



# EXPLORING MEDIEVAL LONGHOUSES IN THE DUDDON VALLEY,

## CUMBRIA

### Tongue House A Interim Report



Oxford Archaeology North

December 2016

Duddon Valley Local History Group

Issue No: 2016-17/1773  
OA North Job No L10953  
NGR: 32426 49758;  
32429 49784;  
32454 49738

Client Name: **Duddon Valley Local History Group**  
 Document Title: **Exploring Medieval Longhouses in the Duddon Valley,  
Cumbria, Tongue House A Interim Report**  
 Document Type: **Interim Report**  
 Report No.: **2016-17/1773**  
 Grid Reference: **32426 49758, 32429 49784, 32454 49738**  
 Invoice Code: **L10953**  
 Receiving Body: **LDNP HER**  
  
 OA Document File Location: **X:\Jamie\PROJECTS\L10953 Duddon Valley Long Houses  
\2016\_Interim\_Report**  
 OA Graphics File Location: **X:\Jamie\PROJECTS\L10953 Duddon Valley Long Houses  
\CAD**  
  
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## SUMMARY

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Oxford Archaeology North (OA North) was invited to provide supervision and enablement for a community archaeology survey and excavation project of three longhouses in the Duddon Valley (Tongue House A and B, and Long House Close) (NGR 32426 49758; 32429 49784; 32454 49738). This was undertaken on behalf of the Duddon Valley Local History Group, in conjunction with the National Trust and the Lake District National Park Authority; the project was financed by the Heritage Lottery Fund. The survey took place in April 2016, followed by the excavation of the first of these longhouses (Tongue House A) in late June and early July 2016.

Initially an archaeological survey was undertaken and this entailed a detailed survey of each longhouse using a theodolite and disto with data plotted in the field. A further process of photogrammetric survey was undertaken across a wide area, using photographs taken from a drone, in order to record the wider landscapes. In conjunction with this, a geophysical survey was undertaken to examine underlying structures and to identify any possible hearths. This preliminary work then culminated with the excavation of Tongue House A longhouse.

Tongue House Building A was revealed as a north-west/south-east aligned structure 10.45m long by a maximum of 4m across. The house in its earliest phase comprised north and south cells divided by a cross passage. The interior of the upper, or north, cell was floored by two layers of cobbles (**1020** and **1028**); alder/hazel charcoal from the lower of the two floor surfaces (**1028**) provided a radio carbon determination of 1514-1798calAD (275±30BP; SUERC-69651).

A hearth (**1006**), and later modification (**1005**), lay toward the south-eastern end of the cell, close to the cross passage. The cross passage itself had been laid with two phases of cobbles (**1026/1029** and **1033**), which was most likely contemporary with those found in the north cell, but more sporadic, and perhaps the stones were displaced by use.

A drain (**1047**) on the west side of the building appeared to partly empty into a soak-away, as well as continuing beyond the limits of excavation; oak charcoal from this feature (**1027**), produced a late seventh to late ninth century date. The likely explanations for this are either old carbon from an adjacent palaeo-channel (**1063**) being reworked when the house was constructed, although this explanation does not address the origins of the charcoal. Alternatively, the charcoal was perhaps derived from heartwood of a long-lived taxa.

Tongue House Building A lay within its own stone-walled enclosure, which itself lay within one corner of a larger enclosure. This, in turn, was part of a whole series of enclosures that extend up Tongue House High Close from the fields and meadows of the valley bottoms, which in this case are the distinctive assarted fields, the piece-meal clearance of waste or forest into the irregular fields, that are seen around Tongue House itself.

## ACKNOWLEDGEMENTS

Oxford Archaeology North would like to thank the Duddon Valley Local History Group (DVLHG) and the Lake District National Park Authority for commissioning the project, and the Heritage Lottery Fund for providing the funding. This project was also made possible in part by a grant from the Council for British Archaeology's Mick Aston Fund, which is supported by English Heritage.

Thanks must go in particular to Stephe Cove, Kenneth Day, Mervyn Cooper, Bob Bell, Alison Matthews, and Peter Matthiessen of DVLHG and Eleanor Kingston of the Lake District National Park Authority, for their considerable involvement and support. We would also like to thank the landowners, the National Trust, and Jamie Lund, in particular, for giving permission to access the three longhouse sites and for their considerable support. We would also like to thank Gail Batten for enabling the use of the Parish Rooms, and to also thank Anthony and Hilary Hartley, from Turner Hall, for allowing access and parking. The heads and staff of all the schools must be thanked for facilitating the children's involvement.

The topographic surveys and excavations were primarily undertaken by volunteers, many of whom also assisted with the geophysical survey. We must thank all for their boundless enthusiasm and energy throughout the project but, in particular, we must mention Christine Anderzen, who came all the way over from Sweden to help out on the excavation.



The volunteers were: Adrienne Calsey; Alan Bell; Alan Dunthorne; Alan Taylor; Alan Westall; Anna Barlow; Anne Catterson; Anthea Jones; Astrid Hardwick; Barbara Green; Bob Mayow; Brian Bromwhich; Brian Hardwick; Cath Ryan; Catherine Whitelock; Chris Shearin; Chris Swanson; Clive Stretton; Craig Stangroom; Debbie Leighton; Dave Hughes; Frances Green; Frances Rand; George Dobson; Gerry Dunleavy; Harris Wood; Helen Beaumont; Helen O'Brien; Helen Quartermaine; Helen Tappenden; Ian Boyle; Irene Dayer; Janice Brockbank; Jeff Benson; Jennifer Gallagher; Jeremy Rowan-Robinson; Joe Bagnall; John Jordan; John Nichols; Joyce Medcalfe; Julian Tetlow; Justin Wood; Kath Sallabank; Keith Nixon; Kelly Artingstoll; Ken Lindley; Len Watson; Lesley Steele; Linda Marshall; Liz Kingston; Louise Ronane; Mark Simpson; Marlene Mussell; Mary Waters; Mike Green; Mike Tappenden; Nick Russell; Philip Minchon; Piers Waterston; Ricky Rushton; Roger Kingston; Ron Buchanon; Sally Varian; Steve Douglas; Sue Batten; Sue Dawson; Sue Lydon; Suzanne Pender, Tamsin Wood.

The volunteers were aided in the topographic survey by Peter Schofield and Jamie Quartermaine. The palaeoenvironmental survey was undertaken by Mairead Rutherford, with the help of the DVLHG volunteers, and Stephie Cove and Brian Hardwick, in particular, are gratefully acknowledged.

The geophysical survey was undertaken by Mike Birtles. The excavations were supervised by Jeremy Bradley, Pete Schofield and Hannah Leighton. The report was written by Jeremy Bradley, Mairead Rutherford, Mike Birtles, Peter Schofield, and Jamie Quartermaine and the illustrations were produced by Anne Stewardson. The report was edited by Jamie Quartermaine, who also managed the project.

## 1. INTRODUCTION

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### 1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 Oxford Archaeology North (OA North) was invited to provide supervision and enablement for a community archaeology survey and excavation project of three longhouses in the Duddon Valley (Tongue House A and B, and Long House Close) (NGR 32426 49758; 32429 49784; 32454 49738) (Fig 1). This was undertaken on behalf of the Duddon Valley Local History Group in conjunction with the National Trust and the Lake District National Park Authority; the project was financed by the Heritage Lottery Fund. The survey took place in April 2016, followed by the excavation of the first of these longhouses (Tongue House A) in late June and early July 2016. The following report documents the results of the archaeological surveys and excavation, and discusses them within their historical and archaeological context.

### 1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 *Location, Topography, Geology:* the Duddon Valley is headed by Harter Fell, Little Stand and Grey Friar; the River Duddon flows to the south-west to Dale Head, Seathwaite and Duddon Bridge, then on to the Duddon estuary. The three sites under study, Tongue House A and B and Long House Close, were on the unenclosed fell north-east of Seathwaite and Long House, on either side of the track between Long House (at the northern end of the Seathwaite Road) and Seathwaite Tarn, at altitudes of 273m, 300m and 294m (NGR 32426 49758; 32429 49784; 32454 49738 (respectively)) (Fig 1). Tongue House A and B were at the steep and rocky outcrops west of this track, around 1km north of Long House, and the Long House Close longhouses were to the south of the Tongue House sites on the east side of the track. The sites have very clear visual remains, with bedrock and natural boulders close to the surface, and are associated with an extensive field system.
- 1.2.2 The underlying geology was of rocks of the Birker Fell Andesite Formation in an environment previously dominated by volcanic eruptions. The soil cover was from Devensian - Diamicton till formed by Ice Age glaciers ([mapapps.bgs.ac.uk/geologyofbritain](http://mapapps.bgs.ac.uk/geologyofbritain)).

## 2. METHODOLOGY

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### 2.1 PROJECT DESIGN

- 2.1.1 A project design (*Appendix 1*) was submitted by OA North in response to an invitation to provide supervision and enablement for a community archaeology survey and excavation project of three longhouses in the Duddon Valley (Tongue House A and B, and Long House Close). The project design was adhered to in full, and the work was consistent with the relevant CIIfA and Historic England guidelines (Chartered Institute for Archaeologists (CIfA) 2014a, 2014b, 2014c; Historic England 2015).
- 2.1.2 Several types of survey were undertaken including detailed topographic survey, a palaeoenvironmental survey, and a geophysical survey (*Sections 2.2-2.4*), and was followed by the excavation of the Tongue House A longhouse (*Section 2.5*)

### 2.2 DETAILED TOPOGRAPHIC SURVEY

- 2.2.1 A detailed topographic survey of each of the house sites was undertaken to EH Level 2 (Ainsworth *et al* 2007).
- 2.2.2 **Survey Methods:** as the survey was intended primarily to serve as a training exercise for the volunteers, the survey techniques employed were devised to be easy to understand, allow for plotting in the field and to be easily affordable by volunteers, but at the same time to provide a range of techniques. This included the use of some outdated technologies, which had a significant impact on productivity, but were off-set by the use of more current techniques that enabled detailed 3D recording.
- 2.2.3 Where appropriate, photographic methods were employed using aerial photography from a drone with respect to survey control established by GPS/ total station. Details of these techniques are outlined below;
- **Theodolite / Disto Survey:** the use of a theodolite/ disto was found to be very effective. The theodolite measured angles and the disto measured the distances, with the data then drawn up in the field by volunteers using an accurate film-based protractor and ruler. This allowed the volunteers to be involved in all stages of the process;
  - **Photogrammetric Recording:** where possible, the sites and immediate environs were recorded by means of high altitude photography, which, using specialist photogrammetric software, allowed the creation of accurate three dimensional models of the site and topographic surfaces. This was achieved using a UAV, a small multi-engined model helicopter, providing photography from any altitude up to approximately 100m height. Survey control was introduced to the photographs by the placement of survey control targets across the site which were located by means of survey grade GPS or total station;
  - The photogrammetric processing was undertaken using Agisoft software which provides detailed modelling using the overlap of up to 300 photographs, enabling the creation of a very detailed Digital Terrain Model (DTM) across the site. The photographs were then digitally draped

over the model to create an accurate three dimensional model of the ground surface. The primary output, however, was an accurate two-dimensional image which was used to generate accurate plans or profiles.

- 2.2.4 **Survey Control:** where possible, survey control was introduced to the sites by means of a high accuracy survey-type differential GPS. This can achieve accuracy of +- 20mm, and ensured that the survey was located accurately onto the Ordnance Survey National Grid. Where mobile reception (necessary to provide corrections for the GPS) was prohibited, then a base station was established to provide consistent accurate control.
- 2.2.5 **Detail Survey Overview:** the detail survey by theodolite recorded all structural and earthwork components. Survey points were marked on the ground using spray paint and the survey drawing was manually drawn up with respect to them. On completion of the survey, the field drawings were digitised into a CAD system. The survey recorded all archaeological features, earthworks and elements. The survey aimed to identify, locate and record all built elements of the landscape.
- 2.2.6 **Photographic Record:** a photographic archive was generated in the course of the field project, comprising landscape and detailed photography. Detailed photographs were taken of the archaeological features using a scale bar. All photography was recorded on photographic *pro-forma* sheets which show the subject, orientation and date. The photography was typically undertaken using a digital SLR camera with 16 megapixel resolution.

### **2.3 PALAEOENVIRONMENTAL SURVEY**

- 2.3.1 Three sites were examined by rapid traverse coring to assess the potential for the preservation of organic sediments. At two of these sites (Tongue House A and Tongue House B) sufficient peat was recorded to further investigate the deposits. Transects were set up around an initial point, and gouge auger samples taken at 5m intervals, as shown on Fig 13. A further small area of potential peat deposition, between Tongue House sites A and B, was also investigated but this yielded only a thin peat accumulation, which was only 0.50m thick. At some distance from the longhouses, a fourth site was investigated, as this looked like a large expanse of low-lying peaty ground, with potential for good peat accumulation, but in the event only 0.50m of mossy sediments were present above bedrock.
- 2.3.2 Each location where a transect was set up, was accurately located using a survey grade GPS. The coring equipment comprised a 30mm gouge auger and a standard hand operated Eijkelkamp (Russian) auger.
- 2.3.3 Each profile was recorded in a field notebook and the data was transferred to *pro forma* lithology tables, with significant layers identified. Relative depths were noted and a description of the deposits, using standard terminology (colour, texture, compaction and inclusions), were made. This follows the English Heritage Geoarchaeology and Environmental Archaeology Guidelines (Ayala *et al* 2007; Campbell *et al* 2011).
- 2.3.4 **Palynology Methodology:** the sediments in the monoliths were described and cleaned prior to sub-sampling for pollen. Volumetric samples were taken from ten sub-samples from two monoliths. One tablet containing a known number of *Lycopodium* spores was added so that pollen concentrations could be calculated

(Stockmarr 1972). The samples were prepared using a standard chemical procedure (method B of Berglund and Ralska-Jasiewiczowa 1986), using HCl, NaOH, sieving and Erdtman's acetolysis, to remove carbonates, humic acids, particles > 170 microns, and cellulose, respectively. The samples were then stained with safranin, dehydrated in tertiary butyl alcohol, and the residues mounted in 2000cs silicone oil. Slides were examined at a magnification of 400x by ten equally-spaced traverses across two slides to reduce the possible effects of differential dispersal on the slides (Brooks and Thomas 1967) or until at least 100 total land pollen grains and spores were counted. Pollen identification was made following the keys of Moore *et al* (1991), Faegri and Iversen (1989), and a small modern reference collection. Plant nomenclature follows Stace (2010). Non pollen palynomorph (NPP) nomenclature follows van Geel (1978). The preservation of the pollen was noted and an assessment was made of the potential for further analysis.

## 2.4 GEOPHYSICAL SURVEY

- 2.4.1 Magnetometry surveys were carried out at all three sites, concentrating on the interiors of the longhouses and a resistivity survey was undertaken of the Long House Close site (Plate 1). Magnetometry is not the best technique for recording rocky landscapes, or where there is the potential for bedrock near the surface; however, it is very effective for the identification of hearths. A rapid survey was undertaken of the interiors of Tongue Houses A, and B, and Long House Close, extending some way beyond the extent of each longhouse.



Plate 1: Undertaking a resistivity survey at Long House Close

- 2.4.2 The detailed magnetic survey was carried out using a Bartington Grad601-2 gradiometer which has an internal data logger. Data was collected in zig-zag mode over a half grid (15m x 30m), the magnetic data was collected at 0.25m intervals on profiles 1m apart (3600 readings per grid). In total, an area of approximately 0.18ha was surveyed with magnetometry (Figs 5, 12 and 14), and most of the recording was undertaken by the volunteers under supervision.

- 2.4.3 The resistance survey is most effective at identifying stone structures; however, it can be masked, and the results confused, by the proximity of natural stones and bedrock. The detailed resistance survey was carried out using a Geoscan RM15 resistance meter, which has an internal data logger. Data was collected by the volunteers in zig-zag mode over 30m by 30m grids. The resistance survey data was collected at 1m intervals on profiles 1m apart (900 readings per grid).
- 2.4.4 **Data Capture and Processing:** the magnetometer survey was carried out in scan mode. The operator walked along survey tapes set out as a guide and observed the changes in reading on the left-hand tube whilst walking slowly forward. Any readings above the background of 1.5nT were recorded in spray paint on the ground to be surveyed in.
- 2.4.5 Resistance data were captured in the internal memories of the instruments and downloaded to a portable computer on-site and backed-up on to a USB drive. The grid was processed to produce an overall plan of the surveyed area, or ‘composite’. The results were analysed and basic initial processing was carried out on-site using Terrasurveyor by DW Consulting.
- 2.4.6 Final processing of resistivity raw data was undertaken off site in accordance with Historic England guidelines (English Heritage 2008) to remove any instrument error or survey effects in order to enhance subtler anomalies normally associated with archaeological features. All data were clipped by the appropriate values where necessary and the following processing steps carried out:
- The data sets were de-spiked in order to remove high contact readings;
  - The grids were edge matched in order to correct for changes in the position of the remote probes;
  - A high pass filter was applied which removes variations in the background geological response;
  - A low pass filter was applied where appropriate, which can improve the visibility of weak archaeological features.

## 2.5 EXCAVATION

- 2.5.1 The excavation of Tongue House A was supervised by a core of three OA North staff members, with the intention that the excavation should allow an area of sufficient size to be excavated and completed over the course of 16 working days, including three weekends of the project. Initially, areas within Tongue House A and its environs were targeted based upon what was thought to be practicable within the time frame of the excavation and, within that remit, those areas which would provide the most data, such as wall junctions and the geophysical survey anomalies were also targeted. A plan of the intended excavation areas in and around Tongue House A was drawn up and submitted to the steering group (representing DVLHG, OA North, LDNPA and the National Trust) for approval.
- 2.5.2 In practice, a flexible approach was undertaken, as outlined in the original methodology, whereby smaller areas were to be opened up initially and then be expanded or additional areas opened as the work progressed. The end result was that all the interior of Tongue House A was stripped and excavated down to extant floor layers and via sondages to examine sub-floor levels. Almost a complete circuit outside of the building was also examined, in particular the area between the

western wall of the building and the western enclosure wall. Initially, three ‘breaches’ were made through the surrounding enclosure walls; however, due to the large size of the boulders used in the construction of the north-west/south-east wall to the south-east of Tongue House A, a location some 30m to the south-west of the longhouse was ultimately chosen to be excavated.

- 2.5.3 The emphasis for the excavation was upon providing a valuable experience for the participants, rather than undertaking extensive areas of excavations to tight timetables. Whilst it was important that all areas opened were fully excavated, the extent of the excavation areas were defined so as to ensure that the participants could comfortably complete these areas within the time allowed.
- 2.5.4 **Turf Clearance and Excavation:** the turf was carefully removed from the excavation areas by manual techniques and stored separately from the spoil and adjacent to the excavation. All excavation was carried out using manual techniques. Spoil from the excavation was stored at a location adjacent to each site. Stone from the collapsed walls of the building and from the three ‘breaches’ made through the surrounding enclosure walls were stacked adjacent to the site.
- 2.5.5 Structural remains were cleaned to define their extent, nature, form and, where possible, date. All information identified in the course of the site works was recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage. Results of the evaluation were recorded on *pro-forma* context sheets, and were accompanied by sufficient pictorial record (plans, sections and colour digital photographs) to identify and illustrate individual features. Primary records were available for inspection at all times.
- 2.5.6 Samples were taken from within the house site to enable phosphate analysis. This work was undertaken by the participants under the guidance of the core OA North staff members after consultation with the OA North palaeoenvironmentalist.
- 2.5.7 A full and detailed photographic record of individual contexts was maintained and, similarly, general views from standard view points of the overall site at all stages of the evaluation were generated. Photography was undertaken using digital photography. Photographs records were maintained on special photographic *pro-forma* sheets.
- 2.5.8 **Planning:** the precise location of all archaeological structures encountered was surveyed digitally by experienced surveyors utilising GPS to record the site according to OS co-ordinates. In this case, a Leica Differential GPS was employed that uses real-time (RTK) corrections using mobile SmartNet technology to achieve an accuracy of  $\pm 0.01\text{m}$ . The accuracy of the OA North GPS system provides for a quick and effective means of recording the position and extent of sites. The digital survey data will be transferred, via Leica Geo Office (V.4), as shp files into a CAD system (AutoCAD 3D 2015), and superimposed onto the embedded digital OS data.
- 2.5.9 Additionally, the site and general environs were recorded by means of aerial photography, using specialist photogrammetric software, which was used to create accurate three dimensional models of the site and topographic surfaces. Two methods were utilised; the first used a UAV (drone), that enables photography from any altitude up to approximately 200m height, this technique was primarily used when placing the building within its wider environs. The second technique used a mast with a camera mounted on top. The latter is not effective at recording large

areas, but could be undertaken by the volunteers, and allowed them to get involved in the photogrammetric process using inexpensive equipment. This was used on a day to day basis to record the progress of the excavation and provide accurate plans. Survey control was introduced to the photographs by the placement of survey control targets across the site which were located by means of survey grade GPS.

- 2.5.10 The photogrammetric processing was undertaken using Agisoft software which provides detailed modelling using the overlap of up to 300 photographs, and creates a very detailed DTM (Digital Terrain Model) across the site. The photographs can then be digitally draped over the model to create an accurate three-dimensional model of the ground surface. The primary output, however, was an accurate two dimensional image which was used to generate accurate plans or profiles.
- 2.5.11 This process generated scaled plans within an AutoCAD system, which was refined by manual draughting. The drawings were generated at an accuracy appropriate for 1:20 scale. Sections were manually drafted at a scale of 1:10. All information was tied in to Ordnance Datum using the GPS. On completion of the excavations aerial photographs were taken of the site using a photographic mast.
- 2.5.12 **Backfilling:** the excavation areas were manually backfilled by OA North and the participants, and the turfs were relaid. In practice, after discussions with the National Trust archaeologist, Jamie Lund, the stone heaps were consolidated, and only smaller stones and rocks were used to consolidate various of the deeper features. The remaining stone was left as cairns adjacent to the site.
- 2.5.13 **Finds policy:** finds recovery and sampling programmes were in accordance with best practice (following current Chartered Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. OA employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who were readily available for consultation.
- 2.5.14 Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC 1998). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham. Samples were also be collected for technological, pedological and chronological analysis as appropriate.

## 2.6 ARCHIVE

- 2.6.1 An archive for the project was prepared during and immediately following the fieldwork programme and a summary forwarded to the Lake District Historic Environment Record. The results of the excavation will form the basis of a full archive to professional standards, in accordance with current Historic England guidelines (2015). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly quantified, ordered, and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the Chartered Institute for Archaeologists.

### 3. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

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#### 3.1 INTRODUCTION

- 3.1.1 **Introduction:** this report has been abstracted from two key publications: *Longhouses in the Duddon Valley Cumbria* collated by the Duddon Valley Local History Group in 2013 (DVLHG 2013) and a more recent work *A Survey of Longhouse Structures in the Duddon Valley, Cumbria* by the DVLHG in 2015 (Matthiessen *et al* 2015). As part of its work on the historical background of the survey sites, the DVLHG searched the National Archive catalogues and undertook a thorough, and wide ranging study of the available primary sources and secondary sources (DVLHG 2013, 12 and 103). The primary sources comprised mainly legal documents, church records and manorial references, some dating from the early seventeenth century but most dating from the eighteenth to twentieth centuries (*op cit*, 12). For an understanding of the patterns of settlement in the Duddon Valley and the Lake District the DVLHG drew upon the works of Angus Winchester (Winchester 1987; 2000). For this interim report a third document was also studied: this was a chapter of the Lake District World Heritage Site Nomination (LDNPA 2015).
- 3.1.2 **Sites under Study:** from an initial Level 1 Identification Survey, as reported by the DVLHG in 2013, a short-list of longhouse sites was identified for a more detailed, Level 2 archaeological survey. Within this group were the three longhouse sites under study, Tongue House A, Tongue House B, and Long House Close (DVLHG 2013, 17 and 20). The sites were found as a cluster, comprising *c* 0.5km<sup>2</sup>, on the unenclosed fells flanking the track from Long House Farm to Seathwaite Tarn.
- 3.1.3 **Historic Environment Record:** Tongue House A is listed in the Historic Environment Record (HER 36559; NTSMR 20024) as a longhouse or shieling with associated walls; there are two other HER sites associated with Tongue House HER 33590 and HER 36558. It appears that Tongue House B is also in the National Trust SMR (NTSMR 23862) as a longhouse or shieling (DVLHG 2013 76). Long House Close is recorded under HER 38570 (NTSMR 23863).
- 3.1.4 **Previous Archaeological Work: Level 1 and Level 2 Surveys:** the DVLHG have found that all the longhouses in their surveys were sited near to surface water and their surrounding landscape had evidence for ancient agricultural activities (DVLGH 2013, 14). The initial survey at Level 1 discovered that, as with all the longhouses of the survey, the sites under study were similar; ie rectangular with cross passages and lateral door openings (*ibid*) and with a single wall perimeter (*op cit*, 17 and 20). Both houses at Tongue House were of approximately similar sizes (*c* 10m x 3.5m) and had three to six courses in their perimeter walls (*ibid*). Both these structures appear to be the best-surviving buildings of the survey, with little stone robbing (*op cit*, 102). The entranceways of both structures faced south-west with a view of the lower Duddon Valley and the outcrop behind it (*op cit*, 76). However, they were 220m apart, and the two structures were not necessarily contemporaneous or associated with each other (J Quartermaine pers com 2016).
- 3.1.5 Tongue House A was a two-celled structure with a cross wall, and had a series of pounds and enclosures around it (DVLHG 2013, 20, 76 and 103-4). Tongue House B had higher walls with one end wall rising to a low gable but there was no remaining surrounding enclosure, only low walls *c* 100m to the north and east

(DVLHG 2013, 77). No cross wall was observed in Tongue House B (DVLHG 2013, 20) and it was likely to have been a single-celled structure, perhaps a shieling associated with summer pastures (Matthiessen *et al* 2015, 131).

- 3.1.6 The southern Long House Close longhouse was 9m x 3.9m in size and had one to two wall courses; it is uncertain whether there was a cross wall, although there may have been two entrances (DVLHG 2013, 41). It was closely associated with longhouse to the west, a circular sheepfold and enclosure walls, pre-dating eighteenth and nineteenth century walls (*ibid*). The southern longhouse was surrounded by a wall which may have enclosed a yard or, if it supported a roof, a small shelter (*ibid*).
- 3.1.7 The initial Level 1 surveys identified patterns of low walls or collapsed low walls used to enclose cleared land. They were perhaps topped with fences or palisades of brushwood and may have housed small cattle or sheep (*ibid*; Matthiessen *et al* 2015, 131); there was no evidence for ploughing or cultivation (DVLHG 2013, 103). The surveys also found many clearance cairns and disused tracks (*ibid*). It was tentatively surmised that the longhouses in the Duddon Valley Surveys were of mid to late medieval date (*op cit*, 104).

## 3.2 SITE HISTORY

- 3.2.1 **Prehistoric and Roman Period:** there is evidence for a significant number of settlements in the Duddon Valley during the prehistoric period, including the Neolithic stone circle at Swinside Farm on the north side of the Duddon estuary. Extensive Bronze Age cairnfields and associated settlements and field systems are to be found across the south-west fells, on the western side of Duddon Valley (Quartermaine and Leech 2012).
- 3.2.2 Hardknott Fort was on the north side of the Duddon Valley and the Roman Road to the fort of Ambleside crossed the valley at Cockley Beck (*ibid*).
- 3.2.3 **Early Medieval and Medieval Periods:** studies of surviving manorial documents, place names, and pollen analysis have demonstrated overall patterns of three phases of colonisation of the Lake District and thus, perhaps, of the Duddon Valley (DVLHG 2013, 86; Winchester 1987 and 2000). An early phase of colonisation is indicated by place names, such as those with *-thwaite*, and *-scale* suggesting clearance and agricultural settlement by Norse peoples (LDNPA 2015, 154). It is generally thought that the Norse colonists of this early period built longhouses where they settled and certainly the design was adopted by Cumbrian builders in the medieval and late medieval period (Matthiessen *et al* 2015, 117-118 and 123). During the tenth century onwards there was a period of increased settlement as evidenced by pollen analysis (DVLHG 2013, 86), but this was followed by a period of reduced population numbers as suggested by the regeneration of the woodlands.
- 3.2.4 A second period of clearance and cultivation began in the second half of the twelfth century and thirteenth century (DVLHG 2013, 86). In the Duddon Valley evidence of farming can be seen on the sides at the valley at c 200-300m (*ibid*). This may have been the period when many of the identified Norse-style longhouses and enclosures adopted by Cumbrian farmers were occupied and worked on all year round (Matthiessen *et al* 2015, 123). The practice of transhumance and living part-year in shielings had also been introduced by the Norse peoples and was later adopted by indigenous northerners (DVLHG 2013, 86; Matthiessen *et al* 2015,

118). Within this second phase of settlement, and by c 1300, there had been further clearances and enclosures in the forests (for instance the forest of Ulpha) (DVLHG 2013, 86-87), perhaps 'assarting' in places such as Seathwaite (LDNPA 2015, 156). The influence of the Abbey of Furness was probably important, through cultivation and later sheep farming, stock farming, such as at Ulpha, fishponds, and iron production (LDNPA 2015, 155-6). Population declined during the fourteenth and fifteenth centuries due to the Black Death, poor harvests, and animal plagues (DVLHG 2013, 87).

- 3.2.5 The third period of population growth in the Lake District took place from the second half of the fifteenth century and during the sixteenth and seventeenth centuries when there was a substantial increase in 'assarting' and in the lease or ownership of enclosed agricultural farmsteads conjoined to form small hamlets (LDNPA 2015, 156-7; DVLHG 2013, 87). At Seathwaite there were two hamlets comprising two or three farmsteads surrounded, at a distance, by smaller farms such as Tongue House, and each farmstead was directly adjacent to small, irregular, enclosed fields or inbye fields (LDNPA 2015, 157). Larger intakes (perhaps through assarting) were on the lower slopes of the unenclosed fell, perhaps using the becks as boundaries (*ibid*). This might reflect the increase in sheep farming in this period as a response to the growth of textile industries in the Lake District. Some family estates also became larger (DVLHG 2013, 88). Thus the open fell side became farmed as enclosed pastures.
- 3.2.6 ***Medieval and early Post-Medieval Periods:*** the Level 2 Survey of the sites under study also recorded any historical information pertaining to the site. There was, however, no reference to the two Tongue House buildings in the documentary record and it has been argued that the paucity of primary sources and documents and records of this period relating to the sites under study might be explained by the abandonment of these longhouses on the upper fells during the medieval period (DVLHG 2013, 91 and 103); thus potentially their occupation may have been at an earlier time (*ibid*). It was also noted that the two sites had little disturbance since they fell into disuse (*op cit*, 15) before the building of the eighteenth to nineteenth century walls in the vicinity (*op cit*, 77). An early documentary reference to Long House Farm was in 1683 and thus the farmhouse may be of seventeenth century date or earlier (Higgins 1986; NTSMR 20632).
- 3.2.7 The Long House Close fells were almost certainly associated with Long House Farm located on the lower levels; nineteenth century OS mapping demonstrated how the intakes on Long House Close were adjacent to the inbyes clustered next to the Long House Farm (1st edition OS map 1850-1851 and DVLHG 2013 41). But it should be said that there seemed to have been no documentary confirmation of any relationship between the enclosures on the upper fells and Long House Farm itself. Long House Farm may originally have been a longhouse prior to being remodelled as a two storey structure (*ibid*) implying a longevity of occupation.
- 3.2.8 Tongue House Farm had a seventeenth century date (a press cupboard was possibly dated 1691: LDNPA 2015, 150). In the same way that Long House Farm related to intakes at Long House Close, it is possible that Tongue House Farm retained pasture on the open fell on Tongue House (close to the sites of Tongue House A and B).
- 3.2.9 It is possible that during the seventeenth century farmhouses may perhaps have retained lands in the upper fells for summer pasture (Historic England 2011).

Tongue House B has been suggested as a shieling (DVLHG 2015 131), and if this was so, the structure may have been associated with Tongue House Farm.

- 3.2.10 There are mentions in the documents of Walney Scar settlement, which may have been a name for a farmstead close to the Walna Scar Road, which is the east/west track leading to the long house (DVLHG 2013, 90). This was possibly in the vicinity of Long House Close longhouses and enclosures, which were north of this road (DVLHG 2013, 90). The location of Walney Scar is uncertain but records, suggest that Walney Scar may have been ‘on the fellside north-east of Long House up the old Lonin and in fields to the left. Three sides of a building stand...Near it is ..... Barn remains....’ (Wade documents cited by DVLHG 2013, 90). The ‘fields to the left’ might have been those north of the Walna Scar Road and in the same area as the Long House Close.
- 3.2.11 *OS 1st edition OS map, 1:10,560, 1850-51 (Plate 2)*: the mapping of the mid-nineteenth century is important as field patterns and upland pasture shown may have been similar to, or derived from, field patterns of the earlier centuries. The 1850-51 OS map showed the farms at Long House and Tongue House and the pattern of small irregular fields, or inbyes, clustered around the farm buildings. Sunny Pike Gill flowed between the two farms and this may have acted as the marker for a possible boundary between the two farms. Five crossing points are shown on the stream between the two farms, and was possibly an indicator of the need for communications, and there was a footpath marked connecting the two farms.



Plate 2: OS First Edition 1:10,560 map 1850-1

- 3.2.12 The northernmost farm, Tongue House, was adjacent to its inbyes and on the slopes north and east of the inbyes were perhaps four large intakes, and to the east of these was Tongue House High Close. The sites of Tongue House A and B were located a short distance further into the open fell but were not indicated on the map in any way. There was one track continuing from the footpath to Tongue House to the north and then north-eastwards along to the stream between Tongue House Close and Tongue House High Close, but no other clear markings for any other tracks or routes from the farm to the upper fells.
- 3.2.13 Long House Farm was adjacent to a cluster of small irregular inbyes to its north and east. On their east side was Broad Hawes and two to three intakes as far north as Sunny Pike Gill. To the east was Long House Close and north-east of the farm was a label *Ancient Stone Walls*, depicting and labelling the sites at Long House Close. No track from Long House Farm to the upper fells was delineated. Further up the fell, Sunny Pike Gill also separated Tongue House High Close and Long House Close.
- 3.2.14 This pattern of farm buildings surrounded by inbyes with intakes on the lower slopes of the upper fells was a feature of the later medieval dispersed farmsteads and settlements of the sixteenth and seventeenth centuries (LDNPA 2015, 156-8 and DVLHG 2013, 87); the field shapes of the enclosed fields and larger intakes persisted into the post-medieval period to be mapped on the OS maps of the nineteenth century. The track between Long House and Seathwaite Tarn was not marked on the 1850-51 map but was first seen on the OS map of 1900, and was associated with the building of the Seathwaite Dam for the Barrow Corporation completed in 1904.
- 3.2.15 **OS map, 1:10,560, 1900 (Plate 3):** the sites under study were marked on this map. East of the track from Long House to Seathwaite Tarn were the *Stone Walls*, and west of the track adjacent to one of the rocky outcrops of Tongue House High Close were marked two short sections of straight stone wall and a possible enclosure.

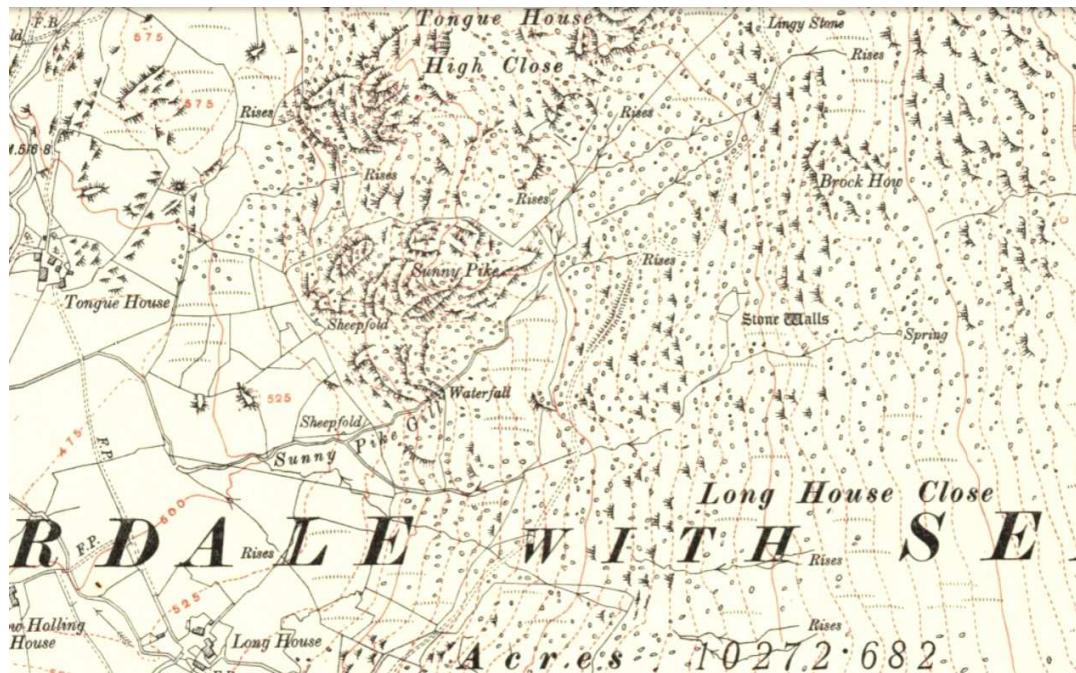


Plate 3: OS First Edition 1:10,560 map 1900

## 4. TOPOGRAPHICAL SURVEY RESULTS

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### 4.1 INTRODUCTION

- 4.1.1 An archaeological survey was undertaken of the three longhouses between 4<sup>th</sup> and 15<sup>th</sup> April 2016. This was undertaken by a process of instrument survey and photogrammetry using aerial photographs taken from a drone. An outline of the results is presented below, although a description of the Tongue House A longhouse is instead provided under the excavation results section (*Section 7*) as that process was able to analyse the form and development of the structure more comprehensively.

### 4.2 TONGUE HOUSE B

- 4.2.1 The Tongue House B site consists of the foundation remains of a single isolated, rectangular, double-thickness walled structure located in the northern half of the walled intake of Tongue House High Close at approximately 300m AOD elevation (Plate 4; Figs 2-4). The structure is orientated north/south and measures approximately 10.5m long by 4.16m wide with roughly straight-sided walls 0.7m wide and surviving up to 0.5m high (Fig 5). The southern end wall elevation is more pronounced with well-defined kerbed foundations and survives as a partial gable end wall up to 0.7m high. The structure is located on a small natural shelf set in the lee of a west-facing crag cliff face (1.4m away) and is within a range of north-east/south-west orientated craggy knolls which descent down the valley side.



Plate 4: Oblique view of the Tongue House B longhouse looking south

4.2.2 Features associated with the structure are limited, there is a single collapsed entranceway set into the centre of the western long wall elevation; there is no evidence for a door sill or jamb (Fig 5; Plate 5). There is slight evidence for wall collapse both internally and to a lesser degree externally and there is no evidence for internal divisions, or platforming of the structure which would be indicative of more permanent domestic occupation.



Plate 5: Vertical orthophoto of the Tongue House B longhouse

4.2.3 Geophysical anomalies were scanned on the small natural shelf area both within and immediately surrounding the structure. Small discrete anomalies which may be indicative of hearth/burning activity were recorded in both the north and south ends of the structure and a larger anomaly was identified internally within the collapsed entrance (Painted blue in orthophoto – Plate 5). A much larger anomaly was located external to the entrance on the western edge of the natural shelf. It is possible that these anomalies were associated with occupation debris/burning; however, it is also likely that they are associated with shallow bedrock with magnetic deposits.

### 4.3 TONGUE HOUSE FIELD-SYSTEM

4.3.1 Both settlement sites of Tongue House A and B are associated, or within, fragmentary elements of a walled field-system which pre-dates the current intact walled intakes at Tongue House Close and Tongue House High Close. There are fragmentary sections of double-thickness wall foundations running up and through the modern walled intakes on the slopes ascending to the north-east of, and away from, the main landholding of Tongue House Farm on the valley floor (Figs 6-10). The field-system consists of meandering field wall foundations running upslope in the south along Sunny Pike Gill, running up the south-east side of the crags in Tongue House High Close, running roughly north a little lower down the fell than the modern intake wall and running north before turning back downslope at an unnamed gill feeding down from Tongue House Crag into Tarn Beck in the valley

bottom. This forms a rough intake surrounding both Tongue House A and B that pre-dates and is slightly smaller than, the modern-walled intake.

- 4.3.2 In addition, at the northern end of the Tongue House intake, it was possibly keyed into a small assarted enclosure consisting of a garth boundary surrounding a possible domestic structure at Tongue House Crag, which has been overlain by a later sheepfold, and is partially on the open common.
- 4.3.3 The field-system is most closely related to the Tongue House A settlement site as the field wall extends up Sunny Pike Gill, roughly 45m to the east of the structure (Figs 6, 8-10). A wall foundation splay off from this alignment and runs roughly north-west for 43m to join up with the small enclosure surrounding the rectangular, domestic structure (Plate 6). There are small fragmentary sections of wall foundation running both between and along the edges of the crags in the immediate vicinity of the south, east and north sides of the Tongue House A site. The isolated structure at Tongue House B is located approximately 80-100m downslope of the intake wall on the northern end of Tongue House High Close, but there is no direct connection with the field system (Figs 6 and 8)



Plate 6: The relict walls associated with the Tongue House A longhouse

- 4.3.4 The walls consist of double-thickness wall foundations with some rubble infill and, in places, there is much obvious wall collapse downslope, and in other places any walling superstructure has been removed, possibly to build the later intake wall. It is uncertain if the walling ever reached a full stock-proof height, or if they contained hedged or fenced tops, or indeed whether they were just defining field plots and were not stock-proof in themselves. It is likely that the outer intake wall

must have been stock-proof, but for the internal boundaries this is uncertain. Essentially these walls, with a minimum of construction, and economy of effort by using the available craggy outcrops, sub-divide areas of cleared ground between the crags into discrete enclosed areas of pasture/rough grazing within the wider intake boundary. There are two discernible enclosed pastures on the east side that are upslope and downslope of Tongue House A, and as yet no dating evidence has been retrieved from excavations on the wall foundations of the field-system.

#### 4.4 LONG HOUSE CLOSE

- 4.4.1 **Introduction:** a detailed survey of the Long House Close longhouse settlement was undertaken by a process of instrument survey of the longhouse and also aerial survey, using a drone, to record the wider field system (Figs 11 and 12). It is located on an area of fell called Long House Close, which is an historic holding of Long House Farm, and is divided from the area of fell called Tongue House High Close by Sunny Pike Gill.
- 4.4.2 The settlement is located on an area of moorland which has a west-facing, uniform, gentle slope and is covered by coarse scree with localised outcropping. A stream is located some 30m to the south of it. The longhouse settlement is particularly significant comprising two longhouses, and a storage structure, which are all linked by an encompassing enclosure boundary. Linked to the settlement are field walls of an open-sided field system that extends to the east.
- 4.4.3 **Southern Longhouse (Sites LC 1 and 2) (Fig 12 and Plate 7):** the southernmost longhouse (LC1) is an elongated longhouse, 10.1m x 4.1m in size, constructed of low (0.35m high) dwarf walls which are typically 0.9m in width. These dwarf walls have a uniform, flat upper surface and served as the foundations for a superstructure that would have been of an organic material, such as wood or peat; with the decay of the superstructure, only the foundation is left and characteristically there is little or no stone collapse associated with the walls. There appears to be a cross-passage through the long house, with two opposing gaps in the walling; however, these gaps are currently used by a sheep trod that extends through the house and it is not apparent if the sheep trod adopted the line of a pre-existing pair of gaps or the sheep trod has formed the gaps. The interior of the longhouse is internally terraced, although there is some slippage that has resulted in a scarp slope at the eastern, upper, end of the house.
- 4.4.4 The dwarf-walled long house (LC1) is surrounded by a semi-elliptical ‘pound’ structure (LC2) which has curved side walls and straight end walls (size: 20.4m x 8.4m). There is an open area to the east and the side walls are set very close into those of the longhouse. The walls are constructed of dry-stone masonry, and stand up to 0.8m in height incorporating some large stones, particularly on the southern side. The northern wall is lower, has a uniform construction, is up to 1.8m in width and has no visible tumble associated with it; as such, this wall was potentially a dwarf wall, although that to the south was not.



Plate 7: LC1 longhouse, comprising a central dwarf-walled longhouse, surrounded by a later enclosure / structure

- 4.4.5 These walls are set so close to the longhouse that there is almost insufficient space to walk between them let alone allow for the movement of stock, and the longhouse is set very much at the western end of the ‘pound’ structure. The overall shape of the structure has far more symmetry than is completely necessary for a pound, and the space contained within the structure is too small to be pastorally useful. As such, the structure does not make sense as a pound that was constructed subsequent to that of the longhouse. The more likely explanation is that the longhouse was later and was located within the existing larger structure (LC2). If the wider structure (LC2) was earlier then there is the possibility that this was an earlier stock pound, and in that case, without the later longhouse, it would have been large enough to accommodate animals. There is the alternative possibility that this was an earlier boat-shaped longhouse, hence the dwarf wall on the northern side, and in terms of size and shape could potentially correspond with an early communal longhouse / hall. However, the ground surface within the LC2 structure has a uniform slope leading up to the eastern end wall, and there is no evidence of internal terracing that would be typical for a domestic structure.
- 4.4.6 **Western Longhouse (Site LC3) (Fig 11 and Plate 8):** the western longhouse has a fairly shortened shape, being 9.1m x 6.0m in size, by comparison with the very elongated form of the other longhouses within the group. It is of dry-stone construction, and there is some collapsed material in direct association with the walls; the average width of the wall and collapse is 1.5m and the width of the actual wall appears to be 0.9m. The stone material is substantially earthfast and the walls are typically 0.3m high. Constructed on top of the longhouse is a square dry-stone bield (4.2m x 4.7m in size) which has walls that are in places in good condition, and are up to 1.0m in height. To judge by the condition, the structure is not particularly old and is consistent with a later post-medieval shepherds bield (LC3b). The western and south-western edges of the underlying longhouse walls, beneath those of the bield, are in very good condition, and have probably been built up and maintained as part of the construction of the bield, whereas the eastern walls are substantially decayed. The construction of the bield has obscured

much of the earlier longhouse and it is not evident if the earlier structure had a cross wall or entrance.



Plate 8: The LC3 longhouse, with a later bield built on top of the western half of the house

**4.4.7 Northern Structure (Site LC4) (Fig 11 and Plate 9):** at the northern end of the settlement is a slightly irregular, almost pentagonal-shaped, enclosure which is relatively small having external dimensions of 8.6m x 7.3m and internal dimensions of 5.4m x 3.9m. It is of dry-stone construction and there is substantial tumble associated with the walls; where the walling is relatively complete the wall width is c 1m. There is a possible entrance to the north-east, facing out from the wider enclosure (Site LC5). The floor of the structure has the same slope as the natural slope outside, and there is no evidence of any internal terracing. The function is uncertain; it is unlikely to have accommodated people, as it has a slightly irregular shape and is not internally terraced. If the building was unroofed then it would not have afforded any better accommodation for stock than the adjacent enclosure (LC5), and in any case was very small, being only about 4m across internally. The suggestion, therefore, is that even though it has an irregular pentagonal shape, it may possibly have had a low sloping roof, in which case it could have provided winter accommodation for limited numbers of stock or, alternatively, may have provided dry storage.



Plate 9: Aerial view of the northern structure

4.4.8 **Settlement Enclosure (Site LC5) (Fig 11 and Plate 10):** extending between the two longhouses, and the northern structure is a decayed wall foundation and forms an irregularly-shaped enclosure. The wall / bank butts against each of the component features and was evidently a later feature. For the most part, it is a low-lying structure containing relatively small amounts of stone and, as such, would have not, by itself, been able to control stock and it is probable that this stone bank was augmented by a fence or similar boundary marker. The eastern boundary of the enclosure, however, has been overlain by a field boundary wall (Site LC6) and this is far more substantial and would have been able to restrain stock, but not in its original form as there is a short, insubstantial section of the original stone bank / wall extending between the corner of the field wall (Site LC6) and the northern structure (Site LC4). In addition, there is a low, narrow, bank that extends between the western longhouse (Site LC3) and the eastern wall of the enclosure, effectively dividing the enclosure. The western stone bank / wall extends through an area of poorly drained ground and again emphasises that this enclosure was an afterthought as if the enclosure was the primary feature and the house structures secondary, then the enclosure would have been moved a small distance upwards onto better drained ground.



Plate 10: The overall enclosure (**Site LC6**) linking the individual structures and the field wall to the east

- 4.4.9 **Field System (Site LC6) (Fig 12):** extending east from the settlement is an open sided field system formed of a single dry-stone wall now substantially decayed. It overlies the eastern boundary of the settlement enclosure (Site LC5) and the northern boundary extends east, through an area of scree before terminating at a small crag. From examination of Google Earth aerial photographic imagery it is evident that beyond the crag, to the north, is a series of further walls between further lines of crags that extend up to 400m from the enclosure (Fig 6).
- 4.4.10 A field wall also extends to the south of the settlement into an area of scree, and, by virtue of the photogrammetry, it has been possible to trace it further for at least 400m through the scree where it follows an erratic course between large boulders. It is, however, open to the east and there is no evidence of further walling in that direction as evidenced from ground survey or from Google Earth imagery. The

scattered, linear elements of field system would appear to define an area of upland intake, with this intermittent boundary defining the eastern limit of the Long House Close holding.

- 4.4.11 There is a possibility that the arrangement of walls would have provided a funnel-type field wall arrangement to feed stock off the fell within the intake lands to the west and into the settlement enclosure, and there is a convenient entrance between the northern structure and the field system to enable this.
- 4.4.12 **Settlement Phasing:** it is evident that there has been considerable development of the site over time. The earliest element is the boat-shaped structure (LC2) at the southern end of the settlement, which was apparently earlier than the dwarf-walled longhouse (LC1) within it. However, the relationship between this (LC1) and the other longhouse (LC3) is uncertain. The enclosure boundary (LC5) post-dated the individual elements (LC1-3) and then the stock enclosure boundary (LC6) was overlain by the walls of the field system. The most recent element was the bield (LC3b) constructed on top of the western longhouse.
- 4.4.13 This phasing indicates that the site probably had an extended life which in some respects (notably the bield) extended into the post-medieval period, but there is considerable uncertainty as to the origins of the settlement. There are notable similarities between the enclosed settlement and one at Southerscales, at Chapel le Dale (North Yorkshire) which is believed to be of early medieval date, but this has yet to be confirmed by excavation. The walls of Longhouse LC1 are dwarf walls, which is a characteristic of early houses, but it also seems to have a cross passage, which is more characteristic of later houses. At present, it is not possible to confirm if the settlement had pre-Conquest origins and it is hoped that the proposed excavation of the houses will be able to clarify the chronology.

## 5. PALAEOENVIRONMENTAL AND GEOARCHAEOLOGICAL ASSESSMENT

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### 5.1 INTRODUCTION

- 5.1.1 A reconnaissance survey, using a gouge auger, was undertaken at boggy sites adjacent to the remains of three longhouses near Seathwaite, Cumbria (Fig 13) (Plate 11). The objective of the survey was to establish the presence, or otherwise, of organic-rich sediments adjacent to the longhouses, and if possible, to collect samples for palaeobotanical assessment. It was hoped that palaeoenvironmental work might shed light on the local environment at the time of occupation of the longhouses. Following the reconnaissance survey, two of the sites (Palaeo Site 2 and 3) were selected for sample collection using a Russian corer.



Plate 11: Coring with a gouge auger near Tongue House B

- 5.1.2 ***Palaeoenvironmental Assessment:*** the collected cores have been used to provide material for a palaeoenvironmental assessment of pollen. A series of eight sub-samples were extracted from the peat sequence from the Russian core sample from Tongue House B and two sub-samples were extracted from the deeper peat from the Russian core sample collected from Tongue House A (Appendix 2) (Fig 13).
- 5.1.3 The cores are stored in the offices of Oxford Archaeology North in Lancaster for future analysis. A sub-sample for AMS dating has been submitted to Dr Gordon Cook at Scottish Universities Environmental Research Centre (SUERC).

## 5.2 PREVIOUS WORK

- 5.2.1 Previous environmental analysis in the Duddon Valley includes a pollen diagram from cores collected from Seathwaite Tarn (Pennington 1964). This diagram was originally undated but, subsequently, the level at which a permanent change in the forest composition was identified, and was dated to 1663-937 cal BC ( $3080\pm140$ ; NPL-124) in the Bronze Age (Pennington 1970). More recent research from the Cumbrian uplands includes pollen data from Tewit Moss and Devoke Water Cairn (Quartermaine and Leech 2012, 199-204) and from the lowlands, the Duddon Mosses (Wimble *et al* 2000).
- 5.2.2 Most relevant to the present study, however, is previous work from beneath and above ring cairns, close to Seathwaite Tarn (OA North 2010). The ring cairns, which were constructed in the Bronze Age, were blanketed by a layer of very amorphous peat; the base of this peat was dated in two places, both dates indicated the peat accumulated between the fifth and sixth centuries AD (cal AD 550-650 ( $1465\pm30$  BP; Poz-24072) and cal AD 430-600 ( $1535\pm30$  BP; Poz-24071)), the early medieval period. Subsequently, a peat sequence was collected from a boggy area close to the ring carins and peat below approximately 1m depth (from the ground surface) was shown to be of Mesolithic age, however, above a depth of 1.04m the character of the peat changed from a very dark brown sedge/herbaceous peat to a more fibrous peat. This change was reflected by an abrupt change in the pollen record, where an assemblage dominated by tree pollen with some herb taxa was replaced by an assemblage of grasses, herbs and heather. This change has been interpreted to suggest that there was an hiatus in the accumulation of peat within the peat basin (OA North 2010). The top of the peat in this core was dated at 0.70-0.71m (from the ground surface) to AD 1650-1960 ( $185\pm30$  BP; Poz-23166). Cereal-type pollen was recorded in sub-samples beneath as well as above this dated horizon (OA North 2010), suggesting that arable cultivation may have taken place in the area prior to AD 1650-1960. Nearby, pollen data from the Devoke Water Cairns suggest that from the early medieval period onwards, the landscape remained largely cleared and was used for upland grazing. There is some evidence for arable farming, and radiocarbon dating suggests that local arable farming may have been practised in this area at least for part of the second half of the first millennium AD (Quartermaine and Leech 2012).

## 5.3 RESULTS

- 5.3.1 The gouge auger survey showed that boggy areas do indeed exist adjacent to the longhouses but that in many cases, these are filled with potentially recent *Sphagnum* growth. Two transect lines, each with five cores, were arranged in a cross configuration through Palaeo-Site 2, to the south of Tongue House A. At Palaeo-Site 3, to the west of Tongue-House B, two parallel transects were established, comprising five cores (Fig 13). In addition, an area to the south-west of Long House Close (Palaeo-Site 1) was explored, and approximately 0.50m of fresh, mossy organics were proved to have accumulated above bedrock at Palaeo-Site 1; however, no formal transects were established. At Palaeo-Site 2, Tongue House A, peat was present to a maximum depth of 1.70m and at Paleo-Site 3, Tongue House B, to a maximum depth of 1.15m.
- 5.3.2 Although gouge augering identified the upper, wet, moss-rich deposits at each of the sites, it wasn't able to recover it. Russian augering was, therefore, undertaken to

recover the humified peat deposits from Palaeo-Sites 2 and 3. From Tongue House A (Palaeo-Site 2), samples from the midpoint of the transect (Core P3) between 0.85-1.35m (as well as a duplicate core from 0.80-1.30m) were collected. Gouge augering had revealed the presence of small wood chips at Core P1 (Palaeo-Site 2) so a further Russian sample from this core location collected peat deposits between 0.50-1.00m; an attempt to collect between 0-0.50m yielded only very wet, fibrous material that slid off the auger blade.

- 5.3.3 At Palaeo-Site 3, Tongue House B, it proved possible to use the Russian Corer to successfully collect a continuous sequence from the middle of the transect, between 0-1.15m depth from the ground surface. This core sample has been selected for pollen assessment, along with two sub-samples from the deeper peat recovered from Tongue House A.

#### **5.4 POLLEN AT PALAEO-SITE 3 (CORE P3)**

- 5.4.1 **Description:** rich pollen assemblages were obtained from six of the sub-samples assessed, but less rich assemblages were recorded at two levels; preservation of pollen was generally good to mixed (*Appendix 4*). The assessment may be interpreted to suggest that two clear pollen assemblages are present within the sedimentary sequence, an older assemblage dominated by arboreal pollen and a younger one comprising mostly pollen of sedges and grasses. These assemblages are separated by pollen showing a gradual transition from the older to the younger assemblage.
- 5.4.2 The first and older assemblage, recorded from the deepest sub-sample at 1.32m to 0.80m, comprises tree pollen which contribute approximately 70-80% of the pollen recorded, including taxa such as birch (*Betula*), alder (*Alnus*), oak (*Quercus*), hazel-type (*Corylus avellana*-type) and heather (*Calluna*), with fewer and sporadic counts for holly (*Ilex*), pine (*Pinus*), elm (*Ulmus*) and crowberry (*Empetrum*). The herb pollen assemblage is dominated by grasses (Poaceae), which, at 0.80m, account for approximately 20% of the pollen counted; other herbs recorded include ribwort plantain (*Plantago lanceolata*), pollen of the carrot family (Apiaceae, a large group containing plants such as pennyworts, water-dropworts and hedge-parsleys), cinquefoils (*Potentilla*-type), devil's bit scabious (*Succisa pratensis*), docks/sorrels (*Rumex* spp.), dandelion-type (*Taraxacum*-type) and buttercup-type (Ranunculaceae). Fern spores are commonly recorded, with the exception of the sub-sample at 1.00m, and include monolete fern spores (Pteropsida), polypodies (*Polypodium*), and fewer counts for bracken (*Pteridium aquilinum*). The recovery of non-pollen palynomorphs (NPP) is variable but there are occurrences of *Glomus* (HdV-207), *Sordaria* (HdV-55A/B) and, at 0.80m, *Gelasinospora* (HdV-1). The record for microcharcoal is also variable, with generally low numbers of microcharcoal particles present but with an apparent peak in microcharcoal at 1.00m.
- 5.4.3 Two sub-samples, at 0.72m and 0.64m, show a gradual change in composition, with pollen at 0.72m comprising approximately 30% tree pollen, while that at 0.64m records 23% tree pollen. The pollen count at 0.64m is less than 100 grains, as recovery was poorer than from the other sub-samples.
- 5.4.4 In the three upper sub-samples, the pollen and associated amorphous plant matter, appear much fresher in appearance than in the lower sub-samples. The pollen assemblages are also strikingly different in composition. Arboreal pollen is reduced

to less than 15% of the pollen counted; pollen comprising mostly grasses, dominates the herb component of the assemblage. Other herb taxa recorded include sedges (Cyperaceae), ribwort plantain, docks/sorrels and cinquefoils. There are also occurrences of common knapweed (*Centaurea nigra*), milkwort (*Polygala*) and pollen of the cabbage family (Brassicaceae, another large group including plants such as garlic, mustard, winter-cresses and shepherd's-purses). *Sphagnum* moss spores are recorded in relative abundance at 0.60m and 0.40m and spores of the club-mosses (*Selaginella*) are also present. Spores of bracken are present in abundance, especially at 0.60m. Fungal spores are present in low numbers but at 0.24m, an abundance of cf. *Byssothecium circinans* (HdV-16C) is recorded. Small quantities of microcharcoal particles are recorded in the upper two sub-samples. Diatom frustules are present within all three sub-samples but are particularly abundant at 0.60m.

## 5.5 INTERPRETATION

- 5.5.1 The pollen assemblages in the deeper sub-samples (between 1.32m–0.80m) suggest possible mixed woodland environments, potentially with small cleared areas. The sub-sample at 0.80m displays a possible decline in tree pollen and a greater degree of openness, as shown by increases in the pollen of grasses and other herbs. Sub-samples at 0.72m and 0.64m show a continued gradual decline in tree pollen and an increase in pollen of herbs of grasses and sedges. The three upper sub-samples appear to show a predominantly open environment, dominated by grasses, mosses and bracken. The data suggest a possible break in the palaeovegetational sequence, possibly between 0.80m and 0.60m. Such a break or hiatus could have resulted from peat being cut away and used for fuel. Correlation with a pollen diagram from Seathwaite ring cairns suggest this could have happened at any time post-dating the late Mesolithic (OA North 2010).

## 5.6 RECOMMENDATIONS

- 5.6.1 Full analysis is recommended on sub-samples from Tongue House B. This would provide detailed reconstruction of the palaeoenvironmental record at the site and permit direct correlation with the pollen diagram from Seathwaite ring cairns. It would be important to date the top of the younger assemblage (between 0.72–0.64m) to determine precisely the age of the peat following truncation and the age at which peat once again began to grow at the site.

## 6. GEOPHYSICAL SURVEY RESULTS

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### 6.1 INTRODUCTION

- 6.1.1 The magnetometry survey, as outlined in *Section 2.2.1*, can be quite limited when recording rocky landscapes, or where there is the potential for bedrock near the surface, therefore its main use at Tongue House A was for the identification of hearths. Resistivity, meanwhile, is most effective at identifying stone structures, although, again, the results are typically confused by the proximity of natural stones and bedrock, both of which were encountered during the excavations.

### 6.2 MAGNETOMETRY

- 6.2.1 Tongue House A produced one discrete area of magnetic enhancement with a further four to the west of the building, but within the area bounded by the enclosure walls (Fig 14). A further 13 anomalies were identified with readings up to 6nT on the plateau south of the longhouse and enclosure.
- 6.2.2 At Tongue House B, there was one broad magnetic anomaly to the west of the longhouse, and a further two small anomalies to the north of the longhouse (Fig 5). Inside the longhouse, at the southern end, adjacent to the extant gable wall was a small magnetic anomaly which has the potential to be a hearth.
- 6.2.3 At Long House Close (Fig 12) there was a potentially significant 5nt anomaly inside the LC3 longhouse, and at its eastern end, and is in a location that could be interpreted as a hearth. Within the LC1 longhouse were two 5nt anomalies, one small localised one at the western end, and one against the southern wall. The latter, being non-central, is in an unusual location for a hearth, but that at the western end could potentially be.
- 6.2.4 Other anomalies beyond the longhouses include an 11nt anomaly (6) to the east of the longhouse LC3 and one against the enclosure wall (5). A further anomaly (4) is located just outside the north-eastern corner of the to the longhouse LC1, but is within the wider pound (LC2).

### 6.3 RESISTIVITY

- 6.3.1 Resistivity was only undertaken at Long House Close, as this site appeared to have the greatest potential for useful results. However, the results of the resistivity survey on Long House Close were masked by the exposed geology and the difficulties in getting both probes in contact with the soils. As a consequence, dummy readings were generated over much of the grid, and the results were very erratic. As such it is not possible to make any reliable interpretation of structural remains indicated by the resistivity plot (Plate 12).

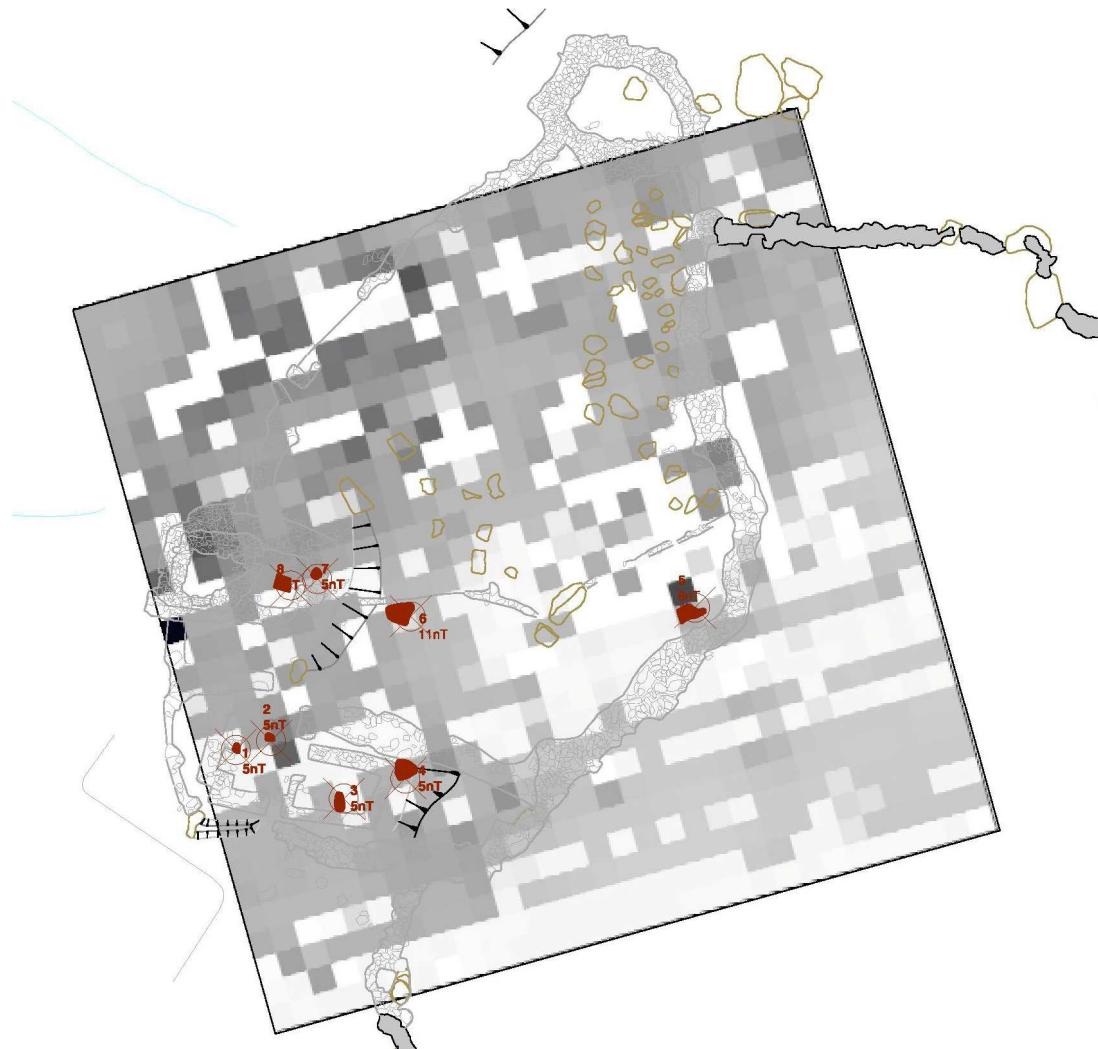


Plate 12: Resistivity plot superimposed on the Long House Close plan

#### 6.4 DISCUSSION

- 6.4.1 The magnetic survey of Tongue House A and environs contained discrete features within the structural remains, these enhancements were not strong enough to be indicative of ferrous objects but were of such a nature that could indicate pits or areas of burning such as hearths. The series of discrete anomalies to the south Tongue House A may represent a series of pits.
- 6.4.2 It should be noted that the bedrock geology in this area is formed of Rhyolitic Stickle Pike Tuff which by its volcanic origins could contain iron and therefore produce magnetic enhancements in the magnetometer survey data. However, it was considered unlikely, due to the generally low background reading, that this rock could account for some of the anomalies. The subsequent excavations confirmed that many of the anomalies were caused by the presence of iron within the bedrock geology.
- 6.4.3 Anomaly (8) at Longhouse Close is against the end wall of the LC3 longhouse and has the potential to be a hearth. Similarly there are two further anomalies in the LC1 longhouse, and the easternmost of these (1) could potentially be a hearth; the other (3) is against a side wall and is less likely to be a hearth.

## 7. EXCAVATION RESULTS

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### 7.1 INTRODUCTION

- 7.1.1 Four separate areas were investigated during the course of the excavation of Tongue House A, with the largest area focussed on the longhouse itself (Trench 1), which was examined by a trench comprising some 102.5m<sup>2</sup> with maximum dimensions of 14m by 3m (Fig 15). Three further trenches, generally measuring 2m by 2m targeted the various enclosure walls associated with the longhouse (Fig 16). Trench 2 was located immediately to the north-west of the longhouse, with Trench 3 situated to the south, finally, Trench 4 was relocated to the south-westerly enclosure wall across the plateau from the longhouse.

### 7.2 RESULTS

- 7.2.1 **Natural deposits:** a series of localised glacio-fluvial deposits (**1062**) formed the natural substrate within the excavation area. Cutting through these was a north-west/south-east aligned ditch or palaeo-channel, **1063**, filled with cobbles and silt, most notably on the south-west side of the area where it was seen as a layer of cobbles and boulders (**1064**), descending down to the south-east. Some of which were adapted, and or augmented as a rough area of hard standing. A feature thought to be a posthole (**1046**), is more likely to be part of the same palaeo-channel system. Oak charcoal was recovered from within both of these features. Exactly what the source was for this charcoal is unclear, similar charcoal was found within a later soak-away feature (**1021**) associated with the house but situated immediately outside its walls. It is possible that this organic material was residual as it produced a radiocarbon assay date of the late seventh to late ninth century calAD.
- 7.2.2 **Phase 1:** the earliest recognisable phase of the house was constructed, generally, without foundations onto the natural substrate (**1010** in the north and **1034** in the south, and corresponds with that outside the house (**1062**)) (Plate 13; Fig 17). There was some evidence of a foundation course of cobbles (**1042**) on the south-west side below wall **1018**, which is likely to have been used to level this part of the structure. The ground within the footprint of the structure fell sharply by 0.82m from north-west to south-east.
- 7.2.3 The north-west/south-east aligned rectangular stone building measured externally 10.45m long by a maximum of 4m across, with internal dimensions of 8.62m long and between 2.09m and 2.42m across (Plate 13). The drystone walls (**1019**, **1018**, **1058**, **1059** and **1060**) remained to a height of 1.15m in places. Walls **1058** and **1060** did not appear to have gable ends, although it is possible that they once exhibited such features, but have since collapsed.



Plate 13: Orthophoto image of House A in its earliest form (Phase 1)

- 7.2.4 The Phase 1 house comprised two cells divided by a cross passage, with the northern cell measuring 4.49m long and comprising walls **1018**, **1022**, and **1060**, and the southern measuring 2.49m long, with the cross passage being between 1.19m and 1.33m wide. A tumbled orthostat, interpreted as a door jamb, appears to mark the position of the entrance on the north-east side. Cobbled floor surfaces were evident in the northern cell (**1028**, lower; **1020**, upper), with charcoal from **1028** surface providing a radiocarbon determination of 1514-1798calAD (275±30BP; SUERC-69651). However, there is a 91.4% probability that the date range lies between 1514 and 1668calAD.
- 7.2.5 Situated centrally, and toward the cross-passage, and set onto the upper cobbled surface (**1020**), was a hearth of flat stone slabs (**1006**) measuring 0.96m by 0.97m (Plate 14). Subsequently, this had been modified by the placing of a rough curb of stones around part of the original hearth (**1005**), and was somewhat larger than the **1006** hearth, with dimensions of 1.4m by 0.8m (shown in green tint on Fig 15).



Plate 14: Interior of the house viewed toward the north-west showing hearth **1006** and surface **1020**

- 7.2.6 Within the cross-passage were two successively laid cobbled surfaces (**1026/2029**), which lay above **1033**, which was the underlying layer of cobbles. Large earth-fast boulders at either entrance may have provided basic thresholds.
- 7.2.7 The southern cell, comprising walls **1019**, **1058** and **1059**, contained structure **1008**, which lay within the angle formed by wall **1058** and wall **1019** (Plate 15). A single course of boulders, measuring between 0.69m and 0.3m, formed the outline of the structure, giving external dimensions of 1.86m by 1.14m, whilst a quartet of earthfast rocks (within natural deposit **1034**) formed the north and part of the north-east walls. A layer of cobbles (**1031**) formed the internal surface of the southern cell; it was sealed (although not structure **1008**), below a layer of silty clay **1030/1037**. Evidence of whether this had naturally accumulated, or was deliberately deposited, was not forthcoming. Within the eastern corner of the cell was a possible hearth (**1007**) formed by a semi-circle of stones (Plate 15).



Plate 15: The southern cell viewed toward the south-east, showing hearth **1007** (top left) and structure **1008** (centre right)

7.2.8 **Phase 2:** at some point the north-east entrance was blocked (**1025**), with the blocking being placed upon a foundation layer of silty clay and cobbles (**1044**) (Fig 18). A wall (**1014**), and overlying cobbled surface (**1026**), had been constructed across the south-east end of the northern cell entirely blocking it off. Dark-brown silt (**1012**, **1013** and **1023**), heavily disturbed by bracken rhizomes, had accumulated over the entirety of the interior of the structure, but was much deeper in the northern cell (**1012**).



Plate 16: Phase 2, showing the blocked cross-passage entrance (**1025**) and cross-wall (**1044**), viewed toward the south-west

7.2.9 **Phase 1 and 2, Exterior features:** the stone and boulder-filled palaeo-channel (**1064**), appeared to have been adapted and utilised as a very rough yard surface, located around the north-west end and the south-west side of the building down to the cross-passage. Several large boulders, placed in the vicinity of the south-west entrance, appear to have acted as stepping stones. Placed within this layer (1064) were a series of drains (**1047** and **1048**). Drain **1047** comprised features **1009**, **1011** and **2005**, which ran down the north-west side of the house and took the form of a narrow channel up to 0.4m wide, which was filled with rounded cobbles and bounded by larger (400-500mm) stones. A second drain (**1048**) fed into **1047** from the north-east. Drain **1047** ran almost the entire length of the house, continuing its course to the south-east beyond the limit of excavation (Plate 17).



Plate 17: Drain **1047**, viewed toward the north-west. The picture on the left depicts the drain opposite wall **1018**, whilst that on the right, shows the drain in relation to walls **1061** and **2003**

7.2.10 The drain, however, may also have emptied into a soak-away located in front of the south-west entrance. This was a 0.9m long by 0.4m feature (**1027**), filled by a dark-brown silt (**1021**) which contained occasional charcoal fragments. A radiocarbon determination was obtained from oak charcoal from **1021** of 676-876 cal AD (1248 ± 33BP; SUERC-69186). The discrepancy between the dates obtained from the charcoal contained within deposits **1021** and floor surface **1028** can be explained by the longevity of oak, as opposed to the short-lived tree species (alder/hazel) that was found in deposit **1028**.

7.2.11 **Enclosure walls:** the building was enclosed within a north-west/south-east aligned irregular pentagonal enclosure (walls **1061**, **1065**, **2003** and **3002**), with walls **1065** and **3002** forming a V-shaped south-east entrance to the enclosure, whilst the eastern side of the house was bounded by an outcrop of rock (Plate 18). Another entrance was located on the south-west side opposite the cross-passage.



Plate 18: Enclosure wall **3002**, located immediately south of House A, showing typical construction techniques

- 7.2.12 This inner enclosure was itself part of a larger group of enclosures associated with the house site, and discussed in *Section 4.3*. This small enclosure, which closely surrounds the house, occupied the northern corner of a larger approximately north-west/south-east aligned enclosure that opened onto a marshy area at the base of a slope. It comprised north-west/south-east aligned wall **1066**, which extended from the 'V' formed by walls **1065** and **3002**, with an entrance at the junction with **1065**. Wall **1061** terminated at an outcrop of rock, but continued south-west as wall **1067**. A large outcrop of rock formed a natural barrier to the south-west of the house, with small areas of wall blocking any obvious gaps, whilst wall **4002**, aligned north-west/south-east, sealed a gap between the above outcrop, and its neighbour some 15m to the south-east.
- 7.2.13 The enclosure walls were examined in three locations (Fig 6; Plate 18), and were generally consistent in construction technique, being built without foundation cut, but usually bedded on a layer of cobbles and redeposited natural deposits. The walls were formed from large irregular boulders with a rubble core, and in the case of the house enclosure wall **2003**, survived in places to a height of *c* 1m in places. Widths of between 1.2m and 1.5m were recorded for the walls.

### 7.3 FINDS

- 7.3.1 The archaeological excavations revealed a remarkable dearth of finds and the only notable find was a horseshoe of early post-medieval date, which was discovered by metal detector in the plot to the west of the long house. A test pit was excavated on the site of the find but no other associated features were identified.

## 8. DISCUSSION

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### 8.1 INTRODUCTION

- 8.1.1 The excavation and subsequent radiocarbon dating of Building A at Tongue House High Close has revealed a domestic structure that was in use during the early sixteenth to later seventeenth century, but it is not possible to confirm that it did not have earlier origins. The building was set within a small stone-walled enclosure, which itself lay within one corner of a much larger sub-rectangular stone-walled enclosure, now overlain by the more recent intake walls that define Tongue House High Close (Fig 6).
- 8.1.2 The function of the building is uncertain and may have changed over time. One possibility is that it was a shieling intended to manage upland grazing in the summer months, but given the association with field systems and pounds it may have been a permanent farmstead or one used for much of the year, not just the summer months. The debate focusses on the extent to which the building allowed for wintering of animals.

### 8.2 TONGUE HOUSE BUILDING A

- 8.2.1 Earlier activity has been recorded in the form of a radiocarbon determination of oak charcoal recovered from a soak-away (**1027**), which produced a late seventh to late ninth century date. This charcoal is likely to have derived from the same sources as several other charcoal bearing features stratigraphically pre-dating the house, in particular a probable palaeo-channel (**1063**), which lay below the south-west wall **1018**. Where this charcoal derives from, and its significance is not clearly understood (*Section 7.2.1*).
- 8.2.2 Tongue House A was revealed as a north-west/south-east aligned structure, 10.45m long by a maximum of 4m across (Fig 15; Plate 1). The structure, in its earliest phase, comprised north and south cells divided by a cross passage. The interior of the upper, or north, cell was floored by two layers of cobbles (**1020** and **1028**), alder/hazel charcoal from the lower of the two floor surfaces (**1028**) provided the radiocarbon determination of 1514-1798calAD ( $275\pm30$ BP; SUERC-69651), with a 91.4% probability that the date range lay within a century and half of (1514 - 1668calAD).
- 8.2.3 A hearth (**1006**), and later modification (**1005**), lay toward the south-eastern end of the northern cell, close to the cross passage. The cross passage itself had been laid with two phases of cobbles (**1026/1029** and **1033**), which were most likely contemporary with those found in the north cell, but were more sporadic, and perhaps the stones were displaced by use. A tumbled orthostatic boulder situated on the north-west side of the north-east facing entrance may have been a partly dislodged door jamb. Such features can be seen in the shieling at Bewcastle, Cumbria, excavated by Royal Commission on Historical Monuments (England); (hereafter RCHME) in the 1960s (Ramm *et al* 1970, plates 3 and 4). That there was no charcoal associated with the hearths (**1006** and **1007**) suggests that wood was not generally used as fuel. Peat, a bed of which lay within the confines of the enclosure surrounding Building A, was probably exploited. In contrast to the expansive peat deposits in the Pennines, those in the Lake District are less

widespread (Winchester 2000, 126) and are often contained in settings like that of Tongue House High Close. The historical record suggests that these more discrete, and very much more finite, peat resources were subject to control throughout the period that Building A was occupied (*ibid*), but commoners using the land of the land would typically have rights of turbary allowing the cutting of peat. The vegetational history would support this idea, which indicates that there was little in the way of woodland in the fells (Quartermaine and Leech 2012) during this later medieval period requiring a greater reliance on peat sources for fuel.

- 8.2.4 The form of the traditional upland longhouse, such as those excavated on Dartmoor (Beresford 1979), would have had a domestic end, and a byre at the opposite end characterised by a drain. Such a drain is not evident in the southern cell of Tongue House A, suggesting that this end must have had an alternative, but uncertain, function. A rectangular stone-bounded structure / bench (1008) placed against wall 1019, with a cobbled floor (1031), remains slightly enigmatic. A similar structure was found within an excavated shieling at White Lyne Common (Northumberland) by RCHME and was there interpreted as a heather or bracken-stuffed seat (Ramm *et al* 1970, 10). Alternatively it could have served as a raised platform for the drying of peat as fuel for a domestic fire; there is a setting of stones laid in the eastern corner of the cell which is interpreted as a hearth (1007), and there is the possibility that the hearth and platform were contemporary. Although the hearth and platform are not consistent with the cell having served as a byre, the use of each end of the house could have changed over time, as was seen with the migration of hearths at House 4, Houndtor, Dartmoor (Beresford 1979).
- 8.2.5 An area of stones (1064), the utilised fill of palaeo-channel 1063, had been used as a rough yard surface, into which a series of drains had been inserted (1047 and 1048; Fig 15, Plate 17). Drain 1047 appeared to partly empty into a soak-away, as well as continuing beyond the limits of excavation. Oak charcoal from this feature (1027), produced the early medieval date cited above. There exists the potential that this was old carbon derived from palaeo-channel 1063, that was reworked when the house was constructed. Alternatively, the charcoal may have derived from the heartwood of a long-lived taxa, in this instance oak, the date could then be suffering from the 'old-wood' effect. Heartwood ceases to exchange with the atmosphere once new growth has developed (ie another growth ring), which means that heartwood may provide a date substantially older than the age of the tree at the time of felling, potentially 700+ years either side of the calibrated age-range (D Druce pers comm).
- 8.2.6 As identified by the DVLHG, Tongue House A lay within its own stone-walled enclosure, which itself lay within one corner of a larger enclosure (Fig 16; Matthiessen *et al* 2015). This in turn was part of a whole series of enclosures that extend up Tongue House High Close from the fields and meadows of the valley bottoms, which in this case are the distinctive assarted fields, the piece-meal clearance of waste or forest into the irregular fields, that are seen around Tongue House itself. It is this relationship between the valley fields and meadows, and what were the formerly unenclosed wastes of the fell sides, that are so typical of the Lake District, and may provide the key to understanding the role of Tongue House A.
- 8.2.7 **Longhouse vs Shieling:** taking into consideration the modest size of the structure, the sixteenth to seventeenth century date, the fell-side location and its setting with the stone wall enclosures / fields, it can be said with some degree of certainty that

Tongue House A is likely to have been seasonally-occupied when stock were removed to summer pastures (Winchester 2000, 85). Although a long-lived tradition in the north of England, the medieval and later stone longhouses differ from those recently examined by the Ingleborough Archaeological Group (IAG 2015; Johnson 2013). Within the Yorkshire Dales these early medieval examples are typified by their rounded corners and dwarf walls' (Dr D Johnson pers comm).

- 8.2.8 The arguments about what constitutes a longhouse are often based on nomenclature, but put simply the modern usage of the term stems from Dr I C Peate writing in the 1930s, and was to describe a house type with a byre, being a literal translation from the Welsh term *ty hir* (*ty* meaning house and *hir* meaning long; Beresford 1979). Archaeologically, the term longhouse describes a long rectangular building, and it should be noted that house does not necessarily denote permanent habitation, where domestic activity residing at one end, could be shared, but not exclusively so, with animals in the other, and the byre is just one possible function of the lower room (*ibid*).
- 8.2.9 The stone-built shielings described by Ramm *et al* (1970) are similar in design and dimensions to the Tongue House A structure (Fig 19). Shielings surveyed by the RCHME whose side walls survived to full height recorded dimensions of between 5ft and 5½ft (*c* 1.5m – 1.67m). Those from Building A were recorded at *c* 1.15m (approximately 3¾ft); however, these walls had undergone some collapse, and did compare favourably with other huts from the RCHME survey, which recorded six examples of walls surviving to a height of between 2½ft to 3½ft. (*op cit*, 9).
- 8.2.10 Generally, only one doorway was recorded in the RCHME surveyed huts; however, most of these shielings were not excavated, and cross-passages or blocked entrances may not have been apparent (*op cit*, 9; Fig 19). The presence of orthostatic door jambs found in structures surveyed by the RCHME has already been mentioned in relation to the possible example from Building A.
- 8.2.11 Gables were also recorded during the RCHME survey, which were lacking at Tongue House A, although this is not to say that they did not once exist, but may have collapsed. Gables were apparent in Tongue House B, but the date of this house has yet to be verified and its relationship with Tongue House A is not clear. Ramm *et al* considered that turf was the most likely roof covering, particularly as there were three instances where it had survived (*op cit*, 10). The house at Tinkler Crags, Northumberland, survived with a single pitched roof, which could be a possible model for Tongue House A, given the lack of gables (*op cit*, 14; plate 2; Plate 19), or a hipped roof with rafters resting on the outer edge of the walls; as proposed by Beresford in the reconstruction of the Houndtor houses on Dartmoor (1979, 128; fig 13B). It should be noted, however, that some of these structures had rounded ends, and was a feature absent on Building A.
- 8.2.12 Thatch is still a common material in the third world and was common for the roofs of the rural poor in Wales until the end of the nineteenth century (William 2010, 145), whilst there are frequent references to thatch as a material in the Lake District prior to the seventeenth century when slate became much more common (Denyer 1991, 158). By far the most common material recorded in the Lake District was 'Thack Brakens'; although the thatching technique is not documented, there are parallels from Scotland from the late eighteenth century (*ibid*). Techniques and photographs recorded from poor houses in rural Wales can perhaps give some idea of another type of roofing known as thrust thatch, which was common on the Irish

seaboard. This involved rough bows or wattle laid over the ridge pole and purlins, with an underthatch of bracken, heather or sods, with straw or rushes held down by rope (Wilam 2010, 162-3, Fig 133). However, it is a photograph taken in 1882 in Cardiganshire, of a very poor cottage, low-walled and windowless, with poorly thatched roof, which might best serve as an exemplar of the appearance of an early post-medieval shieling (*op cit*, 10, fig 6; Plate 20).



Plate 19: Turf-roofed hut as recorded by RCHME in Northumberland (Ramm *et al* 1970)



Plate 20: A picture taken, in Cardiganshire, Wales, dated 1882, of an old lady standing by her poor low-walled cottage with decayed thatch (Wilam 2010)

### 8.3 ‘PASTURED AND FED UPON THE MOUNTAYNES’, THE SHIELING LANDSCAPE

- 8.3.1 Tongue House A can be seen within the remains of an elongated series of irregular stone-walled fields / intake (Fig 6) first identified and surveyed by DVLHG (Matthiessen *et al* 2015) and further augmented by OA North survey. These enclosures / walls ascend the fell-side following the tributaries of Sunny Pike Gill, and ultimately appear to be territorially connected to the valley bottom fields of Tongue House Farm, whose irregular boundaries themselves suggest a medieval origin. Although there is no dating evidence for the enclosures, other than that they predate the later more regular extant boundary walls, the juxtaposition of Building A amongst them appears convincing. It can be argued that Building A was a late-medieval upland transhumant longhouse. Pollen data from the Devoke Water Cairns suggest that from the early medieval period onwards, the landscape remained largely cleared and was used for upland grazing (Quartermaine and Leech 2012). The present name for the area within which Building A is situated, is Tongue House High Close, reinforcing the connection with the valley Tongue House Farm; similarly, the name Scales Brow to the south-west of Building A supports the implication that the site was transhumant, as Scale is derived from the Old Norse *skáli* meaning a shieling or hill pasture. In the Lake District Scale is often found at higher altitudes than the broadly synonymous names *aergi* and *Sætre* (Whyte and Baldwin 1985, 105).
- 8.3.2 Seasonal transhumance and associated structures are widely attested in upland Britain and Ireland (Winchester 2000, 84). Lowland shielings, the evidence suggests, became permanent settlements by the thirteenth century in the Lake District, and the use of shielings is thought to have become near extinct by the late medieval centuries, surviving discretely in northern England and Scotland (Whyte and Baldwin 1985, 109-11; Winchester 2000, 85; Ramm *et al* 1970, 3). Ramm *et al* suggested that shielings in these northern fells were increasingly becoming permanent settlements by the sixteenth century, with historical evidence for the last rents being paid for seasonally occupied shielings generally around the middle of the sixteenth century (Ramm *et al* 1970, 3-5).
- 8.3.3 In the late 1960s, it was reported that shieling huts were a rarity in Cumbria, as opposed to those found further north by RCHME. Whyte and Baldwin writing about shielings in Cumbria in the mid-1980s reflected that groups of huts, rather than single structures, should define the shieling system, which indeed is the case at sites such as Sadgill north of Kendal (Whyte and Baldwin 1985, 110-2). He does, however, concede that isolated huts well above the present settlement limits are likely to be relatively late in date (*op cit*, 111), which is what is proposed here.
- 8.3.4 That shieling huts were being constructed as late as the sixteenth century is attested by the RCHME report, where examples in Bewcastle (Northumberland), were constructed from stones taken from a ruinous pele tower, being constructed after c 1500 and before 1603 when they are depicted on a map. Finds from other sites in Northumberland show occupation continued into the seventeenth century, whilst contemporary accounts indicate that abandonment of shieling sites was widespread by the middle of the eighteenth century (Ramm *et al* 1970, 7). Such evidence, if not associated with the Lake District, suggests that a sixteenth to seventeenth century date for the Duddon example is entirely plausible.

- 8.3.5 Winchester, in *Harvest of the Hills*, highlights the significant expansion of enclosed pasture on the fell sides in the sixteenth and seventeenth centuries (2000). This land lay between the valley bottom fields and meadows and the unenclosed wastes of the higher fells, which offered a more controlled management of the resource. Although the appropriation of the lower fell sides, generally between 200-300m, could be met with resistance by tenants, some communities were taking this type of land for themselves with the tacit approval of the Lords, as long as rent was paid, with such in-taking being ubiquitous in the Lake District valleys between c 1450 and 1600 (Winchester 2000, 68-9). There are references to late-medieval in-taking and shieling in the Derwent fells which also includes the creating of fields from the fell-side fringe (*op cit* 148-49). Again such examples bear similarities to the land organisation and dates from Tongue House High Close
- 8.3.6 Such activity can be associated with the function of the head-dyke, which is the boundary between farm land and the open fell, and such a boundary is indicated on the first edition OS mapping between Tongue House and Tongue House High Close. Thus, the expansion of pasture beyond the head dyke allowed stock to be removed to these higher, and now walled pastures, where they could be seasonally managed from high level houses.
- 8.3.7 Some buildings in the upland pastures were simply intended for milking the stock, and is certainly the case for Scaling names in other parts of Cumbria rather than transhumance proper (*op cit*, 92-3). Notwithstanding that, the division into two cells and with appurtenances such as hearths indicate that Tongue House A had a domestic function rather than purely as a milking parlour.

#### **8.4 TONGUE HOUSE A DEVELOPMENT**

- 8.4.1 **Phasing:** the Tongue House A building displays considerable development over its working life. In the earliest phase it was a two-celled building, with a cross passage, and had two layers of cobbles surfaces in the northern cell with a hearth laid on top. In the second phase the north-eastern entrance was blocked and a partition wall was constructed at the southern end of the northern cell. A series of walls were constructed around the house forming a pair of pounds and it was linked by field walls into a wider intake field system.
- 8.4.2 **Interpreted Development:** the pastoral practices indicated by these later peripheral structures imply a higher level of stock management than that associated with the earliest simple structure, and is more consistent with a farmstead than the traditionally perceived ‘shieling’. The implication is that not only has the building developed but so has the function of the building. In its earliest, and most basic, form it was probably a shieling, providing accommodation for stockmen while the upper fells were grazed in high summer, but latterly may have developed into something more permanent.
- 8.4.3 In its latter phase there are two possible interpretations, either the building had a semi-permanent occupation as an outpost of a valley farm, that is it was potentially used for much of the year excepting the winter months, or that it was a permanently occupied farmstead. The case for the former option is that there are considerable difficulties of farming at this altitude over the winter months and because there is no confirmed usage of the lower (southern) cell as a byre for wintering animals. In this possible scenario the building may have been occupied for much of the remainder of the year, and was likely to have been tied to the lower Tongue House

Farm. Within this context, the distinction between the terms ‘Shieling’ and ‘Longhouse’ becomes very grey, as the building has developed from a hut, occupied by a shepherd for a few months of the year, to a longhouse (or farmstead) that was more intensively worked and may have been occupied for a greater proportion of the year, but yet was still technically seasonal.

- 8.4.4 The other possible alternative is that it was a more permanent squatter settlement, which were briefly prevalent in the sixteenth century as a response to population pressure (Whyte and Baldwin 1985); however, there is no confirmed wintering of stock in the southern cell. Given the possible alternative interpretations it is, perhaps, better to describe the final form of Tongue House A as a longhouse in seasonal (or not) use than to categorise it as a shieling because of the semantic associations that have been applied to that term.

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## APPENDIX 1: PROJECT DESIGN

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### **1. INTRODUCTION TO THE PROJECT**

- 1.1.1 Oxford Archaeology North (OA North) has been invited to provide supervision and enablement for a community archaeology survey and excavation project of three longhouses in the Duddon Valley (Tongue House A and B, and Long House Close). This is to be undertaken on behalf of the Duddon Valley Local History Group and in conjunction with the National Trust and the Lake District National Park Authority and financed by Heritage Lottery Fund. OA North would provide supervision and guidance for a community survey and excavation of the longhouses.
- 1.1.2 This is part of a long standing community project which has already been involved in both detailed and identification surveys throughout the Duddon Valley, and the results of which have been widely disseminated (DVLHG 2009; Matthiessen *et al* 2013). The survey programme identified a number of longhouses that warranted further investigation, and is a class of monument that has rarely been subject to detailed excavation. The wider aim of the project is to involve local people and to provide training in excavation for three of the sites and the survey of four sites.
- 1.1.3 OA North would provide supervision of volunteers undertaking detailed geophysical surveys of each of the three sites, and would entail both resistivity and magnetometry surveys. OA North would also undertake excavations of each site over three seasons. A principal aim of the project is to involve the local community as widely as possible, and to provide new information on the wealth of archaeological remains in the area. This will entail providing presentations to the volunteers and getting them directly involved in undertaking field surveys and also the excavations. There would be the provision of interpretation panels and the project would entail presentations to schools. Ultimately the results would be disseminated in reports, and publications and in updated records for the Lake District National Park Authority Historic Environment Record and the National Trust SMR.

### **2.1 AIMS OF THE PROGRAMME**

- 2.1.1 The primary aims of the project are as defined in the project brief and are as follows:
- To encourage local volunteers to gain an understanding of the history of the area through survey and excavation. The volunteers will learn techniques of surveying and excavation and provide them with a clear understanding of the archaeological processes.
  - The information collated will be able to be used for interpretation purposes to inform local communities and visitors in the catchment.
- The objectives of the project are as follows:
- To excavate part of each long house site with the help of local volunteers to obtain evidence for dates of construction (charcoal, pottery, other artefacts etc) from secure contexts undamaged by bracken.
  - To look for evidence of stock husbandry (livestock types and numbers) associated with each structure.
  - To look for any evidence of crop-growing in the vicinity of the structures.
  - To investigate deposits from secure contexts within and around the structures for palaeo-environmental evidence of foods (*eg* seeds, grains, bones etc) eaten by the former inhabitants.
  - To obtain evidence from pollen and other deposits in peat beds to indicate the nature of the environments surrounding the structures when they were in use.
- 2.1.2 **Community Aims:** the project aims to seek a wide community involvement in the research and investigation of areas within the Lake District National Park, and to foster a wider community awareness of the rich cultural heritage in the local landscapes. It is intended to use the present project as a means of training volunteers, and others in the wider community, in archaeological survey and excavation techniques. Great emphasis will be placed on the virtue of survey

techniques and to encourage a legacy of skills within the community. The project will therefore provide a capacity for further archaeological and historical research in the area. The project will involve local schools and community organisations, and will entail visits to local schools and to provide teaching packs for the schools.

### **3. METHODOLOGY**

#### **3.1 PROJECT PREPARATION**

- 3.1.1 At the outset there will be a process of liaison between OA North, DVLHG, The National Trust, and the Lake District National Park Authority staff. This will entail defining the output formats for incorporation into the HER, and having at least one field visit to examine the known archaeology and refine the project methodology. At the same time a project surveyor will establish survey control across each of the respective sites in advance of the main survey using survey grade GPS.

#### **3.2 INTERPRETATION BANNERS**

- 3.2.1 It is proposed to produce a series interpretation banners which could be used at public events, and workshops. In the course of the project it is proposed that two Roller Banners, and one fabric banner be created, and at the end of the project a legacy Roller Banner be created to commemorate the results of the whole project. The Roller Banner can be free standing and quickly set up at events; they are, however, only intended for internal display. The fabric banner is a waterproof banner than can be erected against walls, and is intended for longer term display. In addition it is also proposed to produce an A3 poster that will advertise the project and can be put up around the area and would be appropriate for external display. The roller banners / fabric banner would be produced at the outset and over the course of the project. They would have limited amounts of text and a small number of large photographs, and would be similar to those used at Sizergh Castle albeit some would be on vertical roller banners rather than A0 format (see below). There would be one banner to describe long houses generally, another to provide information about the project and present the initial survey results and finally there would be one to summarise the previous work of the Duddon Valley History Group. There would also be an A3 poster that would provide a general introduction to the project and would provide contact details. It would be printed either on full weather proofed fabric or on glossy paper which has limited weather resilience.

#### **3.3 SCHOOLS AND GENERAL OUTREACH**

- 3.3.1 There will be a process of interaction with the local schools as part of the projects outreach. The first stage will be a presentation to the five schools at the outset of the project and prior to any visit to site, then it is anticipated that there will be a site visit from the schools in the course of the project. This outreach phase would be undertaken by a member of staff with experience of schools presentations. On the day of the site visit, there will be support from the DVLHG to supervise the children and provide additional instruction. On completion of the project a final presentation will be established for the schools as a follow up and will reinforce the learning experience from the excavation. It is anticipated that there will be 10 days of schools supervision and presentation per year.
- 3.3.2 **Transport:** it is anticipated that the school children will be taken by minibus to the start of the track up to the Seathwaite Tarn and from there they will walk up to the sites. The costs do not allow for the hire of a minibus to transport the children to the start of the UU track.

#### **3.4 ARCHAEOLOGICAL SKILLS WORKSHOP**

- 3.4.1 The first stage of the project will be a skills workshop that will be undertaken at a local hall and would be intended to train volunteers in excavation and survey techniques. It would entail a power point presentation and then a practical demonstration of archaeological methods outside the hall or on adjacent ground. The workshops will have an important need to provide valuable training in advance of the fieldwork, but also serve as an introduction to the archaeologically uninitiated and therefore should, above all be enlightening and entertaining. There will be a mixture of experienced archaeological volunteers, who have been involved in comparable community projects in the past and also there will be those who have had no previous experience; the workshops will aim to provide training for both. This will be achieved by providing a variety of techniques on the workshop day so that there will always be some aspect that even the more experienced volunteers can benefit from. As there will be three workshops, one for each season of fieldwork, there will be

introduced a variety of techniques in the later workshops so that the body of experienced volunteers will continue to be engaged and enthused. In the later workshops this will include a brief presentation of the results from the earlier phase of the project. Although there will be powerpoint presentations, the emphasis of the workshops will be upon the practical demonstrations, and to increase variety it may be appropriate for one or two of the more experienced participants to lead demonstrations in the later seasons. The themes and subjects for the later workshops will develop out of the first season of fieldwork, and it would be inappropriate to propose them at the outset as part of the present project design. It is, however, possible to define the subjects for the first workshop.

- 3.4.2 ***First Workshop:*** the first workshop will start with a brief power point presentation to introduce the participants (and potential participants) to the project and provide them with a guide as to what the project will do, and also will introduce them to the sites. This would outline the range of techniques available to the archaeologist, before addressing in detail the methods that will be undertaken by the participants. This would include an introduction to the theory and practices of archaeological excavation, palaeoenvironmental analysis, finds processing, and survey techniques. This would be followed up by demonstrations and instruction in geophysical survey, site planning, and instrument survey. The survey techniques would include a total station with pen computer (to display the results), and survey grade GPS. There may also be an introduction to the aerial photogrammetric modelling and would allow participants to create their own models based upon photos taken with a photographic mast. The aim would be to introduce the participants to the proposed programme but also to raise interest and enthusiasm. Experience of previous launch events (eg at Holwick and Windermere Reflections) was that these attract lots of people, lots of interest and set the project off to a good start.
- 3.4.3 It is anticipated that the workshops would be delivered over a Saturday prior to the start of the programme and will require three OA North staff, in order to provide sufficient variety of technique and also to provide more personal instruction. The potentially large numbers of attendees will demand that they are split into smaller groups and the activities will be staggered to allow full use of the day and provide for more individual instruction by the professional archaeologists.

### 3.5 DETAILED SURVEYS

- 3.5.1 It is intended that this survey process serve as a training exercise for the volunteers, so the survey techniques will be devised to be easy to understand, and will allow for plotting in the field, is easily affordable by volunteers, but at the same time will provide training in a variety of techniques to present the range of techniques available. This will include the use of some outdated technologies, which will have a significant impact on productivity, but this will be off-set by the use of more current techniques that will enable detailed 3D recording. It is proposed to undertake a range of different survey techniques which will be varied to meet the needs of each long house structure. The general techniques are: theodolite and disto topographic survey, photogrammetry survey from a UAV (drone), magnetometry survey, resistivity survey, palaeoenvironmental survey (coring), and probing survey. Described below are the general techniques and a further section will outline how each will be applied for each long house.
- 3.5.2 ***Topographic Survey:*** it is understood that the physical remains have already been recorded, but there is a need to record the wider topography to set the context for the base survey. This will be done by a range of techniques and will be intended to provide as much training as possible in survey techniques, but is also intended to provide an accurate and general survey of the wider landscape. To survey the immediate environs it is proposed to use a theodolite and disto which is cheap and easy to use equipment, and is a technique which can potentially be used by the group following the end of the present project. In conjunction with this a photogrammetric survey will be undertaken of the wider area using specialist UAV equipment. The two will be combined to create the final survey results.
- ***Theodolite / Disto Survey:*** the use of a theodolite / disto has been found to be very effective during earlier surveys. The theodolite measures angles and the disto measures the distances and then the data is drawn up in the field by volunteers using an accurate film based protractor and ruler. This allows the volunteers to be involved in all stages of the process.
  - ***Photogrammetric Recording:*** it is proposed to record the sites and general environs by means of aerial photography, which, using specialist photogrammetric software, can be used to create accurate three dimensional models of the site and topographic surfaces. For

large landscapes there are two methods available, the first is to use a UAV, which is a small multi-engined model helicopter and provides photography from any altitude up to approximately 200m height. The alternative is to use a mast with a camera mounted on top. The latter is not effective at recording large areas, but can be undertaken by the volunteers, and allows them to get involved in the photogrammetric process using inexpensive equipment. In practice it is proposed to use both techniques. Survey control is introduced to the photographs by the placement of survey control targets across the site which are located by means of survey grade GPS or total station.

- The photogrammetric processing is undertaken using Agisoft software which provides detailed modelling using the overlap of up to 120 photographs, and creates a very detailed DTM (Digital Terrain Model) across the site. The photographs are then digitally draped over the model to create an accurate three dimensional model of the ground surface. The primary output, however, is an accurate two dimensional image which can be used to generate accurate plans or profiles.
- **Survey Control:** it is proposed that survey control be introduced to the sites by means of a high accuracy survey type differential GPS where possible. This can achieve accuracies of +/- 20mm, and will ensure that the survey is accurately located onto the Ordnance Survey National Grid. If at any of the sites there is no mobile reception (necessary to provide corrections for the GPS) then the control will be established by means of a total station.

3.5.3 **Magnetometry Survey:** magnetometry is not the best technique for recording rocky landscapes, or where there is the potential for bedrock near the surface; however it is very effective for the identification of hearths. It is therefore proposed to undertake a rapid survey of the interiors of each of the long houses, but which will also extend some way beyond the extent of each long house.

3.5.4 The detailed magnetic survey will be carried out using a Bartington Grad601-2 gradiometer which has an internal data logger. Data will be collected in zig-zag mode over a half grid (15m x 30m), the magnetic data will be collected at 0.25m intervals on profiles 1m apart (3600 readings per grid). The instrument is easy to use and handle and the basic survey operations and technique can be easily explained to volunteers.

3.5.5 **Resistivity Survey:** the resistance survey is most effective at identifying stone structures; however, it can be masked, and the results confused, by the proximity of natural stones and bedrock. It is anticipated that it will only provide useful results at a selected number of long house sites and the survey will therefore concentrate on those sites.

3.5.6 The detailed resistance survey will be carried out using a Geoscan RM15 resistance meter, which has an internal data loggers. Data will be collected in zig-zag mode over 30m by 30m grids, the resistance survey data will be collected at 1m intervals on profiles 1m apart (900 readings per grid). The instrument is easy to use and handle and the basics of survey operation and technique can be easily explained to volunteers.

3.5.7 **Survey Control:** the survey grids will be staked out and surveyed using either an RTK GPS system or total station to Ordnance Survey co-ordinates to at least 0.05m accuracy. Bamboo canes will be placed at grid node points and survey ropes and canes will be used to mark out the survey traverses.

3.5.8 All data will be downloaded immediately following collection using specialist survey software and will be minimally processed where applicable. Raster images will be exported, usually in .png or .jpg format for presentation and dissemination. These images will be imported into CAD software and overlain on a geo-referenced base plan. An interpretation of the anomalies will be presented in CAD and a non-technical summary and discussion of the results will be included in a report which will accompany the interpretation.

3.5.9 It is proposed that much of the survey area will be surveyed by an experienced geophysicist prior to project participants and casual visitors' involvement in order to allow for some final example data to be available for viewing at the commencement of the project. The survey will be carried out in accordance with English Heritage guidelines (2008) and IFA standards (2010).

3.5.10 **Coring Survey:** a process of environmental coring will be undertaken by experienced palaeoenvironmentalists within and around the area of each long house, macrofossils and pollen. A rapid process of probing will be used to examine stratigraphy of the soils in the environs of each long house to identify any significant deposits, particularly peat, that would warrant more detailed coring. This will be undertaken using a gouge auger and the depth, type, and preservation of the waterlogged

stratigraphy will be recorded on *pro-forma* record sheets, and the survey will seek to record the character of the underlying stratigraphy. The sediment stratigraphy will be recorded using the terminology and procedures outlined by Troels-Smith (1955). If good peat deposits are identified then a core will be undertaken with a Russian Corer which has the capability of taking clean and secure deposits and will be appropriate for radio carbon dating. The cores will be located, both spatially and in altitude, by means of survey grade GPS. Samples will be taken from the top and bottom to facilitate radio carbon assay. Selected sampling will be undertaken within the longhouse to investigate for the potential for charcoal deposits related to a hearth; however, this will entail a limited number of core holes as there is a need to limit disturbance to the buried soil deposits.

- 3.5.11 ***Analysis of Cores:*** an assessment will be undertaken of selected cores taken with the Russian corer, and will be in addition to the recording of the deposits in the field. This will entail taking small samples of peat will from significant levels in the core. These will be examined microscopically in the laboratory for plant macrofossils to confirm the field identification and some will be assessed for pollen sampling. Larger samples from basal deposits will be assessed for radiocarbon dating to provide inception dates for the waterlogged deposits.
- 3.5.12 ***Probing:*** it is proposed to undertake probing at the site and will entail the use of a steel probe to identify stone elements below the ground. It is particularly effective at tracing structures which have a limited surface expression, and where there is a need to establish where and how they continue. Where stone elements are identified the edges will be defined with the probe and then marked on the ground with a survey arrow. The process is continued until the whole outline of a wall or stone structure is defined by survey arrows. The arrows are then surveyed using a survey grade GPS to record the extent of the buried stone features. It is proposed to use the technique at selected sites where it is considered that there is uncertainty about the form of visible structures and where the technique will be profitable.
- 3.5.13 ***Proposed Survey Strategies for each Long House Site:*** each long house is different and the survey needs of each site is correspondingly different. The survey strategies have been devised for each site in order to provide the most informed and effective range of techniques. At each site there will be a need to clear the vegetation from the site to allow a detailed understanding of the site and topography; however, the extent of the vegetation clearance will again depend on the needs of the site.
  - ***Tongue House A:*** the site has very clear visual remains, bedrock and natural boulders close to the surface and is associated with a field system that is fairly extensive. The main topographic survey of the immediate environs around the long house, will be undertaken using the theodolite and disto as that provides the best training potential. The wider area, containing the field system, will be surveyed by means of the photogrammetry using a drone. This will also record the wider topography and will generate contours. The bedrock is too close to the surface to make resistivity an effective technique, but magnetometry will be used to search for a hearth within the structure. There is a possible peat deposit in the immediate environs of the site and it is proposed to use gouge and Russian corers to explore this deposit.
  - ***Tongue House B:*** the site has very clear visual remains, bedrock and natural boulders close to the surface and is associated with a field system that is fairly extensive. The main topographic survey of the immediate environs around the long house, will be undertaken using the theodolite and disto as that provides the best training potential. The wider area, containing the field system, will be surveyed by means of photogrammetry using a drone. This will also record the wider topography and will generate contours. The bedrock is too close to the surface to make resistivity an effective technique, but magnetometry will be used to search for a hearth within the structure. There is a possible peat deposit below the site, and adjacent is an area that looks as though it may have been improved in the past. It is proposed to use gouge and Russian corers to explore this peat deposit and to also undertake a stratigraphic survey, using the gouge auger, to establish the character of the area of improved ground. There is limited potential for probing.
  - ***Long House Close:*** the site is a large enclosure and a group of at least two long houses; it has a mixture of clear visual remains and some which are apparently obscured. There is the potential to explore remains beyond the limits of the main house enclosure. The main aim of the survey will be to identify the character and form of the buried components of the structures, and it is therefore proposed to use a programme of probing and resistivity

survey to explore the extent of the site, and to trace the continuations of surface features which seemingly extend below the surface. A magnetometry survey will also be undertaken to examine the potential for hearths within the long houses. As the emphasis will be on the investigative element of the survey, it is proposed to undertake all of the topographic survey by photogrammetry.

### 3.6 EXCAVATION

- 3.6.1 OA North will supervise the excavation of the long houses, and will entail the excavation of areas of sufficient size to be able to be excavated and completed over the course of 16 working days, including three weekends. In practice the area will be dependent upon the numbers of participants, and it is anticipated that this will entail a flexible approach, whereby smaller areas will be opened initially and can then be expanded or additional areas opened as the work progresses. It is proposed to excavate one long house each year over three years.
- 3.6.2 It is proposed to excavate three of the four sites, and the decision as to which of the sites is not excavated should be informed by the survey programme; however, for practical and planning purposes there is a need to have some guide as to which of the four sites will be excavated in the first year. It is proposed that this site should be Tongue House Close A, because it is conveniently near to the Seathwaite Tarn track, and because it is a logically straight forward site to excavate. It is proposed to make an aperture through the field wall separating it from the track, and it would be sensible that the survey and excavation of this site be undertaken as close as possible to minimise the time that the aperture is open.
- 3.6.3 The following section outlines a methodology for the undertaking of excavations of the long houses. The emphasis for the excavation will be upon providing training, and providing a valuable experience for the participants, rather than undertaking extensive areas of excavations to tight timetables. While it is important that all areas opened are fully excavated, the extent of the excavation areas will be defined so as to ensure that the participants can comfortably complete these areas within the time allowed. At the end of the excavation the excavations areas will be backfilled and the turf will be relaid.
- 3.6.4 It is anticipated that there will be two professional archaeologists supervising the excavations and surveys, and that there will be a ratio of four or five participants for every professional.
- 3.6.5 **Site Preparation and Preliminary Survey:** prior to the commencement of any work, a risk assessment will be compiled by the OA North Project Director. The initial element of the fieldwork will comprise the establishment of survey control using survey grade GPS. Gazebos / tents will be erected on site to provide cover immediate to the site and a mobile welfare unit, including portable toilets, will be established at the closest point to the excavations. It is proposed to use a groundhog welfare unit, which is a towable trailer and can be taken along rough tracks using a 4x4 vehicle, and therefore the unit can be located as close as possible to each excavation area. Netlon fencing will be erected around the excavation areas in order to keep sheep out.
- 3.6.6 **Turf Clearance and Excavation:** at the outset the turf will be carefully removed from the excavation areas by manual techniques and the turf will be stored separately from the spoil and adjacent to the excavation on terram.
- 3.6.7 All excavation will be carried out using manual techniques. Spoil from the excavation will be stored at a location adjacent to each site. Structural remains will be cleaned to define their extent, nature, form and, where possible, date. It should be noted that no archaeological deposits will be entirely removed from the site. It is not anticipated that excavation in any of the trenching will proceed below a depth of 1.2m, although should this be considered necessary, then the trench will be widened sufficiently to allow the sides to be stepped in or battered back to a safe angle of repose.
- 3.6.8 All information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage. Results of the evaluation will be recorded on *pro-forma* context sheets, and will be accompanied with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.

- 3.6.9 Samples will be taken from within the house sites to enable phosphate analysis and will be undertaken alongside the excavation programme. This work will be undertaken by the participants under the guidance of a palaeoenvironmentalist.
- 3.6.10 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photography will be undertaken using digital photography and will be undertaken throughout the course of the fieldwork. Photographs records will be maintained on special photographic *pro-forma* sheets.
- 3.6.11 **Planning:** the precise location of all archaeological structures encountered will be surveyed by a combination of manual techniques using a planning frame or using a total station. All survey drawings will be completed by manual draughting techniques on site. This process will ultimately generate scaled plans within an AutoCAD system, which will then be refined by manual draughting by local community volunteers. The drawings will be generated at an accuracy appropriate for 1:20 scale, but can be output at any scale required. Sections will be manually drafted as appropriate at a scale of 1:10. All information will be tied in to Ordnance Datum. On completion of the excavations aerial photographs will be taken of each site using a photographic mast.
- 3.6.12 **Backfilling:** the excavation areas will be manually backfilled by OA North and the participants, and the turfs will be relaid.
- 3.6.13 **Finds policy:** finds recovery and sampling programmes will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. OA has close contact with Ancient Monuments Laboratory staff at the University of Durham and, in addition, employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation.
- 3.6.14 Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham. Samples will also be collected for technological, pedological and chronological analysis as appropriate.
- 3.6.15 Human remains are not expected to be present, but if they are found they will, if possible, be left *in situ* covered and protected. If removal is necessary, then the relevant Home Office permission will be sought, and the removal of such remains will be carried out with due care and sensitivity as required by the *Burials Act 1857*.
- 3.6.16 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996.

### 3.7 POST-EXCAVATION WORK

- 3.7.1 An archive for the project will be prepared during and immediately following the fieldwork programme for and a summary forwarded to the LDNPA Historic Environment Record. The results of the excavation will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Research Projects in the historic Environment*, 2006). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly quantified, ordered, and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the Institute for Archaeologists.
- 3.7.2 An interim report will be compiled at the end of each season of excavation. It will present, summarise, and interpret the results of the programme. It will include an index of archaeological features identified in the course of the project, with an assessment of the site's development. It will incorporate appropriate illustrations, including copies of the site plans and section drawings all reduced to an appropriate scale.
- 3.7.3 An assessment of the samples will be undertaken on the fauna, the palaeoenvironment for waterlogged plant remains, and for phosphate analysis. It is considered that there is considerable potential to better understand the activities within the longhouses by means of phosphate and macrofossils analysis.

3.7.4 Initial finds processing will, as far as possible, be carried out on site. This may involve the initial processing and cataloguing of finds, cross-checking site records, preparing phase plans, and checking all drawings. Participants will be encouraged to contribute any fresh research information, which may be incorporated into the final report.

### **3.8 INTERIM REPORT PRODUCTION**

3.8.1 ***Interim Report:*** the interim report will present, summarise, and interpret the results of the programme detailed in Stages 3.6 above, and will include the following:

- a front cover to include the NGR and the client;
- the dates on which the fieldwork was undertaken;
- acknowledgements and the names of all contributors to the project, including all the volunteers;
- a description of the project and methodology;
- a summary of the historical background to settlement in the specific areas;
- results of the geophysical survey
- results of the coring programme
- results of the excavation work
- specialist reports on the assessment of the samples and artefactual assessment
- a complete bibliography of sources from which data has been derived;
- presentation of the completed topographic survey mapping
- a copy of this project design, and indications of any agreed departure from that design;
- a gazetteer of all identified monuments and historic features;
- a list of the archive contents;

3.8.2 The report will incorporate appropriate illustrations, including copies of the site plans, and detailed survey plans of each longhouse, all reduced to an appropriate scale. The site mapping will be based upon the CAD base. The report will be accompanied by photographs and historic illustrations illustrating the principal elements of the landscape.

3.8.3 ***Final Report:*** the final report will incorporate all the results of the earlier seasons of work and also will include a landscape assessment to set the wider context for the house sites

3.8.4 ***Popular Report:*** a reduced version of the final report will be compiled, which will be heavy on illustrations and photographs and will be approximately 25 pages in length and in A4 format. Although based on the final report, it will be subject to desk-top publishing design, and will include a well designed cover to improve the visual appearance. It will be commercially printed and it is anticipated that there would be an output of 50 copies. While this will be adequate to present the results to the group it will not be a glossy published booklet and will not be appropriate for publication or commercial sale.

3.8.3 ***Editing and submission:*** the report will be subject to the OA North's stringent editing procedure; then a draft will be submitted to the client and Lake District National Park for consultation. Following acceptance of the report, six bound copies of the report (and digital copy) will be submitted to the LDNPS HER. A summary of the work will be provided for OASIS.

### **3.9 OTHER MATTERS**

3.9.1 ***Access and Welfare:*** access for the sites will be negotiated with the land owners by DVLHG. Access to the sites for excavation will allow for the use of a 4x4 vehicle to gain access. Welfare facilities will be provided for the staff and volunteers. It is proposed to use a ground hog welfare unit, which can be towed to the site behind a 4 x 4 vehicle.

3.9.2 ***Site Conditions:*** all the sites have considerable vegetation cover and this will need to be cleared in advance of the survey particularly, but also in advance of the excavation programme. The extent of

the vegetation clearance will need to be agreed with DVLHG in advance, so that sufficient of the area will be exposed during the aerial and ground surveys.

- 3.9.3 **Health and Safety:** full regard will be given to all constraints during the survey, as well as to all Health and Safety considerations. The OA North Health and Safety Statement conforms to all the provisions of the SCAUM (Standing Conference of Unit Managers) Health and Safety manual. Risk assessments are undertaken as a matter of course for all projects, and will anticipate the potential hazards arising from the project. A very careful risk assessment will be undertaken in conjunction with the client.
- 3.9.4 **Insurance:** insurance in respect of claims for personal injury to or the death of any members of the public in the course of the project will be covered by OA North, who has insurance cover which complies with the employers' liability (Compulsory Insurance) Act 1969 and any statutory orders made there under. For all other claims to cover the liability of OA North in respect of personal injury or damage to property by negligence of OA North. The insurance cover is as follows:
- £10 million public liability
  - £10 million employers liability
  - £5 million professional indemnity

#### **4. WORK TIMETABLE**

- 4.1 The proposed timetable is defined in the brief and is reproduced below:
- Spring 2016, 10 days survey
  - Spring 2016, Preparation of survey reports
  - Summer 2016, Schools outreach
  - Summer 2016, Training Workshop - 1 day
  - Summer 2016, Excavation of long house - 16 days
  - Summer 2016 Production of interim excavation report
  - Summer 2017, Schools outreach
  - Summer 2017, Training Workshop - 1 day
  - Summer 2017, Excavation of long house - 16 days
  - Summer 2017 Production of interim excavation report
  - Summer 2018, Schools outreach
  - Summer 2018, Training Workshop - 1 day
  - Summer 2018, Excavation of long house - 16 days
  - Summer 2018, Production of final report

#### **5. RESOURCES**

##### **5.1 OA NORTH PROJECT TEAM**

- 5.1.1 The excavation will be directed by Jeremy Bradley (Project Officer) and the survey will be undertaken by Peter Schofield (Project Officer), under the guidance of the project manager, Jamie Quartermaine. The OA North element of report production will be split between Peter and Jeremy.
- 5.1.2 *Project Management:* the project will be under the project management of Jamie Quartermaine, BA Surv Dip MIFA FSA (OA North Project Manager) to whom all correspondence should be addressed. Jamie is a very experienced landscape surveyor, who has undertaken or managed literally hundreds of surveys throughout Northern England since 1984, and has considerable

experience of working on similar projects to that proposed. He has managed a major recording programme of Lyme Park, Cheshire, and very detailed surveys of the South West Fells including areas such as Barnscar and Burnmoor. He has also undertaken surveys of Lowther Park, Cumbria, Rufford Park, Lancashire and has also managed the recording programme of Lathom Hall and Park, Lancashire and the survey of the Forest of Bowland for United Utilities. He has been a project manager since 1995 and has managed over 350 very diverse projects since then, which are predominantly survey orientated, but of all periods from the Palaeolithic to the twentieth century.

- 5.1.3 Jamie is a qualified land surveyor (Topographic Sciences Diploma Glasgow University) and has an exhaustive knowledge and understanding of surveying techniques. He regularly runs training courses in survey techniques and has the expertise to devise a variety of survey techniques for training volunteers.
- 5.1.4 **Excavation Director:** the excavations will be directed by **Jeremy Bradley** BA Hons (OA North Project Officer) who has a wide range of archaeological experience, gained over the last 20 years, on both rural and urban sites, and on evaluations and open-area excavation, including large infrastructure projects such as the Wasdale (2012) pipeline. Other projects Jeremy has directed include three campaigns of field work at Furness Abbey Presbytery between 2009-11 and other medieval sites such as Clitheroe Castle sites and Penrith New Squares. Jeremy's chosen area specialism is the medieval period, particularly the study of medieval pottery in the North West. Work on medieval pottery has included a significant assemblage from a pottery production site at Samlesbury, Lancashire and urban assemblages from Carlisle, both of which have been published. Jeremy worked as a Project Officer for Humber Field Archaeology between 1999-2005, which involved supervising all levels of archaeological excavation, post-excavation analysis on sites in Hull, east Yorkshire and North Lincolnshire.
- 5.1.5 **Project Surveyors:** the survey will be undertaken by **Peter Schofield** (OA North Project Officer). Peter works full time on landscape surveys across the north-west. He has undertaken surveys at Hardknott Forest, Cumbria, Hartley Fold Estate, Cumbria, Ennerdale Valley, West Cumbria, a major programme of landscape survey across nine upland areas in North Wales, Little Asby Common for the Friends of the Lake District, and the Holwick and Force Garth surveys, Teesdale. With the exception of Jamie Quartermaine, he is our most experienced landscape archaeologist.

## APPENDIX 2 – POLLEN CORING LITHOLOGY

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953	<b>Gouge Core – reconnaissance survey</b>		
<b>Borehole No.</b>	1 Long House Close			
<b>Easting</b>	-			
<b>Northing</b>	-			
<b>GL ELEV (m aOD)</b>	300m +	<b>Logged by</b>	Mairead Rutherford	
<b>Total depth (m)</b>	1.10	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.57	-	-	No recovery (moss)
0.57	0.64	peat	-	Dark brown humified peat
0.64	0.90	clay	gradual	Very fine grey brown silty clay
0.90	1.10	-	-	No recovery. Gravel at base.

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953	<b>Gouge Core – reconnaissance survey</b>		
<b>Borehole No.</b>	Palaeo-Site 2 Tongue House (A)	Note: "middle of boggy area" adjacent to Tongue House (A) site. This core showed peat was present, so a transect was established with this core as the midpoint.		
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford	
<b>Total depth (m)</b>	1.5	<b>Date</b>	13.3.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	1.0	-	-	No recovery (moss)
1	1.5	peat	-	Brown humified fibrous peat. Rock at base.

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				

<b>Site code</b>	L10953	<b>Gouge Core transect – 5m north from core P3 above</b>		
<b>Borehole No.</b>	P2 Tongue House (A)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford	
<b>Total depth (m)</b>	0.90	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.90	-	-	No recovery (moss). Rock at 0.90m

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953	<b>Gouge Core transect – 10m north from core P3</b>		
<b>Borehole No.</b>	P1 (2) Tongue House (A)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford	
<b>Total depth (m)</b>	0.80	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.80	-	-	No recovery (moss). Rock at 0.80m

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953	<b>Gouge Core transect – 5m south from core P3</b>		
<b>Borehole No.</b>	P4 (1) Tongue House (A)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford	
<b>Total depth (m)</b>	1.10	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				

Depth (m)		Keyword	Upper contact	Description
From	To			
0	0.70	-	-	No recovery (moss)
0.70	1.02	peat	-	Brown humified mossy peat with small wood fragments towards base
1.02	1.10	-	No recovery	Rock at 1.10m

BOREHOLE RECORDING SHEET				
SUMMARY DETAILS				
Site code	L10953 Gouge Core transect – 10m south from core P3			
Borehole No.	P5 (2) Tongue House (A)			
Easting				
Northing				
GL ELEV (m aOD)				
Total depth (m)	1.10	Date	13.4.16	
COMPOSITE LITHOLOGICAL LOG				
Depth (m)		Keyword	Upper contact	Description
From	To			
0	0.50	-	-	No recovery (moss).
0.50	0.90	peat	-	Very fibrous brown mossy peat
0.90	1.10	-	-	No recovery; rock at 1.10m

BOREHOLE RECORDING SHEET				
SUMMARY DETAILS				
Site code	L10953 Gouge Core transect –core P3			
Borehole No.	P3 Tongue House (A)			
Easting				
Northing				
GL ELEV (m aOD)				
Total depth (m)	1.60	Date	13.4.16	
COMPOSITE LITHOLOGICAL LOG				
Depth (m)		Keyword	Upper contact	Description
From	To			
0	1.10	-	-	No recovery (moss).
1.10	1.60	peat	-	Brown humified fibrous peat. Rock at 1.60m.

<b>BOREHOLE RECORDING SHEET</b>				
<b>Site code</b>	L10953	<b>Gouge Core transect – 5m west from core P3</b>		
<b>Borehole No.</b>	P8 (2) Tongue House (A)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>				
<b>Total depth (m)</b>	1.70	<b>Logged by</b>	Mairead Rutherford	
		<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	1.20	-	-	No recovery (moss).
1.20	1.70	peat	-	Brown humified peat, wood fragments; rock at base.

<b>BOREHOLE RECORDING SHEET</b>				
<b>Site code</b>	L10953	<b>Gouge Core transect – 10m west from core P3</b>		
<b>Borehole No.</b>	P9 (3) Tongue House (A)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>				
<b>Total depth (m)</b>	1.20	<b>Logged by</b>	Mairead Rutherford	
		<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.70	-	-	No recovery (moss).
0.70	1.20	peat	-	Brown humified fibrous peat; rock at base.

<b>BOREHOLE RECORDING SHEET</b>			
<b>Site code</b>	L10953	<b>Gouge Core transect – 5m east from core P3</b>	
<b>Borehole No.</b>	P7 (1) Tongue House (A)		
<b>Easting</b>			
<b>Northing</b>			

<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford
<b>Total depth (m)</b>	1.50	<b>Date</b>	13.4.16
<b>COMPOSITE LITHOLOGICAL LOG</b>			
<b>Depth (m)</b>	<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>		
0	1.00	-	No recovery (moss).
1.00	1.30	peat	Brown fibrous peat
1.30	1.35	clay	Brown, wet, organic peaty clay
1.35	1.50	-	No recovery, gravel at base.

<b>BOREHOLE RECORDING SHEET</b>			
<b>SUMMARY DETAILS</b>			
<b>Site code</b>	L10953		
<b>Borehole No.</b>	P6 (2) Tongue House (A)	Gouge Core transect – 10m east from core 2	
<b>Easting</b>			
<b>Northing</b>			
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford
<b>Total depth (m)</b>	1.50	<b>Date</b>	13.4.16
<b>COMPOSITE LITHOLOGICAL LOG</b>			
<b>Depth (m)</b>	<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>		
0	0.70	-	No recovery (moss).
0.70	0.80	peat	Brown fibrous peat
0.80	1.20	peat + clay	Brown fibrous peat and light brown silty clay; rock at base.

<b>BOREHOLE RECORDING SHEET</b>			
<b>SUMMARY DETAILS</b>			
<b>Site code</b>	L10953		
<b>Borehole No.</b>	Palaeo-Site 3 Core 3 Tongue House (B)	Gouge Core reconnaissance survey – middle of "boggy area" adjacent to Tongue House B site. This core showed peat was present, so a transect was established with this core as the starting point.	
<b>Easting</b>			
<b>Northing</b>			
<b>GL ELEV (m aOD)</b>		<b>Logged by</b>	Mairead Rutherford
<b>Total depth (m)</b>	1.15	<b>Date</b>	13.4.16
<b>COMPOSITE LITHOLOGICAL LOG</b>			

Depth (m)		Keyword	Upper contact	Description
From	To			
0	0.20	peat	-	Light brown, fibrous mossy peat
0.20	0.45	peat	gradual	Dark brown/black fibrous peat
0.45	0.50	-	-	No recovery
0.50	0.70	peat	-	Brown fibrous peat
0.70	1.00	-	-	No recovery
1.00	1.15	peat	-	Brown, then blacker fibrous peat. Rock at 1.15m

BOREHOLE RECORDING SHEET					
SUMMARY DETAILS					
Site code	L10953	Gouge Core transect – 5m west from core 3			
Borehole No.	Palaeo-Site 3 Core 2 Tongue House (B)				
Easting					
Northing					
GL ELEV (m aOD)		Logged by	Mairead Rutherford		
Total depth (m)	1.10	Date	13.4.16		
COMPOSITE LITHOLOGICAL LOG					
Depth (m)		Keyword	Upper contact	Description	
From	To				
0	0.50	-	-	No recovery (moss).	
0.50	1.10	peat	-	Brown fibrous peat, rock at 1.10m	

BOREHOLE RECORDING SHEET					
SUMMARY DETAILS					
Site code	L10953	Gouge Core transect – 10m west from core 3			
Borehole No.	Core 1 Tongue House (B)				
Easting					
Northing					
GL ELEV (m aOD)		Logged by	Mairead Rutherford		
Total depth (m)	0.50	Date	13.4.16		
COMPOSITE LITHOLOGICAL LOG					
Depth (m)		Keyword	Upper contact	Description	
From	To				

From	To			
0	0.50	-	-	No recovery (moss). Rock at 0.50m

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953 Gouge Core transect – core 4			
<b>Borehole No.</b>	Core 4 Tongue House (B)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>				
<b>Total depth (m)</b>	1.00	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.50	-	-	No recovery (moss).
0.50	1.00	peat	-	Very wet, sloppy, fibrous peat; rock at 1m

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				
<b>Site code</b>	L10953 Gouge Core transect – 5m east from core 3			
<b>Borehole No.</b>	Core 5 Tongue House (B)			
<b>Easting</b>				
<b>Northing</b>				
<b>GL ELEV (m aOD)</b>				
<b>Total depth (m)</b>	0.50	<b>Date</b>	13.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.50	-	-	No recovery (moss).
0.50	1.00	peat	-	Very wet, sloppy, fibrous peat; rock at 1m

<b>BOREHOLE RECORDING SHEET</b>				
<b>SUMMARY DETAILS</b>				

<b>Site code</b>	L10953		
<b>Borehole No.</b>	2 Tongue House (A)		
<b>Easting</b>	324298		
<b>Northing</b>	497527		
<b>GL ELEV (m aOD)</b>	260		
<b>Total depth (m)</b>	0.50	<b>Date</b>	13.4.16

**COMPOSITE LITHOLOGICAL LOG**

<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0.85	1.33	peat	-	Dark brown, fibrous peat with silty clay.

**BOREHOLE RECORDING SHEET****SUMMARY DETAILS**

<b>Site code</b>	L10953		
<b>Borehole No.</b>	2S (1) Tongue House (A)		
<b>Easting</b>	324298		
<b>Northing</b>	497520		
<b>GL ELEV (m aOD)</b>	256		
<b>Total depth (m)</b>	0.50	<b>Date</b>	14.4.16

**COMPOSITE LITHOLOGICAL LOG**

<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0.50	0.74	Moss peat	-	Dark brown/black, very wet, fibrous mossy peat.
0.74	1.00	peat	-	Light to dark brown fibrous peat with clay.

**BOREHOLE RECORDING SHEET****SUMMARY DETAILS**

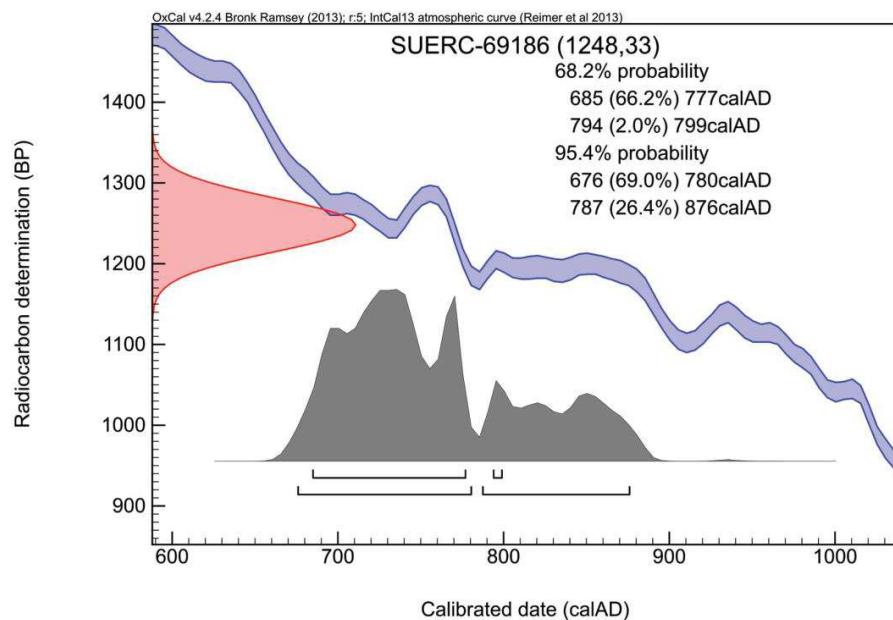
<b>Site code</b>	L10953		
<b>Borehole No.</b>	Palaeo-Site 3 Tongue House (B)		
<b>Easting</b>	324232		
<b>Northing</b>	497837		
<b>GL ELEV (m aOD)</b>	285		
<b>Logged by</b>	Mairead Rutherford		

<b>Total depth (m)</b>	1.15	<b>Date</b>	14.4.16	
<b>COMPOSITE LITHOLOGICAL LOG</b>				
<b>Depth (m)</b>		<b>Keyword</b>	<b>Upper contact</b>	<b>Description</b>
<b>From</b>	<b>To</b>			
0	0.20	moss	-	Fresh moss, light brown, wet, roots, very fibrous.
0.20	0.38	peat	gradual	Dark brown/black fibrous, mossy peat.
0.38	c 0.68	peat	gradual	Variably light to darker brown fibrous peat.
c 0.68	1.15	peat	gradual	Dark brown /black fibrous peat with clay.

### APPENDIX 3 - RADIOCARBON DATES

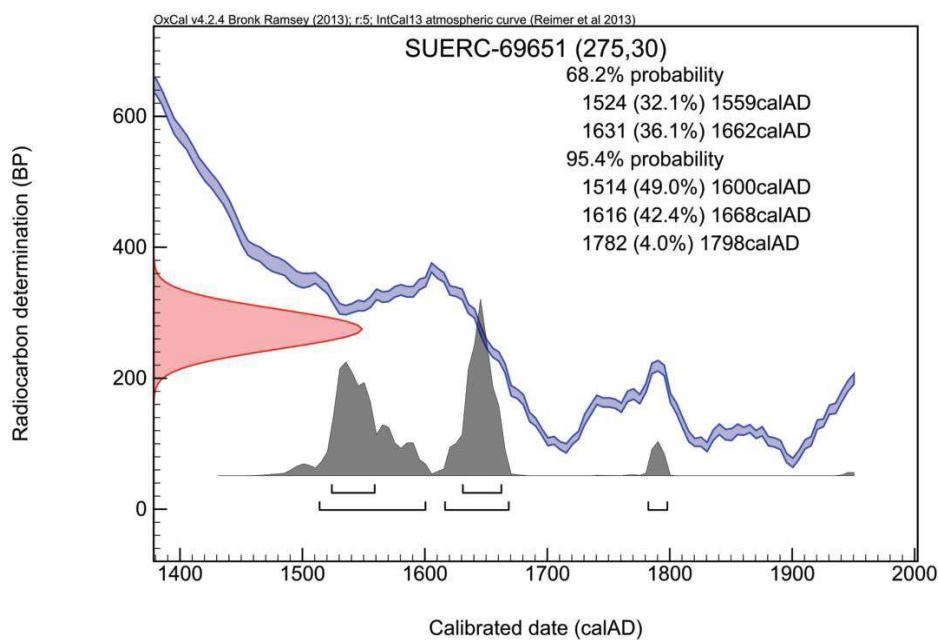
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#### Calibration Plot



Calibration plot for radiocarbon date of an oak sample from context **1021**

#### Calibration Plot



Calibration plot for radiocarbon date of an Alder/ Hazel sample from context  
**1028**

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**APPENDIX 4 – POLLEN TABLE FROM PALAEO-SITE 3**

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Tongue House		A	A	B	B	B	B	B	B	B	B
Preservation		Mixed	Mixed	Mixed	Mixed						
Potential		Yes	Yes	Yes	Yes	Yes	Yes	Possible	Yes	Yes	Yes
Depth (m)		1.32	1.20	1.12	1.00	0.80	0.72	0.64	0.60	0.40	0.24
Trees/Shrubs											
<i>Alnus</i>	Alder	39	25	11	12	18	3	2	6	3	1
<i>Betula</i>	Birch	5	2	12	10	13	5	3		1	1
<i>Quercus</i>	Oak	8	8	6	11	4	6	2	5	2	2
<i>Corylus avellana</i> -type	Hazel-type	32	47	49	35	28	8		1	4	
<i>Fagus</i>	Beech				1				1		1
<i>Fraxinus</i>	Ash						1				
<i>Ilex</i>	Holly		1		1	1					
<i>Pinus</i>	Pine			1						1	2
<i>Ulmus</i>	Elm	1						1			3
Rosaceae	Wild roses		2		1						
<i>Salix</i>	Willow						1				1
<i>Calluna</i>	Heather	2	1	8	8	7	6	4	2	1	2
<i>Empetrum</i>	Crowberry				1	1					
Crops											
<i>Cerealia</i>	Cereal-type							1			
Herbs											
Apiaceae	Carrot family	1	4		1	1					1
Asteraceae	Daisy family				1		1				1
Brassicaceae	Cabbage family								2	1	1
<i>Centaurea nigra</i>	Common knapweed					1			1		
<i>Cirsium</i> -type	Thistles	1									
Cyperaceae	Sedges		1			1	17	4	14	9	
Fabaceae	Pea family	1									
<i>Filipendula</i>	Meadowsweets		2		2	1					
<i>Melampyrum</i>	Cow-wheats				1						
<i>Plantago lanceolata</i>	Ribwort plantain	1				1	4	5	9	5	4
<i>Plantago</i> spp.	Plantains						2	2		1	
Poaceae	Grasses	9	9	12	12	23	31	14	54	49	94

<i>Polygala</i>	Milkworts									1	
<i>Potentilla</i> -type	Cinquefoils		4		4	7	10	9	8	21	1
Ranunculaceae	Buttercups		1	1		2				1	
Rubiaceae	Bedstraws					1	2	1			1
<i>Rumex</i> spp.	Docks/Sorrels	1	1	2		1	2	3	5	6	
<i>Succisa pratensis</i>	Devil's Bit Scabious	1	1	3	1	1			1		
<i>Taraxacum</i> -type	Dandelion-type	1	1	1		1			1	1	
<i>Teucrium</i> -type	Germaners	1									
	Indeterminate herbs	4	4	4	1	0	2		1	1	0
	<b>Total land pollen</b>	<b>108</b>	<b>114</b>	<b>110</b>	<b>103</b>	<b>113</b>	<b>101</b>	<b>52</b>	<b>110</b>	<b>112</b>	<b>112</b>
	Number of traverses	2	2	1	1	1	16	14	3	4	5
<i>Lycopodium</i>	Exotic	1	2	3	1	0	8	4	4	6	8
<b>Ferns and Mosses</b>											
<i>Dryopteris</i>	Buckler-ferns	1	9				2				
<i>Polypodium</i>	Polypodies	10	7	5	1	3	1				
<i>Pteridium</i>	Bracken	3	1	3		2	13	8	46	15	12
<i>Pteropsida</i>	Monolete ferns	36	44	13	6	17	1		14		
<i>Sphagnum</i>	Bog moss spores					1	3	5	15	35	
<i>Selaginella</i>	Lesser Clubmosses								2	1	
<b>Aquatics</b>											
<i>Lemma</i>	Duckweed								1		
<b>Algae</b>											
<i>Pediastrum</i> spp.	Colonial alga									1	
<b>Microscopic charcoal</b>		5	7	3	42	13	2	2	0	10	19
<b>NPP*</b>											
Fungal spores indet.		1	1				3				
Gelasinospora HdV-1						3					
<i>Glomus</i> -HdV-207		1	1			1			2		
<i>Sordaria</i> HdV- 55A/B			1			3	6	1	6	4	4
<i>Sporomiella</i> HdV- 113							4	1			

HdV-18		2								1	
HdV-11			3								
HdV-4			1								
HdV-25				2	1						
cf. <i>Byssothecium circinans</i> HdV-16A						4					
HdV-16C						1					31
Broken grains		5	6	2	1	4	1	1		2	
Concealed grains		7	7	2	8	6	5		8	10	1
Crumpled grains		5	4	5	2	3	3	2	5		2
Corroded grains		1									
Diatoms									Abundant	Common	Common

Table 1: Raw pollen counts, Tongue House sites, Seathwaite, Cumbria

\*NPP = non-pollen palynomorphs

## APPENDIX 5 - CONTEXT LIST FOR TONGUE HOUSE A

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Context Number	Site Subdivision	Description
<b>1000</b>	1	Turf
<b>1001</b>	1	Rubble
<b>1002</b>	1	Rubble
<b>1003</b>	1	Rubble
<b>1004</b>	1	Rubble
<b>1005</b>	1	Hearth surround
<b>1006</b>	1	Hearth
<b>1007</b>	1	Hearth
<b>1008</b>	1	NW/SE orientated stone lined structure
<b>1009</b>	1	Drain
<b>1010</b>	1	Subsoil
<b>1011</b>	1	Drain
<b>1012</b>	1	Dark silt layer
<b>1013</b>	1	Dark silt layer, within structure 1008
<b>1014</b>	1	NE-SW aligned internal dividing wall
<b>1015</b>	1	Rubble
<b>1016</b>	1	Rubble internal (N. cell)
<b>1017</b>	1	Organic lens
<b>1018</b>	1	NW/SE aligned wall
<b>1019</b>	1	NW/SE aligned wall
<b>1020</b>	1	Cobbled surface
<b>1021</b>	1	Fill of soak away
<b>1022</b>	1	NW/SE aligned wall
<b>1023</b>	1	Dark brown layer, in possible structure, SW corner of structure 1008
<b>1024</b>	1	Foundation for wall <b>1014</b>

<b>1025</b>	1	Blocking within NE threshold of cross-passage
<b>1026</b>	1	Cobbling within cross-passage
<b>1027</b>	1	Soak away
<b>1028</b>	1	Cobbled layer, below 1020
<b>1029</b>	1	Cobbles within cross-passage
<b>1030</b>	1	Layer, below <b>1004</b>
<b>1031</b>	1	Cobbled surface in <b>1008</b>
<b>1032</b>	1	Layer below <b>1000</b> , in test pit to the N of longhouse
<b>1033</b>	1	Cobbled surface in W end of cross-passage
<b>1034</b>	1	Same as <b>1052</b>
<b>1035</b>	1	Layer beneath <b>1031</b>
<b>1036</b>	1	Cobbled surface in the entrance between wall <b>2003</b> and <b>3002</b>
<b>1037</b>	1	Layer above <b>1031</b>
<b>1038</b>	1	Layer below cobbles <b>1028</b>
<b>1039</b>	1	Pre-building layer
<b>1040</b>	1	Fill of <b>1041</b>
<b>1041</b>	1	Palaeo-channel
<b>1042</b>	1	Foundation layer below wall <b>1018</b>
<b>1043</b>	1	Fill of palaeo-channel <b>1063</b>
<b>1044</b>	1	Foundation layer within threshold
<b>1045</b>	1	Pre-house layer
<b>1046</b>	1	Void
<b>1047</b>	1	Group number for drain
<b>1048</b>	1	Drain
<b>1049</b>	1	Drain
<b>1050</b>	1	Fill of <b>1051</b>
<b>1051</b>	1	Palaeo-channel
<b>1052</b>	1	Void
<b>1053</b>	1	Natural geology

<b>1054</b>	1	Foundation layer (same as <b>1042</b> )
<b>1055</b>	1	Fill of <b>1056</b>
<b>1056</b>	1	Palaeo-channel
<b>1057</b>	1	Natural geology
<b>1058</b>	1	NE/SW aligned wall
<b>1059</b>	1	NW/SE aligned wall
<b>1060</b>	1	NE/SW aligned wall
<b>1061</b>	1	ENE/WSW aligned boundary wall
<b>1062</b>	1	Group number for lower band of natural, comprising <b>1034</b> , <b>1038</b> , <b>1052</b> , <b>1053</b> and <b>1057</b>
<b>1063</b>	1	Palaeochannel
<b>1064</b>	1	Rubble
<b>1065</b>		Enclosure wall
<b>1066</b>		NW/SE aligned enclosure wall
<b>1067</b>		NE/SW aligned enclosure wall
<b>2000</b>	2	Turf
<b>2001</b>	2	Levelling layer
<b>2002</b>	2	Possible cobbled surface
<b>2003</b>	2	NW/SE aligned boundary
<b>2004</b>	2	Subsoil
<b>2005</b>	2	Drain
<b>2006</b>	2	Foundation for wall <b>2003</b>
<b>3000</b>	3	Turf
<b>3001</b>	3	Subsoil
<b>3002</b>	3	Boundary wall
<b>4000</b>	4	Turf
<b>4001</b>	4	Subsoil
<b>4002</b>	4	Outer boundary wall

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## ILLUSTRATIONS

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