks have been identified within Area 27 forming a complex of enclosures which run on a general northwest-southeast to west-east axis, potentially indicative of a settlement (Figures 18-22). These exhibit possible associated field divisions extending to its north and east. The rectilinear morphology of these cropmarks, which form regular, rectangular enclosure layouts, may be suggestive of a late Iron Age to Roman chronology.

6.2.8. Isolated linear cropmarks forming a set of conjoined rectangular enclosures with internal and external subdivisions have been identified within Area 25 (Figures 18-22). The regular linearity of these cropmarks is suggestive of a dwelling or farmstead of a potential late Iron Age or Roman origin.

6.2.9. Rectilinear cropmarks seen within Area 72 appear to form large unmapped field systems which may extend to the southeast into Area 20 and which run on a general northwest-southeast to southwest-northeast axis (Figures 13-17 & 39-42). Within these, shorter linear cropmarks may be suggestive of smaller enclosures, most of which respect the general orientation of the field systems but with some running at an angle to them. Further linear cropmarks noted in the northeast of Area 72 and in the northeast of Area 20 (Figures 39-42), exhibit a different, northwest to southeast orientation and have been classified as "Archaeology (Possible)". These may relate to further land divisions.

6.2.10. Further *foci* of archaeological activity have been identified within the centre-south of the survey area, extending across Areas 6, 8, 10, 4 and 17 (Figures 3-17). Linear cropmarks identified in the east of Area 8 appear to form a series of possible partial enclosures which are located c. 120m east of a large field system (Figures 8-12). This system runs roughly northeast-southwest for over 500m and appears to have multiple possible double-ditched trackways associated with it. It also appears to extend south into Area 6, where further linear cropmarks have been identified which are considered likely to be archaeological in origin. Approximately 200m to the west of the large field system, in the north of Area 8, a further possible double-ditched trackway appears to lead towards a series of conjoined, partial enclosures (Figures 8-12). Based on the aerial data alone, it is difficult to infer any absolute or relative chronology for these cropmarks. Further cropmarks of probable archaeological origin have been identified to the west and north of Area 8, across Areas 4, 10 and 17 and may relate to trackways and partial enclosures.

6.2.11. Linear cropmarks of a possible archaeological origin have been identified throughout the survey area (Figures 3-57). The morphology and size of these cropmarks may be indicative of former unmapped field divisions and enclosures. Cropmarks suggestive of a possible sub-rectangular enclosure have been identified in Area 43 and correspond to cropmarks already seen on aerial photographs taken in 2009 by Historic England (see section 5.5.4).

6.2.12. Cropmarks and other features indicative of historical and modern agricultural land use have been identified throughout the survey area as former field boundaries depicted on historical maps (Figures 3-57), drains, and modern ploughing regimes. Extant field boundaries and tracks have also been noted.

6.2.13. Broad and elongated cropmarks indicative of probable paleochannels and associated fluvial deposits have been identified across Area 32 (Figures 23-27). Further natural variations were identified as cropmarks and slight changes in the topography and they likely relate to superficial deposits.

6.2.14. A number of linear cropmarks and topographic variations categorised as 'undetermined' have been identified throughout the survey area (Figures 3-57). These cropmarks lack a distinctive morphology and/or are bereft of context which makes an origin for these cropmarks more difficult to assess. Agricultural, natural and modern origins for these cropmarks and topographic variations are considered more likely, but an archaeological origin cannot be completely ruled out.

6.2.15. A number of cropmarks have been classified as not having archaeological significance (Figures 3-57). These relate to extant agricultural features, extant vegetation and modern features. Shadows from buildings and trees have also been included in this category and may have limited the detectability of some of the cropmarks.

6.3.Interpretation

6.3.1. General Statements

6.3.1.1. Cropmarks and topographic variations will be discussed broadly as classification types across the survey area. Only those that are distinctive or unusual will be discussed individually.

6.3.1.2. **Shadows** – The impact of shadows can be apparent within the dataset, identified as broad light responses. Shadows are predominantly present around field boundaries and caused by tall obstructions such as trees and structures. The presence of shading may obscure cropmarks if any are present.

6.3.1.3. **Undetermined** – Cropmarks and topographic variations are classified as Undetermined when their origin is ambiguous and there is no supporting contextual evidence to justify a more certain classification. These cropmarks are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out.

6.3.2. Multispectral Results - Specific Cropmarks & Earthworks

6.3.2.1. **Cropmark - Probable Archaeology (Ring Ditches in Areas 77, 99 & 35) –** A circular cropmark, possibly indicative of a ring ditch and measuring c. 24m in diameter, has been identified within the centre of Area 77 (Figures 38-42) [**77a**] and is visible within the NDVI dataset and barely visible in the orthomosaic data. This was also noted in previous aerial photographs. No discontinuities, suggestive of an access point are visible within the perimeter of the ring ditch. Multiple linear cropmarks surround this cropmark including one c. 120m long that cuts through the centre of the ring ditch. The relationship between the ring ditch and the linear cropmarks is unclear: these may relate to enclosures and/or trackways whose relative dating to the ditch is difficult to assess. Annular and penannular cropmarks possibly indicative of ring ditches have also been identified within Area 99 [**99a**] suggestive of potential prehistoric activity occurring across the survey area (Figures 48-52). An annular and a semi-annular cropmark have been

identified within the north of Area 35 [**35a**] (Figures 23-27). The morphologies, and enhanced vigour of these cropmarks in the NDVI dataset, are indicative of possible ring ditches, possibly prehistoric in origin. A linear cropmark has been identified c. 15m south of these ring ditches. Given the NDVI dataset indicates that this cropmark results from highly vigorous growth, it is possible this relates to another ditch, potentially a land division which could be connected to the ring ditches.

6.3.2.2. **Earthwork - Possible Archaeology (Field System)** – A series of positive earthworks visible in the DSM dataset have been identified within Area 33 [**33a**] and are considered indicative of a possible unmapped field system with an abutting enclosure (Figures 23-27).

6.3.2.3. **Cropmark & Earthwork – Probable & Possible Archaeology (Enclosures and Former Field Systems) –** A rectangular cropmark indicative of an enclosure has been identified within the east of Area 61, surrounded by a double ditch on its northern and western sides and by multiple ditches on its eastern side [**61a**] (Figures 28-32). It is also adjoined by a larger enclosure to the north. Linear cropmarks and earthworks indicative of former field systems have been identified within the north of Area 64 [**64a**] and [**64b**] running towards the enclosures within Area 61 suggestive of a possible association predating known historical field boundaries (Figures 28-32). A series of crosscutting cropmarks have been identified within the west of Area 61 [**61b**] and [**61c**] (Figures 28-32). Smaller rectilinear cropmarks within the southwest corner of the survey area [**61b**] are suggestive of further possible enclosures whereas the longer linear cropmarks towards the north and east are indicative of possible former field systems [**61c**]. These cropmarks have a crosscutting layout which is suggestive of multiple phases of archaeological activity. Further rectilinear and linear cropmarks and earthworks have been identified within Area 57 [**57a],** c. 70m southwest of the area of potential multiphase activity (Figures 28-32). The parallel, narrow linear anomalies identified within these enclosures and extending to their north may relate to an old ploughing regime. The absolute and relative chronologies of these complexes of cropmarks are difficult to assess.

6.3.2.4. **Cropmark - Probable Archaeology (Possible Roman Settlement and Former Field Systems)** – A complex of linear cropmarks suggestive of ditches has been identified within the southwest of Area 27, covering an area of c. 0.7ha [**27a**] (Figures 18-22). The regular, rectilinear morphology of these cropmarks is indicative of rectangular enclosure layouts, potentially suggestive of a settlement area of a Roman chronology. Linear cropmarks, extending from the complex and suggestive of former land divisions, have also been identified c. 70m north of the settlement complex [**27b**] (Figures 18-22).

6.3.2.5. **Cropmark - Probable Archaeology (Possible Roman enclosures)** – Rectilinear cropmarks forming a set of enclosures have been identified within Area 25 with further linked smaller linear cropmarks identifying the presence of internal and external subdivisions [**25a**] (Figures 18-22). It is possible this relates to a dwelling or farmstead of possible Romano-British date.

6.3.2.6. **Cropmark – Probable Archaeology (Enclosures and Former Field Systems) –** A focus of archaeological activity has been identified within Areas 20 [**20a**] and 72 [**72a**], largely represented by linear cropmarks suggestive of rectilinear ditches (Figures 13-17 & 38-42), visible within the NDVI and orthomosaic datasets and already noted on old aerial photographs. This focus of archaeological activity runs in a northwest to southeast orientation throughout Areas 20 and 72 suggestive of a series of field systems predating known historical field boundaries. Smaller rectilinear cropmarks have also been identified within these former field systems, suggestive of contemporaneous enclosures.

6.3.2.7. **Cropmark & Earthwork - Probable Archaeology (Enclosures) –** Multiple linear cropmarks, indicative of potential partial enclosures [**8b**] and [**8c]** have been identified within the centre of Area 8 (Figures 8-12), and were partially visible in old aerial photographs. These double-ditched trackways lead to the west towards further linear cropmarks located in Area 6 [**6a**], suggesting a possible contemporaneous relationship between them (Figures 3-7).

6.3.2.8. **Cropmark & Earthwork - Probable Archaeology (Trackways, Field Systems, Enclosures)** – Further groups of linear cropmarks have been identified in Areas 4 [**4a** & **4b**], 8 [**8a**], 10 [**10a**] and 17 [**17a**] (Figures 13-17 & 18-22). Within the northeast of Area 4 [**4a**], cropmarks may be indicative of possible crosscutting partial enclosures with an associated trackway [**4b**]. About 200m south of these, earthworks likely relating to a partial rectangular enclosure with narrow internal divisions [**8a**] have been identified; a trackway also seems to be associated with these. A group of linear, discontinuous earthworks have been identified in the north of Area 17 [**17a**] and cropmarks have been detected in the north of Area 10 [**10a**]. These are seen forming right angles to one another, and occasionally crosscut each other, and may relate to partial enclosures.

6.3.2.9. **Agricultural –** Throughout the survey area multiple linear cropmarks and earthworks have been identified which have been categorised as "Agricultural". These are visible within the NDVI dataset and occasionally within the orthomosaic data as well. The majority of these originate from extant field boundaries. However, a limited number of cropmarks correlate with former field boundaries visible on historical OS maps (Figures 3-57).

6.3.2.10. **Probable Paleochannel** – Sinuous cropmarks most notable in the NDVI dataset have been identified in the southwest of the survey area, across Area 32 (Figures 3-7), and are located over areas containing river terrace deposits (See section 4.4.3). Based on their morphology, they have been interpreted as indicating the probable presence of paleochannels and associated fluvial deposits.

6.3.2.11. **Natural Ground Cover Variations** – Broad cropmarks illustrating a variety of patterns are visible throughout both the multispectral and orthomosaic datasets and have been interpreted as likely relating to variations in the natural ground cover (Figures 3-57). These may be the result of geological processes occurring in the superficial deposits and/or bedrock but may also include cropmarks originating from poor drainage.

6.3.2.12. **Undetermined –** Cropmarks and variations in the topography of varying morphologies have been identified throughout the survey area and have been categorised as “Undetermined”. The lack of a distinctive morphology for these cropmarks has made their classification difficult. These are considered more likely to relate to modern or agricultural activities or to natural processes, but an archaeological origin cannot be excluded entirely.

7. Conclusions

7.1. An aerial multispectral survey was successfully undertaken over c. 560ha of land south-east of Reading, Berkshire. One c. 10ha area was left unsurveyed due to access concerns, and c. 40ha of land was de-scoped from the survey area since construction works had commenced in these areas by the time the survey was undertaken. Some of the cropmarks and earthworks identified within the datasets correlate with cropmarks previously identified on historical aerial photography. Extant features in the landscape including trees and overgrown vegetation, and pylons have caused some shadows to be present within the datasets. Although limited, this interference has the potential limit the detectability of cropmarks if any were present in these areas. A range of cropmarks and topographic variations indicating archaeological, agricultural, natural and undetermined features have been identified. Where cropmarks and topographic variations can clearly be seen to be the result of extant modern features, they have been marked as "Not of Archaeological Significance".

7.2. At least five complete and partial possible ring ditches have been identified across the survey area, giving evidence of possible prehistoric activity in the area. Several *foci* of probable archaeological activity have been identified, including a possible Romano-British settlement and associated field system; a small and possibly Romano-British dwelling or farmstead; crosscutting enclosures suggestive of multiple phases of activity; further enclosures, trackways, and field systems. Cropmarks and earthworks classified as possibly archaeological in origin have also been identified and may relate to further land divisions.

7.3. Historical agricultural activity has been identified throughout the survey area as cropmarks and earthworks correlating with former field boundaries depicted on historical OS maps. A possible ridge and furrow ploughing regime has also been identified.

7.4. Cropmarks correlating with probable paleochannels and fluvial deposit as well as with further variations in the superficial deposits and/or bedrock have been identified.

7.5. Cropmarks and topographical variations of undetermined origins have also been detected. It has not been possible to definitively determine whether these cropmarks are the result of archaeological, agricultural, or modern practices.

8. Archiving

8.1. MS maintains an in-house digital archive of aerial survey data, which is based on guidance on best practice produced by the Archaeological Data Service (Bewley and Niven, 2011). This stores the unprocessed images, georeferenced processed raster images, ground control points, and a copy of the final report.

8.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

9. Copyright

9.1. Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Services Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

10. References

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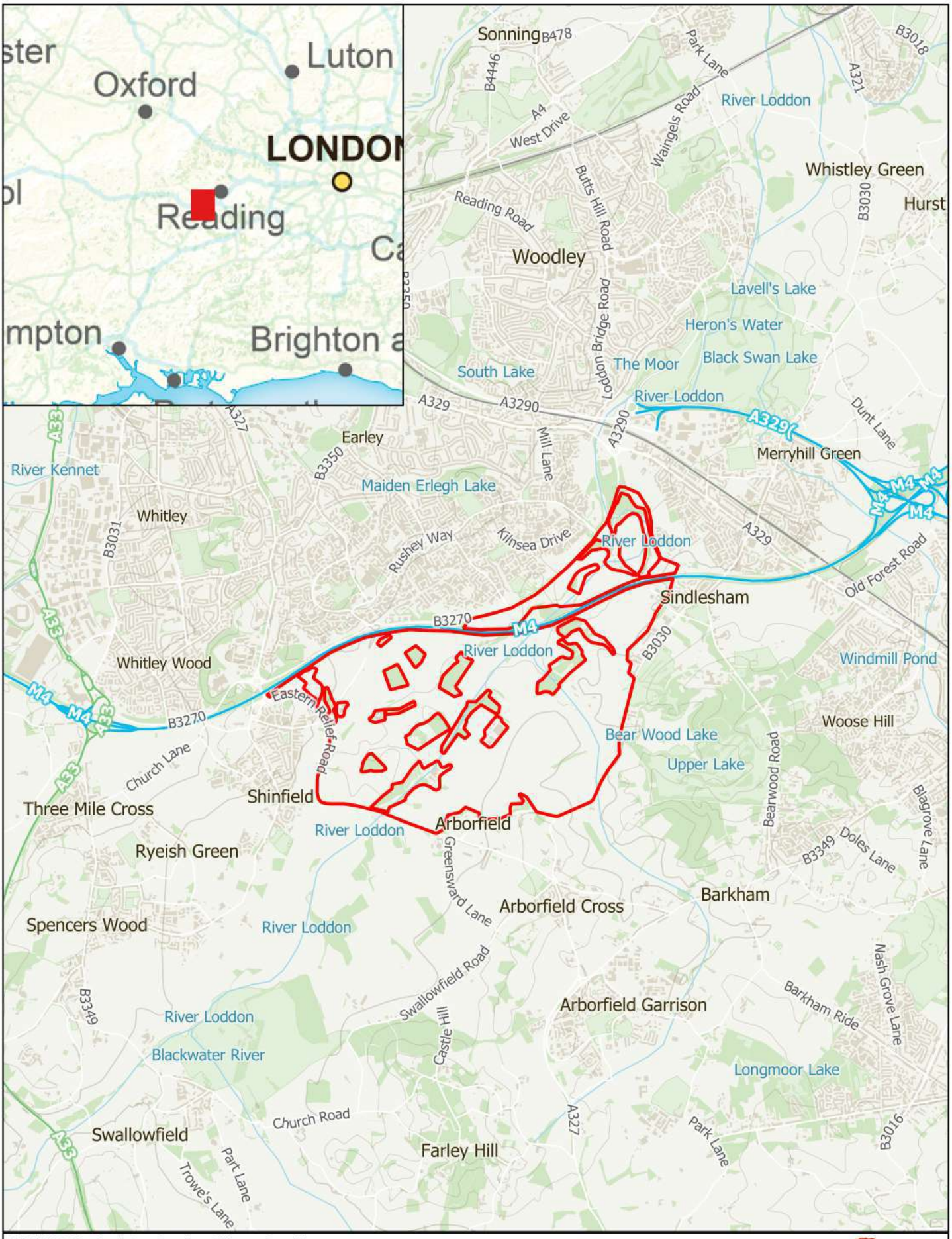
11. Project Metadata

MS Job Code	MSSU1348
Project Name	Loddon Garden Village
Client	RPS Group Ltd
Grid Reference	SU 7569 6859
Survey Techniques	Aerial Multispectral Imaging
Survey Size (ha)	c. 560ha
Survey Dates	2022-10-05 to 2022-10-15
Project Lead	Jake Dolan BSc FGS
Project Officer	Isabella Carli BA MA PCIFA
HER Event No	N/A
OASIS No	N/A
S42 Licence No	N/A
Report Version	0.6

12. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	DW	JD IC	03 October 2022
0.2	Corrections and amendments following Project Lead & Project Officer review	JD, IC	PJ	19 October 2022
0.3	Corrections from Directors	JD, IC	AJS	28 October 2022
0.4	Corrections following Director Check	JD, IC	AJS	28 October 2022
0.5	Comments from Director	IC, MS	PJ	7 November 2022
0.6	Further minor comments from Director	IC	PJ, LG	9 November 2022



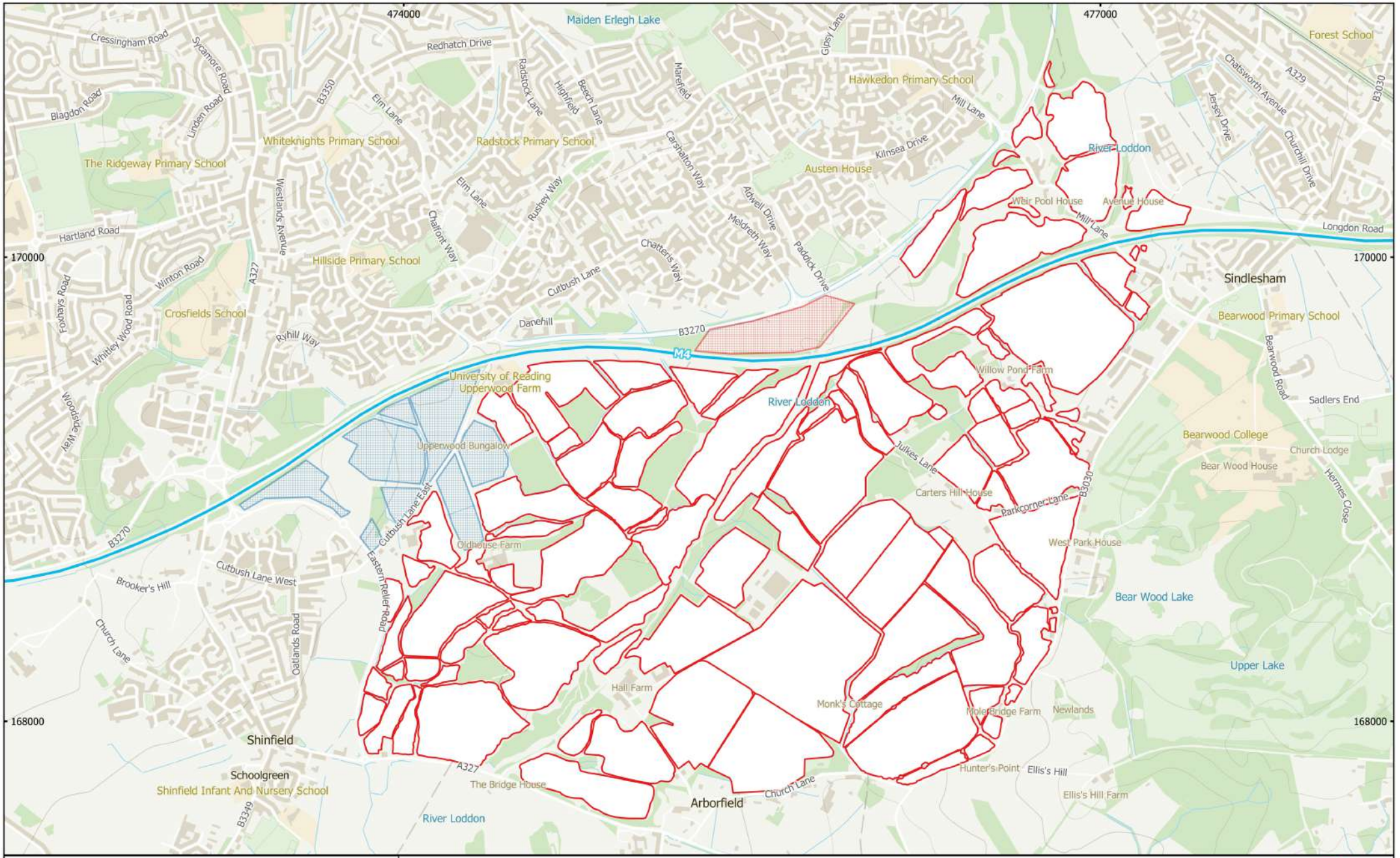
MSSU1348 - Loddon Garden Village, Reading
Figure 1 - Site Location
1:50,000 @ A4

Site Boundary

N

0 1 2 km

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 2 - Location of Survey Areas
1:15,000 @ A3

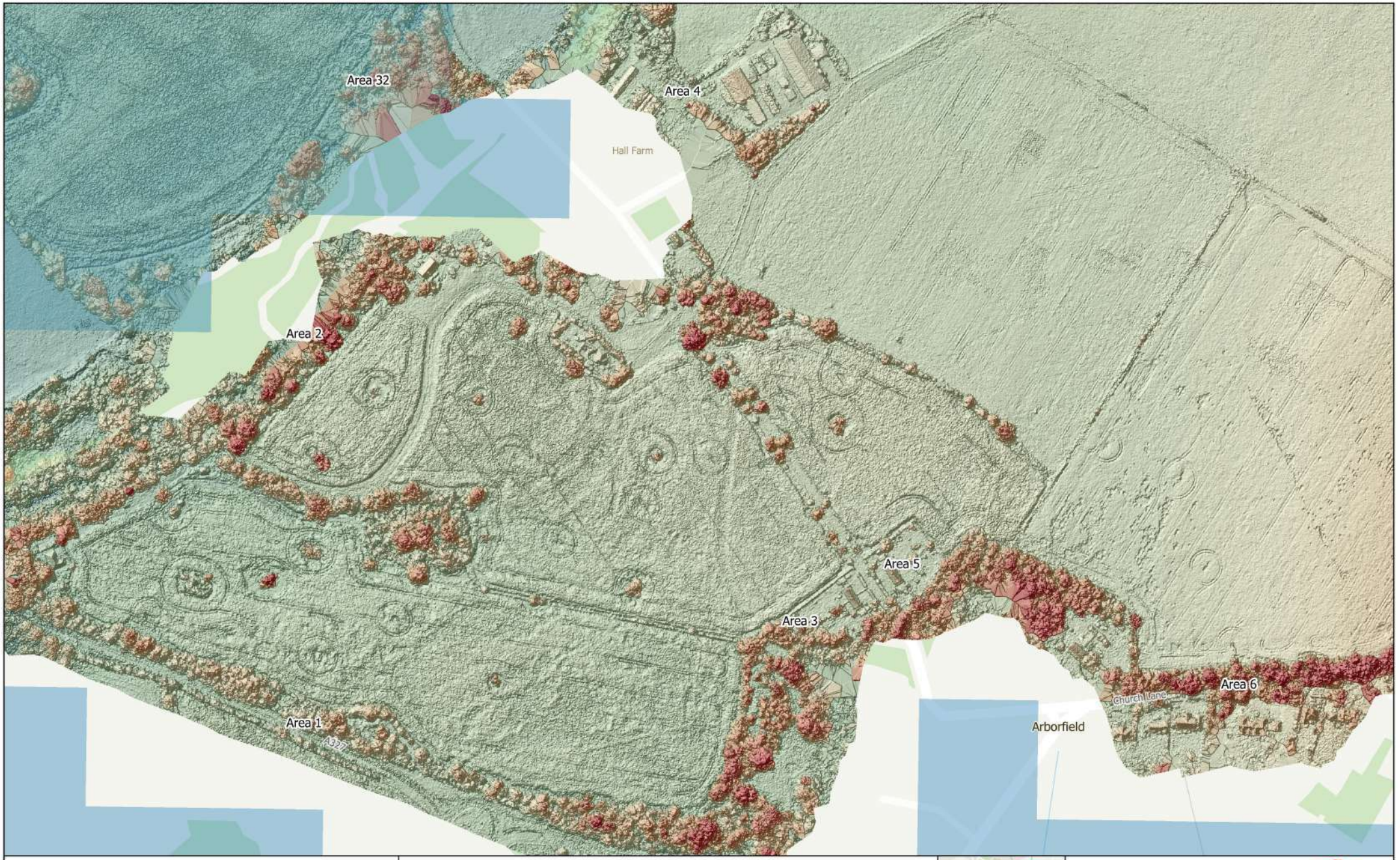
Surveyed Extent
Unsurveyed Extent
Descoped Areas

N

0 500 1,000 1,500 m

magnitude surveys

MSSU1348 - Loddon Garden Village, Reading
Figure 3 - 5cm Photogrammetric Orthomosaic (South)
1:3,000 @ A3



MSSU1348 - Loddon Garden Village, Reading
Figure 4 - 5cm Photogrammetric DSM and Hillshade (South)
Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

85 m 102

N

0 50 100 150 m

magnitude surveys

MSSU1348 Loddon Garden Village, Reading
Figure 5 Multispectral Index (NDVI) (South)
1:3,000 @ A3

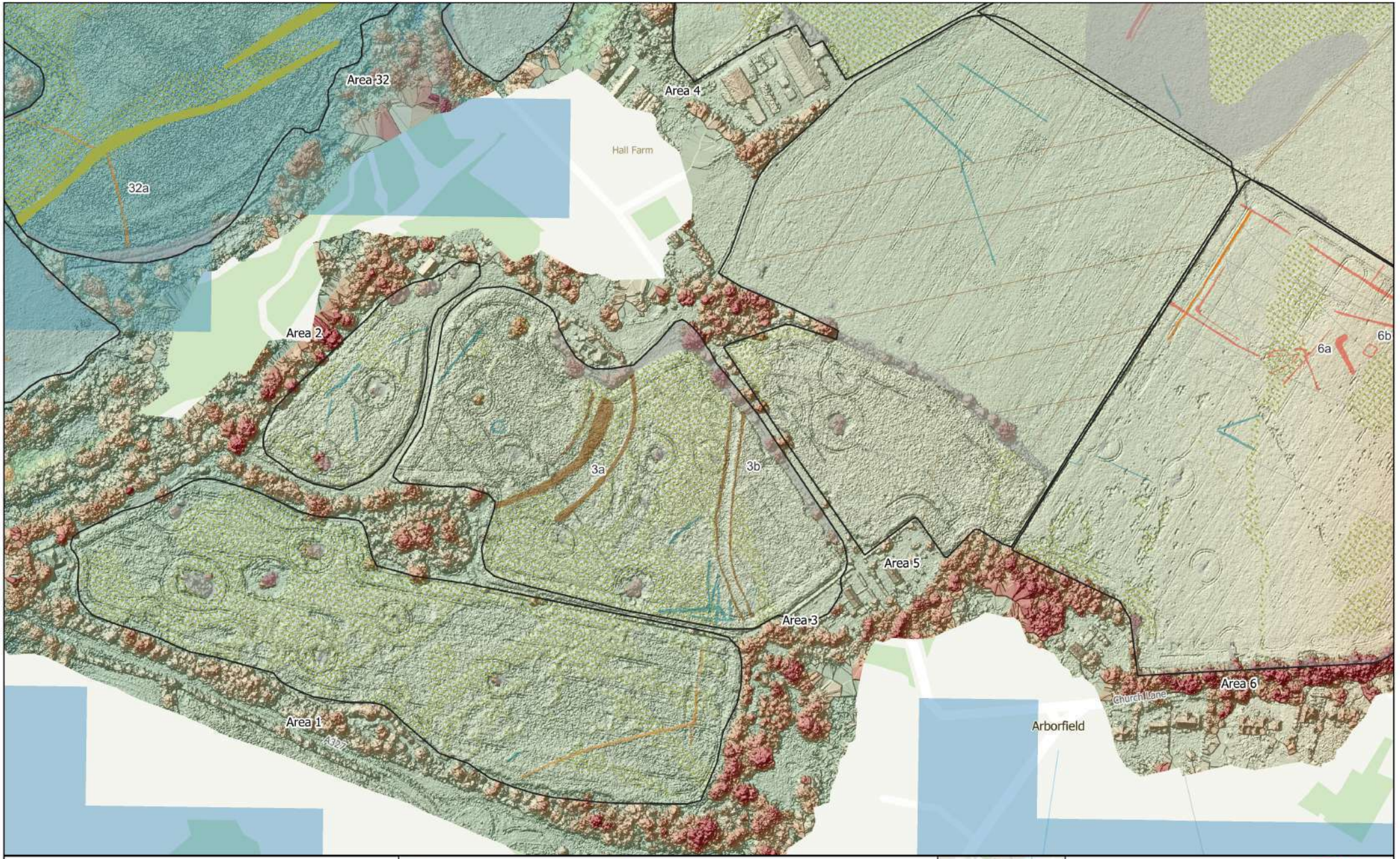
MSSU1348 - Loddon Garden Village, Reading
Figure 6 - Combined Interpretation over Historical Maps (South)
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

N

0 50 100 150 m

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 7 - Combined Interpretation over 5cm Photogrammetric DSM and Hillshade (South). Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

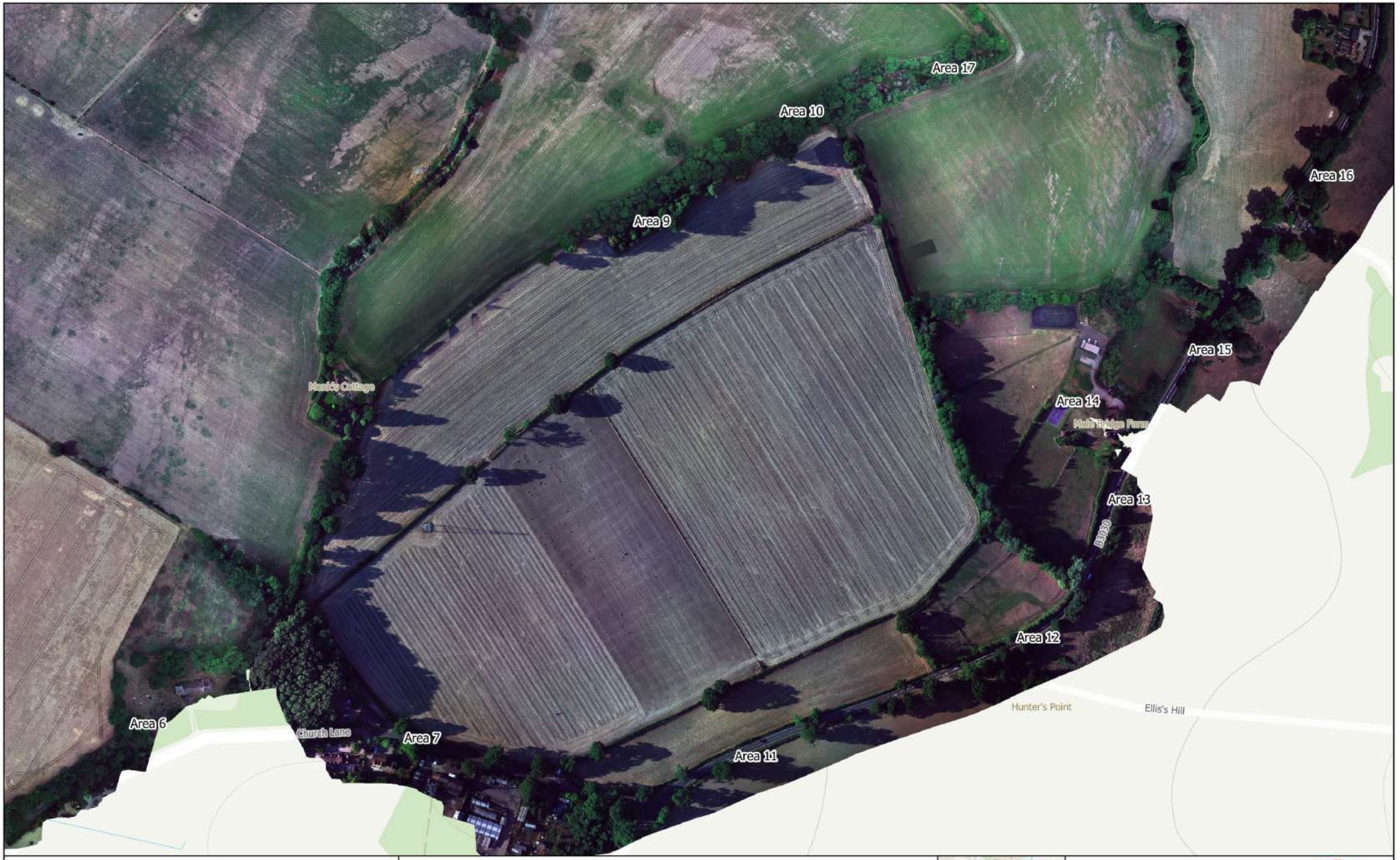
- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

85 m 102

N

0 50 100 150 m

magnitude surveys

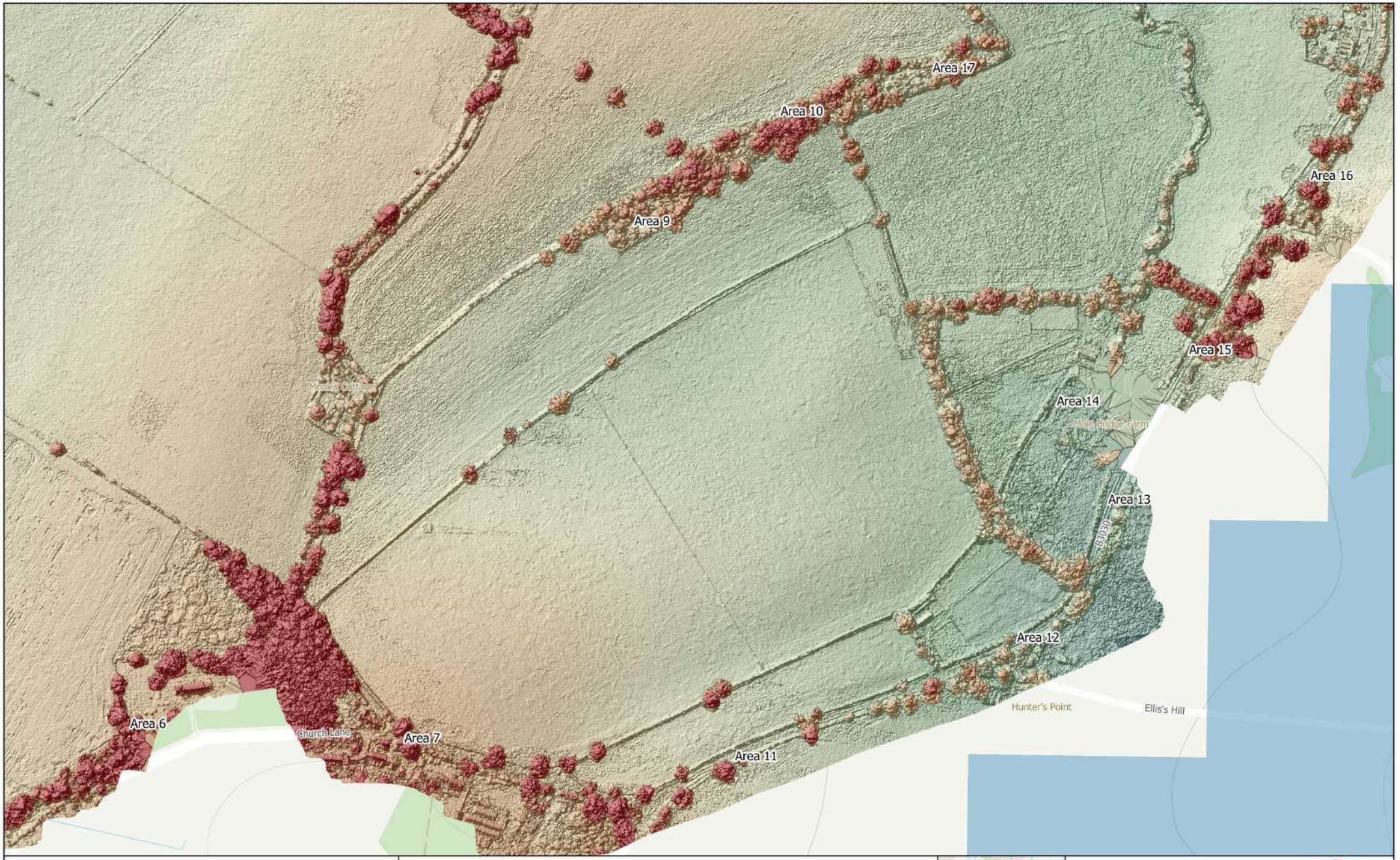


MSSU1348 - Loddon Garden Village, Reading
Figure 8 - 5cm Photogrammetric Orthomosaic (South-east)
1:3,000 @ A3

N

0 50 100 150 m

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 9 - 5cm Photogrammetric DSM and Hillshade (South-east)
Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

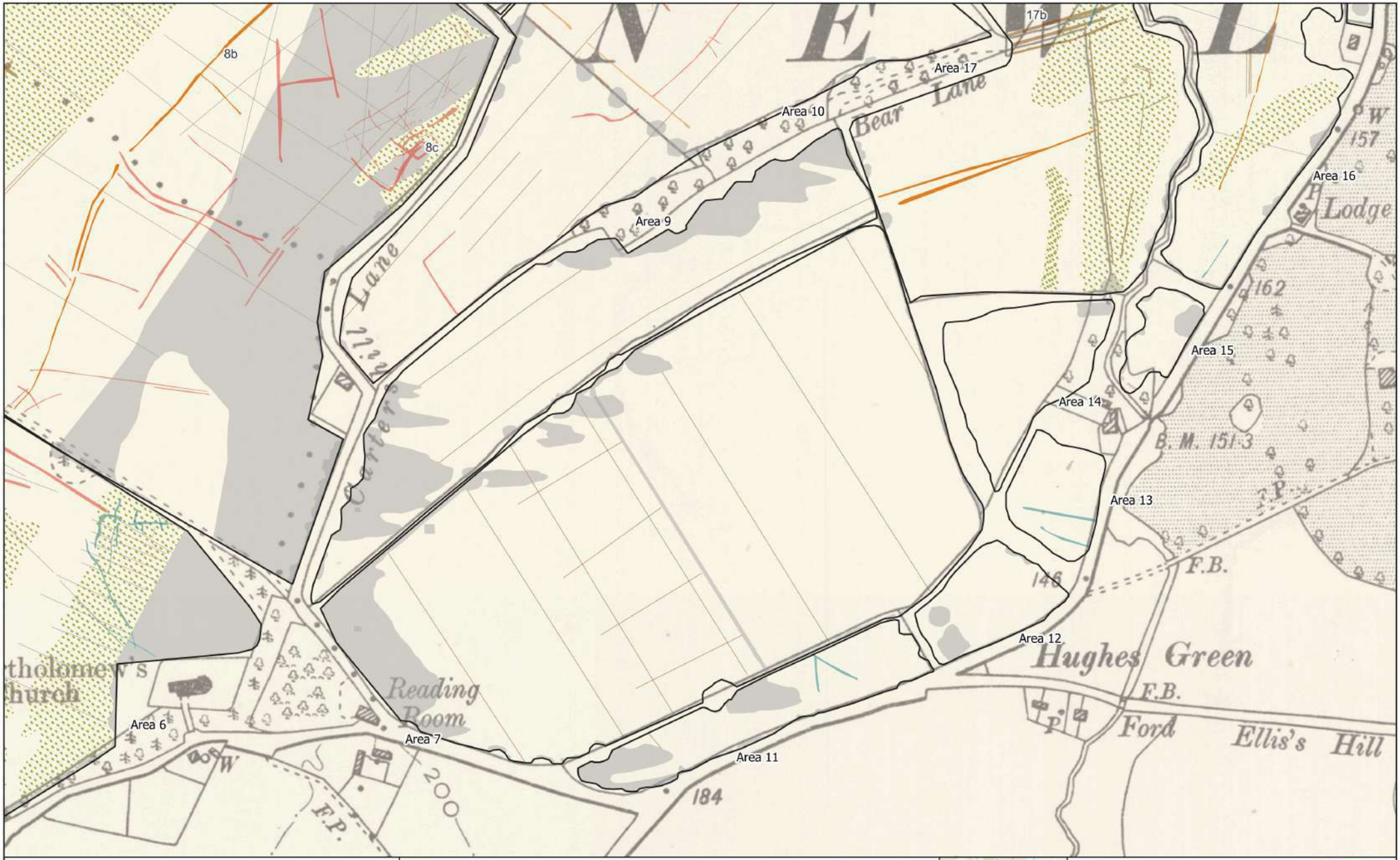
MSSU1348 Loddon Garden Village, Reading
Figure 10 Multispectral Index (NDVI) (South east)
1:3,000 @ A3

Low Vigor High

N

0 50 100 150 m

magnitude surveys



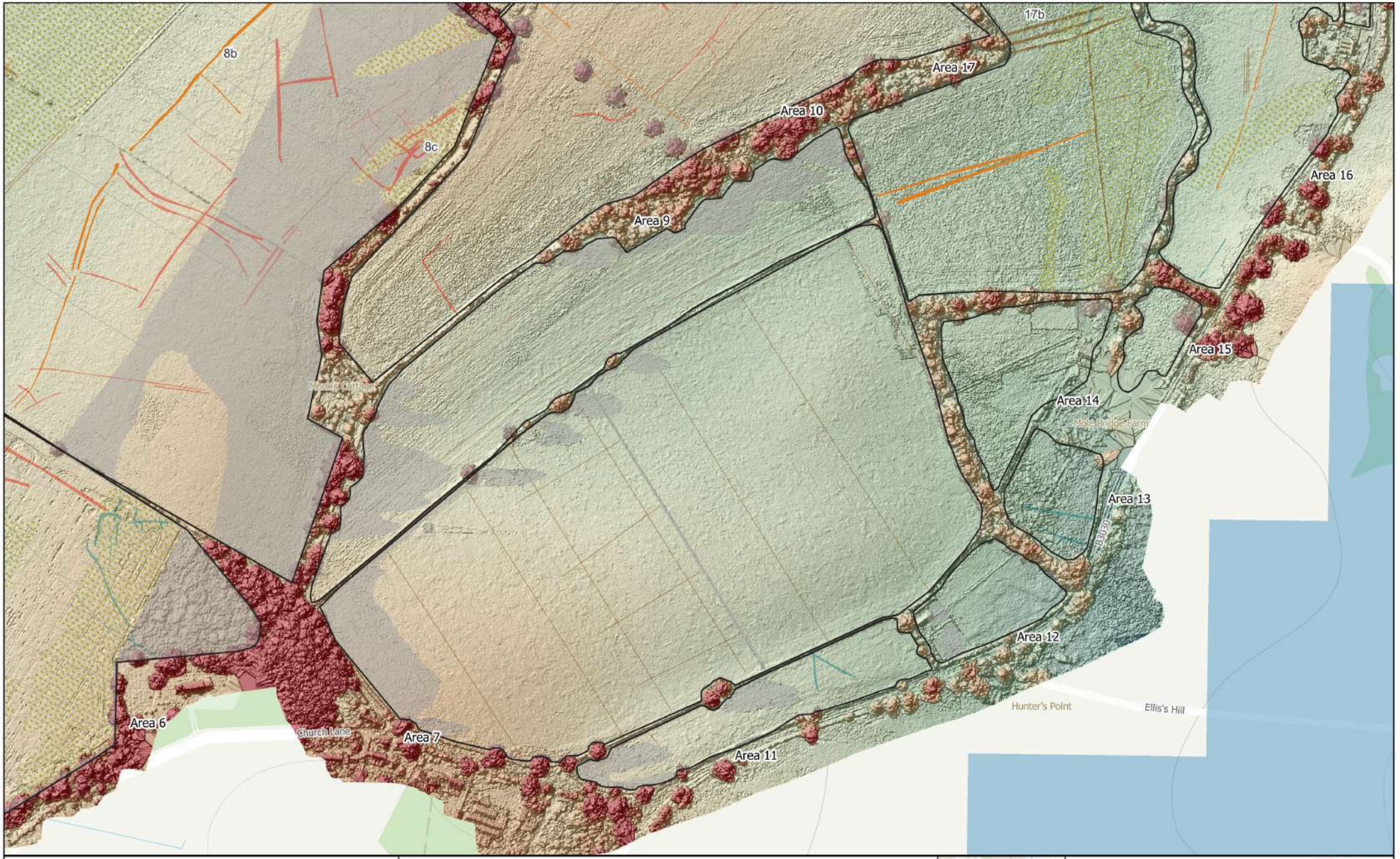
MSSU1348 - Loddon Garden Village, Reading
Figure 11 - Combined Interpretation over Historical Maps (South-east)
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

N

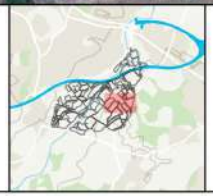
0 50 100 150 m

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 12 - Combined Interpretation over 5cm Photogrammetric DSM and Hillshade (South-east). Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

MSSU1348 - Loddon Garden Village, Reading
Figure 13 - 5cm Photogrammetric Orthomosaic (East)
1:3,000 @ A3



N

0 50 100 150 m

magnitude surveys

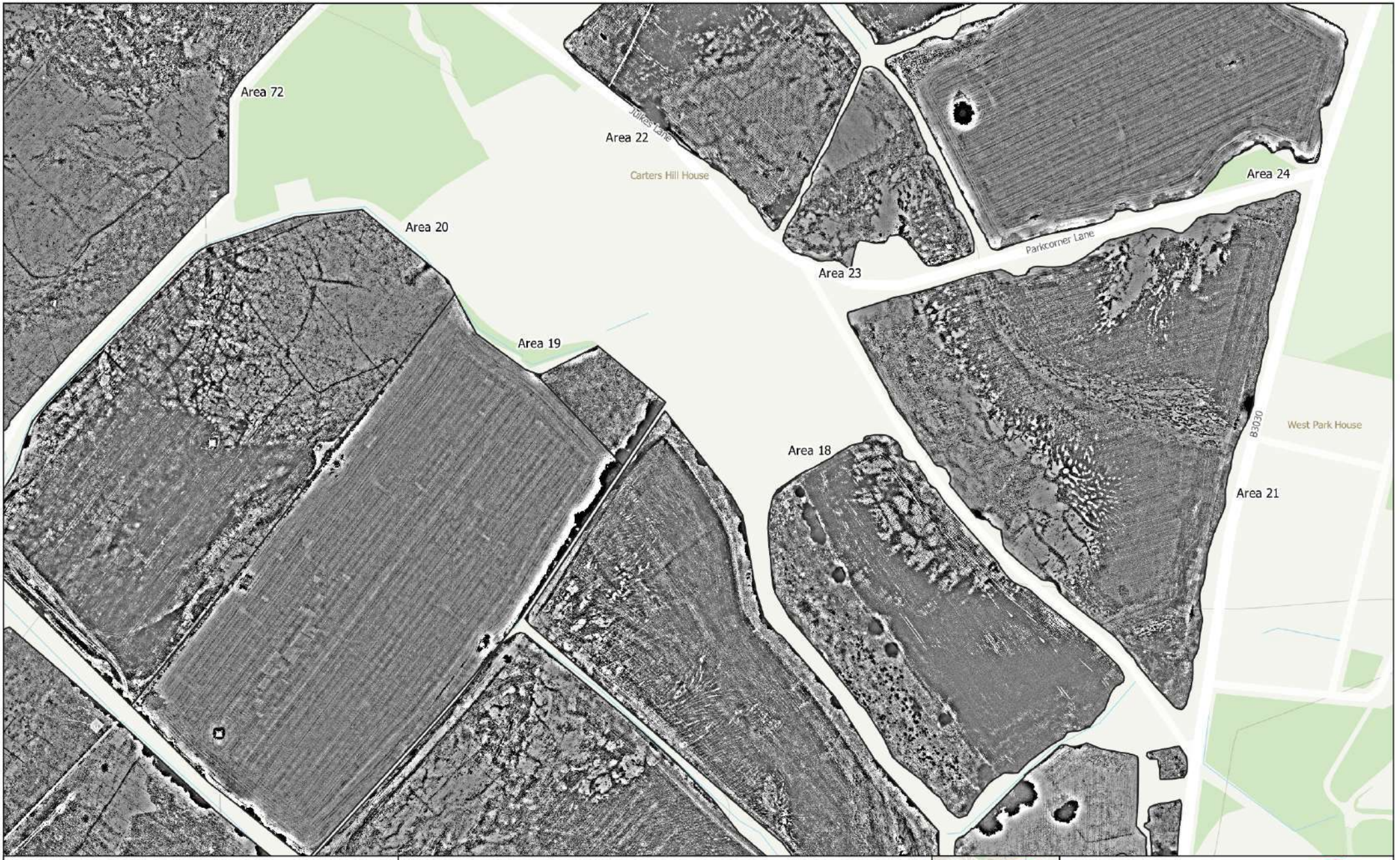
MSSU1348 - Loddon Garden Village, Reading
Figure 14 - 5cm Photogrammetric DSM and Hillshade (East)
Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

85 m 102

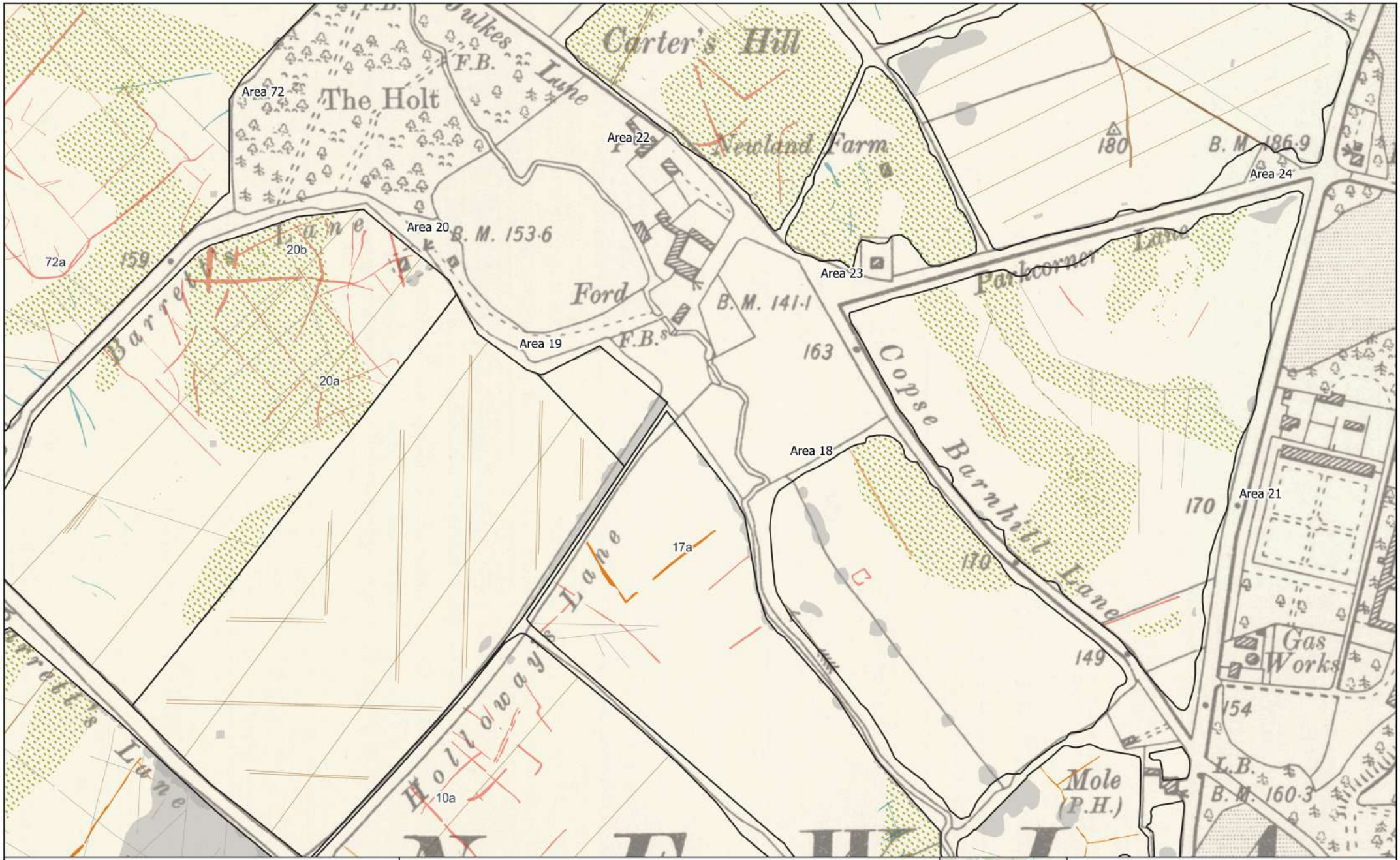
N

0 50 100 150 m

magnitude surveys



MSSU1348 Loddon Garden Village, Reading
Figure 15 Multispectral Index (NDVI) (East)
1:3,000 @ A3



MSSU1348 - Loddon Garden Village, Reading
Figure 16 - Combined Interpretation over Historical Maps (East)
1:3,000 @ A3

Contains historical mapping © CLS Data 2022: Ordnance Survey, 6" 2nd edition c. 1882-1913

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

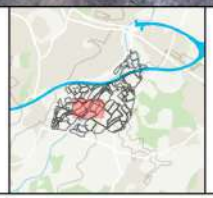
N

0 50 100 150 m

magnitude surveys

MSSU1348 - Loddon Garden Village, Reading
Figure 17 - Combined Interpretation over 5cm Photogrammetric DSM and Hillshade (East). Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

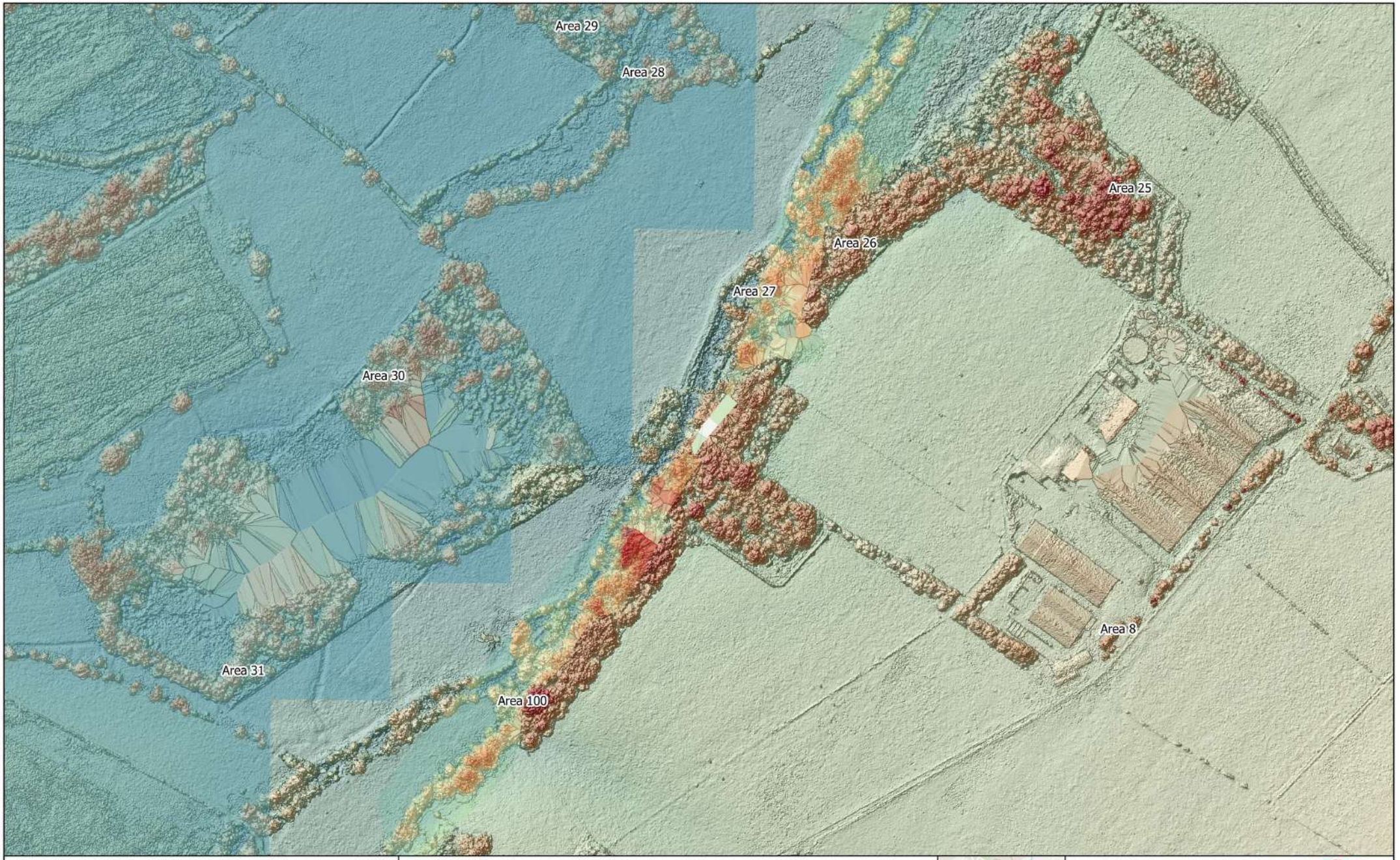
MSSU1348 - Loddon Garden Village, Reading
Figure 18 - 5cm Photogrammetric Orthomosaic (Central (South))
1:3,000 @ A3



N

0 50 100 150 m

magnitude surveys



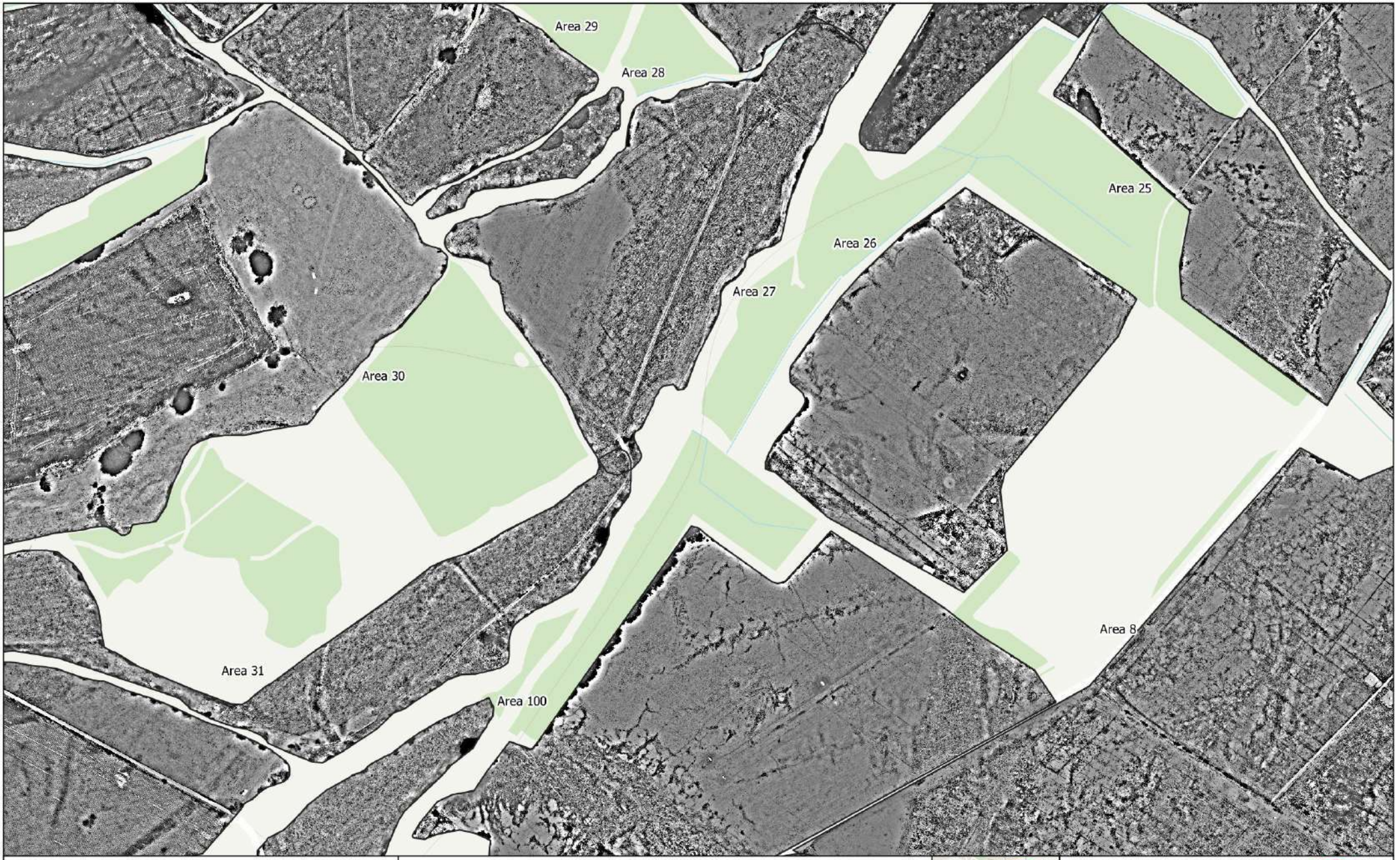
MSSU1348 - Loddon Garden Village, Reading
Figure 19 - 5cm Photogrammetric DSM and Hillshade (Central (South))
Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

85 m 102

N

0 50 100 150 m

magnitude surveys



MSSU1348 Loddon Garden Village, Reading
Figure 20 Multispectral Index (NDVI) (Central (South))
1:3,000 @ A3

Low Vigor High

N

0 50 100 150 m

magnitude surveys

MSSU1348 - Loddon Garden Village, Reading
Figure 21 - Combined Interpretation over Historical Maps (Central (South))
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Probabe Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

N

0 50 100 150 m

magnitude surveys

MSSU1348 - Loddon Garden Village, Reading
Figure 22 - Combined Interpretation over 5cm Photogrammetric DSM and Hillshade (Central (South)). Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Probabe Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Not of Archaeological Significance

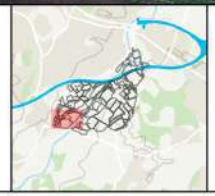
85 m 102

N

0 50 100 150 m

magnitude surveys

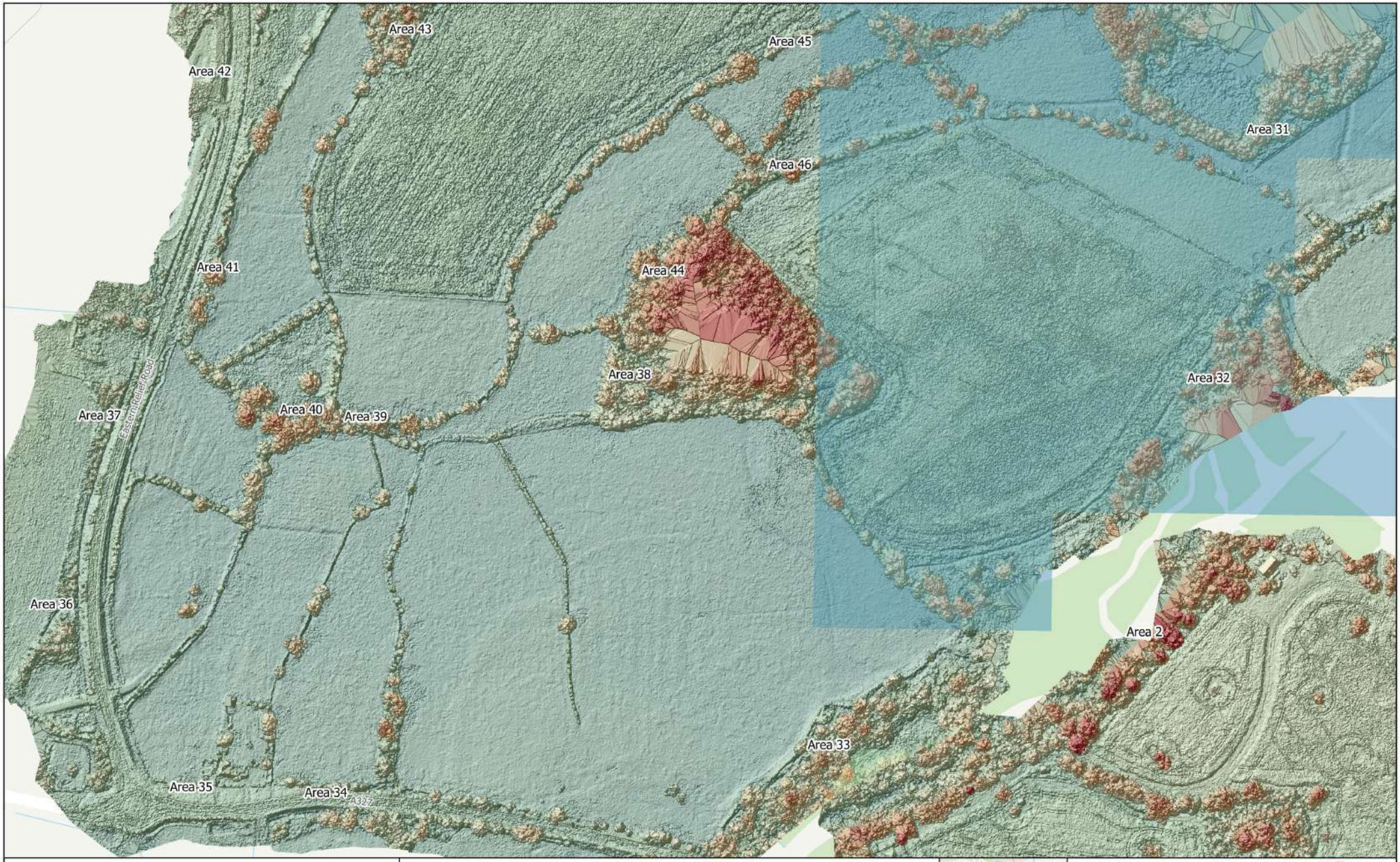
MSSU1348 - Loddon Garden Village, Reading
Figure 23 - 5cm Photogrammetric Orthomosaic (South-west)
1:3,000 @ A3



N

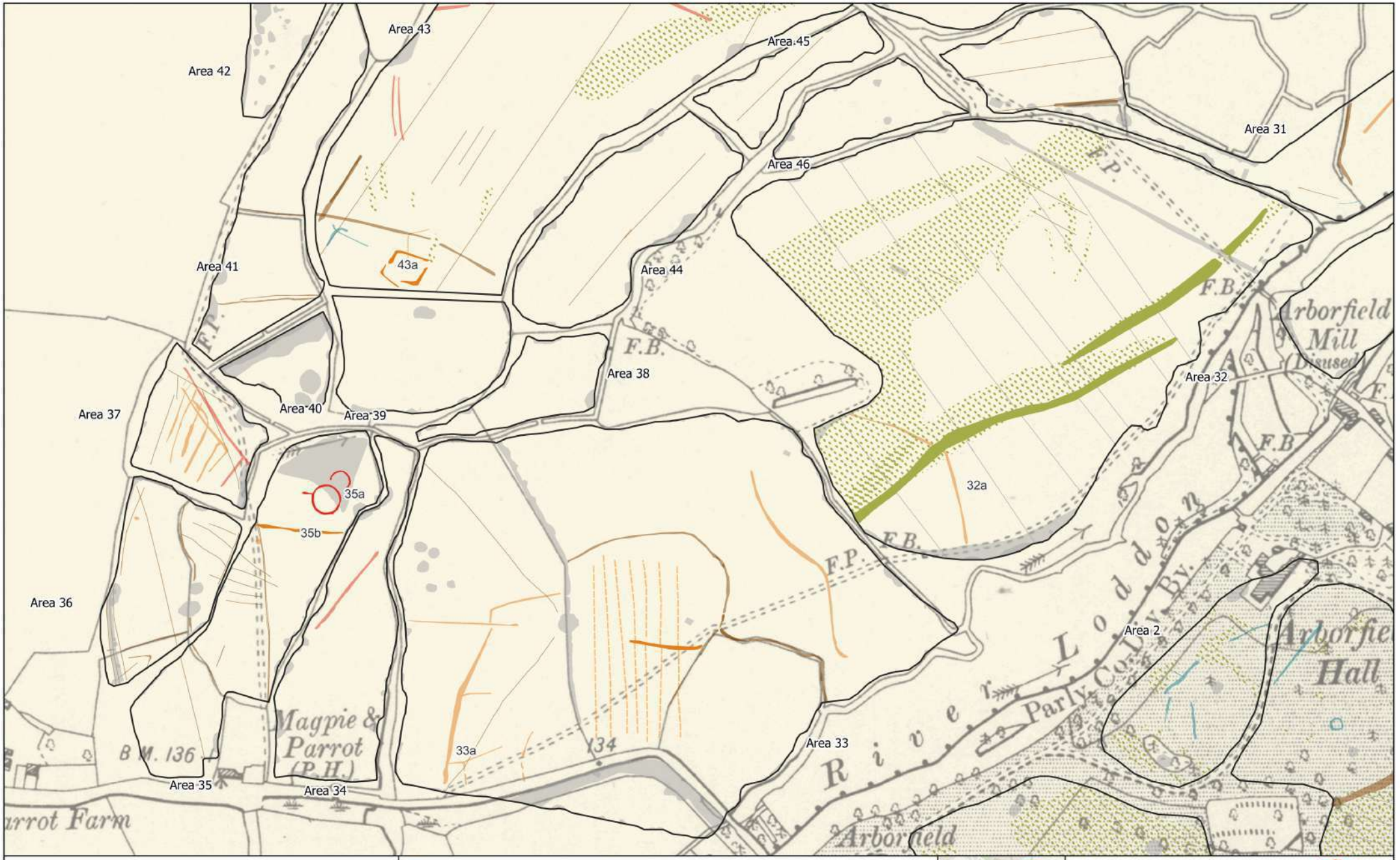
0 50 100 150 m

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 24 - 5cm Photogrammetric DSM and Hillshade (South-west)
Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

MSSU1348 Loddon Garden Village, Reading
Figure 25 Multispectral Index (NDVI) (South west)
1:3,000 @ A3



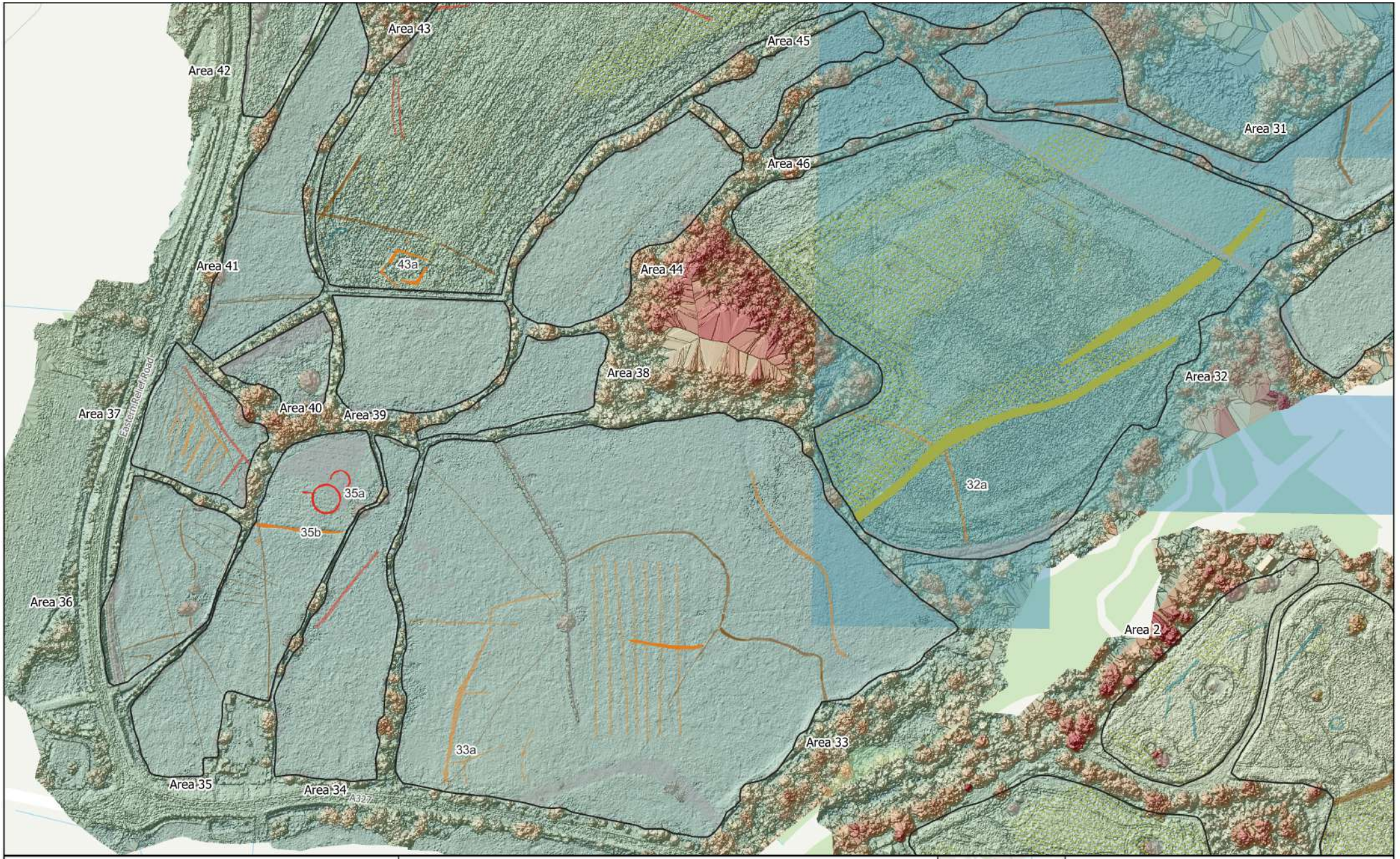
MSSU1348 - Loddon Garden Village, Reading
Figure 26 - Combined Interpretation over Historical Maps (South-west)
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Probabe Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Earthwork (Trend)
- Not of Archaeological Significance

N

0 50 100 150 m

magnitude surveys



MSSU1348 - Loddon Garden Village, Reading
Figure 27 - Combined Interpretation over 5cm Photogrammetric DSM and Hillshade (South-west). Hillshade Parameters: Azimuth 315° ; Angle 45° ; Z Factor 3.0
1:3,000 @ A3

- Agricultural
- Earthwork (Probable Archaeology)
- Earthwork (Possible Archaeology)
- Cropmark (Probabe Archaeology)
- Cropmark (Possible Archaeology)
- Not of Archaeological Significance
- Natural Ground Cover Variations
- Probable Palaeochannel
- Undetermined
- Agricultural (Trend)
- Earthwork (Trend)
- Not of Archaeological Significance

85 m 102

N

0 50 100 150 m

magnitude surveys

MSSU1348 - Loddon Garden Village, Reading
Figure 28 - 5cm Photogrammetric Orthomosaic (West)
1:3,000 @ A3

N

0 50 100 150 m

magnitude surveys