

# TILL-TWEED ALSF/NMP PROJECT

## NORTHUMBERLAND

### SUMMARY REPORT

AMIE Parent Collection UID: EHC01/027

AMIE Event UID: 1378874

Aerial Survey Report Series AER/6/2003

Air Photo Interpretation and Mapping: April – September 2003

Air Photo Interpretation and Mapping: A. Deegan, M. Oakey, D. van den Toorn

Report: October 2003

Summary Report by Alison Deegan

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**English Heritage** 37 Tanner Row, York YO1 6WP

**Tel:** 01904 601901 **Fax:** 01904 601999 **World Wide Web:** <http://www.english-heritage.org.uk>

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## **1 SUMMARY**

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This project is part of the Till-Tweed Geoarchaeology Project. The Till-Tweed Geoarchaeology Project is funded by the Aggregates Levy Sustainability Fund (ALSF) and operated by Drs Clive Waddington and Dave Passmore at the University of Newcastle.

For the Till-Tweed ALSF/NMP Project, blocks of landscapes around the rivers Till and Tweed were surveyed to National Mapping Programme standards. Digital maps, at a nominal scale of 1:10,000, and supporting records were created by a small team of aerial investigators. This team was contracted by WYAS Advisory Service and based with English Heritage's Aerial Survey (North) in York.

The project identified and mapped sites varying in date and type from possible Neolithic enclosures to military remains from the twentieth century. New AMIE records were created for 254 sites and a further 218 enhancements were made to existing records.

## 2 INTRODUCTION

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The aim of the National Mapping Programme (NMP) is to produce a comprehensive record of the archaeology of England, from prehistory to modern times, through the interpretation and mapping of remains that are visible as earthworks, cropmarks, parchmarks and soilmarks on air photographs.

The Till-Tweed ALSF/NMP Project is one of four main strands of the Till-Tweed Geoarchaeology Project that together form a coherent body of research and assessment (Waddington and Passmore 2003). The other strands are geoarchaeological evaluation, fieldwalking and public outreach. Together they will be used to direct future research and management of the project areas and to inform on the content of the interpretative material designed for widening access to the archaeology and environmental history of the area.

From an English Heritage perspective, the acceleration of the National Mapping Programme and particularly the chance to include areas in the north-east of England was welcome.

The work of this project was undertaken according to the project design for the Till-Tweed Geoarchaeological Project (Waddington and Passmore 2003) and the specification produced for the air photo mapping aspect of that project (Deegan 2003).

## **3 SCOPE OF THE SURVEY**

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### **3.1 Geographical scope of the survey**

The areas of the Till and Tweed landscapes surveyed by this project form two spatially distinct blocks linked by an earlier work: the Milfield Basin AP project (Event UID 1369620).

*Figure 1. Location plan for the Till-Tweed ALSF/NMP Project.*

The Till block follows the River Breamish (as the Till is known in its upper reaches) from Ingram, eastward to Powburn and then northward through Chillingham Park to Belford Moor. It covers 5 whole OS 1:10,000 scale quarter sheets. This area is characterised by the broad alluvial valley floor, which is threatened by mineral extraction, and the often steep and wooded valley sides rising to hills and moors. A small part of this block lies within the Northumberland National Park.

The Tweed block follows the River Tweed from Carham, just upstream of Coldstream, to its mouth at Berwick-upon-Tweed, passing through Norham and Horncliffe. The River Till leaves the Milfield Basin at Etal and joins the Tweed at Tweedmill. Land that lies north of the border with Scotland, including much of the north bank of the River Tweed was excluded from this project. The Tweed block consists of 3 whole and 5 part OS 1:10,000 scale quarter sheets, which together are of equivalent area to 5.5 whole quarter sheets. This section of the Tweed is characterised by wide alluvial basins connected by narrower reaches and within the project area the land rarely rises above 90m.

### **3.2 Archaeological Scope**

The aim of the National Mapping Programme is to increase our understanding of the historic environment. It achieves this by identifying, interpreting and recording all probable and possible archaeological features that are visible on air photographs as cropmarks, soilmarks, parchmarks and earthworks. The NMP Sphere of Interest draft report (RCHME 1997) documents in full the scope of the NMP. The main aspects relevant to the landscapes of the Till and the Tweed blocks are summarised below.

#### **3.2.1 Earthwork archaeology**

All extant earthworks identified as archaeological in origin were recorded. Where higher level survey plans were readily available these were used to assist and enhance the air photograph interpretation and transcription. However, not all of the details depicted on these plans were visible on air photographs and therefore not all these features were mapped.

#### **3.2.2 Levelled archaeology**

All cropmark, parchmark and soilmark features identified as archaeological in origin were mapped.

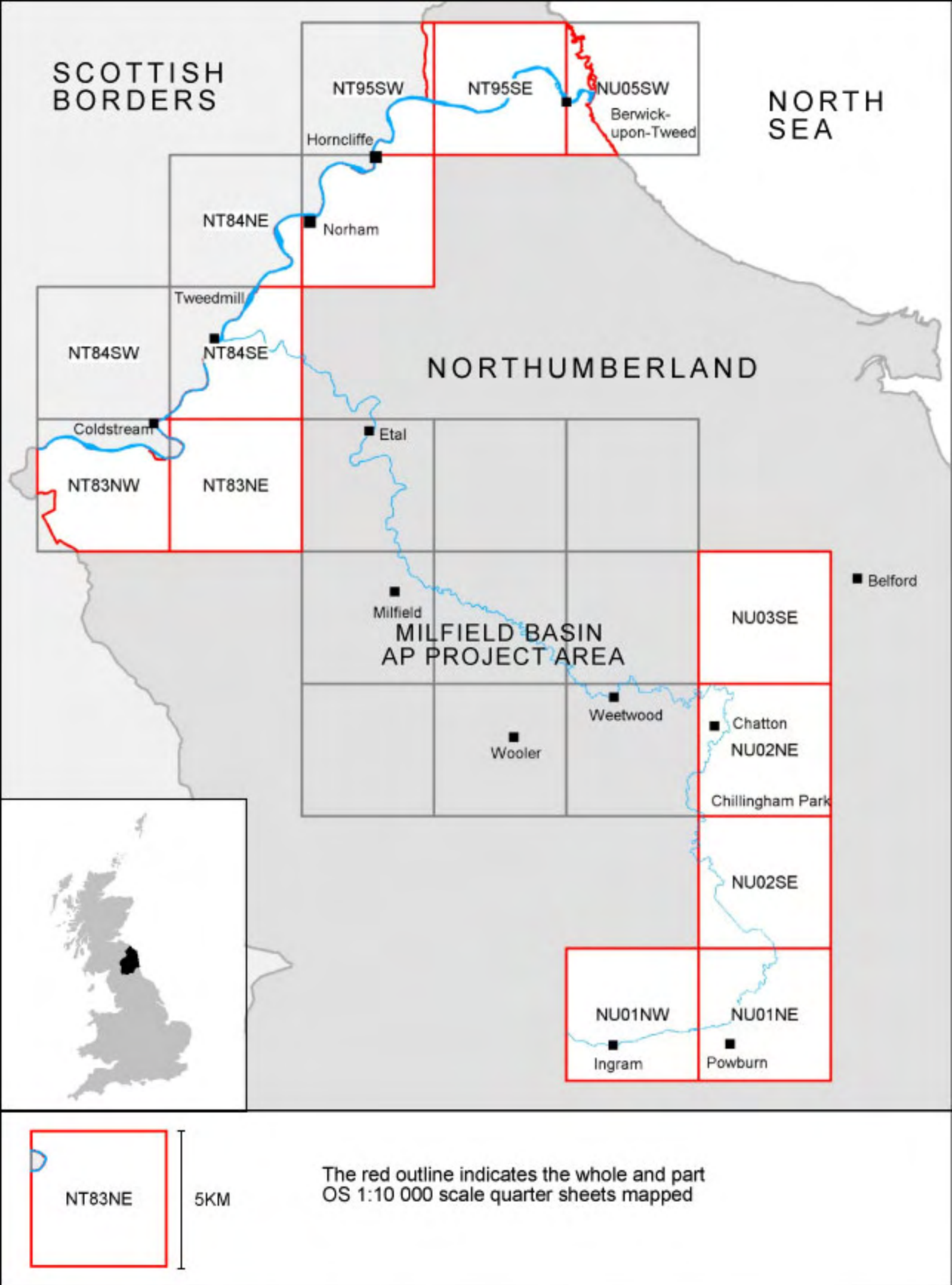


Figure 1. Location plan for the Till-Tweed ALSF/NMP Project.

### 3.2.3 Post medieval and modern field boundaries

Field boundaries (upstanding or levelled) that are visible on air photographs but that are also depicted on first edition Ordnance Survey or later edition maps were not mapped.

### 3.2.4 Medieval and post medieval ridge and furrow

All extant, vestigial, soilmark and cropmark evidence of ridge and furrow visible on air photographs was mapped. Using a simple graphical depiction the extent of the original furlongs (as far as these could be deduced) and the direction of ploughing were delineated. Remains were characterised as prehistoric cord rig, medieval and post-medieval ridge and furrow or post-medieval narrow ridge and furrow such as steam rig.

The state of preservation was evaluated from the latest photography and the remains were distinguished between those that were extant and those that had probably been levelled (see Appendix 1). It should be noted that the date of the latest photography does vary. Whilst in many areas the oblique photographs produced by T. Gates between 1977 and 1999 provide a near contemporary record of monument preservation, in some parts, particularly in the Tweed block, there is no coverage more recent than the 1940s RAF sorties.

### 3.2.5 Industrial features and extraction

Widespread and common small-scale extraction of stone resources was not mapped, except for small limestone quarries associated with limekilns. Large-scale quarries were recorded, especially when in close proximity to archaeological features, or when not depicted on any Ordnance Survey map. Extensive coal mining and associated features were recorded.

### 3.2.6 20<sup>th</sup> century military features

As it is within the brief of English Heritage to record former military features constructed up to and within the Cold War period these features were mapped where visible. In general the presence of complex and extensive sites such as army camps was denoted by a simple outline though selective features within these sites were occasionally mapped "as seen".

### 3.2.7 Buildings

The foundations of buildings visible as earthworks or ruined stonework were recorded. Standing roofed or unroofed buildings or structures were generally not recorded unless they had a particular association in the context of industrial or military sites.

### 3.2.8 Geological features

Geological features were not depicted or recorded.

## 4 SOURCES

### 4.1 Air Photographs

Three collections of air photographs were identified as containing coverage of the two survey areas: the National Monuments Record (NMR), the Unit for Landscape Modelling (ULM, formerly CUCAP) and the Museum of Antiquities (MoA), University of Newcastle. The table below quantifies the number of photographs consulted from each collection; there is considerable duplication between collections. The full contact details for each collection are given in Appendix 4.

| Collection Name | No. of photographs consulted |           |             |           |
|-----------------|------------------------------|-----------|-------------|-----------|
|                 | Till Block                   |           | Tweed Block |           |
|                 | Obliques                     | verticals | Obliques    | verticals |
| NMR AP52004     | 1694                         | 556       | 1004        | 754       |
| CUCAP           | 119                          | 58        | 343         | 20        |
| MoA             | 52(829*)                     | 0         | 107 (562*)  | 0         |
| <b>Total</b>    | 1765                         | 614       | 1454        | 774       |

\* actual no. of photographs listed in the MoA online catalogue

The oblique and vertical coverage of the area held by the NMR was lent to the project for examination at the York office. The specialist oblique photographs were principally the work of Tim Gates although the loan also contained photographs taken by Norman McCord, Derrick Riley, RCHME/EH, CUCAP (now ULM) and the Royal Commission of the Ancient and Historical Monuments of Scotland (RCAHMS). The majority of the oblique photographs date from the period 1977 to 1999 but this collection also contained a quantity of military oblique photographs for the area around Berwick-upon-Tweed, taken in 1941, and 1948-9.

The NMR's vertical coverage for the project areas was rather sparse compared to other parts of England where comprehensive coverage from each decade is usual. For the Till block the most recent extensive vertical coverage dates back to the early 1970s. Within the Tweed block the coverage was very uneven. Most of the photography, some as recent as 1991 was concentrated over Berwick-upon-Tweed whilst areas to the west were covered by only one or two RAF sorties from 1945.

The ULM collection's holdings for this project were quantified using the online catalogue ([www-arcims.geog.cam.ac.uk](http://www-arcims.geog.cam.ac.uk)). The ULM then kindly loaned the relevant photographs on a quarter sheet by quarter sheet basis. Yvonne Boutwood, Aerial Survey, administered the loan liaison between the project and ULM.



The Museum of Antiquities collection holds over 1400 photographs of the project areas but many of these are duplicated in the other two collections. Using the MoA online catalogue as a guide it was deduced that 88% of the Tweed coverage and 97% of the Till coverage was produced either by Tim Gates or, to a lesser extent, CUCAP and thus would simply duplicate photographs that would be supplied in the NMR and ULM loans. Consultation of this collection thus concentrated on the work of other photographers or where previously documented air photo sites had not been visible on either NMR or CUCAP photographs. Approximately 160 selected photographs were consulted at the museum by Matthew Oakey and Daniel van den Toorn when all other mapping and recording had been completed.

## **4.2 Monument Data**

The National Monuments Record database AMIE (formerly NewHIS and previously MONARCH) was routinely consulted. This process was assisted by the output from English Heritage's GIS, HSIS, which facilitates graphic representation of the records with attached summary data.

Elizabeth Williams, SMR Officer, supplied data for the project areas from the Northumberland Sites and Monuments Record. Where possible new and enhanced records in AMIE were concorded with the SMR's own.

## **4.3 Additional sources**

A portion of quarter sheet NU01NE had previously been covered by a higher level survey. The SE Cheviots Project (Event UID 1023799) was an aerial photographic and photogrammetric survey enhanced by ground survey and field observations. Copies of the 1:2500 and 1:1000 scale plans were obtained from the NMR to assist in the NMP mapping. In the absence of grid cuts and map background it was difficult to reconcile the features on these plans with those being mapped by the NMP. Fortunately outline polygons for each record group had been digitised and were available through the HSIS download.

A report on the Archaeological Investigation survey at Norham Castle (Event UID 1363798) was also consulted during the course of mapping and interpretation.

## 5 METHODOLOGY AND RECORDING

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### 5.1 Mapping Methods

All the available air photographs from the specified sources were examined under magnification and stereoscopically where possible. Photographs selected for transcription (rectification and mapping) were scanned at a suitable resolution, this was usually 300dpi. Where permission to scan was not forthcoming from the copyright holder the necessary information was traced onto acetate sheets and these were scanned and rectified.

Scanned images were rectified using the specialist software AERIAL5.18. Control information was derived from the Ordnance Survey raster 1:10,000 maps, which were also used as a base for mapping. Where necessary and appropriate height information from the OS Land-form Profile™ (5m vertical interval, 1:10,000 scale) was used to create Digital Terrain Models in AERIAL5.18 to improve the accuracy of rectification.

Accuracy for the Ordnance Survey raster 1:10,000 maps is in the range of  $\pm 8\text{m}$  and rectification of photographs is normally within  $\pm 2.5\text{m}$ . However areas of open moorland with little control present particular problems which can only be overcome by the availability of good vertical coverage for secondary control.

Rectified images were output from AERIAL5.18 in a TIFF format at a resolution of 300 dpi and a scale of 1:2500. A World file was created alongside each TIFF file and the control information was retained in the AERIAL5.18 RDA file.

The rectified image was placed in Autodesk MAP5® using the World file. The required information was then traced from the photograph into the standard NMP layers using the established NMP conventions (see Appendix 1).

### 5.2 Recording Strategy

There are three strands to the NMP recording strategy. The main strand is the creation of new or enhancement of existing monument records in AMIE. The NMP-generated entries or enhancements for each monument or monument group in this database record the key locational information, the monument types present and their dating, the nature of the evidence, a free text description of the monument or monument group, the source of record information (i.e. photograph and any bibliographic or cartographic references) and administrative details such as concordance with SMR records, record authorship, and links to events and archives.

To assist in the management and querying of the actual map data in the Autodesk MAP5® environment and English Heritage's planned GIS a summary of some of the database information is attached to each feature. Two tables of data are attached to each feature, the content of these tables is listed Appendix 2.

For a small proportion of sites morphological information was entered on the Aerial Survey Morphological Recording Module. The criteria for inclusion in this database are highly selective. This dataset is for internal use only and most aspects are also recorded in the AMIE database, either in the data fields or the free text descriptions.

## 6 PROJECT MANAGEMENT

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The mapping and recording for the project was carried out by a small team of aerial investigators from the Lower Wharfedale NMP Project: Alison Deegan (team leader), Matthew Oakey and Daniel van den Toorn. Tim Gates, the Aerial Archaeological Specialist for the Till-Tweed Geoarchaeology Project, assisted in the processes of monument interpretation and record creation or enhancement. The team was based alongside English Heritage's Aerial Survey (North) team, led by Pete Horne. Yvonne Boutwood was the Aerial Survey project co-ordinator and the first point of contact for matters of interpretation, recording and NMP standards.

The project started on 4th April 2003 and the mapping and recording phase was completed on the 29th September 2003.

Time was allocated to the different tasks of this project as follows:

| <b>Tasks</b>  | <b>Total person days</b> |
|---|--------------------------|
| Interpretation & mapping  | 141                      |
| AMIE recording  | 36                       |
| Other tasks :<br>supervision<br>data checking & administration<br>AP loan management<br>preparation of source material<br>field trip<br>consultation at MoA | 54                       |
| Management Report   | 5                        |
| Printing and data dissemination   | 8                        |
| Total   | 244                      |

This summary does not include the day to day contribution made to the project in terms of support, advice and assistance by Yvonne Boutwood and other members of Aerial Survey (North).

## 7 SUMMARY OF RESULTS

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The following is intended to provide a brief overview of the project's results; a more detailed archaeological report will be produced by Tim Gates for the Till-Tweed Geoarchaeology Project.

The predominant forms of evidence in both survey areas were earthworks and cropmarks, including parching. A small proportion of remains survived as ruined buildings or structures. Soilmarks are not explicitly differentiated from cropmarked sites in the record but it was noted that very few were encountered, probably because these areas were rarely flown at the times of the year when the soils are bare.

The form of evidence is not a reliable indicator of monument preservation because there is no comprehensive contemporary coverage from which to determine current condition but it is interesting to note the differences between the Till and Tweed landscapes.

*Figure 2. The distribution of records by evidence type in the Till-Tweed ALSF/NMP Project area.*

As Figure 2 shows, the majority of the Till records pertain to sites that were upstanding at the time of photography. However over a quarter of records describe sites that are levelled or part levelled. Most of these lie on the lower slopes of the Breamish-Till valley but modern arable cultivation continues up to the higher ground and even elevated sites have been reduced.

In contrast the majority of the Tweed sites have been levelled and appear as cropmarks and parchmarks. Although nearly a quarter of records describe sites which appear to survive as earthworks these are generally the remains late medieval or post-medieval ploughing and terracing and the modern military installations around Berwick-upon-Tweed.

A broad range of site types are present in the Till and Tweed blocks ranging from a possible Neolithic mortuary enclosure to a modern radio station with high frequency direction finder. A full list of the all 117 indexed terms present in the survey area is provided in Appendix 3. The main aspects of each block are summarised in the table below.

*Figure 3. Selected extracts from the Till-Tweed ALSF/NMP Project, Neolithic to Roman period.*

*Figure 4. Selected extracts from the Till-Tweed ALSF/NMP Project, Post-Roman to Twentieth Century.*

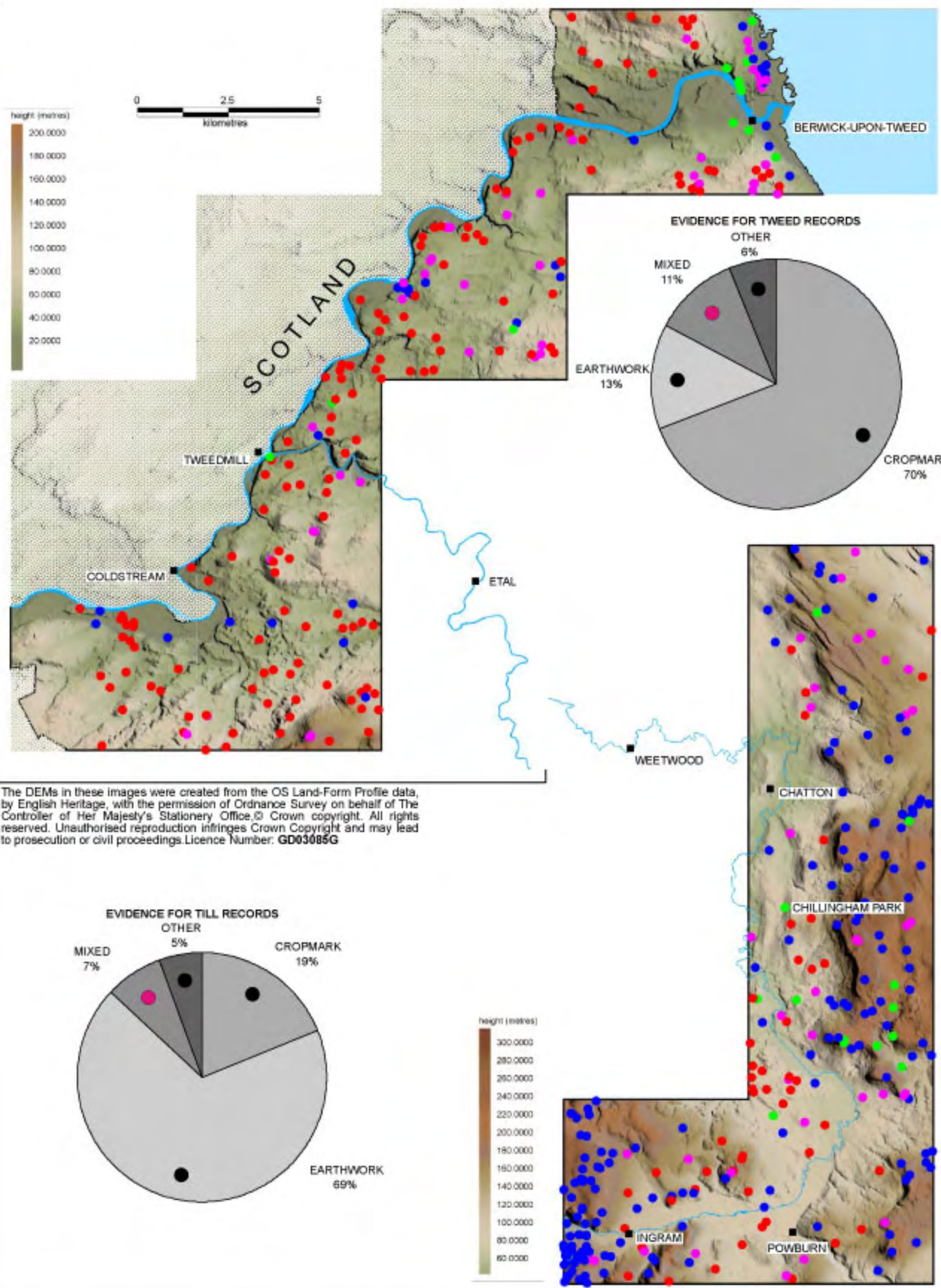
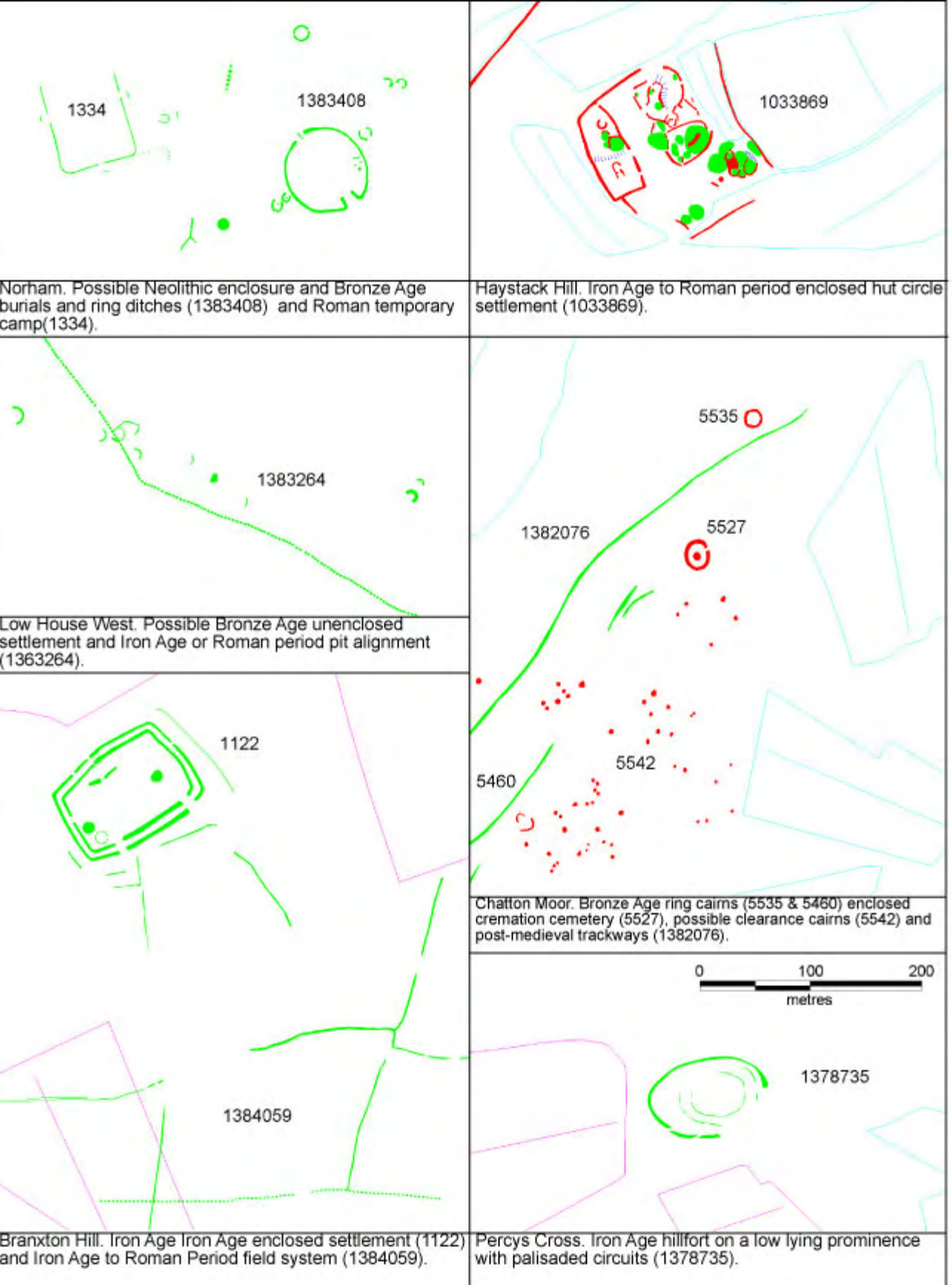


Figure 2. The distribution of records by evidence type in the Till-Tweed ALSF/NMP Project area.



Norham. Possible Neolithic enclosure and Bronze Age burials and ring ditches (1383408) and Roman temporary camp (1334).

Haystack Hill. Iron Age to Roman period enclosed hut circle settlement (1033869).

Low House West. Possible Bronze Age unenclosed settlement and Iron Age or Roman period pit alignment (1383264).

Chatton Moor. Bronze Age ring cairns (5535 & 5460) enclosed cremation cemetery (5527), possible clearance cairns (5542) and post-medieval trackways (1382076).

Branxton Hill. Iron Age enclosed settlement (1122) and Iron Age to Roman Period field system (1384059).

Percys Cross. Iron Age hillfort on a low lying prominence with palisaded circuits (1378735).

Figure 3. Selected extracts from the Till-Tweed ALSF/NMP Project, Neolithic to Roman period.

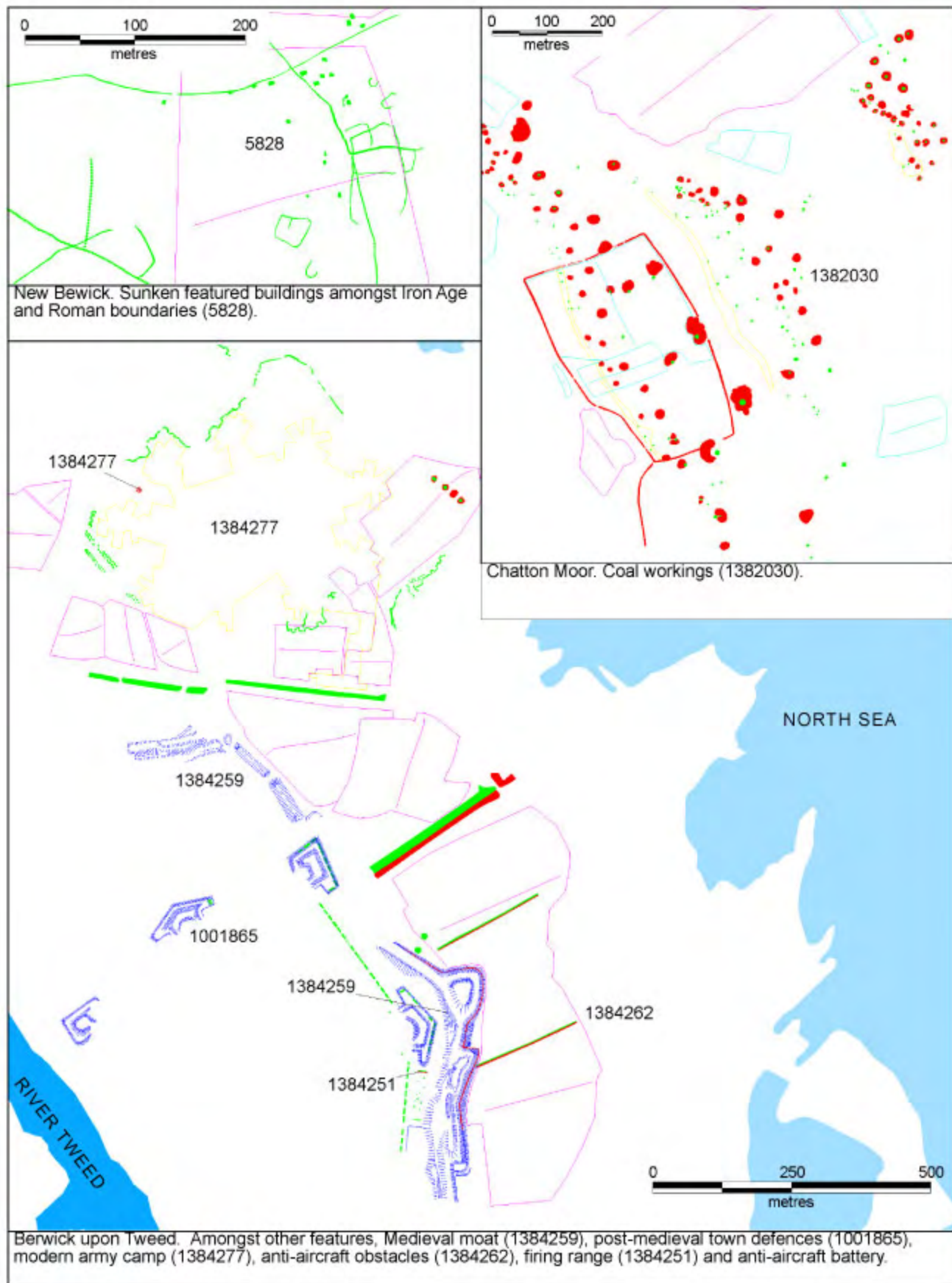


Figure 4. Selected extracts from the Till-Tweed ALSF/NMP Project, Post-Roman to Twentieth Century.



| Period     | Till Block  | Tweed Block  |
|------------|---|--|
| Neolithic  | Stone Circle (UID 1382047)  | Possible “mortuary enclosure” at Carham (UID 1382481). The circular enclosure with inturned entrances at Norham (UID 1383408) (Figure 3) and the arc of round pits at South Ord may also be of this period (UID 1384309).  |
| Bronze Age | Burial cairns, ring banks, enclosed cremation cemeteries, mainly in small clusters or singly on Chatton and Hepburn Moor (Figure 3). Some enclosed settlement, land divisions and cairn fields on Chatton Moor (UIDs 5541, 4452, 1039049) and elements of the extensive upstanding remains on Reaveley Hill may also be of this period.   | Possible remains of an unenclosed settlement at Low House West (UID 1383264) (Figure 3). The burials and ring ditches at Norham (UID1383408) may be of this period as may the possible ring ditch Tillmouth Farm (UID 1385190).  |
| Iron Age   | <p>A large number of enclosures and settlement remains date to this period. Many of the enclosures have multi-vallate, univallate or palisaded defences. The preservation of such sites is particular good on Haystack Hill, where details of internal scoops, huts and divisions are often discernible on the photographs (e.g. UID 1033869) (Figure 3). Unenclosed settlement is also present in the form of three hut circles with possible cord rig nearby on Hepburn Moor (UID 5838). It is likely that more formalised land division was initiated in this period. There are extensive upstanding field systems on Reaveley Hill (UIDs 5221 &amp; 4950) and the levelled remains of long pit alignments and ditches on the river terrace at New Bewick (UID 5828) but these are as yet undated.</p> <p>Some of the features constructed in this period continued in use through the Roman period.</p> | <p>Multi-ditched and palisaded enclosures are prolific. Naturally defended locations are fewer but sites with local advantages are well-used. The form of the double-ditched rectangular enclosure on Branxton Hill is fairly typical (UID 1122) (Figure 3).</p> <p>Evidence for land division is widespread though often fragmentary and ranges from single lengths of ditch or pit alignment to the system of 13 fields associated with the Branxton Hill enclosure (UID 1122). Again some of these features may have developed or continued in use in the Roman period.</p> |
| Roman      | <p>No military features of this period were identified.</p> <p>Possible traces road were visible close to the know course of the Devil’s Causeway Roman Road (Margary No. 87) (UIDs 1380589 &amp; 1380556). Some of the Iron Age defended enclosures continued in use and extensive systems such as New Bewick probably developed in this period.</p>   | <p>Temporary camps at East Learmouth (UID 1118) and Norham (UID 1334) (Figure 3).</p> <p>It is likely that many of the field systems and small single-ditched enclosure amongst them developed in this period.</p>   |

| Period                       | Till Block   | Tweed Block  |
|------------------------------|--|--|
| Early Medieval               | A large group of sunken featured buildings (Grubenhäuser) at New Bewick (UID 5828), one of which was excavated in 1986 (Gates & O'Brien 1988) (Figure 4). Other smaller clusters at Branton (UID 1381872) and Low Hedgeley (UID 1378750) are new to the record.  | Sunken featured buildings may be present amongst the complex linear and maculae cropmarks at Norham (UID 1383400). Others occur singly at Groat Haugh (UID 1383416) or in pairs at Wideopen Plantation (UID 1385207) and East Learmouth (UID 1384009). |
| Medieval                     | Very sparse though some ridge and furrow, lynchets and cultivation terraces may date to this period  | Motte & Bailey Castle at Wark (UID 1143) and town defences around Berwick Upon Tweed (UID 1384259) (Figure 4). Some ridge and furrow, lynchets and cultivation terraces may date to this period.   |
| Post-Medieval                | Extensive industrial landscapes across Chatton and Belford Moors consisting of the bell pits, shafts, spoil heaps and trackways associated with coal extraction (e.g. UID 1392598) (Figure 4).<br>Also farmsteads, field systems, ridge and furrow and cultivation terraces. The abandoned post-medieval farmstead at Brandon White House and its immediate environs are particularly well-preserved for their river terrace location (UID 1378746). | Extensive cultivation remains. Defences at Norham (UID 0360810, 4006) and around Berwick upon Tweed. (UIDs 6574, 6577, 1001865, 1384259, 1384259, 4384340) (Figure 4). Small scale coal extraction on Bleak Ridge (UID 1383317)                        |
| Modern and Twentieth Century | Only large scale quarrying was mapped.   | Extensive military remain around Berwick-upon-Tweed including aircraft obstructions, tank traps, road blocks, anti aircraft battery, several firing ranges and an army camp (Figure 4).  |

This project created 254 new records for archaeological sites and made 218 enhancements to existing records.

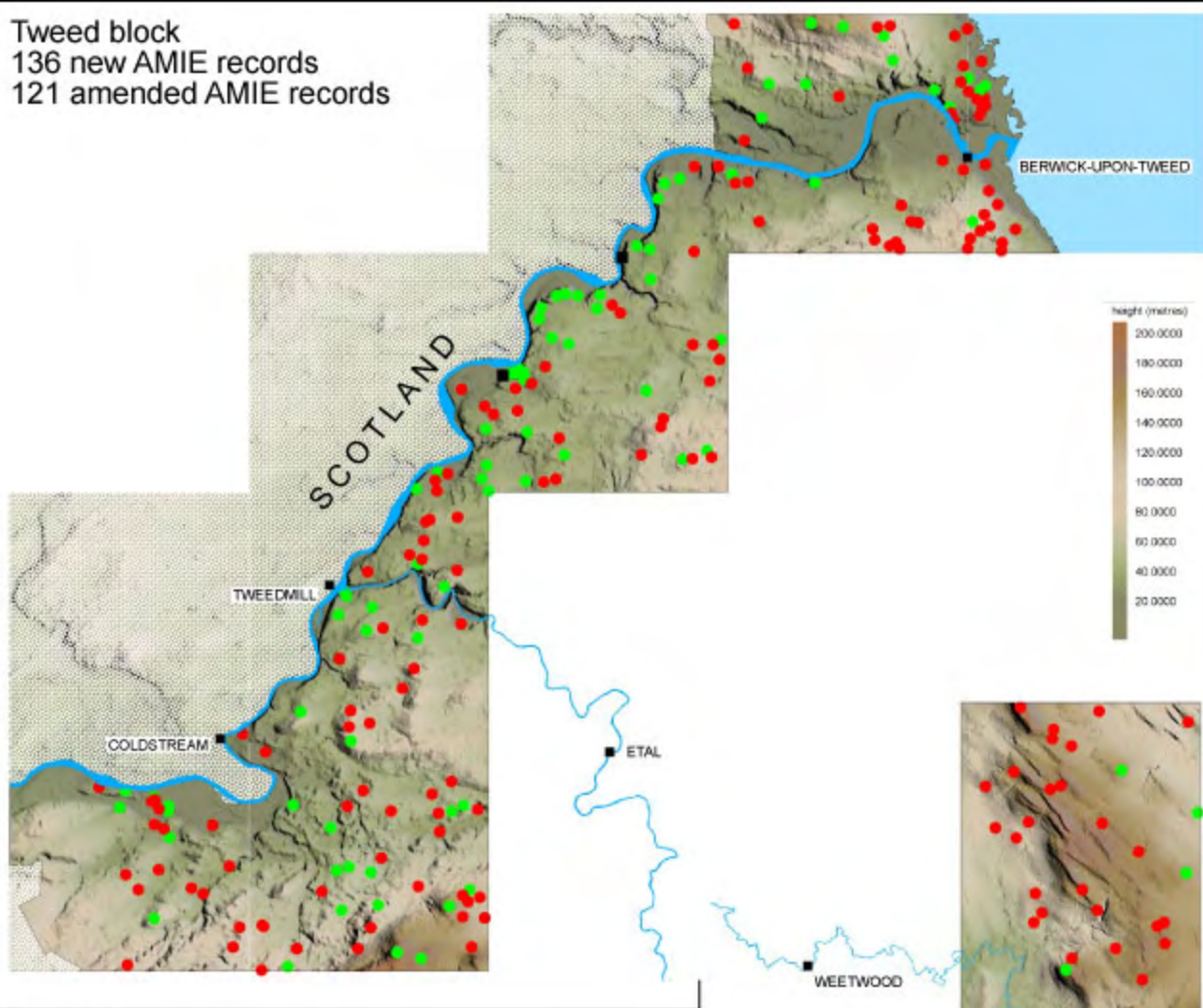
*Figure 5. The distribution of new and amended AMIE records in the Till-Tweed ALSF/NMP Project area.*

Many of the prehistoric and Roman earthworks on Bewick and Belford Moors were generally already well-represented in the record. However, this project has made a significant contribution to the record for medieval and later industrial remains in these landscapes, which previously were largely unrecorded. This project has consolidated and enhanced the previously rather scant record of the levelled pre-medieval landscapes on the lower valley sides. The area to the very south-west of the Till block has been recorded by a higher level survey and consequently the incidence of new records in that area is very low.

In the Tweed block many of the levelled and upstanding prehistoric and Roman sites that lie along the river terraces were already represented in the record but it was sparser for the higher slopes and has now been significantly enhanced by the NMP mapping and recording. The profusion of new sites around Berwick-upon-Tweed mainly record post-medieval to modern military sites illustrating the benefits of the NMP's breadth of scope.

Although the success of the project may be measured in terms of the contribution to the record perhaps a more significant outcome is the final graphic output. This project has collated the information from over four and a half thousand photographs with the information of the existing records and drawn from the local expertise of Tim Gates to produce an accurate digital map of the visible archaeology for large areas of Northumberland. Moreover the map data is enhanced by layers of interrogable data containing information on dating, function, form and photographic source that can be related back to the AMIE record. This is a powerful tool, not just for the planning of field walking but in achieving the overarching objectives of the Till-Tweed Geoarchaeology Project. Furthermore this data will be invaluable to the Northumberland SMR and EH in exercising their responsibilities to the management and protection of our heritage.

**Tweed block**  
 136 new AMIE records  
 121 amended AMIE records



**Till block**  
 118 new AMIE records  
 97 amended AMIE records

- Central point of new AMIE record
- Central point of amended record



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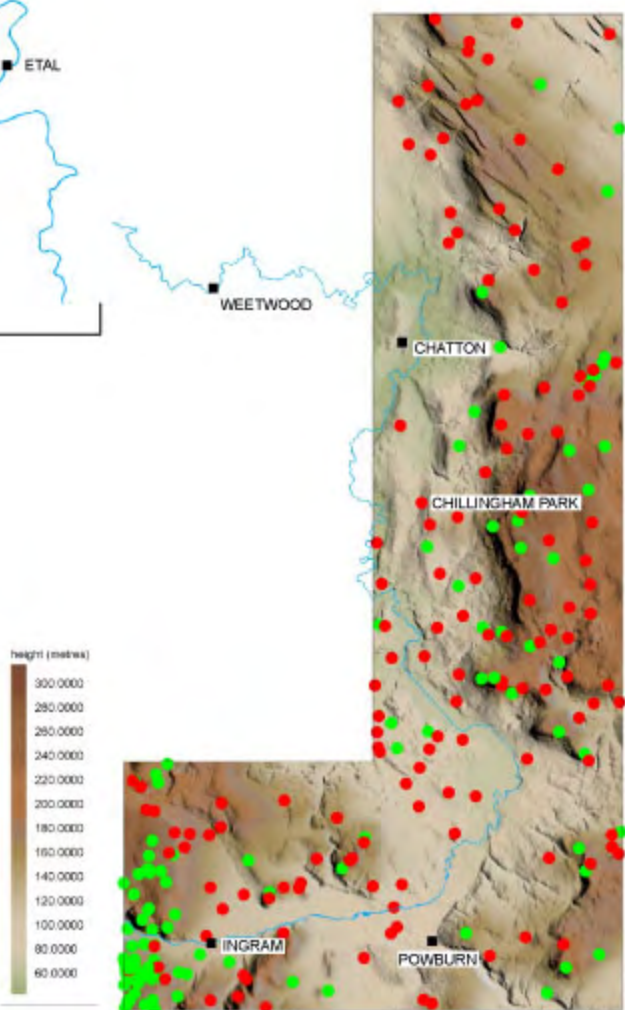


Figure 5. The distribution of new and amended AMIE records in the Till-Tweed ALSF/NMP Project area.

## **8 DATA ARCHIVING AND DISSEMINATION**

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### **8.1 Copyright**

The copyright of the air photo mapping and associated records produced by this project lies with English Heritage. Licence to use this data has been extended to the Till-Tweed Geoarchaeology Project and the Northumberland SMR.

With permission from the copyright holders, this project scanned a large quantity of photographs. The original copyright holders retain copyright of this digital data.

### **8.2 Project Archive**

This project produced 13 Autodesk MAP5® drawing files, one for each whole or part quarter sheet. These will be deposited with the NMR archive and Aerial Survey York and Swindon shall retain digital copies.

The record of the photographs consulted by the project consists of the NMR loan lists (hard copy) and spreadsheets listing the holdings of the NMR, ULM and MoA collections for the relevant areas. In the case of the latter two the spreadsheets have been updated as to whether the actual prints were available for loan or consultation. The paper and digital files will be held by Aerial Survey, York.

The AERIAL5.18 rectification process creates several different output files. The RDA and DTM files will be retained by Aerial Survey, York; they contain the control information and are a record of the error margins of the rectification.

A hard-copy product has also been generated for this project. The digital graphical data is printed, in colour, onto film transparencies at a scale of 1:10,000. The polygon outlines and monument UIDs are printed on a separate sheet that can be overlain to the mapping. These sheets will be archived in the NMR.

### **8.3 Project dissemination**

Copies of the Autodesk MAP5® drawing files have been supplied to the Till-Tweed Geoarchaeology Project for its own use as per the terms of the licence. This data will be imported into the project's GIS. The final product of the Till-Tweed Geoarchaeology Project will have a wider distribution and a further agreement for the dissemination of the NMP aspect of that product must be sought with the NMR.

All the records pertaining to the project areas have been supplied to the Till-Tweed Geoarchaeology Project in a digital rich text format (RTF) as an accompaniment to the mapping.

Both the Till-Tweed Geoarchaeology Project and the Northumberland SMR have received copies of the printed map sheets.

## 9 BIBLIOGRAPHY

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- Deegan, A., 2003. Specification for the Till-Tweed Air Photo Mapping and Interpretation Project, part of the Till-Tweed Geoarchaeology Project. Unpub. document prepared for EH.
- Gates, T. and O'Brien, C. 1988. Cropmarks at Milfield and New Bewick and the Recognition Grubenhäuser in Northumberland. *Archaeologia Aeliana*, vol 5 XVI p1-9.
- RCHME, 1997. *The National Mapping Programme – Sphere of Interest* (internal draft document)
- Waddington, C. and Passmore, D., 2002. Till-Tweed Geoarchaeology Project. Project Design. University of Newcastle. Unpub. document prepared for EH.

## 10 APPENDIX 1

### Autodesk MAP5® Layer content and drawing conventions

| Layer Name       | Layer content   | Attached data tables | Layer colour | Linetype   |
|------------------|---|----------------------|--------------|------------|
| 0                | None (Autodesk MAP5® requirement)   | none                 | 7 (white)    | CONTINUOUS |
| AIRFIELD         | Closed polygons for extent of airfield area   | MONUMENT & MONARCH   | 8 (grey)     | DASHEDX2   |
| BANK             | Closed polygons for supra-surface earthen features such as banks, platforms, mounds and spoil heaps | MONUMENT & MONARCH   | 1 (red)      | DASHEDX2   |
| BANKFILL         | Solid fill for BANK layer polygons  | MONUMENT & MONARCH   | 1 (red)      | DASHEDX2   |
| DITCH            | Closed polygons for cut or wear features such as ditches, ponds, pits or hollow-ways                | MONUMENT & MONARCH   | 3 (green)    | DASHEDX2   |
| DITCHFILL        | Solid fill for DITCH layer polygons   | MONUMENT & MONARCH   | 3 (green)    | DASHEDX2   |
| EXTENT OF AREA   | Closed polygons outlining complex or extensive remains such as mining or army camps                 | MONUMENT & MONARCH   | 2 (yellow)   | DASHEDX2   |
| GRID             | grid lines at 1km intervals   | NONE                 | 7 (white)    | CONTINUOUS |
| MONUMENT POLYGON | Closed polygons encircling all the features comprised within a single AMIE record.                  | MONARCH ONLY         | 7 (white)    | CONTINUOUS |
| RIGARREWK        | Polyline showing the direction of ploughing in outlines of extant ridge and furrow                  | MONUMENT & MONARCH   | 4 (cyan)     | CONTINUOUS |

|              |   |                    |                |                |
|--------------|---|--------------------|----------------|----------------|
| RIGARRLEVEL  | Polyline showing the direction of ploughing in outlines of levelled or crop mark ridge and furrow               | MONUMENT & MONARCH | 6 (magenta)    | ACAD_ISO03W100 |
| RIGDOTSEWK   | Closed polygon defining the furlongs or extent of area of extant ridge and furrow                               | MONUMENT & MONARCH | 4 (cyan)       | DOTX2          |
| RIGDOTSLEVEL | Closed polygon defining the furlongs or extent of area of levelled or cropmark ridge and furrow                 | MONUMENT & MONARCH | 6 (magenta)    | DOTX2          |
| SHEET        | an administrative layer to allow printing   | NONE               | 7 (white)      | CONTINUOUS     |
| STRUCTURE    | For built features including concrete, metal and timber constructions such as military installations            | MONUMENT & MONARCH | 142 (mid-blue) | CONTINUOUS     |
| THACHURE     | Polyline T-hachure convention to schematize sloped features indicating the top of slope and direction of slope. | MONUMENT & MONARCH | 5 (blue)       | ACAD_ISO02W100 |
| VIEWPORT     | an administrative layer to allow printing   | NONE               | 7 (white)      | CONTINUOUS     |



## 11 APPENDIX 2

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### Autodesk MAP5® Attached Data Tables

#### MONUMENT DATA TABLE

The Monument Data table consists of five fields that were input directly through Autodesk MAP5®. The contents of these fields duplicate that of the related fields in AMIE.

| FIELD NAME | FIELD CONTENT  | Sample data for Old Bewick forts          |
|------------|--|---|
| MONARCH    | AMIE Unique Identifier (UID)   | 5743                                      |
| PERIOD     | Date of features (EH Thesaurus)  | IRON AGE                                  |
| TYPE       | Monument type (EH Thesaurus)   | MULTIVALLATE HILLFORT                     |
| EVIDENCE   | Form of remains (EH Thesaurus)   | EARTHWORK                                 |
| PHOTO      | NMR or other reference for the photograph from which the feature was plotted and its date of photography | NU0721/12 TMG<br>1738/108 13-Mar-<br>1980 |

#### MONARCH DATA TABLE

The Monarch Data Table comprises just one field that records the AMIE Monument UID.

| FIELD NAME | FIELD CONTENT                | Sample data for Old Bewick forts |
|------------|------------------------------|----------------------------------|
| MONARCH    | AMIE Unique Identifier (UID) | 5743                             |

## 12 APPENDIX 3

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### EH Thesaurus terms indexed by this project

|   |                        |                                   |
|---|------------------------|-----------------------------------|
| A | AIR RAID SHELTER       | DITCH                             |
|   | AIRCRAFT OBSTRUCTION   | DOUBLE DITCHED ENCLOSURE          |
|   | ANNEXE ENCLOSURE       | DYKE (DEFENCE)                    |
|   | ANTI AIRCRAFT BATTERY  |                                   |
|   | ARMY CAMP              | E                                 |
|   | ARTILLERY FORT         | ENCLOSED CREMATION<br>CEMETERY    |
| B | BAILEY                 | ENCLOSED HUT CIRCLE<br>SETTLEMENT |
|   | BANK (EARTHWORK)       | ENCLOSED SETTLEMENT               |
|   | BASTION                | ENCLOSURE                         |
|   | BASTION OUTWORK        | EXTRACTIVE PIT                    |
|   | BOMB CRATER            | F                                 |
|   | BOUNDARY               | FARMSTEAD                         |
|   | BOUNDARY BANK          | FIELD BOUNDARY                    |
|   | BOUNDARY DITCH         | FIELD SYSTEM                      |
|   | BUILDING               | FIRING RANGE                      |
|   | BURIAL                 | FORT                              |
|   | BURIAL CAIRN           | FORTLET                           |
| C | CAIRN                  | G                                 |
|   | CAIRNFIELD             | GARDEN                            |
|   | CASTLE                 | GRAVE                             |
|   | CHAPEL                 | GRUBENHAUS                        |
|   | CIRCULAR ENCLOSURE     | GUN EMPLACEMENT                   |
|   | CISTERCIAN NUNNERY     | H                                 |
|   | CLEARANCE CAIRN        | HILLFORT                          |
|   | COAL WORKINGS          | HILLFORT/ENCLOSED<br>SETTLEMENT   |
|   | COAL WORKINGS/BELL PIT | HOLLOW WAY                        |
|   | COAXIAL FIELD SYSTEM   | HOMESTEAD                         |
|   | CORD RIG               | HUT CIRCLE                        |
|   | CULTIVATION TERRACE    | HUT PLATFORM                      |
|   | CURVILINEAR ENCLOSURE  | K                                 |
| D | DEFENDED ENCLOSURE     | KERB CAIRN                        |
|   | DESERTED SETTLEMENT    | L                                 |
|   |                        | LIME KILN                         |
|   |                        | LIMESTONE QUARRY                  |

|   |                                |   |                                    |
|---|--------------------------------|---|------------------------------------|
| L | LYNCHET                        | R | RECTANGULAR ENCLOSURE              |
|   |                                |   | RECTILINEAR ENCLOSURE              |
| M | MACULA                         |   | RIDGE AND FURROW                   |
|   | MARKET GARDEN                  |   | RING BANK                          |
|   | MILL POND                      |   | RING DITCH                         |
|   | MILLSTONE WORKING SITE         |   | ROAD                               |
|   | MOAT                           |   | ROAD BLOCK                         |
|   | MORTUARY ENCLOSURE             |   | ROUND CAIRN                        |
|   | MOTTE                          |   | ROUND HOUSE (DOMESTIC)             |
|   | MOUND                          |   |                                    |
|   | MULTIVALLATE HILLFORT          | S | SAND AND GRAVEL<br>EXTRACTION SITE |
| N | NARROW RIDGE AND FURROW        |   | SETTLEMENT                         |
|   |                                |   | SHAFT                              |
| O | OVAL ENCLOSURE                 |   | SHEEP FOLD                         |
|   |                                |   | SHIELING                           |
| P | PALISADE                       |   | SPOIL HEAP                         |
|   | PALISADED ENCLOSURE            |   | STACK STAND                        |
|   | PALISADED HILLTOP<br>ENCLOSURE |   | STOCK ENCLOSURE                    |
|   | PALISADED SETTLEMENT           |   | STONE CIRCLE                       |
|   | PEAT CUTTING                   |   | STRIP LYNCHET                      |
|   | PILLBOX                        |   | STRUCTURE                          |
|   | PILLOW MOUND                   | T | TANK TRAP                          |
|   | PIT                            |   | TEMPORARY CAMP                     |
|   | PIT ALIGNMENT                  |   | TERRACED GROUND                    |
|   | PLATFORM                       |   | TOWN DEFENCES                      |
|   | POND                           |   | TRACKWAY                           |
|   | PROMONTORY FORT                |   | TRAMWAY                            |
|   |                                |   | TRENCH                             |
| Q | QUARRY                         |   |                                    |
|   |                                | U | UNENCLOSED SETTLEMENT              |
| R | RADAR BEACON                   |   |                                    |
|   | RADIO STATION                  |   |                                    |

## 13 APPENDIX 4

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The main air photo collections consulted for this project:

### National Monument Record

English Heritage  
National Monuments Record Centre  
Great Western Village  
Kemble Drive  
Swindon  
SN2 2GZ

### Unit for Landscape Modelling

Air Photograph Library  
University of Cambridge  
The Mond Building  
Free School Lane  
CB2 3RF  
[www-arcims.geog.cam.ac.uk](http://www-arcims.geog.cam.ac.uk)

### Museum of Antiquities

University of Newcastle upon Tyne  
Newcastle upon Tyne  
NE1 7RU  
<http://museums.ncl.ac.uk/archive/>

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