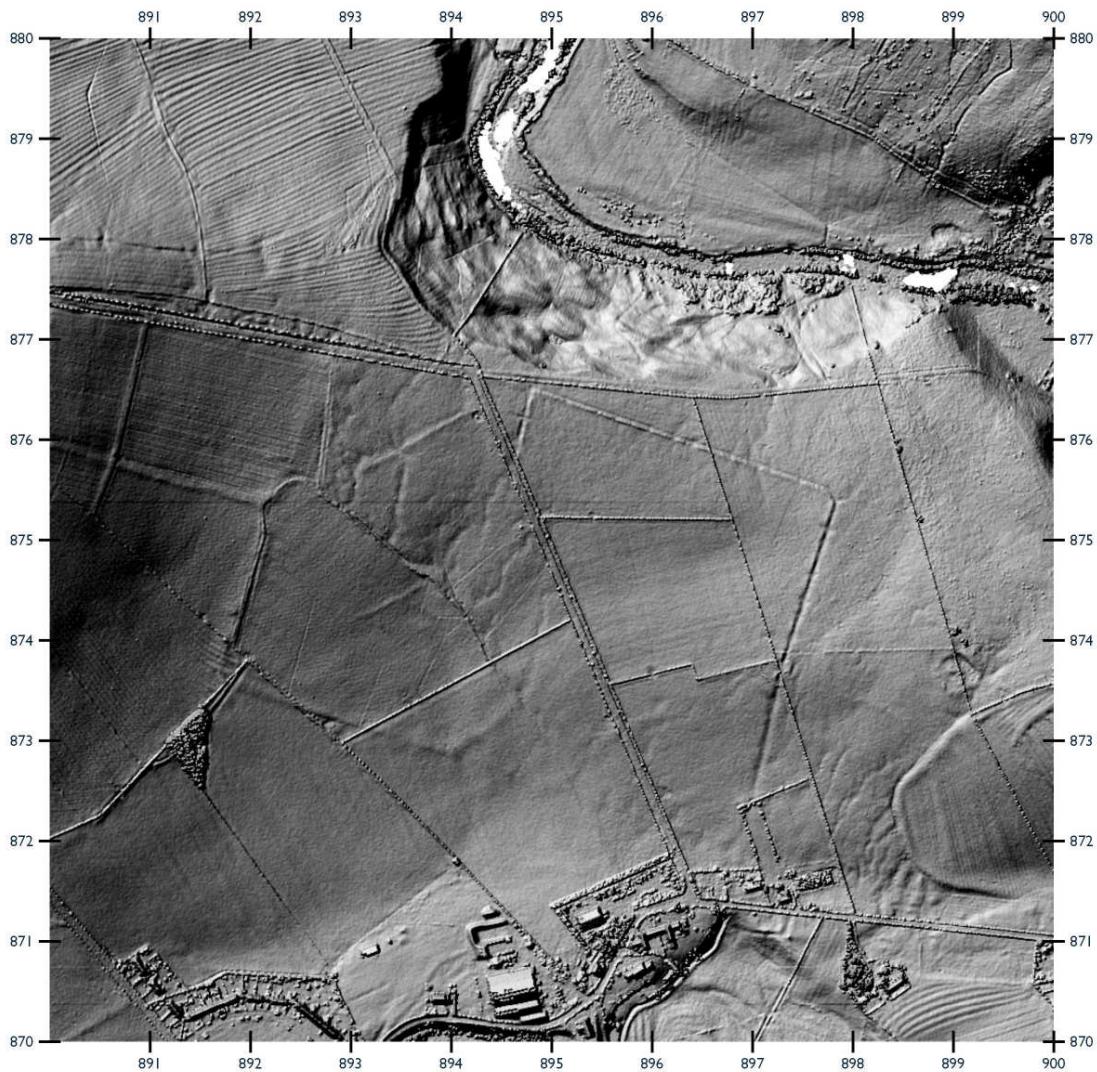




# REDESDALE LIDAR LANDSCAPES

## Project Report



This document summarises the **Revitalising Redesdale Lidar Landscapes** project, an initiative that enabled local volunteers to complete the archaeological survey of 333 sq kms of Redesdale from specially processed Environment Agency lidar data. The project was managed by Karen Collins (Revitalising Redesdale Heritage and Engagement Officer). The Project Consultant was Paul Frodsham (ORACLE Heritage Services).

**This document was written by Paul Frodsham, (ORACLE Heritage Services).  
References to it should be structured as follows:**

Frodsham, P. 2020. *Redesdale Lidar Landscapes. Project Report*. Unpublished report for the Revitalising Redesdale Landscape Partnership and Northumberland National Park Authority.



**ORACLE**  
Heritage Services

*Harnessing the spirit of our past.....  
.....enhancing prospects for our future*

[www.ORACLEheritageservices.com](http://www.ORACLEheritageservices.com)

### ***Cover illustration***

*Digital Surface Model (DSM) lidar image of OS km sq NY8987 showing West Woodburn Roman camp and numerous other features of archaeological interest. This camp was previously surveyed and published as only half its actual size, as recent drainage ditches confused the pattern of Roman earthworks as seen on the ground. Thanks to this project, it can now be recognised as one of the largest Roman camps in Britain, and a potentially very significant site in the story of Roman Northumberland. (See Fig. 4.5 for further discussion of this image).*

## Contents

|   |  |    |
|---|--|----|
|   | FOREWORD                                   | 2  |
| 1 | INTRODUCTION                               | 3  |
| 2 | DISCUSSION OF PROJECT METHODOLOGY          | 7  |
| 3 | ARCHAEOLOGICAL IMPLICATIONS OF THE RESULTS | 14 |
| 4 | ILLUSTRATIONS                              | 25 |
| 5 | SOME SUGGESTIONS FOR FURTHER WORK          | 58 |
|   | REFERENCES                                 | 65 |

## Foreword

**By Karen Collins, Revitalising Redesdale Heritage and Engagement Officer**

Since this project began in 2018, it has ballooned from the originally planned 12-month project to survey 100 square km of Redesdale Lidar data into a project spanning over 2 years and covering 333 square km. The result is a staggering amount of archaeological sites, both new and old, observed and recorded in detail.

The success of this project has in a large part been down to the collective effort of the very dedicated and enthusiastic volunteers working on the project, whom have gone above and beyond what was expected of them in creating this important and long-overdue new archaeological resource for Redesdale.

A huge amount of credit must go to the Project Consultant, Paul Frodsham of Oracle Heritage Services, who has put in a truly enormous amount of work, considerably beyond that which was expected of him, and has been such a wonderful source of information and inspiration for volunteers and staff alike. In the words of one of the volunteers, 'he is infecting us all with his enthusiasm!'

Enormous thanks are also due to Ed Hudspeth, GIS Officer at Northumberland National Park Authority for providing fantastic processed Lidar data to work with, without which we could never have found half as much as we did and for his continued patience and generosity in providing us with technical support throughout.

I can honestly say it has been a hugely rewarding and exciting project to work on and it has been a true privilege to work together with such a great group of people to reveal the hidden archaeological treasures of this little-known but extraordinary part of Northumberland. I hope you enjoy learning about what this project has uncovered and are inspired to come and discover Redesdale and its incredible heritage for yourself.

# 1. Introduction

This ambitious Lidar Landscapes survey, designed to enable a team of volunteers to study all available lidar coverage within Redesdale, was undertaken during 2018 and 2019 as part of the NLHF-funded Revitalising Redesdale Landscape Partnership (Map 1). It was managed throughout by Karen Collins (Revitalising Redesdale Heritage and Engagement Officer, Northumberland National Park Authority). Support during project development and delivery was provided by Chris Jones (Historic Environment Officer, Northumberland National Park Authority). Lidar data was processed for the project by Ed Hudspeth (GIS Officer, Northumberland National Park Authority). The Project Consultant and author of this report was Paul Frodsham (ORACLE Heritage Services).

The survey work was undertaken by a dedicated and enthusiastic team, many of whom had not previously worked with lidar. Some members of this team completed much more work than others, but all played important roles by surveying individual areas and by contributing to the success of project workshops. The survey team consisted of the following individuals, to all of whom the Project Consultant is most grateful: Phil Bowyer, Nathalie Brown, Beryl Charlton, Lorraine Clay, Keith Cooper, Andy Curtis, Kate Dickinson, Nina Dickinson, Ailsa Graham, Alison Jackson, Bob Jackson, Barbara McCabe, Malcolm McCallum, Julian Philipson, William Pointer, Adam Rodgers, Peter Ryder, Barbara Sexon, Andrew Shone, Alison Simmance, Richard Simmance, Anne Telfer, Guy Thouret, Sue Thouret, Sue Underwood, Katy Wilson, Richard Wilson.

The recent development of lidar technology enables the archaeological survey of extensive areas by local volunteers, after only a brief training session, from the comfort of their own homes. This project provided an exciting opportunity for volunteers to undertake extensive archaeological landscape survey throughout Redesdale. Volunteers received training and guidance in the use of lidar in archaeological survey, which some will hopefully continue to use in later projects now this one is complete. The Environment Agency is currently undertaking a new high-resolution lidar survey of the whole of north-east England, so volunteers who have taken part in this project will be well-placed to begin studying this new data just as soon as it becomes publicly available.

This project is based on a methodology developed for recent Lidar Landscapes surveys of comparable upland areas in the North Pennines (such as the Allen Valleys, Weardale and Upper Teesdale) that involved about 200 volunteers and resulted in numerous significant discoveries. The methodology was developed by Paul Frodsham (Project Consultant for this project) and Stewart Ainsworth (Visiting Professor of Landscape Archaeology at the University of Chester, and an expert in the use of lidar in archaeological survey). Reports on these North Pennines projects (Ainsworth 2016; Frodsham 2017) are available online as pdfs.

ALSM (or 'airborne laser swath mapping') data, more commonly referred to as 'lidar' (originally a portmanteau of 'light' and 'radar') is a relatively new information source being used by archaeologists to discover, interpret and record archaeological sites (Crutchley & Crow 2018). The data for this project, now freely available from the Environment Agency, was gathered using sensors mounted on an aircraft. It was not originally commissioned for archaeological survey, but for work relating to flood management; hence the areas recorded are based on river valleys and, somewhat frustratingly for the archaeologist, there are substantial areas, some of much potential

archaeological interest, for which no coverage is available. Nevertheless, coverage for the Revitalising Redesdale project area is generally good (see Map 2), and the potential for significant discoveries here was considered high, even in places where conventional archaeological survey has taken place previously. There are limitations to what can be achieved, not just to do with the lack of coverage in some areas but also due to the resolution of the lidar coverage which, at 1 metre resolution, will not pick up relatively ephemeral features such as prehistoric cord-rigg field systems or small cairns. Neither, of course, given its very nature, can lidar see below the ground surface; it can only record above ground 'humps and bumps', and there will always be other sites, perhaps ploughed flat or buried beneath later sites, of which lidar cannot hope to record any trace. Thus it must always be born in mind that lidar only shows us part of the picture. However, despite these limitations, the project has proved to be very worthwhile for participating volunteers, and the results will be important for future students of local archaeology and for heritage management.

Appropriately processed lidar imagery can reveal aspects of the historic landscape in staggering detail, often being far more informative than aerial photography, but human eyes are required to spot and interpret this detail. This was the role of the project volunteers, who have developed new archaeological and recording skills as well as learning much about the development of the historic landscape within the project area.

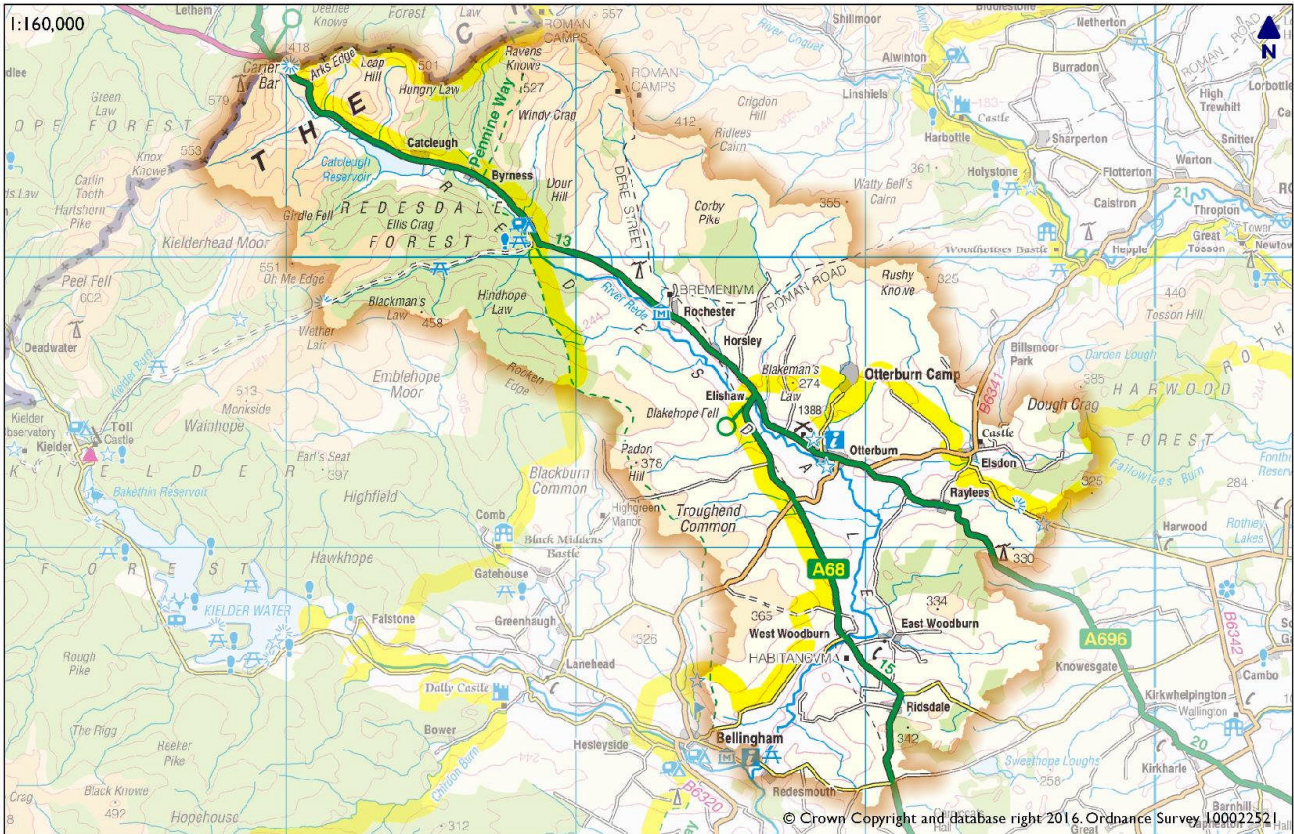
The project methodology (discussed in Section 2) was designed to enable volunteers with little or no archaeological background to make meaningful contributions to the recording and understanding of the historic landscape, while providing the tantalising prospect of significant, even spectacular, new discoveries. The recording method uses software that is either commonly available on most home computers or is freely available on the internet, enabling contributors to work at home at a pace that suits their own circumstances. The project was designed to be essentially paperless as all file exchanges were by email. After validation by the Project Consultant the results were collated within a spreadsheet that will enable them to be readily incorporated into the Northumberland Historic Environment Record (HER). They will thus be available for anyone planning new research projects, while also making a key contribution to future landscape management.

Advice on the kind of sites to look for and how to record them was given at a start-up workshop, and clear guidelines were provided within a comprehensive Project Manual that also includes details of a range of online resources, such as aerial imagery and historic mapping, that volunteers were encouraged to consult in addition to the lidar images provided. Volunteers were encouraged to try and identify all sites by reference to a nationally agreed 'site type' thesaurus; in some cases such identifications might be certain, while in others they may be little more than informed guesses. In all cases, sites were recorded in outline, enabling closer analysis later where appropriate. The Project Consultant was constantly available to help with any queries, and there was ample opportunity to discuss results, including the possible nature of any unusual sites, at a series of project workshops.

The results of the project have been collated into a digital archive which has been passed to the Northumberland HER where it should be available by arrangement for consultation. This report contains a review of the project methodology (Section 2), an overview of the results (Section 3), and some suggestions for future work (Section 5). A selection of images (Section 4) has been chosen to illustrate the results.

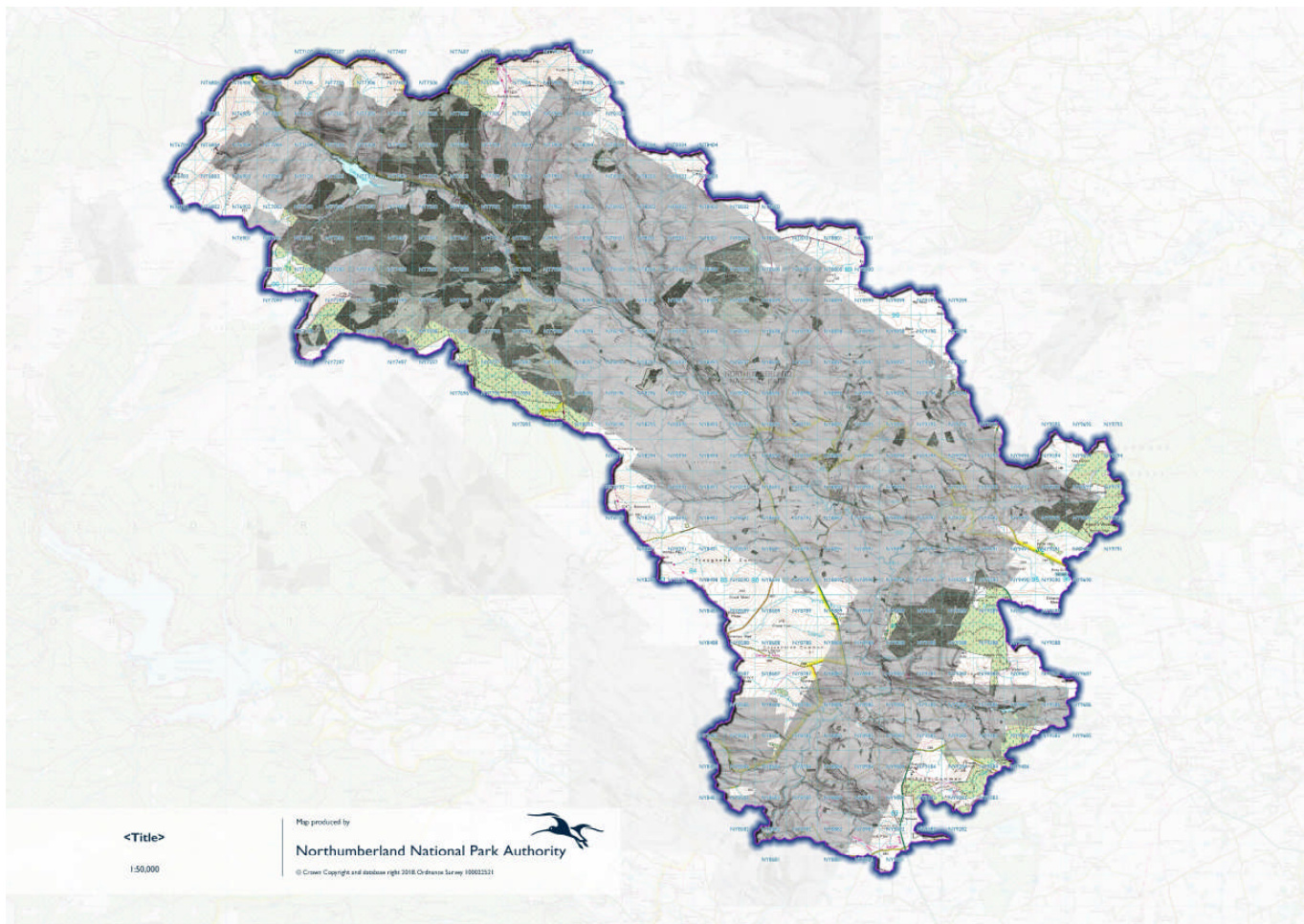
Redesdale

Northumberland National Park Authority 



*Map 1. OS map showing the Revitalising Redesdale project area, outlined in brown. The Northumberland National Park boundary is shown in yellow. The core of the project area is within the national park, but substantial areas in the north-west and south-east lie outside its boundary. The area is wholly within the county of Northumberland. The purple line straddling the north-west corner of the map is the Anglo-Scottish border.*

*Map produced by Northumberland National Park Authority.*



*Map 2. Map showing individual OS km sq map references and extent of lidar coverage within the revitalising Redesdale project area.*

*The Revitalising Redesdale project area is outlined in blue, with available lidar coverage shaded grey.*

*(Note: although of little use if printed at A4, this map becomes clear if enlarged on screen).*

*Map produced by Northumberland National Park Authority.*



## 2. Discussion of project methodology

### 2.1 Introduction

This section of the report summarises the methodology and offers some observations on how it worked in practice. It should be of interest to participants and also potentially of value to anyone planning comparable work elsewhere. The full methodology is set out in the Project Manual (Frodsham 2018), provided to all participating volunteers at the start of the project.

The methodology was intended to enable the rapid assessment of a vast area by a group of volunteers of whom most had never worked previously with lidar, though a few had taken part in similar projects elsewhere. A degree of inconsistency in the results was therefore inevitable, and despite the comprehensive validation process some inconsistencies between different areas remain, perhaps most notably in the level of detailed recording of the post-medieval landscape. While in retrospect it would be easy to criticise some aspects of the project, on balance, as a methodology to enable inexperienced volunteers to survey a very large area, it seems to have worked quite well.

Lidar data from the Environment Agency was processed to make computerised 3D models of the ground and all the features on it at the time of capture, precisely referenced to the OS National Grid, producing what were referred to during this project as 'lidarmaps'. For this project the raw lidar data was processed by Ed Hudspeth at Northumberland National Park Authority to produce 2D 'hillshaded' images which replicate the original 3D data; this technique emphasises features on the ground, including surviving earthworks of archaeological sites and allows the data to be used as image files viewable using basic software on home computers. It is important to stress that although the images look like aerial photographs they are not - they are computer models of everything on the ground that the laser pulses hit. For the lidarmaps used in this project the 3D coordinates of approximately 5 million points were collected in each km square. After much experimentation, it was decided to use lidar imagery with a vertical exaggeration of X4, making earthworks stand out more clearly but without introducing unacceptable distortion to the general appearance of the landscape. Rather than combining lighting from different directions on a single 'lidar map', as had been done for similar projects elsewhere, it was decided to provide volunteers on this project with three separate 'lidar maps', with lighting from the north-west, north-east, and south, for each km sq. It was felt that this made interpretation easier for volunteers. It was also apparent during project planning that combining the light from more than one angle on a single image tended to render some earthworks less clear than when lit from a single angle, thus hindering their identification and interpretation.

This project used primarily Digital Surface Models (DSMs) which record everything on the ground including trees and buildings. Volunteers were also supplied with Digital Terrain Models (DTMs) for which the lidar data has been processed in a special way to effectively strip away areas of woodland and buildings to produce a model of the ground surface beneath. This works better in some places than others, depending on, for example, the density of tree cover. As explained at the project start-up workshop, there was no need for participants to understand the intricacies of this, though a basic understanding of the difference between DSMs and DTMs was considered essential. In

practice, the DTM imagery resulted in hardly any discoveries of significance, due primarily to the density of tree cover within the area's conifer plantations.

As originally planned the project aimed to complete the survey of 100 sq kms, but the commitment and enthusiasm of the volunteers resulted in this soon being expanded to cover the entire Revitalising Redesdale project area. Within the project area, lidar maps were created for a total of 333 km sqs, all of which have either total or partial lidar coverage (see Map 2). Of these, 55 (mostly on higher ground towards the margins of the project area) have less than 30% coverage, and 40 are largely (at least 50%) covered with dense conifer plantations (mostly within Redesdale Forest, towards the north-west of the project area). Those with less than 30% lidar coverage or within conifer plantations have a lower than average chance of containing significant new discoveries, so were not allocated to volunteers but were surveyed by the Project Consultant. The Project Consultant also surveyed much of the upland area around Redesdale Forest, deemed to have a low probability of significant finds. As expected, very few sites were recorded in these areas. Survey within the forested areas was further hindered by the inability of lidar pulses to pierce the dense tree canopy, thus rendering the DTM imagery almost useless for identifying archaeological earthworks.

Project volunteers completed surveys of 200 km sqs, covering all the most interesting bits of the archaeological landscape, all of which were subsequently validated by the Project Consultant who also surveyed a total of 133 km sqs himself. Within their 200 km sqs, the volunteers recorded a total of 2,801 individual archaeological sites. While all of these are retained within the Project Archive, for a number of reasons, as discussed below, many were deemed inappropriate for inclusion in the final Project Database. Following validation the final number of records included in the database and passed on to the Northumberland HER was 1,348, including 1,074 'new' sites. The project results thus represent a very significant contribution to the archaeological study of Redesdale, as discussed in Section 3 of this document.

It would be possible to undertake a lot of detailed statistical evaluation of these results, looking, for example, at variations in the nature of recording between areas, or by individual volunteers, and the variations between the 'raw data' recorded by volunteers and the eventual validated results as set out in the project database and submitted to the Northumberland HER. Analysis of the extent to which the project has added to our understanding of known sites, in addition to discovering new ones, might also be interesting. However, such work would have to be separately resourced as there was little scope for it within the project budget; instead, work has concentrated on the archaeological significance of the results as discussed in Section 3.

## 2.2 Project structure

The project had five basic phases, as set out below.

### *Phase 1: Start-up workshop*

Prior to any lidar data being distributed, potential volunteers were invited to a start-up workshop in West Woodburn. It was considered essential that participants attend this workshop, although a small number did subsequently join the project. The workshop included an introduction to lidar and its use in archaeological survey, an explanation of

the project methodology, and a practical training exercise using newly processed data from Redesdale that no-one had seen previously.

### *Phase 2: Data Recording, Progress Workshops and Guidance Notes*

After the workshop, all signed-up participants were sent, by email, a copy of the *Project Manual*, blank recording forms, and the lidarmaps and other material (see below) for their first km sqs. When complete the results for each km sq were returned to the Project Manager by email, and were saved in a Dropbox for later validation by the Project Consultant. During this process, three progress workshops were held in Otterburn at which emerging results were presented and discussed. These events all overran due to the level of interest amongst volunteers! One of them included a detailed examination of the Roman heritage of Redesdale, including analysis of the lidar imagery of Roman military sites and 'native' roundhouse settlements and field systems. As noted elsewhere in this report, in addition to the 200 km sqs surveyed by volunteers, the Project Consultant surveyed another 133 (mostly those areas without interesting archaeological landscapes, but that still had to be checked in order to complete survey of the entire project area).

Linked to the workshops, about halfway through the project it was decided to produce a Guidance Notes document featuring lidar imagery of various types of site throughout the project area, to help volunteers identify things with greater confidence. In retrospect, it would have been better to have done this right at the start, but it was not included within the original project design and was only added when the project was expanded from the original 100 km sqs to the full 333. Many of the sites featured in it had already been discussed at workshops, but volunteers were pleased to have them illustrated within the Guidance Notes that they could consult whenever they wished. Several of the illustrations included within Section 4 of this report were originally produced for the Guidance Notes.

### *Phase 3: Data Validation*

The Project Consultant checked all results, and, after validation, entered them onto a master database (in the form of an Excel spreadsheet). This database has now been passed to the Northumberland County Council Archaeology Section for incorporation into the Northumberland Historic Environment Record (HER). The validation process, including analysis of all 2,801 individual records produced by the volunteers and the careful checking of every lidarmap (which resulted in the recognition of several sites missed or misidentified by the volunteers), was extremely time consuming. However, it was essential in order to transform the results produced by the volunteers into a structured database of validated results.

Following validation, the workmaps and recording forms were not edited in any way. They therefore illustrate each volunteer's findings rather than the validated results. For this reason, the workmaps should never be consulted other than by reference also to the Project Database.

### *Phase 4: Results workshop*

A final workshop was held in Otterburn to examine and discuss results, enabling participants to present their findings and discuss ideas, including possible follow-up

work, with colleagues, the Project Manager and Project Consultant. Many of the ideas discussed for possible follow-up work are presented here in Section 5.

### *Phase 5: Report and Archive*

The final phase was the production of this report and the Project Archive. The report will be circulated to all participants, and will also be made universally available via the Revitalising Redesdale project website. Given the quality of the results, a summary report may be prepared for publication in an appropriate journal; this requires further discussion.

A digital archive has been prepared and submitted to the Project Manager along with this report. The archive consists of the following:

- This Project Report (pdf).
- The final Results Database (Microsoft Excel spreadsheet).
- All the data produced for each km sq (DSM and DTM lidar, satellite photos, OS map).
- All the volunteer results, filed by km sq. (Workmaps, Summary Forms and Recording Forms).

It is important to note that for the km sqs surveyed directly by the Project Consultant, and for sites noted by the Project Consultant during the validation stage, Workmaps, Recording Forms and Summary Forms were not created, as there was simply not enough time to do so. Instead, details of such sites were entered directly into the project database, with an appropriate degree of information provided therein.

### **2.3 Notes on the recording methodology**

The methodology was created to help volunteers think constructively about what they were doing and to structure their work in a way that would provide consistency throughout the entire project area. As noted above, the detailed methodology is set out within the Project Manual; the following summary may be of interest to anyone wondering how the project worked but without the inclination to study it in great detail. The methodology may initially appear complicated but was designed to be as simple as possible while also generating meaningful results. Throughout the project volunteers were encouraged to ask if there was ever anything they were not sure about. Human contact between participants and project staff was considered essential; the project workshops played a key role in this but the Project Manager and Project Consultant were also available throughout to deal with enquiries by phone or email. It was stressed to volunteers from the start that they were being asked to record what they thought they could see, so they couldn't actually be wrong! In general terms, if they were unsure about something then they were asked to record it, provide a description and a possible interpretation on the recording form, and leave it to the Project Consultant to make a final decision as to what it might be during the validation process. Despite this, a large number of 'unclassified' sites are included amongst the final results, where earthworks were noted but their origin could not be ascertained with any degree of certainty.

### **Workmaps and recording forms**

The project area consists of 333 kilometre-squares (km sqs) as defined by the National Grid and shown on Ordnance Survey 1:50000 and 1:25000 maps (see Map 2). Each km

sq was surveyed separately, with lidar maps provided for each. Participants were provided with the following by email for each km sq that they surveyed:

1. DSM and DTM lidar maps, OS map and aerial photo of each km sq to be surveyed.
2. Blank Site Recording Form
3. Blank Summary Form

Each batch included three DSM (Digital Surface Model) lidarmaps and three DTM (Digital Terrain Model) lidarmaps (with certain features such as trees, buildings and walls removed) of the relevant km sq, accurately rectified to match the OS National Grid. Of each set, one had simulated sunshine from the NW, one from the NE, the other from the S, with shadows on each cast at different angles from the others. Experimentation demonstrated that in many cases particular archaeological earthworks showed up clearly on one of the three lidarmaps while being far less (if at all) visible on the others.

Before starting work, volunteers made a copy of the DSM map lit from the NW and saved this as their workmap for this particular km sq. In some cases, if things were visible on lidar maps other than the DSM NW map, further workmaps were made to record these. In practice, only the DSM NW workmap was needed for the vast majority of km sqs.

All sites noted on the lidarmaps were annotated on the workmaps in accordance with clear guidelines; a worked example was included within the Project Manual. Thus, although some inconsistency in the identification of features was inevitable, the actual way in which they were recorded on the workmaps was consistent across the project area. Sites were recorded using a simple colour scheme (most volunteers used Microsoft Paint, though a few opted for more complex software packages - the only thing that mattered is that the resulting workmap was presented as a jpeg, with all sites clearly marked and annotated. Sites were allocated individual record numbers based on the relevant km sq (eg NY9988-1, NY9988-2 etc). Once allocated, to avoid any confusion, these numbers were maintained throughout the project and are retained within the final database; this is why there are gaps in the numbering system, where sites were not retained at the validation stage, perhaps because they were deemed to be natural features or were merged with other sites. For every site marked on the workmaps, volunteers completed a record form. They also completed a summary form for each km sq, this is in effect an index to the individual record forms, allowing quick identification of everything marked on the workmap.

The Recording Forms and Summary Forms were completed and submitted as Microsoft Word documents. A Recording Form was filled in for each feature recorded, cross-referenced to the Workmap by the unique number allocated to each feature. The Recording Form includes details such as NGR, site type, archaeological period, site form (the vast majority were 'earthworks'), existing HER number (for sites already wholly or partly on the HER, and recorded in Keys to the Past - see below), and source (eg DSM NE lidarmap, satellite imagery, historic OS map). The form also included an open text box for a written description of the site, in which volunteers were encouraged to provide a clear description and also, if appropriate, to speculate about the nature and significance of the particular site. A worked example was provided within the Project Manual. Volunteers had little difficulty with the forms, which were completed and submitted in accordance with the guidelines and which collectively represent a huge amount of work.

For the purposes of the project, bearing in mind the limited archaeological knowledge of many volunteers, allocation of sites to archaeological periods was kept very simple; sites were recorded simply as 'prehistoric, Roman, medieval, post-medieval or unknown, with clarification of more detailed information supplied, where appropriate, within the discussion section of the form. In some cases, more detailed chronological information was added by the Project Consultant during the validation phase, and included within the project database.

## 2.4 Studying individual km sqs and decisions about what to record

Volunteers were invited to spend as long as they liked exploring the lidar maps, and advised that sometimes it is a good idea to have an initial look at one and make some notes, then return to it later, as quite often something will be noted during a second inspection that was missed the first time. They were also encouraged to consult a number of readily available online sources, in addition to the lidarmaps and satellite images provided by the project. For each individual km sq, the chances are that no-one else will have studied it so carefully before, using so many different sources, so project volunteers were encouraged to become the world experts on their particular km sqs! Volunteers were encouraged to consult the following websites for each of their km sqs:

### **House Prices website**

<https://houseprices.io/lab/lidar/map>

An extremely useful online seamless DSM lidar map covering all of England and Wales. Although the imagery is not processed to maximise visibility of archaeological earthworks, most sites are visible to some extent. This resource also enables each individual km sq to be seen in context and can be very useful when a feature crosses a boundary between km sqs.

### **Google Maps and Bing Maps**

[www.google.co.uk/maps/](http://www.google.co.uk/maps/)

[www.bing.com/mapspreview](http://www.bing.com/mapspreview)

These well-known websites provide high-resolution colour aerial imagery. Sometimes, depending on the season, plough-flattened archaeological sites not detectable by lidar can be seen as cropmarks.

### **Keys to the Past.**

<http://www.keystothepast.info/>

A portal into the Northumberland and County Durham Historic Environment Records (HERs). It also provides access to historic and current OS mapping.

### **National Library of Scotland** - online historic mapping

<http://maps.nls.uk/os/>

Enabling split-screen display of high-resolution images of historic large-scale (25 inches to the mile) OS maps along with satellite imagery. (Although not available at the start of this project, lidar imagery is now also available here).

### **Pastscape**

<http://www.pastscape.org.uk/>

Historic England's portal into a vast database of archaeological sites and historic buildings.

Advice on what to look for and how to record it was given at the start-up workshop, and subsequently in the guidance note noted above. Within these guidelines, volunteers were advised to use their own initiative when deciding what to record and in how much detail to describe things. In general terms, the advice was to record anything that looks as though it is, or might be, archaeological, including any mounds, pits or linear features that don't appear to be natural, unless they are obviously of recent date. Features shown on historic maps were recorded, whether or not they were visible on the lidarmaps, and the extent to which they were visible on the lidar imagery was noted.

Specific and straightforward advice was provided with regard to ridge-and-furrow, which covers vast swathes of the Redesdale landscape. Ridge-and-furrow field systems with ridges that appear to be curved were recorded as they are quite likely to be medieval, but straight plough ridges are more recent and the advice was not to record these. Extensive field systems were recorded in outline only, with a note provided on the Recording Form regarding nature their nature (eg state of preservation, relationship to other things) and extent (eg whether they extended onto adjacent km sqs). Old quarries, pits and other industrial features were recorded, along with any information about them provided on old maps, but the advice was to *'avoid recording present-day field boundaries, tracks, buildings, areas of woodland, or other 'modern' features, as doing so can take ages and they will only be deleted at validation stage; you will have wasted your time and that of the Project Consultant doing the validation!'*

Despite the clear guidance, provided within project documentation and discussed at project workshops, it must be admitted that were some issues with the recording of sites that could have been dealt with better. Some volunteers struggled to distinguish between archaeological and natural features, resulting in the recording of dozens of sites that were dismissed at validation stage. It is difficult to know how to deal with this problem, other than through one-to-one tuition. As volunteers were advised to record 'what they thought they could see', they hadn't actually done anything 'wrong' by recording so many 'non-sites', but a great deal of time was spent evaluating this work during validation - time that would have been better spent on other things. The advice regarding ridge-and-furrow turned out to be a bit ambiguous in practice, as many different types of ridge-and-furrow were encountered. This should be studied in detail, as suggested in Section 5 of this report. A small number of volunteers were fascinated by the level of detail of some post-medieval agricultural landscapes visible on the lidarmaps, and despite the guidance they opted to record these in great detail. This was discussed at project workshops, and all the information is retained within the Project Archive, but the level of detail of such work is too great for inclusion in the HER; in most cases these landscapes have been condensed into single 'sites' (most often classed as 'extensive post-medieval field system') with a note that further detail can be found in the project archive.

In spite of such issues (which in the grand scheme of things are of little consequence), the volunteers did an enormous amount of high quality work and the final results, as discussed in Section 3 and illustrated in Section 4, undeniably represent a substantial enhancement of the HER for Redesdale. They also provide a sound basis on which to plan future work, as discussed in Section 5.

## Part 3. Archaeological implications of the results

This section consists of an overview of the project's results, presented chronologically. The project area extends from Redesmouth in the south up to the Scottish border at Carter Bar. This area includes a range of landscapes from the villages and fields of the lower-lying areas up to the bleak high hills of the Border Ridge. It is very tempting to use the results to attempt a detailed account of the archaeology of this entire area, illustrated with distribution maps of different types of site, but this, sadly, lies beyond the remit of the project. Given the amount of information now available, and the sheer number of sites to discuss, it would be immense task. It would perhaps be best done as a series of smaller-scale projects, looking at particular areas or periods, and some suggestions regarding this are presented in Section 5.

The area is probably best known for its Roman military heritage, in particular the line of Dere Street (the 'Roman A1', or more accurately, A68) and the associated marching camps and the great forts of Bremenium at High Rochester and Habitancum near West Woodburn, and the role it played in the Anglo-Scottish medieval wars, most notably the Battle of Otterburn. These are indeed important elements of Northumberland's heritage, but as the results of this project help to demonstrate there is also much more in Redesdale, and certainly much still to find out. It is important to stress that this project did not take place on a blank canvas, but sought to build on important work done previously by others. The best overview of local archaeology is provided by Beryl Charlton (1986) in her book 'The Story of Redesdale'. This is now out of print, but hopefully an updated overview can be produced before too long to incorporate the results of this project. It is probably fair to say that with the exception of investigations into its Roman heritage (eg Richmond 1940; Charlton & Mitcheson 1984; Crow 2004), Redesdale has seen relatively little archaeological fieldwork over recent decades in comparison with adjacent areas such as the Hadrian's Wall corridor to the south and Coquetdale to the north. To an extent this can be seen from an analysis of material presented in the overview of archaeology in the Northumberland National Park published in 2004, although there were several references within that volume to sites and projects in Redesdale (Frodsham 2004). Important archaeological surveys here include those of the Otterburn Training Area (Charlton 1996; Gates 1997), and of Upper Redesdale (Charlton & Day 1978, 1979, 1981, 1982). Although this Lidar Landscapes project represented a completely new way of studying the Redesdale landscape, the results should be studied not in isolation but in very much in tandem with those of earlier work.

Before beginning the chronological summaries, a brief overview of the results will be presented. Although the figures presented here are impressive, it could be argued that they don't really mean much on their own (other than demonstrating the huge amount of work done by project volunteers!). This project has been primarily about identifying sites from lidar imagery, which is important, but the real value of the lidar imagery is the way in which it can be used to help understand how different sites relate to each other, both spatially and through time. A suggestion as to how volunteers may like to move onto a 'next stage' of lidar analysis, progressing from the identification of sites to the interpretation of archaeological landscapes, can be found in Section 5.



A crude summary of the results is presented in Table 1. Throughout the project, where sites were recorded on the Keys to the Past website their existing HER numbers were recorded and a note made of their nature as seen on lidar imagery; in many cases this represents a considerable enhancement of the existing record, though in others the record merely notes that the site is visible on lidar imagery. Sites not noted on Keys to the Past are considered to have been newly discovered, though it is possible that some of these may have HER records but have, for whatever reason, not been added to keys to the Past. To complicate matters, it was noted during preparation of the project archive that a small number of sites had appeared on Keys to the Past during the lifetime of the project! These were recorded by volunteers as 'new' sites, often amidst great excitement, but were later noted to have been added to Keys to the Past, usually with a note that they had been recorded from lidar imagery. This seems to apply mostly to late prehistoric settlements; it has subsequently been established that someone unassociated with this project had reported a number of such sites to the HER, which is perhaps only to be expected during a project lasting a couple of years. The entire archive has not been checked for such anomalies, but where such cases were noted the relevant record has been amended accordingly, with the HER number added. In the final analysis it is of no real consequence whether individual sites had been noted previously or were newly discovered by the project; the important thing is that all sites are recorded at least once and entered onto the Northumberland HER, and where they appear on lidar imagery that this has been examined and a description provided.

| Period                 | No of sites | No of 'new' sites | % 'new' sites |
|------------------------|-------------|-------------------|---------------|
| Prehistoric            | 79          | 36                | 46%           |
| Prehistoric/Roman      | 73          | 30                | 41%           |
| Roman                  | 57          | 38                | 67%           |
| Medieval               | 51          | 37                | 73%           |
| Medieval/Post-medieval | 105         | 87                | 83%           |
| Post-medieval          | 706         | 604               | 86%           |
| Unknown                | 277         | 242               | 87%           |
| <b>TOTAL</b>           | <b>1348</b> | <b>1074</b>       | <b>80%</b>    |

*Table 1. Summary of results by chronological period, after validation.*

In general terms it is probably fair to say that these results are pretty much in line with what was expected at the start. They equate fairly closely with those for other comparable upland areas of northern England for which similar surveys have been undertaken over recent years. It should be pointed out that the high number of 'new' Roman sites relates largely to the recording of different sections of the survey area's two Roman roads that survive as earthworks visible on lidar imagery; these are important observations but are not really 'new sites' and the individual records will presumably be combined within the HER under the main entries for the two Roman roads.

As noted in Section 2, some areas, deemed from the start to be relatively low potential, were not allocated to volunteers but were done by the Project Consultant.

These include the high moorland around the fringes of the project, and Redesdale Forest which covers much of the north-western portion of the area and within which there are few open spaces. Discoveries within these areas were indeed sparse, consisting almost entirely of post-medieval agricultural structures, mostly sheepfolds.

The dense conifer cover was not conducive to lidar survey, as the DTM imagery did not give a sufficiently high-resolution model of the ground surface to enable the identification of any features that might be present. However, given the nature of the landscape around the margins of the forest, it is considered unlikely that much of any great significance survives within the forest, though the Neolithic and Bronze Age burial monuments at Dour Hill and the Three Kings four-poster stone 'circle' do demonstrate activity here and it is possible that other sites may also survive within the forest. Lidar, however, will not be the way to find them, at least not for as long as the forest remains standing.

South-west of the forest, throughout the rest of the project area, sites were recorded in all km squares. The number of sites per km sq varied from 1 up to 80, though following validation almost all km sqs had less than 20 sites. The numbers of sites recorded in each is a result of the complexity of the archaeological landscape together with the ability of the individual volunteer to correctly identify sites. As noted above, the actual number of sites recorded is thus not on its own a reliable indicator of the complexity of the archaeology within any particular km sq. Even the number of validated sites is not really a reliable indicator, as a 'site' can vary from a single structure such as a sheepfold or a mound of unknown origin to an extensive, multi-period agricultural landscape. That said, it is apparent from a brief glance at a map of the numbers of sites per km sq that largest numbers of sites are concentrated in a band roughly 4km wide, extending to 2km either side of the Rede. This is not a surprise.

Within this area, and in a few places outside it (such as around Elsdon), the archaeological landscape is in many places quite complex, with demonstrable time-depth extending back through Roman times into prehistory. There are many areas that would repay more detailed investigation, not into individual sites (though this would certainly be justified in many cases) but into the development of the landscape through time. This account must, however, restrict itself to brief overviews by period. Such accounts are never really satisfactory because these archaeological periods were invented by archaeologists and there were many aspects of continuity between them; they thus represent artificial divisions of a continuous whole, but they are now pretty much set in concrete and this certainly is not the place to try and demolish (or amend) them. During the project, sites were generally only recorded as prehistoric, Roman, Medieval or post medieval, and this is how they are recorded in the project archive. The following account uses the conventional archaeological periods (the approximate dates of which are shown in brackets).

## **1. The Stone Age (Mesolithic, c10,000-4,000BC, and Neolithic, c4000 - 2400BC)**

The earliest evidence for people in Redesdale comes in the form of flint tools of Mesolithic and Neolithic date, and two Neolithic burial cairns high up the valley at Bellshiel (81011. Fig 1.1) and Dour Hill (79021). The Bellshiel cairn is very clear on lidar, the Dour Hill one lies in a small clearing within the north-east corner of Redesdale Forest and is less clear, though still visible. Why these two cairns should exist in such close proximity when no others are known in Redesdale is not known. This project failed to locate any other certain Neolithic long mounds, but the curious mound on Wether Hill (91908. Fig 1.2), recorded on the HER as a natural mound, is certainly a contender and should be inspected on the ground. Elsewhere in northern England, probable late Neolithic 'henges', large circular banked-and-ditched ceremonial sites, have been recorded using lidar, but none were found during this project. If any ever existed here

then they may well have been flattened by medieval or later ploughing. Settlement throughout the Mesolithic and Neolithic was probably largely mobile, and it is most unlikely that any evidence of settlement from so long ago will be found through lidar analysis.

## 2. Bronze Age (c2400 - 800BC)

Several examples of Bronze Age burial cairns are known in Redesdale, though very few have been subject to recorded excavations (the example at Dour Hill being a notable exception). Some are visible as circular mounds, of various sizes, on lidar, though it can be difficult to distinguish between them and natural features. The middle Bronze Age, from about 1500BC, saw the first permanently occupied farmsteads, of round houses with field systems, in the hills. Investigations elsewhere suggest that these landscapes date roughly from about 1500BC and may have continued in use through into the early Iron Age. A substantial Bronze Age roundhouse was excavated in the 1980s at Halls Hill near West Woodburn (90881. Gates 2009). It seems to have been occupied in about 1000BC, though the site had apparently been used for a burial several centuries earlier.

Today, the Halls Hill roundhouse can be seen on lidar imagery in a small clearing within recent forestry, but its extensive field system is now lost beneath a dense cover of conifers and undetectable by lidar. (An assessment of the extent to which it may have survived forestry operations should be attempted when the trees are eventually cleared). These Bronze age field systems generally consist of scattered cairns of stone cleared from the fields, along with occasional stretches of low stone field banks and sometimes visible remnants of roundhouses - though the houses were often of timber and can leave no surface trace. Sometimes agricultural terraces can also be present. Investigations in the Cheviots suggest that these landscapes can have several phases, with not all features necessarily being of the same age.

Groups of clearance cairns, termed 'cairnfields', are usually the most obvious remnants of these early agricultural systems in today's landscape, with further detail often only noted during detailed field survey or excavation. 17 of these cairnfields are included within the project database, ranging in size from half-a-dozen to upwards of fifty individual cairns; many others have presumably been destroyed by later agricultural activity, leaving only those on higher ground not subjected to more recent ploughing. In his published report on the Hall's Hill excavation, Tim Gates makes reference to several other cairnfields in the vicinity, including some outside the current project area. When new high-resolution lidar data is available, this whole area should be carefully checked and it would come as no great surprise if even more evidence of Bronze Age settlement was to be found. Gates also discusses the results of palaeoenvironmental work at Hall's Hill which, together with the examination of a pollen core from Steng Moss c6km to the east (Davies & Turner 1979; Young 2004), suggests a mixed farming regime was in place over much of this landscape during the middle and later Bronze Age.

Some such sites, such as those at Tod Law near Otterburn Camp (89952, 89953, 89956, 899617. Fig 2.3) and Darney Crag and Staniel Cleugh (91871, 91872. Fig 2.1) close to Hall's Hill, have been surveyed previously, but the lidar imagery enables us to see them in far more detail than vertical aerial photography on which they are all but invisible. At Tod Law, important new discoveries have been made during this project, and it is recommended that the entire complex should be resurveyed using a combination of lidar imagery and field observation. Another apparent Bronze Age landscape was

discovered during this project at Horsley Plantation (84978. Fig 2.2), and another has been recorded on the southern slopes of Fawdon Hill (899320. Fig 2.4) where recent investigation by Revitalising Redesdale volunteers seems to have confirmed a Bronze Age date (Carlton & Johnstone 2019). The extensive cairnfield north of Branshaw Bastle (870014. Fig 5.11) seems to be a new discovery by this project. It represents the earliest known phase of activity within what can be seen on lidar imagery as a complex multiphase landscape with occupation extending through until post-medieval times. In a few other places (eg north-east of Silloans, 83024. Fig 2.5) lidar imagery has confirmed earlier records of cairnfields, also providing much more detail.

### 3. Iron Age, including the Roman Iron Age (c800BC - 410AD)

In the Iron Age, during the last three centuries BC, communities in the Cheviots constructed great hillforts in many places, but few have been recorded in Redesdale. More than fifty sites within the Northumberland Cheviots, displaying much variation in size and form, have been classed as 'hillforts'. All that they share in common is an enclosing rampart (sometimes a series of concentric ramparts), usually of earth but occasionally of stone; some have remains of roundhouses visible within them while others have featureless interiors. Most are curvilinear in plan, but a few are rectilinear. Most, but by no means all, are on hilltops, often commanding spectacular views. In Redesdale the large enclosures on Fawdon Hill (89931. Fig 2.4) and Camp Hill, Colwellhill (90932. Fig 3.2), between Otterburn and Elsdon are two good examples; both are clearly visible on lidar imagery but neither seems to have any obvious sign of an associated field system or any other related features. Without excavation we are unlikely to be able to say very much about the detailed chronology or function of these sites. In addition to these two, the project database classifies a further five sites as certain or possible hillforts, though none has been securely dated to the Iron Age and it is certainly possible that some could date from other periods. The example at Ravenscleugh (939122. Fig 3.6) was thought to be a new discovery but now seems to have been previously recorded in the HER - but in the wrong place! A similar enclosure can be seen a little over 1km to the north-west near Haining (92921. Fig. 3.5). The previously unrecorded large enclosure east of the Roman camp at West Woodburn (89873. Fig 4.5) could perhaps be a hillfort, as could a much smaller enclosure above Hudspeth (94911. Fig 3.3). The final example is the small enclosure sitting in splendid isolation above the west end of Catcleugh Reservoir (72031. fig. 3.4), recorded on the HER as a settlement but which in the Cheviots would be classed as a small hillfort. Each of these examples is of interest in its own right and should be surveyed on the ground.

Of very great interest in Redesdale, and far more numerous than the above-mentioned hillforts, are the so-called 'Romano-British' or 'native' settlements, the currency of which probably extends from pre-Roman through into post-Roman times. Some examples are illustrated here in Figs 3.5 - 3.16. Several of these have been known since the mid-nineteenth century, with many more recorded from aerial photography in recent times. About 80 such sites (of which some 25% were new discoveries made during this project) are listed within the project archive; the exact number is debatable due to the vagaries of classification, which has generally been left as it is for sites already on the HER (eg some enclosures classified as small 'hillforts' might perhaps be better classed as along with these sites, and a small number of immediately adjacent sites are combined within single listings). Some of these have been classed previously as Iron Age, others as 'Roman' or 'Romano-British', while the sites have been variously classed as 'settlements', 'farmsteads' or 'enclosures'. While accepting that some may have been

constructed for some purpose other than settlement, the vast majority were probably settlements and for the purposes of this report they will be referred to collectively as 'late prehistoric settlements'. Anyway, the point is that numerous certain and probable late prehistoric settlement sites survive within the project area. In an important paper published in the late 1970s which built on earlier surveys, Charlton & Day (1978) classed all known late prehistoric settlements known at the time in Upper Redesdale and into four basic types:

1. Enclosed 'North Tyne' rectilinear settlements.
2. Enclosed Cheviot type curvilinear settlements. (This is not a particularly good definition as rectilinear enclosed settlements also exist in the Cheviots, such as those excavated at Ingram; Frodsham & Waddington 2004).
3. Unenclosed forecourt settlements, with roundhouses overlooking paddocks but without an enclosing bank.
4. Unenclosed stone roundhouses.

Detailed analysis, including how many of the 80 recorded sites fit within each of these categories, together with a distribution map, would be very useful but is beyond the remit of this report. What is immediately obvious, however, is that in general terms the rectilinear sites tend to occupy relatively low-lying locations close to the Rede and its tributaries, whereas the more curvilinear 'Cheviot-type' sites tend to occupy higher and to our eyes less accessible ground, for example within the Otterburn Training Area. It is interesting to speculate as to the explanations behind such patterns; for example, were the rectilinear sites linked to riverine transport networks, and do some sites relate in any way to the network of Roman roads? How do the different types relate to each other chronologically, and were any occupied through into (or reoccupied in) post-Roman times? The presence of apparent rectangular buildings within some sites certainly suggests post-Roman occupation, but all such sites remain undated. The only certain thing is that more fieldwork will be necessary to investigate such issues.

A small number of these sites seem to have associated field systems, which vary in form. Cord-rigg field systems have long been known in this area, but unfortunately cord-rigg does not show up on 1m resolution lidar imagery so the results of this project should not be regarded as any kind of indicator of the presence or absence of cord-rigg in association with any particular settlement. In many cases, what appear to be late prehistoric settlement sites lie within later, medieval or post-medieval, ridge-and-furrow field systems which in many cases have been laid out to respect the earlier sites. This might suggest that the old settlements were still being used for something, though not necessarily for settlement, within these field systems. Some sites have been ploughed nearly flat, while others have no doubt been ploughed completely flat and thus do not show up on lidar imagery. The three adjacent sites at Woodhill, near Otterburn (87921. Fig 3.10) are particularly interesting in terms of chronology; did they supersede each other, or is the current variation in their condition primarily down to medieval and post-medieval ploughing?

The settlement at Woolaw (81982. Fig 5.1), partially excavated in 1977, shows up well on lidar, though its adjacent cord-rigg fields do not. It consists of four stone-built round houses within a stone-built perimeter wall. The finds from the excavations (Charlton & Day 1978) suggest that the last of at least three construction phases dates from the second century AD, but no scientific dates were obtained and the date of the site's initial construction could well be pre-Roman. Sadly this information is of little value to attempts

to establish the detailed chronology of other late prehistoric settlements throughout the project area, which remains a priority for future research.

Examples at Rattenraw, also clearly visible on the lidar maps and with an extensive contemporary field system, have recently been the subject of survey and small-scale excavation by Revitalising Redesdale volunteers (Bowyer et al 2019a; Curtis et al 2019); further excavation is planned and the results will be important to our overall understanding of this period throughout Redesdale, but we must be careful not to extrapolate from this one site to all the others, especially given their wide variation in form. Establishing the chronology of these sites is important if we hope to approach an understanding of Redesdale before the Romans as well as during Roman times (increasingly referred to by archaeologists as 'the Roman Iron Age', to reflect aspects of continuity from pre-Roman times). Recent Lidar Landscapes projects in the North Pennines (notably Alston Moor, Weardale and Teesdale) have also recorded numerous settlements and field systems from this period; much interesting work could usefully be done comparing Redesdale with these, including investigating the impact of the Roman military on such settlement patterns.

#### 4. Roman military sites (c70-410AD)

Redesdale is particularly important for its Roman military archaeology associated with the line of Dere Street (Richmond 1940), the main Roman road between York and Scotland, which lies partly beneath the present-day A68 but survives elsewhere as an obvious earthwork. The great forts at Bremenium and Habitancum, and several of the known temporary camps along the line of Dere Street, show up well on lidar, as do sections of Dere Street and the Roman road eastwards from Bremenium. It is always worth being extra vigilant when surveying areas around Roman forts as the forts usually attracted extra-mural settlements (*vici*) of which earthworks often survive; even if we can't be sure what they represent, or indeed how old they are, all 'humps and bumps' in such locations should be recorded for subsequent more detailed analysis. One area of potential interest is south-west of Bremenium fort (Fig 4.1), where quite prominent earthworks may well be part of a *vicus*. Earthworks east of the fort at Habitancum may similarly relate to Roman settlement outside the fort.

Unsurprisingly, the project did not find any new forts, but it did make some significant discoveries relating to Roman military archaeology. It is always worth taking extra care when checking the lines of Roman roads to see whether any other sites of Roman (or indeed later) date might lie along them. Redesdale has an extraordinary concentration of Roman 'temporary camps', thought to have been used by troops on the march, and the current project has located a probable 'new' one at Whitfield, immediately west of Dere Street at a point at which the road changes direction (90831. Fig 4.6). It almost seems as though the camp may have existed prior to the road, which was aligned upon its east side. There may even be two camps here, one inside the other; if so then presumably a smaller one was built later on the site of the original, perhaps following (or during) the construction of Dere Street. The site is located within an area that has been much disturbed by medieval and/or post-medieval ploughing, which probably accounts for it not having been noted previously. The lidar certainly suggests a camp here, but the site should be regarded as uncertain prior to being checked on the ground. Another possible camp has been noted at High Rochester, immediately south of the A68, where what look the southern ramparts of a camp, with characteristic curved corners, appear to survive as a low earthwork (829712). These may, however, be no more than a later field

boundary, though it is of course possible that such a field boundary could overlies the ramparts of a camp. The site lies very close to the Rede, and may have been linked to transport along the river, conceivably during construction work at Bremenium. It has been suggested that such camps along the line of Hadrian's Wall could have functioned as construction camps while the Wall was under construction; the same may be true of the known camps at Birdhope, as well as this possible newly discovered one. A couple of other possible but doubtful Roman camps are also noted in the project database, adjacent to Dere Street.

Arguably even more significant than either of the above sites is the recognition that the camp at West Woodburn (89871. Fig 4,5) is about twice as large as previously realised. Although previously surveyed and published (RCHME 1993, 133-4), the previous surveyors did not have access to any lidar imagery and they mistook a recent field drain as the camp's western rampart. On lidar imagery it is immediately clear that the camp is much larger than shown on the RCHME plan; its southern rampart and south-west angle can be clearly seen as low earthworks on the lidar imagery. This camp can now be seen as one of the largest in Northumberland, indeed in the whole of Britain. It is quite possible that it was built by the first Roman troops passing northwards along the line of what would later become Dere Street. It may also have been occupied during construction work on the road, or even perhaps on the fort at Habitancum which lies only about 1km to the south-west (though on the other side of the Rede). This is certainly a very significant discovery that would justify publication in an appropriate Roman journal, perhaps linked to a new ground survey.

One final thing to note here is the presence of possible Roman quarries adjacent to both Dere Street and the link road between Bremenium and the Devil's Causeway to the east (eg 84985, 84987. Fig. 4.8). These are by no means proven to be Roman, but they do look very different from the conventional post-medieval quarries that occur in numerous places throughout the project area, and the correlation with Roman roads seems unlikely to be coincidental.

## 5. Medieval (c410 -1603AD)

In common with much of upland Northumberland, little is known of settlement here from the end of Roman times through until the Norman Conquest, and, just as with other lidar surveys elsewhere, no clear light has been shed on these 'missing centuries' during this project. There are several places where the lidar imagery demonstrates settlement and agriculture during late prehistoric or Roman times and also in medieval times following the Norman Conquest (eg around Birdhope and Woolaw, Fig 5.1), and it seems reasonable to assume that such places would also have been occupied during intervening early medieval times, but we have yet to recognise the nature of such activity. There may also have been continuity of occupation at the Roman forts of Bremenium and Habitancum, but if so then evidence of it remains elusive. Some suggestions as to how we might study this period in Redesdale are offered in Section 5, below.

After 1066 things begin to become a bit clearer. Elsdon was clearly an important settlement from soon after the Conquest, if not before. The Mote Hills, a remarkably well-preserved motte-and-bailey castle that was apparently abandoned a few years after its construction in favour of Harbottle in Coquetdale, is an important site, as is the village church, and while little is known of the nature of medieval Elsdon the very extensive

fields of ridge-and-furrow surrounding the village (93931. Fig. 5.2), and indeed elsewhere in Redesdale, date in large part from medieval times. Such field systems, of probable medieval date although many include evidence of later phases, have been recorded by this project in well over 100 different places (eg Figs 5.2 - 5.9, 5.11). They show up very clearly on the lidar imagery which offers much potential for their study. For the purposes of this project it was decided simply to classify wide, curved fields as medieval, and narrow, straight ridges as post-medieval (with several complexes noted as 'medieval/post-medieval'), but the full story will certainly turn out to be rather more complex than this. Some suggestions regarding the possible future study of these field systems are included in Section 5 of this document.

The number of medieval sites other than field systems recorded during this project may appear initially smaller than expected, but this is probably largely due to the fact that most medieval settlements are still settlements today, with little or nothing of medieval date surviving within them as earthworks susceptible to discovery using lidar imagery. Many such historic settlements will retain evidence of medieval activity buried in the ground, but with out any surface trace. That said, earthworks of probable medieval date have been recorded at several abandoned or shrunken settlement sites. These settlements were clearly integrated within often extensive ridge-and-furrow field systems. Probably the best examples newly discovered by this project are those at Garretshiels, where two settlements (86939, 869310. Fig 5.4), the largest of which is sufficiently sizeable to be classed as a deserted medieval village (DMV), lie within a well-preserved ridge-and-furrow field system (869340) that appears essentially medieval in character. For some unknown reason neither of these settlement sites was chosen for the construction of the present-day Garretshiels Farm, leaving the earthworks available for study.

Further settlement sites of probable medieval date are visible on lidar imagery at Heatherwick and Monkridge (909111, 909112, 919110. Figs 5.5, 5.6), again within ridge-and-furrow fields. Another splendid example was recorded at Broomhope (88832. Fig 5.7). These sites were already on the HER but the lidar imagery enables the earthworks to be seen more clearly than ever before. Further good examples of settlements associated with field systems were recorded at High Town near Hareshaw Linn (84851. Fig 5.8) and near Greenchesters on the Otterburn Training Area (87941, 87948. Fig 5.9).

A known concentration of shielings (seasonal upland houses occupied by farmers managing stock in the summer months away from the villages) above the Cottonshope Burn is clearly visible on lidar imagery (79053. Fig. 5.10). The HER notes that ten structures are visible here, but at least 15 are visible on lidar imagery, along with other possibly related features. This is a good example of an existing record that has been substantially enhanced by the results of this project. Although classed here as medieval, it should be noted that such shieling grounds could be slightly later in date than c1600, though it is also possible that they straddle the divide between medieval and post-medieval; after all, why should long-established patterns of land use change at a point where archaeologists decides centuries later that the medieval period morphed into the post medieval? Further examples of possible shielings were also recorded in several other places.

Anglo-Scottish conflict is a key aspect of medieval Redesdale and had a detrimental effect on settlement and agriculture during the fourteenth, fifteenth and sixteenth centuries, leading to the wild lives of the Border reivers and their distinctive bastle



houses, such as those at Evistones (Fig 5.3) and Branshaw (Fig 5.11). Such sites are sometimes regarded primarily as 'historic buildings', but the lidar imagery demonstrates the often considerable time-depth of such landscapes represented by earthworks in the vicinity of the bastles; at both Evistones and Branshaw, for example, the lidar suggests possible occupation back in prehistoric times.

## 6. Post-medieval and modern (1603 - present day)

When things eventually began to calm down, following the Union of the Crowns in 1604 and the Acts of Union a century later, settlement, agriculture and industry all began to make more of a mark on the landscape. Signs of human activity through post-medieval times, including farms and field systems, quarries, villages, roads and railways have all left their often considerable marks on the landscape, leaving earthworks that can appear quite bewildering on lidar imagery, though most can usually be interpreted through careful analysis. It is of course important to be able to recognise signs of post-medieval activity not only because they can be of interest in their own right, but also because only by accounting for these can we be sure of the extent to which earlier features might also be visible, perhaps peeping through isolated 'windows' in what are essentially post-medieval landscapes.

As noted above, volunteers were advised not to try and record post-medieval agricultural landscapes in any detail, simply because of the huge amount of data that would have been generated had they all done so. However, interesting post-medieval agricultural landscapes were recorded in some places, some of which on close analysis seem to owe their form in part to earlier activity. Numerous examples could be illustrated, for example those near the head of the valley adjacent to Catcleugh Reservoir (72031. Fig. 6.2), recently surveyed by the Revitalising Redesdale project volunteers (Bowyer *et al* 2019), and high up Dere Street at Featherwood (869930. Fig. 6.1). The unusual complex of earthwork enclosures around Whitelee (eg 70053. Fig. 6.3) shows up clearly on lidar imagery and presumably relates in some way to stock management, perhaps including the movement of stock across the Anglo-Scottish border. The study of the development of these post-medieval landscapes would be fascinating but lies beyond the remit of the current project.

The project database includes a total of 706 post-medieval sites, but the number of actual post-medieval sites recorded by volunteers was much greater than this as some volunteers recorded some km squares in much greater detail than necessary for the HER, meaning that many individual sites and features were combined in the database within composite 'post-medieval field systems'. The database also includes large numbers of post-medieval industrial sites such as sometimes extensive complexes of coal mines (eg 85945. Figs 6.4 - 6.6) and ironstone mines (most notably around Broomhope: 89836. Fig 6.7). There is not space here to discuss any of these sites in detail, but it is important to note that lidar imagery now offers a new way of studying the post-medieval landscape, enabling a range of industrial, agricultural and other features to be seen in relation to each other. Much of the uplands towards the north-west of the project area, including Redesdale Forest, contain few recorded sites other than post-medieval agricultural features, most notably sheepfolds. Other post-medieval features recorded throughout the project area include large numbers of quarries and pits of various sizes, agricultural enclosures, holloways, abandoned farmsteads, and rectangular buildings of unspecified function.

The twentieth century has also left its mark on the landscape, notably in the reservoir at Catcleugh, the large-scale industrial works around Ridsdale, and a series of earthworks on the Otterburn Training Area (Fig 8.1) that would be completely baffling to the archaeologist were their military context not known. It is simply not possible for the current project to record all features of post-medieval or recent date that are visible on the lidar maps, but anyone interested in the recent history of any particular areas should certainly consult the relevant images, along with historic maps, to see what they might reveal.

## **Summary**

These results represent a very important contribution to the study of Redesdale, and all participating volunteers are congratulated for their efforts. Alongside the discovery of some very important 'new' sites, and the clarification of details relating to many others, the results demonstrate how lidar, probably better than any other medium, demonstrates the seamless nature of the archaeological landscape. Dividing the landscape up into specific types of site and allocating everything a number, and seeking to place everything in its correct chronological 'box', are essential to this kind of survey, but the lidar imagery clearly demonstrates the spatial and chronological seamlessness of the landscape, enabling us to see how individual 'sites' relate to each other, and how the landscape has developed through time, with many things clearly related to things that happened earlier, sometimes much earlier. So, while the results of this project may appear impressive in terms of the number of sites recorded, and the results will be very important to future landscape management, these figures are relatively meaningless in themselves. The real value of the results lies in the opportunity they now offer for integrated study of the Redesdale landscape through time, something that participants in this project are well placed to undertake should they so wish. Lidar imagery has enabled the HER for Redesdale to be greatly enhanced, but its contribution to furthering our understanding of Redesdale through time has only just begun!

## Part 4. Illustrations

The following illustrations have been chosen to represent a range of sites and landscapes from throughout the project area. They include several sites that were newly discovered during the project, and others where new information has been revealed by the lidar imagery. Many of them were discussed during project workshops, while others are presented here for the first time.

The five- or six-digit numbers provided in the captions are the catalogue numbers used for recording during the project; sites are listed by these numbers in the project archive. The methodology of the numbering system is explained elsewhere in this report.

Some of the images illustrate particular sites, while others cover often complex multi-period landscapes. There are also many other interesting places within the project area that could have been included; anyone studying the area in future should consult the full project archive and certainly should not assume that the sites illustrated here are necessarily the best examples.

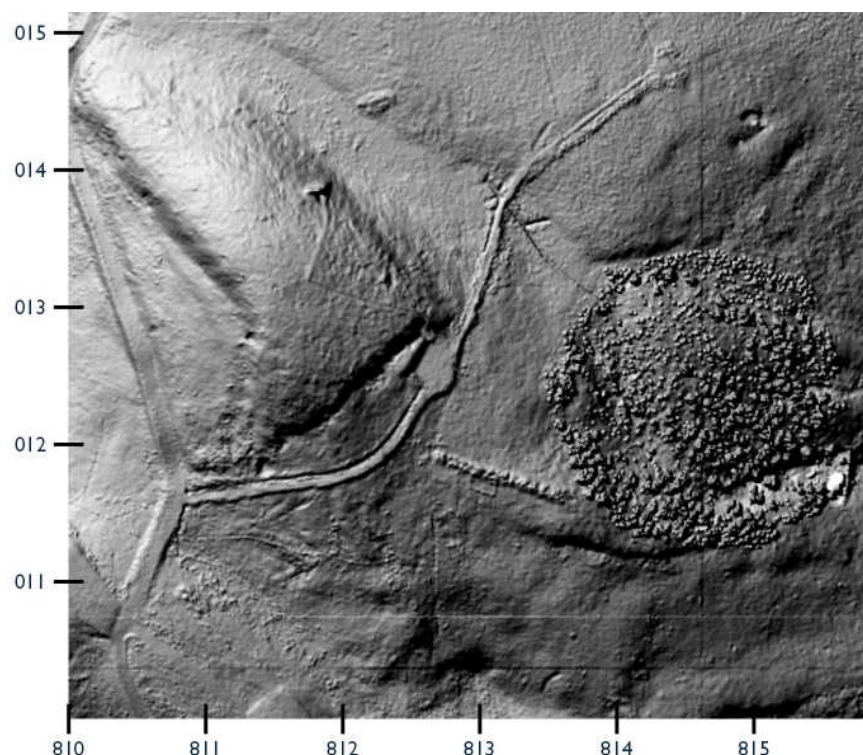
All images are aligned with north to the top. All but three are taken from the original lidar imagery used by volunteers during the project, some with lighting from the north-west and others lit from the north-east. Part of the margin is retained in each image, in order to provide a scale; the gap between each grid number is 100m in all cases. In three cases, composite images of extensive areas, including data from more than one km square, are included to illustrate particular landscapes; these were specially produced for this report by Ed Hudspeth.

The images tend to lose definition when printed and are best viewed on screen, where they can be enlarged as desired - though they inevitably become pixelated if enlarged too much. A few of them appear quite dark, when lighting from another angle would show the general lie of the land more clearly, but these have been chosen because they illustrate the particular sites under discussion more clearly than if the lighting was changed.

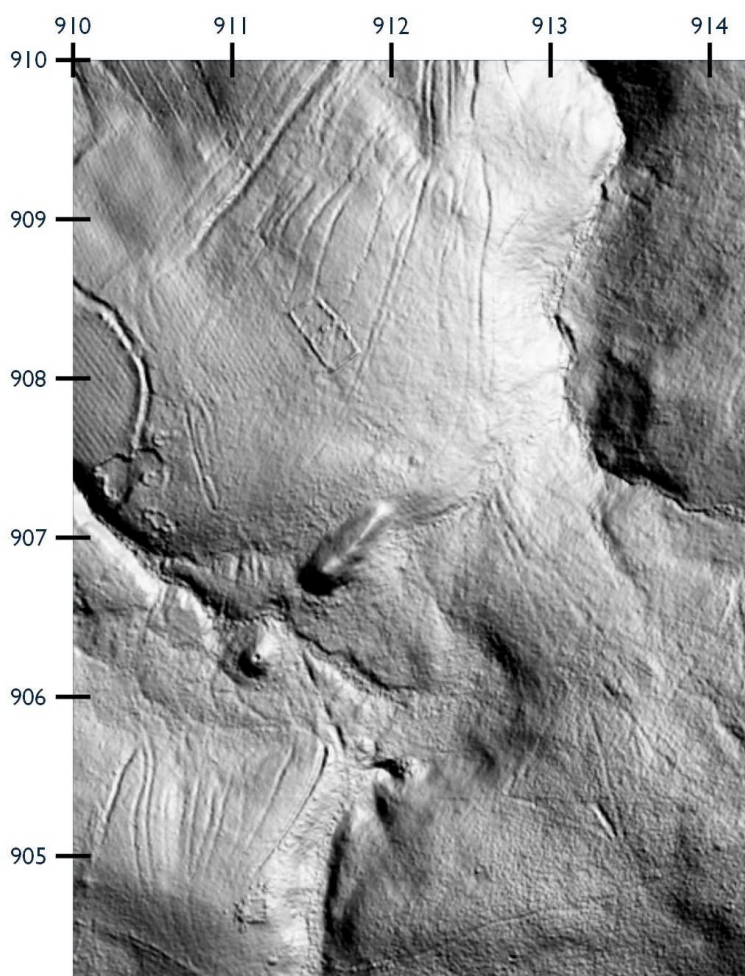
Anyone wishing to discover more about any of the featured places should consult the project archive, which includes the individual kilometre squares of processed lidar data, the preliminary results produced by project volunteers, and the validated results following validation by the Project Consultant. The latter have been sent to Northumberland County Council for incorporation into the Northumberland Historic Environment Record (HER).

As noted in this report, the interpretations presented here should certainly not be regarded as definitive. Much fieldwork must be done before many of these images can be interpreted with any certainty. What can be said with certainty is that this project has cast intriguing new light on many aspects of Redesdale's archaeology, while also demonstrating the clear need for more fieldwork.

## 1. Neolithic

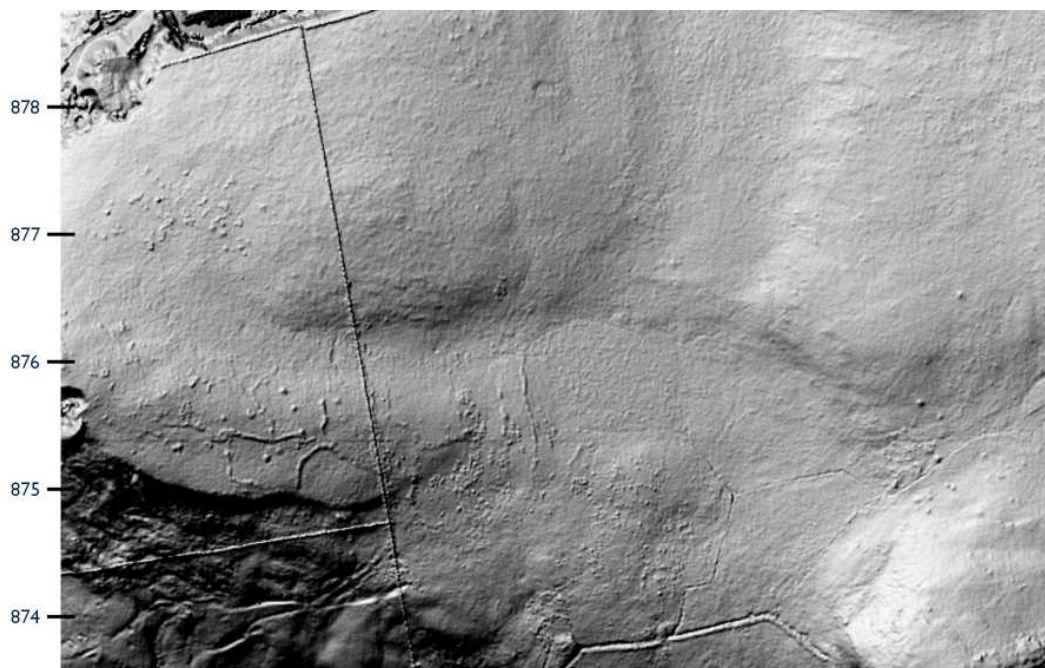


*Fig. 1.1. The mighty long cairn at Bellshiel Law (81011) is clearly visible towards the centre of this image, running roughly W-E between the road and the circular plantation. A much later stock enclosure can be seen built onto its south side. A few small mounds visible to the SE of the long cairn are round cairns, part of an extensive cairnfield (81013) thought to be of Bronze Age date that may include burials and field clearance cairns.*

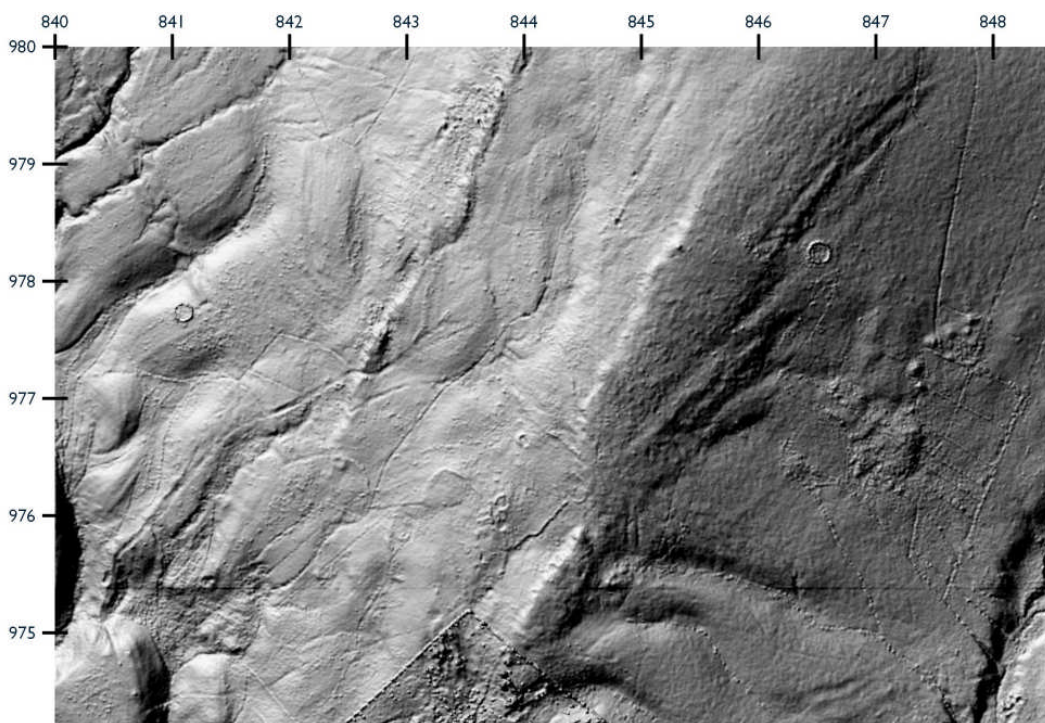


*Fig. 1.2. This substantial long mound (91908) lies within a fascinating landscape at the north-west edge of Wether Hill, c3km south-west of Elsdon. While various interpretations of it are possible, it could possibly be Neolithic and should be checked on the ground. It is classified within the HER as a natural mound, which seems most unlikely on the basis of the lidar evidence. Intriguingly, small round mounds (91906, 91907; both clearly visible here) are aligned with it to the south-west and north-east. The large earthwork enclosure north-west of the long mound is undated, but is certainly of archaeological interest. The holloways visible here are undated but are probably post-medieval.*

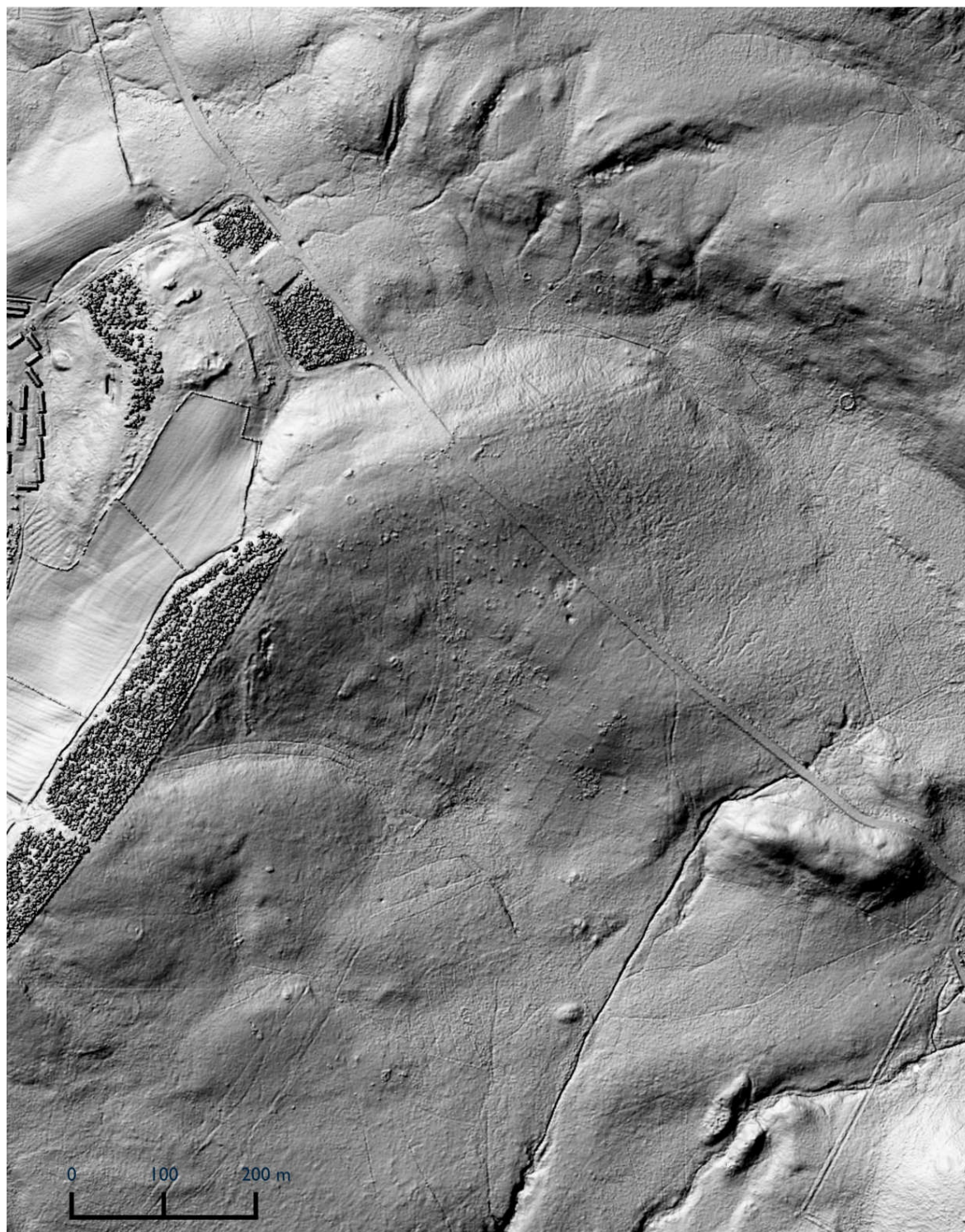
## 2. Bronze Age



*Fig 2.1. Bronze Age landscape at Darney Crag (91871) and Staniel Heugh (91872). Several cairns are visible, along with curved stretches of what are probably field boundaries. Originally recorded from aerial photography by Tim Gates, this is a complex that would certainly justify detailed investigation.*

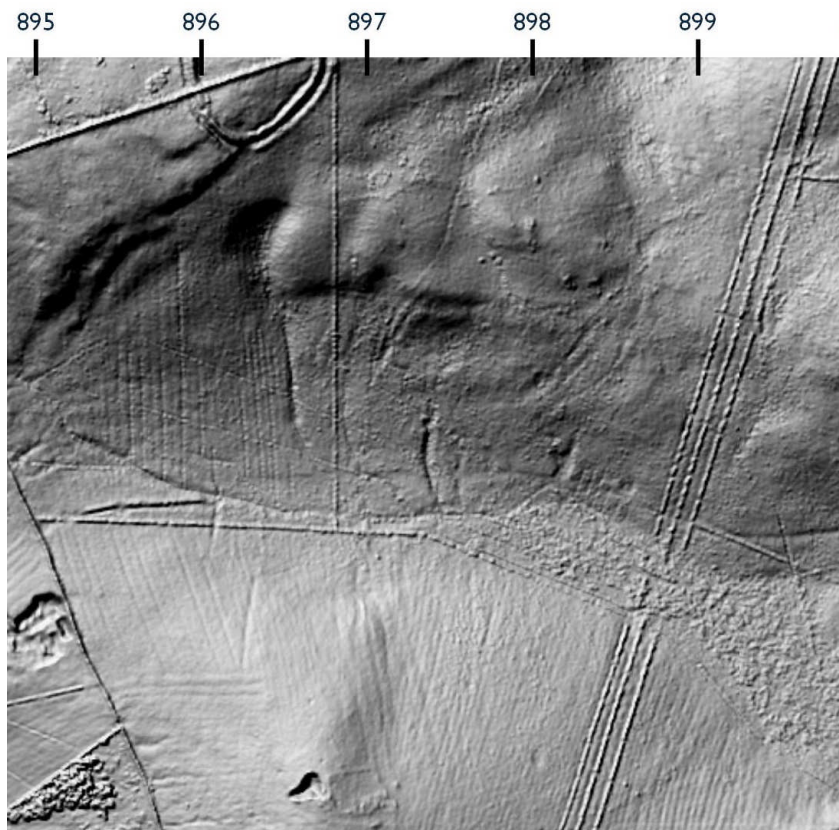


*Fig. 2.2. Several apparent cairns are visible in the central area of this image, along with some stretches of curved linear earthworks similar to those at Darney Crag and also a few possible roundhouses (84978). This is probably another area of surviving Bronze Age landscape, just north of Horsley. The cluster of round mounds towards the east margin (84979) could well be a Bronze Age cemetery. Many other features of later date are also visible here; the linear feature heading SE from the NW corner of the image is Dere Street Roman road.*

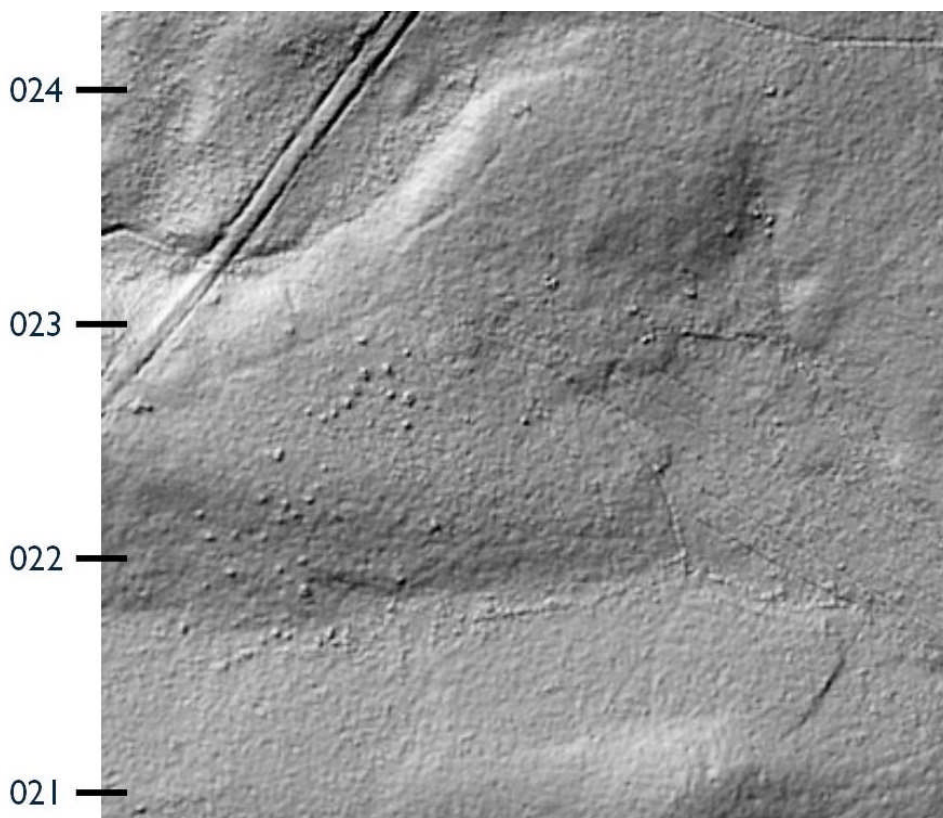


*Fig. 2.3. The Todlaw Bronze Age landscape, just east of Otterburn Camp, has been recorded previously, but the lidar imagery shows new detail. Towards the bottom-left corner of this image two previously unrecorded circular features (89952, 89953), possibly houses or burial/ceremonial monuments, are visible, while a regular field pattern (90957), currently undated, can be clearly seen at the centre, just south-west of the road. Numerous other features, including many cairns, can be seen elsewhere on the image. The Todlaw landscape is extremely important and a new survey, combining the results of previous work with lidar imagery and new field survey, is highly recommended.*

*(This is a composite image, centred on NY90008950, incorporating lidar data from four km sqs. It was produced specially for this report by Ed Hudspeth, Northumberland National Park Authority).*

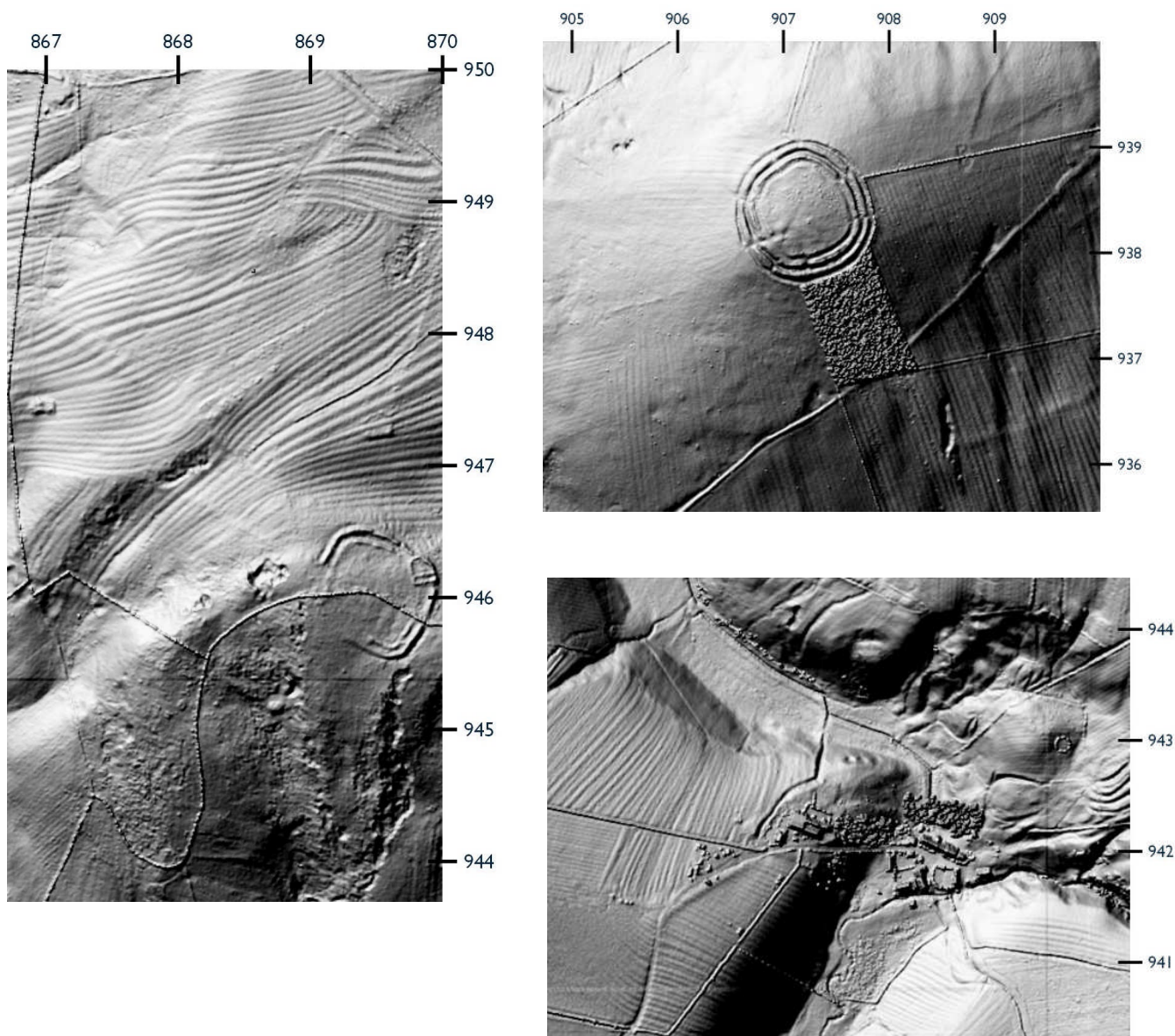


*Fig. 2.4. Part of the Iron Age hillfort on Fawdon Hill (89931) is visible at the northern edge of this image. An extensive cairnfield (899320) can be seen south-east of the hillfort ramparts; recent survey by Revitalising Redesdale volunteers suggests this is of Bronze Age date. The unusual triple-earthwork linear feature (899322) crossing the image from north to south relates to a track and adjacent linear plantation shown on a map of 1806 and presumably dating from the enclosure of this part of Elsdon Common in the 1730s; a good example of documentary sources being used to help interpret lidar imagery.*



*Fig. 2.5. This extensive cairnfield (83024), containing about 50 visible mounds, is recorded on the HER as a 'small cairnfield'; clearly the lidar imagery shows more detail than had been noted previously. It lies at c300m OD, in the wilds of the Otterburn Training Area, about 1.5km north of Silloans. It should be checked on the ground to see whether all the mounds are indeed cairns.*

### 3. Iron Age (including Roman Iron Age).



Several large earthwork enclosures, thought to be defended settlements of Iron Age date, have been recorded in Redesdale, though they are not as common here as to the north in the Cheviots where they are classed as 'hillforts'. None of the Redesdale examples have yet been excavated, but they probably contained timber roundhouses dating originally from the second half of the first millennium BC. Evidence of later field systems can be seen around all three; these may have obliterated evidence of fields and other features contemporary with the hillforts.

Fig. 3.1 (left) is Greenchesters (NY86942), c2km NW of Otterburn; a small later enclosure overlies its eastern ramparts. It looks from the lidar imagery very much as though the main circuit of ramparts was never completed.

Fig. 3.2 (top-right) shows the splendid ramparts of Camp Hill near Colwellhill (NY90932), about midway between Otterburn and Elsdon.

Fig. 3.3 (bottom-right) in this image a possible (and previously unrecorded) small oval-shaped earthwork enclosure can be seen north-east of the farm buildings at Hudspeth (94941). This might be a small hillfort and should be checked on the ground.

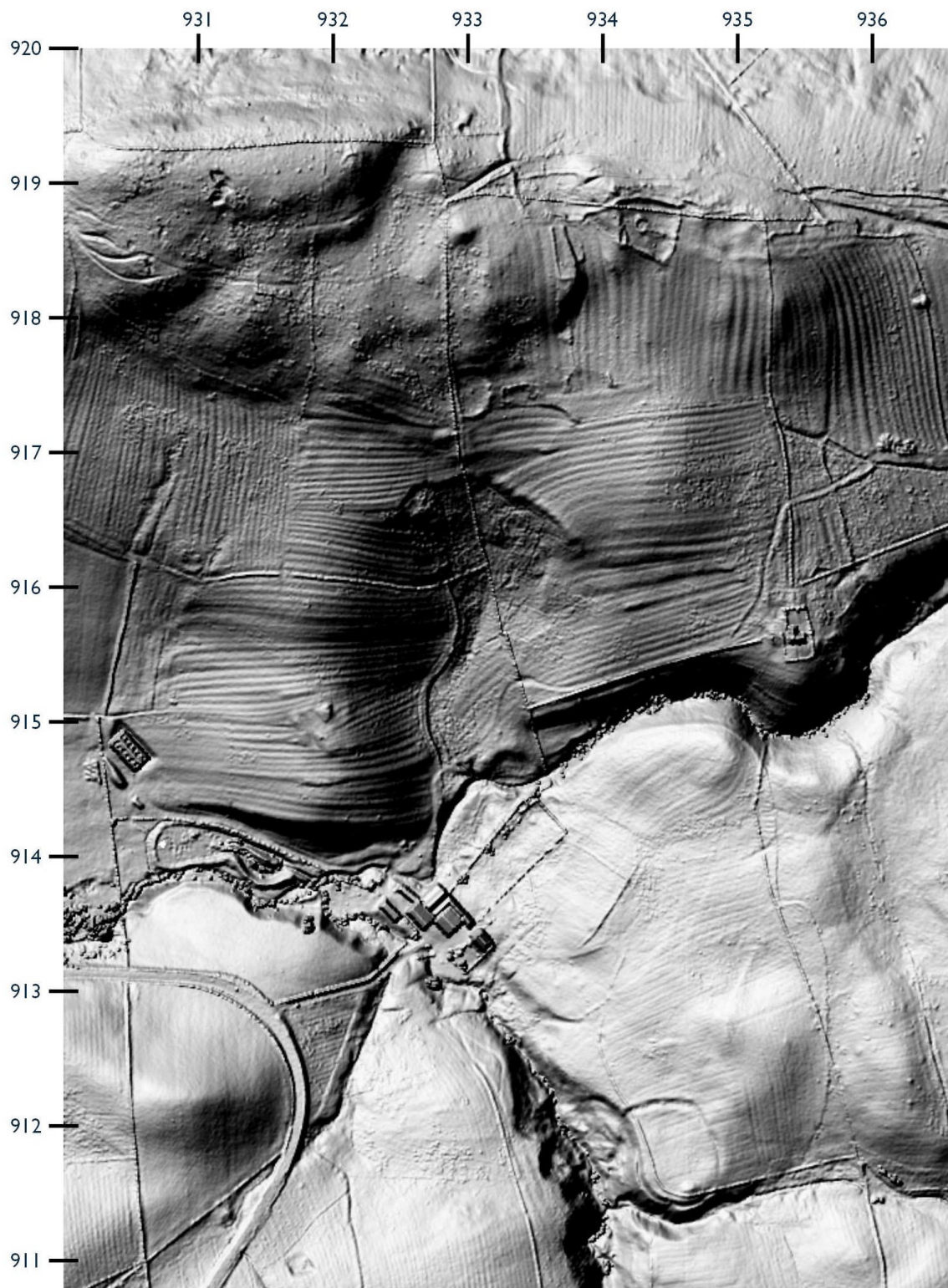




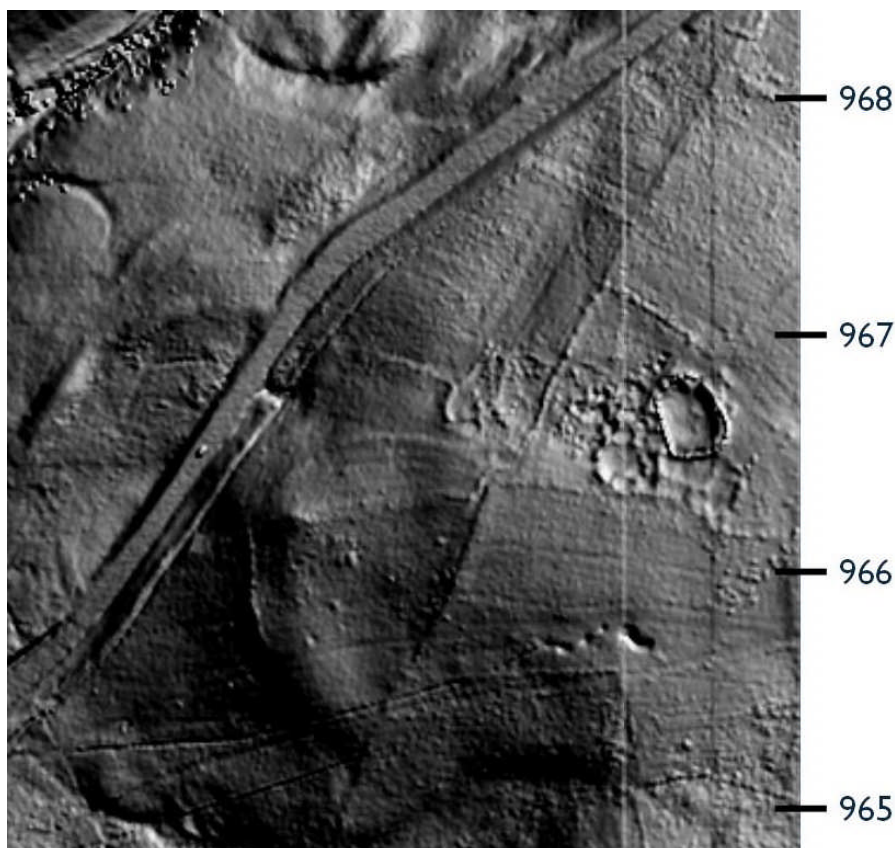
*Fig. 3.4. This enclosure (72031), which could be classed as either a small hillfort or an enclosed settlement, occupies a strategic location overlooking the route of the A68 and the west end of Catcleugh Reservoir. Unlike further down the valley where several comparable sites survive, this one appears always to have existed in splendid isolation. Its location presumably relates to the existence of a natural routeway along the line of what is now the A68.*



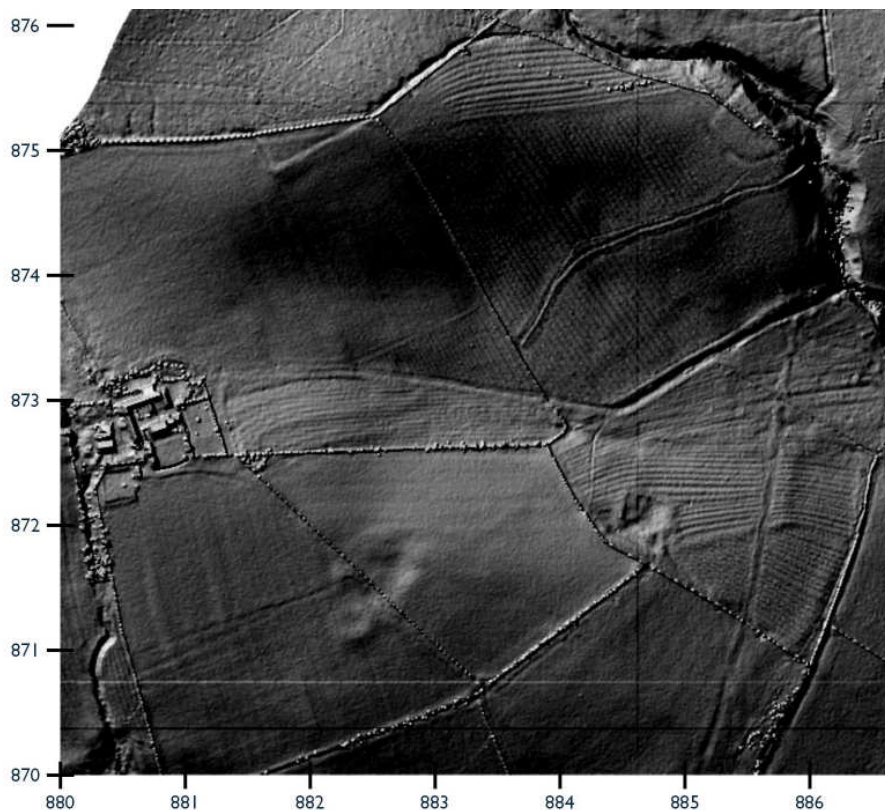
*Fig. 3.5. To the top-left of this image is an earthwork enclosure, probably a small hillfort (92921), to the south of which, at Haining Head, is a complex earthwork (92922), apparently not previously recorded, which appears to represent an Iron Age or Roman period settlement, possibly with later occupation, either side of an apparently ancient holloway. The field system extending over most of the image is of post-medieval date.*



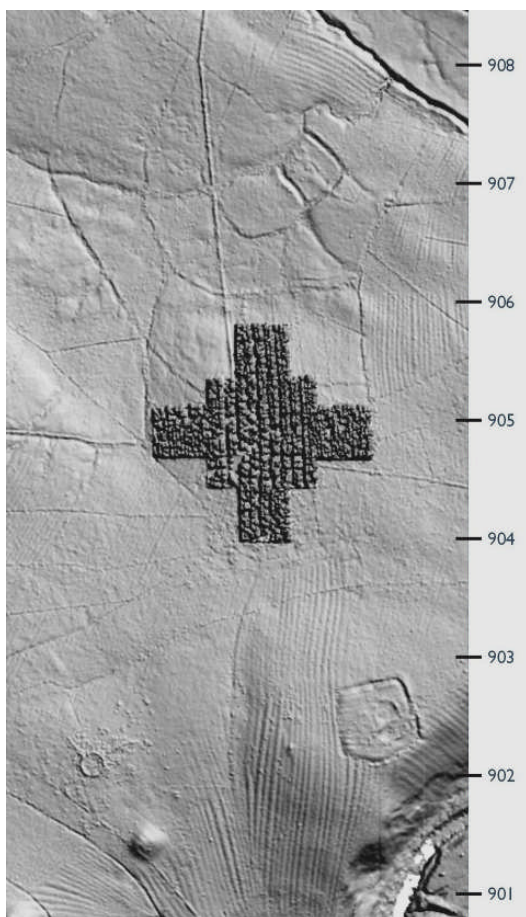
*Fig. 3.6. A very complex multi-period landscape around Ravenscleugh Farm, some 1.5km south of Elsdon. A late prehistoric settlement containing a clearly visible roundhouse (93919) can be seen towards the top of the image, on Gallow Hill, along with several other features that could well date from the same time as the settlement. Close to the south edge of the image is the univallate hillfort of Ravenscleugh (939122; recorded previously but wrongly located on the HER), but the ridge-and-furrow fields that cover most of the image are much later, probably part medieval and part post-medieval. Detailed field survey, and possibly excavation, will be necessary to resolve the detailed chronology of this complex landscape.*



*Fig. 3.7. An apparently previously unrecognised late prehistoric settlement complex (86962) on Yatesfield Hill consisting of roundhouses and paddocks and possibly including at least one rectangular building suggestive of post-Roman occupation. Overlain by an irregular post-medieval sheepfold, presumably built using stone 'recycled' from the site. Surrounded by an unusual field system which could also be late prehistoric in date. A potentially very important complex that should be surveyed on the ground.*



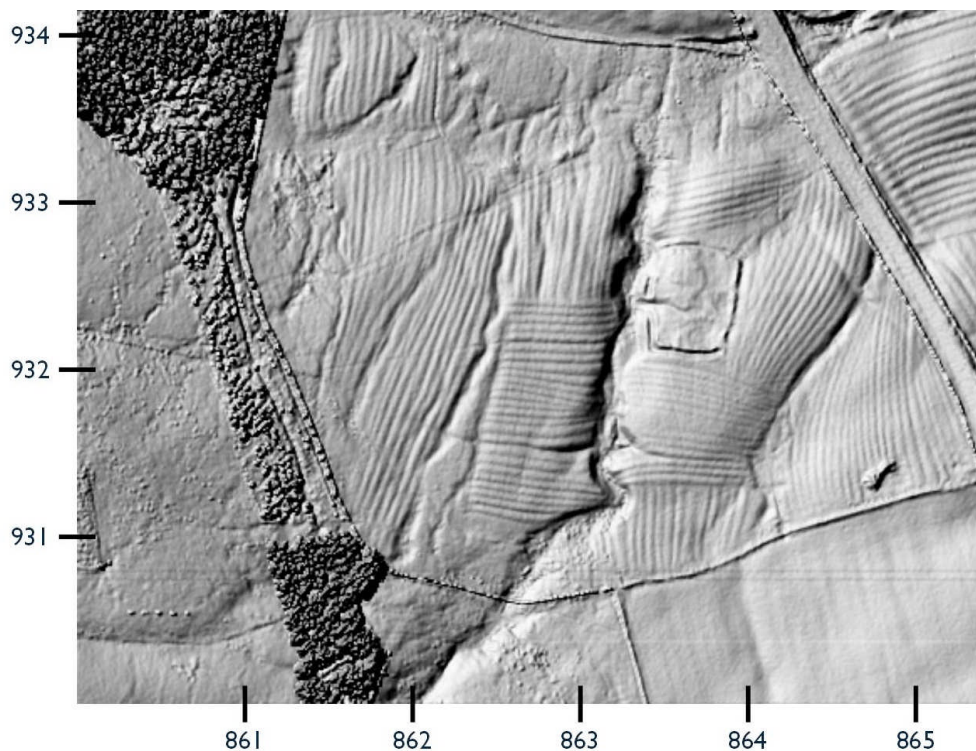
*Fig. 3.8. This area, east of Low Leam, contains three previously unrecognised earthwork enclosures, all of which could well be late prehistoric settlements (88878, 88879, 888710). Two of them lie south-east of the farm and appear to retain evidence of roundhouses, though that closer to the farm has been heavily ploughed in recent times. The third example, crossed by a modern field wall towards the top-right corner of the image, has no visible internal features.*



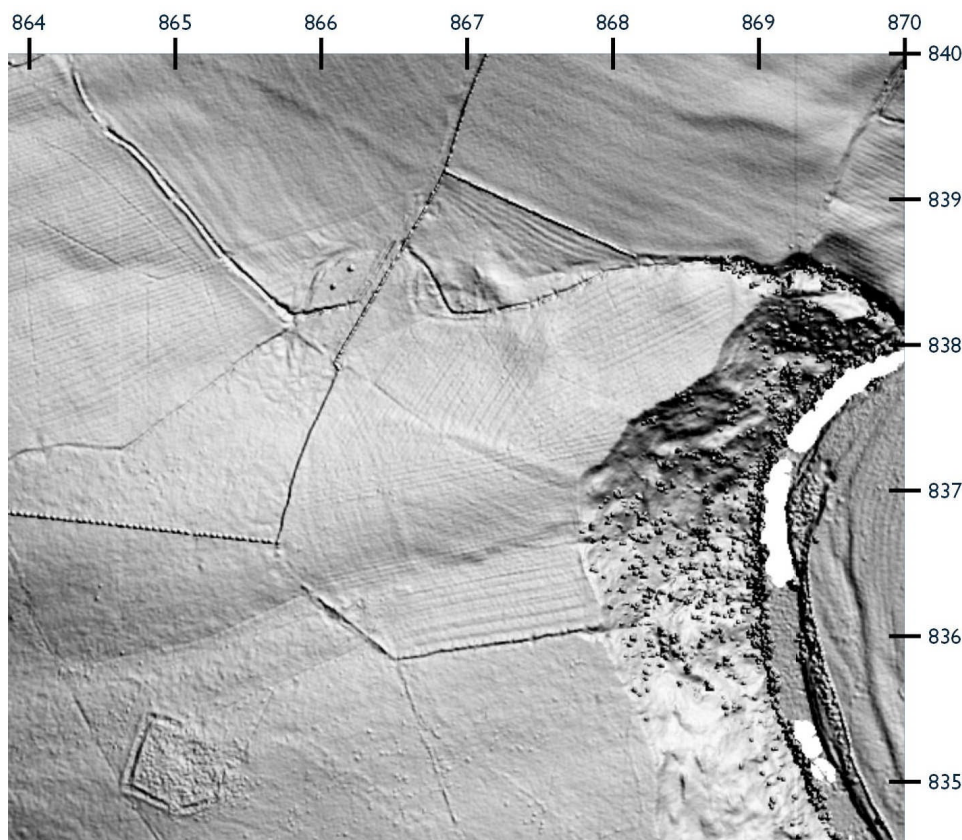
*Fig. 3.9. Two late prehistoric settlements south of Meadowhaugh, just west of the Rede (which can be seen at the south-east corner of the image). The southern site (89901) was known previously, but the northern one (89904), which appears to have an annexe to its west side (though this could be more recent drainage) is a new discovery.*



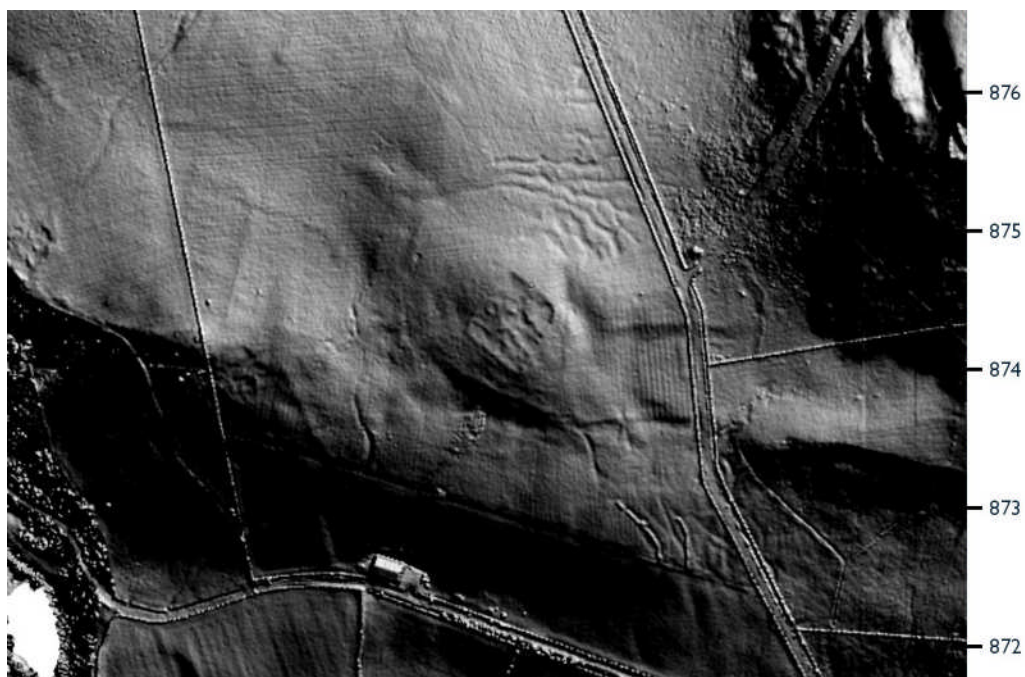
*Fig. 3.10. Three prehistoric enclosures (87921), presumed to be farmsteads, can be seen in this image of Woodhill, 1km S of Otterburn. Intriguingly, one is very well preserved, another is still clearly visible, while the third (unrecognised prior to this project) has almost been ploughed flat. The best-preserved example appears to have an extension containing a roundhouse built against its S side. Excavation will be necessary to establish whether all three sites were in use concurrently, and whether they differed in function.*



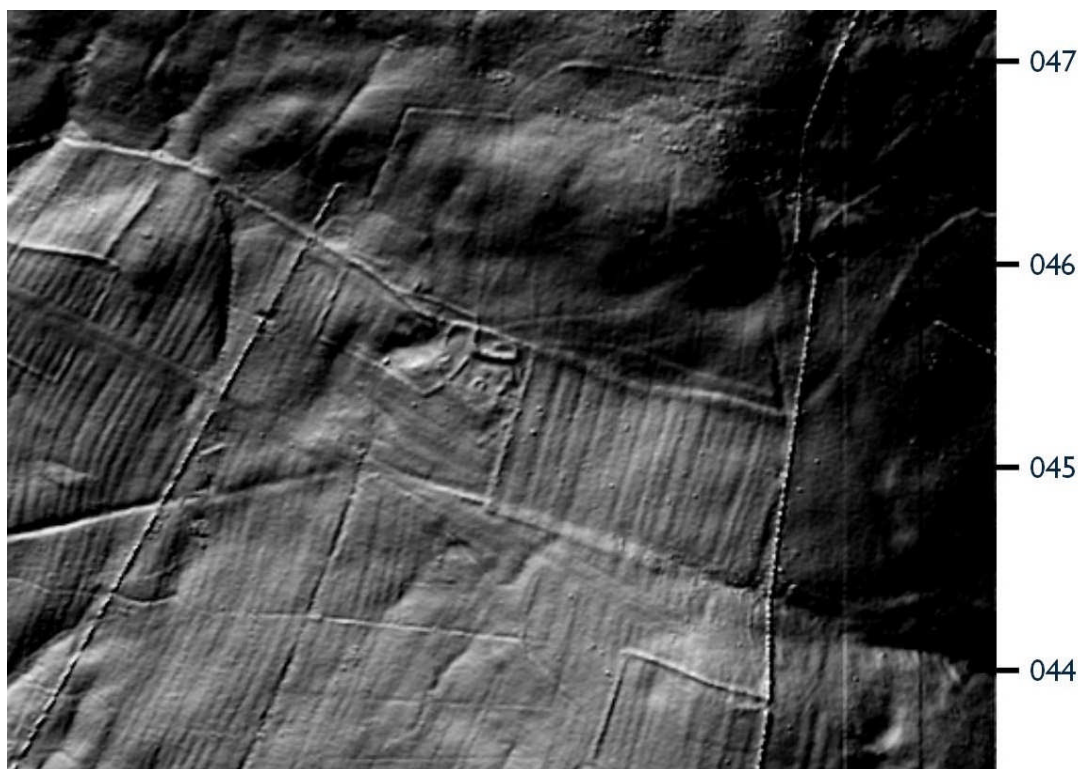
*Fig. 3.11. The interior of this late prehistoric settlement at Garret Shiels (NY8393) contains roundhouses and also rectangular buildings (not clearly visible on this image) of apparently medieval date that might relate to the extensive medieval ridge-and-furrow fields that surround it. It is possible that site was occupied over several centuries, though it may have been abandoned, possibly more than once, and later reoccupied.*



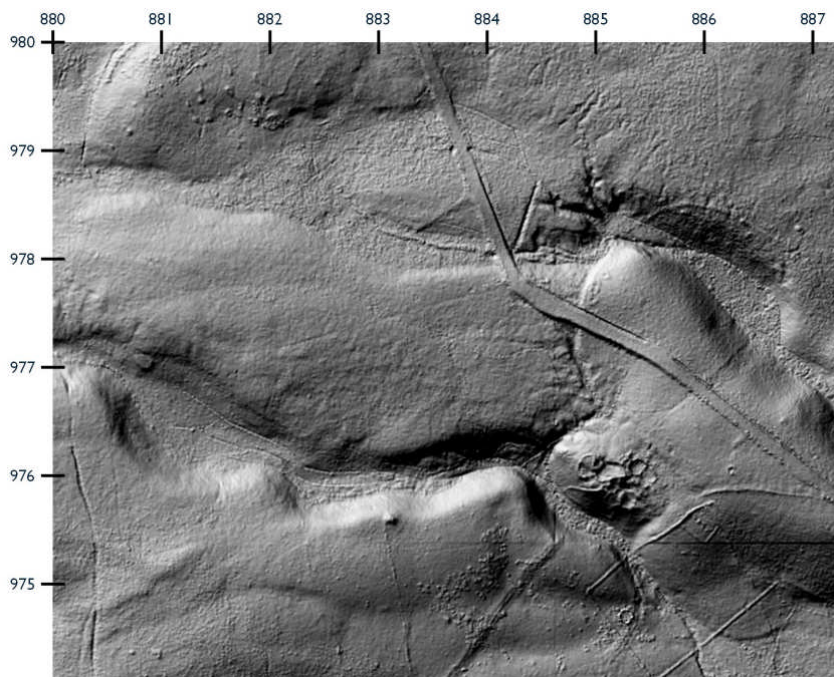
*Fig. 3.12. Three late prehistoric settlement enclosures are visible in this image. The one near the south-west corner of the image (86831) was known previously and has been partially excavated; oddly, its north-east corner seems from the lidar imagery never to have been completed. One of the newly recognised sites (86833), crossed by a modern field boundary, lies at the centre of the image towards the top; the other (86835), only faintly visible due to recent ploughing, lies about 150m to the east, adjacent to the river cliff.*



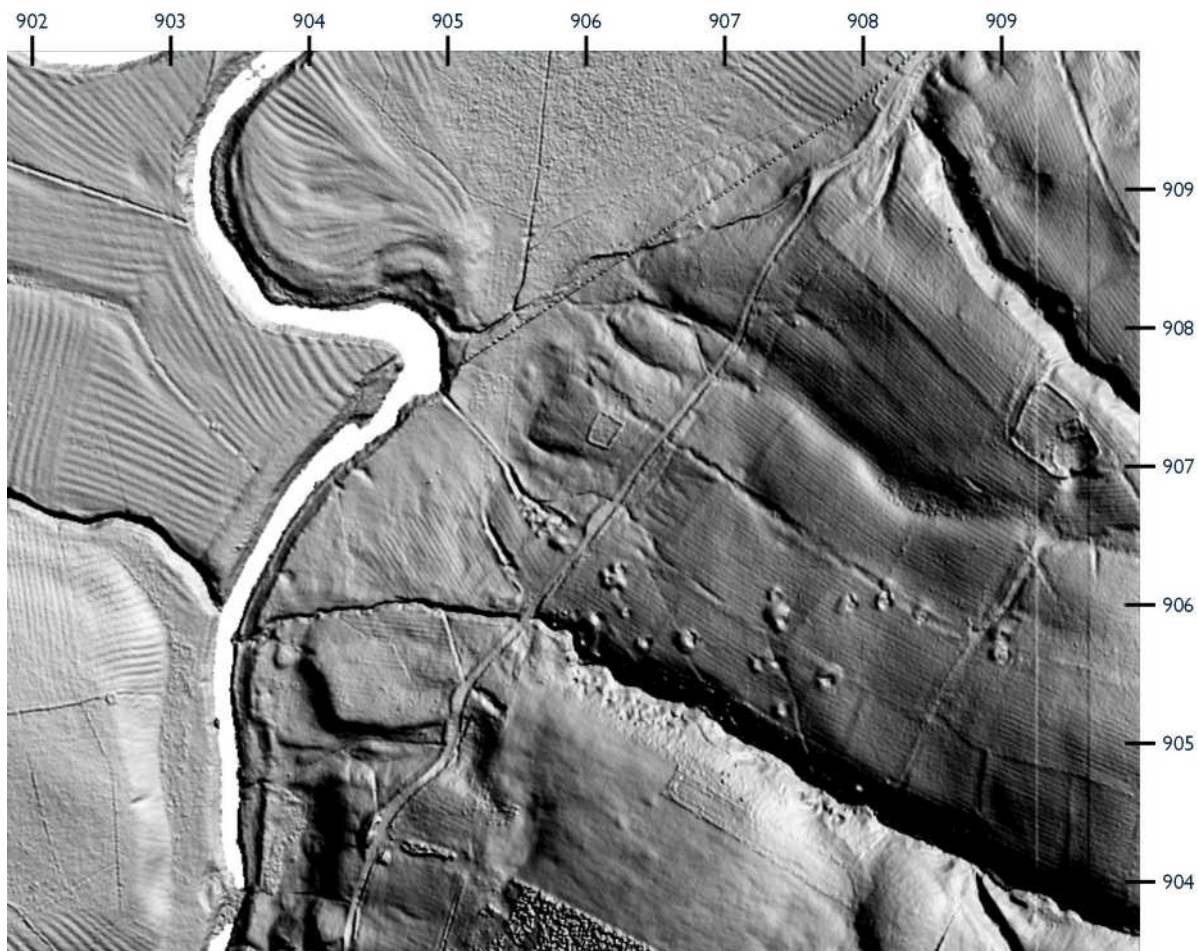
*Fig. 3.13. Earthworks of a late prehistoric settlement, apparently previously unrecorded, can be clearly seen at the centre of this image (90872). Internal earthworks appear to include a couple of roundhouses. Field boundaries (90873) to the west of the settlement may well be related to it. The site lies c0.5km north of east Woodburn. The Rede just clips the south-west corner of the image.*



*Fig. 3.14. At the centre of this image is what appears to be a previously unrecognised late prehistoric settlement (72045) almost hidden within a post-medieval field system. The site is at Ramshope, on the north side of Catcleugh Reservoir, at the opposite end of the project area from fig. 3.13, demonstrating that the distribution of such sites, although uneven, extends along the length of the Rede throughout the project area.*

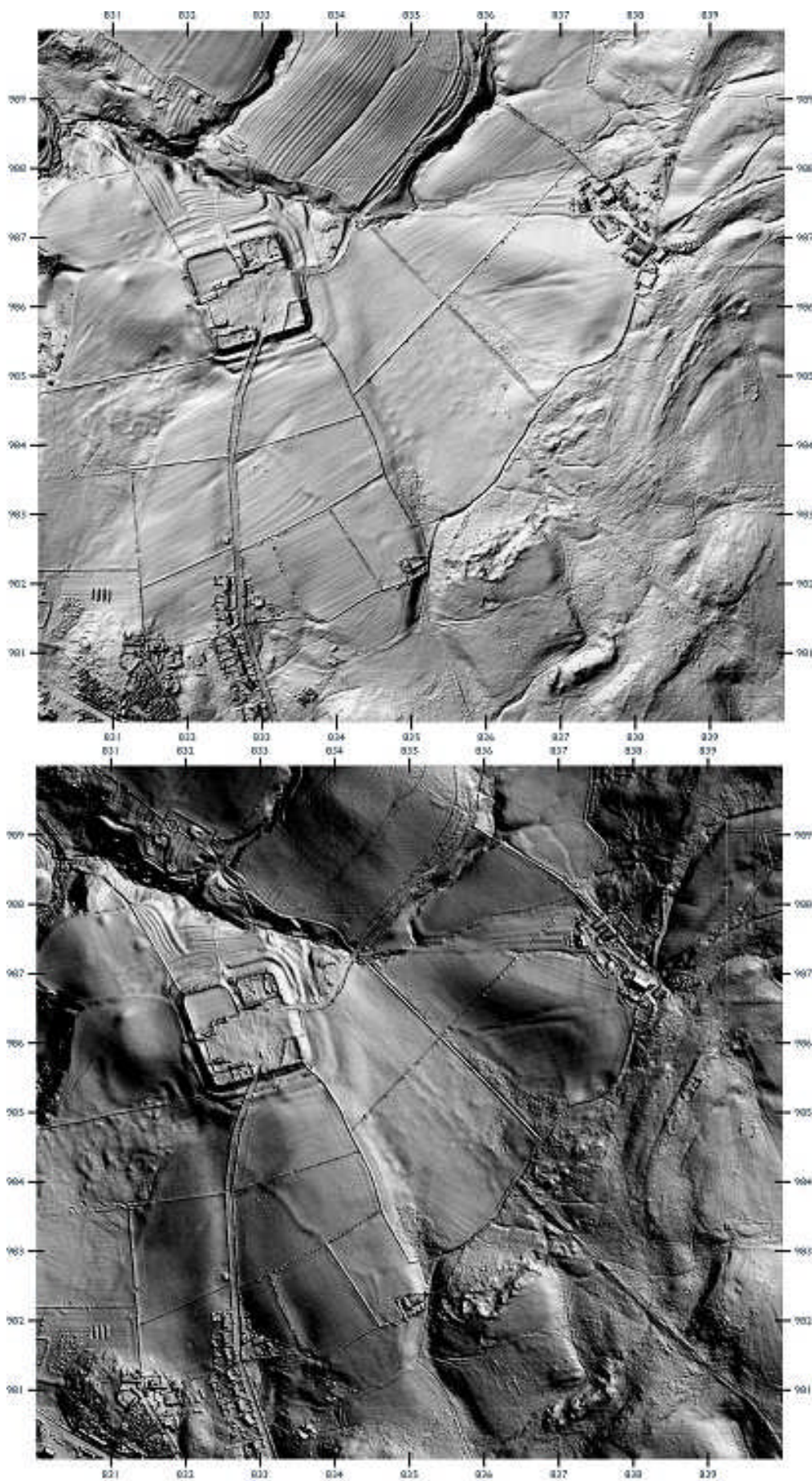


*Fig. 3.15. The well-known late prehistoric settlement at Barracker Rigg (889714) shows up clearly on lidar imagery, as does the presumably Bronze Age landscape at the north-west corner of the image (889717). The presence of both sites in such proximity suggests this may have been a favoured settlement location, perhaps intermittently, for several centuries.*



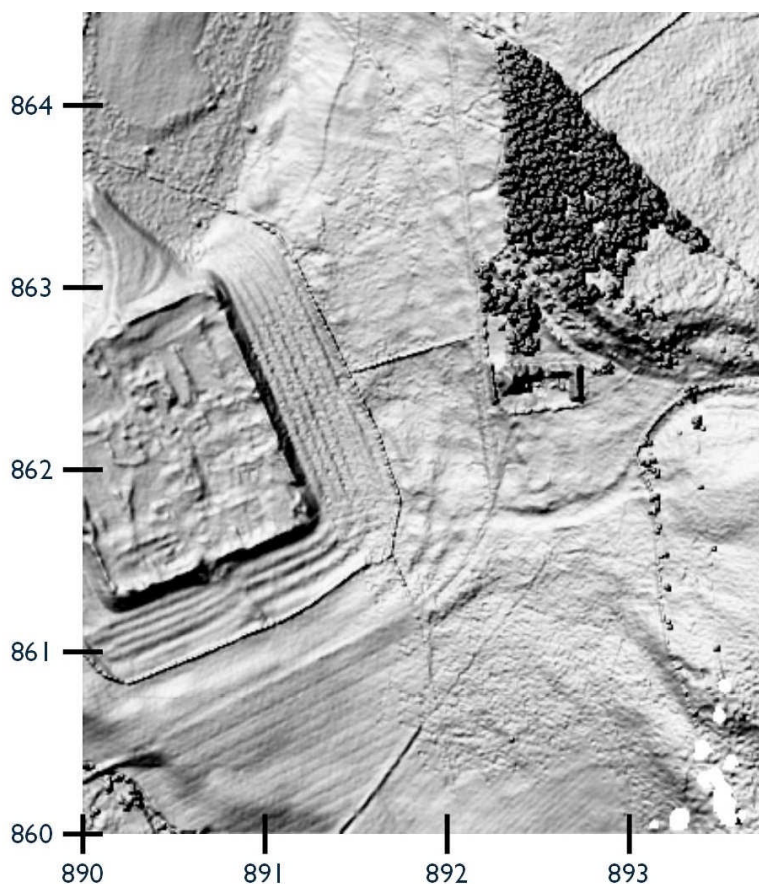
*Fig. 3.16. Part of an extremely interesting multi-period landscape at Wether Hill on Raylees Common. Visible here towards the right-hand margin is a late prehistoric settlement, surrounded to the west and south by a regular field system which may well be at least in part contemporary with the settlement (though it is overlain by post-medieval narrow rigg). Also clearly visible is a complex of bell pits resulting from coal extraction; this is undated but could have eighteenth-century or earlier origins.*

## 4. Roman military



*Fig. 4.1. The great Roman fort of Bremenium (High Rochester) (83981) is crucial to our understanding of Redesdale in Roman times. It was extensively excavated in the mid 19<sup>th</sup> century, and its environs have been intensively surveyed in recent times. The lidar images show the fort ramparts very clearly, and also many other features including an area of earthworks south-west of the fort (83983) that should be investigated on the ground. The upper image is lit from the north-west and the lower one from the north-east; in the latter the line of Dere Street in the fields east of the fort can be clearly seen, demonstrating that it survives here as a low earthwork even though it is not noticeable on the ground. Numerous other features of interest are also visible in these images.*

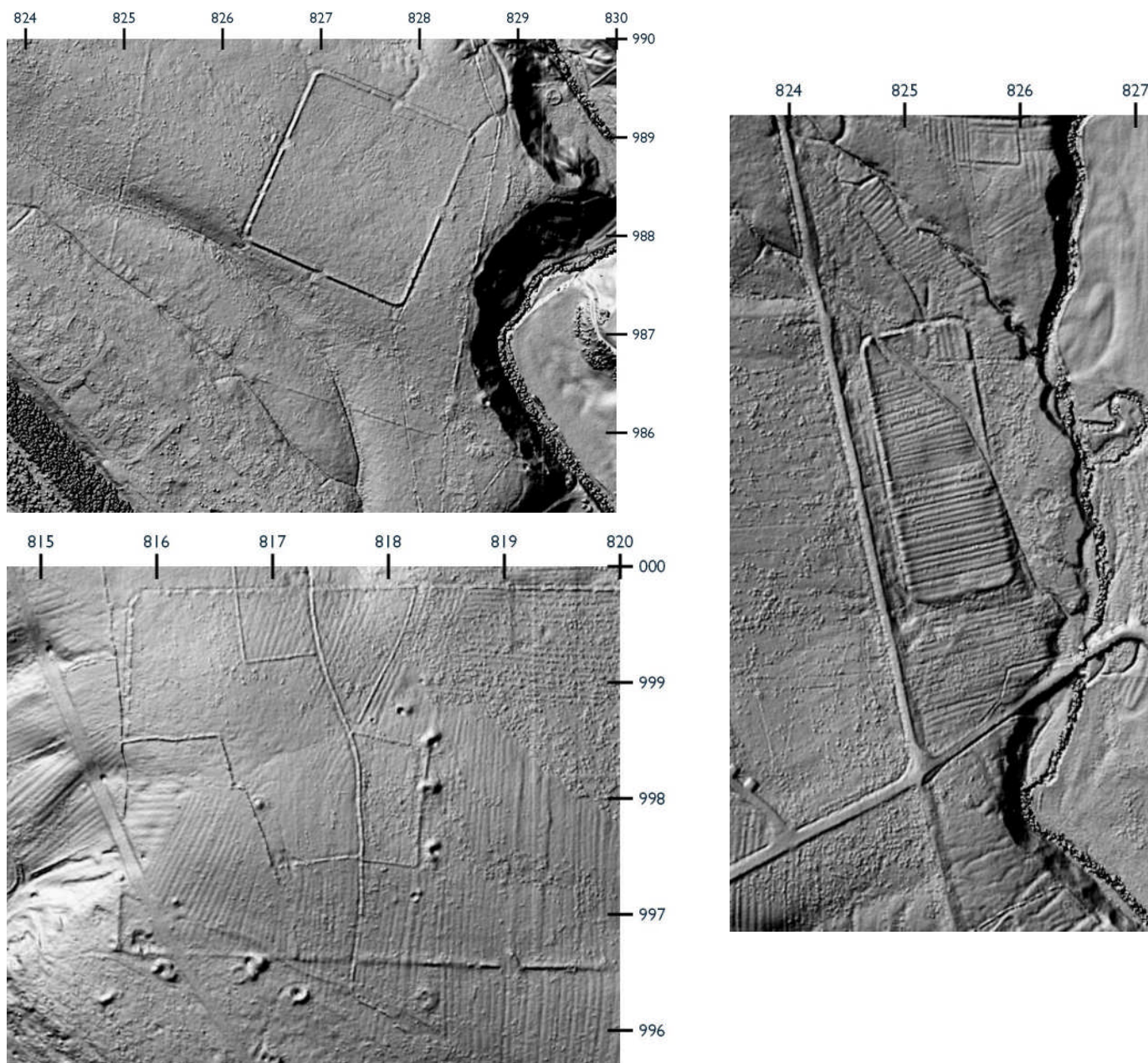




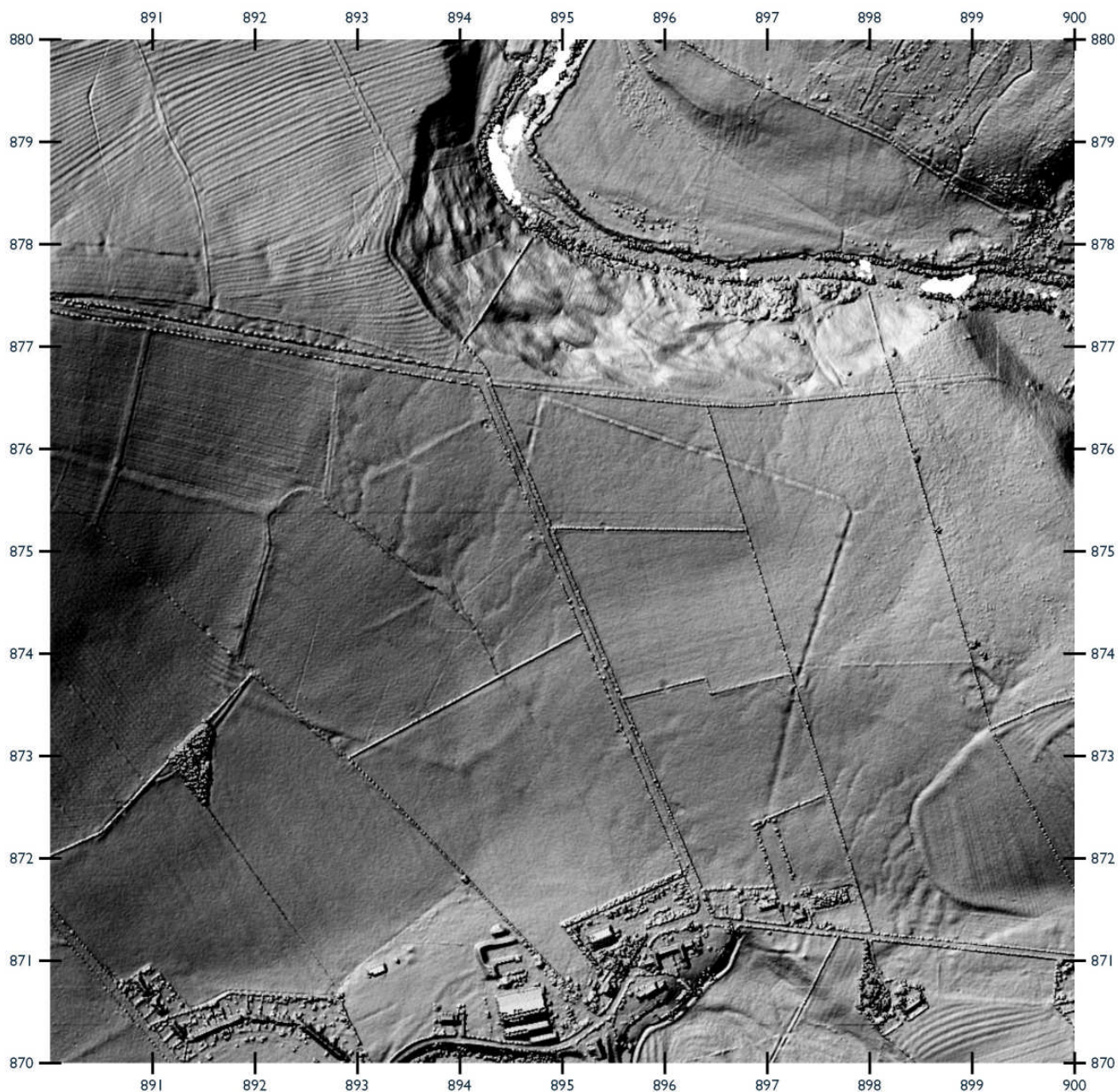
*Fig. 4.2. This image shows most of Habintancum Roman fort (Risingham). The fort has been previously surveyed and partly excavated and the lidar provides no new evidence of any great significance. The earthworks to the east of the fort, extending beneath the present-day buildings and woodland, may represent part of the fort's vicus and should be inspected on the ground.*



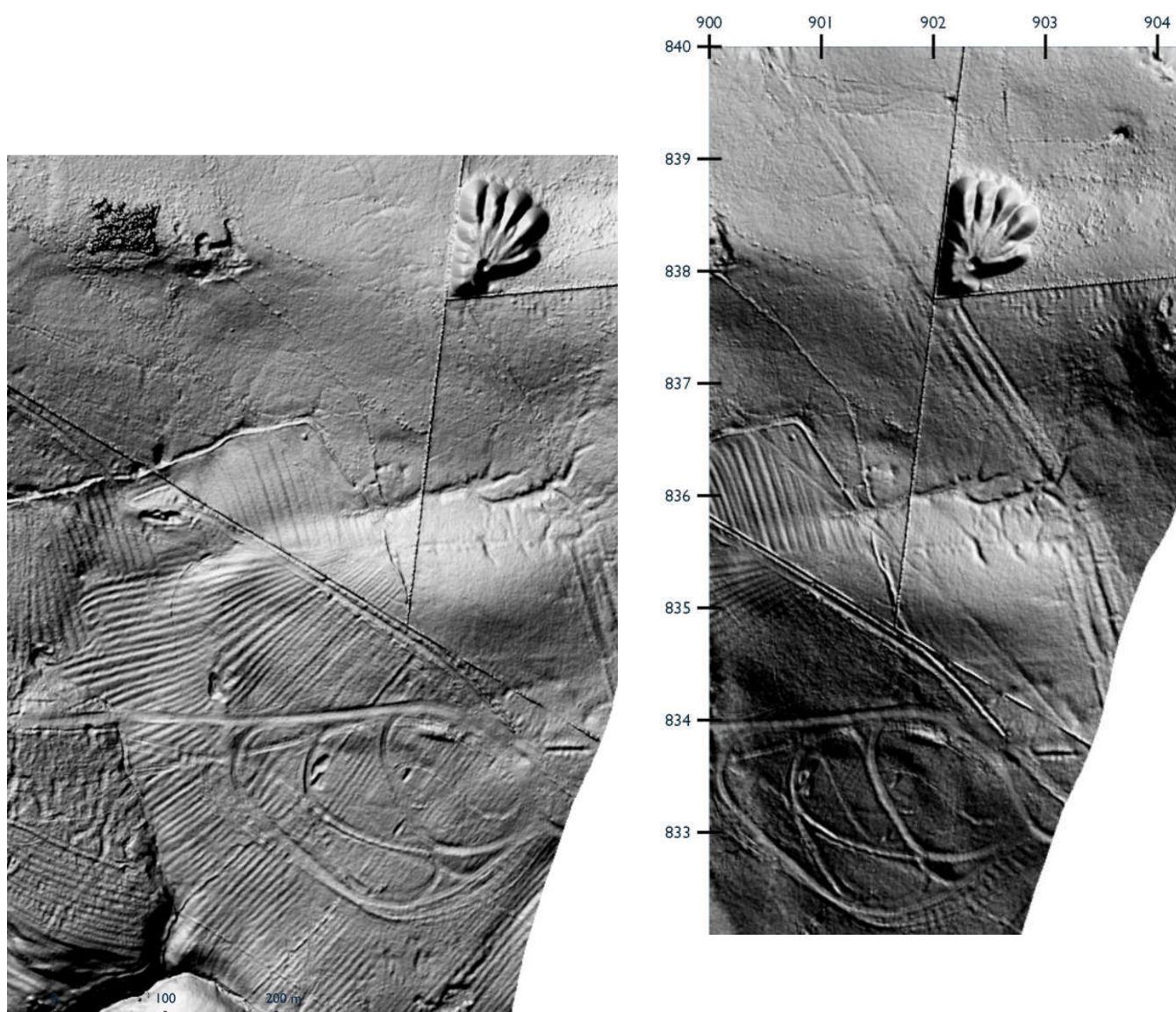
*Fig. 4.3. Earthworks of Blakehope Roman fort and camp (85941) are clearly visible on this image (which is a low-res image combining data from two km sqs). The line of Dere Street can be seen as a slight earthwork towards the top of the image, north of the point at which the A68 deviates to the east; south of this point the A68 lies directly on the line of the Roman road. The HER refers to a fort and a 'possible temporary camp' here; the lidar imagery clearly shows the fort lying within the ramparts of a camp. Dere Street appears to pass through the west side of the camp, suggesting the camp could predate the road. The fort, in contrast, lies immediately east of the road which it presumably post-dates.*



*Fig. 4.4. Redesdale contains an extraordinary array of Roman temporary camps strung out along the line of Dere Street. Although these vary in size and form, they all consist of a single rampart and their curved corners are very distinctive. They are often referred to as 'marching camps' and generally assumed to have been occupied by troops under canvas while on the march, though other uses are also possible. At top-left are the three superimposed camps at Birdhope (829813), adjacent to Redesdale Camp. About 1km N of the Birdhope camps is Sills Burn South (right), an elongated camp lying immediately E of Dere Street, overlain here by a modern road (82992). Bottom-left is Bellshiel, a huge camp c0.5km W of Sills Burn South; several post-medieval bell pits (coal mines) are also visible in this view (81997). The lidar seems to confirm earlier observations that the interiors of these camps are featureless in terms of contemporary earthworks.*



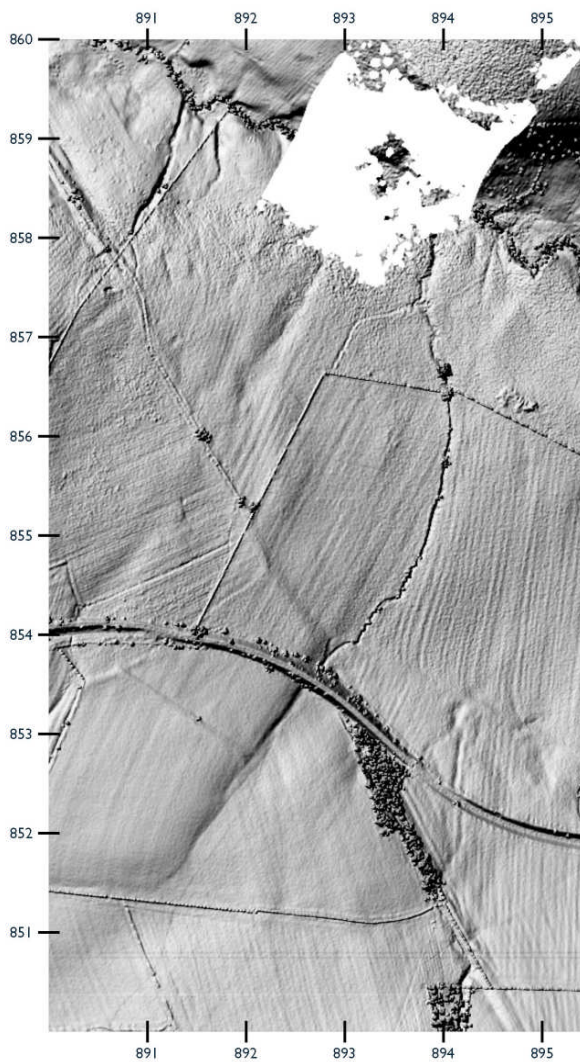
*Fig. 4.5. OS km sq NY8987 showing West Woodburn Roman camp (89871) and numerous other features of archaeological interest. The River Rede is clearly visible at top-right. This camp was previously surveyed and published as only half its actual size, as recent drainage ditches confused the pattern of Roman earthworks as seen on the ground. Analysis of lidar data during this project has recognised the south-west angle of the camp and the full extent of its southern rampart, previously thought to have been destroyed by centuries of ploughing but actually still surviving as slight earthworks. The distinctive curved corners, characteristic of Roman camps, can be clearly seen at the camp's north-east, south-east and south-west angles; the north-west angle is less clear as it is partly overlain by a modern road. Thanks to this project, this site can now be recognised as one of the largest Roman camps in Britain. The large irregular enclosure (89873) towards the south-east corner of the image may be of pre-Roman date, perhaps an Iron Age 'hillfort', with its ramparts later reused as field boundaries in medieval and post-medieval times.*



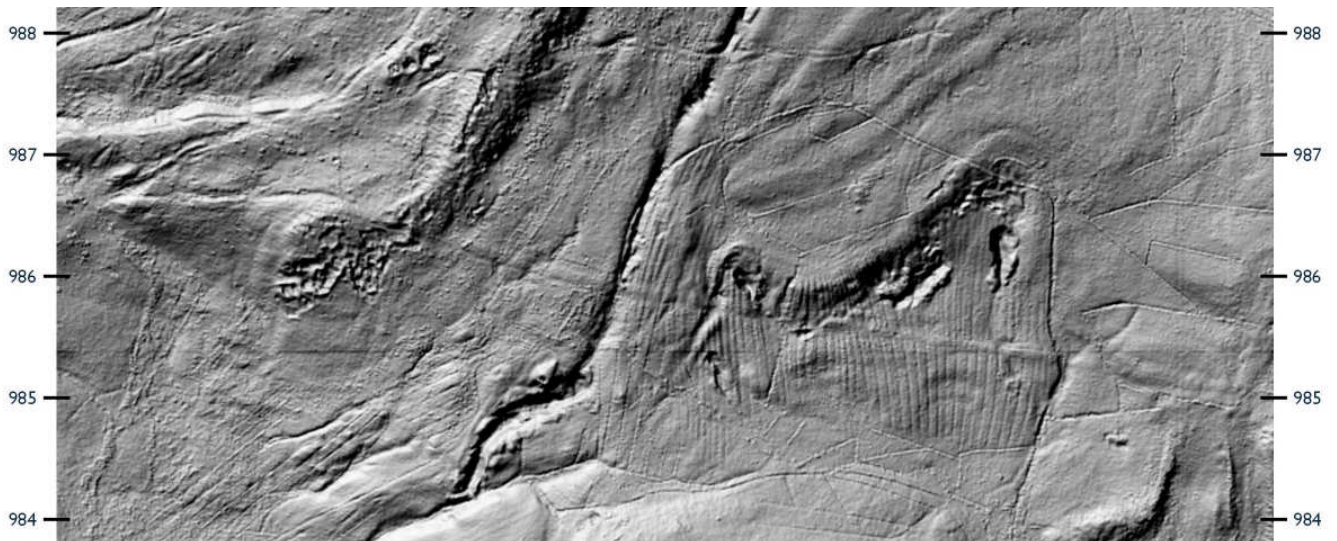
*Fig. 4.6. Earthworks visible on lidar imagery, although much mutilated by later agricultural and other activity, appear to represent a previously unrecognised Roman temporary camp at Whitfield (90831), possibly two such camps, one within the other. This is potentially an important discovery and should be checked on the ground. The site lies immediately west of Dere Street, in the angle formed by the change in direction of the road at this point. Dere Street (90832) is itself clearly visible on the right-hand image, with lighting from the north-east. The 'hand-shaped' earthwork towards the top of both images is a result of nineteenth-century coal mining (90833).*

*As well as illustrating a potentially very significant new discovery, these images demonstrate the value of having lidar data processed with lighting from different directions; some things show up more clearly with lighting from the north-east than the north-west, and vice versa.*

*(The left-hand image, centred on NY90079384, incorporates lidar data from two separate km sqs. It was produced specially for this report by Ed Hudspeth, Northumberland National Park Authority).*

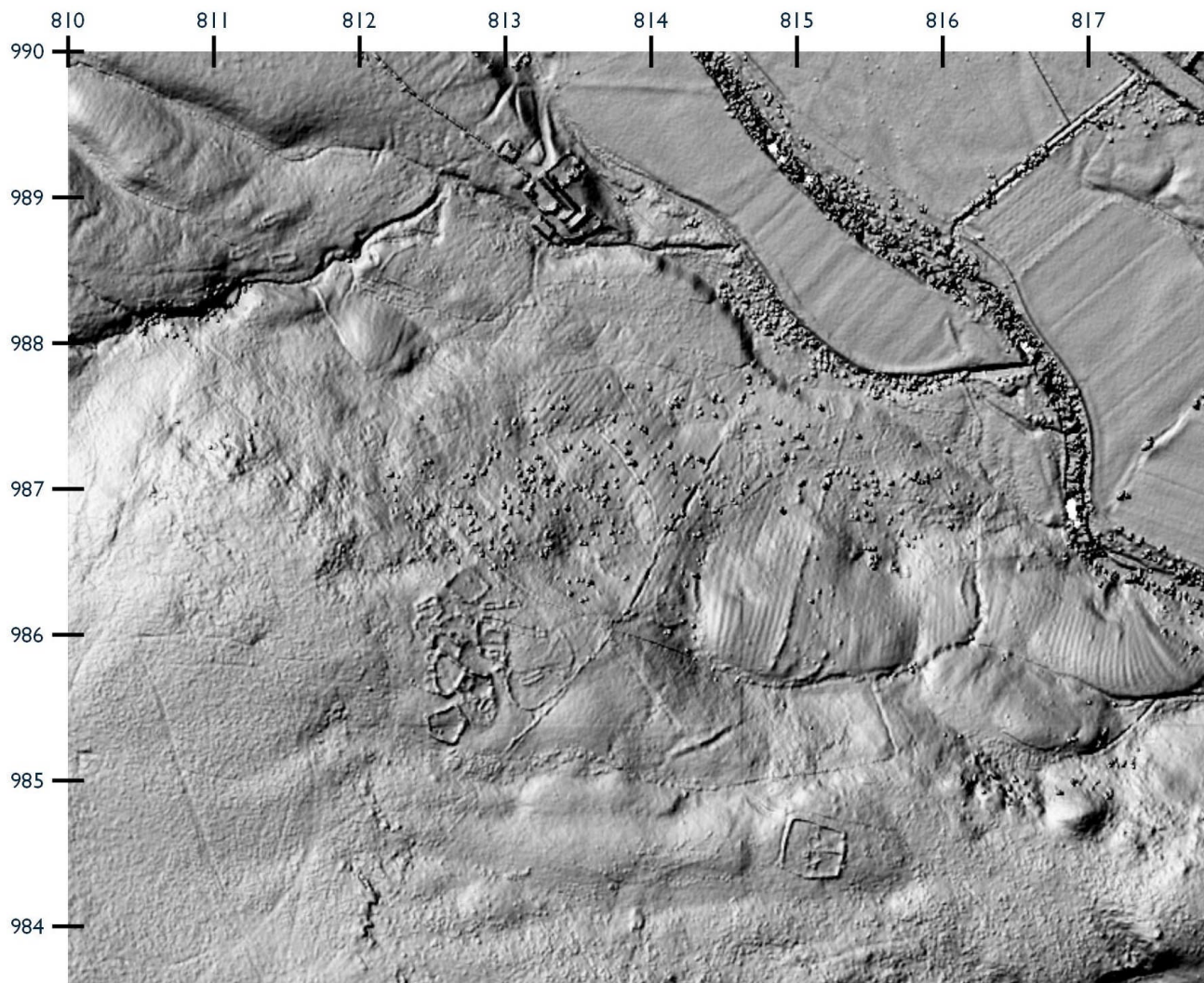


*Fig. 4.7. Dere Street, the main Roman road between York and Scotland, passed through Redesdale where it is now overlain in places by modern roads (notably the A68 and the road across the Otterburn Training Area linking Redesdale Camp with Coquetdale) but survives elsewhere as a low earthwork through fields and over moorland. A stretch of Dere Street (89851) passing beneath fields south of Habitancum fort is clearly visible running from north-west to south-east across this image. Relating to another transport network, some 1800 years later than Dere Street, the curved line passing from west to east across the lower half of the image is an old railway.*

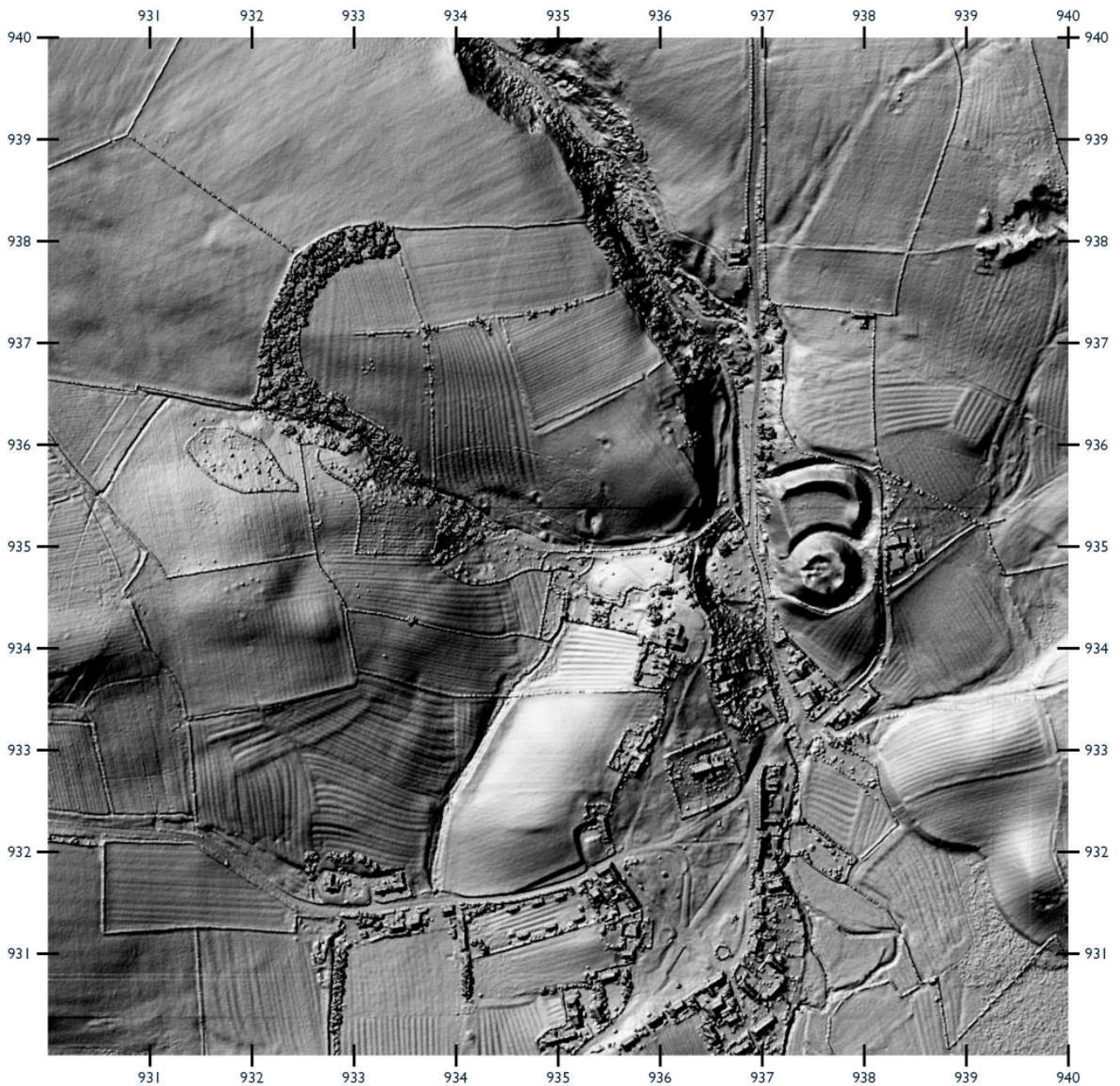


*Fig. 4.8. Dere Street is not the only Roman road within the project area. This image shows a stretch of the Roman road (84984) passing west-east between Dere Street at Bremenium and the Devil's Causeway (the Roman road heading north from near Corbridge towards Berwick on Tweed, now partly overlain by A697). Visible to either side of the road are shallow quarries (84985, 84987) which are not shown on historic OS maps, suggesting they could be ancient. Similar quarries have been noted adjacent to other stretches of Roman road; they could potentially be linked to the construction and maintenance of the roads. These examples should be checked on the ground to see whether any kind of relationship to the Roman road can be established.*

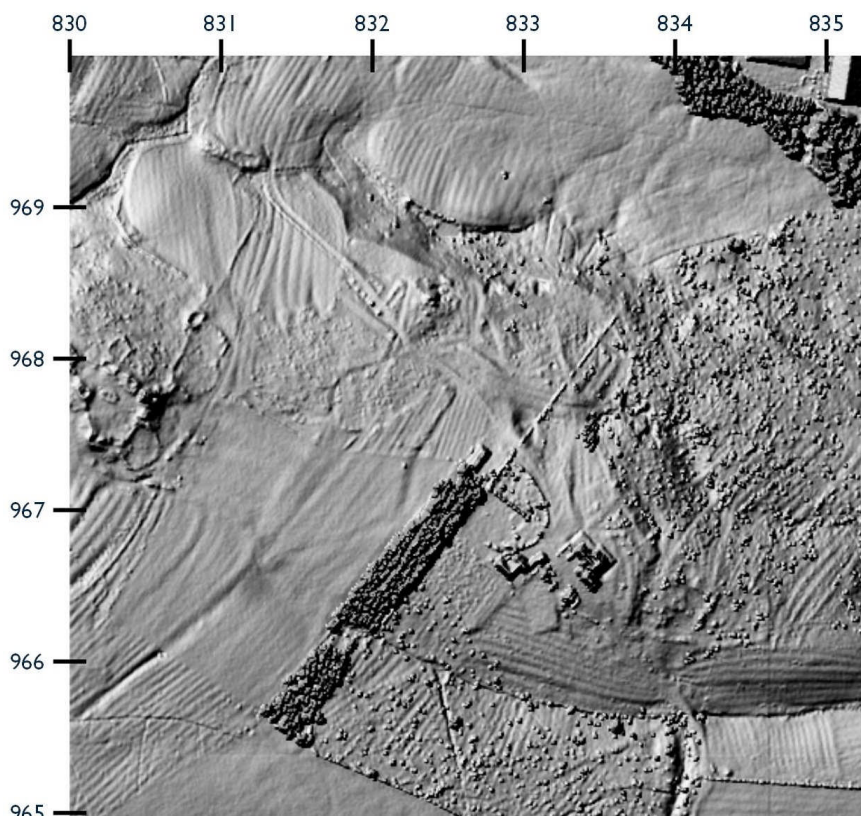
## 5. Medieval



*Fig. 5.1. The earthworks at the centre of this image, at Birdhope (spelt 'Burdhope' on historic OS maps) on the S side of the A68 opposite Redesdale Camp, form what is potentially one of the most interesting archaeological sites anywhere in Redesdale (81981). They include several late prehistoric enclosures with roundhouses, but also rectangular buildings which appear medieval in character. There is a fair chance that this place could have been occupied more-or-less continuously from late prehistory through until medieval times, and could thus include evidence of settlement in Anglo-Saxon and Viking times, about which we know virtually nothing for the whole of Redesdale. The site should be a priority for detailed investigation. Towards the south-east corner of the image is the late prehistoric settlement of Woolaw (81982), excavations here in the 1970s demonstrated three construction phases the detailed chronology of which remains unclear, though it was apparently occupied during Roman times. Towards the north-west corner of the image, on the north side of the Burn, can be seen three rectilinear buildings (81987); these are of unknown date but could be medieval.*



*Fig. 5.2. This km square (NY9393) includes the village of Elsdon; the splendid earthworks of its medieval motte and bailey castle are particularly prominent, with other features of the village such as the church and green also clearly visible. The village is surrounded by remnants of its medieval field system (93931), over which later field systems have been imposed. Within the image several areas of wide, curved ridge-and-furrow of medieval character can be seen, clearly overlain in places by patches of narrow, straight plough ridges. Towards the northern edge large modern fields have been heavily ploughed, effectively wiping away evidence of medieval and post-medieval field systems together with any earthworks that may have survived from earlier periods. There is much work to be done to clarify the character and chronology of field systems here and throughout Redesdale; lidar will be a key tool in such work.*



*Fig. 5.3. At the left margin of this image is the deserted medieval village of Evistones (83961), consisting of several rectangular buildings, of which at least three seem to have been bastles, and associated enclosures. Much ridge-and-furrow (83962) can be seen in the surrounding landscape, some of which has been partially flattened by later ploughing while some remains in very good condition. In places, other earthworks, including a possible oval-shaped enclosure c200m east of the village that could be an Iron Age 'hillfort' (83969), and a rectilinear enclosure at NGR NY83439663 (83967), have been recorded for the first time by this project. This is a complex landscape that should be investigated on the ground.*



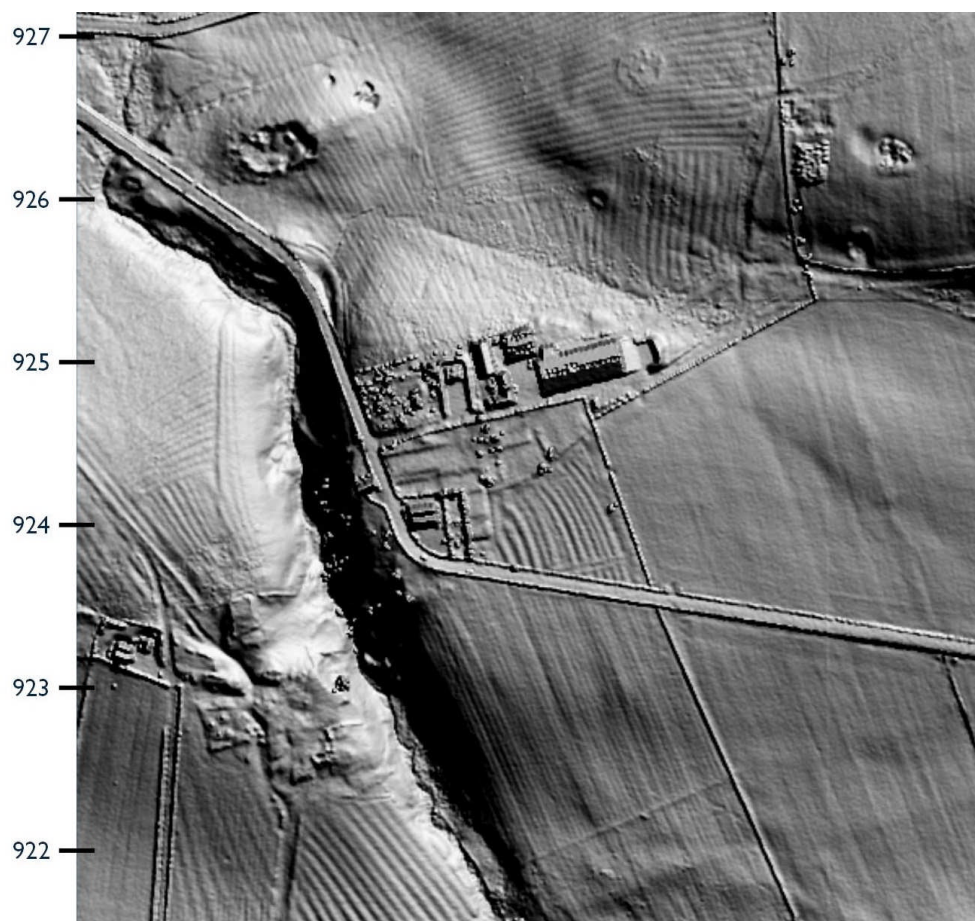
*Fig. 5.4. At top-centre of this image, remains of a medieval settlement (86939) consisting of rectangular houses and paddocks are clearly visible. Another, smaller, settlement can be seen towards the bottom of the image (869310). Both of these are significant new discoveries made by this project. They lie within an extensive ridge-and-furrow field system (869340) at Garretshiels with which they appear to be contemporary. This extraordinarily well-preserved medieval landscape lies just east of the A68 which can be seen towards the south-west corner of the image. Towards the south-east corner of the image an apparent curvilinear enclosure (869356) appears to be respected by the ridge-and-furrow; it could be medieval or earlier. This entire complex should be surveyed on the ground.*



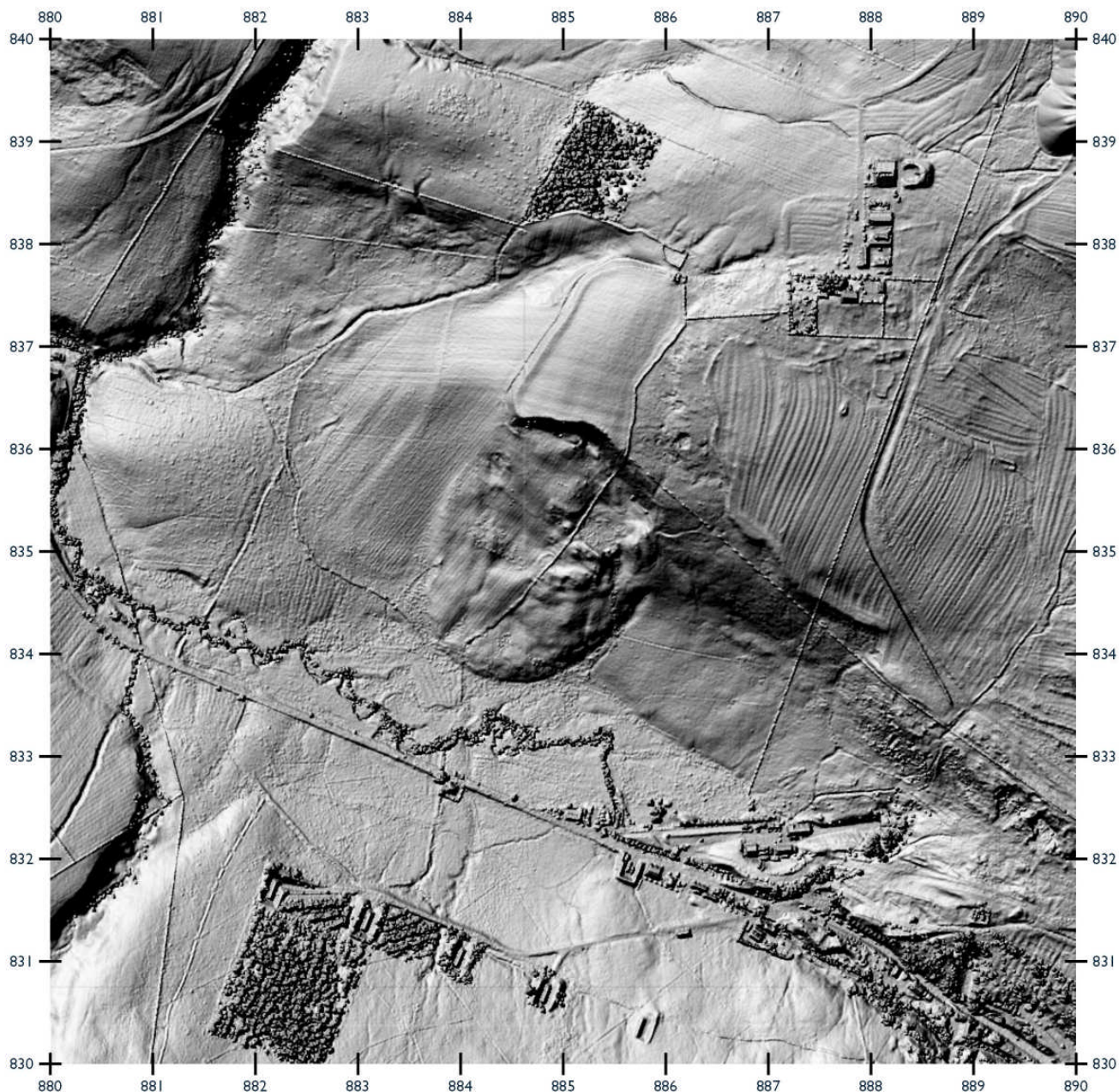


*Medieval settlement and field systems at Monkridge and Heatherwick, adjacent to the A696 roughly midway between Otterburn and Elsdon.*

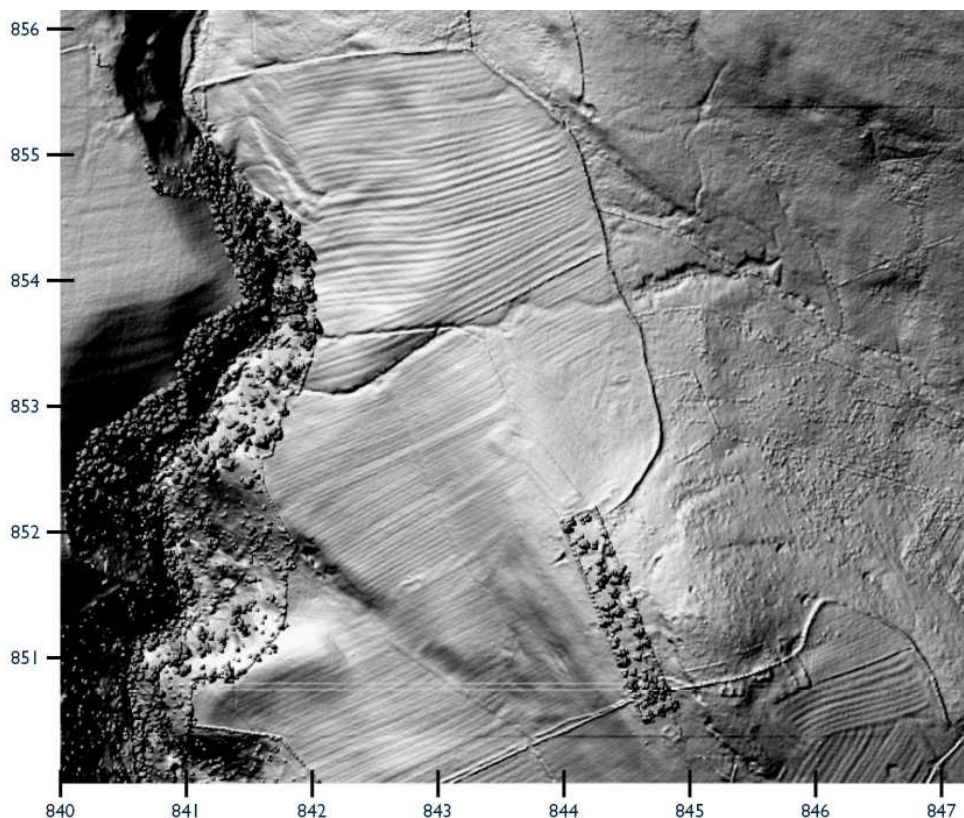
*Fig. 5.5. The HER suggests no earthworks survive here, at Monkridge DMV (919110), whereas the lidar clearly demonstrates that some do, even though much of the ridge-and-furrow field system (91912) has been flattened by recent ploughing in two fields south of the settlement.*



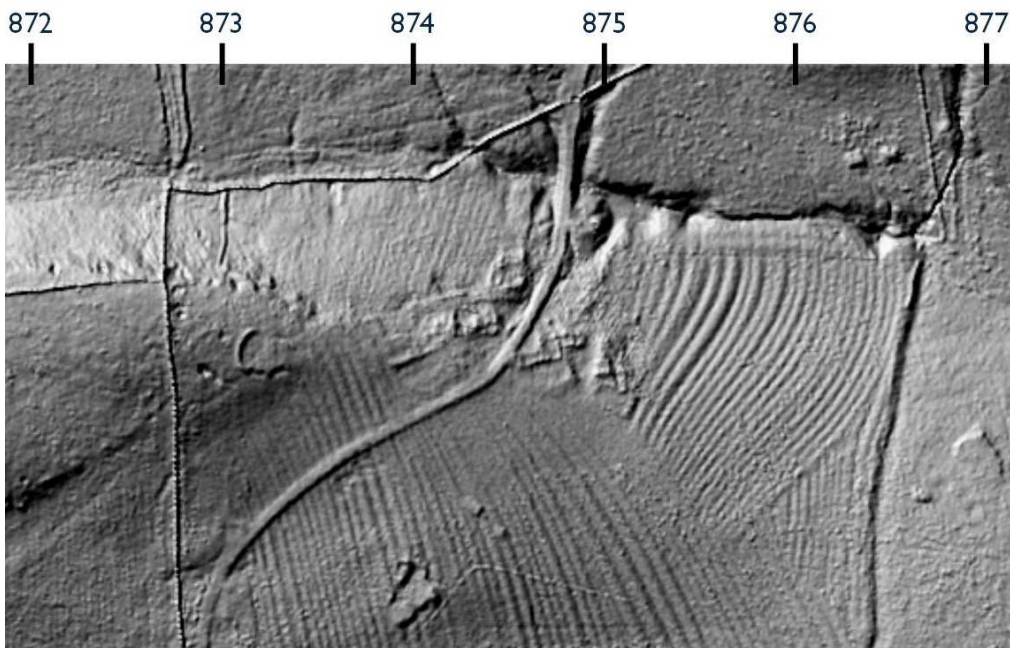
*Fig. 5.6. Clearly visible here are earthworks of probable medieval settlements at Monkridge Hall (90912) and Heatherwick (90911), set within an extensive ridge-and-furrow field system. The cluster of earthworks towards the south-west corner of the image includes the site of the seventeenth-century Monkridge Hall.*



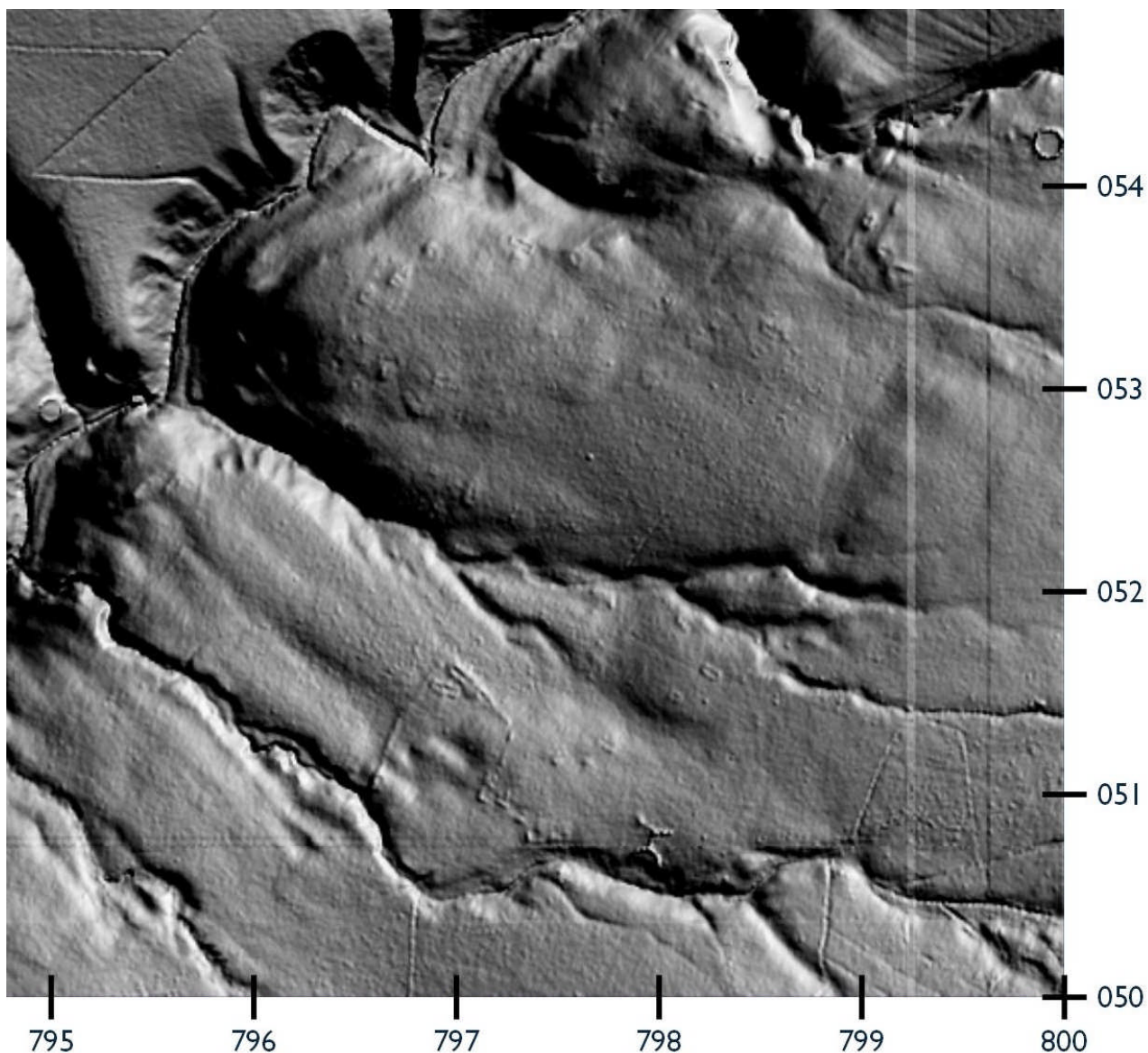
*Fig. 5.7. This km square, at Broomhope c3km south of West Woodburn, contains numerous features of interest. Earthworks of a medieval settlement at Broomhope (88832) are very prominent towards the north-east corner, with well-preserved remnants of its ridge-and-furrow field system to the south. About 500m west of the medieval settlement can be seen a previously unrecorded rectilinear Iron Age or Romano-British settlement enclosure (88837), cut through by a later, probably medieval, field boundary. Remains of a further such settlement (888311) may survive beneath the present-day field wall at NY 8884 8334. Towards the south-east corner of the image lies a complex of earthworks relating to post-medieval ironworking (888310); historic OS maps record the growth and subsequent decline of an extensive industrial complex here, linked to the railway and adjacent quarries.*



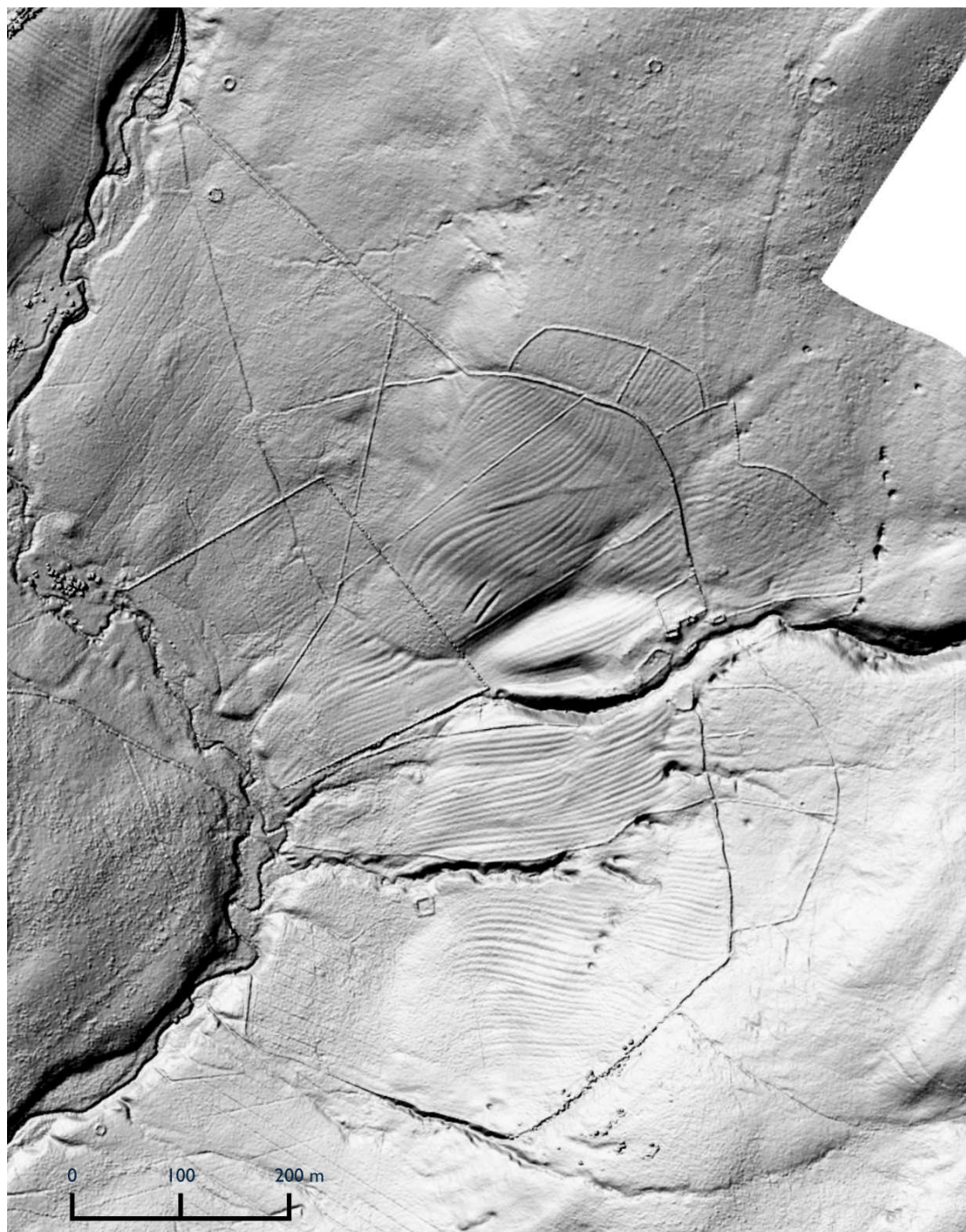
*Fig. 5.8. Earthworks of High Town deserted medieval settlement (84851), east of Hareshaw Linn and about 2km north of Bellingham, show up clearly towards the south-east corner of this image. Note the location of the settlement at the edge of the ridge-and-furrow field system (which appears to include medieval and post-medieval elements), where it was well placed to exploit the unimproved moorland for grazing as well as the ploughed fields. The relationships between medieval settlement, field systems and the wider landscape throughout Redesdale offer much potential for study.*



*Fig. 5.9. A concentration of several rectilinear buildings and enclosures (87941) is visible here within a ridge-and-furrow field system (87948), either side of the Greenchester to Potts Durtrees road on the Otterburn Training Area. This appears to be a quite substantial but previously unrecorded medieval settlement, possibly with a post-medieval phase (though it could be the site of Greenchester DMV (HER N8281) which the HER places c500m to the SW).*



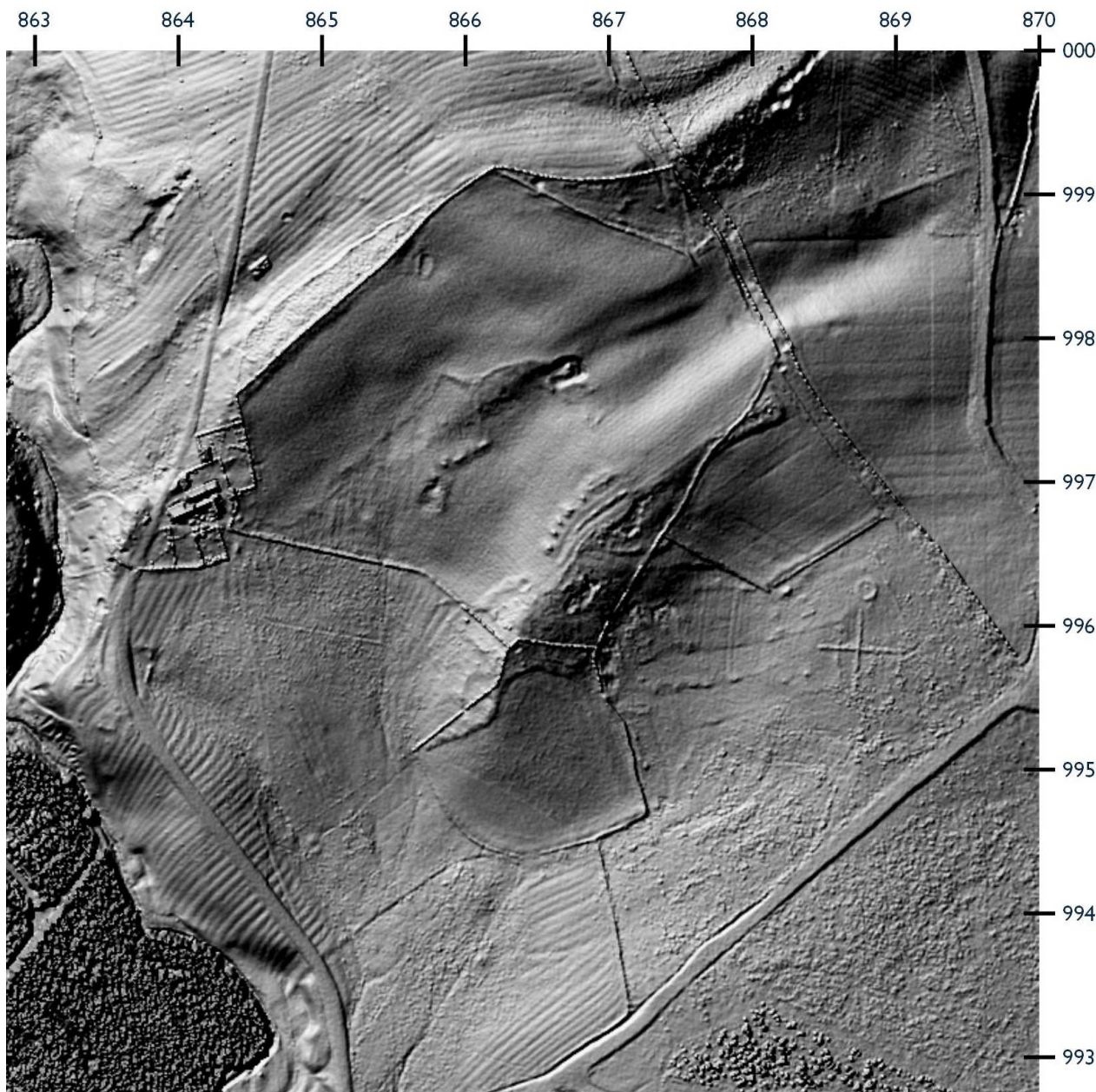
*Fig. 5.10. At least 15 small rectangular features, probably shielings, are visible in this image of an area above the east bank of the Cottonshope Burn on the Otterburn Training Area (79053). The HER records ten shielings and classes them as post-medieval. Shieling grounds such as this are notoriously difficult to date, and could well date back to medieval times. How this particular complex relates to permanent settlements elsewhere in the valley is not known.*



*Fig. 5.11. The complex multi-period landscape at Branshaw (88991), about 3.5km north of Otterburn Camp. Best known for its bastle, right of centre in this image, this landscape contains visible remains extending back some 4,000 years. It has previously been surveyed on the ground and many individual features are already on the HER, so it was not recorded in detail by this project. However, the extensive Bronze Age cairnfield (88001) towards the top of the image seems not to have been recorded previously. Other features of interest include the line of the Roman road from Bremenium (88994) which enters the image c130m north of the south-west corner, is lost within the medieval field system, and can be seen again east of the bastle. Close examination of the earthworks around the bastle suggests medieval settlement and possibly also a late prehistoric or Roman enclosed farmstead. Previous surveys of the area should be revisited in light of the lidar imagery.*

*(This is a composite image, centred on NY87859967, incorporating lidar data from four km sqs. It was produced specially for this report by Ed Hudspeth, Northumberland National Park Authority).*

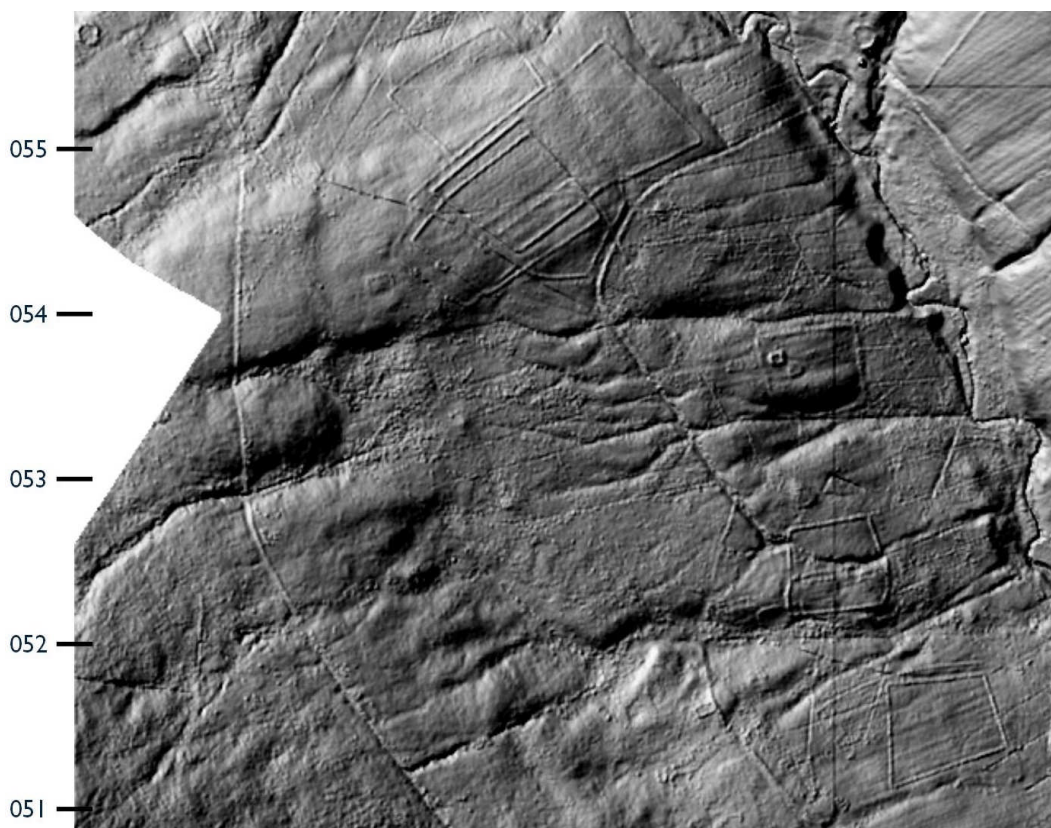
## 6. Post-medieval



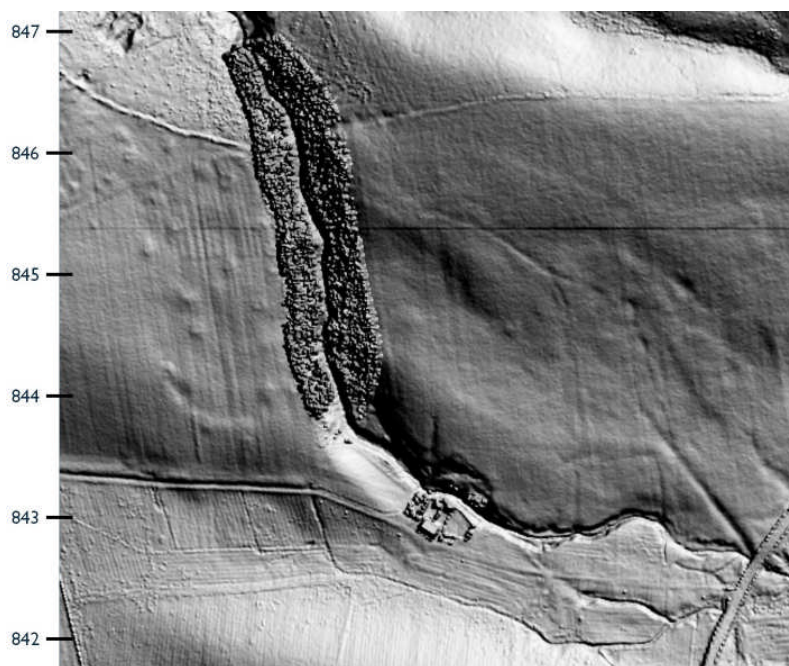
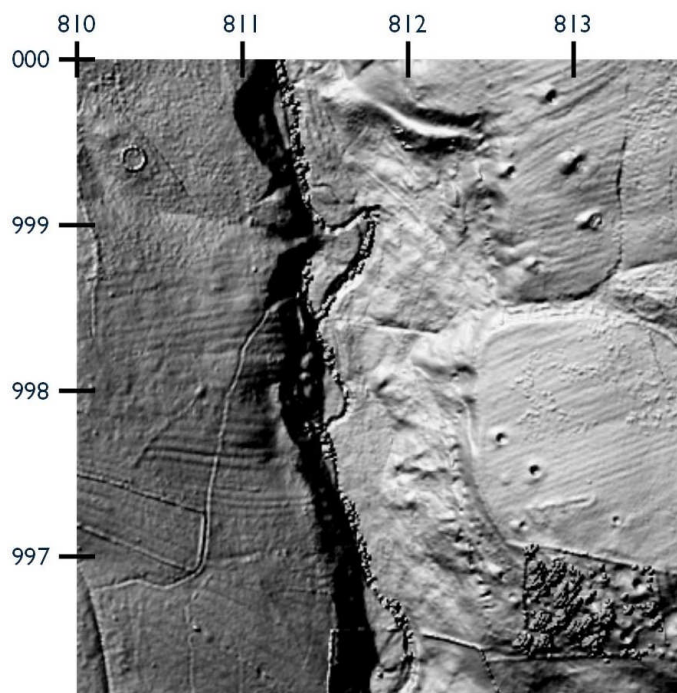
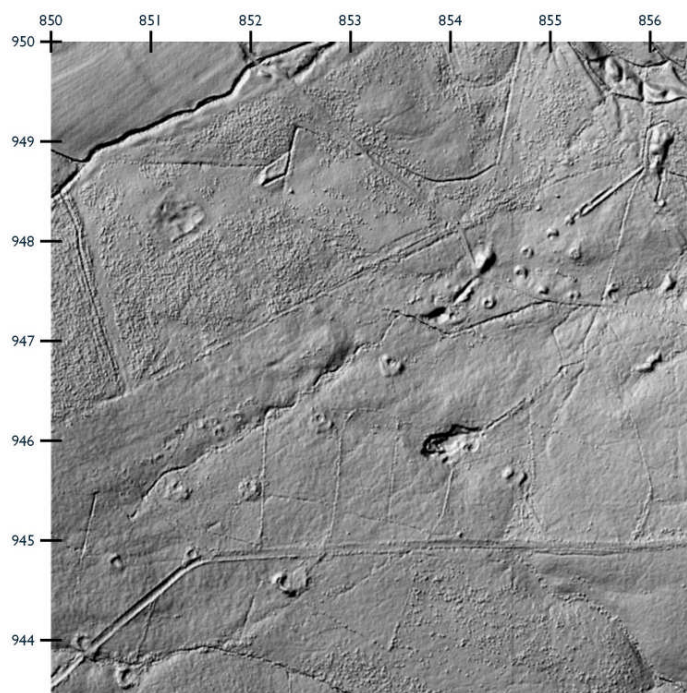
*Fig. 6.1. Most km squares surveyed during the project include some evidence of post-medieval activity. Such evidence is varied and can include settlement (sometimes deserted), field systems and industrial complexes. Evidence of post-medieval agriculture is so widespread that volunteers were advised not to try and record it in any detail; to try and do so for such a large project area would have been completely unmanageable. However, some volunteers did record some areas in detail and all this data is included within the project archive. The area shown here (869930) is around Featherwood on the Otterburn Training Area; most of what is visible here is probably post-medieval, including the very unusual field pattern towards the centre of the image, the explanation of which is unknown but could relate to earlier activity here. Detailed recording of such post-medieval landscapes using lidar imagery linked to historic mapping and other documents would certainly prove interesting in many places throughout Redesdale.*



*Fig. 6.2. This complex, multi-phase agricultural landscape on the south shore of Catcleugh Reservoir (73021) looks essentially post-medieval in date, though recent ground survey suggests that it may incorporate some medieval and prehistoric elements. The ridge-and-furrow can be seen heading beneath the water of the reservoir which was constructed between 1884 and 1905.*



*Fig. 6.3. Several rectilinear earthwork enclosures (70053) can be seen on this image, near Whitelee just a couple of kms from the head of Redesdale at Carter Bar. Other examples also survive nearby. Three of those visible here, towards the top of the image, clearly overlie each other, suggesting development over time. They are all thought to be post-medieval stock enclosures, perhaps related to the movement of stock across the Anglo-Scottish border.*



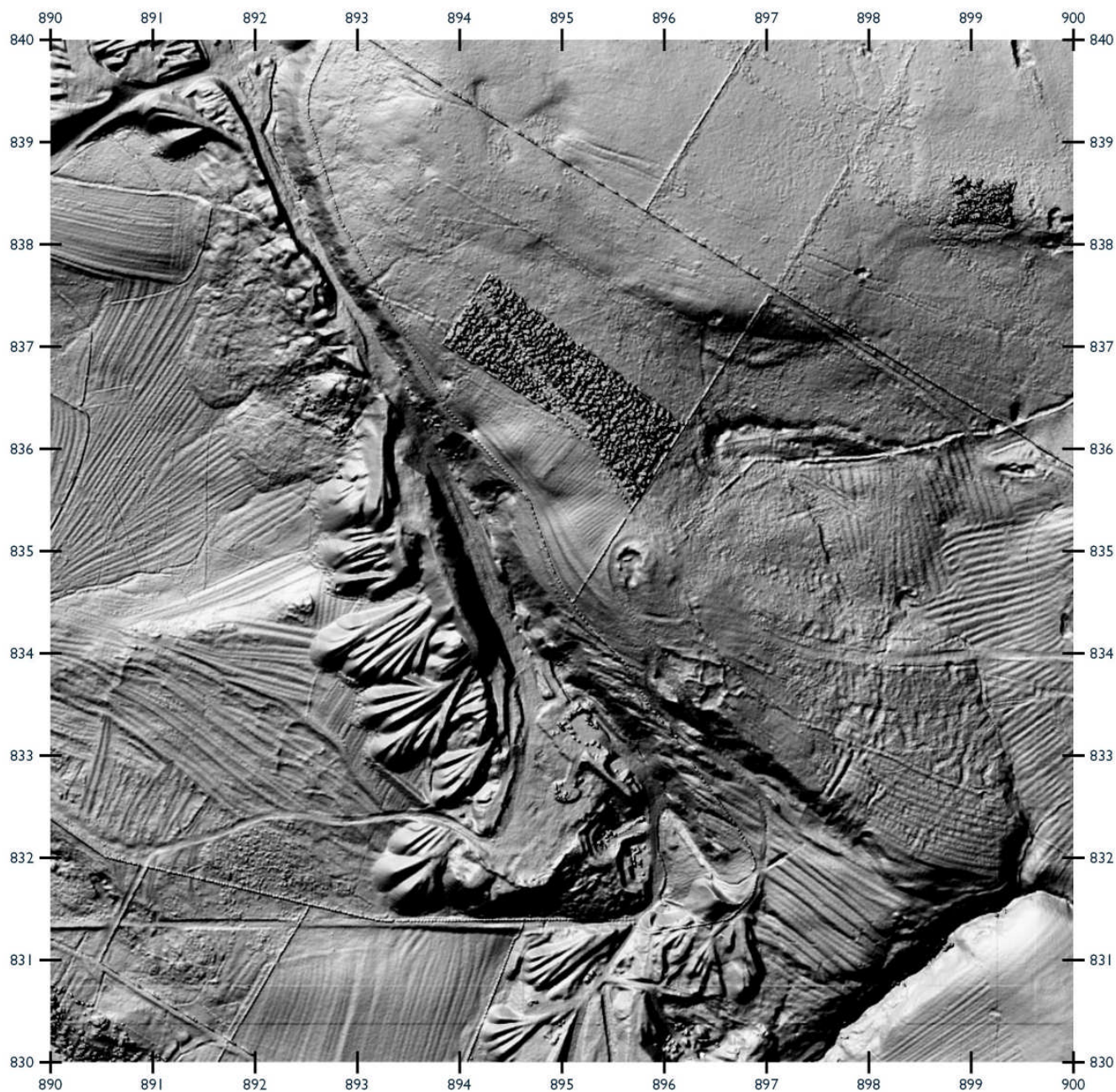
*Evidence of historic coalmining has been recorded on lidar imagery in several cases, often in the form of bellpits, sometimes in large clusters. Most of this activity is post-medieval, but the detailed chronology of many individual sites remains to be resolved.*

*Fig. 6.4 (top left). Part of the very extensive complex of bell pits and other earthworks associated with Brownrigg Colliery on Blakehope Fell (85945). Many of the pits are shown as 'disused' on 1890s OS maps, suggesting that mining here was over by the end of the 19<sup>th</sup> century.*

*Fig. 6.5 (top right). Bellpits at Bellshiel (NY81991, 81993), part of a larger complex that includes some examples within the Bellshiel Roman camp, though there is no suggestion that any of them are of Roman date.*

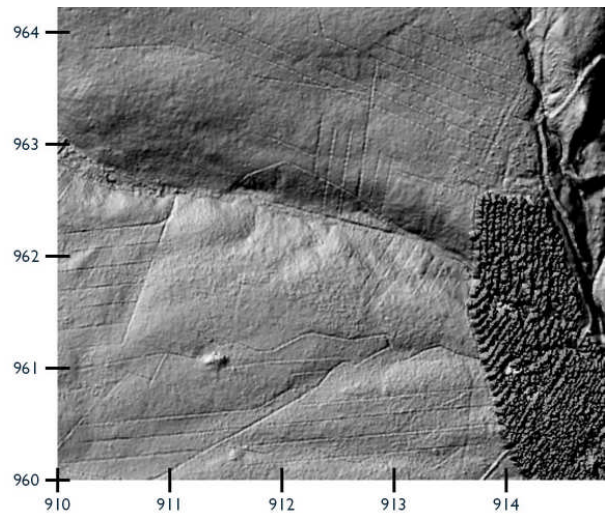
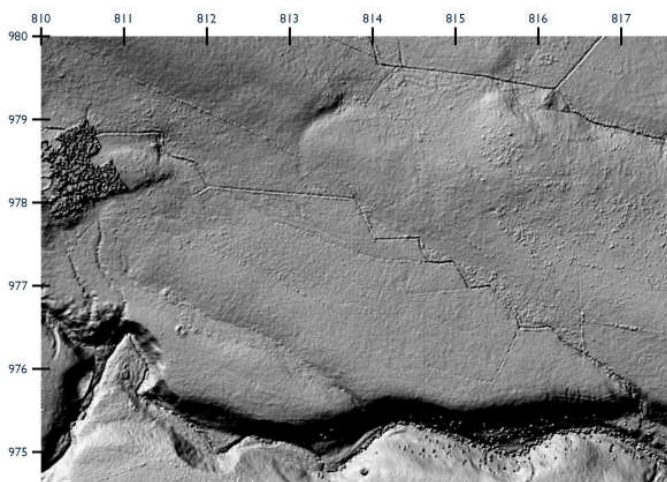
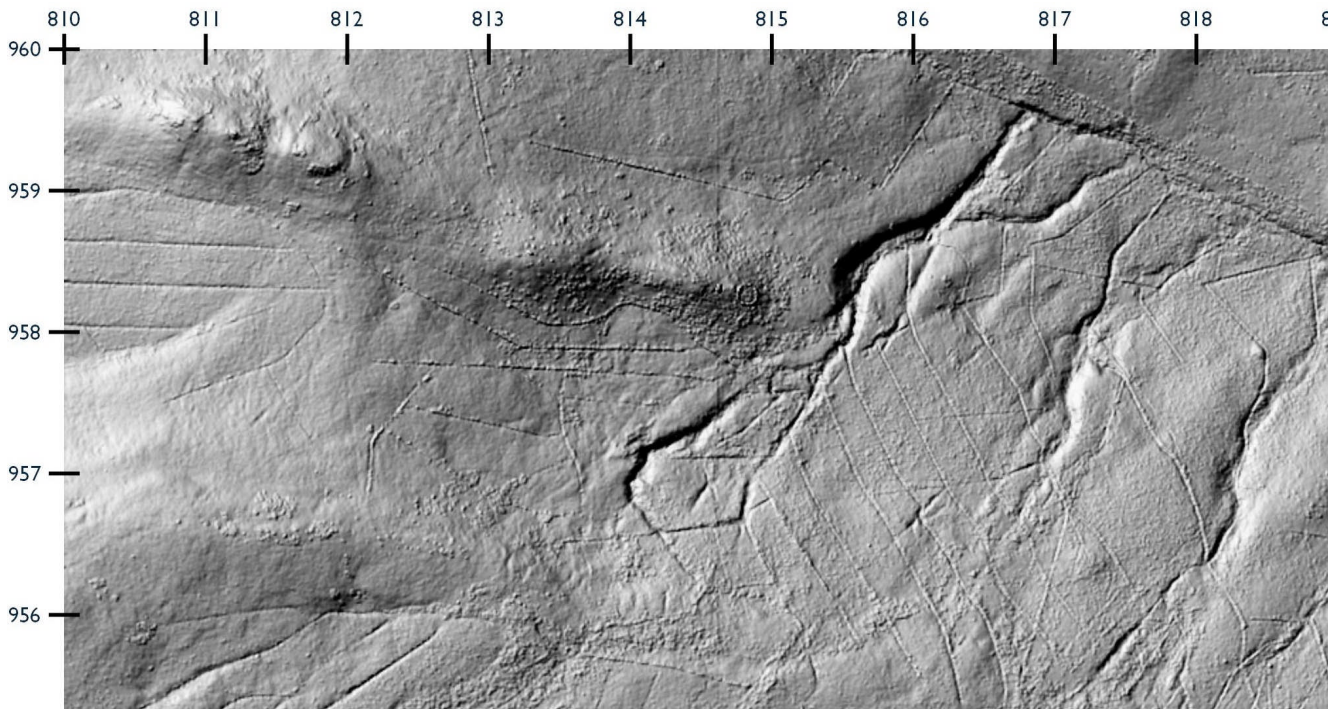
*Fig. 6.6 (bottom). Bellpits either side of the Conheath Burn (85847, 85848) about 1km north-east of Bellingham. Those to the west of the burn are better preserved, with those to the east having been almost flattened by ploughing. Although classed as post-medieval, their actual date is not known for sure.*





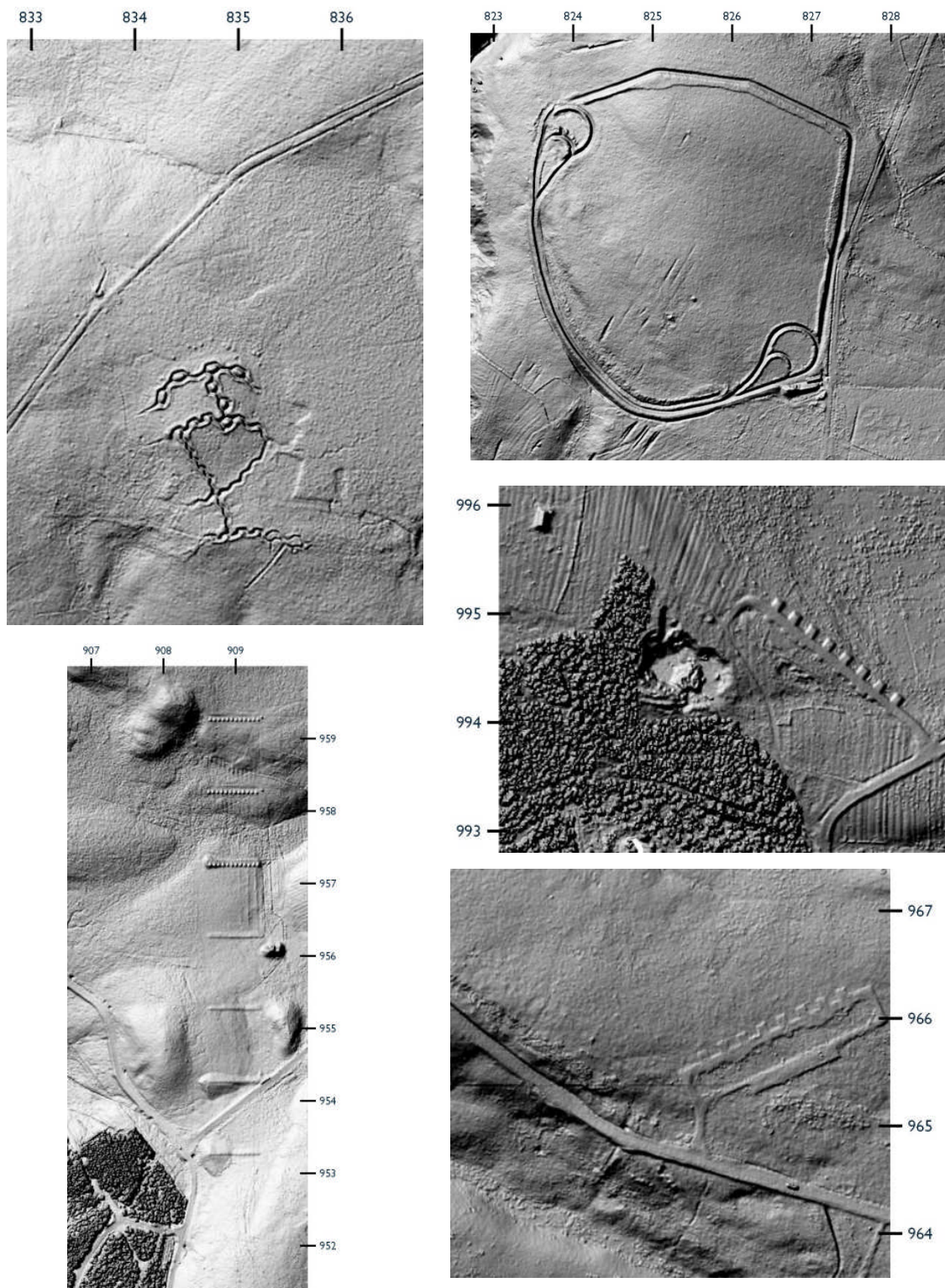
*Fig. 6.7. The distinctive remains of post-medieval ironstone mining, often on a huge scale, can be seen in parts of the Redesdale landscape. In this image the huge-scale workings at Broomhope (89836) can be seen to partially overlie ridge-and-furrow fields (89832) and have almost enveloped a late prehistoric enclosed settlement (89831) just right of centre; people may well have been exploiting the iron reserves here in Roman times. The growth and subsequent decline of these workings is documented on OS maps from the mid nineteenth century onwards.*

## 7. Modern



*Fig. 7.1. Project volunteers were given guidance regarding the kinds of modern features visible on lidar which are of minimal archaeological interest and should not be recorded. These include often extensive and sometimes confusing patterns of drainage ditches, such as those shown here. Initially, and understandably, some volunteers struggled to identify ancient features within patterns of modern drainage, but they became much more adept at this as the project progressed. Should anyone ever wish to undertake research into post-medieval and modern drainage ditches in Redesdale then they would find lidar imagery to be very useful!*

## 8. Military (Otterburn Training Area - OTA).



*Fig. 8.1. Anyone unaware of the presence of the Otterburn Training Area (OTA) might struggle to interpret the above images! Several sites relating to past and present military training on the OTA show up well on lidar imagery, including the WW1 practice trenches at top-left, now legally protected as a scheduled ancient monument. Elsewhere, modern developments such as golf courses or even car parks, can be confusing when seeking to interpret lidar data, but if the lidar is used in conjunction with OS maps and aerial photography or satellite imagery then the chances of misinterpreting such features are greatly reduced.*

## Part 5. Some suggestions for further work

This project has achieved its twin key aims of enabling local volunteers to undertake an ambitious lidar survey of most of the Revitalising Redesdale project area, and producing results that represent a substantial enhancement of the Northumberland Historic Environment Record. In spite of several significant discoveries, it would be fair to say that the results largely reinforce what we already knew of Redesdale's archaeology, rather than necessitating the complete rethinking of any periods. This is largely due to the quantity and quality of previous survey work in the area, notably that by John Day and Beryl Charlton (eg 1978), and Tim Gates (1997, 2009). That said, the results, as discussed in the previous section of his report, certainly offer a completely new way of seeing the archaeological heritage of Redesdale and in due course will probably come to be regarded as a significant episode in the story of archaeological research in the area. The splendid work of the project volunteers, now all collated within the project archive, also provides a sound basis for the planning of future work, much of which could potentially be done by local people with appropriate levels of professional support.

To date, the only people aware of the results of the project are the participating volunteers. There is much interest in local archaeology within the population of Redesdale and it would be good if a public meeting could be arranged to present the results of the project to anyone who might be interested.

With regard to future possibilities, it would be a good idea for a group of people with an interest in the archaeology of Redesdale to get together and draft a Research Framework for the valley, sharing their existing knowledge and also their ambitions for future work. Such a document, which should key in with other relevant regional and period-specific Research Frameworks (most importantly those for North-East England and the Northumberland National Park), would highlight areas where future work is most needed and should help with the acquisition of the necessary resources. This could perhaps be produced by the Revitalising Redesdale project over the next year or two; it could be regarded as a long-term legacy of the project, perhaps to be curated by the Redesdale Society and updated when appropriate.

What follows is a list of ideas that have arisen during the Lidar Landscapes survey. It could potentially be used by local people as the basis for a more comprehensive research framework, as suggested above. Also, project volunteers may wish to undertake fieldwork relating to or more of the following suggestions during the remaining years of the project. The list is not intended to be in any way restrictive; should anyone wish to undertake detailed research into any area of interest identified by the Lidar Landscapes survey then they certainly should not be discouraged from doing so just because it isn't specifically mentioned here. Indeed, any detailed survey of any area would add to the results and should be encouraged. It is always best, though, if research is structured, and the following suggestions will hopefully help to provide a framework within which such programmes of research can be developed.

After a couple of general suggestions, the following suggestions are listed in roughly chronological order. At the time of writing all fieldwork is indefinitely on hold due to the Covid-19 crisis, and it may prove impossible to undertake further such work during 2020. Should this prove to be the case, then the enthusiasm and expertise of volunteers

could perhaps be channelled into the landscape survey proposal outlined as item 2, below, and also possibly into the Research Framework suggested above, as much of the work for both of these could be done remotely with people coming together later in the project to discuss results at one or more workshops.

With regard to possibilities set out below, it should be stressed that anyone undertaking fieldwork in Redesdale should not accept the results of this project without checking the lidar data, either in the form of the lidarmaps produced for this project or reprocessed data, for themselves. While most interpretations reached by this project are probably correct, there is always room for error, and indeed for simply missing things, when surveying such a large area. Also, within the next year or two, new higher-resolution lidar should become available for the whole of Northumberland; it will be interesting to examine this new data and see what further new insights it offers into the archaeology of Redesdale, both in terms of potential 'new' sites and reinterpretations of things recorded during this project.

### **1. Incorporation of results into the Northumberland HER.**

The first thing that should happen following completion of the Lidar landscapes project is that the results should be incorporated into the Northumberland HER, which should be the first port of call for anyone planning further work in Redesdale. The project archive, which is entirely digital, will be passed to the HER; copies should also be made available to any participating volunteers who may wish to consult it.

### **2. Complex multi-period archaeological landscapes.**

There are several areas within the Revitalising Redesdale project area within which lidar imagery demonstrates complex multi-period archaeological landscapes. There is a tendency to try and compartmentalise each of these into a series of 'conventional' site types, each of which is then classified and dated according to the results of fieldwork undertaken elsewhere - often a long way away from Redesdale. It would be an interesting exercise to choose a small number of these complex landscapes and invite volunteers to study them in great detail, using primarily the lidar data (including the results of this project) but also other relevant sources. The work could also include field visits. The basic idea would be to concentrate not on the identification of individual 'sites' but on aspects of continuity and change through time; in effect, building narratives of 'people and place' for each area. For example, how were things that happened at any one time influenced by people's perceptions of things that had happened previously in the area, and how much did they influence subsequent developments? These surveys should pay attention to available palaeoenvironmental studies (much further palaeoenvironmental work is needed in Redesdale, but this requires specialist skills and equipment and thus isn't really suitable for volunteers). The different areas could then be compared at one or more results workshops, at which volunteers would present the results of their work and discuss these with others. Some patterns would no doubt be broadly similar from area to area, while others might vary a great deal, but whatever the results the process would undoubtedly prove rewarding to those doing the work. Such a project would be a new way of using lidar, and would require careful planning to ensure that volunteers are encouraged to think outside conventional 'archaeological silos' but also that the results are recorded in a comparable way from area to area; in addition to providing results of value to the study of Redesdale, the new methodology could well represent a useful legacy of the Revitalising Redesdale project, potentially of use to other projects elsewhere.

### 3. Neolithic

The Lidar Landscapes survey has not resulted in the discovery of any new Neolithic sites, which is not surprising. The possible long cairn and adjacent round cairns on Wether Hill (91906, 91907, 91908), described in the HER as natural, should be inspected on the ground as they certainly do not look natural on lidar imagery (or aerial photography), and they may be very important sites. A detailed topographic survey may be justified. A new detailed survey of the long cairn at Bellshiel, and its adjacent cairnfield, may also prove worthwhile. Why were this and the nearby Dour Hill long cairn (including apparent stone-built chambers) built here, towards the top of Redesdale? The answer may lie in seasonal occupation of this area by communities based for much of the year on lower ground to north and south. Excavation at one if not both sites would be very interesting, but would be complex and would require a comprehensive research design to obtain the necessary consent. On lower ground, although not related to the lidar survey, a programme of field walking could well provide much information about patterns of settlement from the Mesolithic to the early Bronze Age. Such work is ideally suited to groups of local volunteers, although it is inevitably be restricted by the availability of ploughed fields each year. If any field walking is undertaken, the results should be interpreted alongside reanalysis of all known lithics assemblages from the area.

### 4. Bronze Age

The earliest settlements likely to be susceptible to discovery or investigation by lidar are of Bronze Age date. The current survey has thrown new light on the Bronze Age settlement of Redesdale through the discovery of new sites and the revealing of new information about known sites. A potentially excellent small-scale follow-up project would be to visit and survey all the certain and probable Bronze Age settlements and field systems (mostly classed within the project database as 'cairnfields', of which there are 17 in total) identified during this project. Detailed surveys of the following sites, possibly including some geophysics, is particularly recommended:

*Tod Law (89952, 89953, 89956, 899617).*

*Fawdon Hill (899320. Already under investigation).*

*Horsley Plantation (84978).*

*Darney Crag and Staniel Heugh (91871, 91872).*

*Barracker Rigg (889717)*

*Branshaw (870014).*

*North-east of Silloans (83024).*

Subsequent small-scale excavation may then be justified at one or more of these; this would potentially add to the results from the only such excavated site in Redesdale at Hallshill (90881). The results at all sites could then be combined into a new overview of the Bronze Age in Redesdale. This work could also potentially include some predictive modelling, using information about the nature and location of known sites to predict possible locations of others, with such possible locations then subjected to careful examination.

## 5. Late prehistoric settlement

About 80 certain and probable settlements from the Iron Age/Roman-British period are now known in Redesdale, all of which are visible on lidar imagery (a representative sample is illustrated in Section 4 of this report). Many of these have surrounding field systems which appear to be contemporary. This represents an extraordinary resource, offering huge potential to unlock aspects of the story of the region throughout later prehistoric and Roman times, and potentially beyond. Currently, however, these sites, and in particular their chronology, are very poorly understood; it is not possible, for example, to say with any certainty whether any particular site has pre-Roman origins or began life during the conquest. It is probable that most do have pre-Roman origins, but how long into the Roman period were they occupied, and were some occupied (or perhaps reoccupied after a period of abandonment) through into post-Roman times? Ultimately, these issues can only be addressed in any detail through excavation, but the planning of any such programme of excavation will require a detailed survey phase. Every site is unique, but it will be possible to classify them all according to certain characteristics and produce groupings that may prove to have functional and/or chronological implications. This work, which should be designed to build on earlier work such as that undertaken by George Jobey and by Beryl Charlton, should address issues such as size, form, number of roundhouses and other internal features, condition, nature of associated field systems, and proximity to Roman military sites or Roman roads. This could represent a popular volunteer project, ideally linked to a programme of detailed survey including geophysics at a sample of sites. The excavation work already underway at Rattenraw will be directly relevant, and the undertaking of a review of all known sites would help to provide a meaningful context for the results at Rattenraw.

## 6. Roman military sites

The Roman military sites of Redesdale have been subjected to detailed study over the past couple of centuries, and the Lidar Landscapes survey, despite a few significant discoveries, has not added substantially to our understanding of them. There are a few useful exercises that could be undertaken as relatively small-scale volunteer projects, such as:

**6a. Characterisation of Roman roads.** The lidar imagery enables quite detailed analysis of the current condition of Dere Street and the Bremenium - Devil's causeway link road. A small team of volunteers could usefully reanalyse the lidar imagery with a view to producing a condition survey of the surviving remnants of these roads, perhaps linked to field visits to record some sections in detail in the field. A small number of sections across the roads could be excavated to enable comparison of construction methods and current condition in different places. The Lidar landscapes survey has noted undated, shallow quarries adjacent to the Roman roads in several places; these could be included within a survey of the roads in order to try and establish whether they are Roman and were linked to road construction.

**6b. Survey of earthworks SW of Bremenium fort.** Earthworks in the field SW of the fort show up clearly on lidar imagery (83983). They may well be Roman, though could relate wholly or partly to later activity. They should be surveyed in detail, possibly including geophysics. Geophysical survey of other areas around the fort may also be worthwhile, to build on the results of work done several years ago. **Detailed survey of the fort and camp at Blakehope (85941)** may also be justified.

**6c.** One of the project's most significant results was the recognition of the huge size of the **Roman camp at West Woodburn (89871)**. This should be surveyed on the ground to

augment the published RCHME survey. Recent work at Haltwhistle Burn suggests that geophysical survey of camps tends to find little of significance, but some exploratory geophysics at West Woodburn could prove worthwhile to assess the possible below-ground survival of plough-flattened ramparts and to investigate the possibility of surviving internal features. If the West Woodburn camp is surveyed on the ground then it would be useful to extend the survey to investigate the possible prehistoric enclosure to the east. Another site that should be visited on the ground is the previously unrecorded apparent **camp (or camps) adjacent to Dere Street at Whitfield** (90831). It is important to establish whether the earthworks here do represent another Roman camp, and if so the extent to which Roman remains might survive within or beneath remnants of later activity. Another **possible camp was recorded adjacent to the A68 at High Rochester** (829712); this is considered less likely than the previously discussed example, but it should certainly be checked on the ground.

## 7. Early medieval.

In common with recent lidar surveys of other upland regions in northern England, the survey of Redesdale failed to identify any sites dating unambiguously from the early medieval period, from the end of Roman rule in c410AD through to the Norman Conquest of 1066. Elsewhere, the absence of archaeological sites has led to this period being referred to as 'the missing centuries', and this label is no less relevant to Redesdale than to other recently surveyed landscapes. This lack of sites must, however, relate more to our inability to recognise early medieval sites than to a real absence of activity. Establishing the nature of early medieval activity in Redesdale should be regarded as a priority, but may not be easy. Research should perhaps concentrate on known Roman sites where evidence of medieval activity is also known, as continuity of occupation in such places might reasonably be expected. Close analysis of some medieval settlements might also suggest earlier activity, though evidence of this may lie concealed beneath present-day settlements. Some churches may eventually prove to have pre-Conquest origins, as has been suggested but not yet proved for St Cuthbert's at Elsdon. One place which must be a contender for early medieval occupation is Birdhope (81981), where earthworks suggest settlement in late prehistoric and medieval times, with the possibility of continuous occupation throughout this time. Analysis of the lidar imagery confirms the importance of this site which should, at the very least, be subjected to very detailed topographic and geophysical survey. Evidence for early medieval activity could potentially also be sought in field systems, but this will depend firstly on the characterisation of Roman and medieval field systems, after which it may be possible to recognise anomalies in some places that might represent early medieval farming. Place-name research may also have something to offer the study of this period (and other periods), but must be done carefully to professional standards as otherwise the results can be misleading.

## 8. Medieval

Most medieval settlement sites throughout the project area are probably still settlements today, built over in more recent times and thus not susceptible to investigation using lidar. However there are also several abandoned or shrunken sites where earthworks of what appear to be medieval settlements have been recorded during this project. Ideally these should all be surveyed on the ground. Of particular importance are the newly discovered settlements at Garretshiels (86939, 869310), which should be surveyed in along with the ridge-and-furrow field system within which they seem to be integrated. In several other places, lidar imagery illustrates earthworks of settlements within ridge-



and-furrow field systems that are probably medieval, though some could be post-medieval at least in their latest phase of occupation. Surveys of any of these sites would be useful; detailed analysis of the complex at Monkridge (909111, 909112, 91912, 919110) might prove very rewarding, also that at Broomhope (88832). Branshaw (88991) has been surveyed previously, but the lidar imagery presents a new way of appreciating what is an extraordinarily complex landscape; previous survey results should be compared to the lidar imagery. Collectively, detailed surveys of several combined settlement and field system complexes might help to establish the nature and chronology of field systems, many of which have been classified, in the absence of clear dating evidence, as 'medieval/post-medieval' in the project database. Where possible, such surveys should be linked to documentary research, some of which may already have been done though not necessarily related to specific earthwork sites.

Lidar offers a new and effective way of recording the often very extensive ridge-and-furrow field systems which cover vast swathes of Redesdale. There are clearly different types of ridge-and-furrow, with later systems overlying earlier ones in many places. In this project it was not possible to attempt any kind of classification of these different systems, which were simply classed as medieval, post-medieval, or medieval/post-medieval on the basis of brief analysis of the earthworks, with wide curved riggs being classed as medieval. It might be a very useful exercise to survey a small number of field systems using a combination of lidar imagery and field observation, then sample parts of these systems using test-pitting to see whether different types of pottery are found in different places; if so then this might enable the production of a chronological framework that would also be of relevance to associated settlements. This would potentially be an excellent project for volunteers, with a degree of professional supervision. Initial survey work could be done remotely using the lidar imagery produced for this project.

## **9. Post-medieval**

The post-medieval landscape (which for the purposes of this project means everything between c1600 and the present day) offers huge potential for all sorts of fascinating research, combining archaeological fieldwork with documentary research. It is also important to note that an understanding of the post-medieval landscape is important to inform studies of earlier periods, as an ability to 'strip away' post-medieval features makes it much easier to recognise and record earthworks of earlier date. Volunteers were advised not to try to record post-medieval agricultural landscapes in any great detail as doing so for the entire project area would have rendered the project hopelessly unmanageable; some, however opted to do so because they found particular areas interesting. This is fine, but such levels of detail are too great for the HER and for the project database the results have usually been combined into 'agricultural landscapes'. Where this work has been done it demonstrates the potential of lidar to record field systems and other aspects of the post-medieval landscape, and there is much potential for anyone who might be interested to attempt detailed surveys of particular areas, combining lidar evidence with historic mapping and other sources. Examination of post-medieval industrial sites using lidar can be rewarding. Some such sites were linked to old railways, which often show up well on lidar imagery although they were specifically excluded from the current project. While no specific post-medieval projects are suggested here, work on post-medieval sites will be a key element of the multi-period landscape surveys suggested under item 2, above.

#### **10. Sites of unknown date.**

Finally, a project could be designed to address the large number of earthworks (277) for which the date is recorded in the project database as 'unknown'. Within the constraints of the project it was not possible to consider such sites in any detail, and while it may be that the dates or functions of many cannot be ascertained without excavation, it is possible that careful analysis could suggest likely origins for many, enabling them to be classified, albeit perhaps with varying degrees of certainty, in terms of their function and date.

Finally, while the information presented in this report is undeniably fascinating, it is appropriate to end the document with a reminder that archaeology is not primarily about sites, but people. This project relates to the people today who completed it, all the people from the recent and distant past who created the sites and landscapes we study, and people in the future who will use the results of this project to plan and execute further campaigns of archaeological research. The project results are important in their own right, but also because of the legacy they represent in terms of opportunities for people, now and in the future, to use them to enhance understanding of the unique archaeological landscapes and past generations of Redesdale.

## References

- Ainsworth, S. 2016. *Shedding Light on the North Pennines. The Allen Valleys and Hexhamshire Lidar Landscapes Survey*. Unpublished report for the North Pennines AONB Partnership. Available online at: [www.altogetherarchaeology.org](http://www.altogetherarchaeology.org)
- Bowyer, P., Curtis, A. & Green, M. 2019b. *Community Archaeology Survey of a Farmstead Site at Rattenraw Farm, Redesdale. May 26th-28th 2019*. Unpublished report for Revitalising Redesdale Landscape Partnership.
- Bowyer, P., Curtis, A. & Green, M. 2019b. *Community Archaeology Landscape Survey Chattlehope Farm, Redesdale. 21st September 2019*. Unpublished report for Revitalising Redesdale Landscape Partnership.
- Carlton, R. & Johnstone, M. 2019. *Field survey and exploratory excavation of cairn-like features on the south side of Fawdon Hill, Redesdale, Northumberland. September 2019*. Unpublished report by the Archaeological Practice Ltd for Revitalising Redesdale Landscape Partnership.
- Charlton, D.B. 1996. *Fifty Centuries of Peace and War. An archaeological survey of the Otterburn Training Area*. Report produced for the Ministry of Defence.
- Charlton, D.B. 1986. *The Story of Redesdale*. Hexham: Northumberland County Council.
- Charlton, D.B. & Day, J. 1978. Excavation and Survey in Upper Redesdale. *Archaeologia Aeliana* (5<sup>th</sup> series) VI, 61-86.
- Charlton, D.B. & Day, J. 1979. Excavation and Survey in Upper Redesdale: Part II. *Archaeologia Aeliana* (5<sup>th</sup> series) VII, 207-233.
- Charlton, D.B. & Day, J. 1982. Excavation and Survey in Upper Redesdale. *Archaeologia Aeliana* (5<sup>th</sup> series) X, 149-170.
- Charlton, D.B. & Mitcheson, M. 1984. The Roman cemetery at Petty Knowes. *Archaeologia Aeliana* (5<sup>th</sup> series) XII, 1-31.
- Crow, J. 2004. Survey and excavation at Bremenium Roman Fort, High Rochester, 1992-98. In *Frodsham 2004*.
- Crutchley, S. & Crow, P. 2018. *Using Airborne Lidar in Archaeological Survey: The Light Fantastic*. Swindon: Historic England. (Downloadable pdf available on the Historic England website).
- Curtis, A., Bowyer, P. & Green, M. 2019. *Community Archaeology Survey of an Enclosed Settlement at Rattenraw Farm, Redesdale. October 6<sup>th</sup> - 8th 2018*. Unpublished report for Revitalising Redesdale Landscape Partnership.
- Davies, G. & Turner, J. 1979. Pollen Diagrams from Northumberland. *New Phytologist*, 82, p783-804.
- Day, J. & Charlton D.B. 1981. Excavation and Survey in Upper Redesdale. *Archaeologia Aeliana* (5<sup>th</sup> series) IX, 267-298.

Frodsham, P. 2004. *Archaeology in Northumberland National Park*. York: Council for British Archaeology (CBA) Research Report Series 136.

Frodsham, P. 2017. *Lidar Landscapes North Pennines (East)*. Unpublished project report for the North Pennines AONB Partnership. Available online at: [www.altogetherarchaeology.org](http://www.altogetherarchaeology.org)

Frodsham, P. 2018. *Revitalising Redesdale - Lidar Landscapes. Project Manual*. Unpublished document for the Revitalising Redesdale Landscape Partnership and Northumberland National Park Authority.

Gates, T. 1997. *Air Photography and the Archaeology of the Otterburn Training Area*. Unpublished report for the Northumberland National Park Authority.

Gates, T. 2008. Excavation of a Late Second / Early First Millennium B.C. Unenclosed Roundhouse at Halls Hill, near East Woodburn, Northumberland. *Archaeologia Aeliana* 5<sup>th</sup> series vol XXXVIII, p43-85.

Richmond, I. A. 1940. The Romans in Redesdale. In *Northumberland County History vol XV*, 63-154.

Welfare, H. & Swan, V. 1995. *Roman Camps in England. The Field Archaeology*. London: RCHME/HMSO.

Young, R. 2004. Peat, Pollen and People. Palaeoenvironmental reconstruction in Northumberland National Park. In Frodsham, P. (et al) *Archaeology in Northumberland National Park*. York: Council for British Archaeology (CBA) Research Report Series 136, p156-170.





**ORACLE**  
Heritage Services

***Harnessing the spirit of our past.....  
.....enhancing prospects for our future***

**[www.ORACLEheritageservices.com](http://www.ORACLEheritageservices.com)**