Ricknall Carrs and Bishop's Fen, County Durham

Desk-Based Heritage Assessment

And Geophysical Survey

for

Discover Brightwater Landscape Partnership

December 2022

Ecus Ltd

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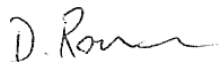

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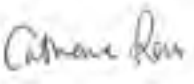

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Summary

Ecus Archaeology was commissioned by the Discover Brightwater Landscape Partnership (the Client) to carry out a desk-based heritage assessment and geophysical survey of two areas of land where it is proposed to improve wetland areas by creating new ponds and channels. Bishop's Fen is located between the A1 Motorway and Sedgefield (centred at NGR NZ 33115 29877) and Ricknall Carrs is located between the A1 and the East Coast Railway Line to the east of Newton Aycliffe (centred at NGR NZ 30995 25191).

The desk-based assessment examined a study area extending for a 1km radius around each site. A search of the County Durham Historic Environment record identified 127 heritage assets, although 63 of these were records of medieval or post-medieval ridge and furrow cultivation and other records were for features which are no longer extant or for artefact findspots. Of the remaining assets, Preston-le-Skerne Deserted Medieval Village and Middleham Castle are scheduled monuments. There are also 14 listed buildings, while Hardwick Park is a Grade II* Registered Park and Garden and Bishop Middleham Deer Park is locally listed. The Bishop's Fen site lies between the Hardwick Park and Bishop Middleham Conservation Areas, while the Ricknall Carrs site lies between the Morden and Aycliffe Village Conservation areas.

The earliest evidence from the area comes from previous palaeoenvironmental studies examining sediments and pollen in the area, including within the Ricknall Carrs site, which have recorded the vegetational sequence of the area since the end of the last ice age. Although there is extensive evidence for early prehistoric activity in lowland County Durham, none has been found within the current study areas; however, such evidence is commonly found in areas adjacent to waterways and other wetland areas such as are present within both of the current sites. The earliest find from either of the study areas is a Bronze Age axe found at Morden Carr near the Ricknall Carrs site. Several Iron Age settlement sites have been discovered to the east and south of Hardwick Hall but there is no similar evidence closer to either of the proposed development areas.

The Bishop's Fen site lies c.1.75km west of the route of Cades Road Roman road and an extensive Roman civil settlement lies to the east of Hardwick Park. Closer to the site, aerial photographic evidence and artefact finds suggest the presence of a Roman settlement site at Island Farm, Bishop Middleham. No Roman remains have been recorded in the vicinity of the Ricknall Carrs.

No early medieval archaeological remains have been recorded in either study area. Bishop Middleham village to the north of Bishop's Fen is presumed to be of Anglo-Saxon origin, although the first surviving documentary reference to the village dates from 1146. Middleham Castle was a fortified manor house used by the Bishops of Durham from the 12th to 14th century and surrounded by Bishop Middleham Deer Park. Ricknall Carrs lies to the north of the Scheduled site of Preston-le-Skerne Deserted Medieval Village, first recorded in 1091. Extensive evidence for ridge and furrow cultivation of either medieval or early post-medieval date has been recorded in both parts of the study area, although no extant remains are located

within either site.

At Hardwick Park, located to the east of Bishop's Fen, a manor house is recorded in 1449. From 1748 the current grounds were laid out and are now a Grade II* Registered Park and Garden. The common fields around Bishop Middleham were enclosed in 1693. The existing field layout at Bishop's Fen is much denuded although parts of that shown on the Bishop Middleham Tithe Plan of 1840 survive. At Ricknall Carrs, some of the divisions shown on the First Edition Ordnance Survey map (1856) survive although others have been removed to create wider fields. The area around Bishop Middleham has been subject to former coal mining and stone quarrying, and this is reflected in the presence of several early waggonways and railways.

The geophysical survey at the two sites, undertaken across eight areas totalling c.42ha, identified a range of features including infilled field ditches, palaeochannels of the River Skerne, possible pits and traces of former agricultural furrows. Some of these could be equated to features portrayed on historic mapping while others remained undated.

In addition, there remains the potential for previously undetected archaeological features to be present within either site. Given the previously wet character of both areas, these are most likely to date from the early prehistoric period when such environments were considered resource-rich and attractive for at least temporary settlement. The Historic England Science Advisor has observed that particular attention should be paid to the interface between any peat and underlying deposits within areas disturbed during the proposed works in order to identify such early remains.

The proposed works have the potential to impact upon the setting of the Listed Ricknall Grange farmhouse which overlooks the Ricknall Carrs, although the impact of the proposed works upon its setting is considered to be Minor. Works at Bishop's Fen would have a Negligible impact upon the setting of the Locally Listed Bishop Middleham Deer Park and a non-designated former wagonway.

At Ricknall Carrs there is known to be a significant area of waterlogged deposits of regional significance and similar deposits may be present within the Bishop's Fen site; however, given the shallow depth of the proposed excavations, the impact of the works upon any waterlogged remains is considered to be Minor. The impact of works at both sites on remains detected by the geophysical survey of ditches, palaeochannels and remnants of ridge and furrow cultivation is considered likely to be Negligible, while the effect on any pits would be Minor.

Undetected archaeological remains could be present within both sites. Depending upon their character, the effect of any impact resulting from the proposed works could range from Minor to Moderate/Substantial.

Durham County Council Archaeology Section may require that further archaeological evaluation mitigation be undertaken prior to commencement of the proposed wetland creation works. The mitigation

requirements would be agreed with relevant consultees in due course, but could include trial trencing and/or an auger survey. It is also likely that a watching brief will be required during construction works.

1. INTRODUCTION

1.1.1 Ecus Archaeology was commissioned by the Discover Brightwater Landscape Partnership (the Client) to carry out a desk-based heritage assessment and geophysical survey of two areas of land where it is proposed to improve wetland areas by creating new ponds and channels. Bishop's Fen is located between the A1 Motorway and Sedgefield (centred at NGR NZ 33115 29877) and Ricknall Carrs is located between the A1 and the East Coast Railway Line to the east of Newton Aycliffe (centred at NGR NZ 30995 25191).

1.1.2 Undertaken in November-December 2022, the purpose of the desk-based study and geophysical survey was to identify any heritage assets that could be affected, and the extent to which they could be impacted by the proposed development. The report conforms to the following guidance:

- *NPPF Planning Practice Guidance: Conserving and Enhancing the Historic Environment* (MHCLG 2019);
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists 2020a);
- *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists 2020b);
- *Code of Conduct: Professional ethics in archaeology* (Chartered Institute for Archaeologists 2021);
- *Conservation Principles, Policies and Guidance: for the Sustainable Management of the Historic Environment* (English Heritage 2008);
- *Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment* (Historic England 2015a);
- *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets* (Historic England 2017);
- *Design Manual for Roads and Bridges, documents LA 104 (Environmental Assessment and Montoring), LA 106 (Cultural Heritage Assessment) and LA 116 (Cultural heritage Asset Management Plans)* (Highways England 2020);
- *Yorkshire, the Humber and the North East: A Regional Statement of Good Practice for Archaeology in the Development Process* (South Yorkshire Archaeology Service 2018);
- *Desk-Based Assessment Advice Note (Version 2)* (Durham County Council Archaeology Section 2020);

- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England 2015b); and
- *EAC Guidelines for the Use of Geophysics in Archaeology* (Schmidt *et al*. 2015).

1.1.3 The report describes the location of the proposed development areas (PDA) and their environs, sets out the methodology and information sources used for the desk-based study and the methodology and results from the geophysical survey. Combining the resulting information, it assesses the potential for the proposed development to cause any harm or loss to heritage assets or their setting, and whether the proposals would comply with national and local planning policy as this relates to heritage.

1.1.4 This report is to be submitted to Durham County Council Archaeology Section (DCCAS) who may request further evaluation works, such as trial trenching or core sampling. Should planning permission be granted for the scheme, there is also likely to be the requirement for an archaeological watching brief during creation of the new ponds and channels.

2. LOCATION, TOPOGRAPHY AND GEOLOGY

2.1.1 The Bishop's Fen site is located between the A1 Motorway and Sedgefield, and lies immediately north-west of Hardwick Country Park. The site is crossed from north to south by the River Skerne, which runs in a straight line and has clearly been canalised. The area of the proposed works is located on the floodplain to either side of the river which is relatively level at a height of c.75-77m above Ordnance Datum. The site comprises relatively level pasture fields (Plates 1 and 2)

2.1.2 Ricknall Carrs is located at the eastern side of the A1 to the north-east of Newton Aycliffe, between the motorway and the East Coast Main Line. The site again lies to either side of the River Skerne, although the proposed geophysical survey area is located to the west of the river. The site is also relatively level, at a height of c.69-72m aOD (Plates 3 and 4).

2.1.3 The bedrock below both sites is Permian Dolostone of the Ford Formation (British Geological Survey 2022) At the Bishop's Fen site this is overlain by Quaternary alluvial deposits of clay, silt, sand and gravel, while at Ricknall Carrs the superficial deposits comprise Quaternary lacustrine clays and silts.

2.1.4 Within the Bishop's Fen site are loamy and clayey floodplain soils with naturally high groundwater, while those at Ricknall Carrs are naturally wet fen peat soils (http://www.landis.org.uk/soilscapes/ accessed 25/10/2022).

2.1.5 The geological conditions are deemed to be suitable for magnetometer survey.

3. PLANNING CONTEXT

3.1 Legislation and policy

3.1.1 The legislation, policy and guidance against which development would be considered are:

- Ancient Monuments and Archaeological Areas Act (1979) (e.g. The National Archives 2019a);
- Planning (Listed Buildings and Conservation Areas) Act (1990) (e.g. The National Archives 2019b);
- National Planning Policy Framework (NPPF) (MHCLG 2021);
- Durham County Plan (adopted 2020);
- The Hedgerow Regulations 1997.

Ancient Monuments and Archaeological Areas Act 1979

3.1.2 Statutory protection for archaeological sites and historic structures of national importance is provided by the Ancient Monuments and Archaeological Areas Act 1979.

3.1.3 The Act states that any works affecting a scheduled monument require permission from the Secretary of State, in the form of Scheduled Monument Consent.

Planning (Listed Building and Conservation Areas) Act 1990

3.1.4 Statutory protection for built heritage is principally provided by the Planning (Listed Building and Conservation Areas) Act 1990.

3.1.5 In considering whether to grant planning permission for development that affects a listed building or its setting, Sections 16 and 66 of the Act require authorities to have special regard to the desirability of preserving the listed building or its setting or any features of special architectural or historic interest that it possesses. Section 72 states that special attention shall be paid to the desirability of preserving or enhancing the character or appearance of Conservation Areas.

National Planning Policy Framework (NPPF) (2021)

3.1.6 The NPPF sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development (para. 11). There are three dimensions to sustainable development: economic, social and environmental (para. 8). The purpose of the planning system is to encourage sustainable development that makes a positive contribution to the quality of the built, natural and historic environment, and contributes to the overall quality of people's lives. To this end, economic, social and environmental gains should be sought jointly and simultaneously through the planning system.

3.1.7 Policy 12 addresses the importance of good design of new structures and features in relation to the existing environment. Paragraph 130 requires that any development be 'sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change'.

3.1.8 Policy 16: Conserving and enhancing the historic environment sets out the framework for local planning authorities to make informed decisions on developments that affect heritage assets. Paragraphs 189–208 set out the information requirements and policy principles in relation to heritage assets.

3.1.9 Paragraph 199 states that 'when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.' The NPPF defines setting as 'the surroundings in which a heritage asset is experienced'. Any harm to an asset's significance and setting requires clear and convincing justification and must be weighed against the public benefits resulting from the proposal.

3.1.10 Details of other NPPF paragraphs relevant to this site are set out in Appendix A.

Durham County Plan (adopted 2020)

3.1.11 The Durham County Plan (para. 5.445) notes that "Heritage assets, designated and non-designated, are irreplaceable, so any harm or loss will require clear and convincing justification", and that (para. 5.447) "County Durham has a wide variety of heritage assets that evidence and reflect human interaction with the landscape from prehistoric times to the present. These are manifested in landscapes, towns and villages, individual buildings and features, ancient monuments, open spaces, historic public realm and archaeological sites, with many phases, over time, inter-laid upon one another."

3.1.12 Relevant sections of **Policy 44, Historic Environment** of the Durham County Plan state that:

> "Development will be expected to sustain the significance of designated and non-designated heritage assets, including any contribution made by their setting. Development proposals should contribute positively to the built and historic environment and should seek opportunities to enhance and, where appropriate, better reveal the significance and understanding of heritage assets whilst improving access where appropriate.
>
> **Designated Assets**
>
> Great weight will be given to the conservation of all designated assets and their settings

(and non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments) (164). Such assets should be conserved in a manner appropriate to their significance, irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Development which leads to less than substantial harm to a designated heritage asset will be weighed against the public benefits of the proposal.

Development which leads to substantial harm to, or total loss of, the significance of a designated heritage asset will only be acceptable where it can be demonstrated that it is necessary to achieve substantial public benefits that outweigh that harm or loss, or where all of the following apply:

- the nature of the heritage asset prevents all reasonable uses of the site;
- no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation;
- conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and
- the harm or loss is outweighed by the benefit of bringing the site back into use.

In determining applications, particular regard will be given to the following:

Scheduled Monuments

a. the sustainable management of the monument and its setting.

Listed Buildings

b. respect for the historic form, setting, fabric, materials, detailing, and, any other aspects including curtilage, which contribute to the significance of the building or structure; and

Registered Parks and Gardens

e. the sustainable management of the landscape, its features and setting.

Non-designated Assets

A balanced judgement will be applied where development impacts upon the significance and setting of non-designated heritage assets.

In determining applications which would affect a known or suspected non-designated heritage asset with an archaeological interest, particular regard will be given to the following:

i. ensuring that archaeological features are generally preserved in situ; and

j. in cases where the balanced judgement concludes preservation in situ should not be pursued, it will be a requirement that they are appropriately excavated and recorded with the results fully analysed and made publicly available."

3.1.13 Supporting Information for the policy states that:

"5.453 All applications affecting heritage assets must be accompanied by a satisfactory Statement of Heritage Significance and Impact (Heritage Statement). Applicants will be required to demonstrate a full understanding of the assets' significance, including any contribution made by their setting. Heritage Statements should be produced by a heritage specialist where appropriate and considered necessary by the council and should be proportionate to the assets' importance.

5.454 Relevant research material, including primary sources, conservation area character appraisals, management proposals and neighbourhood plans should be referenced and used to influence development proposals. It is also recommended that the ICOMOS Guidance on Heritage Impact Assessments is referenced(168). As a minimum the HER must be consulted and any available information utilised appropriately.

5.455 Development proposals which may affect archaeological heritage assets shall be informed by sufficient evidence to enable their significance and the potential impact of the proposal to be fully understood.

5.456 Where proposals are likely to affect sites of known importance, sites of significant archaeological potential, or those that become apparent through the development management process, background research followed up by archaeological investigation will be required prior to their determination. This will also be a requirement for greenfield sites of one hectare or more in extent. The findings of this assessment will be a material consideration which informs subsequent mitigation and the determination of the planning application. All resultant information shall be made available in an appropriate form for inclusion in the HER to advance understanding."

The Hedgerows Regulations 1997

3.1.14 The Hedgerows Regulations 1997 were made under section 97 of the Environment Act 1995. They introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside by controlling their removal through a system of notification.

3.1.15 Hedgerows can comprise an important part of both the ecological and contemporary landscape character of an area, with many hedgerows being of archaeological and historical significance. The loss of hedgerows can have an impact on both the significance of the historic landscape character and the setting of local heritage assets and, as such, the proposed removal of a hedgerow that is deemed 'important' by the local planning authority may be of material consideration during the planning process.

3.1.16 Under these Regulations, a hedgerow is 'important' if it has existed for 30 years or more; and satisfies at least one of the criteria listed in Part II of Schedule 1: Archaeology and history criteria. Of relevance to this particular application is Criterion 5(a).

Criterion 5 - The hedgerow:

(a) is recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Inclosure Acts; or

(b) is part of, or visibly related to, any building or other feature associated with such a system, and that system-

(i) is substantially complete; or

(ii) is of a pattern which is recorded in a document prepared before the relevant date by a local planning authority, within the meaning of the 1990 Act (9), for the purposes of development control within the authority's area, as a key landscape characteristic.

3.1.17 It is not envisaged that any hedgerows will be impacted by the current proposals. In the event that an 'important' hedgerow may be subject to removal, it is recommended that advice should be sought from the local planning authority as to whether a written notice to remove the hedgerow will be required under the Hedgerows Regulations.

4. DESK-BASED STUDY

4.1 Methodology

4.1.1 The study included a desk-based review of published and readily accessible documentary, cartographic and aerial photographic evidence.

4.1.2 The study area comprised a 1km radius around the two PDAs (Fig. 2).

4.2 Objectives

4.2.1 The principal objectives of the study were to:

- identify all recorded heritage assets within the study area;
- assess the potential for previously unrecorded assets of archaeological interest to be affected by the proposals and identify areas where mitigation may be required in order to properly define this interest and/or the effects of development on this; and
- propose mitigation measures that could be built into the development proposals to avoid, reduce or remedy any potential adverse effects identified.

4.3 Information sources

4.3.1 This report is based on a review of available information and desk-based studies. As part of this work, the following repositories were consulted:

- County Durham Historic Environment Record (HER);
- published and unpublished historical and archaeological reports;
- Historic England's National Heritage List for England;
- Portable Antiquities Scheme online database;
- primary and secondary sources; and
- other online sources.

4.4 Previous archaeological work

4.4.1 The HER records 26 previous archaeological interventions within the study area, and research has identified an additional previous pollen study and a dendochronological study within the area. These are listed in Appendix B and their locations shown on Figure 2.

4.4.2 Only three of the interventions have direct relevance to the current study. In the 1970s, augering was carried out at a series of sites across southern and eastern County Durham in order to examine

the post-glacial vegetational sequence through pollen analysis (Bartley *et al*. 1976). Three of these sites, designated Mordon Carrs, Nunstainton Carrs and Bishop Middleham, lie within the study areas and are labelled as such on Figure 2. During the 1990s, a dendrochronological study was carried out on sections of bog oak from Swan Carr at the northern edge of the Ricknall Carrs study area (Baillie 1995). The sites all give a direct indication of the types of waterlogged deposits likely to encountered within the current sites. The third intervention was a borehole survey undertaken by Oxford Archaeology North in 2013 as part of an unrelated development proposal (Rutherford 2013). This covered a wide area to the south of the A1/A689 junction (the centre of the survey is marked as E58698 on Figure 2), with several of the boreholes located within the Ricknall Carrs PDA and providing a direct record of deposits within the site.

4.5 LiDAR

4.5.1 The Environment Agency 1m and 2m resolution LiDAR coverage of the PDAs was examined as part of the study but did not identify any earthwork features likely to be of archaeological interest.

4.6 Historic landscape characterisation

4.6.1 The fields within both PDAs are characterised as enclosed land (http://www.durham.gov.uk/hlc).

4.7 Site walkover survey

4.7.1 The sites were inspected as part of the geophysical survey. The objectives of the inspection were to:

- confirm the presence and condition of previously recorded assets;
- identify additional unrecorded heritage assets or the potential for these;
- assess current landscape character, ground conditions and land use; and
- assess any likely impact the development might have on the significance and setting of specific heritage assets and the historic landscape.

4.7.2 The inspection was carried out in in parallel with the geophysical survey. No previously unrecorded heritage assets were identified during the survey.

4.8 Results

4.8.1 The HER search identified a total of 127 heritage assets within the 1km radius search area around the two sites. Of these, 63 records were for aerial photographic recording of blocks of former ridge and furrow cultivation. These are listed in Appendix C, Table C1, and illustrated on Figures 3 and 4.

4.8.2 The remaining heritage assets within the study areas are listed in Appendix C, Table C2 and shown on Figures 5 and 6. Each heritage asset has been allocated a unique number (HA) for the purposes of this report; other designations associated with each asset (such as HER or National Heritage List numbers) are to be found in Table C2.

Table 1: Time periods used (after Historic England 2015c)

Period	Earliest date	Latest date
Upper Palaeolithic	40,000 BC	10,000 BC
Early Mesolithic	10,000 BC	7000 BC
Late Mesolithic	7000 BC	4000 BC
Early Neolithic	4000 BC	3300 BC
Middle Neolithic	3300 BC	2900 BC
Late Neolithic	2900 BC	2200 BC
Early Bronze Age	2600 BC	1600 BC
Middle Bronze Age	1600 BC	1200 BC
Late Bronze Age	1200 BC	700 BC
Early Iron Age	800 BC	300 BC
Middle Iron Age	300 BC	100 BC
Late Iron Age	100 BC	AD 43
Roman	AD 43	AD 410
Early Medieval	AD 410	AD 1066
Medieval	AD 1066	AD 1540
Post-Medieval	AD 1540	AD 1901
20th century	AD 1901	AD 2000

Designated heritage assets

4.8.3 There are no World Heritage Sites or Registered Battlefields within or immediately adjacent to the study area.

4.8.4 Two Scheduled monuments are located within the study areas. Preston-le-Skerne Deserted Medieval Village (NHLE 1002335, **HA 1**) is located c.500m south of the Ricknall Carrs PDA (Fig. 6), while Middleham Castle (NHLE 1002330, **HA 2**) lies c.700m north-west of the Bishop's Fen PDA (Fig. 5).

4.8.5 There are 14 Listed buildings or structures within the 1km search area around the two sites. Eleven of these (**HAs 3-13**) are concentrated in Middleham village 0.9-1.0km north-west of the Bishop's Carr PDA (Fig. 5). Most of this group are Grade II, with the exception of the Church of St Michael and All Angels with is Grade II* (NHLE 1322826, **HA 3**). Other Grade II listed structures include the road bridge over the railway line adjacent to the site of the former Sedgefield Station (NHLE

1121505, **HA 14**), located c.700m south of the Bishop's Fen PDA(Fig. 5). Sawn Carr Farmhouse (NHLE 1121506, **HA 15**) is located c.1km north of the Ricknall Carrs PDA, while Ricknall Grange farmhouse and yard wall to the rear, also listed Grade II (NHLE 1121510, **HA 16**) lies c.450m south-west of the Ricknall Carrs PDA (Fig. 6; Plate 5).

4.8.6 The Grade II* Registered Parks and Garden of Hardwick Park (NHLE 1000730, **HA 17**) lies to the east of the Bishop's Fen PDA (Fig. 5). The part of the park within the 1km study area includes two non-listed garden buildings, the Bono Retiro and The Bath House (**HA 18** and **HA 19**). Immediately to the north of the Bishop's Fen PDA there is also the locally listed Bishop Middleham Deer Park (**HA 20**).

Conservation areas

4.8.7 The Bishop's Fen PDA lies between the Bishop Middleham (Fig. 5) and Hardwick Park Conservation Areas; the latter lies beyond the study area. The Ricknall Carrs PDA lies between the Morden and Aycliffe Village Conservation areas, both of which lie beyond the study area.

Undesignated heritage assets

4.8.8 Apart from ridge and furrow and the two undesignated heritage assets noted above within Hardwick Park, the HER records a further 44 undesignated heritage assets within 1km of the two PDAs.

Prehistoric

4.8.9 The earliest evidence from the area recorded by the HER comprises palaeoenvironmental records from several previous studies. In the 1970s, Bartley *et al*. (1976) examined sediments and pollen from Mordon Carrs (NZ 321 253), from a site at Nunstainton Carrs (NZ 320 295) now located beneath the A1(M), and from near Bishop Middleham (NZ 324 304) (Fig. 2). The study recorded the vegetational sequence of the area since the end of the last ice age. In addition, a dendrochronological study of sections of bog oak from Swan Carr (NZ 315 266; Fig. 2) has provided a chronology spanning the Late Bronze Age and Early-Middle Iron Age (Baillie 1995).

4.8.10 There is evidence for an infilled post-glacial lake (**HA 21**) located to the south-west of Morden. This lake occupied much of the south-eastern part of the Ricknall Carrs PDA (Fig. 6). A borehole survey undertaken by Oxford Archaeology North in 2013 as part of an unrelated development proposal indicated from radiocarbon dating that the lake existed c.8-10 thousand years ago, and is filled with up to 7.5m of organic sediments including peat, with well-preserved pollen remains.

4.8.11 Evidence for Palaeolithic human activity in the North-East as a whole is sparse and restricted to upland sites (Petts and Gerrard (eds) 2006, 14). However, to the south of the Tees in the lowland Vale of Mowbray, North Yorkshire, possible Late Upper Palaeolithic material has been found at several sites including Nosterfield (Dickson 2011, 273–4) and Killerby (Waddington *et al*. 2009, 4–

5), while evidence for human activity in the area during the Windermere Interstadial, a warmer spell near the end of the Ice Age (c.13900–12900 BP) comes from concentrations of charcoal found in pollen samples from Snape Mires, Marfield and Killerby (Bridgland *et al*. 2011, 250–1; Parker and Passmore 2019, 55). It is thus quite likely that similar evidence awaits discovery in lowland County Durham.

4.8.12 Mesolithic finds from lowland County Durham are mainly restricted to flint scatters and individual findspots of lithic material. Although some sites occur in areas such as the Magnesian Limestone plateau, most have been found in areas adjacent to waterways, such as the on either bank of the Tees or in the submerged forest at Hartlepool (Rowe 2006, 18). The current PDAs lie in an area relatively devoid of significant evidence for the period (e.g. Petts and Gerrard (eds) 2006, fig. 9), but recent work in the Vale of Mowbray has shown that Mesolithic finds are generally closely associated with sites adjacent to waterways and other wetland areas (Speed 2021, 124). Previous finds elsewhere along the course of the River Skerne, such as just to the south of the Ricknall Carrs study area at Heworth House (noted in HER entry H6865) indicate that such material may also be present in the current areas.

4.8.13 As for the Mesolithic period, records for the Neolithic and early Bronze Age in lowland County Durham are currently sparse and barely mentioned in the Regional research Framework, with only one 'key' site referenced between the Tees and the Tyne (Petts and Gerrard (eds) 2006, fig. 13). Nevertheless, material from these periods is present in the region, and the current limitations of the evidence likely stem more from the limitations of past fieldwork as from any genuine absence. As with earlier periods, the main evidence comes from flint scatters. A few Neolithic monuments are known, such as possible cursuses at Barford and Copeland House, West Auckland, and possible henges at Copeland House and Chester-le-Street; however, surprisingly few domestic features such as pits have been recorded in the county as a whole.

4.8.14 Evidence from the 1970s pollen study indicates small-scale tree clearance during the Neolithic (4th millennium BC) with more extensive deforestation in the Bronze Age (2nd millennium BC), and cereal pollen occurred shortly after (Bartley *et al*. 1976). Despite this, no Neolithic evidence has been recovered from the current study areas, and the only Bronze Age find is a socketed axe found at Morden Carr at the edge of the former lake (**HA 22**, Fig. 6), although there is more evidence in the wider area such as two Early Bronze Age cremation burials and flint tools found to the south of Newton Aycliffe during construction of the Hitachi train factory (Churchill 2014).

Iron Age and Romano-British

4.8.15 Numerous ditched enclosures thought to represent Iron Age settlement sites have been recorded from aerial photographs in County Durham, but until recently, few of these sites had been

excavated (Petts and Gerrard 2006, 36). However, recent work has greatly expanded their number and increasing numbers of sites lacking substantial boundaries are beginning to be recognised through remote sensing techniques and during excavation, sometimes found as antecedents for Roman settlements (Mason 2021, 10-25). Several Iron Age settlement sites have been discovered to the east and south of Hardwick Hall (ibid, fig. 12.24), that at Brakes Farm only 1km from the Bishop's Fen PDA. A series of archaeological projects in advance of industrial development beyond the current study area to the south of Newton Aycliffe have also found Iron Age farmsteads at Amazon Park (Churchill 2014) and Forrest Park (ongoing project). Nevertheless, despite the wealth of evidence for the period in the wider area, the only record for the period within the current study areas is the find of an Iron Age glass bead at Bishop Middleham Hall (**HA 23**, Fig. 5).

4.8.16 There is more evidence in the vicinity from the Roman period. The Bishop's Fen PDA lies c.1.75km west of the route of Cades Road Roman road (HA **24-6**, Fig. 5) and recent discoveries have demonstrated the presence of an extensive Roman civil settlement flanking the road in Hardwick East Park (Mason 2021, 404-27). To the north of the Bishop's Fen PDA, another Roman road has been suggested in the vicinity of Bishop Middleham (**HA 27**), and to the east of the village it has been speculated that a line of former lakes along the course of the River Skerne may have been canalised during the same period (**HA 28**).

4.8.17 Aerial photographic evidence suggests the presence of a Roman settlement site at Island Farm, Bishop Middleham (**HA 29**), c.500m north of the Bishop's Fen PDA, and this identification is supported by reports of finds of Roman coins and brooches in the same area (**HA 30-32**). A short distance to the west, a set of *patera* (Roman bronze cooking vessels) has been found at Bishop Middleham Deer Park (**HA 33**).

4.8.18 The HER records two additional undated cropmark sites that might represent prehistoric or Romano-British activity, both near Bishop Middleham. One is of a circle with a linear feature (**HA 34**) and the second is a square enclosure (**HA 35**).

4.8.19 No Roman remains have been recorded in the vicinity of the Ricknall Carrs PDA.

Medieval

4.8.20 No early medieval archaeological remains have been recorded in either study area.

4.8.21 From its name Bishop Middleham village (**HA 36**, Fig. 5) is presumably of Anglo-Saxon origin, Middleham literally meaning the middle settlement, perhaps a vill in the centre of an Anglo-Saxon estate (Watts 2002, 77). However, the first surviving documentary reference to the village dates from 1146, and the Boldon Book of 1183 records 32 households in the village. Middleham Castle (**HA 2**), a fortified manor house, was a principal residence of the Bishops of Durham from the 12th

to 14th century, although the earliest surviving documentary evidence is from 1313. Today it only survives as earthworks and small areas of exposed stonework. Geophysical survey and excavations, undertaken as part of a community project in 2019 (Appendix B, E66208 and E74203), have demonstrated the survival of significant archaeological remains of the castle. Adjacent to the castle lay Bishop Middleham Deer Park (**HA 20**) of which parts of the boundary wall survive. This remains as parkland and is registered on the Local List. There is documentary evidence that the medieval castle was also accompanied by a fishpond (**HA 37**).

4.8.22 Elsewhere in Bishop Middleham, the Church of St Michael and All Angels dates from the 13th century and is Listed Grade II* (NHLE 1322826, **HA 3**). The churchyard contains a number of interesting post-medieval memorials (collectively **HA 38**), several of which are individually Listed Grade II (**HA 4-8**), and a Grade II War Memorial (**HA 9**). A hollow way in the village may have a medieval origin (**HA 39**).

4.8.23 The former Hardwick Mill (**HA 40**), which probably had a medieval origin, once stood immediately to the south-east of the Bishop's Fen PDA. The associated mill race (**HA 41**) was mentioned in a charter of possibly 13th century date.

4.8.24 To the south-west of Bishop Middleham, and west of the Bishop's Fen PDA, a stone causeway has been found during ploughing linking the high grounds of Bishop Middleham and Nunstainton (**HA 42**). Nearby at NZ327303 there is the remains of a bridge abutment. Although undated, the causeway is conceivably of medieval origin.

4.8.25 As noted above, the Ricknall Carrs PDA lies c.500m north of the Scheduled site of Preston-le-Skerne Deserted Medieval Village (NHLE 1002335, **HA 1**, Fig. 6). The village was first recorded in 1091 as *Prestetona* and as *Preston super Skiryn* in 1384. The name is Old English in origin and probably means the *Tun* or dwelling of the priests. Whilst possibly suggesting an early ecclesiastical role for the site it is more likely that the village and manor was owned by the Church. Surviving earthworks of the medieval villages' houses and field system can clearly be seen in around the modern farms of Preston Manor Farm and Preston East and West Farms. These farms should be thought of as the successful parts of the village which have been rebuilt and continuously occupied over time. It is likely that much of the village was finally abandoned in the 18th and early 19th centuries, shrinking to the three established farms that remain. The earthworks lie on the south bank of the old course of the River Skerne, and cover an area of c.400m east-west and 160m north-south.

4.8.26 To the north of the Ricknall Carrs PDA, there are earthworks of probable medieval ponds at Great Isle Farm, Bradbury (**HA 43**).

4.8.27 Extensive evidence for ridge and furrow cultivation of either medieval or early post-medieval date has been recorded in both parts of the study area (Figures 3 and 4). However, none of the remains are located within either PDA.

Post-medieval to modern

4.8.28 The earliest post-medieval evidence from the study areas recorded by the HER is documentary evidence for a windmill at Hardwick during the 16th century (**HA 44**, Fig. 5)

4.8.29 Hardwick Park, located to the east of Bishop's Fen, is a Grade II* Listed Park and Garden (**HA 17**). A manor house with domestic chapel is recorded at Hardwick in 1449. The estate was acquired by John Burdon in 1748 and he set about laying out the grounds, augmented from c.1754 by a series of garden buildings designed by James Paine and executed by Durham architect John Bell. Two of these, the Bono Retiro and the Bath House (**HA 18** and **HA 19**) are located within the 1km study area. The estate remained in private hands until 1923. Following various changes of ownership, part of the land was acquired by Durham County Council in the 1970s, Hardwick Hall and part of the gardens is now run as a hotel, and the remaining parts of the former estate are under private ownership and farmed.

4.8.30 The common fields around Bishop Middleham were enclosed in 1693 (Haile 1970, 12). Bishop Middleham Tithe Plan (Davison 1840) shows the north-eastern part of Bishop's Fen divided into several fields, a layout still extant at the time of the 1859 Ordnance Survey map (Fig. 7) but today extensively altered. The south-western part of the PDA was divided into several sub-rectangular fields and denuded remnants of these boundaries survive. This enclosure resulted in a shift from from small scale farming to larger farms being run by fewer labourers (Durham County Council 2012).

4.8.31 At Ricknall Carrs, the First Edition Ordnance Survey map shows that in 1856 the south-eastern part of the PDA was still divided into a series of medieval strip-fields running from north to south running parallel to the River Skerne (Fig. 8). Several of these divisions remain although others have been removed to create wider fields.

4.8.32 Unlike many of the 'pit' villages in the area, Bishop Middleham grew little in the later 19th century it did not acquire the terraced housing seen elsewhere, and in 1894 Francis Whelan described the village as being of 'very primitive appearance'. Although Bishop Middleham Colliery (**HA 45**, Fig. 5) opened in 1845, an attempt to sink an additional shaft at Island Farm in 1870 had to be abandoned due to waterlogging and the colliery was eventually amalgamated with Mainsforth Colliery.

4.8.33 Bishop Middleham brewery opened on Front Street in 1705 (**HA 46**) and was shown on the First

Edition Ordnance Survey map. The building burned down in 1899 and was rebuilt the following year; however, after acquisition by Newcastle Breweries in 1910 the brewery was closed.

4.8.34 Several other buildings or structures within Bishop Middleham are of note. Grade II listed buildings include The Hall in Church Street (NHLE 1121463, **HA 10**), built in c.1765, nearby 18th century walls (NHLE 1121464 and 1322825, **HA 11** and **HA 13**), and The Cottage on High Street (NHLE 1121468, **HA 12**), also 18th century. A group of non-designated farm buildings (**HA 47**), although much altered, are also of probable 18th century origin. Other structures recorded by the HER but only known from 19th century or early 20th century cartographic evidence are a former dovecote at Castle View (**HA 48**) and a former chapel (**HA 49**).

4.8.35 Besides coal mining, another major industry in the area was limestone quarrying. New Kiln Quarry and limekiln (**HA 50**), located to the east of Bishop Middleham village, was active in the mid-19th century, replacing an earlier adjacent quarry (**HA 51**). Quarrying continues at Bishop Middleham quarry to the north-east of the village (**HA 52**). To the south-east of the Bishop's Fen PDA, the First Edition Ordnance Survey map also marks a small sandstone quarry (**HA53**).

4.8.36 The shift to larger farms during the post-medieval period created many of the farmsteads that today exist across the study areas. Several of these are noted by the HER. Island Farm to the south of Bishop Middleham village (**HA 54**, Fig. 5) dates from the 18th century and is possibly built from stone taken from Middleham Castle. To the north-east of the Bishop's Fen PDA, East House Farm and Sprucely Farm (**HA 55** and **HA 56**) are both courtyard farms already in existence by the 19th century. To the west of Bishop's Fen, Thorney Close (**HA 57**) is a small post-medieval farmstead shown on the First Edition Ordnance Survey map, as was the nearby Stony Hall (**HA 58**) which is no longer extant. At Brakes Farm, to the south-east of Bishop's Fen adjacent to Hardwick Park, there are documentary references to farming in the medieval period, although the current farmstead is probably 18th century (**HA 59**). To the north of the Ricknall Carrs site, Sawn Carr farmhouse (**HA 15**, Fig. 6) dates from the 18th while Ricknall Grange farmhouse (**HA 16**) to the south was built in c.1840. As noted above, the modern farms of Preston Manor Farm and Preston East and West Farms to the south of Ricknall Carrs represent the remnant of the deserted medieval village of Preston-le-Skerne (**HA 1**). In addition, the HER records a post-medieval stable at Preston-le-Skerne which was demolished in 2011 (**HA 60**).

4.8.37 The study areas are crossed by several railway lines. Immediately to the north-west of the Bishop's Fen PDA is the earthwork of a former railway line running from north-east to south-west (**HA 61**, Fig. 5). This line is not shown on the First Edition Ordnance Survey map, surveyed in 1856, whereas it is marked on the 1896 revision as "Old Waggonway", connecting the by-then-disused Bishop Middleham Colliery (**HA 45**) to the North East Railway Hartlepool Branch, still extant to the

west of the Bishop's Fen PDA. This originally formed part of the Clarence Railway, opened in 1833, which included a station at Sedgefield (**HA 62**), adjacent to the A689 to the south of Bishop's Fen. Sedgefield Station closed in 1964 and has been demolished; however, a contemporary road bridge over the railway line adjacent to its site is still extant and is Listed Grade II (**HA 14**). From 1835, a branch of the Clarence Railway originally led westwards from Bradbury towards Chilton (**HA 63**), and parts of the track are still traceable.

4.8.38 The HER notes two further 20th century heritage assets. To the north-east of the Bishop's fen PDA lies Bishop Middleham sewage works (**HA 64**) which was established in the early 20th century. The only military asset recorded in the area is a World War II bombing range marker (**HA 65**, Fig. 6) known from aerial photographic evidence, which was located in the north-western part of the Ricknall Carrs PDA.

Potential for previously unrecorded heritage assets

4.8.39 There remains the potential for previously undetected archaeological features to be present within either site. Given the previously wet character of both areas, these are most likely to date from the early prehistoric period when such environments were considered resource-rich and attractive for at least temporary settlement. Any evidence for such activity would be most likely to be found on any slightly higher areas overlooking the edges of what would, at the time, have been wetland areas. The Historic England Science Advisor has observed that particular attention should be paid to the interface between any peat and underlying deposits within areas disturbed during the planned works. Such wetland areas continued to have a ritual significance into the later prehistoric and Romano-British periods, with deposits of metalwork and other material made into the water; this behaviour may account for the find of the Bronze Age axe at Morden Carr (**HA 22**) on the periphery of the former lake.

5. GEOPHYSICAL SURVEY

5.1 Introduction

5.1.1 The surveys at Ricknall Carrs and Bishop's Fen comprised multiple smaller areas targeting the locations of proposed future work and covered c.42 ha in total (Figs. 9 and 10). The survey was carried out in accordance with a Written Scheme of Investigation (Ecus 2022) and was carried out between the 1st and the 15th of November 2022.

5.1.2 The objectives of the survey were to:

- undertake a geophysical survey within the agreed areas deemed suitable for data collection;
- attempt to identify, record and characterise any subsurface remains within the survey boundaries;
- assess the archaeological significance of identified anomalies; and
- identify possible concentrations of past activity in order to inform the requirement for any further archaeological investigation at the site.

5.2 Methodology

5.2.1 The gradiometer survey used Bartington Grad601-2 dual magnetic gradiometer systems with data loggers (Appendix D). Readings were recorded at a resolution of 0.01nT and data was collected with a traverse interval of 1m and a sample interval of 0.25m or less. The survey data was collected either with a cart or with reference to a site survey grid comprised of individual 30m x 30m squares referencing a baseline on NGR NZ 30721.50 25898.27 for Ricknall Carr and NZ 33026.25 29544.80 for Bishop's Fen. The survey was located using Real Time Kinematic (RTK) differential GPS equipment with a positional accuracy of at least 0.1m using OS coordinates and could be relocated by a third party.

5.2.2 The processing was undertaken using TerraSurveyor software and consisted of minimal industry standard processing procedures.

5.2.3 On the greyscale plots (Figs 11-15), positive readings are shown as increasingly darker areas and negative readings are shown as increasingly lighter areas. The interpreted data uses colour coding to highlight specific readings in the survey area (Figs 11-15). In this report, the word anomaly is used to refer to any outstanding high or low readings forming a particular shape or covering a specific area. Appendix E details the terminology and characterisation of anomalies used for interpreting data.

5.3 Mitigating factors

5.3.1 Field boundaries comprised fences and hedges. At the time of survey, dry conditions prevailed which should not have had any negative impact on the collected data. Where necessary, a two-metre buffer was observed along metal fences to minimise the effects of magnetic interference on the survey and to help to reduce any masking of potential buried features.

5.3.2 While there were areas of magnetic interference within the data set the location produced good useable data.

5.3.3 The results of geophysical survey may not reveal all potential archaeology within a survey area, and geological, agricultural and modern features may mask weaker archaeological responses.

5.4 Results and interpretation

5.4.1 For convenience and ease of managing survey data, each survey block was given an Area number (Figs 9 and 10).

5.4.2 Anomalies found within the survey data are listed in Table 2.

Table 2: Survey anomalies

Anomaly	Area	Anomaly type	Description	Interpretation
1	1	Probable archaeology	Linear positive anomaly with east to west orientation	The anomaly is a drainage ditch with a possible northern spur merging into it and is visible on the surface as shallow hollow, not depicted on historical maps. It may also follow an older field boundary.
2	1	Historical feature	Linear positive anomaly with northwest to southeast orientation	The anomaly closely follows a drainage channel depicted on historical OS maps of 1859.
3	2	Probable archaeology	Rectilinear positive anomaly	The anomaly denotes a probable enclosure, but a drainage channel is also a possibility.
4	2	Probable archaeology	Linear positive anomaly with east to west orientation	The anomaly may represent a boundary ditch.
5	2	Probable archaeology	Linear positive anomaly with east to west orientation	The anomaly may represent a boundary ditch.
6	2	Possible archaeology	Circular positive anomaly	The anomaly may denote a pit feature of unknown period.
7	2	Historical feature	Linear positive anomaly with west to east orientation	The anomaly closely follows a drainage channel depicted on historical OS maps of 1859.
8	2	Historical feature	Y shaped Linear positive anomaly with northeast to southwest orientation	The anomaly represents a drainage ditch, visible on the surface and depicted on historical OS maps of 1859.

Anomaly	Area	Anomaly type	Description	Interpretation
9	2	Paleochannel	Broad sinuous linear anomaly stretching from east to west	The anomaly denotes a paleochannel, not clearly visible on the surface.
10	2	Paleochannel	Broad faint linear anomaly oriented east to west	The anomaly denotes a paleochannel, not clearly visible on the surface.
11	4	Probable archaeology	Linear positive anomaly with southwest to northeast orientation	The anomaly may denote a drainage ditch.
12	3	Possible archaeology	Linear positive anomaly with a southwest to northeast orientation	The anomaly may denote a drainage ditch and could be a continuation of no. 11.
13	3	Possible archaeology	Linear positive anomaly with a southwest to northeast orientation	The anomaly may depict a drainage ditch related to the railway bank to the south.
14	4	Possible archaeology	Short linear positive anomaly with northwest to southeast orientation	The anomaly may represent a small drainage ditch connecting with no. 11.
15	6	Possible archaeology	Scatter of positive circular anomalies	The anomalies form a cluster of small pit type features of uncertain date.
16	5	Possible archaeology	Circular positive anomalies	The anomalies form a cluster of pit type features.
17	3, 4	Possible archaeology	Circular positive anomalies	The anomalies possibly denote mostly isolated pit type features.
18	3	Historical feature	Linear positive anomaly with a northwest to southeast orientation	The anomaly closely follows a drainage channel depicted on historical OS maps of 1859, 1898 and 1923.
19	5	Historical feature	Linear positive anomaly with a northwest to southeast orientation	The anomaly closely follows a field boundary depicted on historical OS maps of 1859, 1898 and 1923.
20	5	Paleochannel	Broad linear anomaly with a northwest to southeast orientation	The anomaly denotes a paleochannel, not visible on the surface.
21	4	Paleochannel	Broad linear anomaly with a west to east orientation	The anomaly denotes a paleochannel, not visible on the surface.
22	3	Paleochannel	Broad linear anomaly with a west to east orientation	The anomaly denotes a paleochannel, not visible on the surface.
23	7	Probable archaeology	Irregular shaped positive anomaly	The anomaly may denote a pit type feature
24	7	Probable archaeology	Irregular shaped positive anomaly	The anomaly may denote a pit type feature
25	7	Possible archaeology	Curvilinear positive anomaly with east to west orientation	The anomaly may be a drainage ditch entering into historical channel 32.
26	7	Possible archaeology	Curvilinear positive anomaly with east to west orientation	The anomaly is possibly a field boundary ditch.
27	7	Possible archaeology	Curvilinear positive anomaly	The anomaly may be a drainage or boundary ditch.
28	7	Possible archaeology	Curvilinear positive anomaly with northeast to southwest orientation	The anomaly is possibly a field boundary ditch or remnant of a paleochannel.

Anomaly	Area	Anomaly type	Description	Interpretation
29	7	Possible archaeology	Linear positive anomaly with north to south orientation	The anomalies denote ditch features, possibly drainage related. Might be linked to no. 30.
30	7	Possible archaeology	Linear positive anomaly with north to south orientation	The anomalies denote ditch features, possibly drainage related. Might be linked to no. 29.
31	7	Possible archaeology	Linear positive anomaly with northeast to southwest orientation	The anomaly is possibly a drainage ditch extending from historical channel 32.
32	7	Historical feature	Linear positive anomaly with west to east orientation	The anomaly closely follows a drainage channel depicted on historical OS maps of 1859.
33	7	Historical feature	Linear positive anomaly with west to east orientation	The anomaly closely follows a field boundary depicted on historical OS maps of 1859, 1898 and 1923.
34	7	Paleochannel	Curvilinear positive anomalies	The anomalies most likely denote remnants of paleochannels
35	8	Historical feature	Linear anomaly with east to west orientation	The anomaly matches a water channel depicted on historical OS maps of 1859, 1898 and 1923.
36	8	Historical feature	Broad curvilinear anomaly	The anomaly matches the location of a trackway depicted on historical OS maps of 1898 and 1923. The anomaly is depicted on OS maps from 1859 as a water channel.
37	8	Paleochannel	Curvilinear positive anomalies	The anomalies most likely denote remnants of paleochannels

5.5 Discussion

5.5.1 The geophysical survey produced usable data of the fields under study, though some areas are obscured by the masking effect of highly magnetic readings.

5.5.2 Survey Areas 1 and 2 were at Ricknall Carr (Fig. 9) and Areas 3-8 were at Bishop's Fen (Fig. 10).

5.5.3 Area 1 was located between the west bank of the canalised River Skerne and the A1 motorway. The area appears to be part of an old flood plain with few features of archaeological interest identified. Feature 1 is an east to west oriented drainage ditch running parallel to the fence to the south, with a short northern spur ditch joining it (Fig. 11). The ditch is visible on the surface and has a low bank on the south side. Feature 2 is a remnant of a water channel depicted on OS 6inch map from 1859. Other features within the field are either field drains (orientated south-west to north-east or north-west to south-east) or possibly furrow marks. There is a noticeable increase in magnetic noise to the west of Feature 2, it was also noted on site that the ground levels in this area were slightly elevated, possibly as a result of soil moving activities during construction of the adjacent A1(M). A similar type of magnetic noise, but to a lesser degree, is visible in the southern half of the area to the east of Feature 2. This may be related to an introduced soil, but may also be an effect of waterlogging.

5.5.4 Area 2 was located along west side of River Skerne and south of Area 1 (Fig. 12). The area contained few features of archaeological interest but like Area 1 mainly showed features related to drainage. Feature 3 is a doglegged probable enclosure ditch cut by the current boundary ditch. A straight linear feature (4) extends eastwards from the north end of Feature 3; however, the feature is probably unrelated to no. 3 and is possibly a field boundary. Feature 5 is also likely to be a field boundary or a drainage ditch. Feature 7 is a linear boundary depicted on the OS 6-inch map of 1859, along with Feature 8, a large Y-shaped drainage ditch, visible on the surface. Field drains are visible, predominantly orientated roughly from north to south, and furrow marks area visible as narrow parallel lines with an east to west orientation. Two sinuous east to west oriented paleochannels 9 and 10 are also visible within the field, though 10 is a much fainter anomaly. The area to the north of paleochannel 9 contains the same magnetic noise present in Area 1, and its close alignment to the paleochannel suggests it might be a waterlogging effect.

5.5.5 Area 3 at Bishop's Fen (Fig. 13) was located in a fork between two dismantled railway lines, the northern one first shown on the 1859 OS 6-inch map and by 1923 reused as the Bishop Middleham Quarries Railway, and the southern one labelled as Fishburn Colliery Railway on the 1923 OS 6-inch map. Feature 13 is a linear ditch feature which may denote either a water channel depicted on the OS 6-inch map of 1859, a field boundary depicted on the OS 6-inch map of 1898 or a ditch along a railway bank depicted on the OS 6-inch map of 1923. Feature 18 is visible on the surface as a linear depression corresponding to a water channel depicted on the OS 6-inch map of 1859 and depicted as field boundary on the OS 6-inch maps from 1898 and 1923. A faint linear feature, 12 may be a continuation of Feature 11 from Area 4 and could connect with channel 18. Paleochannel 22 comprises amorphous interconnected linear positive anomalies that appear to be oriented from east to west. Field drains are faintly visible within the field, orientated from southwest to northeast.

5.5.6 Area 4 was located north of the dismantled railway line and northeast of Area 3 (Fig. 13). Feature 11 is a possible water channel or track/road, although as it is not depicted on historical OS maps it is difficult to be sure which type of feature it represents. Short linear feature 14 may be the remnant of a drainage ditch, connected to Feature 11. Faint amorphous anomalies cross through the area from east to west and probably represent paleochannel activity (21). A few possible pit type features (17) are visible in the field.

5.5.7 Area 5 was located north of the dismantled railway line and northeast of Area 4 (Fig. 13). It contains Feature 19, which is a field boundary depicted on the OS 6-inch map of 1859 to 1923. A cluster of possible pit type features 16 can be found within and around paleochannel 20. Furrows are vaguely visible in the data as narrow parallel lines orientated from southwest to northeast.

5.5.8 Area 6 was located on the south side of the dismantled railway line and south of Area 4 (Fig. 13). It contained a cluster of small possible pit type features (15). Possible furrow marks are also faintly visible within the field.

5.5.9 Area 7 was located south of the railway line and south of Area 3 (Fig. 14). It contains two historical features and several possible features which may be of archaeological interest. Feature 32 is a channel depicted on the OS 6-inch map of 1859 and Feature 33 is a field boundary depicted on the OS 6-inch maps from 1859 onwards. Features 29 and 30 are potentially both the same feature and may represent a ditch. Feature 31 is a straight ditch, extending from feature 32 and may be a water diversion or drainage ditch for the field. Other linear features, 25-28, could all be either field boundaries or drainage features. Two irregular shaped anomalies (23-24) in the southwest corner of the surveyed area may represent large pits or old water holes/ponds. Field drains are visible at regular intervals running from east to west. Paleochannels (34) are visible within the field, curving from the east towards the southwest. A few furrow marks are also visible running from north or northwest to south or southeast.

5.5.10 Area 8 was located in the next field south of area 7. It contained few features of archaeological interests (Fig. 15). Feature 35 is a channel or drainage ditch depicted on OS 6inch map from 1859, 1898 and 1923. Feature 36 is possibly a track depicted on OS 6inch map from 1898 and 1923 or water channel at same location on OS 6inch map from 1859. Paleochannel 37 is visible, stretching from northeast corner and to the south limit. Field drains are visible as east to west broadly spaced linear features. Furrow marks are visible as narrow spaced linear with either east to west orientation or north to south.

5.5.11 Overall, the survey has shown that potential archaeological features are visible within the survey data. Although the majority of features identified appear to be related to drainage of the areas or historical field boundaries, there are areas, often along paleochannels, which may hold features of human activities not visible in the dataset.

5.6 Archive

5.6.1 The records of the geophysical survey are currently held by Ecus.

5.6.2 In determining which material will form part of the archive, the Chartered Institute for Archaeologist Archive Selection Toolkit will be used (available online at http://cifa.heritech.net/selection-toolkit).

5.6.3 The archive will be prepared in accordance with national guidelines (Brown 2011; CIfA 2020b). The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate. Digital records of the geophysical survey will be held by Ecus.

5.6.4 The archiving of the digital data arising from the project will be undertaken in a manner consistent with professional standards and guidance (Archaeology Data Service/Digital Antiquity 2011). Preparation of the digital archive will follow policy, guidance and procedures issued by the Archaeology Data Service (2020), Historic England (https://historicengland.org.uk/research/methods/archaeology/archaeological-archives/adapt-tookit/) and DigVentures (https://digventures.com/projects/digital-archives/).

6. ASSESSMENT OF SIGNIFICANCE AND IMPACT

6.1.1 This section discusses the significance of those heritage assets that could be affected by the development proposals in either the construction or operational phases, and the potential impact of the proposals on this significance.

6.1.2 The importance of the remains is assessed against the criteria set out in the Design Manual for Roads and Bridges document LA 104 (Highways England 2020). The criteria for understanding the significance of heritage values is provided in Appendix F. The criteria for assessing the value of the asset is set out in Table F1, the magnitude of impact is set out in Table F2 and the criteria to assess the significance of effects of impact is provided in Table F3.

6.2 Development description

6.2.1 The archaeological assessment works and geophysical survey were initiated by the Discover Brightwater Landscape Partnership in support of a planning application for a proposed scheme to improve wetland areas at two sites in County Durham. Bishop's Fen is located between the A1 Motorway and Sedgefield (centred at NGR NZ 33115 29877) and Ricknall Carrs is located between the A1 and the East Coast Railway Line to the east of Newton Aycliffe (centred at NGR NZ 30995 25191).

6.2.2 The proposal at both sites is to create a series of new ponds and channels. The scrapes are likely to a maximum of c.0.5m deep. Although no detailed methodology for the work is currently available, it is likely that these will be created using a tracked or wheeled back-acting mechanical excavator with minimal, if any, additional temporary infrastructure (such as works compounds or access trackways) required.

6.3 Potential impacts

Designated assets

6.3.1 The proposed development would have no impact upon Scheduled remains of Preston-le-Skerne Deserted Medieval Village (**HA 1**) or Middleham Castle (**HA 2**) which lie respectively c.500m and c.700m from their nearest PDA.

6.3.2 Of the 14 listed buildings within the two study areas, 11 (**HA 3-13**) are located within Bishop Middleham village 0.9-1.0km north-west of the Bishop's Carr PDA and will not be impacted by the proposed development. The Grade II road bridge over the railway line adjacent to the site of the former Sedgefield Station (**HA 14**) is located c.700m south of the Bishop's Fen PDA and, being largely concealed within a railway cutting, is not intervisible with the PDA. The proposed works will therefore have no impact upon its setting.

6.3.3 Only two listed buildings were located within the Ricknall Carrs study area. Sawn Carr Farmhouse (**HA 15**) is located c.1km north of the site. The farmhouse stands on slightly elevated land and therefore overlooks the proposed development area; however, given the distance between the two, any impact of the proposals upon its setting is considered to be Negligible. Ricknall Grange farmhouse and yard wall to the rear (**HA 16**) also stands on higher ground, located c.450m south-west of the Ricknall Carrs PDA. This elevated position means that it also overlooks parts of the site (Plate 6). However, despite this closer proximity, although the asset is of Medium importance (Table F1), the impact of the proposed works upon their setting is considered to be Minor (Table F2) and the significance of the effect upon them to therefore be Minor (Table F3).

6.3.4 The Grade II* Registered Parks and Garden of Hardwick Park (**HA 17**) lies c.0.9km to the east of the Bishop's Fen PDA; however, intervening belts of woodland mean that the two areas are not intervisible and the proposed works will therefore have no impact upon the setting of the park.

6.3.5 The Locally Listed Bishop Middleham Deer Park (**HA 20**) is located immediately to the north of the Bishop's Fen PDA. This is of only local (Low) significance and, given the nature of the proposed works, the impact of the development upon it is considered to be Minor and the significance of effect upon its setting would be Negligible.

Non-designated assets

6.3.6 At Bishop's Fen, non-designated assets to the east of the PDA are screened from the site by woodland (Fig. 5), and the proposed works will have no impact upon their setting. Most of the remaining non-designated assets are located 0.5-1.0km from the site (and many are not intervisible with it) so any impact upon their setting will be Negligible. Several assets shown on Figure 5 are located closer to the PDA. However, most of these are no longer extant, including Hardwick Mill (**HA 40**), a 19th century sandstone quarry (**HA 53**), Thorny Close farmhouse (**HA 57**) and Stony Hall (**HA 58**), while the buried remains of an undated causeway (**HA 42**) are not visible. The only extant and visible asset close to the PDA is the former wagonway (**HA 61**). This is of only local (Low) significance, the impact of the proposed works upon its setting would be Minor and the significance of effect therefore Negligible.

6.3.7 The HER does not record any heritage assets within the Bishop's Fen PDA. However, the geophysical survey (Areas 3-8) recorded several infilled ditches and channels. Some of these could be equated to features shown on historical mapping. There were also several groups of undated possible pits. All of these features are considered to be of Low (local) significance. Given the shallow depth of the proposed works (up to c.0.5m), any impact upon the ditches or channels would be Minor and the significance of effect Negligible. For any pits that might be present, the impact would likely be Moderate and the significance of effect Minor. Faint traces of former furrows were

detected in several of the geophysical survey areas. These remains are of Negligible importance. However, where they occur within the proposed areas of excavation, the impact of the works upon them would be Moderate but the overall significance of that impact would be Negligible.

6.3.8 The area may also contain waterlogged deposits (peat) of possible regional (Medium) palaeoenvironmental significance. However, due to the shallow depth of the proposed works, it is considered that any impact upon such deposits would be Minor and the significance of that effect also Minor.

6.3.9 At Ricknall Carrs, two non-designated assets have been recorded within the site boundary, a Second World War bombing range marker (**HA 65**). However, this is no longer extant, and the proposed development will therefore have no impact upon it. Much of the site also overlies an infilled post-glacial lake (**HA 21**). The borehole survey undertaken by Oxford Archaeology North (Rutherford 2013) has shown that deposits within this basin contain Holocene palaeoenvironmental evidence of regional significance and extend to depths of up to c.7.5m. However, despite the Medium importance of these remains, the shallow nature of the proposed works means that any impact upon the remains will be Minor and the significance of that effect would therefore be considered to be Minor.

6.3.10 The geophysical survey at Ricknall Carrs identified several infilled ditches and palaeochannels. Several of these could be related to features depicted on historic mapping while others remain undated. The shallow depth of the proposed works means that any impact upon the ditches or channels would be Minor and the significance of effect Negligible.

6.3.11 There is the possibility that additional, undetected, archaeological remains could be present within both sites. The Historic England Regional Science Advisor has observed that early prehistoric lithic scatters are commonly found at the base of peat deposits, and it is quite possible that such material may be present at one or both of the sites (see para. 4.8.12 above). Depending upon their extent and level of preservation, and any association with in situ waterlogged deposits, any such groups of material would be of either local or regional (Low or Medium) significance. Should they be present in areas subject to excavation as part of the proposed scheme, the impact upon them would likely be Moderate or Major. Depending upon the circumstances, the significance of that impact could range from Minor to Moderate/Substantial.

6.4 Mitigation

6.4.1 Mitigation measures can be incorporated at various stages during the design and construction of the scheme and should be adopted in the following hierarchy:

- firstly, avoid adverse impacts as far as possible by use of preventative measures, including scheme design;
- secondly, minimise or reduce adverse impacts to 'as low as practicable' levels; and
- thirdly, remedy or compensate for adverse impacts that are unavoidable and cannot be reduced further.

6.4.2 Mitigation should consider the assessment of significance, assessment of impact and tolerance of the asset to change.

6.4.3 In advance of the proposed works, DCCAS may request further evaluation works at one or both sites, such as trial trenching or core sampling. Should planning permission be granted for the scheme, there is also likely to be the requirement for an archaeological watching brief during creation of the new ponds and channels.

7. CONCLUSIONS

7.1.1 This report has sought to identify any heritage assets within the PDAs and their environs, the significance of which could potentially be affected by the development proposals for the site. The document has assessed the significance of the heritage assets and the potential impact on them from the proposed development. It has also assessed the potential for previously unrecorded heritage assets to be present within the PDAs and the potential for them to be affected by the planning proposal.

7.1.2 This document has identified all the recorded heritage assets, and the potential for previously unrecorded assets, within a study area extending 1km in radius from the PDAs that may be affected by the proposed development. It has assessed the significance of these assets and the potential impact to them.

7.1.3 The archaeological assessment identified a total of 127 heritage assets within the study areas, of which 63 records were for aerial photographic recording of blocks of former ridge and furrow cultivation and several more were artefact find spots or recorded features which are no longer extant. Most of the remaining heritage assets lie at a distance from the PDAs and will be unaffected by any development. Exceptions include the Listed Ricknall Grange farmhouse (**HA 16**) which overlooks the Ricknall Carrs PDA, although the impact of the proposed works upon its setting is considered to be Minor. The Locally Listed Bishop Middleham Deer Park (**HA 20**) and a non-designated former wagonway (**HA 61**) are located immediately to the north of the Bishop's Fen PDA, but the impact of the proposed works upon the setting of both assets is considered Negligible.

7.1.4 At Ricknall Carrs there is known to be a significant area of waterlogged deposits of regional significance (**HA 21**), and similar deposits may be present within the Bishop's Fen site. However, given the shallow depth of the proposed excavations, the impact of the works upon any waterlogged remains is considered to be Minor.

7.1.5 The geophysical survey has shown that both PDAs contain below-ground remains ditches, palaeochannels of the River Skerne and, in the case of Bishop's Fen, possible pits and remnants of ridge and furrow cultivation. The significance of the impact of the proposed works upon the ditches, palaeochannels and ridge and furrow is considered negligible, and for any pits that might be present it would be Minor.

7.1.6 Undetected archaeological remains could be present within both sites. Depending upon their character, the effect of any impact resulting from the proposed works could range from Minor to Moderate/Substantial.

7.1.7 DCCAS may require that further archaeological evaluation mitigation be undertaken prior

commencement of the proposed wetland creation works. The mitigation requirements would be agreed with relevant consultees in due course but could include trial trenching and/or an auger survey. to development of the site. It is also likely that a watching brief will be required during construction works.

7.1.8 The extent and timing of any further archaeological works should be agreed with DCCAS (MHCLG 2021, Policies 4 and 16).

7.1.9 An OASIS form has been completed on the results of the works (Appendix G). Following approval, a pdf version of this report will be submitted within three months to the Archaeology Data Service via the OASIS form.

8. References

Archaeology Data Service/Digital Antiquity (2011) *Guides to Good Practice*. York: Archaeology Data Service, University of York.

Archaeology Data Service (2020) *Guidelines for Depositors: Preparing Datasets (version 4.0)*. https://archaeologydataservice.ac.uk/advice/PreparingDatasets

Aspinal, A., Gaffney., C and Schmidt, A. (2008) *Magnetometry for Archaeologists*. Plymouth: Altamira Press.

Baillie, M.G.L. (1995) *A slice through time: dendrochronology and precision dating*. London: Batsford.

Bartington Instruments Ltd. (n.d.) *Grad601 Single Axis Magnetic Field Gradiometer system*. Oxford: Bartington Instruments Ltd.

Bartley, D. D., Chambers, C. and Hart-Jones, B. (1976) 'The vegetational history of parts of south and east Durham'. *New Phytologist* 77(2), 437-68.

Bridgland, D., Innes, J., Long, A. and Mitchell, W. (eds) (2011) *Late Quaternary Landscape Evolution of the Swale-Ure Washlands, North Yorkshire*. Oxford: Oxbow Books.

British Geological Survey (BGS) (2022) *Geology of Britain Viewer*. https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/

Brown, D. H. (2011) *Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation. Second Edition*. Published by IfA on behalf of the Archaeological Archives Forum (AAF).

Chartered Institute for Archaeologists (CIfA) (2020a) *Standard and guidance for historic environment desk-based assessment*. Reading: Chartered Institute for Archaeologists.

Chartered Institute for Archaeology (CIfA) (2020b) *Standard and guidance for archaeological geophysical survey*. Reading: Chartered Institute for Archaeologists.

Chartered Institute for Archaeologists (CIfA) (2020c) *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*. Reading: Chartered Institute for Archaeologists.

Chartered Institute for Archaeologists (CIfA) (2021) *Code of Conduct: professional ethics in archaeology*. https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2021.p

df

Churchill, D. (2014) *Hitachi Intercity Express Manufacturing Plant, Amazon Park, Newton Aycliffe, County Durham: Post-Excavation Assessment Report*. Unpublished Wardell Armstrong Archaeology Report 10448. https://doi.org/10.5284/1028188

Dickson, A. (2011) 'Appendix 2: Lithics', in Dickson,A. and Hopkinson, G., (eds) *Holes in the Landscape: Seventeen Years of Archaeological Investigations at Nosterfield Quarry, North Yorkshire*, 271–310.

Durham County Council (2012) *Bishop Middleham Conservation Area Appraisal*. https://www.durhum.gov.uk/BishopMiddlehamCA

Durham County Council (2020) *County Durham Plan (adopted 2020)*. https://www.durham.gov.uk/article/3266/Development-Plan-for-County-Durham

Ecus (2022) *Ricknall Carrs and Bishop's Fen, County Durham: Written Scheme of Investigation for Geophysical Survey*. Unpublished Ecus Ltd Report NAA 22/56.

English Heritage (2008) *Conservation Principles, Policies and Guidance: for the Sustainable Management of the Historic Environment*. London: English Heritage.

Gaffney, C. and Gater, J. (2003) *Revealing the Buried Past*. Stroud: Tempus Publishing.

Haile, N. (1970) *A Short History of Bishop Middleham*.

Highways England (2020) Design Manual for Roads and Bridges. https://www.standardsforhighways.co.uk/dmrb

Historic England (2015a) *Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment*. Swindon: Historic England. https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/

Historic England (2015b) *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide*. Swindon: Historic England.

Historic England (2015c) *Periods List*. https://heritage-standards.org.uk/wp-content/uploads/2015/08/Periods-List-HE-FISH-WP.pdf

Historic England (2017) *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets*. Swindon: Historic England. https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets

Mason, D. J. P. (2021) *Roman County Durham: The Eastern Hinterland of Hadrian's Wall*. Durham County Council.

Ministry of Housing, Communities and Local Government (MHCLG) (updated 2019) *NPPF Planning Practice Guidance: Conserving and Enhancing the Historic Environment*. https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment

Ministry of Housing, Communities and Local Government (MHCLG) (2021) *National Planning Policy Framework*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

Parker, L. and Passmore, D. (2019) Killerby Quarry Geoarchaeological Study. Archaeological Research Services Ltd Report 2019/140. https://www.archaeologicalresearchservicescom/wp-content/uploads/2019/07/Geoarchaeological-Study.pdf

Rowe, P. (2006) 'The Mesolithic period in Teesside', in Petts, D., and Gerrard, C. (eds), *Shared Visions: The North-East Regional Research Framework for the Historic Environment*. Durham County Council, 18-9.

Rutherford, M. (2013) *The Isles Wind Farm, Durham: Interim Palaeoenvironmental Augering Report*. Unpublished Oxford Archaeology North Report L10657.

Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J. (2015) *EAC Guidelines for the Use of Geophysics in Archaeology*. EAC Guidelines 2. Belgium: Europae Archaeologiae Consilium.

Soil Survey of England and Wales (1983) *Soils of England and Wales 1:250 000 Map Sheet 1: Northern England*. Southampton: Ordnance Survey.

South Yorkshire Archaeology Service (SYAS) (2018) *Yorkshire, the Humber and the North East: A Regional Statement of Good Practice for Archaeology in the Development Process*.

Speed, G. P. (2021) *Living between the Monuments: Prehistoric evidence from the A1 Dishforth to Barton Improvement Schemes, North Yorkshire*. https://doi.org/10.5284/1086870

The National Archives (2019a) *Ancient Monuments and Archaeological Areas Act (1979)*. https://www.legislation.gov.uk/ukpga/1979/46

The National Archives (2019b) *Planning (Listed Building and Conservation Areas) Act (1990)*. https://www.legislation.gov.uk/ukpga/1990/9/contents

Waddington, C., Brightman, J. and Shakarian, J. (2009) *Killerby Prospect Fieldwalking Evaluation*. Unpublished Archaeological Research Services Ltd report. https://www.archaeologyresearchservices.com/wp-content/uploads/2018/08/Fieldwalking-Study-2009.pdf

Watts, V. (2002) *The Place Names of County Durham*. Nottingham : English Place-Name Society.

Whellan, F. & Co. (1894) *History, Topography and Directory of the County Palatine of Durham*. London: Ballantyne, Hanson & Co.

Online sources

National Library of Scotland maps: http://maps.nls.uk/

Historic England National Heritage List for England: https://historicengland.org.uk/advice/hpg/heritage-assets/nhle/

Old Maps: www.old-maps.co.uk

Google Earth: http://earth.google.co.uk

MAGIC (DEFRA): http://magic.defra.gov.uk/MagicMap.aspx

The Hedgerow Regulations (1997) https://www.legislation.gov.uk/uksi/1997/1160/contents/made

Cartographic sources

Davison, T. (1840) *Bishop Middleham Tithe Plan*. Durham Diocesan Records DDR/EA/TTH/1/18.

Ordnance Survey (1859) Six-inch map sheet Durham XLIII (surveyed 1856)

Ordnance Survey (1861) Six-inch map sheet Durham XXXV (surveyed 1857)

Ordnance Survey (1898) Six-inch map sheet Durham XXXV.SE (revised 1896)

Ordnance Survey (1898) Six-inch map sheet Durham XLIII.NE (revised 1896)

Ordnance Survey (1898) Six-inch map sheet Durham XLIII.SW (revised 1896)

Ordnance Survey (1898) Six-inch map sheet Durham XLIII.SE (revised 1896)

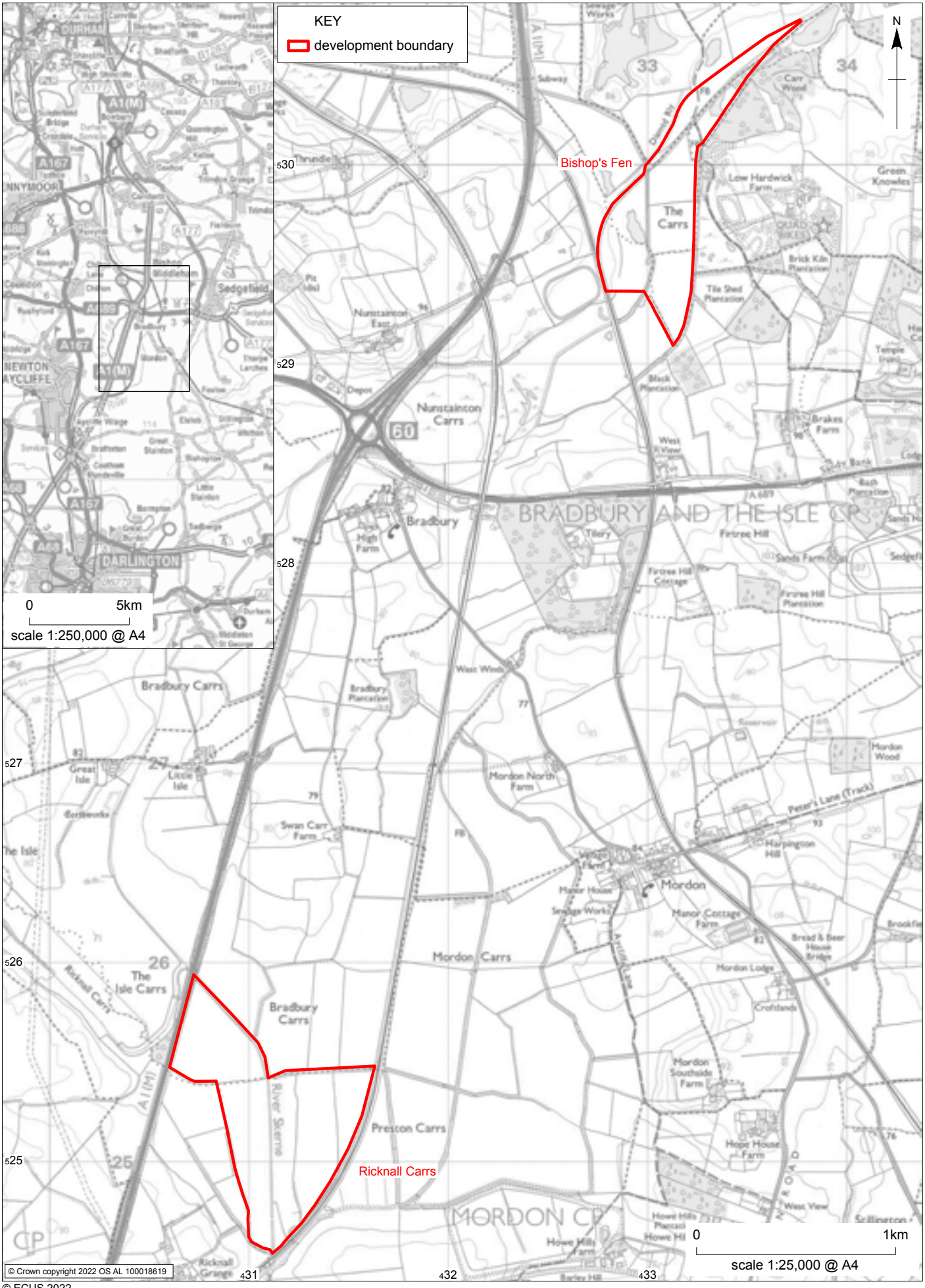
Ordnance Survey (1923) Six-inch map sheet Durham XXXV (revised 1914-5)

Ordnance Survey (1923) Six-inch map sheet Durham XLIII.NE (revised 1914)

Ordnance Survey (1923) Six-inch map sheet Durham XLIII.SW (revised 1914-5)

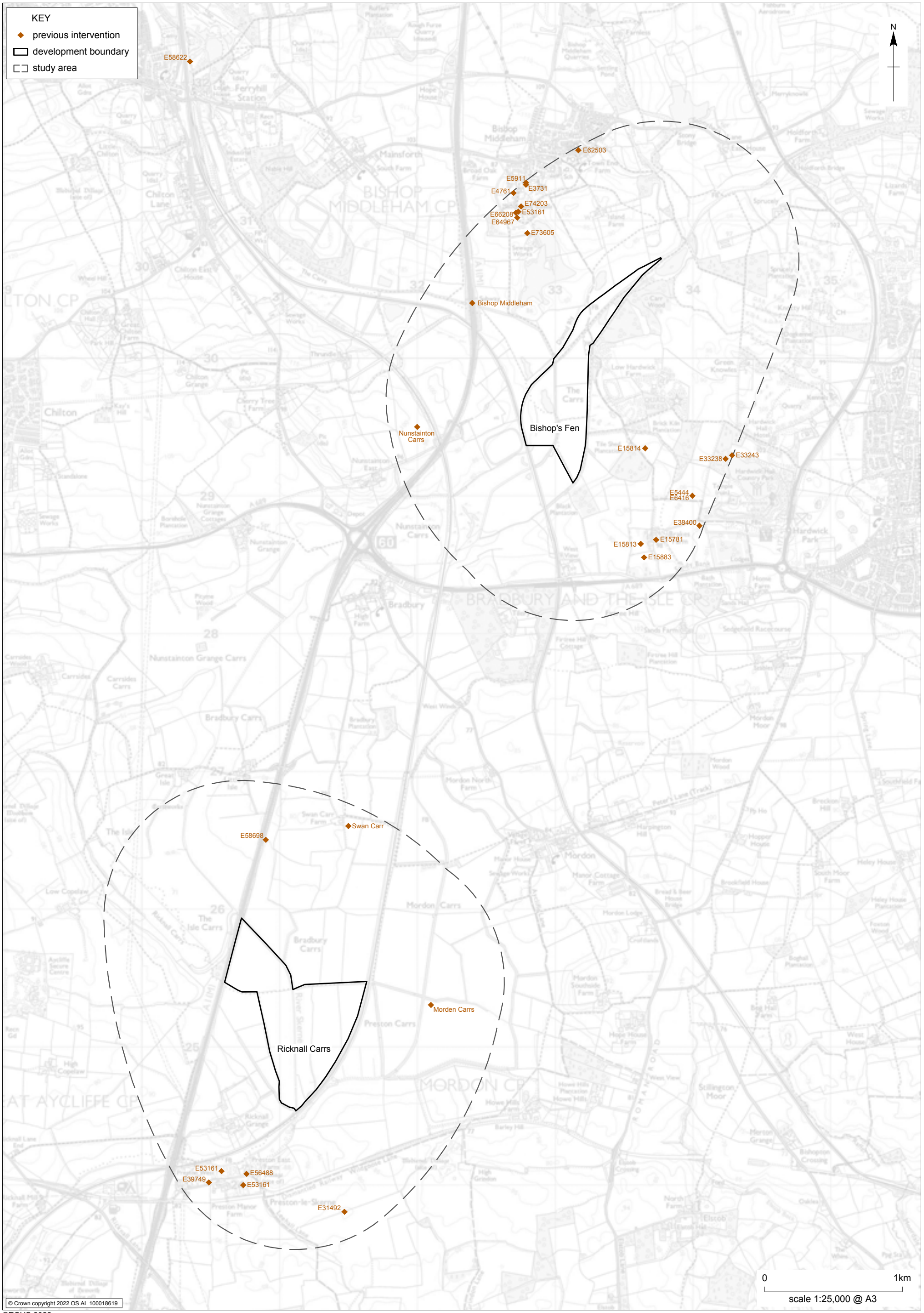
Ordnance Survey (1923) Six-inch map sheet Durham XLIII.SE (revised 1914-5)

Ordnance Survey (1951) Six-inch map sheet Durham XLIII.NE (revised 1948)



Ricknall Carrs and Bishop's Fen: site locations

Figure 1

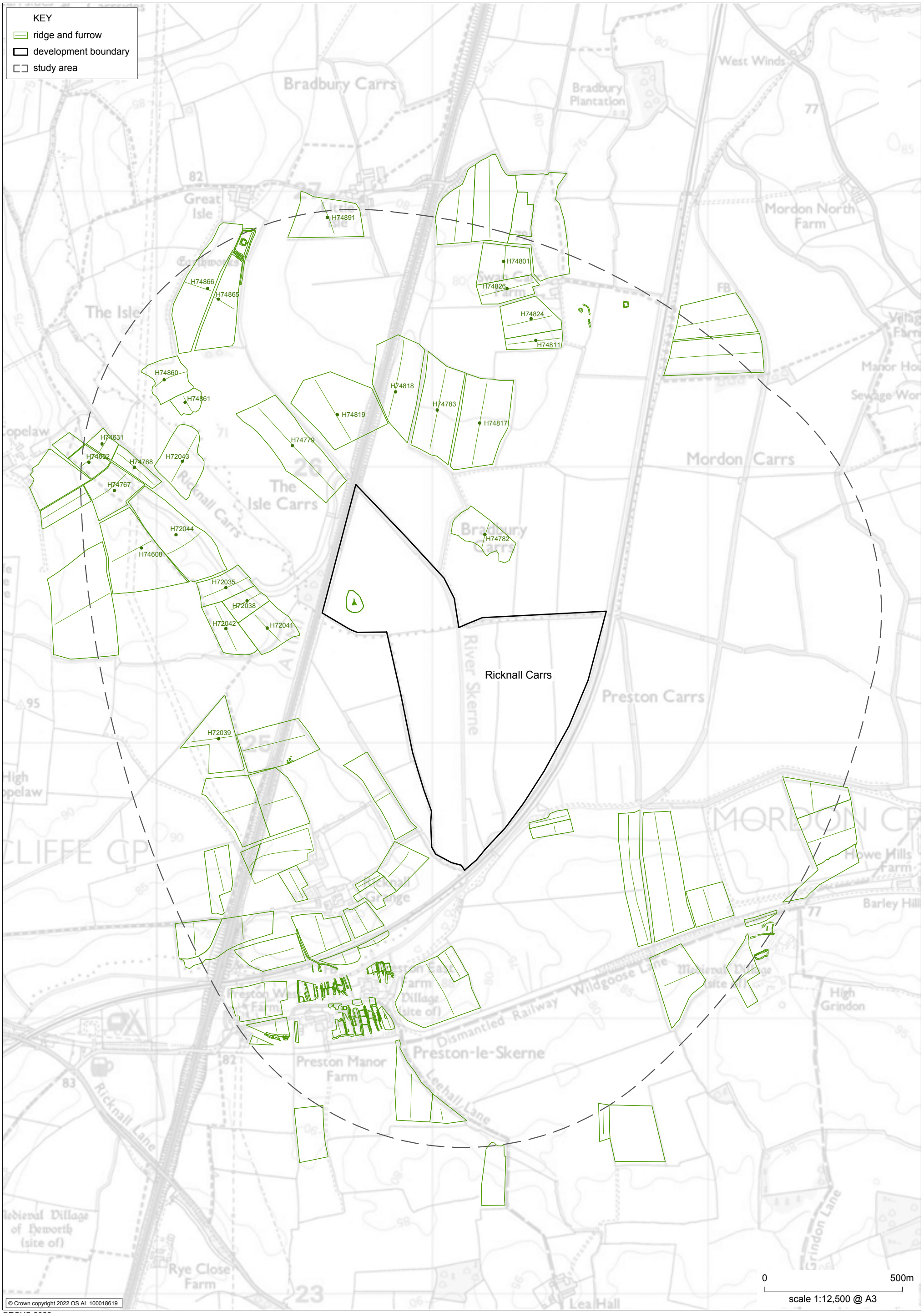


Ricknall Carrs and Bishop's Fen: previous interventions in the study area

Figure 2

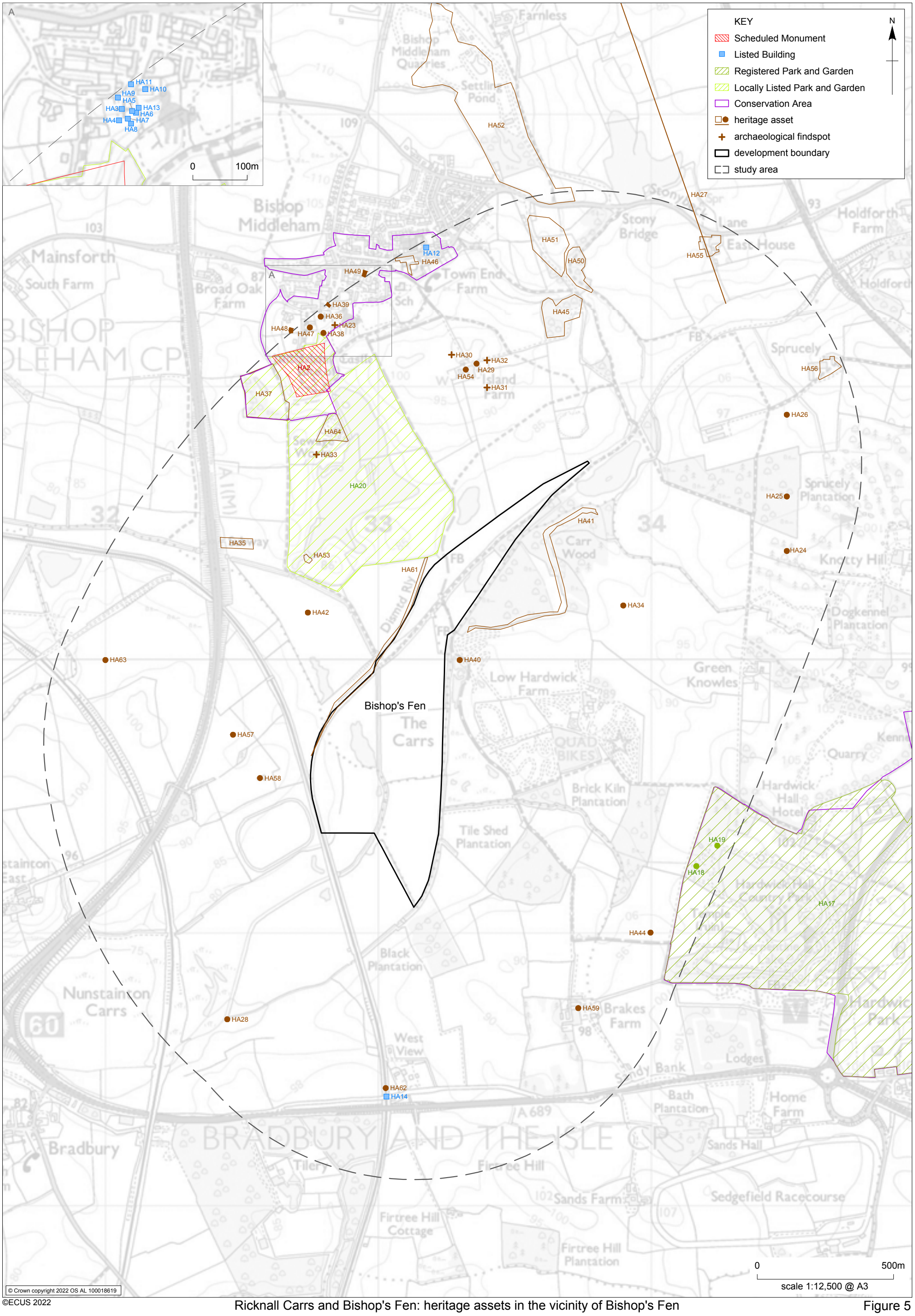
Ricknall Carrs and Bishop's Fen: ridge and furrow in the vicinity of Bishop's Fen

Figure 3



Ricknall Carrs and Bishop's Fen: ridge and furrow in the vicinity of Ricknall Carrs

Figure 4



Ricknall Carrs and Bishop's Fen: heritage assets in the vicinity of Bishop's Fen

Figure 5

KEY
Scheduled Monument
Listed Building
heritage asset
archaeological findspot
development boundary
study area

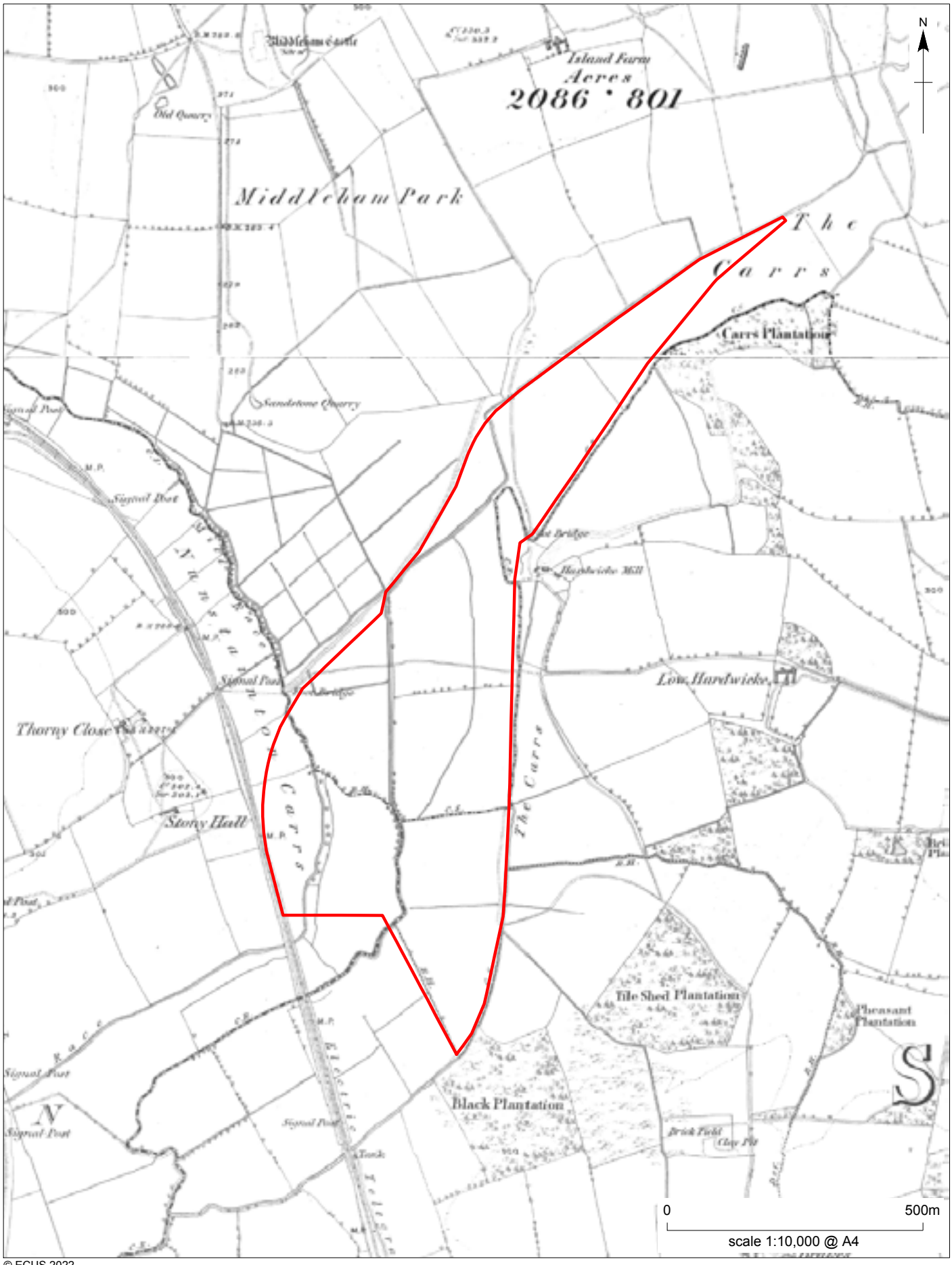
N

HA43
HA15
HA22
HA21
HA65
Ricknall Carrs
HA16
HA60
HA1

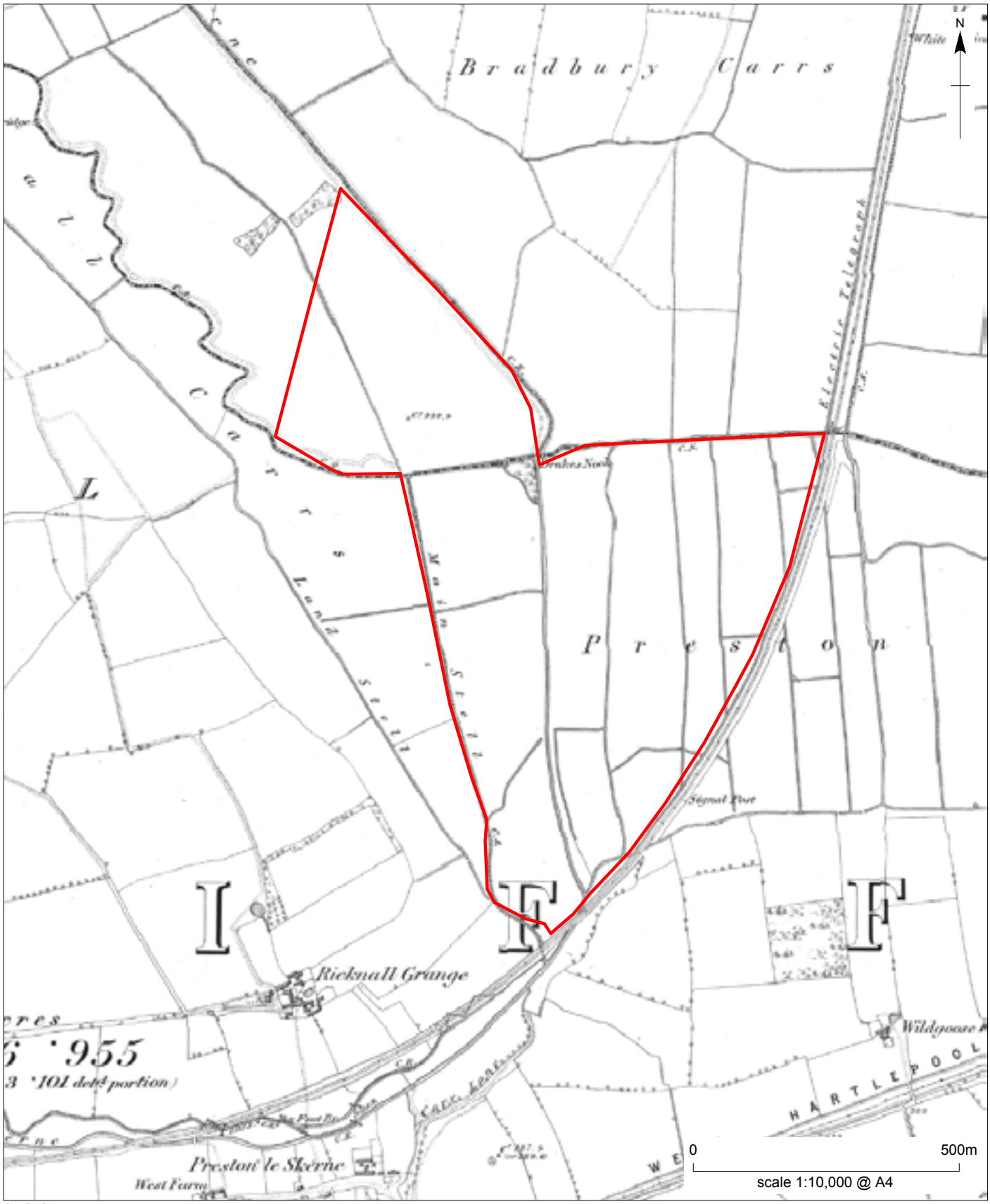
0 500m
scale 1:12,500 @ A3

Ricknall Carrs and Bishop's Fen: heritage assets in the vicinity of Ricknall Carrs

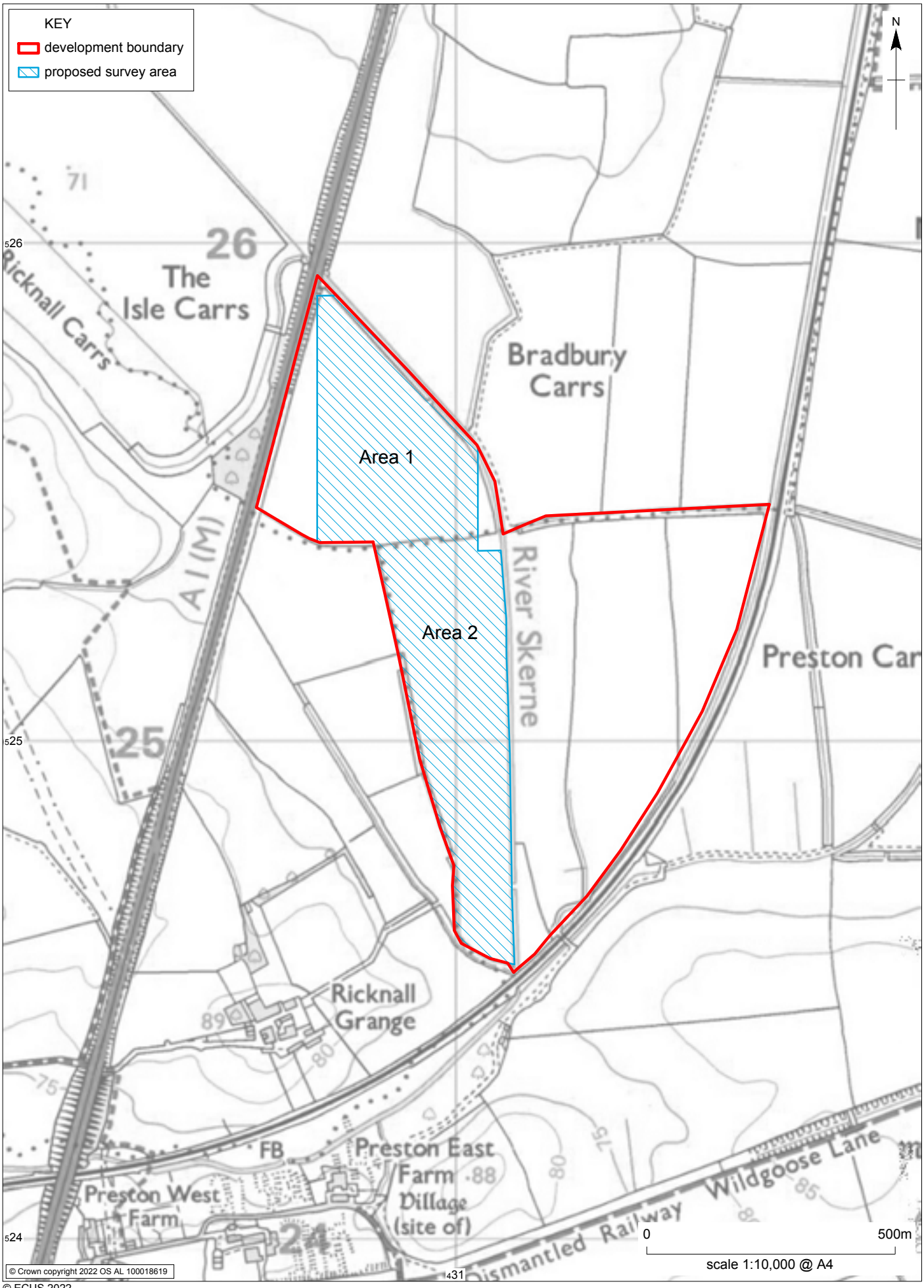
Figure 6



Bishop's Fen: site location overlain on Ordnance Survey 6" map, surveyed 1856-7 Figure 7

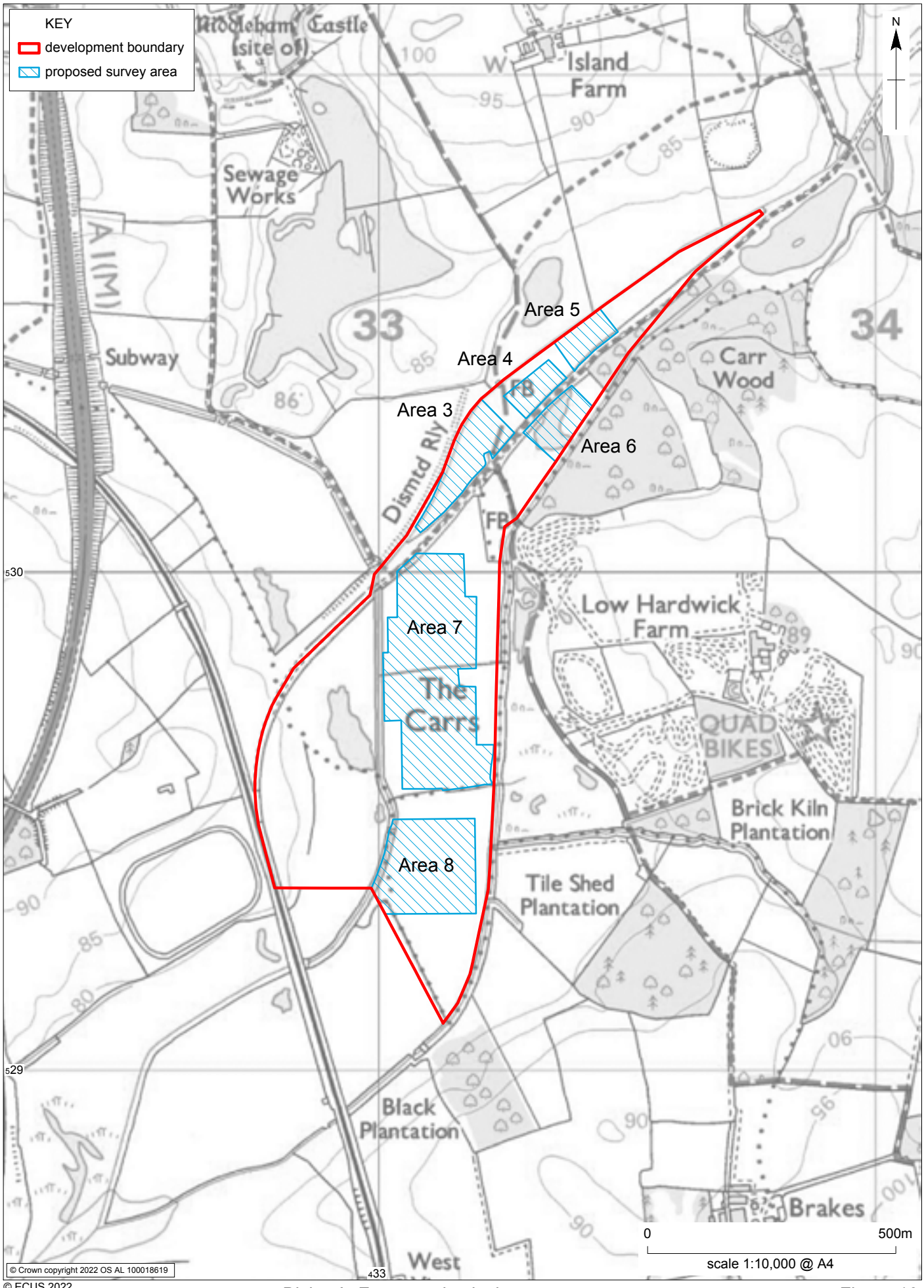


Ricknall Carrs: site location overlain on Ordnance Survey 6" map, surveyed 1856 Figure 8



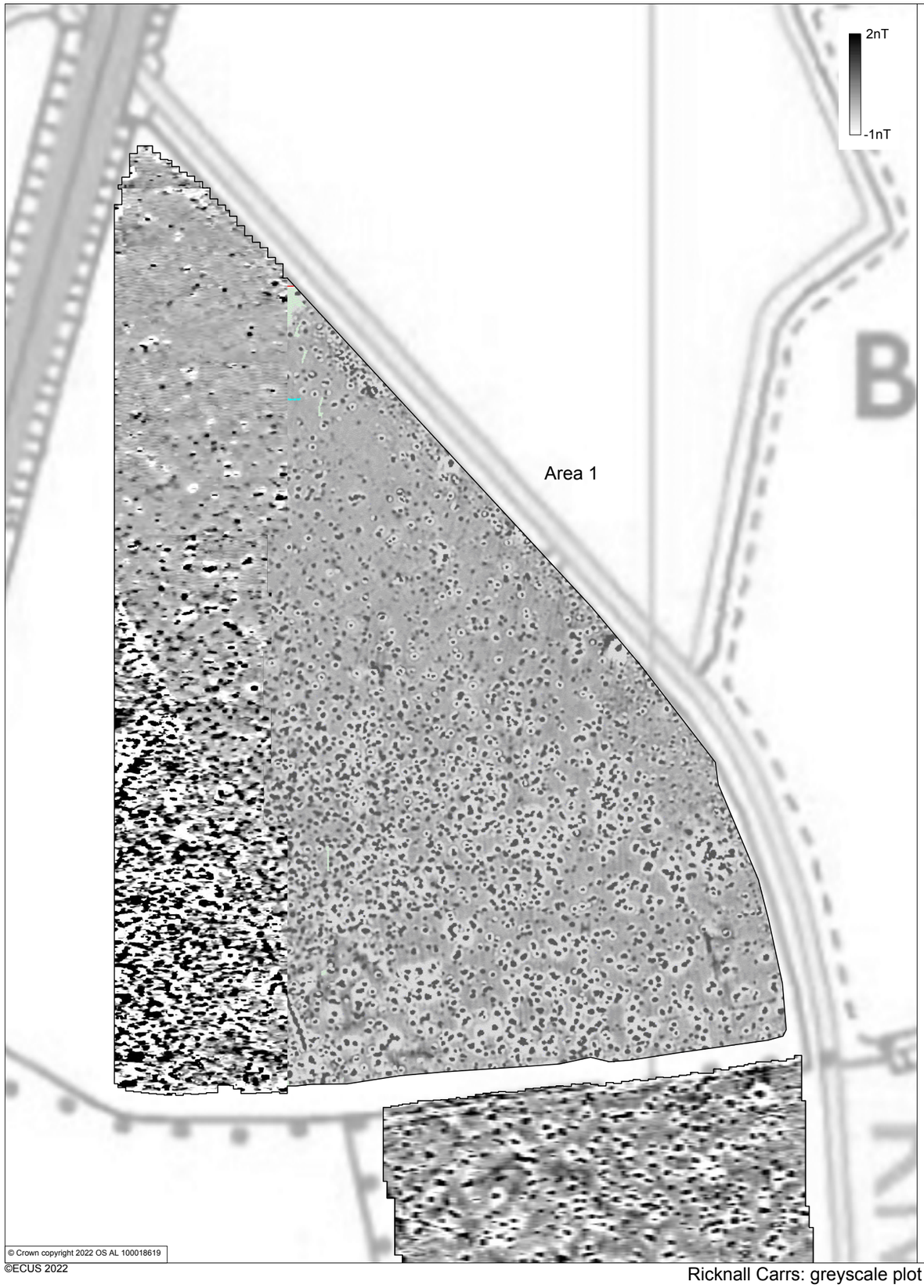
Ricknall Carrs: geophysical survey areas

Figure 9



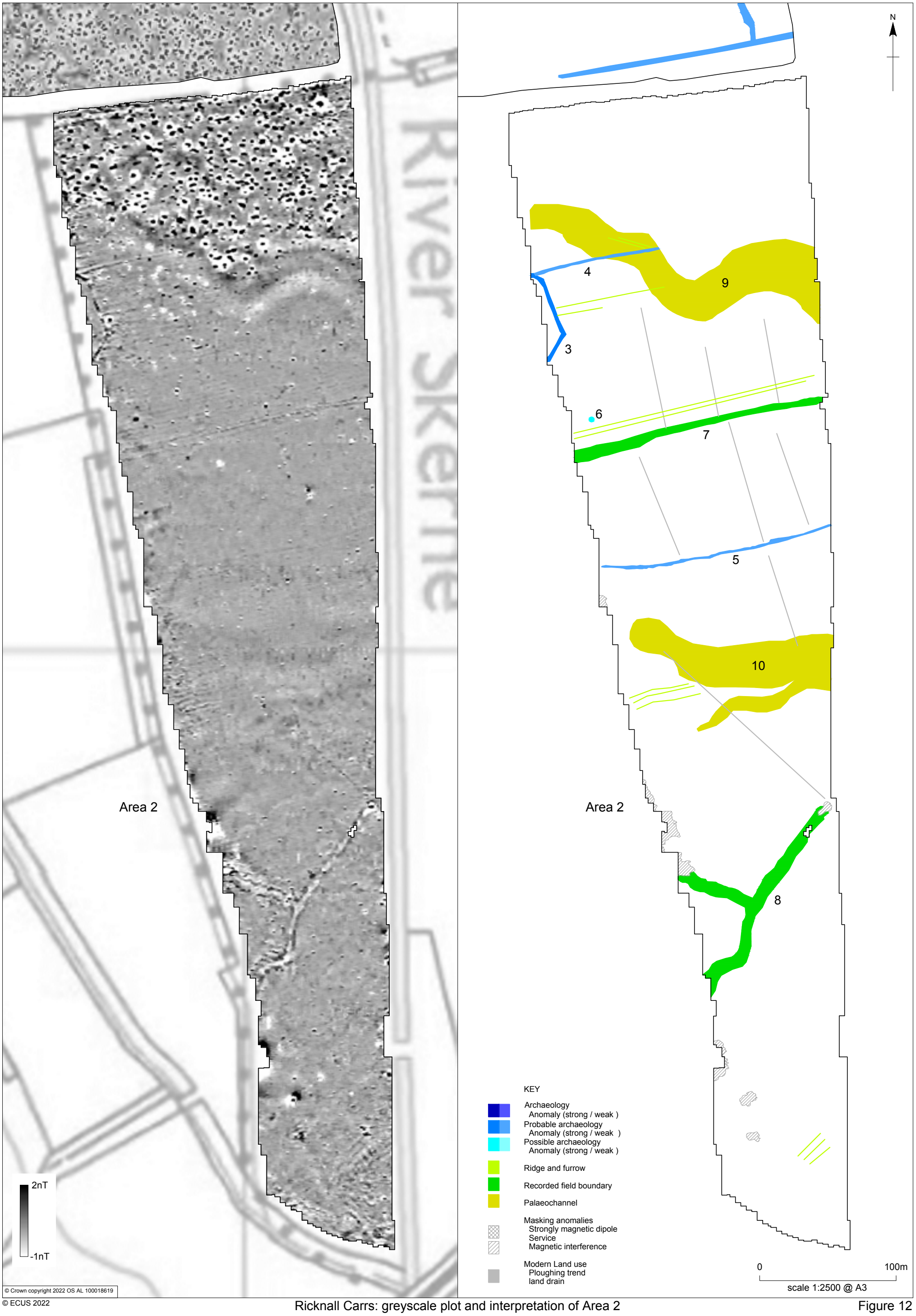
Bishop's Fen: geophysical survey areas

Figure 10



Ricknall Carrs: greyscale plot and interpretation of Area 1

Figure 11



Ricknall Carrs: greyscale plot and interpretation of Area 2

Figure 12

2nT
-1nT

Area 5
Area 4
Area 3
Area 6

KEY

Archaeology
Anomaly (strong / weak)
Probable archaeology
Anomaly (strong / weak)
Possible archaeology
Anomaly (strong / weak)

Ridge and furrow

Recorded field boundary

Palaeochannel

Masking anomalies
Strongly magnetic dipole
Service
Magnetic interference

Modern Land use
Ploughing trend
land drain

N

Area 5
16
19
20

Area 4
21
17
11
14
17

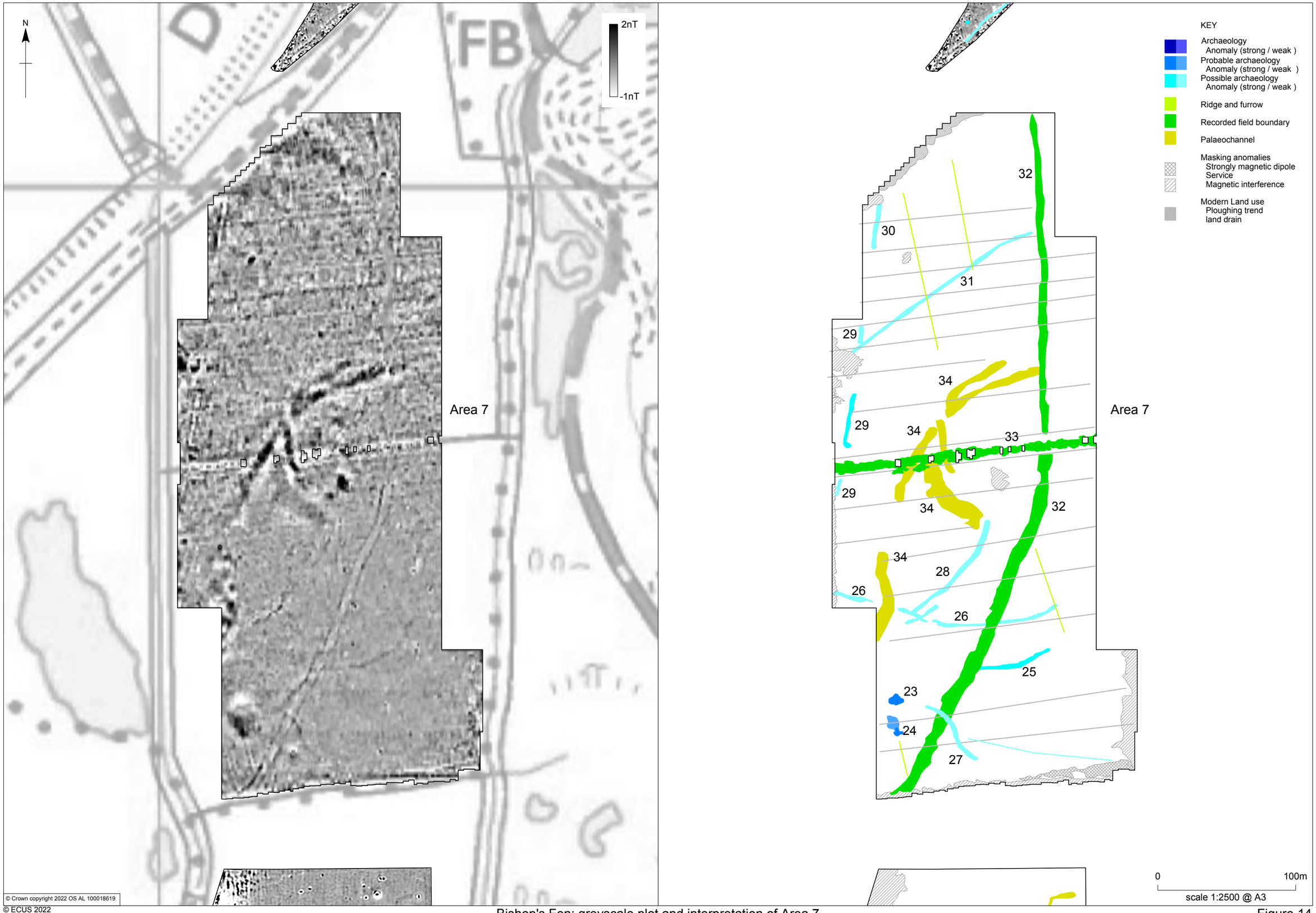
Area 3
12
17
18
17
22
17
13

Area 6
15

0
100m
scale 1:2500 @ A3

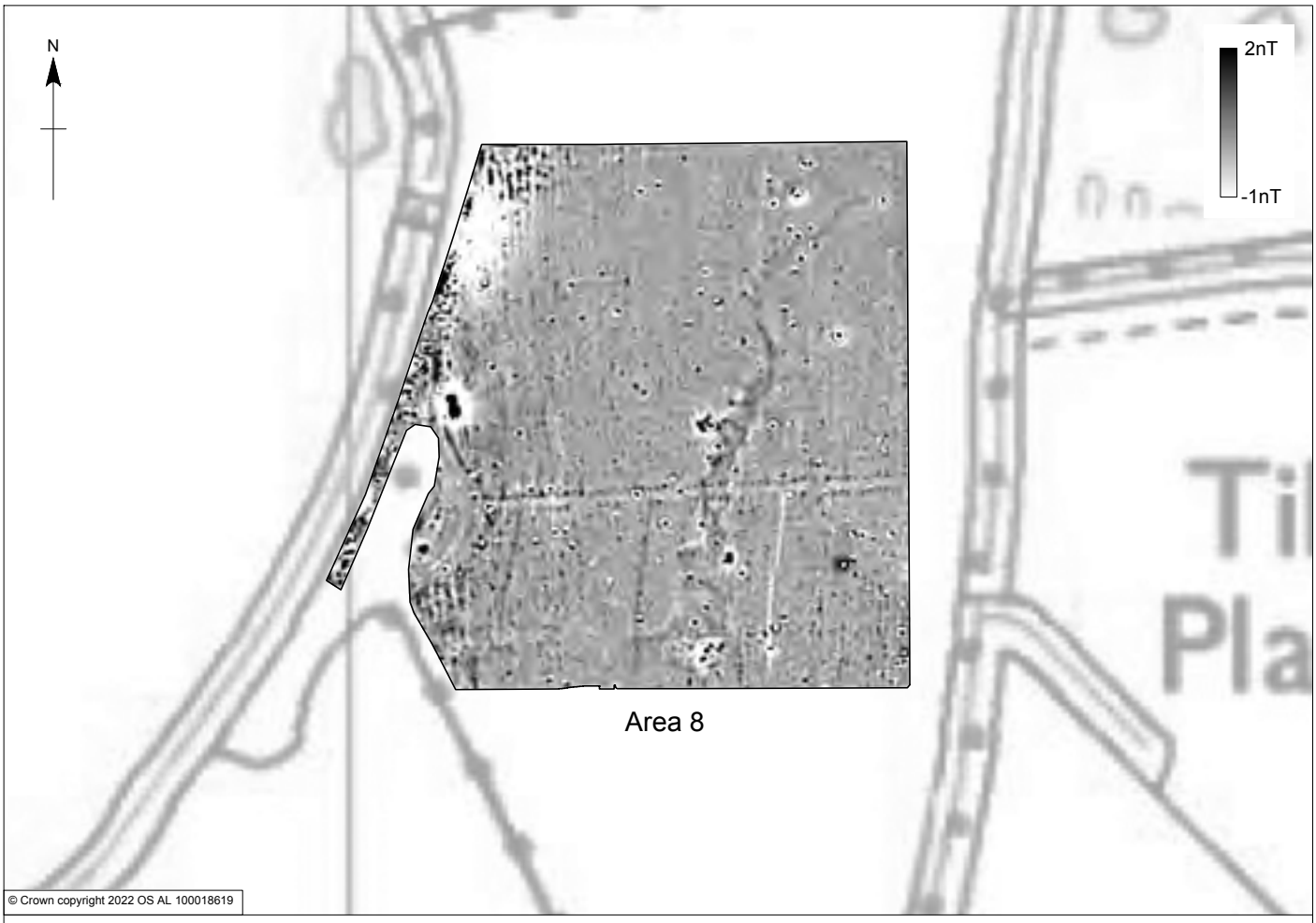
Bishop's Fen: greyscale plots and interpretations of Areas 3-6

Figure 13



Bishop's Fen: greyscale plot and interpretation of Area 7

Figure 14



Bishop's Fen: greyscale plot and interpretation of Area 8 Figure 15

Plate 1

View eastwards across the north-eastern part of the Bishop's Fen site

Plate 2

View westwards across the southern part of the Bishop's Fen site

Plate 3

View southwards across the Ricknall Carrs site

Plate 4

View northwards across the Ricknall Carrs site

Plate 5

Ricknall Grange Farmhouse

Plate 6

View south-west from the southern end of the Ricknall Carrs site towards Ricknall Grange

Appendix A: Relevant NPPF Policies

National Planning Policy Framework (NPPF) (2021)	
Paragraph 194	In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation
Paragraph 195	Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal
Paragraph 196	Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision
Paragraph 197	In determining planning applications local authorities should take account of: the desirability of sustaining and enhancing heritage assets and putting them to a viable use consistent with their conservation the positive contribution that preservation of heritage assets can make to sustainable communities including their economic vitality the desirability of new development to making a positive contribution to local character and distinctiveness
Paragraph 199	When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its

	significance
Paragraph 200	Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of: a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional; b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional
Paragraph 201	Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply: the nature of the heritage asset prevents all reasonable uses of the site; and no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and conservation by grant funding or some form of charitable or public ownership is demonstrably not possible; and the harm or loss is outweighed by the benefit of bringing the site back into use
Paragraph 202	Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use
Paragraph 203	The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset
Paragraph 204	Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred
Paragraph 205	Local planning authorities should require developers to record and advance understanding of

	the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted
Paragraph 206	Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably
Paragraph 207	Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole
Paragraph 208	Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies

NPPF glossary:

This glossary sets out the definitions for heritage and archaeological issues that should be treated as a material consideration in the planning process. Those definitions of relevance to the current application are:

Historic environment:

- All aspects of the environment resulting from the interaction between people and places through time (including all surviving physical remains of past human activity whether visible, buried or submerge), as well as landscaped areas and planted or managed flora.

Heritage assets:

- A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It

includes designated heritage assets and assets identified by the local planning authority (including local listing).

Archaeological interest:

- There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point.

Setting of a heritage asset:

- The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

Significance (for heritage policy):

- The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.

Historic environment record:

- Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use.

Appendix B: Previous interventions within the study area

Event No.	Description	Grid Reference
-	1970s. Palynological study of sites in south and east Durham (Bartley *et al*. 1976). Included sites within the study areas at Morden Carr, Nunstaintin Carrs and Bishop Middleham.	NZ 321 253 NZ 320 295 NZ 324 304
-	1990s. Dendrochronological study of timbers from Swan Carr (Baillie 1995)	NZ 315 266
E3731	1993. Assessment and analysis of fabric and churchyard of the Church of St Michael, Bishop Middleham	NZ 3279 3126
E4761	1994. Watching brief at Fourmarts Lane, Bishop Middleham	NZ 3270 3120
E5444	1999. Durham County Council. Historic Landscape Survey at Hardwick Park, Sedgefield	NZ 3400 2900
E5911	2002. Tees Valley Archaeology. Archaeological evaluation trenching at the Church of St Michael, Bishop Middleham	NZ 3279 3127
E6416	1967. Bishop Auckland Archaeological Research Group. Attempt to prove the existence of Cade's Road, thought to continue across the Hardwick Hall estate	NZ 3400 2900
E15781	2007. Northern Archaeological Associates. Desk-based study of Brakes Farm, Sedgefield	NZ 33736 28680
E15813	2007. Archaeological Services WYAS. Geophysical survey at Brakes Farm, Sedgefield	NZ 33731 28631
E15814	2007. Archaeological Services WYAS. Geophysical survey on land north of Brakes Farm, Sedgefield	NZ 33642 29306
E15883	2007. Northern Archaeological Associates. Evaluation trenching at Brakes Farm, Sedgefield	NZ 33649 28552
E31492	2009. Archaeological Services, Durham University. Geophysical survey for A1 Wind Farm, Newton Aycliffe	NZ 31472 23797
E33238	2002. Northern Archaeological Associates. Evaluation for Hardwick Park Restoration Project, Phase 1	NZ 34241 29268
E33243	2002. Archaeological Services, Durham University. Evaluation for Hardwick Park Restoration Project, Phase III	NZ 34309 29037
E34273	2006-7. Archaeological Research Services. Aerial photographic interpretation and desk-based assessment, Aggregate Areas in County Durham Archaeological Assessment (ALSF) Project (c.425km^2) (Not illustrated)	NZ 25766 43644
E38400	2009. Northern Archaeological Associates. Excavation at Brakes Farm Sedgefield. Investigated 3 sides of rectilinear enclosure of probable Iron Age or Romano-British date. A burial was found in one of the ditches	NZ 34090 28638
E39749	2011. Archaeological Services, Durham University. Watching brief at Preston East Farm, Preston-le-Skerne. No significant archaeological features found	NZ 30543 24024
E43661	1977-8. Bowes Museum/DoE. Survey of the Coal Measures and Magnesian Limestone Escarpment (Not illustrated)	NZ 22717 34284 (centre)
E43667	1983-4. Archaeological Unit for North East England. Survey of the Durham Coalfield. Aerial photographic interpretation (Not illustrated)	NZ 21726 40380 (centre)
E53161	1991. RCHME. Durham SAMs Project. Desk-based assessments, field visits and measured surveys	Various

Event No.	Description	Grid Reference
E56488	2011. Pre-Construct Archaeology. Watching brief at Preston East Farm, Preston-le-Skerne. No significant archaeological features found	NZ 30760 24072
E58622	2012-5. The Archaeological Practice Ltd. Ferryhill Atlas Project. Desk-based assessment, building survey and test pitting	NZ 30349 32155 (centre)
E58698	2013. Oxford Archaeology North. Auger survey at The Isles Wind Farm	NZ 30900 26500 (centre)
E62503	2016. Unknown individual. Photographic survey at Town End Farm, Bishop Middleham	NZ 33171 31511
E64967	1999. Bishop Middleham Parish Council/County Archaeologist. Geophysical survey at Middleham Castle	NZ 32727 31020
E66208	2019. Dig Ventures. Geophysical survey in advance of community archaeology project at Middleham Castle	NZ 32718 31056
E73605	2022. Pre-Construct Archaeology Ltd. Desk-based assessment of land at Bishop Middleham	NZ 32800 30907
E74203	2019. Dig Ventures. Excavation at Middleham Castle	NZ 32736 31056

Appendix C: Heritage assets within the 1km radius study area

Table C1: HER records of ridge and furrow within the study area

ID	Description	Period	Grid Ref
H72035	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30251 25557 (centre)
H72038	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30328 25509 (centre)
H72039	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30225 25008 (centre)
H72041	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30401 25410 (centre)
H72042	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30251 25408
H72043	Ridge and furrow, Great Aycliffe, earthworks	Post-medieval	NZ 30093 26016
H72044	Ridge and furrow, Great Aycliffe, earthworks	Medieval or post-medieval	NZ 30070 25749 (centre)
H72429	Ridge and furrow, Sedgefield, site of (aerial photographic evidence)	Post-medieval	NZ 34467 30053 (centre)
H72430	Ridge and furrow, Sedgefield, site of (aerial photographic evidence)	Post-medieval	NZ 33660 30058 (centre)
H72431	Ridge and furrow, Sedgefield, site of (aerial photographic evidence)	Post-medieval	NZ 33626 30289 (centre)
H72432	Ridge and furrow, Sedgefield, site of (aerial photographic evidence)	Post-medieval	NZ 33559 30213 (centre)
H72433	Ridge and furrow, Sedgefield, site of (aerial photographic evidence)	Post-medieval	NZ 33468 30258 (centre)
H74608	Ridge and furrow, Great Aycliffe, site of (aerial photographic evidence)	Medieval or post-medieval	NZ 29944 25701 (centre)
H74631	Ridge and furrow, Great Aycliffe, site of (aerial photographic evidence)	Medieval or post-medieval	NZ 29801 26079 (centre)
H74632	Ridge and furrow, Great Aycliffe, site of (aerial photographic evidence)	Post-medieval	NZ 29753 26012 (centre)
H74767	Ridge and furrow, Great Aycliffe, site of (aerial photographic evidence)	Medieval	NZ 29846 25910 (centre)
H74768	Ridge and furrow, Great Aycliffe, site of (aerial photographic evidence)	Medieval	NZ 29919 25994 (centre)
H74774	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33077 28659 (centre)
H74777	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32044 29152 (centre)

ID	Description	Period	Grid Ref
H74778	Ridge and furrow, Bradbury and The Isle, earthworks	Post-medieval	NZ 31963 29091 (centre)
H74779	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30493 26073 (centre)
H74781	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33293 29020 (centre)
H74782	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31192 25750 (centre)
H74783	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31019 26202 (centre)
H74784	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32902 28511 (centre)
H74785	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32963 28685 (centre)
H74786	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32892 28803 (centre)
H74787	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33026 28860 (centre)
H74788	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33457 28873 (centre)
H74789	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33415 29068 (centre)
H74801	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31260 26742 (centre)
H74811	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31377 26455 (centre)
H74815	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32979 29147 (centre)
H74817	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31173 26155 (centre)
H74818	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30868 26268 (centre)
H74819	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30656 26185 (centre)
H74820	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32902 28664 (centre)
H74821	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32818 28750 (centre)
H74822	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32010 29927 (centre)
H74823	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32322 29705 (centre)

ID	Description	Period	Grid Ref
H74824	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31360 26534 (centre)
H74826	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31273 26643 (centre)
H74839	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33293 29330 (centre)
H74840	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33297 29418 (centre)
H74859	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 31922 29105 (centre)
H74860	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30027 26312 (centre)
H74861	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30103 26230 (centre)
H74865	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30224 26605 (centre)
H74866	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30185 26644 (centre)
H74867	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32123 29093 (centre)
H74868	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32008 29094 (centre)
H74872	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33399 29285 (centre)
H74873	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33457 29405 (centre)
H74874	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33660 29412 (centre)
H74875	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33687 29324 (centre)
H74877	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33803 29252 (centre)
H74878	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33787 29057 (centre)
H74879	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33623 29006 (centre)
H74880	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 33542 29061 (centre)
H74881	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32757 28176 (centre)
H74888	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32060 29855 (centre)

ID	Description	Period	Grid Ref
H74890	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 32415 28428 (centre)
H74891	Ridge and furrow, Bradbury and The Isle, earthworks	Medieval or post-medieval	NZ 30620 26902 (centre)

Table C2: Other heritage assets within the study area

HA No	ID	Description	Period	Grid Ref
Scheduled monuments				
HA 1	1002335 H317 H6865	Preston-le-Skerne Deserted Medieval Village	Medieval	NZ 30578 24092 NZ 30736 23991
HA 2	1002330 H1117	Middleham Castle	Medieval	NZ 32718 31055
Listed buildings				
HA 3	1322826 H1118	Grade II*. Church of St Michael and All Angels, Church St, Bishop Middleham	13th century	NZ 32799 31258
HA 4	1121465 H34610	Grade II. Dunn tomb c.8m south of door of Church of St Michael, Bishop Middleham	c.1718	NZ 32794 31237
HA 5	1121466 H34611	Grade II. Brabant tomb c.3m south of Church of St Michael, Bishop Middleham	c.1683	NZ 32818 31254
HA 6	1121467 H34612	Grade II. Burrall tomb c.6m south of chancel of Church of St Michael, Bishop Middleham	c.1743	NZ 32825 31251
HA 7	1322827 H35856	Grade II. Gainforth tomb c.9m south of Church of St Michael, Bishop Middleham	c.1704	NZ 32810 31240
HA 8	1322828 H35857	Grade II. Watson tomb c.18m south of Church of St Michael, Bishop Middleham	c.1685	NZ 32816 31231
HA 9	1433582 H48864	Grade II. War Memorial cross, St Michael's churchyard, Bishop Middleham	1921	NZ 32792 31279
HA 10	1121463 H1120	Grade II. The Hall, Church St, Bishop Middleham	c.1765	NZ 32842 31294
HA 11	1121464 H34594	Grade II. Wall opposite Wall of Hall garden, Church St, Bishop Middleham	Early 18th century	NZ 32816 31303
HA 12	1121468 H34613	Grade II. The Cottage, High St, Bishop Middleham	Early 18th century	NZ 33179 31514
HA 13	1322825 H35845	Grade II. Wall to west of The Hall, with steps, piers and gates, Bishop Middleham	17th-18th century	NZ 32830 31260

HA No	ID	Description	Period	Grid Ref
HA 14	1121505 H34903	Grade II. Road Bridge, 15m south of the former Sedgefield Railway Station	c.1833	NZ 33031 28398
HA 15	1121506 H34904	Grade II. Sawn Carr Farmhouse	Mid 18th century	NZ 31432 26643
HA 16	1121510 H34907	Grade II. Ricknall Grange Farmhouse and Yard Wall to Rear	c.1840	NZ 30588 24417
Registered Parks and Garden				
HA 17	1000730 H2526	Grade II*. Hardwick Park	18th century	NZ 34667 29132
Which includes (non-designated):				
HA 18	H5789	The Bono Retiro	18th century	NZ 34168 29244
HA 19	H5790	The Bath House	18th century	NZ 34245 29319
Locally Listed Park and Garden				
HA 20	H1116	Middleham Park, Bishop Middleham. Medieval deer park, much of boundary wall survives	Medieval	NZ 32935 30659
Non-designated heritage assets				
HA 21	H58700	Location of former glacial lake, extent determined by auger survey	Prehistoric	NZ 31637 25382 (centre)
HA 22	H344	Findspot, Bronze Age socketed axe, Morden Carr, Sedgefield	Bronze Age	NZ 32000 26000
HA 23	H4573	Findspot, glass bead, Bishop Middleham Hall	Iron Age	NZ 32842 31229
HA 24	H3352	Cades Road, Sedgefield, suggested route of road between Great Stainton and Chester-le-Street. At given coordinate an agger is said to have been visible and 'excavation shows cobbles' although no reference for this	Roman	NZ 347 293
HA 25	H3353	Cades Road, Sedgefield, suggested route of road between Great Stainton and Chester-le-Street. At given coordinates there is said to be exposed stone and a slight agger	Roman	NZ 345 304 NZ 345 306 NZ 345 309
HA 26	H3354	Cades Road, Sedgefield, suggested route of road between Great Stainton and Chester-le-Street. Stonework and an agger put forward as evidence	Roman	NZ 342 316
HA 27	H7952	Suggested line of Roman road, Bishop Middleham area, NZ 338 327 to NZ 343 312	Roman	NZ 34034 32002 (centre)
HA 28	H5884	'Lost lakes of County Durham', speculative theory about Roman canalization of a line of former lakes along the River Skerne	Roman	NZ 32447 28682 (centre)
HA 29	H9112	Possible Roman site, Island farm, Bishop Middleham, aerial photographic evidence	Roman	NZ 33361 31087

HA No	ID	Description	Period	Grid Ref
HA 30	H6326	Supposed findspot, Roman coins and brooches at Island Farm, Bishop Middleham	Roman	NZ 33270 31120
HA 31	H7953	Findspot, Roman coins, Island Farm, Bishop Middleham, no details available	Roman	NZ 33400 31000
HA 32	H7954	Findspot, Roman coins, Island Farm, Bishop Middleham, no details available	Roman	NZ 33400 31100
HA 33	H4877	Findspot, patera set, Bishop Middleham Deer Park	Roman	NZ 32774 30754
HA 34	H62336	Cropmark of circle with linear feature, Bishop Middleham	Undated	NZ 33900 30200
HA 35	H62337	Cropmark of square enclosure with central square protrusion, Bishop Middleham	Undated	NZ 32482 30429
HA 36	H6649	Bishop Middleham village	Early medieval to modern	NZ 32791 31277
HA 37	H1119	Middleham Castle fishpond, documentary evidence	Medieval	NZ 32586 30974
HA 38	H3651	Headstones at Church of St Michael, Bishop Middleham (and see Listed individual stones above)	Post-medieval	NZ 32800 31200
HA 39	H64608	Hollow way, Bishop Middleham	Undated	NZ 32818 31303
HA 40	H1123	Hardwick Mill, Bishop Middleham, site of. Documentary and cartographic evidence	Medieval/ post-medieval	NZ 33300 30000
HA 41	H1124	Mill-race at Hardwick Mill, Bishop Middleham, documentary evidence	Medieval/ post-medieval	NZ 33623 30313
HA 42	H67435	Causeway, Great Isle, Bishop Middleham. Stone causeway found during ploughing linking the high grounds of Bishop Middleham and Nunstainton. Nearby at NZ327303 there is the remains of a bridge abutment	Undated	NZ 32743 30174
HA 43	H339	Probable medieval ponds at Great Isle Farm, Bradbury, earthworks	Medieval	NZ 30329 26838
HA 44	H347	Possible site of windmill, Hardwick, Sedgefield, documentary evidence	16th century	NZ 34000 29000
HA 45	H3649	Bishop Middleham Colliery (site of)	1845	NZ 33668 31267
HA 46	H3647	Brewery on Front Street, Bishop Middleham, site of. Documentary and cartographic evidence	19th century	NZ 33110 31460
HA 47	H16719	Farm buildings at Bishop Middleham	18th century	NZ 32749 31220
HA 48	H3795	Dovecote at Castle View, Bishop Middleham, site of. Cartographic evidence OS 1st Edition	19th century	NZ 32680 31209
HA 49	H3660	Chapel, Bishop Middleham, site of. Cartographic evidence OS 1923	20th century	NZ 32951 31418
HA 50	H16534	New Kiln Quarry, Bishop Middleham, site of. Cartographic evidence for quarry and kiln, active on OS 1st Edition but disused by 2nd	19th century	NZ 33729 31438
HA 51	H16535	Quarry just outside New Kiln Quarry, site of. Shown as disused on OS 1st Edition	Post-medieval	NZ 33627 31534
HA 52	H2988	Bishop Middleham Quarry	20th-21st century	NZ 33399 32017

HA No	ID	Description	Period	Grid Ref
HA 53	H16553	Sandstone quarry west of Carr Wood, site of. Shown as active on OS 1st Edition	19th century	NZ 32742 30371
HA 54	H3654	Island Farm, Bishop Middleham, group of buildings possibly built with stone from the castle ruins	18th-20th century	NZ 33322 31065
HA 55	H16529	East House Farm. Courtyard farmstead	19th century or earlier	NZ 34218 31525
HA 56	H16531	Sprucely Farm. Courtyard farmstead with gin-gang	19th century or earlier	NZ 34652 31074
HA 57	H16555	Thorny Close, small farmstead shown on OS 1st Edition	Post-medieval	NZ 32468 29726
HA 58	H16556	Stony Hall, site of. Shown on OS 1st Edition	Post-medieval	NZ 32567 29567
HA 59	H64361	Brakes Farm, Sedgefield. Medieval documentary references to farming in area, current farm possibly 18th century, shown on OS 1st Edition	Medieval to post-medieval	NZ 33735 28723
HA 60	H56486	Former stable at Preston-le-Skerne, site of. Shown on OS 1st Edition, demolished 2011	Post-medieval	NZ 30760 24094
HA 61	H2992	Former waggonway at Bishop Middleham, earthworks	19th century	NZ 32990 30017
HA 62	H71078	Sedgefield Station on the Clarence Line, site of. Opened 1833, closed 1964	19th century	NZ 33028 28429
HA 63	H2994	Former Chilton Branch of the Clarence Railway at Bradbury, earthworks	1835	NZ 32000 30000
HA 64	H3658	Sewage treatment works, Bishop Middleham	20th century	NZ 32845 30925
HA 65	NMP ID 7491	Bombing range marker, aerial photographic evidence	WWII	NZ 30718 25501

Appendix D: Gradiometer survey technical information

GRADIOMETER SURVEY

Magnetic surveys measure distortions in the earth's magnetic field caused by small magnetic fields associated with buried features (Gaffney and Gater 2003*,* 36) that have either remnant or induced magnetic properties (Aspinal *et al.* 2008*,* 21–26). Human activity and inhabitation often alter the magnetic properties of materials (Aspinal *et al.* 2008*,* 21) resulting in the ability for numerous archaeological features to be detected through magnetic surveys. Intensive burning or heating can result in materials attaining a thermoremanent magnetisation; examples of which include kilns, ovens, heaths and brick structures (Aspinal *et al.* 2008*,* 27; Gaffney and Gater, 2003*,* 37). When topsoil rich with iron oxides, fills a man-made depression in the subsoil, it creates an infilled feature, such as a pit or ditch, with a higher magnetic susceptibility compared to the surrounding soil (Aspinal *et al.* 2008*,* 37–41; Gaffney and Gater 2003*,* 22–26). Magnetic surveys can also detect features with a lower magnetically susceptibility than the surrounding soil, an example of which is a stone wall.

LIMITATIONS

Poor results can be due to several factors including short lived archaeological occupation/use or sites with minimal cut or built features. Results can also be limited in areas with soils naturally deficient in iron compounds or in areas with soils overlying naturally magnetic geology, which will produce strong responses masking archaeological features.

Overlying layers, such as demolition rubble or layers of made ground, can hide any earlier archaeological features. The presence of above ground structures and underground services containing ferrous material can distort or mask nearby features.

Particularly uneven or steep ground can increase the processing required or distort results beyond the capabilities of processing. It is also possible in areas containing dramatic topographical changes that natural weathering, such as hillwash, often in combination with intensive modern ploughing, will reduced the topsoil on slopes and towards the peaks of hills and possibly destroy or truncate potential archaeological features. Conversely features at the bottom of slopes may be covered by a greater layer of topsoil and so if buried features are present they appear faint within the results, if at all.

Over processing of data can also obscure or remove features, especially if there are on the same orientation as the direction of data collection. Consequently, where possible, attempts are made to ensure data is not collected on the same orientation as known potential features and that data quality is sufficient to minimise the required data processing.

INSTRUMENTATION

The data was be collected using Bartington Grad 601-2 fluxgate gradiometers, either in a cart configuration with four sensors arranged at one metre intervals or as handheld pairs of sensors. The Bartington 601-2 is a single axis, vertical component fluxgate gradiometer comprising a data logger battery cassette and two sensors. The sensors are Grad-01-1000L cylindrical gradiometer sensors mounted on a rigid carrying frame; each sensor contains two fluxgate magnetometers with 1m vertical separation.

The difference in the magnetic field between the two fluxgates in each sensor is measured in nanoTesla (nT). Ecus gradiometer data is recorded with a range of ±100nT, which equates to a resolution of 0.01nT.

It should be noted that the actual resolution is limited to 0.03nT as a consequence of internal instrumental noise (Bartington Instruments Ltd, n.d., 23).

The gradiometer records two lines of data on each traverse, the grids are walked in a zig-zag pattern amounting to 15 traverses per 30m grid. The gradiometers are calibrated at the start of every day and recalibrated whenever necessary.

Appendix E: Data visualisation information

The data was used to produce a series of images to demonstrate the results of surveys, detailed below:

- Greyscale/colourscale plot – This visualised the results as a shaded drawing with highest readings showing as black, running through different shades to lowest showing as white.
- Interpreted plot – Through detailed analysis, anomalies have been interpreted and possible features identified. Interpretation drawings are used to show potential features and in particular to reinforce and clarify the written interpretation of the data. Anomalies have been characterised using the terminology detailed in the following section and have been assigned colour coding, which is outlined in keys on figures associated with this report.

MAGNETIC ANOMALIES AND TERMINOLOGY

Table E1: Lexicon of terminology

Terminology	Detail
Anomaly	Any outstanding high or low readings forming a particular shape or covering a specific area with the survey results.
Feature	A man-made or naturally created object or material that has been detected through investigation works and has sufficient characteristics or supporting evidence for positive identification.
Magnetic susceptibility	The ability of a buried feature to be magnetically induced when a magnetic field is applied.
Magnetic response	The strength of the changes in magnetic values caused by a buried feature with either a greater or lesser ability to be magnetised compared with the soil around it. Anomalies are considered to either have strong/weak or positive/negative responses. The strength of magnetic response (along with patterning) can be essential in determining the nature of an anomaly, but it should be noted that the size or strength of the magnetic response does not correlate with the size of the buried feature.

Patterning of an anomaly	The shape or form of an individual anomaly.
Thermoremanence	The affect caused when a material has been magnetically altered through a process of heating. Thermoremanent magnetisation occurs when an object or material is heated passed the Curie Point and acquires a permanent magnetisation that is associated with the magnetic field that they cooled within (Gaffney and Gater 2003, 37).

Different anomalies can represent different features created by human occupation, agricultural or modern activity, or natural pedological or geological changes in the substrata.

Anomalies interpreted as 'greater' are considered more likely to be of the interpreted characterisation; whereas a 'lesser' categorisation represents a more tentative interpretation applied to those anomalies with weaker increases in magnetic response or if the anomaly has incomplete patterning or irregular form.

The strength and size of anomalies can vary depending on the magnetic properties of the feature, the magnetic susceptibility of the soil, the depth at which the feature is buried, and the state of preservation.

Table E2: Characterisation of anomalies

Characterisation	**Detail**
Archaeology	
Archaeology and Probable archaeology	Linear anomalies with a positive or negative magnetic responses, and composed of a patterning or shape that is suggestive of a buried archaeological feature. These are often indicative of structural remains or infilled features such as ditches. The strength of anomaly signal can be suggestive of the properties of the feature. Negative linear anomalies represent upstanding or infilled features that are less magnetically susceptible than background readings, for example structures or ditches composed of a non-igneous stone material. Bipolar linear anomalies considered to be of an archaeological nature are indicative of material with a high magnetic susceptibility, such as a brick wall. Isolated anomalies or anomalies with a more amorphous form possibly represent infilled features or thermomagnetic features such as areas of heating/burning of an archaeological origin. Unless associated with conclusively identified archaeological remains, such as linear anomalies, absolute identification of positive responses can be problematic

Characterisation	Detail
	as it is often not possible to decipher if they are of an archaeological, modern or agricultural origin. Consequently, isolated positive responses are not shown within the interpretation unless composed of a broad form or belonging to a series of isolated positive responses. Bipolar responses considered likely to be of an archaeological origin are also interpreted as isolated anomaly (archaeology). These are considered to relate to material with a very strong magnetic susceptibility or thermoremanent magnetisation.
Possible archaeology	Weak and diffuse anomalies with an uncertain origin are denoted by trends. It is possible that these belong to archaeological features but given their weak signatures or incomplete patterning it is equally plausible that they relate to agricultural features or natural soil formations.
Recorded field boundary	Linear anomalies, either with positive or negative magnetic responses, that correspond with the location of field boundaries recorded on historic maps, Aerial photos or LiDAR coverage of the site.
Ridge and furrow	Broadly spaced linear anomalies that are likely to be indicative of earlier forms of agriculture, such as ridge and furrow. These often correspond with the location of earthworks visible on the ground or identified on aerial photos or LiDAR survey coverage.
Masking anomalies	
Strongly magnetic bipolar or dipolar. Service	Positive anomalies with associated negative 'halo' (bipolar) denote features with a strong magnetic response are likely to be of a modern origin. Isolated bipolar responses of a modern nature are likely to relate to buried ferrous material or objects, such as metallic agricultural debris. If a trend is noted in the alignment or spacing of isolated bipolar responses, it is possible that they are indicative of ferrous fittings or connectors used on buried non-magnetic buried utilities. Linear bipolar anomalies are likely to be indicative of modern services.

Characterisation	Detail
	Dipolar anomalies relate to individual spikes within the data and tend to be caused by ferrous objects. These responses have only been shown when located near to archaeological features. When the site is located in a mining landscape it is possible that identified dipolar anomalies relate to mining activity and are indicative of further pits or mine shafts.
Magnetic interference	Areas of magnetic disturbance, often along the edges of survey areas are caused by standing metal structures such as fencing and buildings. Also, areas of increased magnetic response denote areas of disturbance containing a high concentration of dipolar or bipolar responses. These are generally considered to be caused by modern debris in the topsoil, although it is possible that the disturbance is in part also caused by isolated archaeological material or geological or pedological changes in the substrata.
Modern agriculture	
Ploughing trend, land drain	Ploughing trend tends to be regularly spaced linear anomalies, often with a narrower spacing, that conform with ploughing regime at the time of survey, or a recent regime recorded on aerial photos of the site. The response and distribution of land drains varies depending on the composition of the land drain and associated ditch or channel. Consequently, land drains can be composed of weak / strong positive / negative magnetic responses and are identified as a product of either their variance in magnetic values or positioning compared with regularly spaced linear anomalies considered to relate to modern ploughing. Land drains can be located within former agricultural regimes, such as ridge and furrow.

Appendix F: Assessment criteria

Table F2: Criteria for establishing sensitivity and importance of archaeological remains (after Design Manual for Roads and Bridges (DMRB), 2020, Document LA 104, table 3.2N)

Very High	• World Heritage Sites (including nominated sites). • Assets of acknowledged international importance. • Assets that can contribute significantly to acknowledged international research objectives.
High	• World Heritage Sites (including nominated sites). • Assets of acknowledged international importance. • Assets that can contribute significantly to acknowledged international research objectives.
Medium	• Designated or undesignated assets that contribute to regional research objectives. • Remaining tier Archaeological Priority Areas, where used by the LPA.
Low	• Designated and undesignated assets of local importance. • Assets compromised by poor preservation and/or poor survival of contextual associations. • Assets of limited value, but with potential to contribute to local research objectives.
Negligible	• Assets with very little or no surviving archaeological interest.
Unknown	• The importance of the resource has not been ascertained.

Magnitude of impact

'Impact' refers to a predicted change to the baseline environment arising from either the construction or operation of the scheme. Impacts can be both negative or positive, and reversible or irreversible. Table F2 below sets out the criteria adopted for this assessment and is based on the criteria set out in the DMRB (2020).

Table F2: Factors in the assessment of the magnitude of impact on archaeological remains (after Design Manual for Roads and Bridges, 2020, Document LA 104, table 3.4N)

Major Change	Change to most or all key/fundamental archaeological materials, such that the resource is totally altered. Where adverse, this would equate to destroyed or left completely

	illegible. Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified, if adverse, it would be substantial harm or loss of legibility. Considerable changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials, such that the asset is slightly altered. In terms of adverse impact. This would be minor or less than substantial harm or loss to the asset or slight loss of legibility. Slight changes to setting.
Negligible	Very minor changes to archaeological materials, or setting.
No Change	No change to fabric or setting of historic building.

Significance of effect of impact

The significance of the impact of the proposals on heritage assets is determined by the interaction of receptor value/sensitivity and impact magnitude. Impacts can be positive (i.e. enhance the heritage asset) or negative (i.e. detrimental to the resource). Table F3 below sets out the criteria adopted for this assessment and is based on the criteria set out in the DMRB.

Table F3: Archaeological remains — significance of effects matrix (after Design Manual for Roads and Bridges, 2020, Document LA 104, table 3.8.1)

Value Sensitivity	Very High	Neutral	Minor	Moderate/ Substantial	Substantial	Substantial
	High	Neutral	Minor	Moderate/ Minor	Moderate/ Substantial	Substantial
	Medium	Neutral	Negligible	Minor	Moderate	Moderate/ Substantial
	Low	Neutral	Negligible	Negligible	Minor	Minor/ Moderate
	Negligible	Neutral	Neutral	Negligible	Negligible	Minor
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
		Magnitude of Impact				

Appendix G: OASIS form

Summary for ecusltd1-510594

OASIS ID (UID)	ecusltd1-510594
Project Name	Ricknall Cars and Bishop's Fen, County Durham, Geophysical Survey
Sitename	Bishop's Fen, Ricknall Cars
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Project Identifier(s)	Project 2183
Planning Id	
Reason For Investigation	Heritage management
Organisation Responsible for work	ECUS ltd
Project Dates	01-Nov-2022 - 11-Nov-2022
Location	Bishop's Fen NGR : NZ 33115 29877 LL : 54.6628951982303, -1.4881498439108 12 Fig : 433115,529877 Ricknall Cars NGR : NZ 30995 25191 LL : 54.6209193597913, -1.52150851229229 12 Fig : 430995,525191
Administrative Areas	Country : England County : Durham District : County Durham Parish : Bishop Middleham Parish : Mordon
Project Methodology	Ecus Archaeology has been commissioned by the Discover Brightwater Landscape Partnership to carry out evaluation of two areas of land where it is proposed to improve wetland areas by creating new ponds and channels. Geophysical surveys will initially be undertaken at both sites, alongside a Desk-Based Assessment. Depending upon the results, Durham County Council Archaeology Section may request further evaluation works.
Project Results	The geophysical survey at the two sites, undertaken across eight areas totalling c.42ha, identified a range of features including infilled field ditches, palaeochannels of the River Skerne, possible pits and traces of former agricultural furrows. Some of these could be equated to features portrayed on historic mapping while others remained undated.
Keywords	
Funder	
HER	Durham County Council HER - noRev - LITE
Person Responsible for work	Greg, Speed, Oskar, Sveinbjarnarson
HER Identifiers	
Archives	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