Bullets, Ballistas and Burnswark

Research design for archaeological fieldwork at Burnswark, Dumfries and Galloway

Summer 2016

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1: Summary

This Project Design describes the research background, aims, objectives and the methodology for an archaeological excavation and survey of Burnswark Native fort and Roman camps near Ecclefechan (NGR NY 1862 7872, SM667) on the eastern edge of Annandale in in southern Scotland. It sets out to establish a justification of the proposed excavation within the two Roman camps and how the work to be done in the scheduled area builds on work already undertaken between 2013 and 2016. It details how the work is relevant to and aligns with Historic Environment Scotland Policy Statement June 2016, the Historic Environment Strategy for Scotland, ScARF as the national research framework and the conservation and management of the Burnswark Scheduled Monument itself.

The proposed fieldwork is projected to take place between 22 August and 5 September 2016 and will require Scheduled Monument Consent (SMC). It represents the third stage of the current investigation of Burnswark following the proof-of-concept metal-detecting survey in 2013 (Case ID: 201207617) and the survey and excavation on and around the hillfort carried out in August-September 2015 (Case ID: 201502096), both of which were granted Scheduled Monument Consent.

The proposed works would:

- Confirm for the first time the presence of Roman sling bullets in the North camp by limited excavation of a 5x2m trench (the minimum size required to bracket a statistically significant group of metal-detected targets).

- Confirm by stratigraphic context their relationship to the North Camp to ensure they are not later losses.

- Explore by non-destructive LIA (lead isotope analysis) their relationship with stratified (see below) lead ammunition from the South Camp

- Confirm for the first time by excavation of a 10x1.5m trench (minimum required to obtain suitable selection of stratified South Camp bullets) the relationship of probable 'dropped ammunition' to the rearward element of the hillfort-facing rampart of the Roman South Camp.

- Establish the relationship of these ‘dropped bullets’ to any ‘paved’ surface tentatively identified by previous excavation.

- Establish by LIA analysis of the two groups of lead bullets the likelihood that the ballistic events were contemporaneous, something which has never before been established and has a direct bearing on the understanding of this site. If this is confirmed this will have a major impact on our understanding of the sequence of events and by extrapolation, the nature of Roman siege (assault) tactics which will be of international significance.

- Explore a third cluster of non-lead metal signals in the South Camp by a 6x4 m trench (the minimum required to encompass the cluster) to establish the survival of non-lead objects. This will allow assessment of the threat of loss to corrosion by the highly acidic soil. It will also hopefully allow retrieval of material suitable for C14 analysis to help dating of the site, a matter of high importance to the interpretation of the site and its context to Roman movements in the South of Scotland.

- The new work for 2016 will build on the Project’s impressive public engagement elements listed and laid out below. It will allow continued volunteer participation and ensure continued media interest, both of which have considerably added to the wider education objectives and understanding of the site in particular and Roman military tactics in general.

- The 2016 proposals will strengthen the academic objectives of the project, give greater opportunity for public involvement, build on cross-project co-operation with Scottish and European partners and underscore the publication strategy (both popular and academic).

2: Introduction

Burnswark Hill rises to nearly one thousand feet from the surrounding flat Dumfriesshire countryside. As one of the most prominent landmarks of the Solway basin, it is easily identified from much of the western end of Hadrian's Wall and well down the Cumbrian coast. The panoramic views from the summit overlook the main north-south route of the Annan valley. Its history has long fascinated archaeologists and scholars.

On the table top summit are the remains of ramparts of a 17 acre hillfort which originated in the Early Iron Age. Archaeological studies have shown that there were timber round houses within these ramparts. With two substantial and well preserved Roman camps on opposite sides of the hillfort, Burnswark is unique amongst Roman sites in Britain. For the last six decades there has been considerable debate as to whether the Roman remains represent a genuine siege, or a series of practice works.

Attention has been drawn to the unusual features of the site, in particular the unique mounds at the three northern gates of the South Camp, known locally as The Three Brethren. These measure some 3.5m high and are up to 15m across, and are frequently interpreted as 'ballista platforms'. There is also the unusual placement of the two camps, and the suggestion of connecting circumvallation features, whilst paralleled elsewhere within the Empire, that is unique within Britain. Thirdly the peculiar shape of the northern camp, which gives the impression of two separate camps that have been joined together, and finally the collection of stone balls, lead sling bullets and tri-flanged arrowheads, all contribute to the uniqueness of this site.

The Scottish Archaeological Research Framework (Hunter and Carruthers 2012) notes "*The Roman character of the siege works at Burnswark is, however, not in doubt, but here opinion is divided over their interpretation, with some favouring a genuine siege and others preferring to see it as a training exercise*" and goes on to state "*The interpretation of the Burnswark earthworks is highly controversial and renewed fieldwork would offer some resolution*." The framework also recommends the use of systematic metal-detecting in relation to locating the battle of Mons Graupius, as this was how the Kelkrieise battlefield was uncovered (Schlüter 1999). The same principles for systematic detecting have been applied by the Burnswark Project. "*The most important reason for the study of the archaeology of conflict is that only by searching for evidence of such an event can a close approximation be obtained of exactly what took place on a particular site*" (Sutherland 2005). Recent advances in the methodologies of battlefield archaeology over the last decade give the opportunity to bring a new approach to the site, and to see if new light can be shed on the siege debate, with the further aim of refining the chronological sequence and inter-relationship of features, and to place the activities on site within the broader framework of Roman activity in the border zone.

3: Location

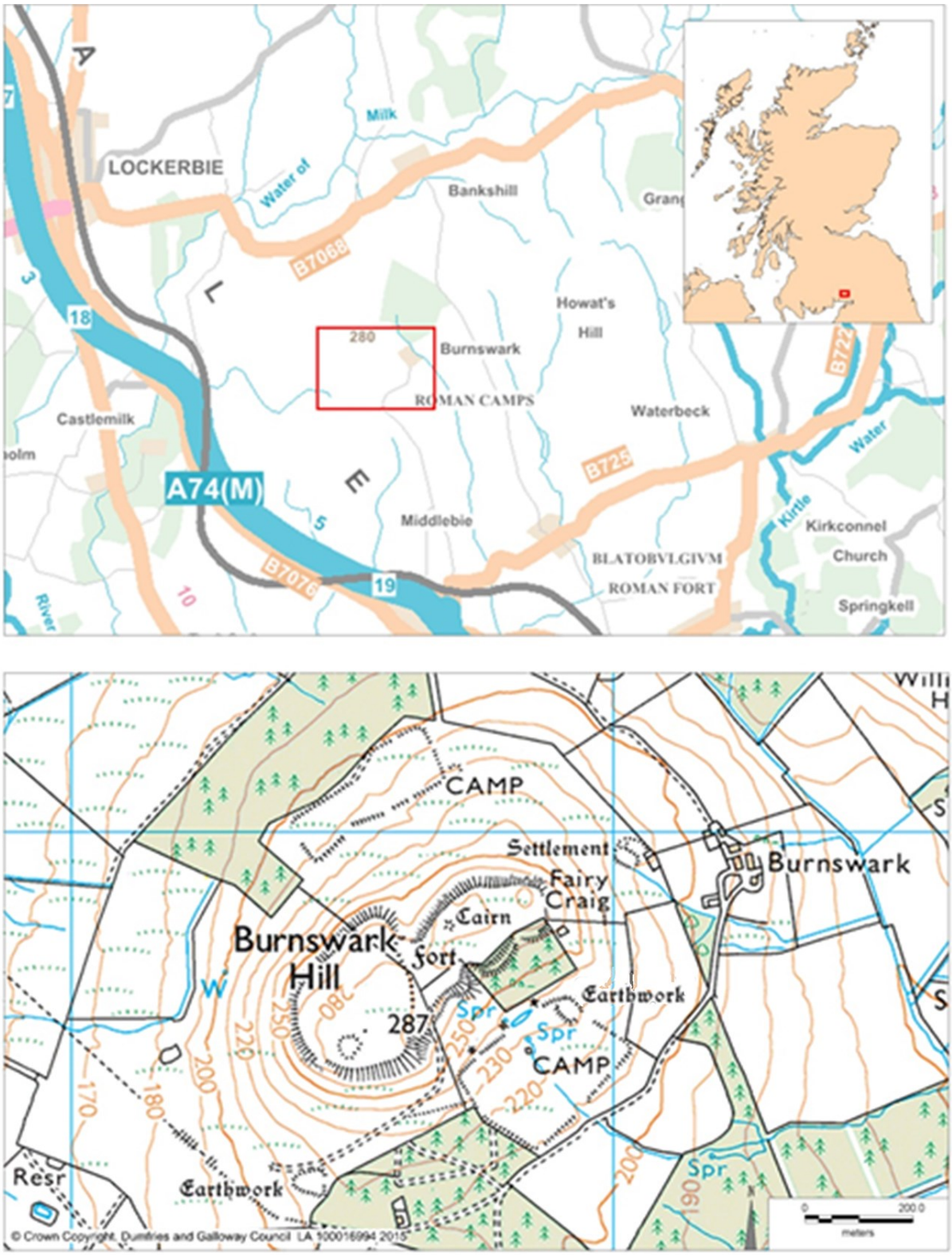

Figure 1: Site Location

4: Research background

The Roman camps were first recorded by the antiquarian Alexander Gordon in the 1720s (Gordon 1726) but it was William Roy who produced the first survey of the camps and their relationship to the fort in 1752, as part of works later to be incorporated into his 'Military Antiquities of the Romans in North Britain' (Roy 1793).

Figure 2: William Roy's survey of the camps and fort

The earliest known excavations to have taken place at Burnswark were by Barbour in 1898 (Christison, Barbour and Anderson, D, J and J. 1899). Excavation was undertaken in selected areas of the Roman camps and around the gateways and summit of the hillfort. Barbour indicated that the two gates on the south side of the hillfort had paved entrances, that the ramparts of both the Roman camps were stone-faced, and that there were stone buildings and roadways in the central area of the South Camp. He also conducted excavations in the feature he called the 'Redoubt' in the north-eastern corner of the South Camp, revealing a number of phases of occupation.

Finds included a number of lead sling bullets 'glandes' from the areas of both gateways on the south side of the hillfort, some more within the Redoubt, as well as a number from within the South Camp itself “ten in one group, others singly, one from the counterscarp of the north ditch, a number of stone balls, singly, an iron spear-head and fragments of another weapon”.

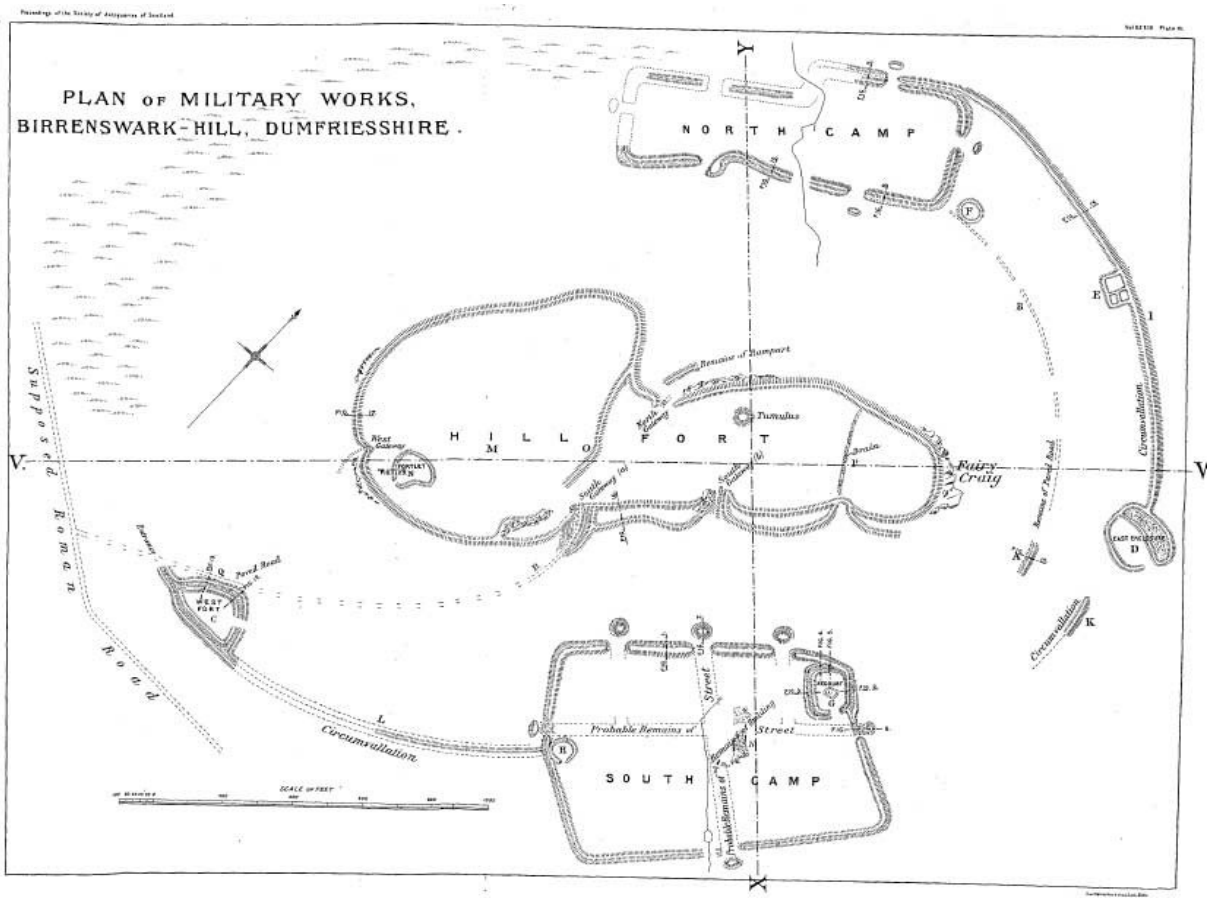

Figure 3: Barbour's Plan of 1899

Survey of the remains and finds made at that time seemed to confirm the suggestion put forward by earlier antiquarians that the site was the scene of a major conflict between native and Roman.

In 1915 George Macdonald visited the site to compile the entry for the inventory of monuments for the county (RCAHMS 1920). Small scale trial excavations were undertaken by R.G. Collingwood in 1925 (Collingwood 1927), who cast doubts on the veracity of the alleged circumvallation works, and who also suggested that the northern defences of the North Camp had never been completed.

Small scale works were also undertaken by J.K. St. Joseph in the 1940's, principally within the North Camp trying to establish whether it was of one phase or two.

The most extensive excavations were undertaken by George Jobey who examined both the South Camp and the hillfort in a series of trenches excavated from 1965 to 1970 (Jobey 1978). Jobey demonstrated that the ramparts around the fort had been commenced in the mid first millennium BC; that the ramparts had collapsed outwards prior to the Roman works, and that occupation of the summit continued into the second century AD. He showed that the paved road layers through the fort entrances, excavated by Barbour, lay above collapsed rampart material, and that there was an earlier surface associated with the gateway a metre below the paving.

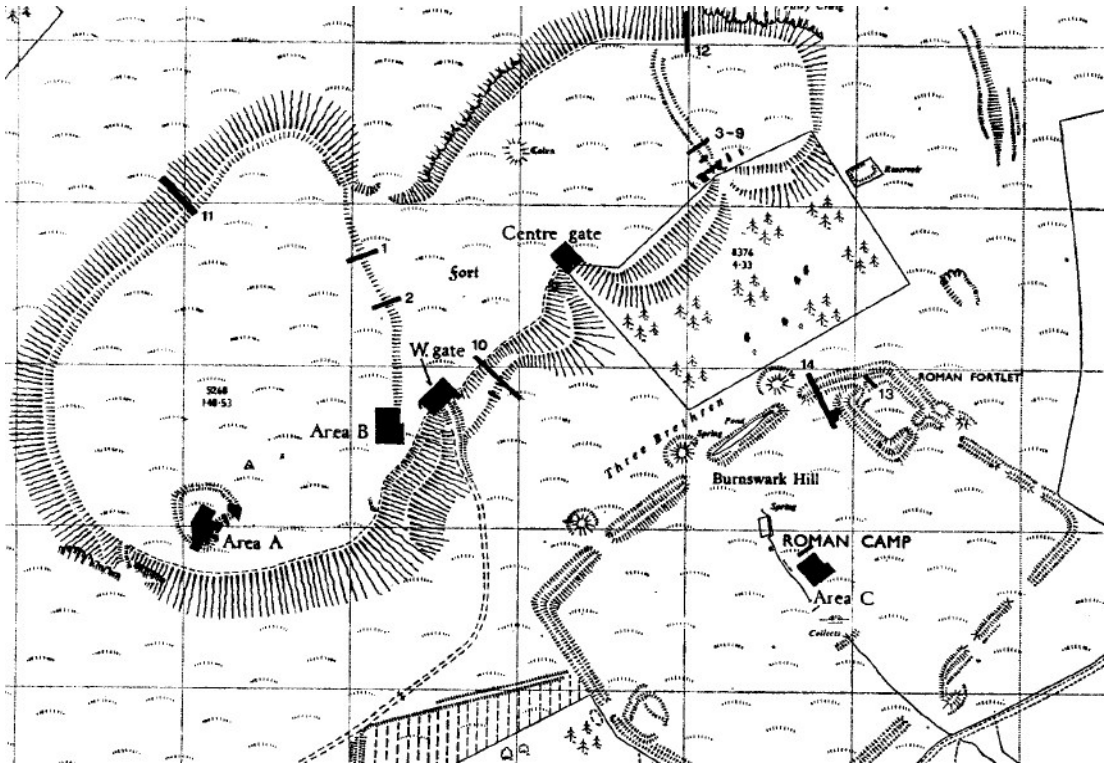

Figure 4: Jobey's Excavation Areas

Jobey saw the Roman camps as probable siege practice works, following the hypothesis mooted by Kenneth Steer in 1964 shortly before the excavations began. This view was reinforced by the fact that the lead sling bullets and iron arrowheads located around the gateways and rampart overlay the collapse of the rampart. The mid-second century dating accorded with the broad dates of the pottery, and the Roman phasing was based on the fact that the South Camp stratigraphically post-dated the square earthwork in its north-eastern corner (Barbour's 'Redoubt') presumed to be an Antonine fortlet.

Figure 5: Aerial view of South Camp, showing 'fortlet/redoubt' in its north-east corner (bottom right) ©RCAHMS

Survey by RCAHMS in the 1990s for their Eastern Dumfriesshire volume suggested that some of the ancillary earthworks, ascribed by Barbour to the Roman period, on the north-east and south-west side of the hill, be interpreted as prehistoric settlements, and that some of the elements of the so-

called circumvallation were later field walls and tracks. Detailed topographic survey of the north-eastern enclosure (Barbour's redoubt) and the South Camp identified potential earlier features, and it has been suggested that some of these may indicate an earlier camp.

A geophysics survey of the South Camp was undertaken in 2008 by Dr R Jones of Glasgow University (Jones, Malcolm and O'Grady 2009), using both magnetometry and resistivity. The magnetometry revealed a number of rectilinear anomalies within the South Camp, as well as clusters of strong positive responses.

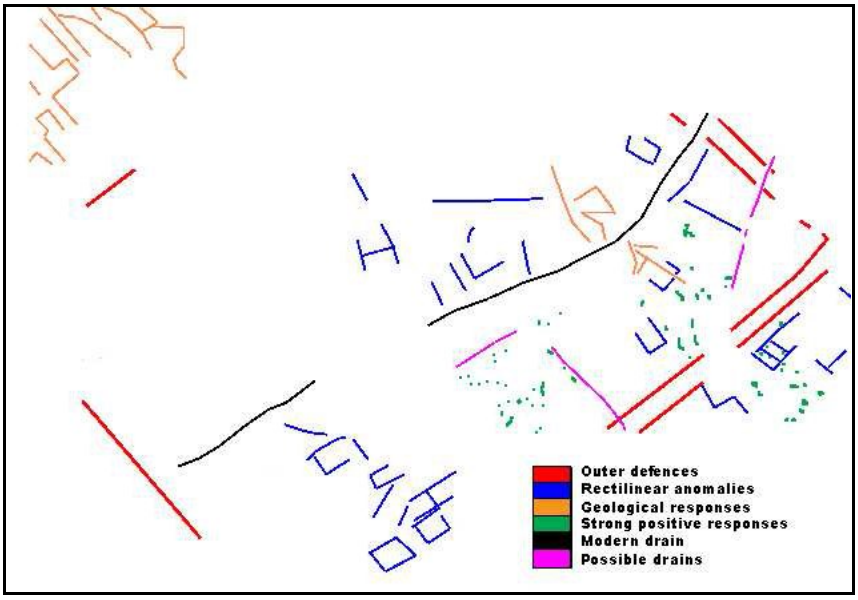

Figure 6: Interpretation plan of the magnetic survey (Fig 7b in Jones, Malcolm and O'Grady 2009)

It is possible that some of the rectilinear features could relate to the buildings suggested by Barbour, perhaps reinforcing the idea of a more permanent construct than a simple siege camp, but their nature and significance remain uncertain in lieu of excavation, especially as more recent geophysics has suggested a lack of permanent structures (Posluchny, pers. comm).

The view of Burnswark as a training facility has been increasingly challenged over the last decade, commencing with Campbell's work 'The Roman Siege of Burnswark' (Campbell 2003), and followed by Davies (2006), Keppie (2009) and Hodgson (2009). In addition reconsideration of the enclosure in the north-east of the South Camp has led to its interpretation as an Iron Age feature (S.Halliday pers comm), consequently affecting Jobey's fundamental assumption for the dating of the South Camp, namely that it post-dated an Antonine fortlet. As a result Maxwell has gone so far as to suggest that the earlier camps may relate to the campaign of Petillius Cerealis against the Brigantes in the mid 1st century (Maxwell 2004).

5: Summary results of the 2013 – 2015 works

In 2015 as part of a Heritage Lottery Funded project two trenches were hand-excavated and recorded within and across the rampart of the hillfort. In conjunction an extensive, non-intrusive metal detector survey was undertaken across both of the Roman camps and much of the surrounding area. Trench 1 uncovered a pebbled surface within the interior. Trench 2 examined the stratigraphic sequence around the stone rampart on the south-west side of the hillfort. Finds included a number of lead sling bullets, including a form not previously recognised, stone projectiles, an iron point possibly from a ballista bolt and two pieces of pottery of probable late prehistoric date. The detecting survey recorded over two thousand signals, with significant distribution patterns of lead readings along the southern rampart and face of the hillfort, and behind the north rampart of the South Camp.

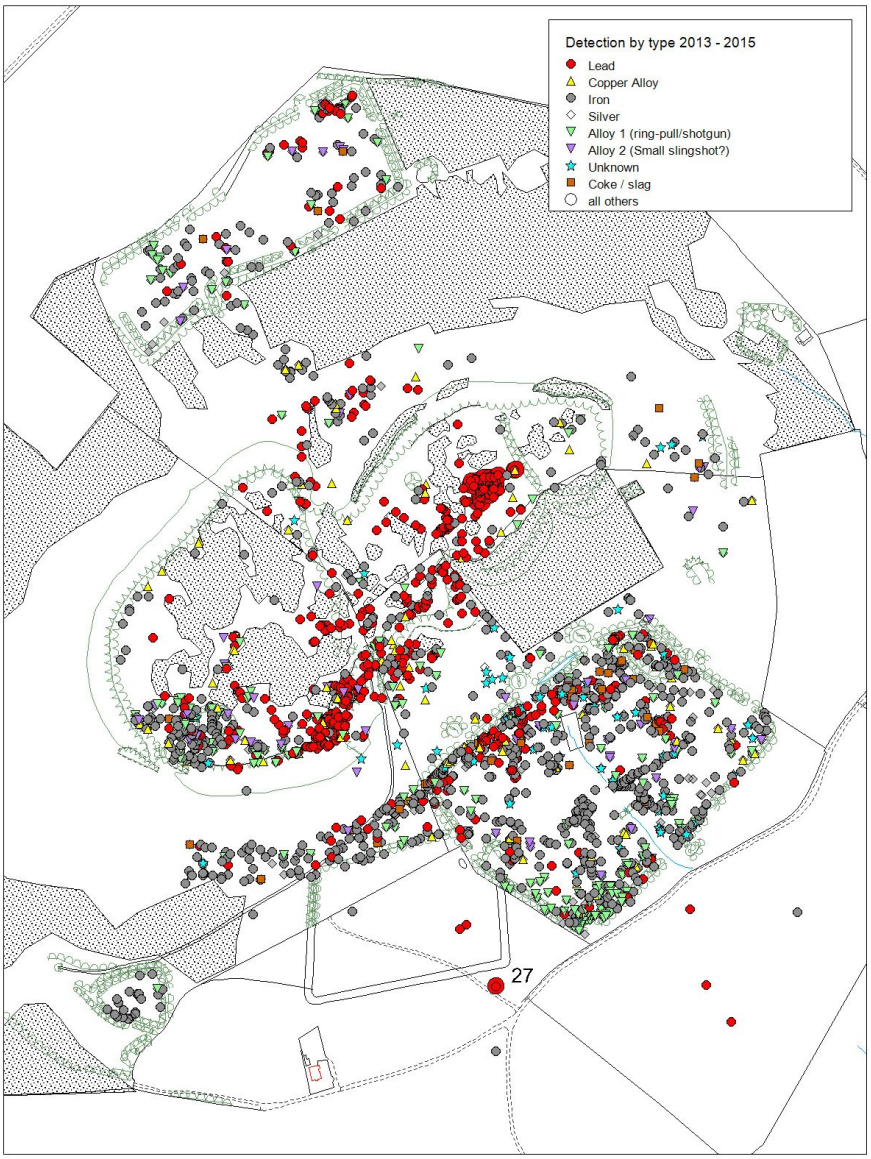

Figure 7: Plot of detecting results to date (silver readings redacted for public dissemination)

The positions of the finds were marked with flags and their GPS coordinates recorded. Once a findspot was located its position was marked with a clearly visible tag. In order to achieve consistency in the results a single machine was then used to calibrate the reading for the findspot. The index machine was an XP Deus Mk I (XP Industries Castanet-Tolosan, France) using a 12" coil. The machine was set to automatically ground balance. Each day, the machine was calibrated against a replica lead projectile which had been matched for size and weight. The location was then recorded using a GPS device; either a Magellan eXplorist 310 (MiTAC Digital Corporation, Fremont, USA) was used, or a Garmin eTrex H.

The GPS figures were logged into a database along with the find number, detector reading, proposed metal type and any pertinent notes for the particular findspot. The data from the resulting table was entered into MapInfo GIS software, enabling the results to be plotted against the earthworks.

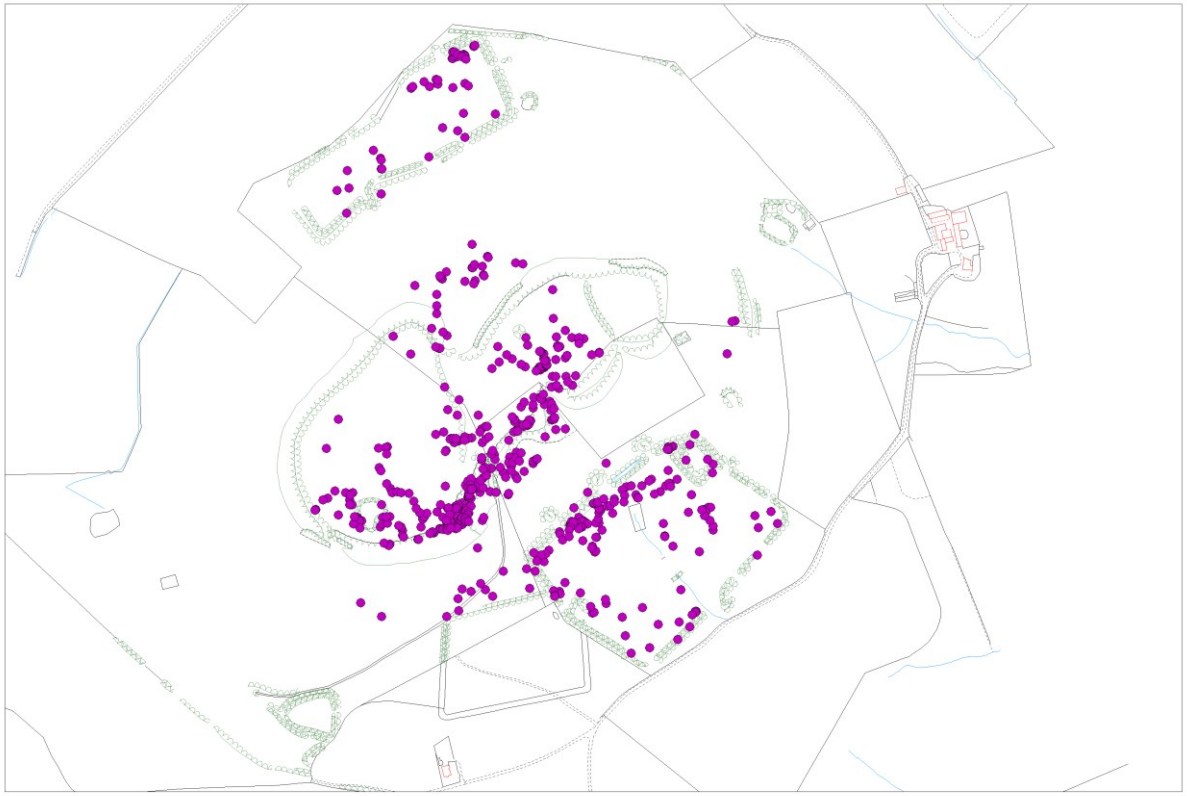

Figure 8: Distribution of lead sling bullets based on detecting surveys to date.

700 lead signals were detected across the site which, given the correlation between detected lead signals and recovery of sling bullets from the excavation (see below) indicates the presence of at least 650 actual bullets. These were not just in the gateways as had been previously suggested, but across a full half kilometre of the hillfort rampart. This suggests a massive missile barrage had been directed at the hilltop fort.

Targeted interventions determined that there is a diagnostic correlation between the detector reading and the sub-surface objects. The 2015 detecting survey predicted that 18 lead bullets would be found in the two trenches excavated. 17 were recovered indicating that the survey was at least 94% accurate. Two of the small sling bullets were only spotted when spoil heaps were sieved to catch small objects. Some of these small bullets may have been missed altogether in previous studies.

Figure 9: Sling bullet being excavated in 2015. The poles with red tags mark the locations determined by the pre-excavation metal detector survey.

Two main types of Roman cast lead sling bullets were identified at Burnswark before the 2015 Project, lemon shaped (Type 1) and acorn shaped (Type 2). About one in five of the bullets were acorns. Acorns have only ever been found at Burnswark Hill and other within a fifty mile radius of this site. Lemons have been found at many Roman sites in Britain and elsewhere.

Recent examination of over fifty sling bullets in the collections of the National Museum of Scotland and Dumfries Museum led to an unexpected discovery. A third previously unrecognised sub group of significantly smaller lemons was identified (Type 3). Many weigh less than 20g, as opposed to the normal 50g, and each contained a single circular hole, approximately 5mm in diameter and 5mm deep. The 2015 excavations uncovered 17 bullets: 6 lemons (Type 1), 6 lemons (Type 3) and 5 acorns (Type 2).

Experimental archaeological work has demonstrated two extraordinary facts concerning the new class of smaller bullets with holes. Firstly, they could be successfully slung in small groups of three or four to create a form of grapeshot. This had been independently confirmed by T Richardson in his work on Roman sling bullets at the Royal Armouries.

More intriguingly, the holes proved to confer an aerophonic quality. In flight these lead shot whistled, or more accurately gave off a buzzing sound, suggesting a possible use as a psychological weapon. Such a weapon would necessarily only be beneficial against a target capable of hearing them, rather than an inanimate training target, a further indication that a real conflict event occurred at the site.

Figure 10: Sound profile of Type 3 sling bullet in flight, the peaks denote the buzz sound as the bullet tumbles through the air.

Lead was sampled from a selection of Burnswark bullets as well as sling bullets from other parts of Scotland and the north of England. Mass spectroscopy of these samples was performed by the Earth Sciences Department of Goethe University in Frankfurt, Germany. Nearly all of the acorn shaped bullets have the same isotope fingerprint and the lemon shaped ones are also closely related but not identical. The lead used to make all of the acorns came from the same source, possibly from the same batch. The tests showed that the lead did not come from a local source such as Wanlockhead or northern England. It does have some similarity to lead found in Germany. This raises the possibility that Roman troops brought the lead from Germany to Burnswark.

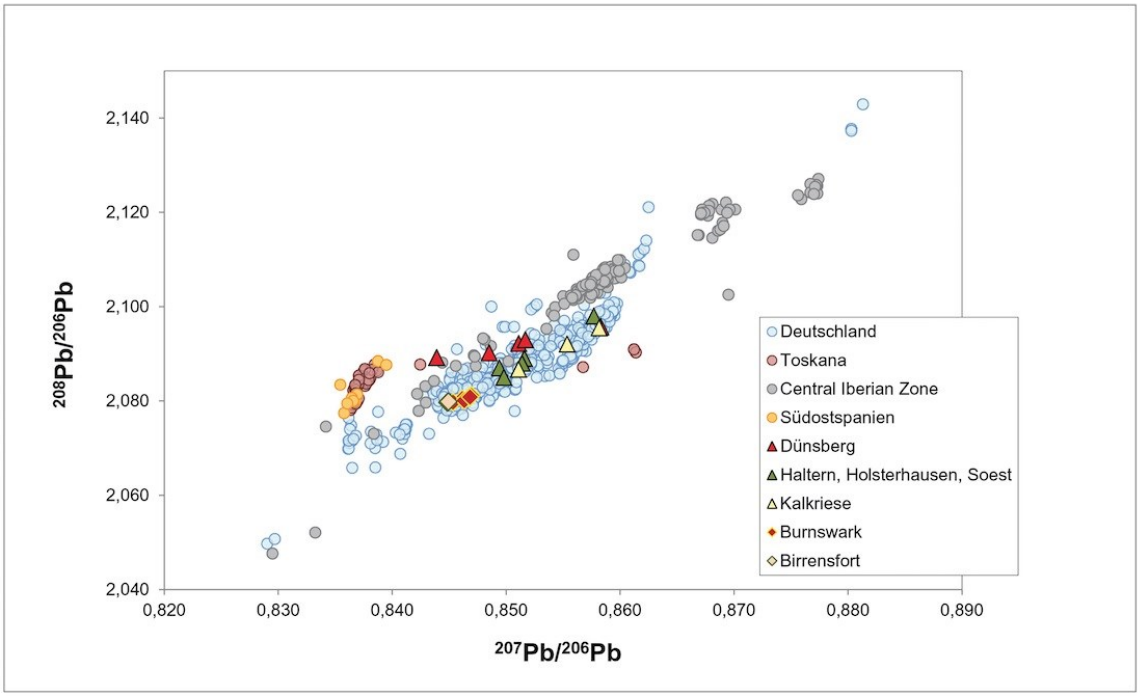

Figure 11a: Lead isotope analysis on lead sling bullets from Burnswark, Birrens and sites on Hadrian's Wall in relation to other finds of Roman sling bullets.

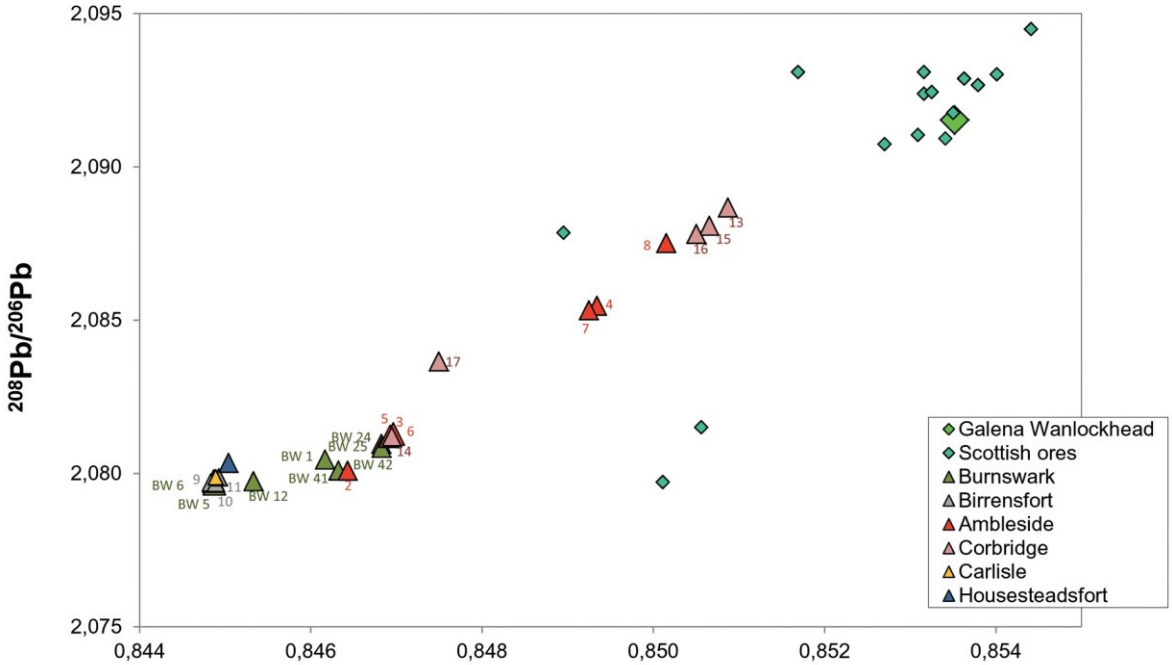

Figure 11b: Detailed view of lead isotope analysis on lead sling bullets from Burnswark, Birrens and sites on Hadrian's Wall

In association with the project Dr Axel Posluchny of Romano-Germanic Commission (RGK) of the German Archaeological Institute (DAI) under the framework of the ArchaeoLandscapes Europe project (http://www.arcland.eu),undertook geophysical survey and soil coring on the hill fort and in the South Camp (Section 42 Consent, Case ID: 201501711). Magnetic survey was carried out in the eastern half of the Roman South Camp including the so-called ‚Fortlet' in its northeastern corner.

The magnetic survey data showed (apart from various modern features like drainage structures and iron objects) a number of smaller features. None of those features formed structures that are known from Roman camps with a longer occupation.

The lack of field ovens, essential for cooking of the daily meals of the Roman troops during a longer occupation of the place, makes it very clear that at least the South Camp at Burnswark has not been used for a longer period.

Figure 12: Greyscale plot of survey data from the eastern half of the South Camp.

6: Stakeholder engagement

During the excavation a site diary was kept via a project Facebook page, which at its height reached over 14,000 people, and engendered much positive feedback.

Figure 13: Week two statistics on the project's page

The project has so far had significant local involvement, building up skills within local groups with historical interests, including Middlebie Historical Society, Eskdale and Liddesdale Archaeological Society, Kirkcudbright Historical Group, Friends of Moffat Museum, Friends of Annan Museum and the Dumfries and Galloway Natural History and Antiquarian Society. The project has also engaged a number of local detectorists, as well as members of Combat Stress, encouraging them in the broader aspects of approaching the cultural heritage resource.

A highly successful open day saw over 150 visitors to the site, and the project was covered in local papers and on Border television. A film of the project is being made, for dissemination to local schools and museums.

The project has undertaken a number of lectures at conferences to disseminate the preliminary results:

- Limeskongress in Ingolstadt
- 2015 and 2016 Archaeological Research in Progress Conferences in Edinburgh and Galashiels
- 19th international Roman Military Equipment Congress in St Andrews
- Archaeology Now! at the Senate House in London
- Fields of Conflict Conference in Dublin (September 2016)

The excavation featured as the cover story on the May 2016 issue of Current Archaeology magazine, (http://www.archaeology.co.uk/articles/features/burnswark.htm) where the discovery of the new sling bullets' aerophonic qualities caught the imagination of journalists, leading to an appearance on Radio 4's Today programme (http://www.bbc.co.uk/programmes/p03x0zqb)and on Radio Scotland, as a result of which the project featured on a number of archaeology and history news websites, including LiveScience (http://www.livescience.com/55050-whistling-sling-bullets-from-roman-battle-found.html) The Project so far has also featured in The Times, The Daily Mail, BBC Radio Wales and the World Service, and a piece is currently in preparation for the Association of Roman Archaeology newsletter.

The project also liaised with Dumfries and Galloway Council's museum service to create an exhibition, "The Offensive Romans", complete with associated activities programme, that launched in June 2016 and which will tour round the museums of Dumfriesshire and the Scottish Borders over the next 18 months.

Local schools will be contacted with regard to undertaking site and museum visits as part of Level 1⁄2 Curriculum for Excellence history (People, Past Events and Society: SOC 1-04a and SOC 2-04a).

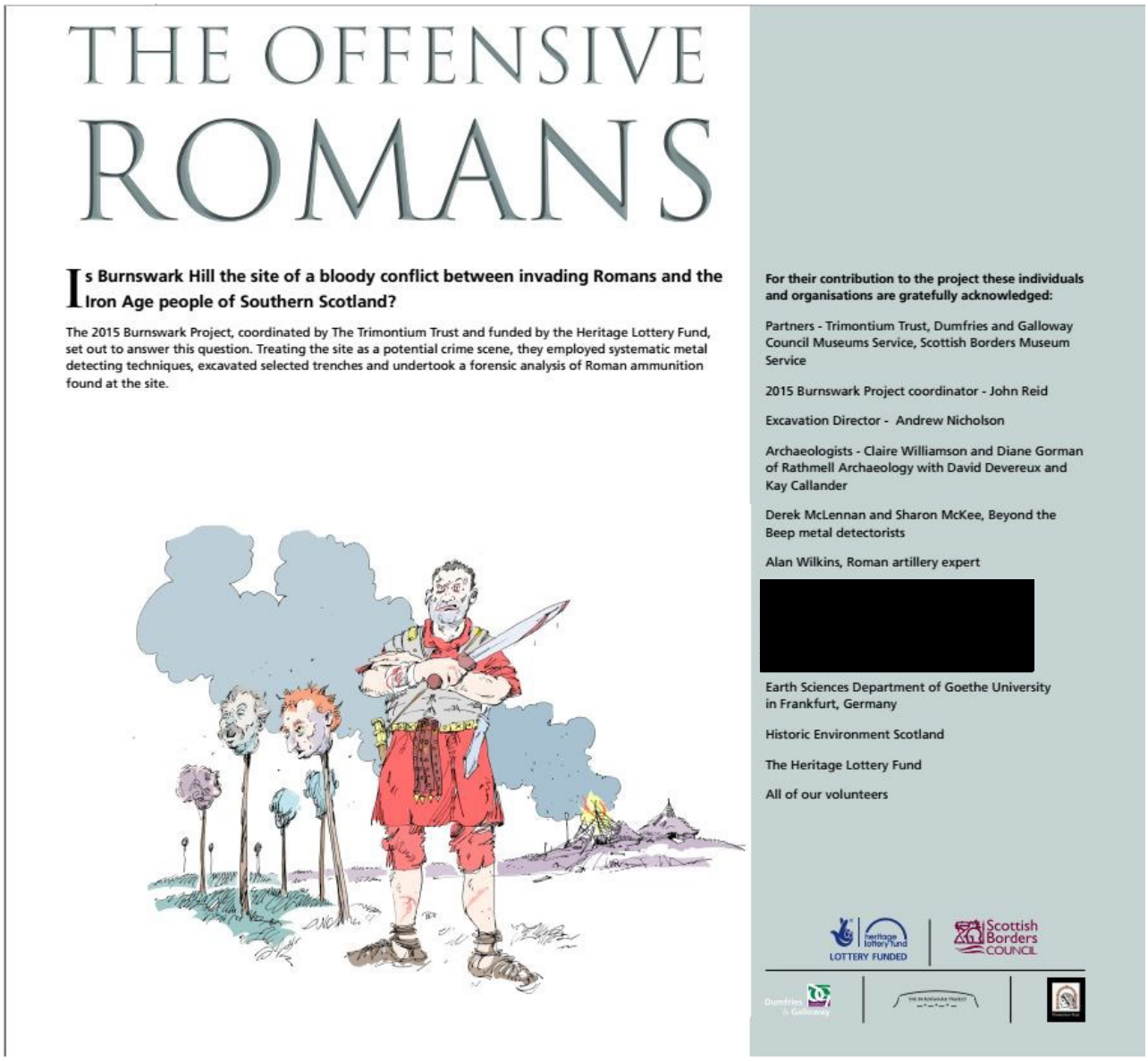

Figure 14: Introductory panel from exhibition touring museums across Southern Scotland.

7: Project Outcomes and Justification

It is hoped that this continuation of the project will conclude the non-invasive survey of the complex and provide accurate spatial data of metallic finds by category. A summary report will be submitted to *Discovery and Excavation in Scotland*. The DSR will be uploaded to the Archaeology Data Service via the OASIS system, and a hard copy will be lodged with Dumfries and Galloway Council's Historic Environment Record, the Royal Commission on Ancient and Historical Monuments of Scotland, and with Historic Scotland.

The completed work will be collated with the results of the previous pilot project (once there has been agreement with HS on the format of the data) and a final report submitted for publication in a peer reviewed journal such as PSAS or Britannia. The paper from the Fields of Conflict Seminar will be published in a conference volume.

The project intends to continue to train local volunteers in a variety of excavation and recording skills, building a capacity in local heritage groups to undertake their own projects and to enable access to the historic environment to a wide range of the local population through associated lectures, displays and open days.

The project has been shortlisted for the forthcoming season of Digging for Britain, giving the opportunity to supplement the outreach with a video diary during the excavation and survey, and the possibility of exposure through nationwide television.

<u>Contribution to the conservation and management of the Scheduled Monument</u>
The survey work carried out to date by the Burnswark Project within the Burnswark Scheduled Monument has added to our knowledge and the intrinsic value of the complex of features comprising the designated monument, hence assisting in underpinning its national importance (see Historic Environment Scotland Policy Statement June 2016, section 2.14 and Annex 1).

The limited proposed excavation (less than 0.01% of the area of the Scheduled Monument) is in line with the concept of a minimum level of intervention 'that is consistent with conserving what is culturally significant' in the monument (Historic Environment Scotland Policy Statement June 2016, section 3.16).

The proposed excavation would assist with the management and conservation of the Scheduled Monument by providing an assessment of the condition of the archaeology below the surface, its depth and character and the presence of possible impacts in the past – for instance the 2015 surveys have indicated that the northern side of the South Camp was used for tank training exercises during the Second World War. It would also assess the metal finds recovered in terms of their state of preservation or decay, and the wider implications for the extensive metalwork recorded in the whole survey (Historic Environment Scotland Policy Statement June 2016, sections 1.10 and 3.19).

The results of the project to date, summarised in Section 5, are of national and international significance. The public engagement outlined in Section 6 clearly demonstrates public benefits of national importance, in both a direct and indirect fashion, which outweigh the impact on the

national cultural significance of the monument, in accordance with the principle laid out in Historic Environment Scotland Policy Statement June 2016, section 3.19.

Whilst the small changes resulting from the excavation would clearly not be reversible, they are "carefully considered, based on good authority, sensitively designed and properly planned" (Historic Environment Scotland Policy Statement June 2016, section 3.20).

Our Place in Time: The Historic Environment Strategy for Scotland

The vision set out by the Scottish Government in *Our Place in Time*: the Historic Environment Strategy for Scotland (2014) is that the historic environment will be at the heart of a flourishing and sustainable Scotland. It notes that this vision will be reached through the aims of understanding, protecting and valuing Scotland's historic environment.

The Burnswark Project clearly meets all three aims of the Government's vision:

- Understanding – By investigating and recording our historic environment to continually develop our knowledge, understanding and interpretation of our past and how best to conserve, sustain and present it.

- Protecting – By caring for and protecting the historic environment, ensuring that we can both enjoy and benefit from it and conserve and enhance it for the enjoyment and benefit of future generations.

- Valuing – By sharing and celebrating the richness and significance of our historic environment, enabling us to enjoy the fascinating and inspirational diversity of our heritage.

In terms of the Cross-Cutting Strategic Priorities the project is providing a sound evidence base to assess the importance of the Burnswark complex of sites and specifically the national importance of the Scheduled Monument of Burnswark and its management and conservation in that context.

The project works through a partnership model (actively involving the Trimontium Trust, University of Glasgow, Dumfries and Galloway Museums Service, Live Borders Museums and Galleries Keltenwelt am Glauberg Research Centre and Goethe University) to further our understanding of Roman and Native interaction on the Frontiers of Empire.

In terms of the Strategic Priorities the aim of the project is to *Understand* the Burnswark complex through investigation and recording. This will provide the basis for the *Protection* of the group of sites, specifically the Scheduled Monument at Burnswark, and a greater professional and public appreciation of its *Value* and significance.

The aims and objectives of the Burnswark Project are strongly aligned with the Scottish Archaeological Research Framework (ScARF) including the impact of Rome, interaction with the indigenous population and the chronology and military methodology of the Roman expansion into Scotland, as well as addressing a Case Study highlighted in the framework as in need of modern research. Work on the lead isotopes was also highlighted as an area in need of further research (Hunter and Carruthers 2012, Section 5.6.2). The project is underpinned by international partnership and collaboration and is emphasising and promoting the international quality of the Roman archaeology of Scotland.

8: Programme of work in 2016

To date there has been no evidence uncovered to determine whether the two Roman camps at Burnswark are contemporary. The proposals for 2016 are to extend the techniques successfully used on the hill fort in 2015 into the two camps. It is proposed to finish the systematic detecting survey, covering the lower slopes of the west side of the hill, and a wedge of undetected ground to the north and east of the South Camp. Additionally the trimming of vegetation on the western part of the summit will allow more of the interior of the hillfort to be detected.

A previously unsurveyed area to the east of the North Camp, outwith the scheduled area, where Danish detectorists discovered a number of Roman coins in 2013, will be subject to geophysical survey by Dr Richard Jones of Glasgow University to determine if the finds are an isolated deposit or related to structural features of a previously unknown Roman site in the complex.

Targeted excavation, in the form of three small trenches to be undertaken to confirm the nature of the signals recorded by the detecting survey, and to establish the presence of sling bullets in both of the flanking Roman camps. This would enable us to explore the stratigraphic location of the signals and to correlate finds to those from previous works.

The first trench, 5m by 2m, is proposed to be in the northern corner of the North Camp where a distinct cluster of readings was a notable result from the 2015 survey, to verify the readings and test the relationship of the objects uncovered to the stratigraphic sequence within the interior of the camp.

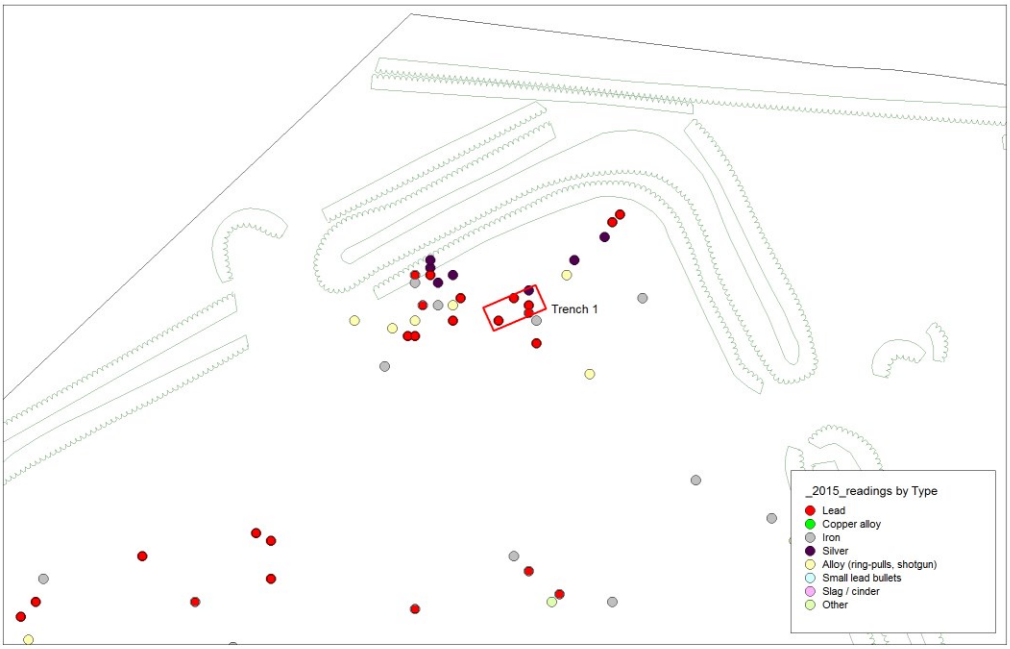

Figure 15: Proposed location of Trench 1 in North Camp

The second trench, 10m by 1.5m in the South Camp, behind the central portion of the north rampart, to confirm the detected presence of sling bullets there and to test the deposits comprising the ramparts, to locate the buried former ground surface and to test for the presence or absence of an intra-mural road.

A third trench, 6m by 4m, also on the back of the central portion of the north rampart of the South Camp to examine a cluster of non-lead readings. This will allow the mid-range of detecting signals to be ground-truthed, allowing a better interpretation of the numerous other signals recorded during previous surveys, and to establish the survival, condition and conservation status of the non-lead finds from the site. Between both of the proposed trenches in the South Camp the full spectrum of signals recorded in earlier surveys will be able to be tested and verified.

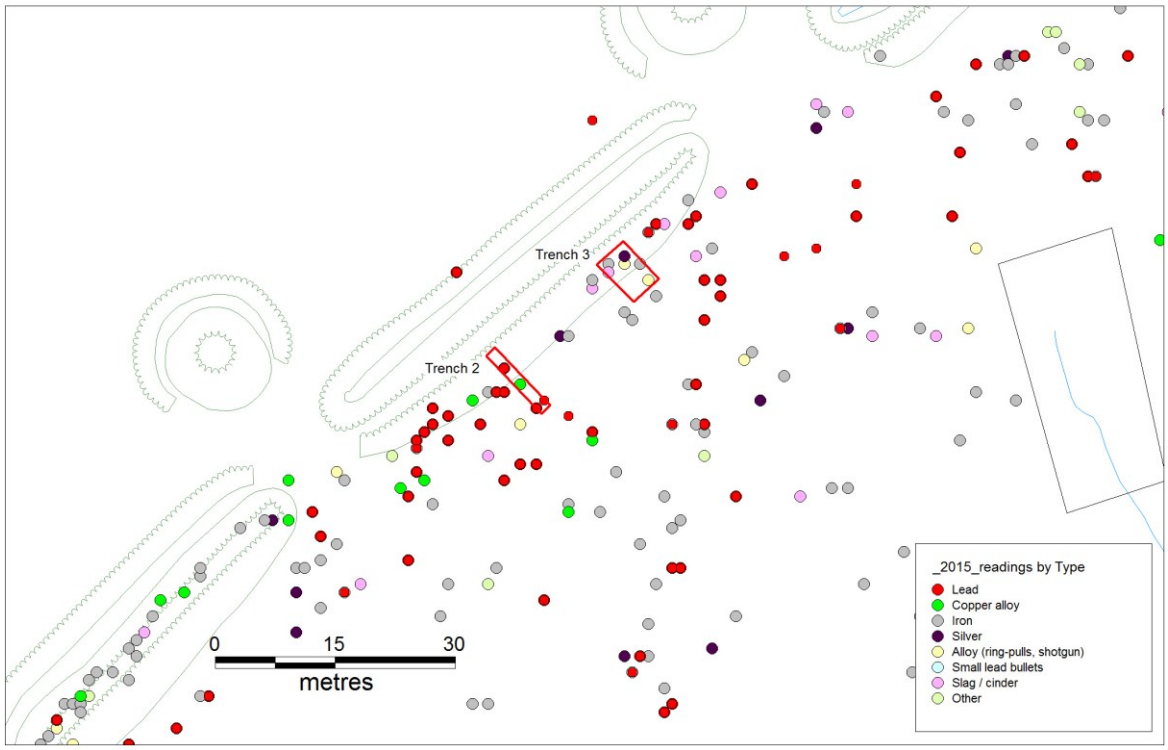

Figure 16: Proposed location of Trenches 2 and 3 in South Camp

Further sampling is proposed of excavated bullets from the camps for lead isotope analysis. Given the results of the analysis noted above, if bullets were recovered from both the north and south camps, and their results matched the current data, then it could be clearly demonstrated that the two camps and the missile activity on the fort were all contemporary, something that has only been conjectured to date.

The 2015 excavations were unable to recover material suitable for C14 dating relating to the putative assault, due to the relevant stratigraphy lying at the base of and open to potential contamination by the topsoil. It is hoped to find more firmly stratified deposits suitable for sampling within the camps, allowing opportunity for better dating for the activity.

9: Personnel and methodology

The Burnswark Project is jointly-directed by Dr John Reid, Chair of the Trimontium Trust and Andrew Nicholson, Archaeologist for Dumfries and Galloway Council. John has been examining Roman military activity in the Scottish Borders for over two decades, looking at a variety of documentary, epigraphic and archaeological sources. Andrew has been archaeologically active in Dumfries and Galloway for three decades, working on research and development-led sites. An early medievalist with extensive fieldwork and GIS experience, he has an abiding interest in military history and conflict archaeology. He will act as Site Director and will co-ordinate the recording, GIS, sampling strategy, site archives and post-excavation work, as well as the production of risk assessments and safe working procedures.

The two site supervisors are David Devreux and John Pickin, both former museum curators with Dumfries and Galloway Council and currently independent archaeological consultants. David is a Roman specialist, in particular with ceramics, whilst John's specialisms lie in industrial archaeology and metallurgy. Dr Richard Jones of Glasgow University and Dr Axel Posluchny of Keltenwelt am Glauberg Research Centre have aligned their own geophysical research projects to run in collaboration with the ongoing excavation and survey.

The investigative works will be implemented through hand-cut trenches that will be excavated under archaeological supervision.

In accordance with policy on the excavation of human remains, the local constabulary, Historic Environment Scotland and Dumfries & Galloway Council Archaeology Service will be notified should articulated in situ human remains be uncovered in the course of excavations.

Should the archaeological deposits exceed a safe working depth, 1.2m below existing ground surface, consultation will take place with the client and Historic Scotland. If it is deemed necessary to proceed to greater depth the trenches will be enlarged to allow steps or the edges will be battered.

All recording will be done using the standard single context recording method of practice: site plan at 1:100, sections drawn at 1:10, individual features will be planned at 1:20 scale, and digital colour photographs will be taken. All context, small finds and bulk samples will be given unique numbers. Any artefacts that are retrieved will be subject to standard Treasure Trove procedures.

Following excavation the trenches will be backfilled and the site returned to its original state. The base and sides of the excavation will be lined with geotextile material to differentiate excavated and unexcavated deposits.

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