BASSENTHWAITE REFLECTIONS
HERITAGE LOTTERY LANDSCAPE PARTNERSHIP SCHEME

UNLOCKING HIDDEN HERITAGE PROJECT

COMMUNITY GEOPHYSICAL SURVEY AT PAPCASTLE AND COCKERMOUTH

CUMBRIA

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Summary

Between 2007 and 2010, Grampus Heritage and Training Ltd managed the Unlocking Hidden Project, one of 30 projects funded through the Bassenthwaite Reflections Heritage Lottery Landscape Partnership Scheme.

This report shows the results of the geophysical survey on 8 areas of land near Papcastle and Cockermouth in Cumbria. The survey was undertaken following the identification of Roman material by local people on a flood damaged field to the west of the town of Cockermouth. Several pieces of Roman pottery were recovered from the surface of the Broomlands field following the severe flooding of Cockermouth in November 2009.

A team of committed local volunteers completed the magnetometry survey with training and supervision from Grampus Heritage and Training Ltd. The survey was conducted using the Geoscan FM256 dual system.

The survey results are remarkably clear, particularly given the flood-damaged condition of the Broomlands field, and have revealed evidence of extensive settlement and activity in the Roman period alongside the current course of the River Derwent. The subsequent discovery of a Roman watermill during the excavation phase of the project, adds weight to the theory that at least one channel of the river was in a similar position to the current river course during the Roman period.

The survey results show evidence of an extended Roman settlement on the south side of the river at Papcastle, where no Roman site was known to exist. The results in Area 1 (Broomlands) show a road running parallel to the river, to the east of which several ditched enclosures are visible. The survey also shows buildings, a section of marching camp, a possible iron smelting site and a large sub-circular enclosure.

On the north side of the river (Area 2), geophysical survey revealed the layout of a large building measuring 35m X 30m with a possible water channel running outside the western wall. The building is interpreted as Roman due to the scale, location and symmetrical nature of the northern end of the structure. Area 3, to the east of this building, also shows evidence of at least two possible structures of unknown date. To the west of the village in area 4, heavy plough damage which is visible as rigg and furrow, makes interpretation of the eastern section of the field difficult, but a clear enclosure was discovered in the western side of the field, close to the river and sitting alongside a small hill. The results show magnetic disturbance, thought to be from human activity, inside the enclosure and on the hill, though no clear structures can be interpreted. In a field alongside the river to the west of the A595 Cockermouth bypass (area 5), an aerial photograph showing an apparent ring ditch was supplied by the county archaeologist Mark Brennand. The geophysical survey of the field not only clearly shows the ring ditch (possible hut circle) but also an arrangement of parallel lines of pits, which are interpreted as the postholes of a large timber building measuring at least 40m in length.
The results of the survey have greatly increased our understanding of the nature and extent of the Roman settlement at Papcastle and the relationship between the site and the river, with land on the flood plain being heavily exploited for both settlement and industry. The survey does not reveal the full extent of the settlement on the south side of the river, with the road and ditched enclosures clearly continuing beneath the railway embankment to the south and perhaps into the Fitz beyond.

Acknowledgements

Fieldwork Volunteers
First and foremost we must acknowledge the enthusiasm and commitment of the Unlocking Hidden Heritage volunteer team. Without their input and many days of fieldwork, come rain or shine, the project would certainly not have been possible. The Unlocking Hidden Heritage volunteer survey team during 2010 included: Faye McNamara, Ian Thomson, Martin Harkins, Sallie Johnston, Robin Smalley, Elspeth White, Lee Richardson, Jean Thornthwaite, Jane Holmes, Rosemary Ashburn, Pat Bacon, Peter Todd, Mike Bacon, Walter Longcake, Mick Fairfield, Lynda Howard, Caroline Pollard, Angela Hayhurst, Phil Hayhurst, Anne Asquith, Roger Asquith, Frank Thwaites, Daniel Proctor, Mark Lawson, Joanne Wilkinson and Ray Newton. The survey was supervised by Mark Graham and Charlotte Marinos of Grampus Heritage and Training Ltd.

We are grateful to local resident Mr Ray Buckingham who made the initial contact with Grampus Heritage and who shared his knowledge of the post-flood discoveries during our first site visit. Special thanks are also due to local metal detectorist Peter Skillen, for sharing his knowledge of the Broomlands field and for helping to document the survey process through photography. We would also like to thank metal detectorist Peter Hirst for sharing his knowledge of the site.

Landowners
We gratefully acknowledge the kind permission granted by landowners Mr Robert Jackson and Mr Eldred Curwen to access the land and undertake the fieldwork. We would also like to thank land agent Edwin Thompson and Mr David Robinson of Dovenby Craggs farm for their permission and support during the Broomlands survey.

Archaeological Input
The input and advice of our partners in the Bassenthwaite Reflections project has been invaluable to the successful design and delivery of the Unlocking Hidden Heritage surveys. Special thanks are due to Mr Mark Brennand, senior historic environment officer for Cumbria County Council, for his encouragement, input and advice throughout the survey process. The enthusiastic support from Mr Brennand greatly added to the sense of achievement felt by volunteers in the field.

We are extremely grateful to Jan Walker, Pat Bull and the West Cumbria Archaeological Society for their contribution to the survey and active involvement in the discussion and interpretation of anomalies.

Finally would like to acknowledge the value of the initial site assessment by Stuart Noon of the Portable Antiquities Scheme. This work raised awareness of the potential of the site and helped to justify the value of further fieldwork.
1. Introduction

Between 2007 and 2009, the Unlocking Hidden Heritage project undertook a series of archaeological surveys in the Bassenthwaite Lake water catchment area. The aim was to engage local volunteers in the process of archaeological survey and to raise awareness and appreciation of the rich cultural landscape of the area.

An extension was granted to the project in 2009 which allowed for a further year of fieldwork to take place in 2010. The serious flooding to the town of Cockermouth and surrounding farmland took place in November 2009 before a survey target had been decided for the 2010 fieldwork. After the flooding, a local metal detectorist reported finding Roman material on a heavily flood damaged field known as ‘Broomlands’ to the south of the town. The site was visited by the county’s senior historic environment officer and the Portable Antiquities Scheme and was considered worthy of further examination.

Grampus were contacted in March 2010 by local archaeologist Jan Walker, who had been invited to look at the field by local resident Ray Buckingham. During this walkover visit with Mr Buckingham, a substantial amount of Roman pottery was noted on the surface of the flood scoured field, sufficient in quantity to suggest that a Roman site had been damaged on the south side of the river from the known Roman fort and vicus at Papcastle to the north.

This evidence, combined with support for fieldwork from the county archaeologist Mark Brennand and an article on the initial site assessment written by Stuart Noon of the portable antiquities scheme, led to Grampus requesting a change of target for the 2010 survey. Permission was then granted by the Basenthwaite Reflections programme to undertake a community geophysical survey on land alongside the River Derwent at Cockermouth and Papcastle.

The fieldwork at Papcastle was undertaken as part of a community archaeology project, ‘Unlocking Hidden Heritage’, running for four years, as part of the ‘Bassenthwaite Reflections’ Heritage Lottery Funded Landscape Partnership Scheme. The ‘Unlocking Hidden Heritage’ project aimed to include local people in archaeological survey and research. The geophysical survey took place over six weeks in May and June 2010.

2. Desk based assessment

It is beyond the scope of this community fieldwork project to undertake a comprehensive desk-based assessment of the survey area. An extensive Urban Survey of Cockermouth and Papcastle was conducted by Suzanne Hartley in 2006 for Cumbria County Council and English Heritage which forms the core assessment document used by the team and referred to in this report. The assessment report is available online at: http://ads.ahds.ac.uk/catalogue/projArch/EUS/

Additional documents used by the survey team and discussed in the body of the main report include the 1872 ‘Guide to Cockermouth’ written by John Askew, the collective works of Bernard Bradbury, first edition ordnance survey maps and sale deeds provided by local landowners.
3. Project Background and Research Aims

The Unlocking Hidden Heritage project engaged community volunteers in archaeological survey and fieldwork in the Bassenthwaite Lake water catchment between 2007 and 2010. Each year the project sought to undertake a season of geophysical survey on an archaeological site within the catchment. Although initially only a three year programme, a one year extension was granted to the Bassenthwaite Reflections scheme and to certain projects with the potential to further build on the results of previous work. The Unlocking Hidden Heritage project was granted an additional year of activity in Autumn 2009, meaning that a fourth season of archaeological fieldwork could be funded in 2010.

During the initial visit to the Broomlands field by Grampus in February 2010, it was apparent that the flood water had removed a substantial amount of topsoil from the ploughed surface of the field. The tenant farmer, Mr David Robinson, explained that a crop of winter barley had been in the field and that a few areas of intact surface could be identified where the crop survived. In addition to the removal of plough soil, the flood waters had cut deep channels (over 1m in depth) in the eastern part of the field and had deposited river cobble and gravel as the water slowed before re-entering the main river channel to the west.

Before fieldwork began, some reinstatement of the field took place, with machinery used to take material from the deepest gravel deposits on the surface of the field to the west, which was used to fill in some of the deepest cut channels in the heavily damaged south east section of the field. The site was visited by Grampus during the reinstatement and it was clear that no intact ground surfaces were cut into during this activity.

Although there was strong evidence from unstratified surface finds to suggest a Roman archaeological site had been damaged in the area, the condition of the field in its post-flood damaged state raised serious doubts about the potential for good magnetometry results or, indeed, whether any archaeological deposits would have been completely washed away.

Plate 1. Cockermouth and the Broomlands Field during the flood event of November 2009
4. Fieldwork Methodology

A magnetometer survey was carried out in 8 fields to the south and west of Papcastle. Permission was kindly granted by Mr David Robinson, Mr Robert Jackson, Mr Eldred Curwen and land agents Edwin Thomson to undertake the fieldwork. The survey was conducted using a geoscan FM256 dual fluxgate gradiometer system, with data processed using Geoscan’s Geoplot 3 software. All of the fieldwork was carried out by project volunteers with supervision and training provided by Grampus staff. Data was downloaded on-site using a laptop computer, which enabled volunteers to see the results of the squares they had surveyed. In addition, a printed copy of the survey data was produced each evening and brought to site the following day. This enabled all volunteers to participate in continuous discussion and interpretation of the anomalies being discovered.

A 20 X 20m grid was established on each site using handtapes. The survey was conducted at the following resolution: 0.1nT readings, traverse interval 0.5m, readings taken every 0.25m in the traverse direction. The final results were georeferenced within Ordnance Survey map data using the total station (Leica TCR 307) to plot the grid position in association with field boundaries.

Plates 2, 3, 4 & 5: Community volunteers conduct the magnetometry survey of the flood-damaged Broomlands field. Photographs courtesy of Peter Skillen

Plates 6 & 7: Surveying and downloading in the field. Extensions of the grid were decided in the field to allow significant anomalies to be fully included where possible.
A community excavation was led by North Pennines Archaeology in Area 1 on the Broomlands field from 9th August to 3rd September 2010. The trench locations are shown in Figure 4. Trenches were positioned to investigate geophysical anomalies on the site. Knowledge gained from the excavation has assisted in the interpretation of area 1 contained within this report; however the excavation results will be fully reported separately by North Pennines Archaeology.

5.0 Results

The results of the magnetometer survey are shown by individual areas in Figures 3 to 20 in appendix 1 of this report. For each area there is one figure of the geophysical data and one interpretive plot. With the exception of area 1, the interpretation is offered without the benefit of excavation. This report takes care to avoid the sometimes tempting ‘over-interpretation’ of unknown geophysical anomalies. Interpretation is offered for the clearest archaeological anomalies and for features which are visible above-ground, such as old field boundaries, which may show as linear features in the data. The parameters of the displayed data are shown in the key on the right hand side of each plot. For each area, several plots have been produced and studied to assist in interpretation including raw data, positive, negative, bluescale, dot density and relief. To illustrate the results clearly in this report, only positive greyscale plots of the data are included.

For orientation the reader should refer to figure 2, which shows all of the survey grids numbered by area.

5.1.0 Results - Area 1

Plate 8: Results from first day of survey in Broomlands (Area 1)

The first area surveyed was in the flood damaged ‘Broomlands’ field to the west of Cockermouth. From the first on-site download (shown above) it was apparent that the technique of magnetometry was suitable for the site and that archaeological anomalies were visible in the data. The first data collected in the far south west corner of the field clearly showed a complete ditched enclosure, with a possible road and other linear features extending beyond the surveyed area. The first result was far clearer than we could have predicted and led to a very exciting community survey as the ‘magnetic map’ of the field was created.

The full result of the Area 1 survey is shown in figure 3, and with an interpretive overlay in figure 5. The evaluation trench locations for the excavation led by North Pennines Archaeology are shown in figure 4.
The survey of the Broomlands field (Area 1) revealed the most complex and prolific archaeological anomalies of any of the surveyed areas. The ditches show particularly well in the data as dark linear anomalies.

5.1.1 The Road and the River

A road can be seen entering the field from the southwest corner defined by two parallel linear ditches on either side. These ditches are aprx. 15 metres apart and were identified during the evaluation in trench 1 (Figure 4) along with a gravel road surface. The alignment of the road, running parallel to the current course of the river at this point, gives some weight to the argument that at least one channel of the Derwent ran in a similar position at the time of the road’s construction.

The results of the survey have added greatly to our understanding of the movement of the River Derwent over the past two thousand years. Prior to the survey, it was not known how far the river has meandered in the past. Given the extent and force of the flooding in 2009, it would not be unreasonable to assume that occupation on the flood-prone plain would not have taken place in the Roman Age or that any traces of such activity would have been entirely destroyed through natural flood events and meandering or re-routing of the river channel. We can see from the survey data that the river has not meandered through the site as, if it had, all of the archaeology would have been destroyed. The presence of a mill and the alignment of the road both suggest that at least one channel of the river was in a similar position in the Roman Age. We do not know if the River Derwent ran in multiple channels during this period, however further survey and research in ‘The Fitz’ to the south of the Broomlands field could help to clarify this.

Given the extent of the archaeology in area 1, and the existence of a road, it is logical that we should consider the location of a river crossing to link this settlement and activity with the known Roman fort and vicus to the north. The road ditches are clear in the data for aprx 80 metres before coming to a sudden end. It is possible that this is the result of scouring activity by the recent flooding, during which the flood waters cut a new channel through the field in this area. It is also possible that the road turned to cross the river somewhere in this area and two possible crossing points are offered as dotted lines in figure 5. The westernmost proposal is based on the ending of the visible road ditches in the geophysical data and the easternmost considers that the mill race would re-enter the main river channel before the bridge or ford. In truth, there is little evidence in the geophysical data for a structured crossing point and these options are offered only for discussion. The river channel has been cutting material from the northern bank and depositing on the southern bank, which means that although footings for a bridge or fording point are likely to be lost on the northern bank, they may well survive and be now ‘landlocked’ to the south. It is worth noting here that the substantial dressed stone foundations of the mill, standing 3 courses high, do not show well in the magnetometer data. It is equally possible that any substantial stone footings for a bridge abutment, if they were to exist, could effectively be masked from magnetometer survey as ‘stone in stone’ and may not show clearly in the data.
5.1.2 Ditched Enclosures

A series of ditched enclosures can be clearly seen alongside the road in the southwest portion of the field, the majority of which lie to the east of the road. The fill of the ditches, being more magnetic than the surrounding natural gravels and silts, shows very clearly as a series of positive linear anomalies which are visible in the survey data as black lines. The arrangement of the ditched enclosures reveals a structured planned layout which, when evaluated during the excavation, revealed evidence of occupation and settlement, as well as ritual offerings and small scale industry. The findings from the trenches in this area will be fully reported in the forthcoming North Pennines Archaeology Excavation Report. Evidence of timber buildings (burnt beams) and cobble spreads, as well as hearths, large amounts of pottery, fragments of inscription and a rotary quern suggest that the ditched enclosures may have been individual plots for wooden houses and workshops.

The extent of the complex of enclosures to the south of the surveyed area is not known, as the anomalies clearly extend under the railway embankment and road. Geophysical survey in ‘The Fitz’ to the south may detect a continuation of this settlement and road.

5.1.3 The Mill

The initial interpretation of the geophysical data, prior to the excavation, identified a possible narrow trackway or lane running alongside what was thought to be the Roman riverbank. This feature, defined by parallel linear anomalies (thought to be ditches), curves into the field and has an area of very ‘clean’ geophysics in a lowering of the field to the north. This ‘clean’ area, which shows as a uniform grey colour in the greyscale plot, was thought to be the Roman river channel which has been naturally infilled as the river cuts into the north bank and deposits on the south side of the curve.

It was decided to target this area during the evaluation (trench 5, figure 4) to investigate the relationship between the site and the river and to look for further evidence of the course of the river in the Roman Age. The curving nature of the anomaly certainly suggested that it was created to respect a natural river channel, now a low point in the field alongside the river. It was only through excavation that the nature of the anomaly was understood and reinterpreted.

Trench 5 was located across the parallel lines thought to define the trackway. The complex stratigraphy of naturally deposited gravels and silts made excavation difficult, as with other areas on the site. The excavation showed that the parallel lines were not the result of ditches but rather of two clay deposits which yielded a number of iron nails. Overlying and between these was a sequence of naturally deposited river gravels. When these later deposits were removed, a waterlogged deposit containing preserved wooden planks was revealed. The wooden planks were lining the base of a water channel and the lower part of vertical edging timbers could also be seen. Although the timber edging of the channel was largely destroyed, being higher and drier than the waterlogged base of the channel, the lining timbers were visible as organic lines and as timbers still vertically
placed in parts of the lowest waterlogged deposit. The anomaly, initially interpreted as a track or lane, was therefore created by the existence of clay packing behind these timbers, which were used to line the sides of a mill race.

Following the identification of the timber lined channel, provisionally dated as Roman from ceramics found on the timbers, it was decided to extend the trench. The evaluation had revealed one large cobble in the southern side of the race in the eastern section. A re-examination of the geophysical data showed the mill race (not trackway!) leaving the river channel to the east, following a fairly straight course for some 80 metres and then turning to rejoin the main channel to the north (shown in blue, figure 5). It is logical that a mill would be placed at the end of the straightest section of race to draw most power from the flow of water. The continuous line of the race was broken in the magnetometer data immediately to the east of the evaluation trench, where the large cobble was situated. The trench was therefore extended to the east in the hope that the initial trench had been located across the tail race immediately alongside a watermill.

Plate 9: The Roman Mill During Excavation

The substantial dressed sandstone foundation of the mill, which was revealed in the eastern extension to trench 5 (shown above), stood up to 3 courses high and attracted a good deal of media attention. It is perhaps surprising that such a substantial foundation does not show more clearly in the magnetometer data. The reason for this appears to be that the sandstone blocks are surrounded by natural gravel, which has a similar magnetic signature to the sandstone. By contrast, foundations where clay has been brought to the site and deposited show very clearly as the clay has a much stronger positive magnetic signature than the natural gravels. The clay and cobble foundations of the large building in trench 6 are a good example of this.

During a visit to the site, professor David Shotter suggested that the construction of the mill, with such large sandstone blocks, would almost certainly be a military endeavour.
Further discussion of the date and function of the mill is provided in the North Pennines Archaeology excavation report.

5.1.4 Sub-Circular Enclosure

A large sub-circular anomaly was detected in the Broomlands survey, apparently respected by the surrounding planned layout of the complex. The partial enclosure, shown outlined in green in figure 5, sits almost centrally in the Broomlands field with the ditched enclosures to the west and the mill and river to the north.

The enclosure appears to be open on the northern side toward the mill and large building. The boundary of the enclosure is also faint and broken in the south east, though this may be recent destruction due to the heavy flood scouring in that area. The perimeter of the anomaly encloses an area approximately 50m wide from east to west. A fainter horseshoe shaped feature can also be seen in the western side of the enclosure with the open end of the horseshoe to the east (centre) of the enclosure.

The discovery of this feature led to much discussion and debate among the survey team, and the term ‘amphitheatre’ was very quickly adopted to refer to the anomaly on-site, though many other possibilities were also discussed. The enclosure certainly dominates a central position within the surrounding complex.

During the excavation an evaluation trench was located across the boundary of the enclosure (Trench 4, figure 4) to determine what was creating the anomaly and to look for dating evidence. The boundary of the enclosure is created by a broad clay and cobble foundation of Roman origin but appears to be situated, at least in the small area evaluated by the excavation, over a filled in ditch. The evaluation trench was only 1.8m wide and only a small slot was cut through the clay and cobble to identify the underlying ditch. Full details of the excavation are provided in the North Pennines excavation report, though further excavation of a larger area of the anomaly is clearly needed to fully understand the feature. With evidence of both military and civilian activity in the Broomlands complex, cautious interpretation of the function of this enclosure as an earth and timber amphitheatre remains plausible, pending more detailed investigation.

5.1.5 Building Foundation

The initial interpretation of the geophysical survey appeared to show evidence of buildings in the north of the site. Trench 6 (Figure 4) was located to evaluate this area through excavation. The evaluation revealed the clay and cobble foundations of a large Roman building which corresponded to the magnetometry results. Although the Roman layers in this part of the site have been lost through ploughing and flood scouring, the building was dated to the Roman period through a mid 2nd century coin found in the clay foundation. As has already been discussed, the building shows so clearly in the survey because the imported clay used in the foundation has a much stronger positive signature than the surrounding gravels.
It is worth noting here that local metal detectorist Peter Skillen and other early visitors to the site (including County Archaeologist Mark Brennand and Stuart Noon of the Portable Antiquities Scheme) observed potentially similar foundation remains to the west of this building following the flood event in November 2009. At the time of survey and excavation however, this area had been covered by soil stripped during the re-surfacing of the nearby cricket field and no further investigation was carried out as part of this project.

5.1.6 Roman Camp

A textbook ‘playing-card’ corner of a Roman camp, with internal clavicular entrance, can be seen in the east of the site, highlighted in light purple in figure 5. A possible trackway shows as a broad darker line heading through this entrance from south west to north east. A small trench (trench 7, figure 4) was located during the evaluation to investigate the camp entrance. The ditches were identified though few artefacts were recovered. A possible second-phase boundary in this area shows as a right angled corner within the camp ditch, aligned with the large building identified in Trench 6. This possible second phase boundary (shown as a brown dotted line in figure 5) has a dotted appearance and may be a series of pits or postholes, culminating in a large pit alongside the possible iron smelting site to the east. The possible later phase boundary was not investigated during the evaluation and so no evidence of the phases of the structure was obtained. The alignment of the playing card corner and right angled corner are sufficiently different to suggest they are of different phases rather than contemporary in construction, though the fact that the right angled boundary lies entirely within the playing-card cornered ditch suggests that the latter may have been in existence when the later phase right-angled boundary was created.

It is not possible to trace a complete camp enclosure within the survey data, though this may be due to magnetic disturbance masking the signal of the ditches. It is possible that the camp was never completed and the corner created as a training exercise for troops based in the nearby fort, however the position of the camp at the far east of the riverside complex, and the existence of a possible second phase to the structure, suggest that the camp boundary maintained a strategic function for a considerable time.

5.1.7 Iron Smelting Site

The easternmost archaeological anomaly discovered during the survey of Broomlands shows as a clearly defined sub-circular area of strong magnetic disturbance. This is displayed as a cluster of strongly positive and negative black and white dots in the survey plots and is highlighted in yellow in figure 5. The strong magnetic signal from the feature, along with surface finds of 3 pieces of slag during the survey, suggest that the disturbance is created as a result of iron smelting waste. The slag from the possible furnace obscures any underlying structure or features in the area and the nature and date of the feature will only be fully understood through excavation. The position of the anomaly at the far east of the site, closely situated to the east of the camp boundary,
suggest that it is likely to be Roman in origin and contemporary with rest of the Broomlands complex.

The south east corner of the Broomlands field was not included in the geophysical survey due to the severity of the flood damage in this area. The flood waters cut new channels over 2 metres deep in places and, although some of this land was already reinstated at the time of the fieldwork, it was not considered suitable for survey. The general layout of the site suggests that, although some archaeology may have been destroyed in this area, this is not likely to have been a concentrated area of activity as the area to the east of the iron smelting site was not flood damaged and shows little evidence of archaeological remains. Any extension to the settlement is likely to occur to the south along the line of the Roman road and possibly into ‘The Fitz’ beyond the old railway embankment.

5.2 Results – Area 2

Following the success of the survey in the Broomlands field and the clarity and concentration of archaeological activity, it was decided to conduct further survey on the northern bank of the Derwent towards Papcastle. The area shown as ‘area 2’ in figure 2 was chosen to look for a possible river crossing connecting Broomlands with the fort to the north. The land in area 2 also appears to be of a similar elevation to Broomlands and may also have been utilised for settlement or industry in the Roman period. Permission to undertake this survey was kindly granted by the landowner Mr Robert Jackson of Papcastle.

The survey began in the eastern side of area 2 and the first results revealed the layout of a large building with symmetrical square annexes on the northern side (Figures 6, 7 & 8). Further survey showed that this building stands alone in the immediate area. The size of the building is impressive, measuring some 40m from north to south and 30m east to west. The northern and western walls of the structure show most clearly in the survey data and a dark slightly curving linear feature, interpreted as a water culvert, can be seen running outside of the western wall from the direction of Sibby Brow to the north and ending abruptly at a possible annexed structure on the south west corner. Some magnetic disturbance can be seen to the west of this structure which may be thermoremnant and the result of burning activity.

The eastern wall of the building is more difficult to determine due to the presence of a strongly magnetic feature which appears to form a semi-circular annex. A mirrored curving line in the interior of the building gives the impression of a near full circle occupying the majority of the south east quarter of the structure.

An area of magnetic disturbance on the riverbank to the south of the building is interpreted as a drain or outflow channel shown in light green in figure 8. This corresponds with a section of possible wall revealed by the flood damage in November 2009.
It is not possible to provide a definitive interpretation for the function of the building without targeted excavation. Nevertheless, the scale and symmetry of the structure are consistent with other large Roman buildings. The possibility that fresh water is being brought to the building from above perhaps increases the temptation to interpret as a bathhouse, though many other kinds of structure could also require a fresh water supply.

Askew (1872) refers to a possible Roman bathhouse at Papcastle when he writes “In the field adjoining Sibby Brows, at the bottom of a straggling wooded bank, a piece of splendid road sweeps down to the river. Between this road and the river are some faint traces of a large building, which may have been the public baths”. Askew is certainly referring to the area of flood plain on which the survey grid for area 2 was established, though it is difficult to be certain which part of this area he is referring to. It would seem that the ‘splendid road’ is a reference to ‘Friar’s Walk’ which runs down the front of the Sibby Brow escarpment and follows the bottom of the steep bank before turning to meet the river in the far west of the area.

The building discovered in area 2 does lie between Friars Walk as it comes down Sibby Brow to the north and the River Derwent to the south. Could this be the building to which Askew is referring? The reference appears to suggest that the possible bath house lies further to the west in this area. The survey team did not have permission to undertake survey in the field at the foot of Sibby Brow. An additional grid was considered to investigate the land at the foot of the brow to the west, though this was decided against as the survey team was advised that recent material had been deposited there to try to stabilise this very wet area.

5.3 Results – Area 3

Area 3 lies to the north of the Broomlands Field on the northern bank of the river. Although the field contains some steeply sloping areas, there are also two flatter areas which were surveyed in separate grids. The aim of the survey in this area was to look for evidence of a road crossing from the Broomlands Field and connecting the Broomlands site with the fort and vicus to the north. Permission for this survey was kindly granted by the landowners in Salmon Lodge and The Burrows.

Unfortunately, a survey error led to the majority of the lower grid being heavily staggered. This may be a result of an error with one of the switches on the equipment. Time limitations led to a re-survey of only the 3 south west grid squares, which appeared to show evidence of structures. Although there are linear features visible in the corrupted data, we know that at least some of these are drains and services running to the river from the village above. Unfortunately, the staggered nature of the data does not allow for more detailed interpretation other than a conclusion that there is no clear road passing through the site resulting from a river crossing.

Figure 10 outlines the possible buildings identified in area 3 with pink dotted lines. Although the definition of walls is not as clear as the structure identified in area 2, the data appears to show the remains of 3 separate structures in the lower grid. The strong
signal from the disturbed areas makes interpretation difficult and these may actually result from one or two larger structures. It is not possible to offer a date of origin for the anomalies in the south west grid. They lie on a flat area of the field close to the river bank and only 50m to the east of the building identified in area 2, where the topography is also suitable for building. The plateau lies immediately to the south of a Victorian landscaped garden and the anomalies may be associated with this.

The upper section of the field lies between Salmon Lodge and The Burrows and was surveyed in a separate grid. The survey of this area was without error and covered the plateau at the top of a steeply sloping bank above the river. The two linear features running north/south in the eastern half of the grid are interpreted as drains and services from the village to the north, though this is unproven. It is also worthy of note that local landowner Robert Jackson described some very well constructed culverts and drains in the village of unknown date. It is possible therefore that a constructed drainage system dating from the Roman period could still underlie the village.

The western half of the upper grid in area 3 revealed the most interesting anomalies in this area. A number of apparent pits show as sub-circular dark anomalies and are highlighted in green in figure 10. Although the strength of signal and shape of each pit anomaly strongly suggests that they are archaeological, we must acknowledge that the survey area is on the top of the limestone escarpment and a geological reason for the anomalies could only be ruled out through excavation. Three of the pits appear to be on the outside edge of a large square anomaly measuring around 15m X 15m. This feature is interpreted as a possible building, though once again the lack of definition in the wall signals makes detailed interpretation impossible. Nevertheless, the disturbed nature of the square anomaly, which consists of both positive and negative short linear anomalies, does contrast markedly with the band of largely undisturbed land surrounding the feature. The fact that three of the pits lie on the edge of the feature (one to the west, one to the east and one on the south east corner) adds weight to an archaeological interpretation for the pits. The anomaly appears to front onto a possible boundary or street which just cuts diagonally across the north west corner of the grid. The size and location of the feature, along with a lack of evidence for any late structures on the site from early maps, supports the interpretation as a Roman building. It is not possible to infer either state of preservation or depth of the deposit from magnetometry data alone.

5.4 Results – Area 4

The fourth area investigated was the closest the survey came to the fort of Derventio at Papcastle. For this reason, area 4 was chosen to see if the vicus extended from the fort to the west and down the slope towards the river. Although we were hopeful for good results in the western section of the field (closest to the fort), we were also aware that the field does slope from east to west and is also visibly scarred by deep and regular rigg and furrow. The Roman road heading north from Papcastle (Derventio) to Maryport (Alauna) is believed to run immediately to the north of Area 4.
The results in the western part of area 4 were somewhat disappointing. Although, once again, the gradiometers were functioning well in the location, it was quickly apparent that the rigg and furrow plough pattern would make identification and interpretation of earlier (pre-ploughing) anomalies difficult. Figure 12 attempts to clarify this situation by overlaying the strongest plough lines in green. This leaves a number of linear features on different alignments. The drain (with manhole) shows clearly in the centre-south of the plot. The features shown in blue may be ploughed out ditches of earlier enclosures but may also be natural features such as old water channels. They do not appear to form any structured layout and lie on a sloping part of the field. The linear anomalies highlighted in yellow are some of the clearest ‘pre-plough’ linear anomalies (interpreted as such because the plough lines cut through these features). It is not possible to interpret the date or function of these linear anomalies.

The clearest and perhaps most interesting archaeological feature in area 4 lies in the western part of the field and is highlighted in pink in figure 12. The feature is defined by an enclosure, the boundary of which shows as a dark almost d-shaped enclosure. The dark signal of this enclosure may be the result of a stronger magnetic ditch fill. This enclosure is not visible above ground or from vertical aerial coverage and lies immediately to the north of and alongside a small hill in this lower part of the field. The hill commands a strong position overlooking the river Derwent and the Derwent valley. The hill itself may also be surrounded by an enclosure, marked by a pink dotted line in figure 12. Both the hill to the south and the enclosure to the north contain a very high concentration of magnetic anomalies when compared to the undisturbed ‘clean’ signal given by the surrounding land. The two unsurveyed squares immediately to the east of the enclosure could not be included due to the presence of a large metal animal feeder.

The land to the west of the enclosure gives a very uniform grey signal showing little evidence of activity. The land to the west is also uniform with the exception of the pale negative stripes in the plough direction. It is significant that the plough striping to the east of the enclosure appears to stop at the edge of the perimeter and perhaps even respects the enclosure boundary. It is difficult to be certain, given the rather irregular signal of the perimeter, but the plough striping does not seem to cut through either the ditch or interior of the enclosure. This could be explained in the southern part of the feature as this is a hill which may have been too much trouble for the plough. In the case of the northern d-shaped enclosure however, there is no such prohibitive terrain to prevent ploughing, which suggests that the feature, or at least a remnant earthwork of the feature, was extant at the time of ploughing.

Without the aid of excavation, providing even a cautious interpretation of date and function of this feature is problematic. The feature has certain characteristics of a motte and bailey arrangement, with the small hill to the south of the feature forming the motte and the d-shaped enclosure (bailey) immediately alongside the hill to the North. The dotted appearance to the disturbance inside both parts of the site would not be inconsistent with timber buildings, thermoremanent signals from small hearths, timber fortifications and pits. Indeed, to pursue the theory further, the irregular signal from the perimeter of the d-shaped enclosure may be the result of a palisade trench or even a stone
foundation rather than a more uniform and substantial defensive bank and ditch earthwork. This could also explain why the feature is not at all visible above ground, even though the deep ploughing appears to respect it.

The northern –d-shaped enclosure encloses an area of only 0.12ha, with the whole feature covering 0.4 hectares in the surveyed area.

The extensive urban survey of Cockermouth and Papcastle by Cumbria County Council and English Heritage makes reference to the ‘popular tradition’ that Papcastle is so named because of an early castle built there by Gilbert Pipard. The survey document suggests the more likely origin of the name to be from the Old Norse word ‘papi’ referring to a hermit and notes that no archaeological evidence exists for the castle structure (Hartley. 2006) Nevertheless, reference to the existence of a medieval fortification at Papcastle in an uncertain location is intriguing given the results on the hill in the west of area 4. The location commands a dominant position overlooking a narrowing in the river valley and would be well placed to control movement up and down the river corridor. One must question however why such a fortification would be constructed so far away from the presumably ready supply of stone at the site of the Roman Fort. The location of the fort could also serve a similar function, though it would be further away from the river.

Perhaps the fact that the feature is located immediately above the well constructed trackway of ‘Friars Walk’ is a clue to the purpose of the enclosure. The location would seem a suitable position for a chapel, though no clear building can be seen in the geophysical data. The urban assessment document (Hartley. 2006) tells of references to a hospital at Papcastle and the location of this enclosure would provide a suitable plateau for a chapel and wooden buildings, close to the river and yet sufficiently distant from the main centres of population. Field name evidence suggests however that a chapel may have stood to the west of this location (see 5.7).

Though these two potential functions of the enclosure in area 4 are worthy of discussion, in truth, it is only through targeted excavation informed by the geophysical data that the date and function of these anomalies will be finally understood.

5.5 Results – Area 5

During the survey of area 4, the county archaeologist Mark Brennand forwarded an aerial photograph to the survey team of a field on the north bank of the Derwent on the western side of the Cockermouth bypass. The photograph was taken in the 1980s prior to the construction of the bypass and appeared to show a circular feature as a positive cropmark. Permission to survey the field was once again kindly granted by Mr Robert Jackson and the team moved on to area 5.
The survey team attempted to rectify one of the oblique aerial images to assess the location and scale of the cropmarks and to allow for a good comparison with the georeferenced survey data. The image above shows the attempted rectification and indicates that the bypass now cuts diagonally through the south east corner of the field before crossing the river. It should be noted that this is a ‘best fit’ rectification as insufficient control points could be found to provide a true plan rectification of the image.

The results of the survey in area 5 are shown in figures 13 and 14. The survey team were delighted with clarity of the circular feature in the magnetometry data and the additional information obtained. The circular feature shows very clearly in the western part of the field and can now be accurately measured to 13m diameter. Furthermore, the circle has a clear entrance in the western side and an adjoining enclosure boundary. The circle encloses an area of around 140m$^2$ and the adjoining boundary forms a small enclosure of some 580m$^2$.

The presence of an adjoining boundary and a clear entrance in the west suggests that the feature is a hut-circle with adjoining enclosure. We must consider that although the diameter of 13m would be a large hut circle, the dark circle may be a ringditch around the outside of a smaller hut circle within the ditch. The dark spot in the centre of the circle appears to be a post or posthole and the bipolar (black and white) anomaly in the western side may be a thermoremnant anomaly, perhaps from an off-centre hearth immediately inside the entrance. Three broad positive elongated anomalies are visible in the data and highlighted in pink in figure 14. Two of these appear to lie entirely within the survey grid.
to the north and the east of the circle. They appear to be archaeological features, being defined and part of the layout of the site, though their composition and function is unknown. It is not possible to say for certain if these are infilled ditches or raised banks and trackways now completely covered over, though they are interpreted as ditches in figure 14.

To the north east of the circular feature, in the northern centre of the survey grid, there are two almost parallel lines of pits which were not detected on the aerial photograph prior to survey. These dark (positive) pits enter the grid from the north centre and run for some 43m in a NW / SE alignment. These are shown in blue in figure 14. Some of the original discussions on the site considered whether the pits could be some form of ritual alignment, given the scale of the structure. They are spaced between 6m and 8m apart. Further research and consultation however revealed examples of Roman timber buildings on this scale, such as the Roman granary at Inchtuthil in Scotland (De.la bedoyere 2001) where the timber structure measures around 40m in length.

Further examination of the geophysical data reveals a continuation of fainter pits on the same alignment. These appear to form and extension or different phase of building, running for a further 20 metres toward the south west. If contemporary, this gives an overall length to the building of over 60metres. The northern extent of the structure could not be included in the survey due to the presence of a metal fence boundary and so the full length remains unknown. The area 6 survey did not find a continuation of the feature in the field to the north east, though this leaves a window of 40m of unsurveyed ground between the grids where the structure must end. Two parallel positive linear features protrude from the near centre of the eastern side of the whole structure and may be an indication of an entrance.

The nature of the archaeology in area 5 is difficult to interpret, particularly given the contrasting style of structures. It could be that the circular and rectangular large timber building are of two different periods and are unrelated. The fact that the largest of the broad elongated possible ditches is on the same alignment as the parallel postholes.
suggests that at least these 2 features are contemporary. The ditch, in turn, appears to respect both the circle and adjoining enclosure, presenting the appearance of a planned spatial layout to the site.

The dark green line plotted along the southern side of the field in figure 14 shows the location of the post-flood fencing which runs along the riverbank. This fenceline was surveyed in with the total station during the registering of the geophysics grid. The flood event of November 2009 heavily eroded this section of riverbank and a walk along the bank during the survey recovered 3 fragments of Roman pottery in the section. These 2 pieces of degraded samian and one piece of mortaria were in a fairly uniform silty deposit in the riverbank and had not washed in during the recent flood. It is not possible to say if they are from the survey field (area 5) or have washed downstream from the Broomlands site (area 1) during an earlier flood event. No other pottery was visible in the bank of any period.

Also during the survey of the riverbank, an unusual hard iron-rich deposit was recorded protruding from the riverbank, almost perpendicular to the current bank. The deposit was revealed by the recent flooding. Although the feature had an industrial appearance, with apparent orange iron staining, no evidence of slag could be found. The deposit may be a continuation of the southernmost ‘ditch’ anomaly, visible running towards the riverbank and highlighted in pink in figure 14. A sample of the concretion was taken for assessment by Lynda Howard and was found to contain charcoal.

Plate 12 (Above left): Volunteer Mick Fairfield measures the depth of the hard iron-rich concretion revealed by the flood erosion. The line of river cobble in the distance shows the riverbank position before the 2009 flood, with the original river channel beyond. Plate 13 (Above right): Detail of the deposit showing the iron-rich layering.

Other anomalies in area 5 include areas of magnetic disturbance in the northern part of the field and alignments of linear features arising from either plough or drainage activity of unknown date.
5.6 Results: Area 6

Area-6 lies to the north west of area 5 and was chosen to see if the posthole alignment of the rectilinear structure in area 5 continued. The field immediately to the north of area 5 and west of area 6 could not be surveyed as it was in crop.

The second reason for surveying area 6 was a reference in Askew’s guide to Cockermouth (1872) which reads “...in the second field on the Broughton road, on the left, there are still some remains of an amphitheatre.” The landowner Robert Jackson kindly showed the survey team some of the land deeds to the farm which clearly show that area 6 was sub-divided into two fields. This suggests that at the time of writing, Askew’s reference to “...the second field on the Broughton road...” would actually lie within area 6.

Plates 14 (left) and 15 (right): Fragment of rotary quern discovered by survey volunteer Mick Fairfield during area 6 walkover survey. Shown with 5cm scale.

During the course of the survey in area 5, some of the fieldwork volunteers undertook a boundary survey to look for evidence of re-used building stone in the walls and hedges. One of the fieldwork volunteers, Mick Fairfield, identified and recovered a fragment of rotary quern to the east of the survey field. The location is marked in figure 16. The quern fragment was lying on the surface of the grazed field, along with other dumped stone, and is likely to have been brought into the field from an unknown location.

The results of the survey in area 5 are shown in figures 15 and 16. Areas 5 and 6 can be seen together in figure 21, which shows all of the georeferenced survey data. The old boundary which sub-divided the field as shown on the early map can clearly be seen running roughly north/south through the area and marked with a green and black line in figure 16.

The results show that the parallel posthole alignment, interpreted as a large rectilinear timber building in area 5, does not continue into area 6. Some plough striping can be seen
across most of the field running parallel to the old sub-dividing boundary. A long broad positive anomaly in the south west of the grid, outlined in pink in figure 16, is very similar in shape and signal to the broad linear features identified in area 5. Two positive anomalies to the west of this feature are interpreted as pits.

A linear pattern on a different alignment to the plough striping can be seen in the data and is highlighted in red in figure 16. This pattern consists of both positive and negative linear anomalies and may result from drainage of the field, though the landowner considered this to be unlikely as the field is naturally well draining and these anomalies do not appear to be in a logical pattern for the local topography. They may therefore be a remnant of an earlier field system.

A very faint enclosure boundary can be seen in the south east of the survey data. The enclosure has the appearance of an inverted teardrop and appears to pre-date both the sub-dividing boundary running down the centre of the field and the plough striping in both sections of the field. This enclosure is of unknown date and function and is highlighted in a red dotted line in figure 16.

An area of high magnetic disturbance can be seen in the centre north of the survey plot and is highlighted in yellow in figure 16. This may be a result of industrial activity or recent burning.

The feature described by Askew as ‘the remains of an amphitheatre’ in this area remains a mystery. Mr Jackson informed the survey team that the profile of the bank in the field to the east of the survey grid was altered considerably during the construction of the Cockermouth bypass. He described the original bank profile as being more of a curving arc or semicircle cutting into the bank which retained water at the base. Waste material from the bypass construction was deposited in this area, creating a far more uniform profile and infilling this curving feature. It is possible that this curving bank profile was entirely natural but interpreted by Askew as the remnant of an amphitheatre. Pre-bypass aerial photographs may provide clues if any were taken of this area.
5.7 Results: Area 7 ‘Chapel Hill’

During discussions with landowner Robert Jackson, the survey team were informed of a small hill on the north bank of the River Derwent between Papcastle and Broughton known as chapel hill and marked as such on early maps. The name ‘Chapel Hill’, combined with the neighbouring field of ‘Redkirk’, the presence of ‘Friars Walk’ in Papcastle and ‘Priest’s Bridge’ to the north convinced the survey team that a day of geophysical prospection was worthwhile on the Chapel Hill site to look for evidence of an early church.

Plate 16: Detail of sale deed from early 20th century showing the field names of ‘Chapel Hill’, ‘Redkirk Top’, ‘Redkirk Wood’ and ‘Redkirk Bottom’. Only Chapel Hill was included in the survey. Document courtesy of Robert Jackson.

The Chapel Hill survey is marked as area 7 in figure 2 and the results are shown in figures 17 and 18. Following the success of the previous survey areas, and the clarity of earlier results, the Chapel hill results in area 7 were disappointing. The survey revealed only a few possible linear anomalies of archaeological origin, which are highlighted in red in figure 18 and offered with only a low level of confidence. There are two areas of high magnetic disturbance in the field which are highlighted in yellow in figure 18. These may be from areas of burning, metal contamination or industrial activity. The origin of the name ‘Chapel Hill’ and the neighbouring ‘Redkirk’ fields remain a mystery. The survey only covered the hill itself and did not look at the Redkirk field to the east or any other surrounding land.
5.8 Results: Area 8

With only one day of survey remaining in the Unlocking Hidden Heritage project, the survey team decided to conduct a day of prospection in a new area. Area-8 was chosen because it lies alongside the line of the Roman road which runs from the fort at Papcastle to Maryport. Permission was again kindly granted by Mr Jackson to undertake the survey, which investigated a plateau to the west of the Roman Road on the first hill to the north. The main reason for this prospection was to look for evidence of a cemetery, the location of which is unknown from Roman Papcastle but which we can reasonably predict from known cemetery locations would lie alongside one of the main roads leaving the town.

The survey results from area-8 are shown in figures 19 and 20. The data shows 3 main archaeological features. A linear with a positive dotted appearance can be seen running east/west along the northern part of the grid. This feature is visible above-ground and can be seen as an old field boundary which would have sub-divided the survey area and joined the existing right angled boundary corner in the west of the field.

In the centre-west of the plot, there appears to be part of an enclosure with a possible entrance in the south east corner. Unfortunately the team did not have sufficient time remaining to extend the grid and include the western part of this possible enclosure. Nevertheless, the feature is convincing as an archaeological anomaly.

In the southern part of the plot, a strong linear feature can be seen running east/west across the grid. Although this may be another old field boundary, the anomaly is quite different from that given by the known field boundary to the north. The southern linear is a much broader feature and is more likely to be a trackway than a boundary. The signal of this feature appears to be negative in the centre with a darker linear on either side, perhaps arising from ditches. The track may head towards a gate in the west of the field.

Figure 20 also highlights some possible pits in the south of the grid, though area 8 is in a limestone area and the anomalies may be geological.

Further survey in area 8 is recommended to investigate the possible enclosure and trackway. If proven to be a constructed trackway, it would be of great interest to see if this spurs from a junction in the Roman Road to Maryport.
6. Conclusion

This document brings together the work of a dedicated and enthusiastic team of local volunteers who freely gave their time over a six-week period in summer 2010 in the hope of increasing our understanding of the history and heritage of Cockermouth and Papcastle. The survey was given an added significance by the collective desire among the whole team to find something positive in the wake of such a dramatic and damaging flood event in the town.

From the very first day on the heavily flood damaged and gravel strewn Broomlands field in area 1, both the community response and the survey results surpassed all expectations. The results of the survey have revealed a wealth of archaeological anomalies on both sides of the River Derwent and greatly increased our understanding of the nature and extent of the vicus associated with the Roman Fort at Papcastle.

The Bassenthwaite Reflections funded excavation on the Broomlands field allowed the Unlocking Hidden Heritage project to further engage community volunteers in archaeological research. The opportunity to excavate on this Roman site was the climax of four years of survey fieldwork and a fitting end to the programme. Although only a small part of the Broomlands complex was evaluated, the excavation provided a wealth of information to assist in the interpretation of the geophysical survey results. The full results of the excavation will be reported separately in the forthcoming North Pennines Archaeology Ltd excavation report.

The main result of this season of survey work is a greater understanding of the nature and extent of the Roman settlement associated with the fort of Derventio at Papcastle. Although the survey has revealed many archaeological anomalies in the surveyed areas, it is clear that a further programme of community investigation will be necessary to fully understand the nature and extent of the vicus. The survey results have provided a wealth of additional research targets and have left several key questions for future researchers (see section 7).

We feel that this project has demonstrated the potential of community geophysical survey to identify significant archaeological remains and that the technique of magnetometry, combined with targeted community excavation, allows trained volunteers to make significant archaeological discoveries and contribute greatly to the understanding of their own heritage and landscapes.

7. Suggested Future Research

Carefully targeted evaluation excavation of a number of features identified through the geophysical survey would be desirable to determine the date and function of features, as well as the state of preservation beneath the ground. Priority targets include:

- Evaluation of large building identified in Area 2
-Evaluation of two possible buildings in area 2 (upper and lower grid)
-Evaluation of small hill and enclosure in area 4
-Evaluation of hut circle/ring ditch in area 5
-Evaluation of possible large timber building (parallel pit alignment) in area 5

Further excavation in area 1 on the Broomlands field could:
- Increase our understanding of the activities and industry in the area of ditched enclosures to the south.
- Investigate the area interpreted as an iron-smelting site and recover dating evidence for the activity.
- Investigate the possible building foundations photographed after the flood event and then covered over by waste from the cricket field.
- Target a section of the large sub-circular enclosure to see if the clay and cobble foundation is consistently built over an in-filled ditch.
- Look for evidence of a river crossing point.

Further geophysical survey is recommended to answer key questions including:
- Trace the extent and continuation of settlement activity along the road to the south (into The Fitz).
- Search for evidence of cemetery along known roads leading out of the settlement (incl. more work around area 8).
- Investigate the Redkirk fields to look for evidence of an early church.
- Survey the fort area to clarify fort layout and evidence of surrounding activity to the north and east.

Grampus Heritage and Training Ltd are seeking to initiate a further programme of community fieldwork and have submitted an expression of interest and project outline to the Heritage lottery Fund.

8. Bibliography


