



# Morrelhirst Bastle, Hollinghill, Northumberland: An Archaeological Survey of the Landscape Evidence

Cara Pearce

Discovery, Innovation and Science in the Historic Environment



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**MORRELHIRST BASTLE  
HOLLINGHILL  
NORTHUMBERLAND**

**An Archaeological Survey of the Landscape Evidence**

Cara Pearce

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## **SUMMARY**

The bastle and surrounding earthworks at Morrelhirst, near Forest Gate in Northumberland, were recommended for further investigation by Peter Ryder during research for his county inventory of towers and bastles in 1995. Twenty years later this investigation has now taken place, forming part of a new Historic England study of these border farmsteads. Morrelhirst's bastle, its setting and history of occupation has been examined through a combination of aerial assessment, detailed earthwork survey and documentary research.

The bastle, concealed within the upper valley of the Forest Burn, does not appear to have been a solitary structure. A second building of similar shape and size located immediately south-east may have been contemporary and subsequently developed to form the core of a later farmstead once the bastle's defensive qualities were no longer valued. This farmstead appears to have continued in use until superseded by the present Morrelhirst Farm, established a short distance to the north in the mid-19th century, after which the older settlement fell into ruin. The landscape surrounding the bastle was heavily modified by the straightening of a stream course and the introduction of an adjacent railway line in 1872, yet it is still possible to identify agricultural patterns associated with the early farmstead. These are primarily the remains of ridge and furrow cultivation, although associated boundary features and pens indicate a focus on pastoral farming, which remains the principal use of the land today.

## **CONTRIBUTORS**

The investigation was carried out by members of Assessment Team North. Dave Went, Marcus Jecock and Cara Pearce undertook the field survey; Cara Pearce transcribed information from aerial photographs (assisted by David Knight, Remote Sensing Team) and carried out the documentary research with Clare Howard. The report was prepared by Cara Pearce, with contributions from Dave Went and graphics assistance from Philip Sinton (Imaging and Visualisation Team).

## **ACKNOWLEDGEMENTS**

The author would like to thank the land owners, the Northumberland Estate, and their representative Robin Smeaton for permission to carry out the survey, and David Milburn, Estate Shepherd, for assistance and access to the site.

## **ARCHIVE LOCATION**

The survey and report archive will be deposited at the Historic England Archive, Engine House, Firefly Avenue, Swindon.

## **DATE OF SURVEY**

The ground survey took place 13-16 October and 2-4 November 2015.

## **CONTACT DETAILS**

Assessment Team North, Historic England, 37 Tanner Row, York, YO1 6WP.

David Went; 01904 601948 dave.went@HistoricEngland.org.uk

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## INTRODUCTION

This report documents the remains of a post-medieval defensive farmstead, or bastle, and associated settlement earthworks at Morrelhirst in the parish of Hollinghill, Northumberland, centred approximately 1km west of Forest Burn Gate at TZ 0578 9594 (Figure 1). The site at Morrelhirst occupies a sheltered position where the Linn Kern and Blue Burn combine to form the Forest Burn, one of the River Coquet's many tributaries. The bastle is visible as an outline defined by the foundations of the walls. To the south-east are a number of earthwork features representing further structures and later spoil heaps, while to the north-west lies a large expanse of ridge and furrow reflecting patterns of post-medieval and perhaps medieval cultivation. The area in question is on land belonging to Morrelhirst Farm which is part of the Estate of the Duke of Northumberland. The bastle was scheduled in 1999 in recognition of the significance of the surviving earthworks and the likely preservation of undisturbed archaeological deposits (NHLE 1018994). It is currently listed on the Heritage at Risk Register due to its unsatisfactory condition and a general state of decline resulting from natural erosion (Historic England 2015, 31).

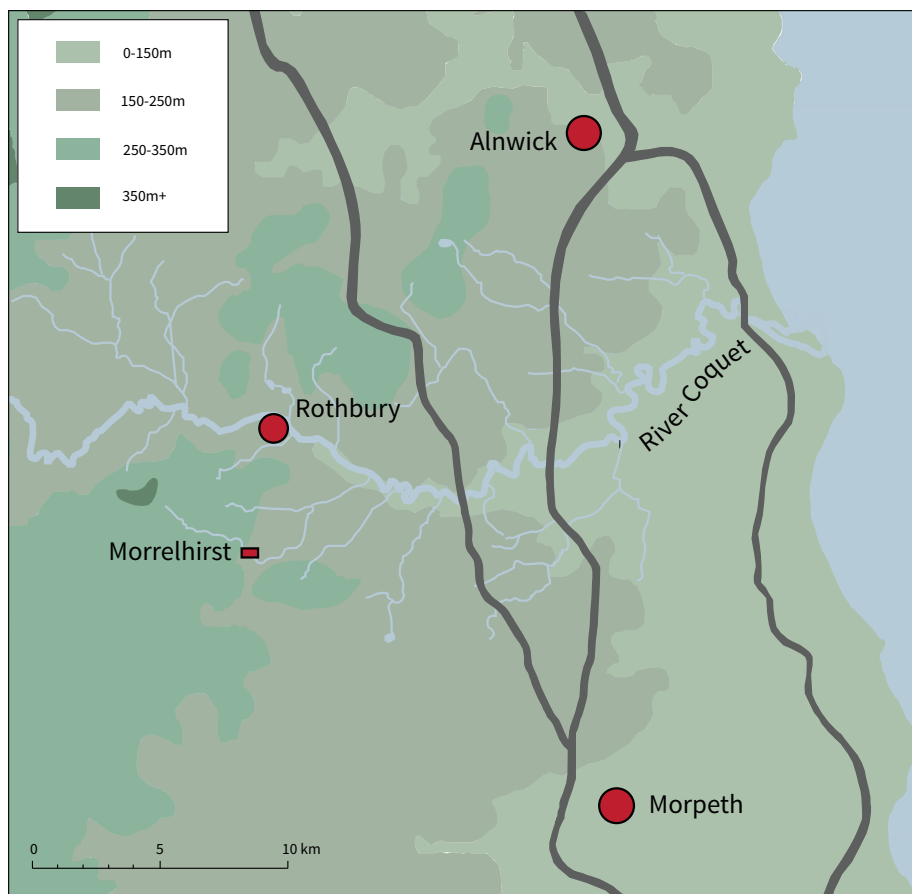


Figure 1. The location of Morrelhirst bastle. © Historic England. Based on Ordnance Survey information © Crown Copyright [and database rights] 2016. OS 100024900

The Morrelhirst study is part of a larger scale research project, 'Stronghouses and Bastles of the Border Counties' currently being undertaken by Historic England. The latter project is drawing together existing information and undertaking new case studies in preparation for a book which is intended to foster better management and conservation through an improved understanding of the significance of bastle buildings, some 380 of which survive in England alone, together with their wider settings (Taylor 2015). In particular the project is indebted to Peter Ryder, whose work in the 1990s and 2000s resulted in extensive gazetteers of bastles and towers covering Northumberland, Cumbria and County Durham (Ryder 1990; 1995a-f; 2002; 2006). The Morrelhirst bastle was identified by Ryder as a site which would 'merit an earthwork survey', citing its location as 'odd' and highlighting the surrounding earthworks as being of interest (1995b, 33).

A combination of methods was used to analyse the bastle within its landscape setting. Historical research focused on primary documentary evidence from the Northumberland Archives at Woodhorn and the Northumberland Estate archive at Alnwick Castle, alongside a range of published secondary sources. Archaeological investigations comprised an assessment of historic and modern aerial photography, the results of which were mapped in order to characterise the post-medieval landscape surrounding the settlement, plus a detailed earthwork survey of the core of the settlement. The survey was carried out by members of Assessment Team North and served as training for the author, then employed as a Historic Environment Placement (HEP) funded by the Chartered Institute for Archaeologists (CIfA).

This investigation of the bastle site at Morrelhirst, and the enhanced understanding it provides, is intended to assist in the future management and conservation of the monument.

## HISTORICAL BACKGROUND

Bastles are small rectangular, thick-walled buildings found in the border lands between England and Scotland. A defensive form of dwelling, they are considered to be a response to the endemic state of banditry and lawlessness, including the activities of the border reivers, infamous for their violent raids on livestock and property, which prevailed across the northern marches in the late 16th and 17th centuries.

In essence these were two-storied farmhouses, measuring on average c10.5 x 7.5m externally. The window-less ground floor, ventilated by narrow slits or loops, served as a byre and the upper floor provided domestic accommodation (Ramm *et al* 1970, 61). Access to the byre was provided by a single narrow doorway, often located in the gable end of the building. The upper floor doorway, usually in the long side, would be accessed by an external ladder and also by an internal ladder or steps from within the byre below. Well-preserved bastles retain evidence for first-floor hearths, smoke hoods, storage shelves or cupboards and, in some cases, sleeping lofts accommodated under the pitch of the roof. In times of threat livestock could be brought into the byre and a stout door secured by a draw-bar from within. The person securing the animals could then climb to the living accommodation through a trap door, or sometimes via an internal stair, and with the ladder to the main door withdrawn the whole property might achieve a measure of security. A few bastles are recorded as having additional protective features including quenching holes, as seen at Boghead Bastle (Lax *et al* 1997, 4) to extinguish fires near the wooden door, or gun loops such as one observed at Black Cleugh, Plenmeller (Ryder 1995f, 128-9) which might have enabled the occupants to dissuade their assailants in an altogether more forthright manner.

Typical bastles were built of roughly coursed rubble, with massive masonry quoins and lintels, and steep gables supporting stone slate roofs. Internally there are two distinct forms: those in which the upper floor was carried on a stone barrel vault, and those in which the upper floor was supported by timber beams. The foundations of both types usually consist of substantial boulder plinths which can sometimes be seen below the first course of the walls.

In Northumberland, bastles appear to be concentrated along the valleys of the North and South Tyne and the rivers Rede, Coquet and Aln. Ryder (1995a, 10) notes that the stereotypical view of a bastle as a solitary standing structure is likely to be misleading as many sites appear to have been accompanied by outbuildings. Bastle farmsteads may be found in isolation, arranged within sight of a neighbouring bastle, for example Low Cleugh and High Cleugh near Corsenside, or even grouped together in hamlets such as the deserted village of Evistones and within the present village of Wall or the town of Haltwhistle. In historic literature these buildings have been variously termed as bastles, peles and occasionally towers, although within the current Historic England study the terms 'pele' and 'tower' are used to refer to distinct forms of building which belong to other periods, or represent different functions or levels of social status.





Figure 2. The Raw, Hepple, Northumberland: a fine example of a standing bastle. The lower entrance is modern, replacing the original byre door in the gable wall to the right. An external stairway leads to the upper doorway which would have originally required a ladder. © Historic England.

Mackenzie (1825, vii, 50) states that the whole of Rothbury Forest was dotted with 'solitary farmsteads ¼mile to a mile distant from each other' and identifies these farmsteads as 'bastle buildings'. However, there is little physical evidence to support such a distribution. The nearest known examples to that at Morrelhirst are at Ritton White House, 1.4 km (0.9 miles) to the south-west, and Bog Hall, slightly further away to the east. Neither of these falls within the current boundary of Rothbury Forest, nor within direct sight of the Morrelhirst bastle, which may be considered to have stood in relative isolation. Hodgson (1858, 359), in his *History of Northumberland*, supposes that the bastles within the Northumberland Estate were built by the Duke of Northumberland, and although there is no direct evidence to support his view it is possible that they were introduced to attract and retain tenants during uncertain and lawless times, as has been suggested for various large estates across Northumberland (Frodsham *et al* 2004, 105; Natural England 2013, 11).

Protective night-watches were established across Northumberland in the mid-16th century, set up in response to a survey carried out on the condition of the frontier by Sir Robert Bowes in 1551. This was followed by a further survey in 1552 completed by John Dudley, 1st Duke of Northumberland, and by an Act of Parliament in 1555 which appointed commissioners for the rebuilding of fortifications and required the

strengthening of properties and lands within 20 miles of the border (Bates 1891, 221). In 1553 such a watch was established across Coquetdale in order to protect the population from raids both by Scots and by their closer neighbours in Redesdale (Dixon 1903, 474). Mackenzie describes the men of 'Tindale and Redesdale' as having been 'more frequently tempted by the rich vales of the Bishopric of Durham and other districts' rather than to the 'desolation' of the Scottish hills (1825, 57). The stretch of the watch that ran from 'Moryslehirst to the Stony Ford' was to be held by sixteen men, divided into pairs, from sunset to dawn: 'Two in every Passage of the Inhabitants of Rothburie Forest' (Dixon 1903, 474, translated from Nicholson's 'Leges Marchiarum or Border Laws'). Indeed, Bates (1891, 218) states that the 'Men of Coquetdale were of best repute' in reference to the night watches. The number of men on each watch indicated above could imply a greater state of defence across the Forest than is currently identified.

The only known documentary reference to Morrelhirst prior to the mid-16th century dates from 1310 and describes a vaccary, or cattle farm, at 'Mirihildyrst' (Hodgson 1858, 345), the exact location of which is unknown. According to Dixon (1903, 477) a survey of the Duke of Northumberland's possessions in 1569 (lately forfeited to the Crown) lists John Redhead, William Hall, Gerard Lawson and Thomas Potts as tenants at 'Morelyhurst'. Although it is unclear precisely which land or buildings were associated with whom, it seems likely there were by this time a number of dwellings in the area now occupied by Morrelhirst Farm.

A claim of £9 for 'the spoyle of the Towere at the Hirst' by a Thomas Potts is attributed by Dixon (1903, 195) to the 'Papers of the Wardens of the Middle March' compiled by Sir Robert Bowes in 1586 and assumed to relate to Morrelhirst – a view shared by other authors including Dodds (1999, 195). Richardson's transcription<sup>1</sup> ('Thomas Pott of the Herst for the spoyle of the towere xll') states that the original was written in the reign of Henry VIII and it is therefore more likely to be the earlier 1542 survey carried out by Bowes and Ralph Elleker (Richardson 1847). Whether this claim by Thomas Potts does indeed refer to a raided and damaged structure at Morrelhirst, or even to the same Thomas Potts mentioned in the 1569 survey, is far from certain, although Potts is evidently a family name which persists at this location (see below).

Locally 'the Hirst' - a common Northumbrian place-name meaning a wooded hill or knoll (Beckensall 2004, 12) - could refer to either Morrelhirst or Hesleyhurst some 3.5km north-west. Morrelhirst is associated with field names 'the Hurst' and 'Hurst east field' in a document of 1616-17 (AC:A IV 5-6), and Captain Andrew Armstrong's 1769 map of the County of Northumberland notes a place labelled 'Hirst' in this bend of Forest Burn, with 'Hirst Rigg' to the north and a 'W.Hirst' further south-west along Blue Burn (Figure 3). However, there are two known bastle sites within the area of Hesleyhurst (which contains the former place-names of Low Hirst and High Hirst) identified as Bog Hall and Brockley Hall, and a further site in Hesleyhurst, The Lee, is also worthy of consideration. This latter site is recorded as a possible tower or

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<sup>1</sup> Richardson, like others, interprets 'xl' to mean £9 instead of £40. The latter, in context with other values in the document, might appear to be the more likely sum.

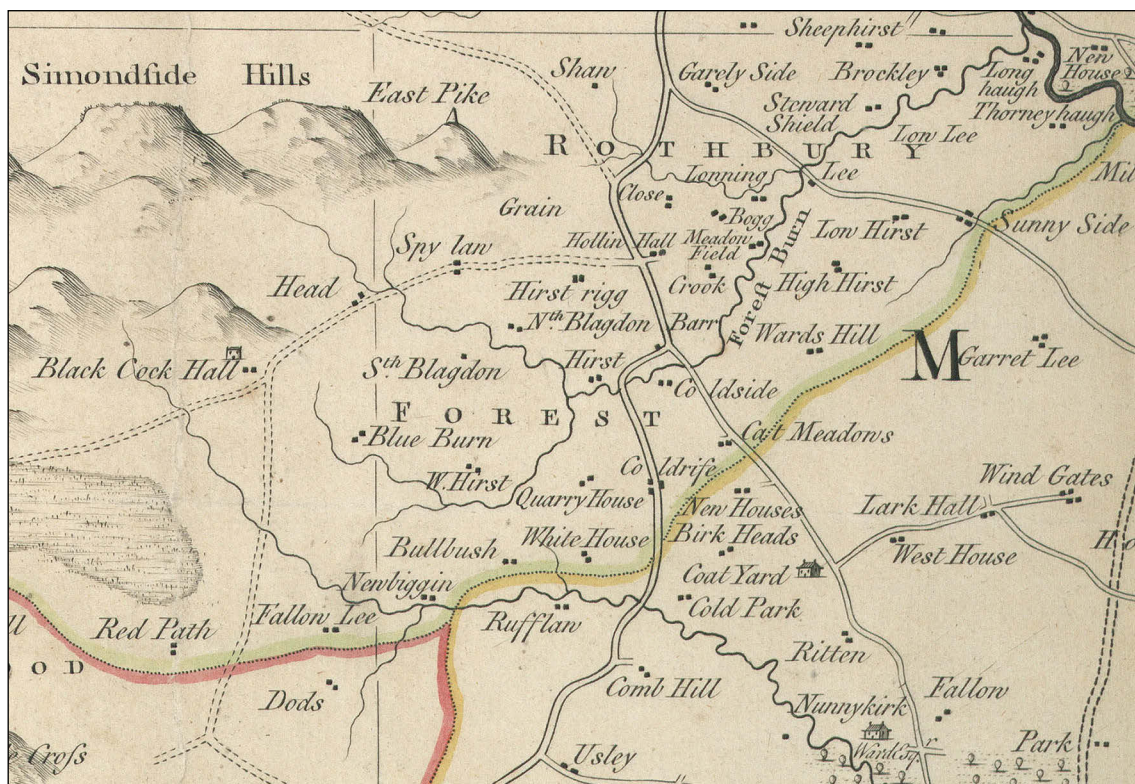


Figure 3. Extract from Armstrong’s map of the County of Northumberland 1769. Reproduced with permission of Northumberland Archives, Woodhorn. Note the frequent occurrences of the place-name ‘hirst’. Morrelhirst is located at the confluence of the two streams forming the Forest Burn at the centre of the map.

pele in the National Record of the Historic Environment (NRHE uid 21252) based on a description from the 1569 survey mentioned above, although there is no trace visible on the ground or described in local records. Further afield, some 25km to the south-east in Ashington, buildings identified as a castle, a tower and a farmhouse are all known as the Hirst. Aspects of these buildings are recorded on both Greenwood’s map of 1828 and Armstrong’s 1769 map. Possible though it might be, Morrelhirst is therefore far from being the only candidate for the ‘Towere at the Hirst’ (Dixon 1903, 195).

The intake of land for farming in Northumberland in the 16th century may have been advanced to some extent by a sense of insecurity. An order made in 1552 by Lord Wharton, President of the Council of the North, advised that all arable, pasture and common ground suitable for ‘Tillage, Meadows or Grassings’ should be enclosed by ‘ditches five quarters in depth’ and hedged above three quarters high’ (summarised from Butlins’ translation (1976, 154) of Nicholson’s *Leges Marchiarum* 1705, 326).<sup>2</sup> Whether this advice was taken seriously or not a process of enclosure was certainly taking place, the most common approach being the intake of areas of moor, waste and forest. Butlins (1976, 159) states that Rothbury Forest experienced

<sup>2</sup> A quarter of a yard being 9 inches, the ditches should be 3ft 9ins, or 1.14m deep, and the hedges a minimum of 27 ins or 0.69m high.



Figure 4. An extract from the 'Plan of the Barony of Rothburie' 1622, reproduced with permission from the Collection of the Duke of Northumberland, Alnwick Castle Archive. Morrelhirst is represented by the left-hand dark-toned field at the bottom of the frame.

'more enclosure and reclamation' than any other region in the county; he quotes the 1586 survey of the estate which describes the land as 'barreyn and not very commodious for the lord, and now incremented by divers and improvements' and suggests that early enclosure was likely to have occurred in the Forest due to its size and the fact that plots could be appropriated without causing dispute.

The earliest known map of the area is a 'Plan of the Barony of Rothburie' (AA: AC.O.XXIII.1) dated 1622 which assessed sources of possible revenue on the Duke of Northumberland's estate. The plan shows a number of buildings, strip fields and areas interpreted as proposed improvements (Figure 4). Two roofed buildings are depicted in the approximate location of the Morrelhirst bastle. The fields marked on the map appear to be suggested areas of intake based on the text on the map and the intent of the survey. It is likely that the western area of intake at Morrelhirst is 'the Hurst' and the eastern area is 'Hirst East Field', both of which referred to on the accompanying 1616-17 survey (AC:A IV 5-6). These plots were evidently realised. Their measurements are comparable with the same parcels of land identified on the tithe apportionment of 1847 (see below) and their boundaries can be traced, more or less, through a succession of historic maps up to and including modern Ordnance Survey editions (Figure 5). The treatment of settlements on 17th-century maps is

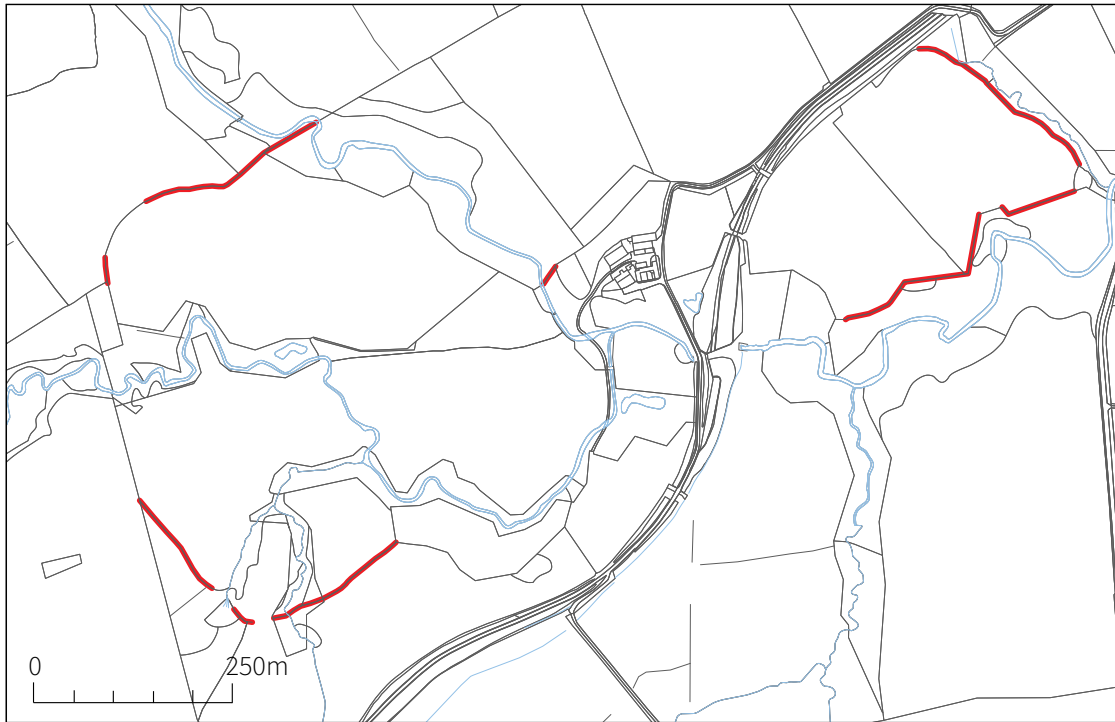


Figure 5. The area of Morrelhirst bastle from the 1622 'Plan of the Barony of Rothburie' from Alnwick Castle (top) and the persistent boundaries highlighted in red on the modern Ordnance Survey map (bottom). Note the accuracy in the depiction of the rivers on the early map. Top image reproduced with permission from the Collection of the Duke of Northumberland, Alnwick Castle Archive. Bottom image © Crown Copyright [and database rights] 2016. OS 100024900.

often illustrative at best and highly stylised. On this map, however, the cartographer has drawn different configurations of houses in each location which suggests knowledge of the character of the individual settlements and a desire to capture something of their actual composition. Only the more significant buildings would have been included on this map, of course, and there is a question as to whether these were existing buildings, or buildings intended as part of the assessment of future revenue; but the pattern is intriguing nonetheless, not least for the position of the western building on the bend of the stream at Morrelhirst, which bears a striking similarity to the location of the bastle.

The 1622 map is based on a written survey of the Duke's estate compiled in 1616--17 by Francis and William Mayson (AA: AC:A IV 5-6; C Hunwick, Alnwick Archivist, pers comm). This survey lists 'Morrel hurst' held by Thomas Potts, who had recently succeeded Robert Potts as tenant of the land. Associated with 'Morrell hurst' were one house and garth, one cottage house and garth, a moiety or half of 'the Hurst' which measured 29 acres, 3 roods and 29 3/16 perches (12.11ha) and 'Hirst east field' covering 11 acres and 22 3/4 perches (4.5ha). In 1619 a yeoman, 'William Potte of Rothburie', and his mother were listed as tenants on land that was also formerly occupied by Robert Potte and paying a rent of 20s (AA: MIV No4g). It is possible that this relates to one of the dwellings mentioned in the above survey. There is also a lease (made out to one ?Walter Grymes) dated to 1618 but the condition of this document made it difficult to discern precise information (AA: MIV No4g 1618).

The Pott(s) family continued to reside at Morrelhirst through the 17th century. In 1676 a lease between a yeoman Thomas Potts and the Estate was agreed for a tenement called 'Molluhus' for a rent of £3 13s 4d (AA: MIV No4 g 1676). This land and its associated buildings were passed to another Thomas Pott (or perhaps the same individual) and Robert Pott in 1697 for the same rent (AA: MIV No4g 1697), and by 1717 it had transferred from the aforementioned pair to a further Thomas Potts, yeoman, and William Potts, a shoemaker (AA: MIV No4g 1717). There are two leases dated 1738. The first, for 'Morrel-hurst', was between the Estate and William Potts and Thomas Potts, with an under tenant listed as Thomas Carnaby, for a rent of £1 16s 8d (AA: MIV No4g 1738a). A second lease, for the same rent, was to 'Thomas Potts of Rothburie' for a 'moiety of a messuage and lands' at 'Morrilhurst' which was formerly held by Robert Potts, his grandfather and Thomas Potts, his great uncle (AA: M.IV No4g 1738b). It is not clear which part of Morrelhirst each tenancy relates to, although as the two rents equate to the former single rent of £3 13s 4d, it may be assumed that the property was divided equally.

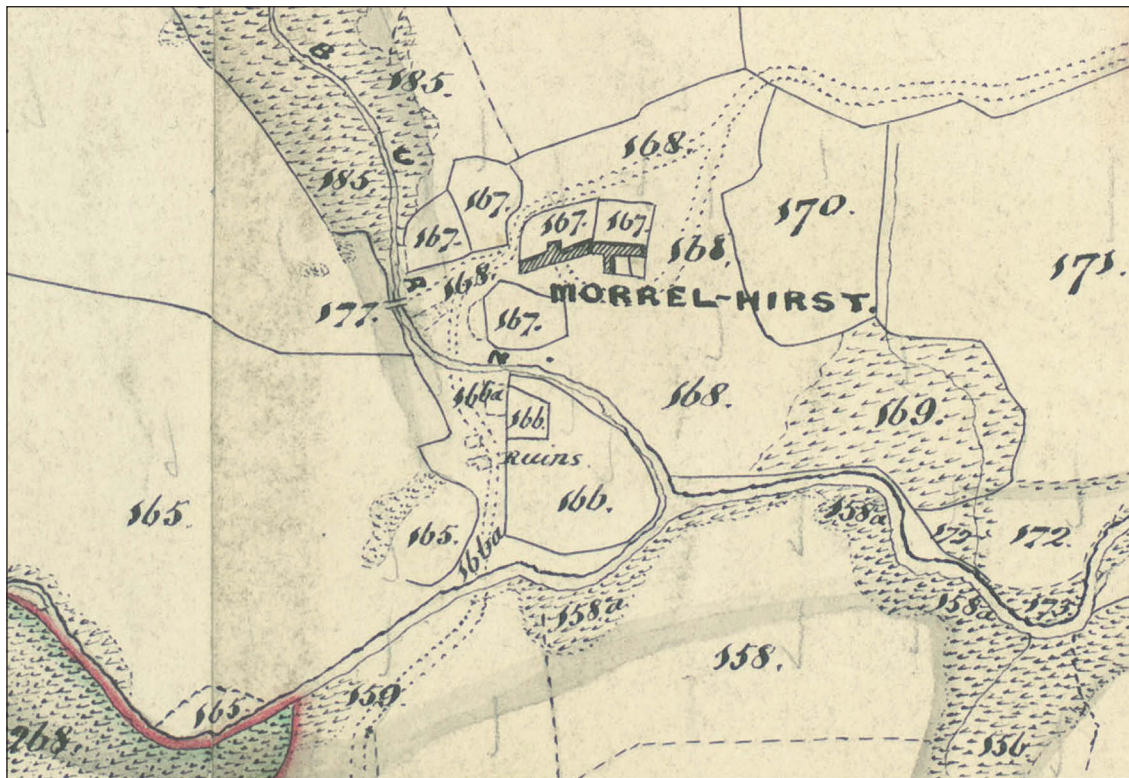
The multiplicity of Potts tenancies at Morrelhirst may reflect an old form of family law common to the region known as gavelkind, a form of partible inheritance by which land was split evenly among all sons upon a father's death. Whilst this may have kept familial units in close proximity it also meant that the land was broken up into ever smaller parcels, in some cases eventually becoming too small to be economically viable (Frodsham 2004, 99). Whether or not this law applied at Morrelhirst, a formal division had clearly arisen in the tenancy in 1738 and from this date until 1850 there are leases relating to North Morrilhurst Farm and South Morrilhurst Farm.



Figure 6: Extract from Greenwoods' Map of Northumberland (1828). Reproduced with permission of Northumberland Archives, Woodhorn.

A further area of land at Morrelhirst can be traced through a series of leases which identified 20 acres (8ha) of 'non-improvement' common land and a dwelling which was rented for a sum of 20s by John Simpson in 1685 (AA: MIV No4g 1685). It was later passed to his son John Simpson in 1726 (AA: MIV No4g 1726) before the tenancy was taken over by John Readhead in 1749, by which time the land was described as a small 'improvement of Morrel Hurst' (AA: MIV No4g 1749). It is possible that this is the same parcel of land identified above as being occupied by William Potte and his mother.

It is not known precisely when the present farm at Morrelhirst was established, however tenancy agreements dated 1777 which grant 'North Morrillhurst' to Henry Story and 'South Morrill Hurst' to Matthew Hume demonstrate a dramatic increase in rent compared to earlier figures - £50 and £130 respectively (AA: MIV 13a21, MIV 13a16) – which can only have been justified by the development of new buildings and the improvement of further land or fields. It is unclear which parts are referred to as North Morrillhurst and South Morrill Hurst. However the scale of the increased rent at South Morrill Hurst and its geographical relationship with East Hirst Field may suggest that this was centred on the Morrelhirst estate farm which stands today (Figures 6, 7 and 8).



165.	The Pike field – wood re included	169.	Stuffed wood
166.	the Mill Close – Garden re included	170.	The Little close
166a.	The Old Mill Lane – ruins of buildings re included	171.	The east field
167.	Buildings and garths at Morel Hurst	172.	The east field haugh
168.	The house pasture - roads between re included	177.	Kyloe pasture
		175.	Morel Hurst North Pasture
		268.	Morel Hurst Plantation

Figure 7. Extract from the 1847 tithe map (NA: DT 253L) identifying features in the vicinity of the bastle and associated ruins. The field names listed have been transcribed directly from the accompanying tithe apportionment (NA: ZAN Bell 79/10). Reproduced with permission of Northumberland Archives, Woodhorn.

Christopher and John Greenwood's Northumberland map of 1828 (Figure 6) shows the present farmhouse with yards on the north side of the burn, as well as a rectangular roofed building in the approximate location of the eastern building on the 1622 plan, and a smaller square building, also roofed, directly to the north. On the 1847 tithe map (Figure 7) the structures here are labelled as 'ruins' and referred to on the accompanying apportionment as 'Old Mill lane ruins', a name which according to Dixon (1903, 477) persisted through successive parish registers.



From 1847 onward, when a tenancy agreement is recorded between Matthew Wintrip of Morrelhurst and the Estate for both North Morrillhurst and South Morrillhurst farms along with Coldside Farm and East Coldside Farm (AA: ACA/Agmt/2433), Morrelhurst is referred to as a single entity. The first edition 6-inch Ordnance Survey map surveyed in 1863 shows no structures ruined or otherwise to the south of the stream, so it is possible that these buildings were completely demolished by this point or in such a state of disrepair that they were not considered suitable for inclusion on the map. The name 'Old Mill Lane' persisted.

The landscape of the area was physically altered by the construction of the Northumberland Central Railway which opened in 1872. At Morrelhurst the line was laid to the east of the farm, and course of the Blue Burn was straightened along the line of an existing field boundary, shown on the 1847 tithe map (see Figure 6), to create a higher confluence with the Linn Kern, thereby drawing both streams into a single culvert beneath the new railway embankment (Figures 8 and 9). This act altered the relationship between the site of the former bastle and the land to the east formerly enclosed by the two streams, a relationship which may have been significant in the original siting of the settlement. This field, shown containing a small enclosure on the 1847 tithe map, is listed in the apportionment as 'The Mill Close' and garden (NA: ZAN Bell 79/10).



Figure 8. Extract from 6-inch Ordnance Survey map, surveyed in 1863 and published in 1966 prior to the construction of the railway. Reproduced with permission from the original in the collection of the National Library of Scotland.

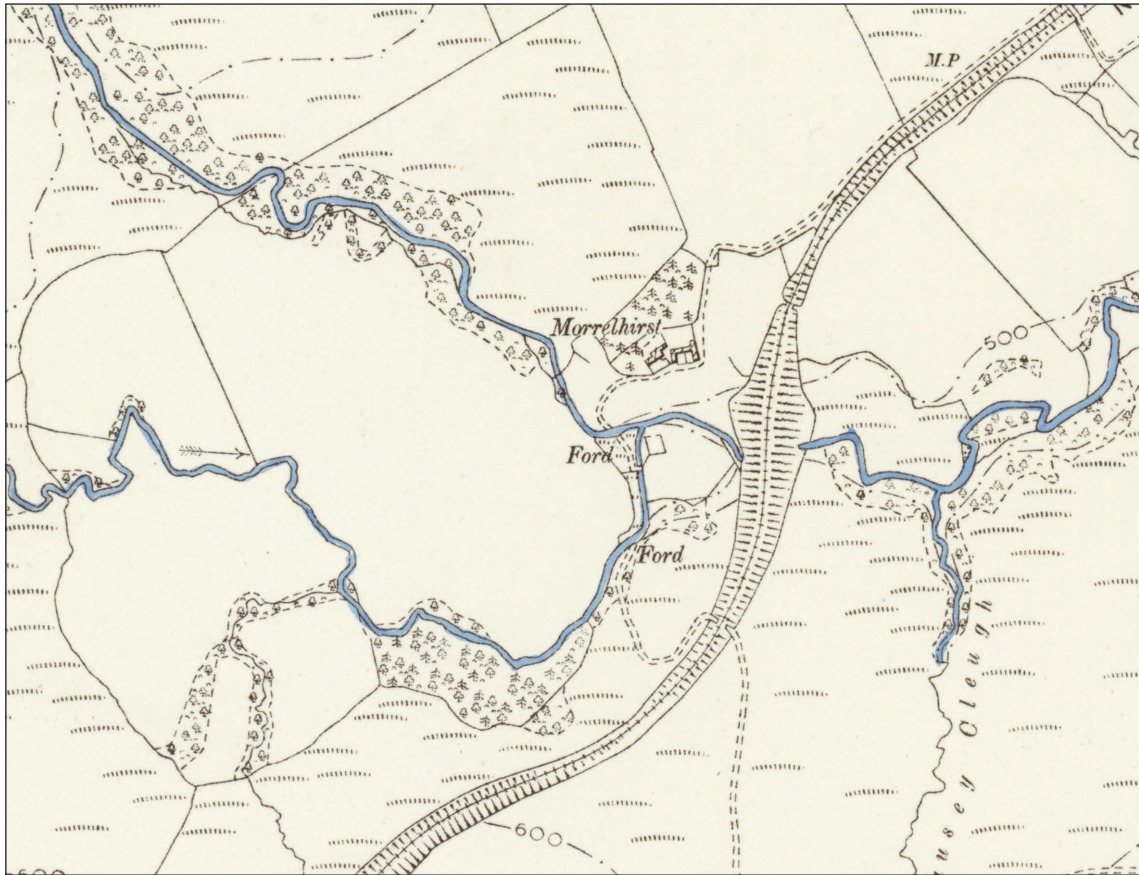


Figure 9. Extract from the second edition 6-inch Ordnance Survey, surveyed in 1896, published 1899, showing both the railway and the reorganised water courses. Reproduced with permission from the original in the collection of the National Library of Scotland.

## AERIAL ASSESSMENT

Aerial imagery, both photographs and lidar, was assessed and mapped<sup>3</sup> in order to examine the setting of the bastle and compare the form of the surrounding fields with that of the wider farming landscape. This section describes these wider agricultural patterns as depicted in the resulting aerial assessment (Figure 10) and labelled P-X. The bastle and adjacent earthworks are addressed in more detail in the following section.

The underlying geology of the assessment area is one of carboniferous sedimentary rock cycles made up of sandstones, mudstones and limestones, generally overlain by till deposits except where river courses have cut through them (British Geological Survey 2016). The landscape surrounding the study area is typical of the region with high ridge-tops supporting rough grazing for sheep and cattle on heather, descending through grass moorland and improved pasture across the lower slopes and valley floors created by the River Coquet and its tributaries. The slopes surrounding the survey area show elements of large scale 18th- and 19th-century enclosure and earlier piecemeal intakes (Natural England 2013, 6). These fields are frequently marked by former ridge-and-furrow ploughing and improvement drainage patterns.

The archaeological features identified from the aerial sources were predominantly earthwork in form, sometimes masked by extensive tree cover along the courses of the streams, or levelled by more recent episodes of ploughing. The general pattern of agricultural earthworks appears to represent fairly late post-medieval ridge-and-furrow cultivation, typified by large fields marked by ridges either created by horse-drawn plough, or by later steam-ploughing where the ridges are very straight, narrow and regularly spaced. There are instances however where traces of an earlier plough pattern, potentially medieval in origin, can be identified. The field at P, adjacent to the bastle, is one such example. The slight curvature to the alignment is a tell-tale sign that the furlong may have been established with an ox-drawn plough and the distance between furrows, which is marginally wider than that of the neighbouring furlongs, also implies an earlier origin for this cultivation. It is worth noting that even these ridges are not particularly broad, and tend, at their maximum extent, to reach no more than 6.5m in width, somewhat less than the common medieval standard. At Q the furrows are slightly 'S' shaped in alignment and less uniform in width. Here, it is likely that the origin of the cultivation was medieval and later ploughing has spilt the wider ridges of the earlier period into two narrower ridges of slightly irregular width. This imposition of a later cultivation pattern upon possible medieval fields can be seen in a number of other places. At R the only earthworks visible are those of post-medieval steam ploughing, although traces of the earlier boundaries or furlongs are evident as cropmarks where they have been heavily cross-ploughed. At S there is a small irregular parcel of land where the cultivation appears to be medieval in origin, surrounded by steam-ploughed fields and later banked boundaries. The fields surrounding the mapped area are broadly similar in character, dominated by late, narrow and regular plough patterns,

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<sup>3</sup> See later sections on methods and sources for details of the mapping process.

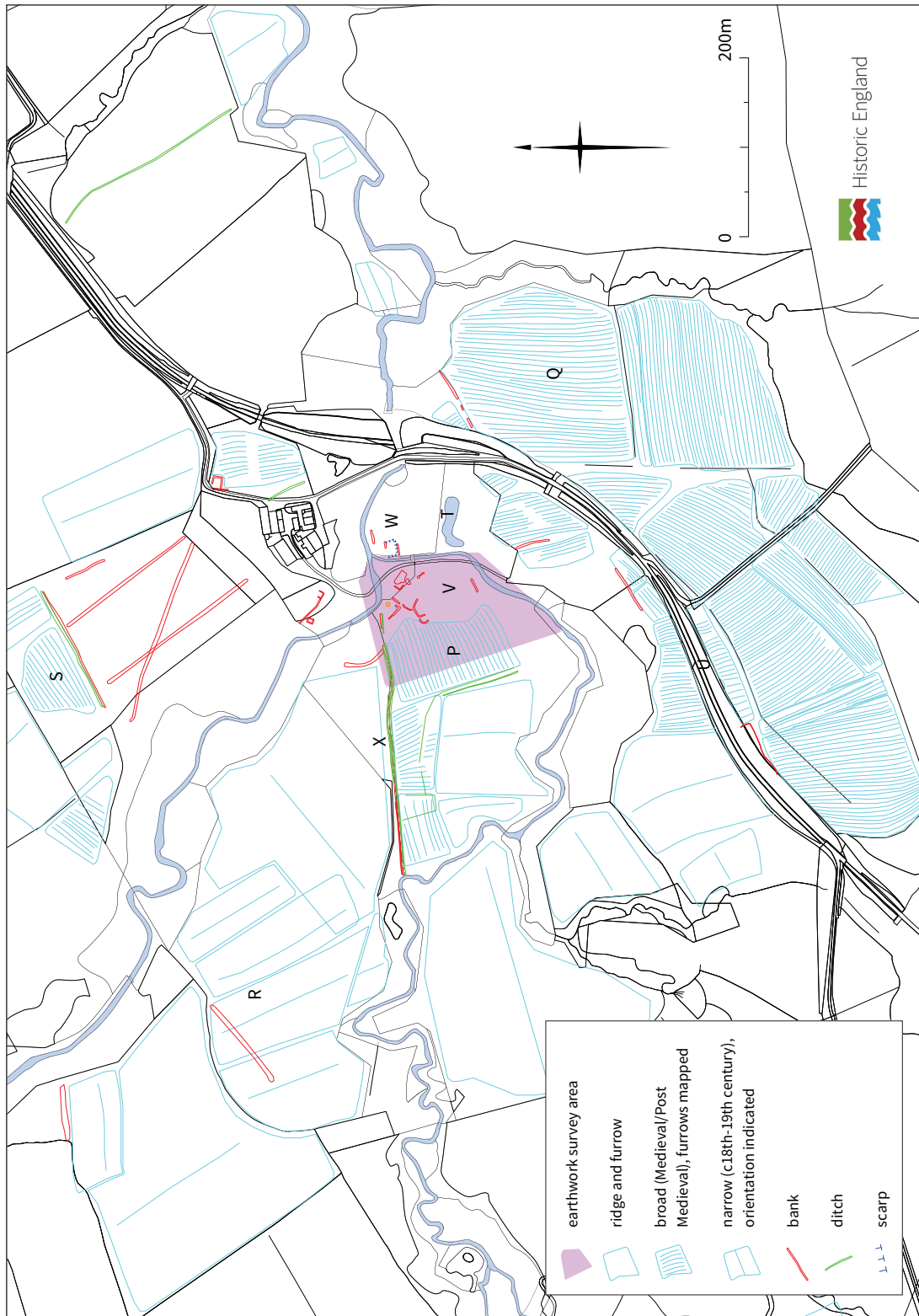


Figure 10. Aerial assessment of the post medieval landscape. Fields of narrow, regular (i.e. late) ridge and furrow are indicated by a single line marking the direction of ploughing. © Historic England. Drawn by Cara Pearce.



Figure 11. Aerial photograph of the landscape surrounding the bastle showing extensive ridge and furrow patterns as well as areas of cross-ploughing and widespread drainage. OS/1044 V 128 06-May-2001 © Crown copyright. Ordnance Survey

although these are generally contained within much larger and more regular fields than those seen in the immediate vicinity of Morrelhirst (Figure 11).

Many of the fields of ridge and furrow, particularly those north of the bastle, have been cross-ploughed in later episodes of agricultural improvement; others are truncated by later drainage ditches. Aerial photography reveals numerous buried drains across the area which can be seen as cropmark features, both in the form of sinuous ditches and extensive herringbone drainage. The fields surrounding the bastle have long been used for pasture and some of the grassed over ridge-and-furrow earthworks are scarred by animal trample. Where this poaching effect is most concentrated it is usually due to the presence of feeding pens.

The railway which opened in 1872 required a large embankment at Morrelhirst to carry the line over the valley of the Forest Burn. As part of this phase of construction, the course of the stream was altered: the change illustrated by the first and second editions of the Ordnance Survey map (see Figures 8 and 9). The remains of the former watercourse can be seen in pond T. Areas of well-preserved ridge and furrow cluster along this line [U] where fields purchased by the railway company (NA: SANT/BEQ/5/4/13/6/6/1 ) were left divided, isolated or otherwise unsuited to further cultivation.

The water courses, the Linn Kern and the Blue Burn, played a large role in creating the present day topography and may well have been the defining features of the landscape in which the bastle operated, not only in marking a natural boundary but also in the creation of small areas of pasture from the scars of stream migration. One such feature [V], created by the Blue Burn to the south of the bastle, appears to have been enhanced by the addition of a series of banks, interpreted as possible animal pens, appended to the northern slopes of the natural hollow. From here there is a subtle trace on the lidar imagery of a bank which runs from the top of this slope eastwards down towards the bastle. The shape of the embayment is further defined by a plough headland from the ridge and furrow aligned to the west. Within the field [W] which once formed part of the immediate landscape to the east of the bastle, a lower terraced area was identified, highlighted by banks on two sides. This area matches the extent of the 'Mill Close garden' shown on the 1847 tithe map mentioned above.

A long sinuous double ditch with a central bank [X] appears to have served as the northern boundary of a group of fields contained within the broad southern loop of the Blue Burn and Linn Kern. It touches the bank of the Linn Kern approximately 10m north-west of the bastle and extends over a distance of some 258m to meet the Blue Burn on the other side of the peninsula, some 258m to the west. This feature appears generally to respect the margins of the earlier fields, but it is clearly a later imposition, curtailing the field of slightly wider ridge and furrow in the centre of the loop and poorly aligned with the ridges in the field to either side.

## ANALYTICAL EARTHWORK SURVEY

The detailed earthwork survey was carried out over a week in October 2015, followed up by three further days in November. Its purpose was to examine the bastle in its immediate landscape, analyse the surrounding earthworks (some already highlighted by Ryder) and map these features within the local topographical context. This, it was hoped, would shed further light on the origin and development of the settlement, as well as providing information on the conservation issues which had placed the monument on the Heritage at Risk Register (Historic England 2015, 31). The analytical earthwork survey is illustrated as Figure 12; key areas and individual features mentioned below are labelled A-O, or are otherwise indicated on the plan.

The survey area (see Figure 12) covers the bastle and all related earthwork features in the immediate surroundings. These features are concentrated along the steep southern side of the narrow valley created by the Linn Kern and contained to the east by the artificially altered line of the Blue Burn. To the south and east of the bastle is an area of long marshy grass and reeds which was saturated at the time of survey. The eastern edge of the bastle is directly adjacent to the steep c 2m-deep bank carved by the Linn Kern. To the south-east of the bastle a number of earthworks, interpreted as a combination of structural features and spoil heaps, lie on relatively flat ground bounded by the confluence of the two streams. Overlooking the site to the east is the main plateau of agricultural land which is likely to have been directly associated with the bastle, and to the south lies the circular embayment mentioned above, formed by a former course of the Blue Burn.

### Bastle

The earthwork remains of the bastle [D] are rectangular in plan and oriented north-west to south-east, measuring approximately 8.5m x 4.5m internally and with external dimensions of 11.2m x 6.8m (Figure 13). Three of the walls survive as low stony banks, 1.2-1.6m wide and 0.35-0.6m high, now grassed over and incorporating tumbled material which slopes towards the interior (Figure 14). The fourth wall, to the north-east alongside the stream, has visible upstanding stonework, two courses (c 0.8m) high and c 0.85 wide. Dimensions are suggestive of the original form of the structure taking into account tumbled material. This wall, the internal edge of which does not appear as consolidated masonry, is constructed of roughly-shaped stone blocks measuring c 0.45m by 0.4m. A substantial quoin, 1.1m long and 0.25m high, remains in situ at the northern end. The boulder plinth forming the wall's foundation can be seen extending for at least 0.3m below the lowest masonry course where erosion has occurred along the stream bank. The plinth appears to be constructed of large rounded stones, probably taken from the stream bed. The southern corner of this wall is heavily disturbed by a large alder tree, the roots of which are entwined in the remaining stone work, and the rest of the stream-side wall is similarly colonised by two substantial trees and other, lesser shrubs (Figures 15). The course of the Linn Kern has evidently shifted significantly to the south over the centuries, leaving the remains of the building in a precarious situation.

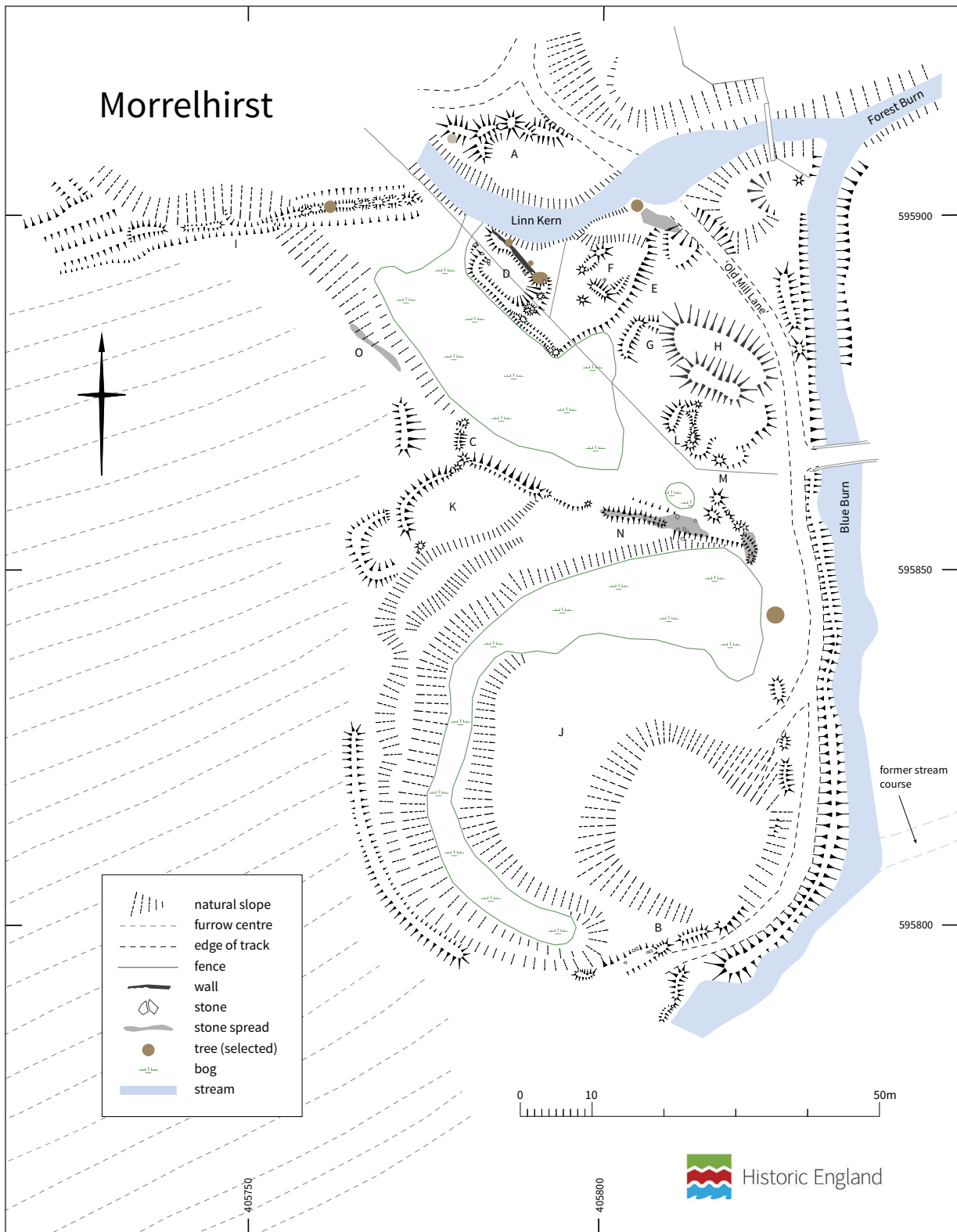


Figure 12. Earthwork survey plan of the Morrelhirst earthworks, 2015. Not to scale, reduced from the original survey scale of 1:500. © Historic England. Drawn by Cara Pearce



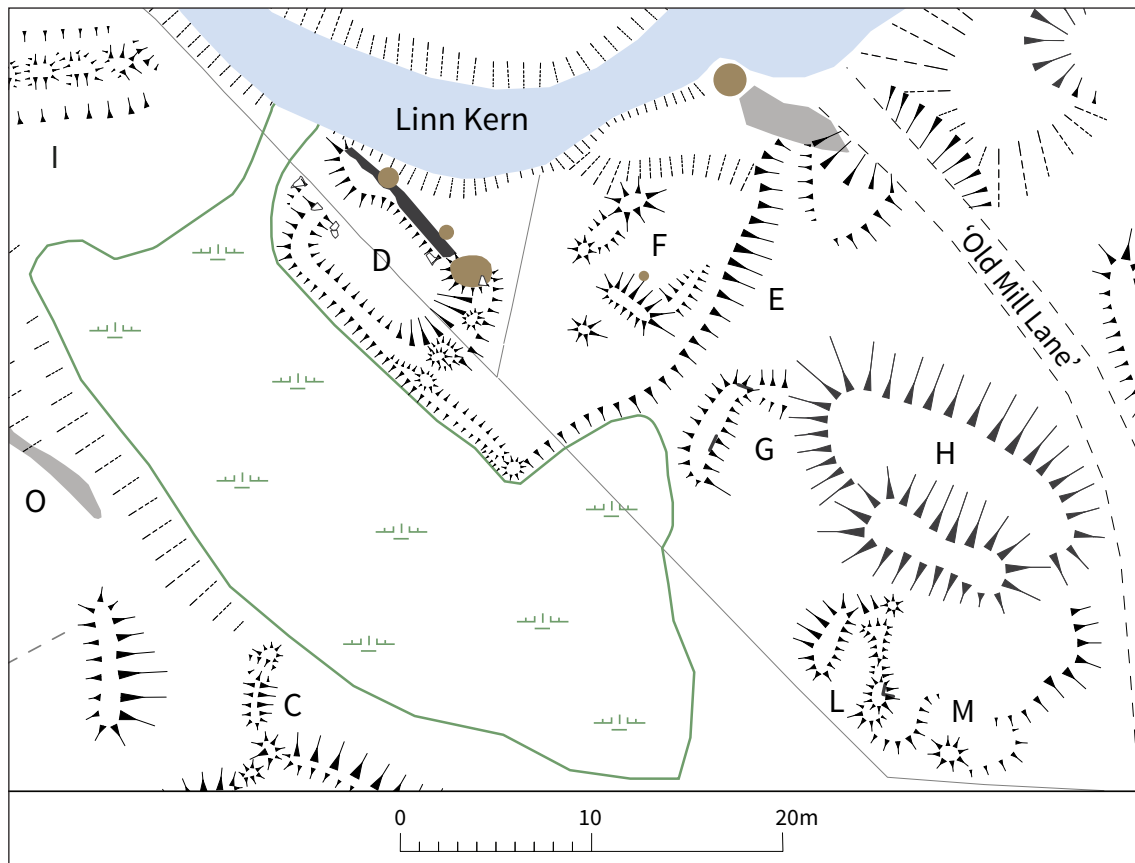


Figure 13. Detail from the earthwork plan at 1:200 scale showing the bastle and surrounding structural earthworks. Trees which are damaging the features are also depicted. © Historic England. Drawn by Cara Pearce

The exterior of the south-west wall running along the bog edge is very clear and stands to 0.6m high, whereas the internal face is less distinct and reaches a height of 0.35m. The earthwork on the south-east side of the building is the most irregular in height and has a central depression with two mounds of material either side along the line of the wall. It is possible, as Ryder (1995b, 33) noted, that this depression represents the byre doorway, although a clear vertical break in in the opposite north-west wall, marginally left of centre, is the more probable entrance. No trace of a moulded jamb or rebate survives though, and it is to be assumed that the better masonry has long since been removed for re-use elsewhere (Figure 16). There has also been some more recent damage where a post-and-wire fence was laid across the site prior to it being scheduled in 1999, cutting a line through the earthwork and potentially displacing some of the stonework (English Heritage 1999). Rotten posts lying beside the north-east wall (with one upright still in place) indicate that the fence line may originally have been further towards the stream or that some kind of pen had been created within the bastle.

A low bank appended to the corner of the south-east wall, oriented north-west to south-east, runs south-east for 5.5m before terminating at a small earthen mound.



Figure 14. The bastle viewed from the north-west with the fence line running through the suspected entrance, 12 June 2015. © Historic England / Simon Taylor.



Figure 15. The north-east wall of the bastle viewed across the Linn Kern, showing the top of the boulder plinth and the effects of tree growth, 15 October 2015. © Historic England / David Went.

There are a number of extended bastles in the region where a later building has been attached to a gable end, and Ryder (1995b, 33) makes the reasonable suggestion that this too may be evidence of an extension. However, there is no evidence of the wall returning to form a second gable end, and given the slight nature of the earthwork and the firm, level area it contains (Figure 17), it may be better interpreted as the boundary of a yard or garden plot attached to the bastle.

Perpendicular to the extended wall a slight hollow, with a distinct scarp along its north-west edge, runs along the edge of the bog. Where this hollow [E] meets the wall it is fairly shallow, although it marks a clear division between the drier and wetter ground. As the feature extends north-eastwards towards the track from



Figure 16. The north-east facing side of the possible entrance showing damage to the stonework. © Historic England / Cara Pearce



Figure 17. The south east wall of the bastle viewed from within the building's footprint, and the level area extending further south-east which may be a second building or a yard. The large spoil mound [H] is visible beyond. 12 June 2015. © Historic England / Simon Taylor.

the present day farm it widens to a more recognisable path, the increased depth of which, exaggerated by the height of the surrounding earthwork features, takes the form of a hollow way – an eroded channel created by the passage of people or animals over time. It is possible that the scarp by the yard wall is just the outer edge of this hollow way, and the rest of the feature has been masked by the encroaching marshy land.

## Other structures

To the west of the hollow way, a series of small banks form three sides of a probable structure, c 5.5m in width, and open to the north-east [F] (see Figure 12 and 13). They are irregular in width and diminish in height towards the north-east. It is not known whether there was ever a fourth side to the structure. The interior of the feature is visibly lower, by 0.25m on average, than the exterior, a difference which may be exaggerated by the effects of animal erosion beneath a hawthorn bush growing in the centre of the structure. The feature lies c 0.3-5m below a slight terrace rising toward the stream which can be identified as a natural scarp from its exposed profile along the eroded bank. It is possible that this terrace continued further east before it was truncated by the hollow way [E], the farm track (formerly known as ‘Old Mill Lane’) and some minor quarrying activity at the modern confluence of the two burns.

There are a number of earthwork features to the east of hollow E, two of which (G and L) are likely to represent structures, while the others appear to be a series of spoil heaps [H]. The most clearly defined structural element is an L-shaped bank with a subtle short return [G] underlying the lower of two large spoil heaps (Figure 18). Stonework can be seen through the turf and the lines of faced stones can be picked out in places. On average these walls measure 0.9m in width and stand to a maximum height of 0.25m. This building appears to have been approximately 5.9m wide and, though its length is masked by stone robbing and later dumps, its alignment appears quite similar to that of the adjacent bastle [D]. It is tempting to identify this building as the southern structure shown on the 1622 map (see Figure 5), although such an association can only be speculative at best.

The second structure [L] is more amorphous, formed of a series of small banks and mounds representing fragments of a wall, perhaps a building, surrounded by mounds of demolition debris. Again stonework can be seen in places within the earthwork. The most clearly defined wall is oriented perpendicular to building G, perhaps suggesting that it formed part of an outbuilding or an attached pen. Alternatively, as the 1847 tithe map implies (see Figure 7), this wall may have been part of an extension on the south-west side of a separate structure, now completely obscured by the extent of the demolition and the spread of the later spoil heap [H].

The most dominant feature in this area is the large spoil heap [H] constructed in at least three phases, which stands to a maximum height of 1.25m. The larger body of the heap has been levelled flat at its north-west end and slopes from there towards the river. This is overlain on its southern edge by a smaller more irregular



Figure 18. Wall line of structure G with the short return underlying the large spoil heap, 15 October 2015. © Historic England / David Went.

mound, and both appear to overlie a broader earlier spread of material which is most noticeable to the south-east. The size and orientation of the upper heaps suggest that they were created when the new channel for the Blue Burn was excavated around 1870, although the spot may have been chosen as it was already good for little else following the demise of buildings which, according to the tithe map, were already ruinous more than 20 years before. Beyond structures G and L, south of the fence line, a series of small mounds [M] constructed from stone piles has been interpreted as further clearance. Similarly, north of the Linn Kern, there are a series of irregular earthworks [A]. These have been tentatively interpreted as dumped material relating to clearance from the stream, possibly to maintain the flow of the water. It is also possible that fallen material from the bastle may have been cleared from the stream below.

### The former mill

'Mill Close', the area between the streams to the east of the new channel of the Blue Burn, is shown on the 1847 tithe map containing a pair of appended enclosures or possibly a small ruined structure and larger enclosure with the name 'Mill Close Garden' (see Figure 7). These features are also shown on a near-contemporary map of Hollinghill township by Thomas Bell, which appears to be mainly copied from the tithe map (MIV No4g 1618). The garden - a sunken terrace bounded by banks - can still be seen on the far side of the channel (see Figures 10 and 11, aerial feature W),

but all trace of the smaller feature appears to have been lost, probably as a result of the construction of the new length of the Blue Burn c 1870. If there had been a building in this location it would be a strong candidate for the mill from which 'Old Mill Lane' and the adjacent tithe apportionments took their name. Such a mill is unlikely to have sat directly on the Linn Kern, as that would imply an undershot wheel set within an unregulated channel - an arrangement both inefficient and vulnerable to damage in times of flood. Another possibility, however, is that the mill stood alongside a leat which took water from the more constant and slightly higher course of the Blue Burn and used the Linn Kern as the tail race. The north-south boundary between land parcels 166 and 166a shown on the tithe map could represent such a leat, long redundant in 1847. If there had been a leat in this location then its course might well have been adopted for the later Blue Burn realignment, which certainly followed this boundary and took advantage of a c 2m fall between the Blue Burn at the southern end and the Linn Kern to the north.

### Agricultural earthworks

Running east-west between the Linn Kern and the Blue Burn, and passing 10m to the north-west of the bastle [D], is a boundary bank [I and X] (see Figure 11 and 12). Across the higher ground the boundary is visible as a continuous bank flanked to either side by ditches, utilising existing ridges and plough headlands, including the northernmost ridge in the furlong closest to the bastle. As such it appears to be a later addition to the broad patterns of ridge and furrow on the field overlooking the bastle, possibly indicating a move towards a pastoral regime which required a boundary to contain livestock. Ploughing could have continued, perhaps intermittently, within the furlongs to the south and cross-ploughing evidently took place north of the boundary where a new headland was formed running parallel with the ditch on the northern side of the bank. The eastern portion of the bank, situated on the lower ground next to the bastle has a different character: a wall-like line of rubble piles stabilised by turf, in which the earthen material has sunk or eroded to give the appearance of an interrupted bank. The ditches are more distinct here on this lower ground and become shallower and wider as they rise uphill onto the plateau. In places there is evidence of a revetment wall [O] supporting the slope below the ploughed edge overlooking the bastle. It is fairly crude, constructed simply of stones pushed into the slope (Figure 19).

To the south of the bastle, alongside the Blue Burn, lies a large circular embayment [J] 65.3m in diameter carved out by a former river course, the bed of which still holds water. At the time of the 1622 map (see Figure 5) the river may still have been following this earlier course. The eastern and southern edges of the embayment were later enclosed by a bank [N and B] constructed in turf with rubble centres - a boundary which cannot have come into existence until after the burn had shifted to its more southerly course, as shown on the Ordnance Survey map of 1866 (see Figure 8). There are a number of breaks in this bank and in some places it can only be traced by a linear arrangement of stones. It appears completely flattened by the course of the track. In most cases it is strengthening natural undulations in the valley floor and so differs in height along its length. Around the western edge of the



Figure 19. The revetment running below edge of the slope which separates the agricultural plateau from the bastle below, 12 August 2015. © Historic England / Rebecca Pullen.



Figure 20. The pens surrounding the embayment with the short spur (centre left) running towards the bastle at the base of the slope. In the distance (centre right) the subtle earthwork of the plough headland highlights the top edge of the embayment. 14 October 2015. © Historic England / David Went.

embayment there is a slight plough headland which contributes to the general sense of enclosure, but this does not appear to have been physically connected to the lower banks.

To the north of the embayment, along its upper edge are two curvilinear earthworks, which are likely to be some form of animal enclosure [K] (Figure 20). The smaller C-shaped feature to the west clearly post-dates the final ploughing of the nearest furrow, and is much less pronounced than the larger enclosure which, apart from where it has suffered collapse along the rim of the embayment, has banks of up to 0.65m in height. There is a possible entrance to this larger pen on its northern corner, with a slight hollow leading up to it. This is exaggerated by an isolated relic of plough headland to the north of the feature creating a funnelled effect from the field, enhancing the interpretation of an animal pen. A short stretch of bank [C] is appended to this feature which runs in a northerly direction to the edge of the bog where all trace of it is lost. No surface trace of any features could be identified in the marshy grass; however, it is tempting to believe it may have led towards the bastle yard and beyond to the hollow way. Running east-west from this spur is a small stretch of rubble bank which sits along the northern edge of the embayment. If the short bank does lead towards the bastle then it is possible that these rubble banks represent some form of enclosure around the settlement.

There is a low bank along the west edge of the course of the Blue Burn where it was straightened and brought further west to suit the railway company around 1870. Its size does not equate to the amount of material which must have been removed to straighten the water course, much of which may be accounted for by the large spoil heaps dumped over the site of the former farmstead [H]. This bank is only slightly visible where the Blue Burn meets Linn Kern, but can be seen for the length of the survey area southwards beyond the bridge, may have been intended simply to consolidate the new stream-edge. Its height has been exaggerated somewhat by wear along the adjacent track.



## DISCUSSION

The bastle itself is a small example of the building type, with maximum external dimensions of 10.9 x 6.8m and walls 0.85-1m thick – somewhat narrower than the more commonplace width of about 1.2m (4ft) encountered elsewhere (e.g. Ramm *et al* 1970, 61). It is unclear from the earthworks whether the other structures, boundaries, cultivation remains and pens recorded as part of this survey are contemporaneous with the bastle, although inferences may be drawn from a combination of physical and documentary evidence. The proximity of the southern structure [G] (see Figure 12) to the bastle and the similarity of orientation suggest that it was an associated building. They are possibly depicted together on the 1622 map, and perhaps identifiable from the Maysons' 1616 survey as two farm buildings; one a cottage and one a farmhouse. Building F may have been an ancillary structure not worthy of depiction at this time, or it is a later addition. It may be that depicted as a square standing building (together with G, albeit on a different orientation to earlier mapping) on Greenwood's 1828 map, and as a recognisable ruin on the 1847 tithe map, while the bastle, appearing on neither source, appears to have been demolished by this period.

Whilst the location of the site on marshy land may have marked it as unusual, it is likely that the ground was better drained and much drier when the bastle was in use. Changes in the local hydrology will have occurred with altering the watercourse, and the improvement works and drainage on the agricultural land above would have increased run off down the slope. Movement along the hollow way may also have created a degree of erosion, which can now be seen as the sharp straight edge of the bog. There are other examples of bastles located in a lowland position on the edge of a stream, such as Stone Hall bastle in Henshaw (Ryder 1995e, 90-1) or Boghead bastle in the Tarsset Valley, which as the name implies is on marshy ground (Lax *et al* 1997, 4). It is possible that the increasing saturation of the ground at Morrelhirst was a factor in the final abandonment of the farmstead.

The buildings indicated by the 1622 map occupied a different landscape from the one visible today. They straddled the neck of a small peninsula of land extending to the east, framed by the natural courses of the Linn Kern and Blue Burn, which doubtless provided an area of sheltered pasture between the converging streams. To the west, the higher plateau contained within the southern loop of the Blue Burn appears to have been under cultivation before the bastle was built, and it continued to be tilled with horse-drawn ploughs in the 17th and 18th centuries.

The 1622 map is interpreted as formalising existing tracts of intake. The aerial assessment, whilst noting that the majority of the ridge and furrow in the wider landscape is comparatively late, found traces of earlier cultivation within the intake boundaries in the form of smaller field parcels, broad and sinuous ridges, or split ridges. The 1622 map is surprisingly accurate in its detail for the period and based on this evidence it seems likely that East Hirst Field, to the north of the Forest Burn (see Figure 5), was also cultivated at this time although extensive later ploughing here has removed all earlier traces. One small tract of broad ridge and furrow north

of the current farm building which might be medieval in origin has survived, and is perhaps indicated by one of the small intake parcels depicted (admittedly further south than its true location) on the 1622 map.

The 1622 map indicates that the Blue Burn originally ran around the western side of the embayment to the south of the bastle. The rubble bank along the northern side of this embayment [N] may therefore have begun life as an enclosure wall separating the early settlement from this stream. That the attached pens [K] were directly associated with the bastle is indicated by the lidar imagery which suggests that the spur wall running north [C] continued towards the bastle, broken only by the hollow way as it approached the building (Figure 13). Bank N must still have been a practicable boundary when it was recorded for the 1847 tithe map, by which time the river had moved southwards and the embayment itself had been partially enclosed with a rubble bank or wall [B], perhaps to serve as another, larger pen.

The long bank and ditched boundary [I] (see Figure 12) which runs across the fields on the higher plateau serves to contain the fields within the southern loop of the Blue Burn, and is quite probably linked with the development of the Morrelhirst farmstead, perhaps in the period of the bastle's occupation. Combined with the pens attached to the side of the embayment, this boundary may represent a shift towards more pastoral farming, although arable cultivation probably continued on a permanent or rotational basis. A modified headland along the western edge of the furlong nearest to the bastle [P] certainly supports the possibility that cultivation practices were altered rather than abandoned in a single act.

By the later 18th century there were two farm holdings at Morrelhirst, north and south. The documentary evidence does not give sufficient information to establish exactly where each holding was located, although it seems likely that a dramatic rent increase for South Morrel Hirst in 1777 reflects investment in what was to become the present Morrelhirst Farm. The location of North Morrel Hirst has not been determined.

Morrelhirst Farm was fully established and the older farmstead had long since declined into ruins when construction of the railway brought the next major change to the immediate area in the early 1870s. Spoil heaps were thrown up across the remains of the old farm buildings where the course of the Blue Burn was diverted to cut across the eastern spur of land immediately east of the former bastle. This area, termed 'Mill Close' in 1847, is shown on the tithe map containing a pair of appended enclosures or possibly a small ruined structure and larger enclosure with the name 'Mill Close Garden'. The larger enclosure - a sunken terrace bounded by banks - can still be seen, but all trace of the smaller feature appears to have been lost to the line of the new Blue Burn. It is possible, likely even, that a building in this location, situated on a mill race which preceded the later realignment of the Blue Burn, was the mill from which the lane and the tithe apportionment took its name.

The walls of the bastle, the adjacent building and the putative mill will each have contained valuable masonry in addition becoming sources of useful rubble. Some of

this may well have found its way into the present Morrelhirst farmhouse and farm buildings, although no detailed architectural study has been made to test the theory. The current track which runs from the existing farmhouse to the fields following the route identified as 'Old Mill Lane' is well surfaced in some places where large stone slabs have been laid. The scheduled monument, which is tightly defined by the extent of the bastle walls, is currently on the Heritage at Risk Register (Historic England 2015). The principal conservation concern for the bastle is erosion. The ground on which the bastle stands is in the process of being undercut by the Linn Kerr and the damage to the structure itself is heightened by the fact that three well established trees are growing through the exposed wall. The large alder tree which is growing on the east corner of the structure, largely displacing the stonework, is now holding part of the wall together. Should the tree fall the entirety of the remaining wall would collapse with it.

From the assessment of the landscape evidence it is clear that the remains of the bastle are only one part of a much wider narrative of occupation at this location. It is likely that some of the earliest agriculture in the surrounding fields was carried out before the construction of the bastle, which implies the presence of a still earlier settlement, so far undetected. Contemporaneous, or partially contemporaneous to the bastle is structure G, linked to the bastle by the hollow way, both thought to be enclosed by a rubble bank and associated with animal pens alongside the embayment. This farmstead continued beyond the need for the bastle as a defensible building and was possibly still in occupation during the earliest phase of the current farmhouse. During its lifespan it is likely that structure G was extended, the mill came into existence and smaller outbuildings, for example structure F were constructed. All had ceased occupation in favour of the remaining Morrelhirst farmstead by the middle of the 19th century, and had long been demolished when the railway line transformed the landscape around 1870.

## SURVEY METHODS

The primary stage of the survey was an assessment of remotely sensed data covering the wider landscape in which the bastle is situated, approximately 1km<sup>2</sup>. All oblique and vertical photography held by the Historic England Archive, alongside orthophotography (TIFF) and 2m height data (ASCII) supplied through Aerial Photography for Great Britain, and Google Earth imagery, was systematically assessed for the identification of medieval and post medieval archaeological features, including cropmarks, soilmarks, parchmarks and earthworks. Environment Agency (EA) 1m LiDAR (Light Detection and Ranging) data was also assessed where available and all digital height models were processed to model 16-direction hillshade.

Scanned and digital images were rectified using AERIAL. 5.36. Control was primarily derived from APGB orthophotography. Where control on orthophotography was insufficient Ordnance Survey 1:2,500 MasterMap<sup>®</sup> vector data were used. The error margins in rectifying the photography were within ±2m. 5m Digital Terrain Models (DTM) supplied as ASCII gridded data through APGB were used to improve the accuracy of rectification.

The medieval and post-medieval archaeological features identified were mapped in AutoCAD using imagery sources loaded using world (TFW) files. The mapping was carried out following the basic depiction conventions outlined by National Mapping Programme (NMP) Guidance. However, as the post-medieval agricultural landscape was a particular focus, individual furrows were also mapped in order to provide a more detailed assessment of the agricultural practices surrounding the bastle.

The detailed earthwork survey was undertaken to Historic England's Level 3 standard (Ainsworth *et al* 2007) using a combination of Global Navigation Satellite System (GNSS) and robotic Total Station Theodolite (TST). The survey was carried out within Ordnance Survey National Grid with co-ordinates for a local base station established using differential GNSS (Trimble R10). The use of both GNSS and TST (Trimble 5600) was determined by the tree coverage in the survey area. Accordingly, two further control points were established under the tree cover in order to create a closed-loop control network of three stations. Detail, both topographic and archaeological, was collected as rapid point data using two GNSS rovers, or by using the TST in reflector and reflector-less modes. Sufficient data were collected to enable the survey to be output at a scale of 1:1000. The survey of the bastle itself was carried out graphically at a scale of 1:200 by tape and offset from a baseline surveyed in by GNSS.

The data were downloaded and the traverses computed using Trimble Geomatics software before being loaded into AutoCAD 2012 and plotted at a scale of 1:1000 on polyester film to be taken into the field for adjustments and completion. A further plot was produced at 1:200, with the surveyed baseline, in order to draw the bastle by hand from taped measurements.

The drawn plan was scanned into AutoCAD at a scale of 1:1 and any additions to the digital survey of the bastle traced off. These were combined with the point data from the GNSS and TST in order to produce a hachure plan. This was later refined for publication in Adobe Illustrator.

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## Archive Sources

In text references are prefaced with either NA for the Northumberland Archives at Woodhorn, or AA for the archives held at Alnwick Castle. Where there are multiple documents within a single reference they are followed by the date.

### *Northumberland Archives (NA)*

Map of the County of Northumberland 1769 Captain Andrew Armstrong

Map of the County of Northumberland 1828 Christopher and John Greenwood

**DT. 253L** - 1847 Tithe Map: 'Plan of the township of Holling Hill, in the Parish of Rothbury, in the county of Northumberland. Belonging to his Grace, the Duke of Northumberland' Surveyed by Thomas Bell. Scale 8 chains to 1 inch.

**ZAN Bell 79/10** – 1847 Tithe apportionment

**SANT/BEQ/5/4/13/6/6/1** – 'Valuation of farms, valuers report of Moralhurst Farm, Rothbury' Jan 10th 1872 (a valuation of farms 1851-1872 which lists the general state of both Morrellhurst and Coldside Farm)

### *Alnwick Castle Archive (AA)*

**AC:A IV 5-6** – Survey 1616-1617 by Francis and William Mayson detailing Robert Potts as tenant at Morrell hurst

AC.O.XXIII.1 – 'Plan of the Barony of Rothburie' dating to 1622.

MIV No4 g 1618 - Map of Hollinghill Township and accompanying terrier to survey.

Alnwick Castle Additional – Thomas Bell- Volume 3- No72, part 2. 1850

Sy.MIV 13a21 - Lease of North Moril Hurst to Henry Story 1777

Sy.MIV 13a16 - Lease of Sourth Moril Hurst to Matthew Hume 1777

MIV No4 g 1618 - Lease relating to Morrell Hurst to Walter Grymes 1618

MIV No4 g 1619 - Lease of a messuage and tenement appurtenance at Mirril-hurst to William Potte and mother.

MIV No4 g 1676 - Lease of a tenement called molluhus to Thomas Pott 1676

MIV No4 g 1685 - Lease of an improvement part of Morrell hurst to John Simpson 1685

MIV No4 g 1697 - Lease of land at Morrill Hurst to Robert and Thomas Pott 1697

MIV No4 g 1705 - Lease of part of land at Morrell Hurst to John Simpson 1705

MIV No4 g 1717 - Lease relating to tenements and appurtenances at Morrellhurst to Thomas Potts and William Potts 1717

MIV No4 g 1726 - Lease for 20 acres of Morrel Hurst to George Simpson 1726

MIV No4 g 1738a - Lease of a moiety of messuage and lands in Morrell-hurst to William Potts 1738 and lease of lands to Thomas Potts, under tenant Thomas Carnaby 1738.

MIV No4 g 1738b - Lease for a moiety of messuage and lands in Morrell-hurst to Thomas Potts.

ACA/Agmt/2433 - Agreement for lease of North Morrellhurst, East Coldside and Coldrife Farms to Matthew Wintrip 1831

ACA/Agmt/A4026 - Agreement for lease of Morrellhurst and Coldside Farms to William Carr 1872

A5407 - Agreement for lease of Morrellhurst and Coldside Farm to William Carr and Henry Carr 1884



A.4026 1/2 - Estate of the Duke of Northumberland lands sold to Northern British Railway Company

## Aerial Sources

**Orthophotography** provided by Aerial Photography Great Britain (APGB) as ASCII  
Tiles: NZ 04 94, NZ 04 95, NZ 04 96, NZ 05 94, NZ 05 95, NZ 05 96, NZ 06 94, NZ 06 95, NZ 06 96  
Date: 13-May-2009

Height Data at 2m resolution provided by APGB as ASCII  
Tiles: NZ 04 94, NZ 04 95, NZ 04 96, NZ 05 94, NZ 05 95, NZ 05 96, NZ 06 94, NZ 06 95, NZ 06 96  
Date: 16-Jul-2006

LIDAR provided by the Environment Agency as ASCII  
Tiles: NZ 05 95, NZ 05 96, NZ 06 96

## *Historic England Archive Aerial Photographs*

The collection of aerial photography held by the Historic England Archive comes from a range of sources as well as in house photography. All those for the study area were assessed, comprising solely vertical photography flown by the RAF and Ordnance Survey. They are listed below by flight number followed by the frame within that flight.

Sortie No	Frame No	Date Flown
RAF/106G/UK/628	4339	10-Aug-45
RAF/106G/UK/628	4340	10-Aug-45
RAF/106G/UK/628	4341	10-Aug-45
RAF/106G/UK/1393	7020	10-Apr-46
RAF/106G/UK/1393	7021	10-Apr-46
RAF/106G/UK/1393	7022	10-Apr-46
RAF/106G/UK/1393	7023	10-Apr-46
RAF/106G/UK/1393	7024	10-Apr-46
RAF/106G/UK/1392	3196	10-Apr-46
RAF/106G/UK/1392	3197	10-Apr-46
RAF/106G/UK/1392	3198	10-Apr-46
RAF/106G/UK/1392	3199	10-Apr-46
RAF/106G/UK/1392	4123	10-Apr-46

Sortie No	Frame No	Date Flown
RAF/106G/UK/1392	4124	10-Apr-46
RAF/106G/UK/1392	4125	10-Apr-46
RAF/106G/UK/1392	4126	10-Apr-46
RAF/106G/UK/1392	4127	10-Apr-46
RAF/106G/UK/1392	4128	10-Apr-46
RAF/106G/UK/1392	4196	10-Apr-46
RAF/106G/UK/1392	4197	10-Apr-46
RAF/106G/UK/1392	4198	10-Apr-46
RAF/106G/UK/1392	4199	10-Apr-46
RAF/541/A/442	3189	30-Jul-48
RAF/541/A/442	3190	30-Jul-48
RAF/541/A/442	3191	30-Jul-48
RAF/541/A/442	3192	30-Jul-48
RAF/541/A/442	4280	30-Jul-48
RAF/541/A/442	4281	30-Jul-48
RAF/541/A/442	4282	30-Jul-48
RAF/541/A/442	4283	30-Jul-48
RAF/541/A/442	4284	30-Jul-48
RAF/540/571	3001	30-Jul-51
RAF/540/571	3002	30-Jul-51
RAF/540/571	3003	30-Jul-51
RAF/540/571	3025	30-Jul-51
RAF/540/571	3026	30-Jul-51
RAF/540/571	4001	30-Jul-51
RAF/540/571	4002	30-Jul-51
RAF/540/571	4003	30-Jul-51
RAF/540/645	3041	11-Dec-51
RAF/540/645	3042	11-Dec-51
RAF/540/645	3043	11-Dec-51
RAF/540/645	3044	11-Dec-51
RAF/540/1792	485	13-Mar-56
RAF/106G/UK/582	3184	02-Aug-45
RAF/106G/UK/582	3185	02-Aug-45
RAF/106G/UK/582	3186	02-Aug-45

Sortie No	Frame No	Date Flown
RAF/106G/UK/582	3187	02-Aug-45
RAF/106G/UK/582	3188	02-Aug-45
RAF/106G/UK/582	3189	02-Aug-45
RAF/106G/UK/582	4130	02-Aug-45
RAF/106G/UK/582	4131	02-Aug-45
RAF/106G/UK/582	4132	02-Aug-45
RAF/106G/UK/582	4133	02-Aug-45
RAF/106G/UK/582	4134	02-Aug-45
RAF/106G/UK/582	4135	02-Aug-45
RAF/106G/UK/582	4194	02-Aug-45
RAF/106G/UK/582	4195	02-Aug-45
RAF/106G/UK/582	4196	02-Aug-45
RAF/106G/UK/582	4197	02-Aug-45
RAF/106G/LA/160	1020	03-Mar-45
RAF/106G/LA/160	2020	03-Mar-45
RAF/106G/LA/140	1028	20-Feb-45
RAF/106G/LA/140	1029	20-Feb-45
RAF/106G/LA/140	1030	20-Feb-45
RAF/106G/LA/140	1031	20-Feb-45
RAF/106G/LA/140	2023	20-Feb-45
RAF/106G/LA/140	2024	20-Feb-45
RAF/106G/LA/140	2025	20-Feb-45
RAF/106G/LA/140	2026	20-Feb-45
RAF/106G/LA/140	2028	20-Feb-45
RAF/106G/LA/140	2029	20-Feb-45
RAF/106G/LA/140	2030	20-Feb-45
RAF/106G/UK/696	1018	23-Aug-45
RAF/106G/UK/696	1019	23-Aug-45
RAF/106G/UK/696	1020	23-Aug-45
RAF/106G/UK/696	1021	23-Aug-45
RAF/106G/UK/696	1022	23-Aug-45
RAF/106G/UK/696	1023	23-Aug-45
RAF/106G/UK/696	1024	23-Aug-45
RAF/106G/UK/696	1071	23-Aug-45

Sortie No	Frame No	Date Flown
RAF/106G/UK/696	1072	23-Aug-45
RAF/106G/UK/696	1073	23-Aug-45
RAF/106G/UK/696	1074	23-Aug-45
RAF/106G/UK/696	1075	23-Aug-45
RAF/106G/UK/696	1076	23-Aug-45
RAF/106G/UK/696	1077	23-Aug-45
RAF/106G/UK/696	1078	23-Aug-45
RAF/106G/UK/696	2002	23-Aug-45
RAF/106G/UK/696	2003	23-Aug-45
RAF/106G/UK/696	2004	23-Aug-45
RAF/106G/UK/696	2005	23-Aug-45
RAF/106G/UK/696	2006	23-Aug-45
RAF/106G/UK/696	2007	23-Aug-45
RAF/106G/UK/696	2008	23-Aug-45
RAF/106G/UK/696	2009	23-Aug-45
RAF/106G/UK/696	2018	23-Aug-45
RAF/106G/UK/696	2019	23-Aug-45
RAF/106G/UK/696	2020	23-Aug-45
RAF/106G/UK/696	2021	23-Aug-45
RAF/106G/UK/696	2022	23-Aug-45
RAF/106G/UK/696	2023	23-Aug-45
RAF/106G/UK/696	2024	23-Aug-45
OS/73370	745	08-Jul-73
OS/73370	746	08-Jul-73
OS/73370	747	08-Jul-73
OS/73370	748	08-Jul-73
OS/73486	860	18-Oct-73
OS/73486	861	18-Oct-73
OS/73486	862	18-Oct-73
OS/73486	863	18-Oct-73
OS/71244	23	26-May-71
OS/71244	24	26-May-71
OS/71244	25	26-May-71
OS/71244	54	26-May-71

Sortie No	Frame No	Date Flown
OS/71244	55	26-May-71
OS/71244	56	26-May-71
OS/66169	16	20-Jul-66
OS/66169	17	20-Jul-66
OS/66169	18	20-Jul-66
OS/66169	19	20-Jul-66
OS/66169	20	20-Jul-66
OS/66169	21	20-Jul-66
OS/69242	274	10-Jun-69
OS/69242	275	10-Jun-69
OS/69242	276	10-Jun-69
OS/69242	277	10-Jun-69
OS/69242	278	10-Jun-69
OS/69242	279	10-Jun-69
OS/69243	13	10-Jun-69
OS/69243	14	10-Jun-69
OS/69243	15	10-Jun-69
OS/69243	16	10-Jun-69
OS/69243	17	10-Jun-69
OS/69243	18	10-Jun-69
OS/69243	19	10-Jun-69
OS/69243	50	10-Jun-69
OS/69243	51	10-Jun-69
OS/69243	52	10-Jun-69
OS/69243	53	10-Jun-69
OS/69243	54	10-Jun-69
OS/69243	55	10-Jun-69
OS/69243	82	10-Jun-69
OS/69243	83	10-Jun-69
OS/69243	84	10-Jun-69
OS/69243	85	10-Jun-69
OS/69243	86	10-Jun-69
OS/69243	87	10-Jun-69
RAF/58/2655	125	09-Dec-58

Sortie No	Frame No	Date Flown
RAF/58/2655	126	09-Dec-58
RAF/58/2655	127	09-Dec-58
RAF/58/2655	128	09-Dec-58
RAF/58/2655	129	09-Dec-58
RAF/58/2655	130	09-Dec-58
RAF/58/2655	38	09-Dec-58
RAF/58/2655	39	09-Dec-58
RAF/58/2655	40	09-Dec-58
RAF/58/2655	41	09-Dec-58
RAF/58/2655	42	09-Dec-58
RAF/58/2655	124	09-Dec-58
RAF/58/2655	125	09-Dec-58
RAF/58/2655	126	09-Dec-58
RAF/58/2655	127	09-Dec-58
RAF/58/2655	128	09-Dec-58
RAF/58/2655	129	09-Dec-58
RAF/58/2655	130	09-Dec-58
RAF/58/2655	131	09-Dec-58
OS/00934	2703	07-Apr-00
OS/00934	2704	07-Apr-00
OS/01044	122	06-May-01
OS/01044	123	06-May-01
OS/01044	124	06-May-01
OS/01044	125	06-May-01
OS/01044	127	06-May-01
OS/01044	128	06-May-01
OS/01044	129	06-May-01
OS/01044	130	06-May-01

## APPENDIX 1: RECORD CONCORDANCE

The footprint of the bastle was designated as a scheduled monument (legacy no. 31725) in 1999. This designation has since been transferred to the National Heritage List for England (NHLE) as list entry no. 1018994.

Morrelhirst is also recorded as monument no. N10735 in the Northumberland Historic Environment Record (NHER), and as monument entry UID 21168 (NZ 09 NE 1) and event record UID 1602372 in the National Record of the Historic Environment (NRHE), formerly the National Monuments Record (NMR), maintained by Historic England, Swindon.



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