5. ARCHAEOLOGICAL INVESTIGATION OF THE NORTH EAST COAST

5.1 Introduction

The following Chapter discusses each of the fifteen locations targeted for rapid field survey. In sections 5.2 – 5.15 each survey location will be discussed in terms of its landscape setting, topography, previous research, known history and land use. The visible remains are discussed broadly by period and specific case studies examined. The specific impact and nature of any erosion at each site is then considered in relation to specific archaeological remains, to allow quantification and assessment of specific threats.

During all of the fieldwork, data from the first phase of NERCZA was utilised to provide informed interpretations and aid the selection of targeted fieldwork locations. Phase 1 data was also used as a reference in the description of each of these survey locations to demonstrate both confirmed and updated interpretations of what had been recorded as part of Phase 1 compared to what was seen on the ground during Phase 2. The description and discussion of the fifteen survey locations considers each location separately from south to north. Supplementary locations that were visited as part of the project but not initially targeted after Phase 1 are discussed separately in the summary of this Chapter.

Section 5.17 deals with fieldwork data relating to the Second World War archaeology of the Northumberland Coast AONB recorded as part of a subsidiary project undertaken by Archaeological Research Services Ltd. This data was also incorporated into this project's GIS. A table summarising all recorded sites by period from all of the fieldwork undertaken is included in a separate gazetteer of sites. Implications and recommendations for future management of all the sites surveyed are discussed in the summary within each site report and in more depth in Chapter 7 of this report.

Figure 5.1.1 Surveying earthworks of Second World War defences preserved above Skiningrove Harbour

5.2 Overdale Wyke

5.2.1 Background

Phase I of the NERCZA project highlighted two possible prehistoric enclosures and a possible ploughed out barrow thought to be Bronze Age in date (Tolan-Smith 2008 84,). These are located at Overdale Wyke north of Sandsend in North Yorkshire within the North York Moors National Park. The aim of the survey at this location was to identify any surviving earthworks, the extent of erosion and the risk faced by the monument from increased rates of erosion, as well as the collection and recording of any artefacts in the vicinity (Waddington & Chatterton 2009, 13). The survey also aimed to identify any other archaeological features within the environs of the Overdale Wyke enclosures to provide additional contextual information and determine whether other as yet unknown sites are at risk.

The survey of Overdale Wyke did not reveal any surface evidence of the enclosures but did record many other features in the area surrounding Overdale, Kettleness and Sandsend. Many of these features where newly discovered while all of the records updated the current knowledge base and provided up to date condition statements for the features they related to.

5.2.2 Location and geology

Overdale Wyke (NU 85489 14278) (SMP PU 21.3 – 22.3) is located on a stretch of the North Yorkshire coast that includes some of the highest cliffs along the North East coast (Figure 5.2.2). The geology consists of Whitby Mudstone, with clay overburden and shale. The steep cliffs show the scars of the alum industry, which historically was prevalent in this area. The foreshore comprises a rock cut platform visible at low tide from Sandsend in the south to Runswick Bay in the north. The cliffs along this 5.1km length of surveyed coast rise to a height of 97m from the sandy beach at Sandsend. The cliffs are susceptible to erosion from ongoing slumping after under cutting by wave action and several significant erosion events have been recorded recently (SMP2). Current land use includes small fishing and tourist villages of Sandsend and Runswick Bay with mostly arable agricultural land and small farm settlements and hamlets. The land that the enclosures sit within is currently owned and managed by the Mulgrave Estate and seems to have been left fallow for sometime to encourage grouse.

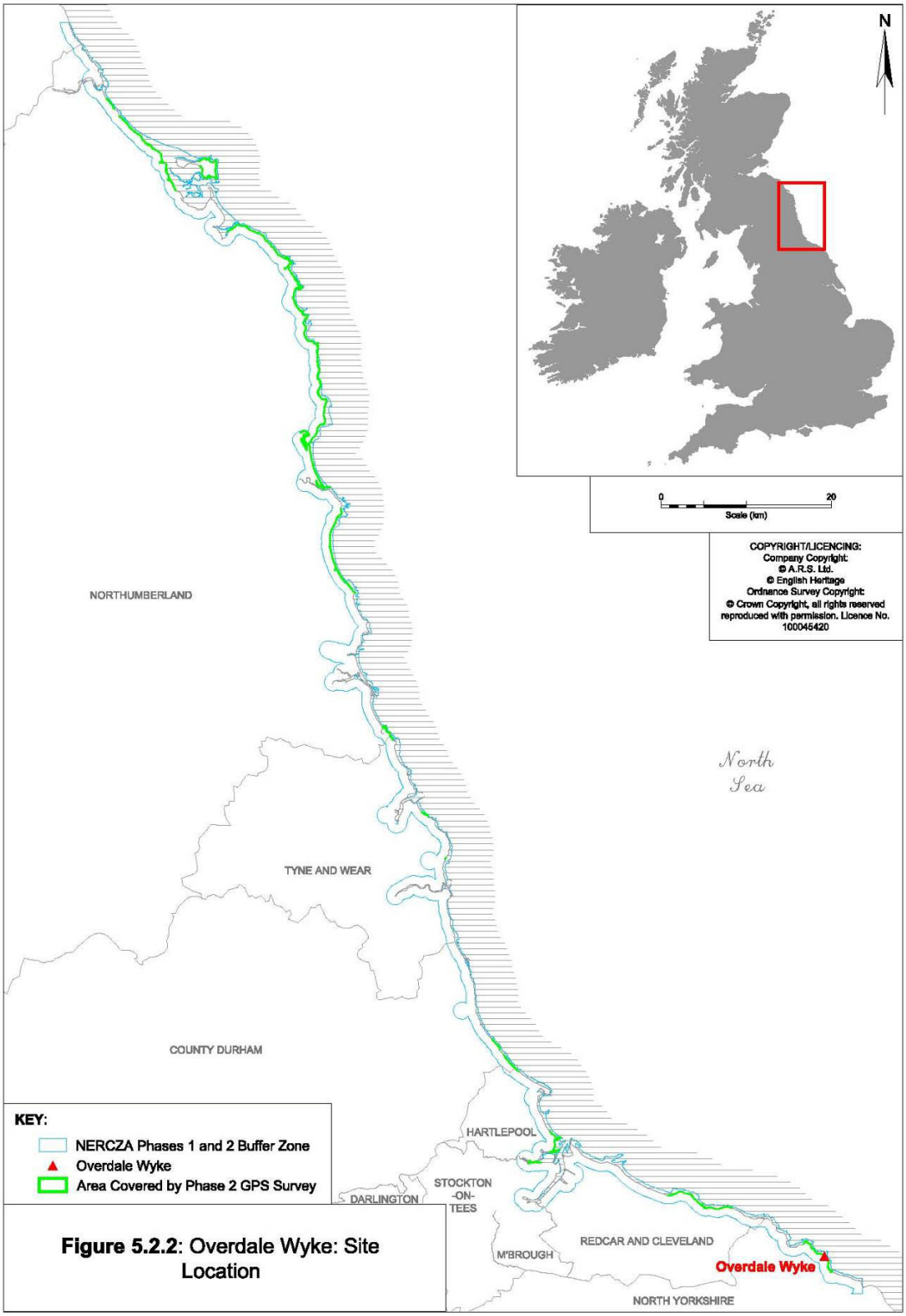

Figure 5.2.2: Overdale Wyke: Site Location

Figure 5.2.3 Overdale Wyke from the south showing the location of the cliff top enclosures

5.2.3 Previous research

The NERCZA Phase 1 study looked at this part of the coastline as part of block 1 of the study area (Tolan-Smith 2008, 84). Although a holistic approach was taken looking at all archaeological elements, the key sites identified were the industrial remains of the former alum industry around Sandsend and Kettleness and the enclosures, surviving as crop marks, at Overdale Wyke. It is these sites that were targeted for rapid survey.

The alum industry of the North Yorkshire coast has been investigated in detail by English Heritage (Jecock and Hunt 2005). Alum works at Kettleness and at Loftus have both been subjected to detailed analytical field survey and historical research by the English Heritage Archaeological Survey Team. These detailed level 3 (Ainsworth *et al* 2007) surveys produced accurate plans of the complex earthworks that survive at these industrial sites. The history of the alum industry was also investigated, specific to each site as part of these investigations.

5.2.4 NERCZA Phase 2 Archaeological Investigation

The archaeological survey carried out as part of this study quickly established that the dense vegetation cover in the vicinity of the Overdale Wyke enclosures would obscure any surviving earthwork remains. Furthermore, the landscape having been heavily ploughed and improved in the past would suggest that there was little likelihood of upstanding earthwork remains surviving. If there were surviving remains they would now be heavily truncated and only visible as very subtle features. In addition, any surviving remains would be obscured due to the current level of vegetation cover. Utilisation of available Lidar data does not provide coverage of this area, high quality 0.5m resolution Lidar could indicate the presence of earthworks, except heavily graded ones.

Figure 5.2.4 Overgrown Vegetation obscuring the location of the Overdale Wyke prehistoric enclosures.

Having established that the survey of the enclosures themselves was impractical due to vegetation cover, the boundaries of the survey area were extended. The Overdale Wyke survey therefore included a much wider area and this has provided much more detail on what coastal archaeology survives resulting in a good information base for its future management. The survey covered the entire 5.8km cliff top from the beach at Sandsend to the alum works at Kettleness (Fig 5.2.14). Survey work was also undertaken further inland and on small areas of foreshore where access was safe at low tide (Fig 5.2.14).

The survey revealed archaeology dating from a range of periods including prehistoric and the Second World War and highlighted the industrial development of this part of the coast in the post-medieval period. The following sections will discuss the features identified and broadly characterise this part of the coast by period.

5.2.5 Prehistoric

The reason for targeting this location for rapid survey was to learn more about the survival of the Overdale Wyke enclosures identified on aerial photography, however as outlined above full detailed inspection on the ground was impossible due to dense vegetation cover. This said, the extensive ploughing in the vicinity makes the survival of visible earthwork remains extremely unlikely. Despite this set back upon investigating the surrounding area a struck flint (record number 430) was recovered from a ploughed field just to the west of the enclosures (Fig 5.2.14).

The project does not include full field walking within its scope, but this chance find was accurately recorded and suggests the possibility of further positive results from any future programme of field walking in the vicinity of the enclosures. This one flint alone does not provide evidence of widespread prehistoric activity and could be merely residual. This evidence combined with previous investigation undertaken as part of the North East Yorkshire Mesolithic project (Grahame *et al* 2008, Waughman *et al* 2006)) in this vicinity indicates that further field walking on the coastal margin may yield more worked lithic material. This could provide additional context to the prehistoric activity in the area and possibly the enclosures located at Overdale Wyke.

5.2.6 Romano British

The Goldsbrough Roman signal station (429) (Fig 5.2.4) is a well known monument along this part of the North Yorkshire coast. It is currently a scheduled ancient monument (SAM no 32476). It has been subject to much previous work including antiquarian and later excavations which revealed it to be similar in nature to the completely excavated example at Scarborough Castle (Pearson 2009). The rapid survey recorded its condition to provide a complete picture of the archaeology of this coastline. The site is surrounded by post medieval ridge and furrow ploughing, although the monument itself does not appear to have been over ploughed.

Figure 5.2.5 Earthwork remains of Goldsbrough Roman signal station on a high point east of Goldsbrough village, viewed looking south

5.2.7 Early Medieval

No features were observed or recorded dating to this period.

5.2.8 Medieval

The most obvious medieval feature still visible within the landscape is evidence of ridge and furrow agriculture that can be seen as crop marks on aerial photographs (Fig 5.2.5). These crop marks can be seen around Kettleness and Goldsbrough broken up with later post-medieval ploughing. Evidence of ridge and furrow was extensively recorded by the Phase 1 survey. Although recognised by the Phase 2 fieldwork there was no time to record large areas of ridge and furrow ploughing due to the rapid nature of the survey. Also, ridge and furrow survives only as crop-marks in this area and not as positive earthworks, detracting further from their importance as an archaeological monument on account of their poor survival.

Figure 5.2.6 Medieval ridge and furrow visible as subtle crop marks on an otherwise even field surface.

5.2.9 Post-Medieval

During the post-medieval period this stretch of coastline was exploited by the alum industry. This was an important and profitable industry that produced fixative for dyes for the textile industry and which can be described as the first chemical industry in Britain (Jecock and Hunt 2005). There were several large alum works along the North Yorkshire coast around Kettleness (425). One of these complexes lies 2.6km to the north of the Overdale Wyke enclosures while another large alum quarry (415) lies immediately to the south. The alum quarries have left large scars in the cliff faces of this part of coast and the lunar landscape they have created as a result is easily recognisable. Again, because recent detailed work has been undertaken by English Heritage the quarries were not surveyed in detail as part of this project although a rapid walkover survey was undertaken.

What the survey did record was the surviving infrastructure surrounding the alum quarries, most significantly the rail link from Whitby to Redcar which

survives in part as an earthwork embankment (427) and cutting (413). The railway also survives as a tunnel between Overdale Wyke and Kettleness and part of the original route that was subsequently abandoned still survives south of Kettleness (422). This original cliff edge route was not completed and was ultimately abandoned due to the instability of the cliffs and risk of subsidence. This led to the construction of the tunnel (421) (Fig 5.2.6) and diversion of the route inland.

Figure 5.2.7 Tunnel mouth (422) at Kettleness end looking south.

Later in the nineteenth century the industrial railway developed into a passenger line and two station buildings survive, one at Sandsend (432) and one at Kettleness, along with platforms and outbuildings. Along the former track bed some fragments of sleeper survive along with voids where others would have been. At Sandsend the railway continued south to Whitby across a large viaduct, which has now gone, however the pier bases are still visible in Sandsend beck and on the beach (Fig 5.2.7).

Figure 5.2.8 Pier base for a now removed 19th century railway viaduct at Sandsend Beck looking south with an *in situ* WWII anti tank cube in the foreground.

Several other ephemeral industrial features were also recorded surrounding the alum quarry at Kettleness (Fig 5.2.8). Some of these may relate to a later exploratory stone mine opened in the 20th century, although others may relate to the alum works themselves. A large metal pole, possibly part of a winch system but currently of unknown date or function, is an example of such a feature.

Figure 5.2.9 part of possible winch system at Kettleness (scale = 2m).

5.2.10 20th Century

The 20th century archaeology is perhaps the most obvious and easy to identify at this location, the defence of the coast during the Second World War had an especially profound impact that can still be seen today at many locations. The most visible WWII remains can be seen at Sandsend itself with anti tank defences (434, 433) visible at the mouth of Sandsend Beck (Fig 5.2.8). These anti-tank blocks were placed deliberately to defend against possible incursion of tanks and armour up the creeks in the event of an invasion. The ant-tank blocks are visible at low tide and are intermittently covered with sand by the Sandsend Beck, which obscures them from view (Fig 5.2.9).

Figure 5.2.10 Anti-tank blocks in Sandsend beck beneath the remains of a former brick-built railway viaduct.

Also visible on the beach at Sandsend are the remains of a pillbox (515), evidently slumped from its original cliff top position, on to the beach (Fig 5.2.10). It has clearly been destabilised by ongoing erosion and now lies slumped on the beach exposed to wave action. During the course of the survey further slumping was observed between September 2009 and January 2010, the pillbox had moved a further 1.2m down slope according to the GPS position. This variation is accurate to within 0.3m so there has been at least 0.5m of slumping since the pillbox was first observed during the fieldwork.

The defences around Sandsend were placed to prevent a successful landing on the wide sweeping beach which would have provided access inland for heavy armour and enemy troops during WWII. This is paralleled on many beaches up and down the North East Coast which were suitable for a landing, most notably Druridge Bay in Northumberland which is discussed in detail in section 5.9.

September 2009

January 2010

Figure 5.2.11 Two views of Pillbox 515 showing how it has slumped further onto the beach at Sandsend in 4 months.

Along the cliffs heading north from Sandsend towards Kettleness there is further evidence of WWII defences. An example of this is a camp recorded from aerial photography as part of Phase 1. This location was visited as part of the Phase 2 fieldwork. It had previously been thought that there would be no trace of the camp surviving as it comprised temporary structures and was relatively small in size. This conclusion had been reached as no evidence was visible on the latest

aerial photography. However, several elements of the camp survive including heavily truncated earthworks together with some faint crop marks which delineate the extent of the camp (417), and 1940s brickwork (416) can be seen in the make up of the track, within the camp extents.

The most visible element of the camp is the remains of a Vickers twin anti aircraft machine gun post (420) (Fig 5.2.11), which survives intact with the exception of the gun itself. The brick weapons pit, metal frame and springs all survive. Evidence of this exceptional survival demonstrates that there is still potential for more subtle WWII remains, such as trenches and weapons pits, to survive intact further along this stretch of coast.

Figure 5.2.12 Previously unrecorded Vickers machine gun post at Sandsend.

5.2.11 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.26m per year (SMP2 for north East England).The base of the cliffs along this part of the coast are exposed to direct wave action during high tides. This has been observed at Sandsend in particular where there is clear evidence of undercutting and destabilisation of the mudstone cliffs. This has caused several episodes of slumping, for example the one described in section 5.1.10 and shown in figure 5.1.10 where the whole foundation of a pillbox (515) has collapsed and fallen on to the beach below. This is the common threat faced by this whole section of coast due to the direct action of the sea upon the base of the cliff.

The development of the alum industry along this particular piece of coastline has also contributed to the destabilisation of the tops of the cliffs. Large quarries and test pits along with the associated infrastructure, and notably the creation of the original and ultimately abandoned rail link between Whitby and Redcar in the mid 19th century, have all contributed to the destabilisation of the cliff edge.

Utilising the SMP2 preferred policy predictions as a guide it can be seen that several heritage assets are under long term threat in this area (Fig 5.1.14). The predicted retreat due to sea level rise and increased erosion from storm events can be seen to encroach on to 90% of the newly recorded features in this location within the next 100 years. It must be emphasised that the projected retreat is only a prediction which will be subject to change due to the variable factors that affect sea level change and coastal erosion.

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Figure 5.2.13 The cliffs of Sandsend alum works showing the extent of inundation by the tide together with the direct and on going erosive effects of the sea.

Based on these predictions most of the archaeological features recorded during the Phase 2 project will not be directly affected for at least 50 years. This is not to say there is no current significant threat from erosion, as there is clearly an ongoing issue with land slumps and direct wave action at the base of the cliff. However, it is important to note that not all sites within this survey area are under the same level of threat. By combining Phase 1 interpretations and the field data collected by Phase 2 and with the SMP2 datasets, the level of threat that each individual recorded asset currently faces can be estimated. This can be done to project threat in the immediate future and also in the long term, to see what future threats heritage assets may face.

5.2.12 Summary and conclusions

Overdale Wyke presents an example of soft mudstone cliffs being undermined by direct erosion. This has led to increased instability of the cliffs along the coast which has caused some archaeological assets to slump from their original positions on to the beach. On the beach these assets are under further threat form direct wave action and more vigorous erosion. The erosion of these cliffs is an ongoing problem that is only going to become worse when considering possible sea level rise and the resultant and more frequent storm events. This more severe erosion will eventually cause increased destabilisation of the cliff and

an increase in the rate of erosion. The precise causes of this erosion have been studied in detail by the Boulby Geoscience Research Group (Steadman *et al* forthcoming), from Durham University, using advanced technical monitoring to research long term causes of cliff erosion (see http://www.boulbygeoscience.org/).

Figure 5.2.14 A rapidly eroding Alum pier at Sandsend that is exposed to direct wave action.

Some of the causes of erosion in this area would seem to stem from the historic land use of the coastal cliffs. Alum quarrying, along with the construction of other industrial structures, and notably the original route of the Whitby – Redcar branch railway, has contributed significantly to cliff top erosion. This has destabilised the cliffs and encouraged the slumping initiated by the natural processes. However the threat from the sea alone can be seen by the extent of change in a very short period of the location of the pillbox (515) at Sandsend. This may be a type of monument which is common along the coast and relatively recent in date, but it represents some of the most threatened archaeology along this part of the coastline.

As stated in section 5.2.14 the same level of threat cannot be applied to the whole stretch of coastline, therefore the survey has attached a level of threat (measured from 1 – 10), agreed by the project team in the field, for each recorded asset. The complete list of these can be found in the gazetteer of sites produced as a separate document. This data can then be used to identify an average level of threat for all of the assets for this particular stretch of coastline. This will then allow an assessment of risk to heritage assets for each stretch of coast to be undertaken by aggregating the monuments at each survey location together. This process is undertaken and described in detail in Chapter 7.

Management Area		Policy unit	Policy Plan			Comment
			2025	2055	2105	
MA21	Runswick Bay to Sandsend Ness	21.3	NAI	NAI	NAI	
MA22	Sandsend Wyke	22.1	NAI	NAI	NAI	Consideration of works associated with the unit to the east
MA22	Sandsend Wyke	22.2	HTL	HTL	HTL	

Table 5.2 North East Shoreline Management Plan 2 policies for Management Areas 21 and 22 (Sandsend to Kettleness).

The Shoreline Management Plan (SMP2) (Table 5.2) for this stretch of coastline recognises the importance of the alum industry at both Sandsend and Kettleness. However, the prehistoric enclosures at Overdale Wyke and surviving military archaeology are not directly referred to. Despite this information the coastline between Kettleness alum works and Sandsesnd village is designated as No Active Intervention for the next 95 years. This means that these heritage assets should be prioritised for any further recording work as they will continue to be lost in coming years.Sandsend village itself is unsurprisingly designated Hold the Line due to the settlement and infrastructure there. This also effectively protects the archaeological remains of industrial and military origin that are present within the settlement. However, a predicted baseline erosion rate of 0.1m a year at Kettleness and at Sandsend cliffs and 0.25m (SMP 2) at Sandsend village indicates that erosion is ongoing along this entire stretch of coastline. By comparing the projected loss of coastline for 2025, 2055 and 2105 the immediate threat to sites such as the Overdale Wyke enclosures can be estimated (fig 5.2.14).

By looking at this projected data we can see that the easternmost enclosure at Overdale Wyke is under threat, eroding within the nest 20 – 50 years. This also applies to the alum quarries (415 and 426) and military remains (419, 420, arc431, 414) along this stretch of coastline. This projected risk from erosion over the next 20 – 50 years, combined with the lack of above ground evidence of the enclosures at Overdale Wyke, means that there is scope for further work. Further investigation of the enclosures such as geophysical survey together with full level 3 earthwork surveys and field walking if the field containing the enclosures was stripped of vegetation could be usefully undertaken to assess the significance and survival of these heritage assets. Limited excavation would provide further information to inform both condition of survival and characterisation of the site as well as helping in establishing the significance of the site. Once such work has been undertaken then a long term plan for dealing with this threatened site can be implemented.

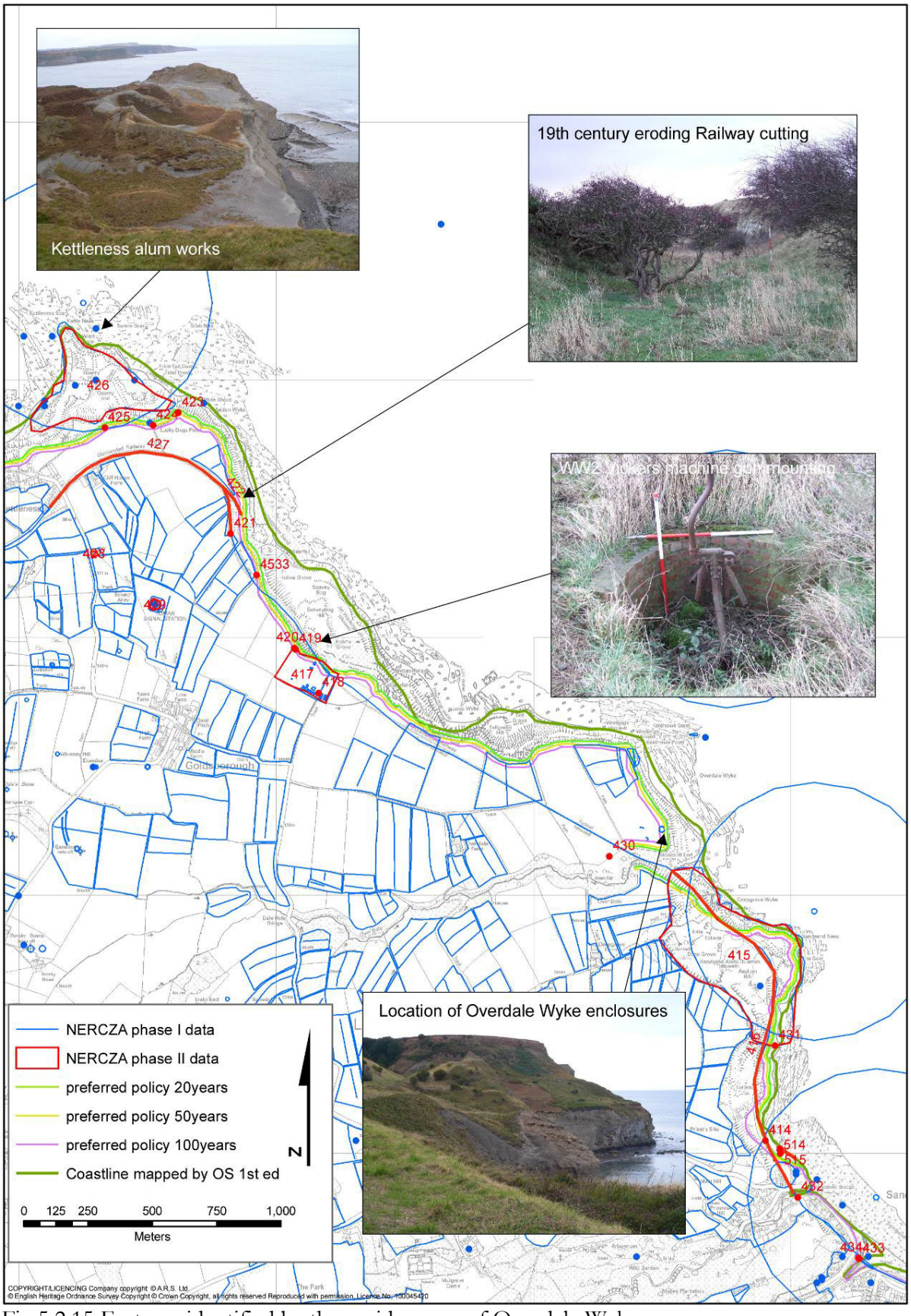


Fig 5.2.15 Features identified by the rapid survey of Overdale Wyke

5.3 Saltburn, Hummersea and Skinningrove

5.3.1 Background

The North East Rapid Coastal Zone Assessment Phase 1 identified the remains of alum works in the cliff face at Hummersea as being at particular risk from erosion. These remains are currently 8m above sea level. the main surviving structures have been engulfed by a landslip from the cliff above an what is visible exposed in the cliff face is of a very fragmentary nature. All the North Yorkshire alum works were situated close to cliffs and several have been reduced by cliff collapse and landslip. English Heritage has undertaken detailed photogrammetric recording of the remains exposed in the cliff face at Loftus alum works (near Skinnigrove). However, beneath the cliff at Loftus, on the foreshore, there are a series of docks and piles of both burnt and unburnt shale which were all once part of the alum industry. These features are located in a very hostile coastal environment and under imminent threat of erosion. The English Heritage survey did not deal with the foreshore and there is an urgent need for a survey to record these threatened features before they are removed for good. Tees Archaeology manages a local group of active volunteers who are keen to be involved in such projects and it is intended to work with the group and foster the continued monitoring of these historical assets in the future.

There are other industrial remains in the area surrounding Hummersea including the remains of rut ways and other rock cut features probably relating to the 19th century alum works between Saltburn and Loftus. Also visible in the area surrounding Hummersea are several features surviving from the Second World War including pillboxes, trenches and weapons pits. Given the vulnerability of this stretch of coast the rapid survey investigated an area 4km north and 2km south of the Hummersea alum works in order to gain a wider perspective on how this is affecting surviving archaeology.

Figure 5.3.3. Remains of alum house exposed in the cliff face at Hummersea.

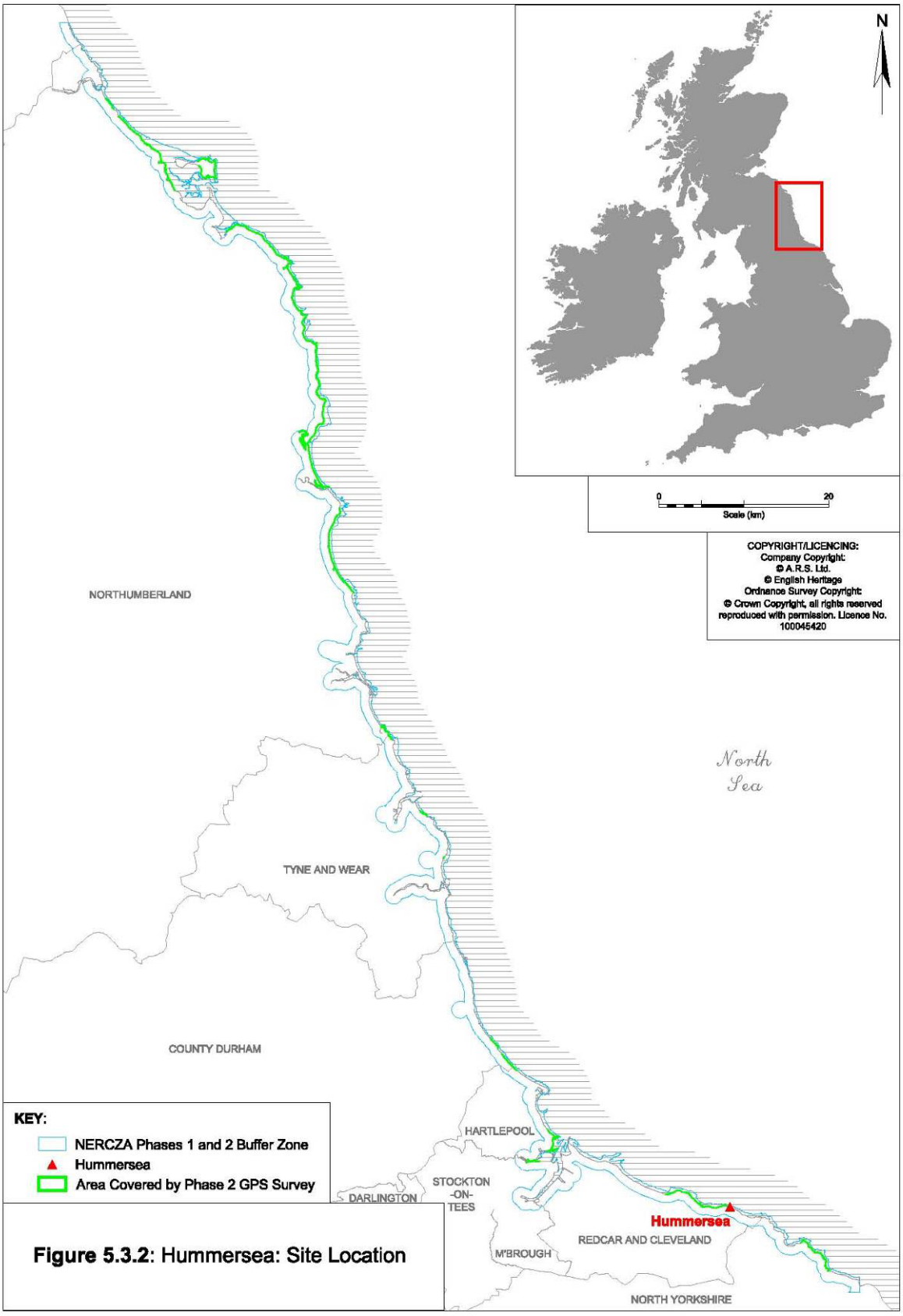


Figure 5.3.2: Hummersea: Site Location

5.3.2 Location and geology

The alum works at Hummersea are located on cliffs between Saltburn and Sandsend (NGR NZ 72658 19821) (SMP PU15.4 -17.3). This part of the North Yorkshire coast is located on geology of Whitby Mudstone, with clay overburden and shale. The steep cliffs show the scars of the alum industry which historically was prevalent in this area. The foreshore comprises a rock cut platform with sand beaches at Hummersea Bay, Skinningrove and Saltburn.

Current land use in the area is agricultural with some small industrial development at Skinningrove. There is also small-scale fishing industry activity while the settlement at Saltburn is an early 20th century seaside resort. Historically, the main activities in the area would have been industrial related to the alum and ironstone works and fishing at the numerous small bays and harbours.

Figure 5.3.4 A view of Skinningrove harbour taken from the north, the pier of the ironstone works is visible extending into the North Sea.

5.3.3 Previous research

Tees archaeology manage a group of local volunteers who have been systematically recording the evidence of rutways visible on the rock cut platforms of the foreshore between Saltburn and Skinningrove. This project, known as the Saltburn rutways survey, has also recorded other features such as postholes and a possible fish trap (Green 2008, 2009). In preparation of reports in 2007, 2008 and 2009 background research into the alum industries has been undertaken. English Heritage has undertaken detailed survey of the alum works at Loftus as part of their ongoing study of the Yorkshire alum works. This highlighted the key buildings and earthwork elements that survive within the alum quarry. Also, key elements of what remains on the foreshore where identified including areas of burnt shale and the stone built alum pier.

Several articles and publications on the alum industry have also covered the area surrounding Hummersea and been published in local journals including in the 'Cleveland Industrial Archaeologist', however none of these investigations has presented a complete survey of the archaeology or included detailed threat assessments.

5.3.4 NERCZA Phase 2 Archaeological Investigation (5.3.1)

5.3.5 Prehistoric

Phase 2 of the NERCZA survey revealed no surviving prehistoric remains on the coast between Saltburn and Loftus.

5.3.6 Romano-British

A Roman signal station is said to have stood on the cliffs above Huntcliff Foot, however, despite field investigation the rapid survey identified no upstanding or eroding remains related to the signal station. There maybe buried remains surviving and if this is the case they are certainly at imminent risk of collapse on to the foreshore. The size and extent of these signal stations can be seen at both Scarborough (Pearson 2009) and Goldsbrough (Burn 2010), so this site may have substantial survival below the soil, and further investigation by close-spaced geophysical survey followed by evaluation trenching may be of use in gaining further understanding of what actually survives below the surface, its potential significance and its vulnerability to erosion.

Figure 5.3.5. Possible cliff top location of Roman signal station recorded by antiquarian excavation, notice the evidence of significant slumping of the cliff.

5.3.7 Early Medieval

Phase 2 of the NERCZA survey revealed no surviving Early Medieval remains on the coast between Saltburn and Loftus.

5.3.8 Medieval

One possible medieval feature was identified by the survey in the form of a linear bank close to the edge of the cliff. The bank was approximately 0.4m high and 1m wide, and it is possible that this represents a medieval plough headland. The current ploughed fields are set further inland and the Cleveland Way footpath runs between these fields and the possible headland bank. Any other evidence of medieval ploughing has therefore been removed by later ploughing and the creation of the Cleveland way.

5.3.9 Post-Medieval

The most prevalent surviving archaeology in this area dated to the post-medieval period. This is unsurprising considering the scale of both the alum and ironstone industries in the area. The survey identified several large structural remains associated with both these industries together with earthworks and rock cut features that help to mark their former extent across the landscape. These features include rock cut postholes, rutways, earthwork remains of industrial buildings and boundaries.

Figure 5.3.6 Remains of the former fan house at Skinningrove ironstone mine, looking west.

The most prominent industrial features are the upstanding structural remains, such as the fan house (19) for the ironstone mine at Skinningrove (Fig 5.3.6). Structural elements of this survive either side of the railway branch line that still serves the current ironstone works. These structures have signed interpretation and are set well back from the edge of the cliffs on National Trust land. This means that they can be characterised as low risk structures and are not under any immediate threat from erosion.

Perhaps the most threatened remains seen were those visible in the cliff face. Such features were observed at Hummersea and Saltburn, where structural

remains are eroding out of the cliff. The former alum house at Hummersea is the most prominent example of this, and is threatened not only from direct wave action at high tide but also from ongoing slumping of the cliff from above (Fig 5.3.7).

Fig 5.3.7 Remains of Hummersea alum works slumping and eroding

Similar remains can be seen at Saltburn (Fig 5.3.8) although the exact form and function of these buildings is not precisely known. Further investigation of the cliff top remains, not visible on the surface, could be carried out to gain a better understanding and preserve them through detailed record. Further historical research has been undertaken as part of the Saltburn rutways project (Green 2008, 2009) but no attempt has been made to investigate the Saltburn alum works other than the NERCZA Phase 1 rapid survey.

Fig 5.3.8 Archaeological remains of Saltburn alum works eroding.

Fig 5.3.9 Surveying structures eroding from the alum works at Loftus

Other upstanding remains can be seen further south at Loftus where the alum works have already been extensively surveyed by English Heritage (Hunt *et al* 2005). The NERCZA survey rapidly re-established the position of the structures within the alum works and assessed the level of threat to them. Here, the proximity of many of the surviving remains to the edge of the quarry cliff meant

that many have partly collapsed and further degraded since the English Heritage survey (Hunt *et al* 2005).

Other structural remains identified included alum liquor settling tanks, still visible in overgrown cliffs (Fig 5.3.10). These remnants of the alum industry are well preserved and not as threatened as those within the alum quarry, directly on the cliff edge. However, they are still exposed to threat from long term cliff retreat. Also, all elements of the alum works must be considered as a whole as the understanding of the operation of the site suffers if part of it is lost or damaged by erosion.

More ephemeral remains can also be seen on the foreshore below the alum works at Hummersea and Loftus. Here rock cut features such as large rectangular holes (Figs 5.3.11 and 5.3.12) could be interpreted several different ways. They could be what are locally referred to as hulleys, rock cut holes that were used for the storage of bait and fishing equipment in the inter-tidal zone. There is no easy way to date these features but they most likely date to the 18th or 19th centuries due to the clean cutting of the rock. They could also be post holes and this is more likely of (78, 79) below the Loftus alum works, as a linear pattern can be seen. This may be part of a foreshore structure or an earlier alum pier, predating the stone pier that still survives (76).

Fig 5.3.10 Extant remains of settling tanks on the cliff top looking South.

Fig 5.3.11 Extant remains of large rock-cut features on the foreshore at Hummersea.

Fig 5.3.12 One of the smaller rock cut post holes at Loftus

The other rock cut feature that was frequently observed and recorded during the course of the Phase 2 survey was rut ways. It was deemed unnecessary to attempt to record all of these as firstly it would take more time and resources than were

available, and secondly this would overlap with the ongoing work of the Saltburn Rutways Survey. However, several were recorded (70, 80) and an extent of visible rutways (701) also recorded to show the area in which they have been seen to be still extant by the NERCZA survey team.

Fig 5.3.13 Surviving extent of stone alum pier at Loftus

Fig 5.3.14 Recording one of the numerous rutways between Saltburn and Skinningrove.

5.3.10 20th Century

The stretch of coast between Saltburn and Loftus also contains many surviving Second World War remains. Between Saltburn and Skinningrove the structural remains of two pillboxes survive, one sits in pasture fields west of the Cleveland Way (48) and although the area surrounding the upstanding remains has been heavily ploughed there is little direct threat to this monument. Another pillbox can be seen on the beach at Skinningrove (17). This structure has slumped down from the cliff onto the beach and is exposed to direct wave action (Figs 5.3.15 and 5.3.16). This pillbox has been observed both covered with sand and almost fully exposed demonstrating the changeable nature of its setting. It is set within the inter-tidal zone and repeatedly covered with sand and then re-exposed to the elements.

Figure 5.3.15 Slumped pillbox on the beach looking south towards Skinningrove harbour as seen in September 2009 .

Figure 5.3.16 The same slumped pillbox as above more exposed to wave action, this time looking north. This photograph was taken in early December 2009 and demonstrates the changeable nature of the beach deposits and environmental conditions.

Other Second World War features identified include the earthwork remains of fire trenches and weapons pits seen particularly around Skinningrove. One well-preserved example (36) previously identified during the Phase 1 project is still extant on Skinningrove pier (Fig 5.3.17). The foxhole element is dug against two of the pier walls with a low defensive bank still extant internally. This would have been enhanced with sandbags and perhaps barbed wire defences.

These earthwork elements can be seen as some of the most at risk archaeology along this section of coast. These features were originally intended as temporary defences, and therefore were not expected to last more than a few years. They are also preserved in a thin strip of preserved land between agricultural land, ploughed fields, and the coastline. This makes the survival of these earthwork remains potentially significant, as they are increasingly under threat with ongoing erosion and retreat of the coast. This can be seen elsewhere along the coast and as approximately 75% of the newly identified archaeological sites date from the Second World War, it represents the largest proportion of directly threatened archaeology.

Figure 5.3.17 A preserved weapons pit on the western end of Skinningrove pier.

5.3.11 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.1m per year (SMP2 for north East England). The till cliffs along this stretch of coast are some of the areas most exposed to erosion in this region. There is little dune or beach protection and the archaeological features, especially those identified on the foreshore, such as rutways, postholes and other structures, are most at risk from erosion. The changeable nature of this stretch of coast is highlighted by the changing situation of pillbox (17) within just 3 months. Recent work by the Boulby Geoscience Project from Durham University in partnership with Cleveland Potash have suggested the rates of erosion here might not be as

severe or as rapid as previously thought (Steadman *et al* forthcoming). This research claims to have identified ancient landslips still visible along the coast. There is, however, also evidence that the cliffs here do periodically destabilise and collapse causing occasional rock fall erosion events that build up and increase the likelihood of one-off major rock fall events. The Boulby Project has identified this erosion pattern through long-term monitoring of the cliff face and repeated high resolution laser scanning of the cliff to track the development of rock falls. Although there is little overlap between the area covered by NERCZA Phase 2 and the Boulby Geoscience Project, there is a clear case for direct comparison due to the proximity of Boulby to Skinningrove, Loftus and Overdale Wyke.

It s clear that features on the foreshore along this stretch of coast are at imminent risk from erosion. Ongoing storm events will eventually remove the remains of rock cut features such as rut ways and post holes as well as other features such as shipwrecks and wooden posts. Also at risk are the cliff top features that relate to the military and industrial development of this coast as the cliff retreat undermines these remains resulting in their collapse and slumping. Along this stretch of coast it is not so much the rate of erosion that is alarming but when rare, but significant, erosion events occur large amounts of archaeological material is removed very quickly.

5.3.12 Summary and conclusions

This stretch of the coast within policy units 15.4 – 17.3 is mostly covered by a policy plan of No Active Intervention. The only areas covered by management plans are the area of Saltburn itself which is designated as Hold The Line and a comment of investigation of the potential threat to the railway line at Skinningrove (16.1). This leaves a substantial section of the coast containing possible Roman, Medieval, Post-Medieval and 19th/20th century remains vulnerable to coastal retreat. While the rate of erosion of these hard rock cliffs may not be as rapid as some other areas along the coast, the potential for significant rock falls leading to cliff destabilisation and collapse has been demonstrated (SMP2 for the North East 2008).

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA15	Marske and Saltburn Sands	15.4	HTL	HTL	HTL	
MA16	Huntcliffe	16.1	NAI	NAI	NAI	Investigate potential threat to railway
MA17	Skinningrove	17.3	NAI	NAI	NAI	

Table 5.3 Shoreline Management Policy 2 policies for Saltburn and Skinningrove

The survival of above-ground archaeology from the post-medieval period can be seen to be generally good with industrial, structural and military features surviving very well. However, little is known about the extent of survival below ground, especially of medieval and earlier remains. Further investigation of sites such as the Roman signal station (Sherlock, 2005) south of Saltburn would also

be beneficial, and possible features associated with the alum industry, which may survive well below ground but at present this is unconfirmed without recourse to further investigative fieldwork.

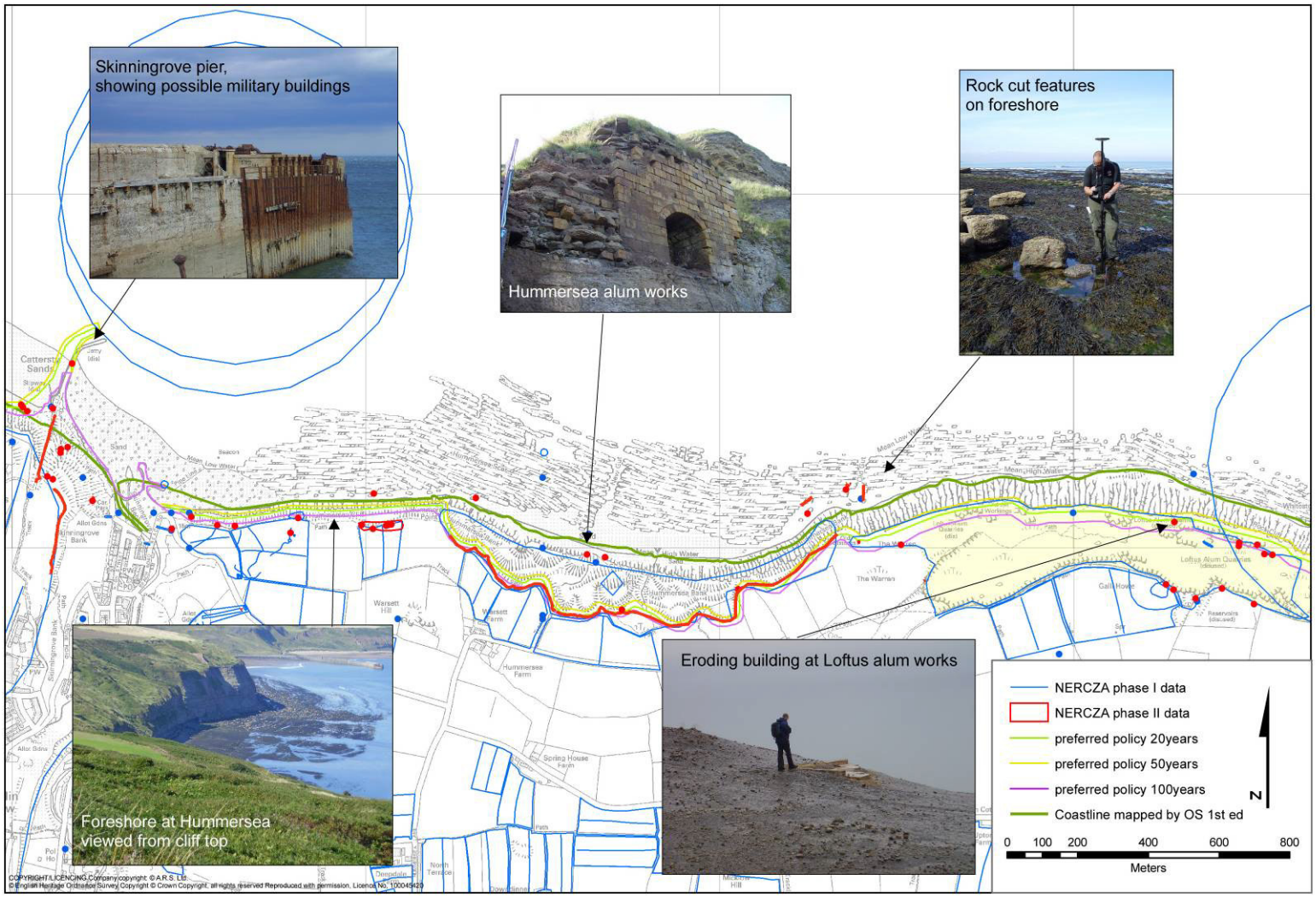


Fig 5.3.18 Archaeological features recorded by NERCZA Phase 2 at Skinningrove - Hummersea

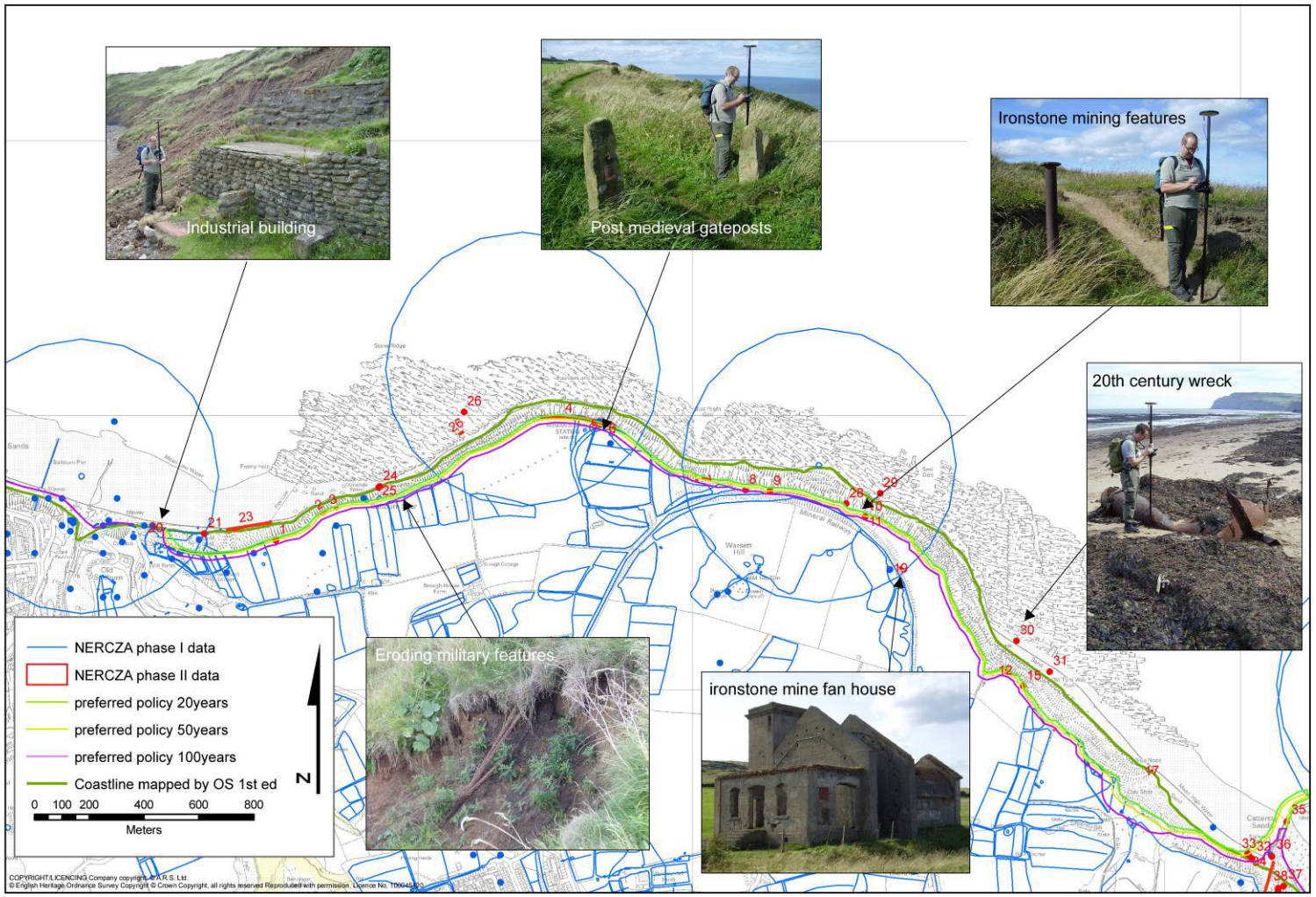


Fig 5.3.19 Archaeological features recorded by NERCZA Phase 2 at Saltburn - Skinningrove

5.4 Greatham Creek and North Gare, Teesside.

5.4.1 Background

The SMP2 recommendation for the areas adjoining Greatham Creek is 'No Active Intervention' to be followed in the middle term by 'Managed Retreat' which may involve the construction of sea defences. Three categories of asset in this area can be considered vulnerable to the effects of flooding due to rising sea levels and/or the construction works involved in the erection of sea defences. These consist of a prehistoric midden identified by the Phase 1 study, a group of medieval and later salterns and the military features of the Greatham Creek Defence Area, the latter being one of the most complete surviving Second World War defensive complexes in the North East.

Fig 5.4.3 Stanton type air raid shelter at Greatham Creek, part of former bombing decoy.

5.4.2 Location and geology

The Greatham Creek defence area is located between Middlesbrough and Hartlepool, north of the mouth of the River Tees (NGR NZ 50721 25534) (SMP PU 13.1 – 13.5) (Fig 5.3.1). The area is made up of superficial deposits of alluvium with sands and silts underlain by glacial till. The solid geology beneath this is Sherwood sandstone (BGS). The area is mainly salt marsh with a large proportion of reclaimed land for industry surrounding this. Land use is currently a mixture of industrial complexes, brine fields and open pasture. The area is low lying and open and as a result is at risk of flooding if projected sea level rise is correct (see projected sea levels on Fig 5.4.1).

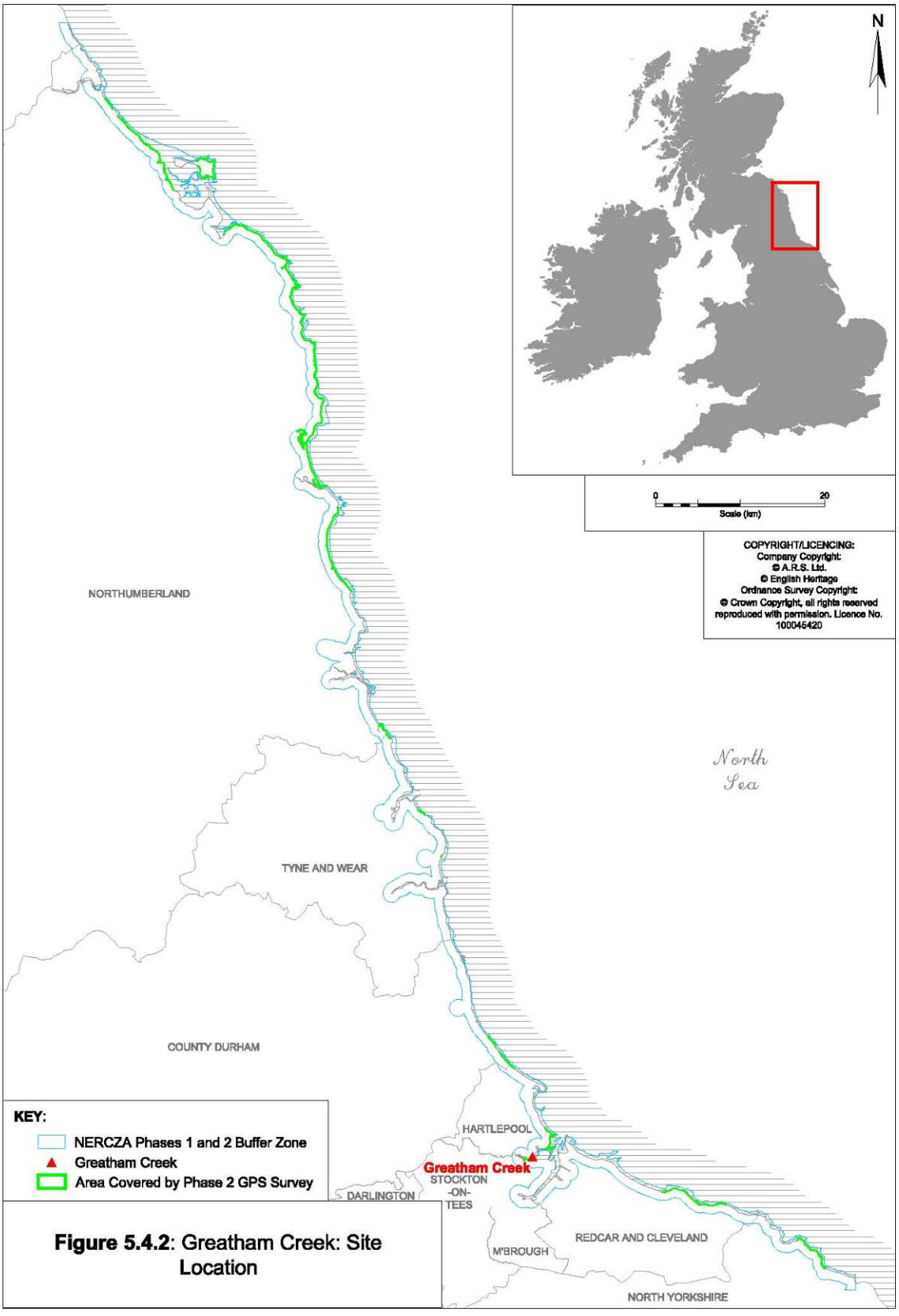


Figure 5.4.2: Greatham Creek: Site Location

5.4.3 Previous research

Areas of Greatham Creek have been investigated separately before as part of Environmental Impact Assessments which have included cultural heritage chapters. One of these was undertaken on behalf of the environment agency by Northern Archaeological Associates but as with assessments undertaken as part of commercial development this did not cover a wide area or include a high level of detail on what still survives. Studies of the military landscape such as the Defence of Britain project have also covered this area. However, no holistic study of the surrounding area has been undertaken. As a result of this the area surrounding Greatham Creek around the North Gare (NGR NZ 53677 28231) was also investigated in order to give as complete a picture of the surviving defences as was possible.

The Defence of Britain project examined detailed Ministry of Defence records in order to piece together a picture of what was planned for the Greatham Creek Defence area. However the limitations of the Defence of Britain project, for example inconsistent fieldwork methodology, have previously been recognised and are discussed in greater detail in section 5.17. In addition, what was recorded by the Ministry of Defence during the Second World War as planned was not necessarily built in the same way or at all during the Second World War. So although an excellent record of planned defences survives this does not necessarily reflect what was actually built and what survives on the ground. This principal applies equally to other sites with surviving military remains recorded by NERCZA along the coast.

Fig 3.4.4 Generator house for bombing decoy with Stanton shelter in background.

5.4.4 NERCZA Phase 2 Archaeological Investigation

5.4.5 Prehistoric – Early Medieval

There was no prehistoric, Romano British or early medieval archaeology identified during the course of the survey

5.4.6 Medieval

The main medieval remains identified were the extensive survival of medieval saltern mounds. These mounds were identified from the air during Phase 1 of and within Phase 2 the mounds were assessed in terms of their level of threat and their extent and position accurately mapped. A concentration of these (184) was located directly west of the North Gare, in a field surrounded by reclaimed land, dunes and developed areas.

Fig 5.4.5 recording one of the Saltern mounds, modified in the cold war to house a Royal Observer Corps station.

The medieval salterns are a predecessor to the modern brine fields, both used for salt production. They can also be seen to the south in the area directly surrounding Greatham Creek.

5.4.7 Post-Medieval-Modern

Post-medieval archaeology in the area takes the form of reclaimed patches of land and industrial components. Many of these areas are still in use and as a result have evolved considerably. One of the most obvious elements of the post-medieval archaeology is the reclamation of land from the 19th century onwards. Historic Ordnance Survey mapping shows the development of the landscape from the 1860s onward and clearly demonstrates that the area west of North Gare, to the south of the medieval salterns, was not reclaimed until late in the 19th century. The survey actually picked up evidence of this in the form of part of a former dune system visible on the 1st and 2nd edition OS maps. This was

recorded initially with the thought that it may be a saltern mound. However, inspection of the historic mapping indicated that this area was in fact not reclaimed until the late 19th century. This ruled out a medieval date and when the position corresponded to the position of dune 'islands' it was realised that this was actually a remnant of the pre-reclamation landscape preserved within the reclaimed fields.

Fig 5.4.6 Remnant of pre-reclamation landscape preserved to the west of North Gare.

A relict railway embankment (151) also survives running through the brine fields at NGR (NZ 50942 24989). This was formerly attached to the brine works but fell out of use in the early 20th century. The embankment is clearly extant, although some sections have now been removed. It has been re-used later as the foundation bank for pillboxes and section posts. This can be seen elsewhere in Northumberland where gun emplacements have been seen placed on top of such embankments to provide better firing positions.

Fig 5.4.7 Former railway embankment reused as a platform for a pillbox (left) and section post (right).

The survey also revealed evidence for a possible shipwreck in proximity to the North Gare. The whole outline of the vessel can be seen on aerial photograph transcription from Phase 1. However, now only a small section is visible (156). This was photographed and when revisited 3 months later the location was re-established but the wreck was no longer visible at all.

Fig 5.4.8 Partially visible remains of Shipwreck (158) on the foreshore at North Gare.

5.4.8 20th Century Military archaeology

The majority of archaeological features recorded a Greatham Creek and North Gare related to the Second World War defence area. The survey recorded extensive surviving remains ranging from slight earthworks such as anti-glider trenches to upstanding buildings such as pillboxes and section posts. Also recorded was evidence of Cold War activity, and the surface remains of the entrance to a surviving Royal Observer Corps bunker was also recorded.
The most obvious surviving features are the well-preserved pillboxes and section posts that can bee seen in the area surrounding the creek. These can be distinguished by their distinct shapes, pillboxes being square or rectangular structures built out of thick concrete, while section posts are of less substantial concrete and are chevron shaped. Three section posts (143, 144, and 145) can be seen along a former strategic track (146) just south of seal sands. Although now partly buried by a dyke that forms the edge of the nature reserve they are still excellently preserved with several internal features surviving. These section posts were used to house a section of infantry who could fire out of the rifle loop holes. Pillboxes are different in that they would house machine gunners and larger calibre guns. It is likely that the presence of so many section posts in the area of Greatham creek can be attributed to the fact that the marshy ground prohibited the successful excavation of fire trenches. More section posts can be seen in the area of open fields to the north of the surviving bombing decoy site.

Fig 5.4.9 Partly buried section post (145) showing their distinctive chevron shape in plan.

The front of these section posts is no longer visible but the interiors show that the rifle loop holes are still open and sand is beginning to fill these structures. Internal features may in time be lost as a result of this. Section posts can also be seen on the railway embankment (152) described in section 5.3.10 and here they appear to from a "fortlet" (Fig 5.4.12) defending the creek itself, presumably to stop any incursion up this waterway.

The remains of partially demolished pillboxes (155, 156, 154) were located on the North Gare itself and these correspond to known locations relocated using Phase 1 data. The remains of a concrete wall with loopholes and foundations can clearly be seen. These demolished remains are being reused to reinforce the collapsing sections of the North Gare pier (Fig 5.4.10)

Fig 5.4.10 The remains of pillboxes used to reinforce the North Gare pier

Fig 5.4.11 remains of loop holes in concrete wall fragments from demolished pillbox

Several smaller defensive features were also recorded, these included a previously recorded spigot mortar (141) (Fig 5.4.13) now buried by the track leading to the nature reserve. Only the mortar pivot is still visible protruding from the track. This would have been one of several such spigot mortar along the Creek placed in key firing positions to allow rapid repositioning. The others have now been lost.

Fig 5.4.12 'Fortlet' 152 overlooking Greatham Creek made up of two large section posts.

Fig 5.4.13 Spigot mortar base 141 partially protruding from track edge.

Also visible along the edge of the Creek were two possible positions for pillboxes facing inwards to protect against incursions from the channel. These rectangular concrete platforms are the typical shape and size and are made from concrete comparable with other defensive structures in the area (Fig 5.4.14). However, there is no way to definitively verify these as pillboxes as they are not identifiable on period photography.

Fig 5.4.14 possible remains of demolished pillbox 142.

Several earthwork remains were also observed; these primarily consisted of anti-glider trenches (177, 178, 183, 182, 189). Although many of these were identified by the Phase 1 mapping the Phase 2 fieldwork found many of these were no longer visible. Several were seen in the vicinity of North Gare and others were well-preserved within the Hartlepool Golf club. The development and reclamation of these areas has led to many of these trenches having been destroyed. Field survey also found that many of the anti-glider trenches identified by Phase 1 in the area recorded as 184 were not in fact anti-glider trenches but either natural channels or drains, possibly related to salt production in the medieval period.

Fig 5.4.15 Recording remains of a surviving anti-glider trench 182.

Also visible in the dunes to the north of North Gare were extensive lines of anti-tank blocks. These are visible in dunes as a double row all the way from the Gare for at least 2km. They are buried in places, but the same continuous line can be re-established (165, 160, 164, and 161) and the line followed in dune banks which now cover the anti-tank blocks. Also seen in and around these lines of anti-tank blocks were the remains of barbed wire being exposed in small dune blow-outs. These remains are extremely fragile and are being effectively blown away in strong winds. The lines of barbed wire can be seen as stained areas of sand with fragmentary remains of barbed wire, and occasionally picket wire, surviving.

Fig 5.4.16 Anti-tank blocks at North Gare.

Fig 5.4.17 Remains of barbed wire and picket wire at North Gare.

The surviving military remains of a First world war seaplane base were also recorded, although they had been reused later. The site of the former pier has been used as the foundation for a Second World War pillbox. Phase 2 identified the location and surviving extent of the First World War seaplane base at North Gare first identified as part of Phase 1. There are buildings surviving directly next

to the power station that date to 1915 (204), which are presumably related to the seaplane base. A slipway and pier (203) survive close to the power station, these were built for the seaplane base, and it is on this pier that the Second World War pillbox (202) was constructed. An area of raised flat ground between the slipway and 1915 buildings is clearly visible, this platform is evidently the remains of the sea plan base itself, the buildings having subsequently been removed.

Fig 5.4.18 Remains of a WWI seaplane base (203) at North Gare.

As well as this earlier element of defensive archaeology the survey revealed a much more recent phase of military activity. In the area of saltern mounds (184) the survey identified the remains of a hatch and other surface features belonging to a Royal Observer Corps monitoring post. These were built all over the country to monitor the conditions and resulting situation in the event of a nuclear attack (Cocroft 2008). The surface features would have been a hatch, several equipment antennas, and a ventilation system. The field survey identified the probable locations of a hatch (185) and ventilation shaft (186) protruding from a modified saltern mound (187). The hatch was sealed and there is no way of gaining access easily so there is no way to ascertain the internal condition of this monument.

Fig 5.4.19 Remains of sealed hatch into ROC Cold War monitoring post.

5.4.9 Threat from erosion

The Shoreline management plan indicates that the typical erosion rate for this type of undefended coastline is 0.1m per year, although at Greatham there is also the additional risk of flooding. The main types of recorded archaeology relate to structural remains in locations where they are not under direct threat from erosion. The section posts and pillboxes at Greatham Creek are not under immediate threat unless sea levels rise significantly in the future. This would then lead to increased impacts upon them. Similarly the lines of anti-tank blocks at North Gare are actually helping to protect the coast as they are accumulating sand and creating artificial dunes around them. Further inland the greatest threat posed to the medieval remains other than sea level rise is that of ongoing trample from cattle which, over time, could significantly change their profile and remove medieval evidence.

There is a significant threat to the remains of the seaplane base at North Gare as it is exposed at high tide and the slipway is in a significant state of decay. On the Gare pier the remains of Second World War defences have evidently been bulldozed away recently to reinforce the dilapidated pier structure. Although there can be no way of preserving these remains now this could be seen as an exemplar of what not to do. A significant proportion of the story of the Second World War defence of this area has been lost as a result of this action. Ephemeral remains, such as the barbed wire entanglements being revealed in the dunes, are not just threatened by erosion but pose a threat themselves. They could be a hazard for dog walkers or children as they are still sharp and dangerous. This means they should be a priority for further management as they have minimal archaeological interest, other than as a record of their presence, but pose a problem to the areas amenity.

5.4.10 Summary and conclusions

The main threat in the Greatham Creek area is flooding due to ongoing sea level rise and increased threat of dune blowouts from erosion. The SMP2 policy for this area is No Active Intervention or Managed Realignment of the coast (see Table 5.4). The exception to this is the area around the North Gare and Seaton Carew. Here, the developed areas and existence of the power station mean that policy is to protect the area from any further erosion and defend against flooding. The impact of these on archaeology is that any flood defence works or implementation of sea defences could inadvertently destroy or damage some areas of archaeological interest and importance. For example, the seaplane base west of North Gare.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA13	Seaton Carew	13.1	HTL	HTL	HTL	Consider planned realignment
MA13	Seaton Sands	13.2	NAI	NAI	NAI	Possible future feed with dredged material
MA13	North Gare	13.3	HTL	HTL	HTL	
MA13	North Gare Sands	13.4	NAI	R	R	controlled by structure to south
MA13	Bran Sands	13.5	NAI	NAI	NAI	Investigate use of dredged material

Table 5.4 Shoreline Management Plan 2 policies for the Greatham Creek area.

The Archaeology in the area of Greatham Creek and North Gare represents one of the best-preserved examples of a completed Second World War defence area along the North East Coast. It also has the added First World War and Cold War elements giving a chronology of defensive activity within the same area. Much of what was originally constructed still survives in some form allowing a picture of the various stop lines and key defensive points to be built up. This archaeology is clearly under threat from both active erosion and demolition in the short term and rising sea levels in the long term.

The medieval remains, while not under immediate threat, must also be considered in the long term. Rising sea levels would see a large percentage of the land reclaimed by man in the 19th and 20th centuries reclaimed by the sea in the 21st century. This would not just affect the military archaeology and produce a landscape more akin to that depicted on the 1st edition Ordnance Survey mapping, but also increase flood risk further inland, leading to the area of medieval salterns being directly affected.

Given this context there is benefit in maximising understanding of the significant elements of the wartime archaeology followed by a detailed survey of the medieval salterns. Such surveys would then provide a more complete record and gain in understanding for both sets of what are currently exceptionally well-preserved remains.

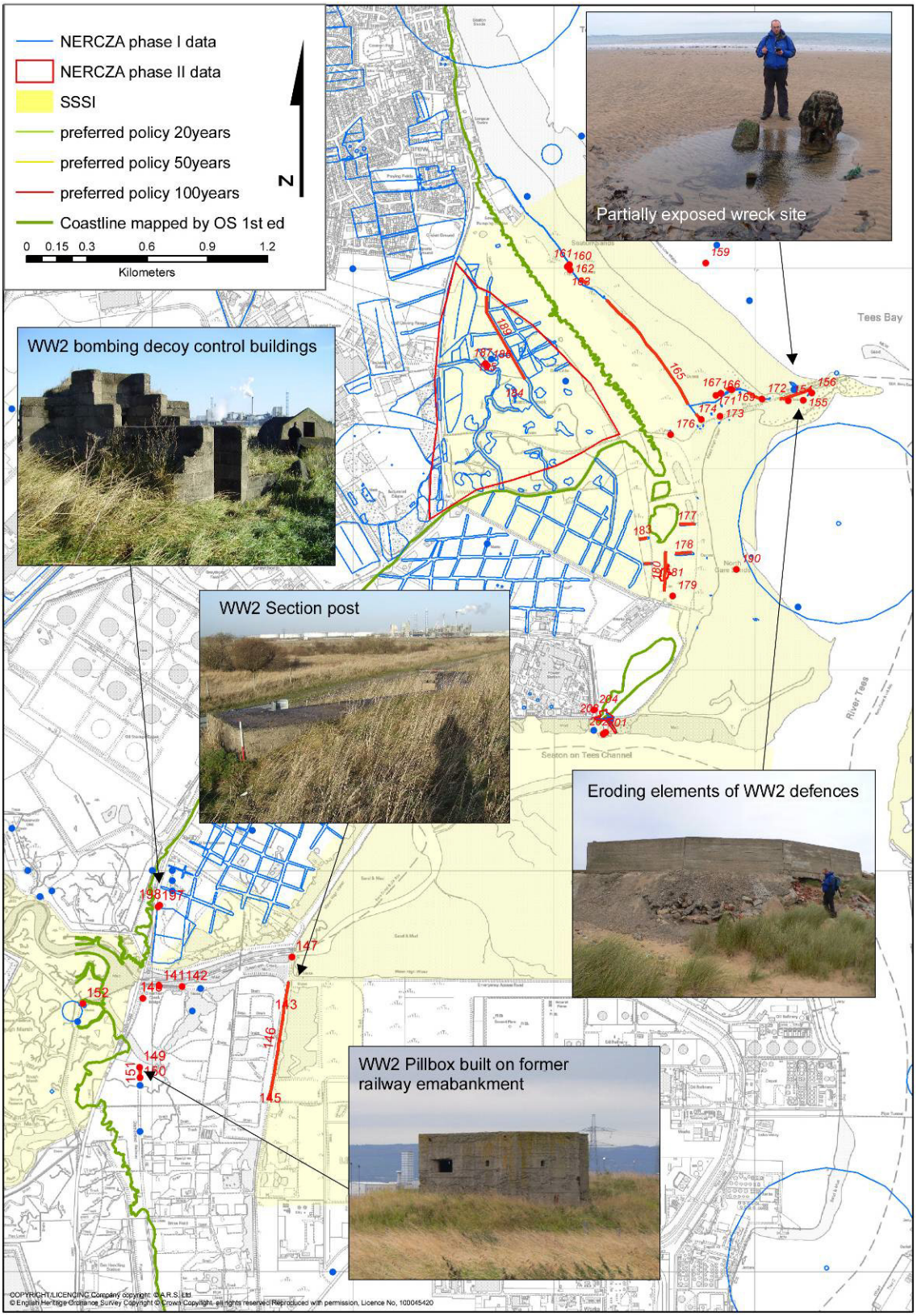


Fig 5.4.20 Archaeological sites recorded by NERCZA phase II at Greatham Creek / North Gare

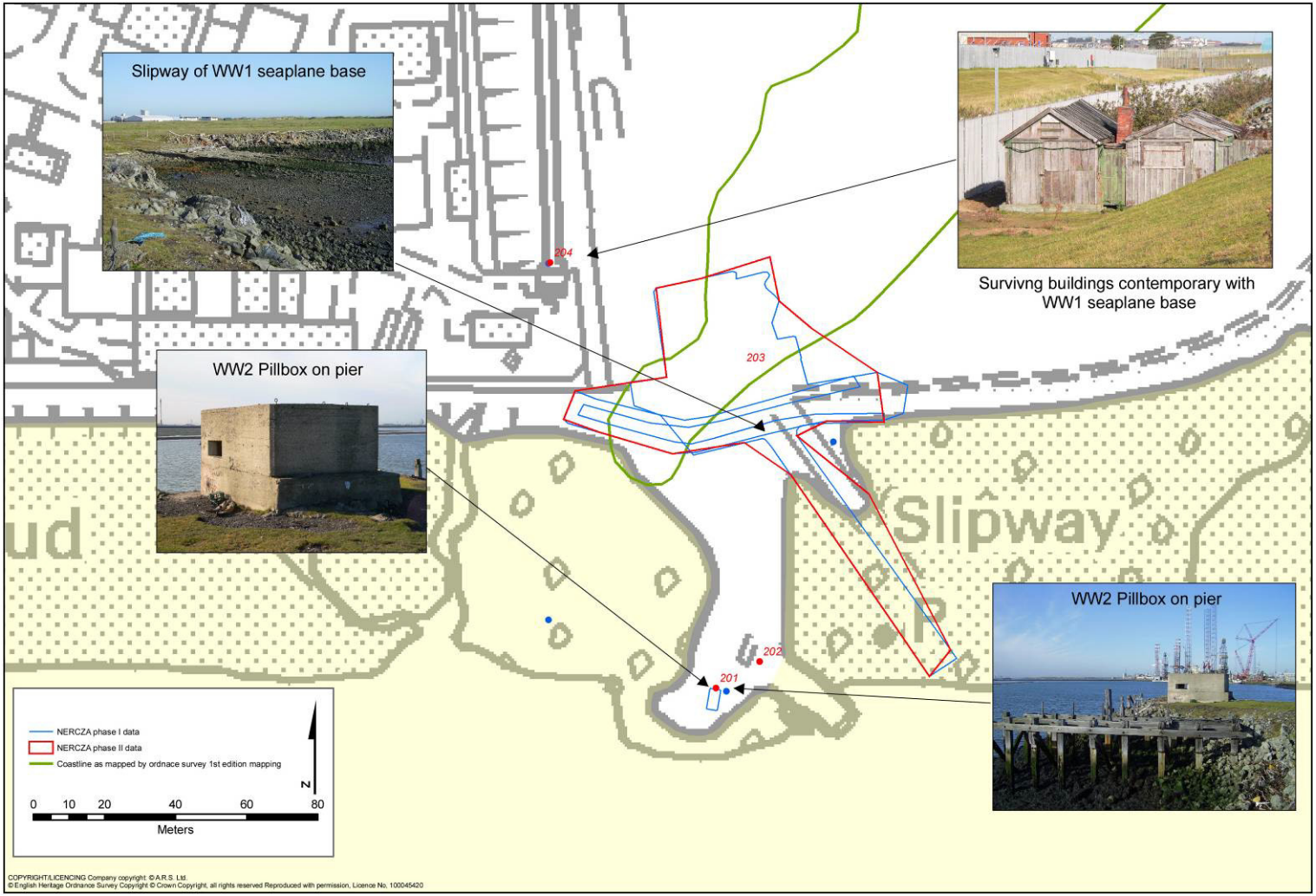


Fig 5.4.21 Recorded archaeological features at the WW1 seaplane base found at North Gare

5.5 Crimdon Dene and Blackhall, County Durham.

5.5.1 Background

The possible location main flint scatter site at Crimdon Dene is close to the MHWS limit while the sites at Blackhall are on the cliff edge. Within the SMP2 these sites are in an area of the coast where the recommended policy is one of 'No Active Intervention'. The former is vulnerable to the effects of sea level rise and the latter to the erosion of the cliff. The first aim of the survey was seek to identify the location of the scatters. A detailed check of the area was made to identify whether there were further visible flint scatters in the vicinity, as flint scatters are rarely found in isolation.

An organic layer buried below a layer of sand was identified as a possible land surface potentially related to that described as containing the flint scatter (Coupland 1936). This possible land surface was sampled as part of the palaeoenvironmental sampling and is discussed further in Chapter 6.
What also became evident during the course of the field survey were the extensive surviving Second World War remains surviving around the mouth of the Crimdon Beck. The survey area was therefore expanded to include and assess the extent of these remains. A similar exercise was undertaken at Blackhall focusing on the surviving remains of the colliery.

Fig 5.5.3 Crimdon Dene in full flow in winter.

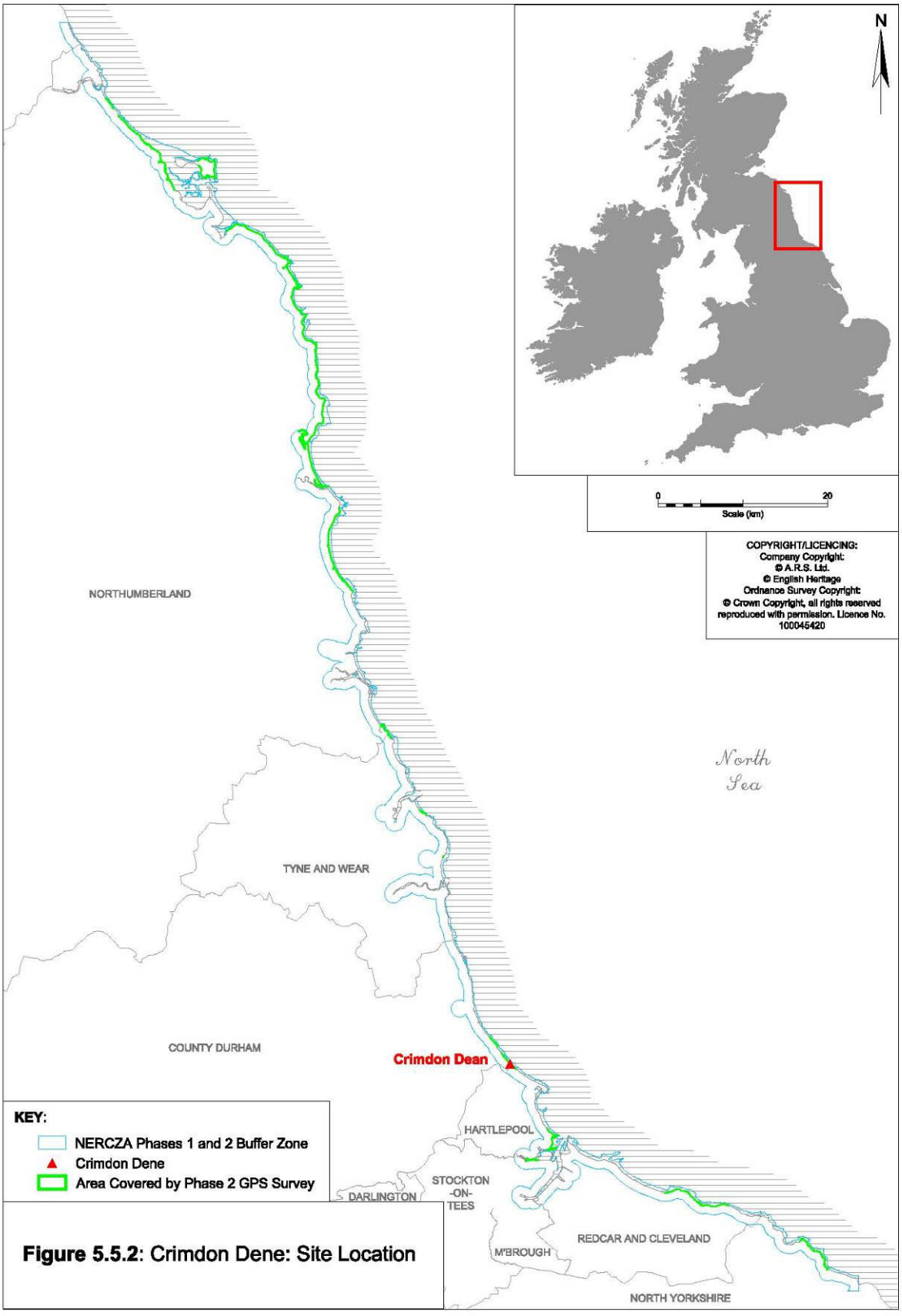


Figure 5.5.2: Crimdon Dene: Site Location

5.5.2 Location and geology

Crimdon Dene is located on the Durham coast north of Hartlepool (NGR NZ 48913 36566) (SMP PU11.1). The geology of the area is Magnesian Limestone overlain by a clay till which supports a grassland cover. The coastal cliffs are broken up with small valleys winding inland between low rolling hills. These denes and valleys have formed foci for settlement during the prehistoric period, and for the Mesolithic in particular (Waddington 2007). There are large sand dunes to the south of Crimdon Dene and these are eroding rapidly as they are being cut back by wave action, but also by the flow of the Crimdon Beck which is cutting onto the dune system from the landward side. To the north the dunes run into limestone cliffs with a rock cut platform and intermittent sand beach.

Fig 5.5.4 One of the large dunes to with the Dene in the foreground, showing the effects of ongoing erosion.

5.5.3 Previous research

Extensive research into Mesolithic activity on the Durham has been carried out since the 1920s. Trechmann first identified the Mesolithic flint scatter at Crimdon Dene in 1912. He retrieved a scraper and several flakes (Raistrick and Coupland 1936). Further investigation revealed Mesolithic flints exposed on the surface of the till but situated below the overlying sand, a situation witnessed elsewhere on the North East coast at Nessend, Holy Island and Newbiggin for example. Raistrick and Coupland identified cores and flint chips and compared the Crimdon Dene site to that further up the coast at Newbiggin (Raistrick and Coupland 1936). Coupland records that 12,000 flints were recovered from the visible exposures. It is not currently known if these artefacts or any archive survives from these early investigations.

The location of the site is described by Raistrick and Coupland (1936, p84):

"The site is situated at the mouth of Crimdon Dene, about 2 miles north of West Hartlepool, where the small burn makes a southerly band as it approaches the sea, forming on the north side of a longish spur, between the shore and the burn. This spur is actually a small cliff of boulder clay covered in part by blown sand."

This is the only archaeological investigation that has taken place at Crimdon Dene, although various attempts to relocate the scatter have taken place. Further work was undertaken at Blackhall were a second scatter was located and limited excavation undertaken by Coupland. This site is proximal to the large former colliery at Blackhall.

Fig 5.5.5 Investigating the landscape containing the flint scatter recorded by Raistrick and Coupland.

5.5.4 NERCZA Phase 2 Archaeological Investigation

5.5.5 Prehistoric

The Phase 2 survey of Crimdon Dene did not identify any definite prehistoric features. However the probable location of the Crimdon Dene lithic scatter as described by Trechmann was thought to have been identified. Using the description of the site (see above) the possible location of this layer was identified (se fig.5.5.1). Buried below sand on a spur of land several organic-rich layers were observed that represent old land surfaces. These organic horizons were sampled (Fig 5.5.6) for radiocarbon dating and the spur of land and sampling points surveyed. However the organic samples have subsequently returned dates of cal 1956 AD, ruling out these deposits as prehistoric. The location of the Crimdon Dene flint scatter has therefore not been identified and the implications of this are discussed in more detail in Chapter 6.

Fig 5.5.6 Uncovering the buried organic layer on the spur of land at Crimdon Dene.

Several pieces of flint were retrieved from the spur of land during the survey although these were out of context and also heavily beach rolled (98). It is possible that they are remnant cores as one in particular seemed to have a series of planned blade scar removals. As flint occurs naturally here in beach pebble form it is not always certain as to whether a piece has been worked. The evidence for surviving prehistoric remains at Crimdon Dene is suggestive but not yet conclusive. The organic remains do not represent a prehistoric layer and the location of the flint scatter remains to be definitively located. Further investigation and a more detailed survey would enhance the understanding of this site and it's potential.

Fig 5.5.7 Location of the "spur" of land described by Coupland which is thought to be the land on the right of the picture.

At Blackhall no surface evidence of the lithic scatter reported to be there was observed.

5.5.6 Other pre-medieval evidence

No Romano British or early medieval features were identified during the course of the survey in this area.

5.5.7 Medieval

Remnant earthworks of broad medieval ridge and furrow ploughing were observed within Crimdon Dene caravan park (87). These remains are preserved on two plots of land directly to the north of the park and as well as being broad have a distinct reverse S bend to them indicating that they were formed by ox and not horse drawn ploughs. This type of ridge and furrow is associated with the medieval period. The graded nature of the earthworks suggests that the field was ploughed again in the post-medieval period thereby truncating the earlier ridges.

Fig 5.5.8 Location of the remains of heavily graded broad medieval ridge and furrow at Crimdon Dene Caravan park.

5.5.8 Post-Medieval

The main post-medieval evidence comes from the remains of the colliery at Blackhall. Earthwork and structural remains survive on the east side of the railway. Part of the site is now an industrial estate, however to the south of this extensive but fragmentary remains of the former works can be seen. This site could be recommended for a full detailed Level 3 survey (Ainsworth *et al* 2007) to fully record all components of the site. The current survey recorded only the extents of the visible remains. Building platforms, tracks, and other earthworks, as well as fragmentary structural remains, can all still be identified within the extent of the former works.

Fig 5.5.9 The Blackhall colliery site.

5.5.9 20th Century

The main element of 20th century archaeology were military features dating to the Second World War. At the mouth of Crimdon Dene the Phase 1 recorded extensive defensive features visible on aerial photography, presumably defending the easy access up the Crimdon Beck. Unsurprisingly most of these more ephemeral features have since been removed, however the remains of pillboxes, section posts and an anti-tank battery can still be seen.

The well preserved anti-tank battery (83) is defended by a pillbox (82) and a communications trench (105) is also still visible running up the hill between them. Interestingly, although the Phase 1 study picked up features such as anti-tank cubes across the base of Crimdon Beck and the military features on the beach and cliff top in the vicinity of this battery, they did not pick up any trace of features 82, 83 or 105. This perhaps highlights the limitation of aerial survey as these unrecorded features are now some of the most visible in the landscape and are exceptionally well preserved. The anti-tank battery was most likely heavily camouflaged during the Second World War and this may account for it not having been picked up on contemporary aerial photography.

Fig 5.5.10 Anti-tank battery at Crimdon Dene, showing access on the roof.

The anti-tank battery is exceptionally well preserved, probably due to the partial burial by sand of most of the structure which has served to protect it. Both the pillbox (82) and battery (83) are on the edge of an area of stable dunes, below the golf course and overlooks a commanding position over the beach and mouth of Crimdon Beck.

Fig 5.5.11 Pillbox (82) built to defend the anti-tank battery (83).

To the south of these structures two areas of collapsed concrete rubble (104) and (106) can be seen eroding out of the dune cliff and slumping down onto the beach. These areas of rubble relate directly to earlier structures recorded in Phase 1. Also visible on the beach are the remains of three pillboxes (108, 109, 110) and a section post (512), all relatively well-preserved and partially buried by beach sand. It is also possible to say from comparison with the 2009/2010 GPS position with the 1940s AP transcription data that all of these remains have shifted several metres from their original position, probably due to slumping and long shore drift. A second section post was visible until very recently and is even depicted on the latest Ordnance Survey mapping but has since either eroded or been removed as it was unsafe, and was gone by the time of the survey.

Fig 5.5.12 One of the exposed pillboxes (106) on the beach at Crimdon Dene.

Another surviving Second World War element at Crimdon Dene is the earthwork remains of trenches. There is an extensive network of these directly overlooking Crimdon Beck forming what can be described as a hilltop redoubt. Trenches can be seen forming a zig zag fire trench pattern, with communication trenches extending back from the main fire trench to the edge of what is now a footpath. Although now heavily overgrown, the survival of these trenches is exceptional with some over 1m deep.

During the wartime period beach defences comprising anti-tank blocks and barbed wire were deployed at Crimdon Dene. These are no longer visible on the beach but many anti-tank blocks can be seen removed from the beach in caches behind the dunes (112). At the same location *in situ* anti-tanks blocks (111) have been used as the foundation for a modern bridge.

Fig 5.5.13 Top: Anti tanks block utilised as a foundation for a modern bridge. Bottom: Cache of anti tank cubes probably removed from their original location.

There are other military remains visible in the vicinity that cannot be positively identified due to the level of ongoing erosion. These concrete structures (114) (116) are at immediate risk of collapse and also relate to features identified during the Phase 1 survey.

Fig 5.5.14 eroding unidentified military remains at Crimdon Dene

5.5.10 Threat from erosion

There is an ongoing risk of erosion at Crimdon Dene, especially to the south of the beck. The erosion and destabilisation of the dune cliff, combined with the erosion caused by the cutting back of Crimdon Beck have led to a high rate of erosion. By comparing aerial photography from the 1940s and the 2009 survey an estimated rate of erosion over a 60 year period can be worked out. It can be seen by comparing the 1940 and 2009 position of the same military features that some parts of the cliff have retreated as much as 40m in 60 years. That works out at a localised rate of erosion of 0.67m per year. Although not the most accurate method due to the shifting of the archaeology as a result of long shore drift, this is a useful way to estimate the erosion rates at a local level using the surviving archaeology (Fig 5.5.15).

5.5.13 Summary and conclusions

There is significant archaeological potential at Crimdon Dene for both the surviving Mesolithic and for substantial surviving Second World War remains. Not only is there a large amount of surviving military remains preserved, but there is the potential for preserved Mesolithic archaeology. The project has identified the possible location of the Mesolithic flint scatter first identified in 1912 that has produced 12,000 flints (Raistrick and Coupland 1936). It has been seen elsewhere that such sites could preserve further evidence of prehistoric settlement as was case with the Mesolithic house at Howick (Waddington 2007).

Management Area		Policy unit	Policy Plan			Comment
			2025	2055	2105	
MA11	Crimdon Valley	11.1	NAI	NAI	NAI	Local management to beck may be considered. Possible beneficial use of dredging for environmental reasons

Table 5.5 Shoreline Management Plan 2 policy for the area of Crimdon Dene

The SMP policy for this stretch of coast is 'no active intervention' in the shoreline management plan PU11.1. Taking the rate of erosion seen to the south of the beck, the potential importance of any buried archaeology and the preservation of Second World War archaeology, it is clear that the site faces a high level of threat. The military archaeology preserved at Crimdon Dene is not the best-preserved along the North East coast; however the amount which survives within a small area does make the site interesting. For this reason further investigation of the location of this Mesolithic site and a more structured programme of field walking and excavation would be helpful and crucial to increasing our understanding of the survival of the Mesolithic at Crimdon.

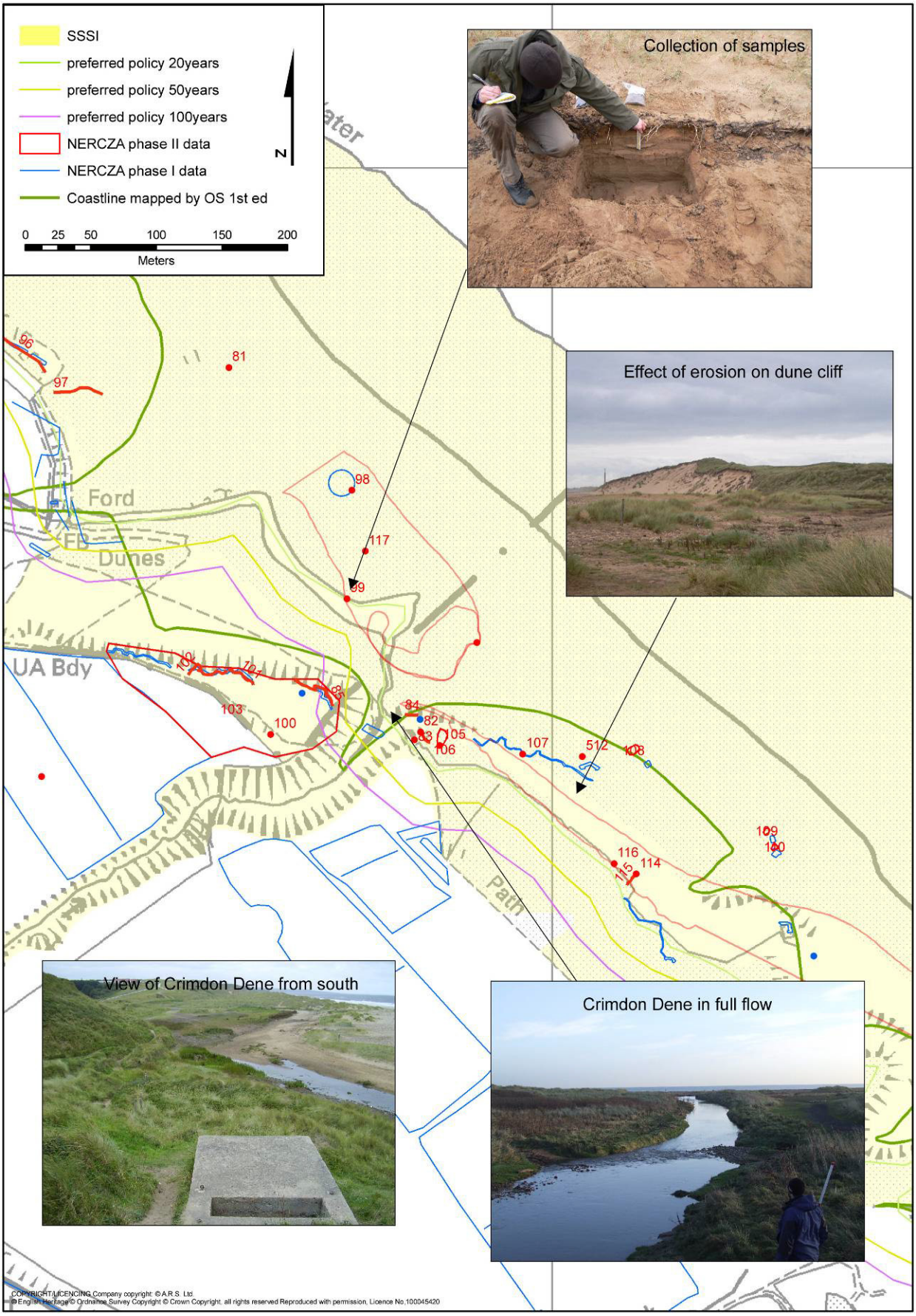


Fig 5.5.15 Archaeological features recorded at Crimdon Dene by NERCZA phase 2

5.6 Trow Point, Tyne and Wear.

5.6.1 Background

At Trow Point an erosion rate of 0.2m/per year has been recorded (SMP2 for North east England 2008) and the SMP2 policy recommendation is to allow the cliff face to retreat. Any remaining evidence of the Trow Point barrow will soon be lost at this rate of erosion. The survey aimed to:

- Ascertain whether the barrow is suffering active erosion.
- Evaluate both the present level of threat to the barrow and the nature of those threats.
- Examine whether there are other visible features associated with the barrow and the extent to which such features are subject to, or at risk from, erosion.
- Record the present extent and condition of the barrow.

Upon initial walkover survey of the site it became clear that it was unlikely that any evidence of the barrow survived. Although there are numerous earthworks surviving on the top of Trow point it is unlikely that any of these relate to the prehistoric period. As with many of the sites surveyed, the majority of features identified relate to Second World War defences and the main exception to this was the late nineteenth century gun emplacement on the point itself.

Fig 5.6.3 The site of the experimental late Victorian "disappearing gun" on Trow point.

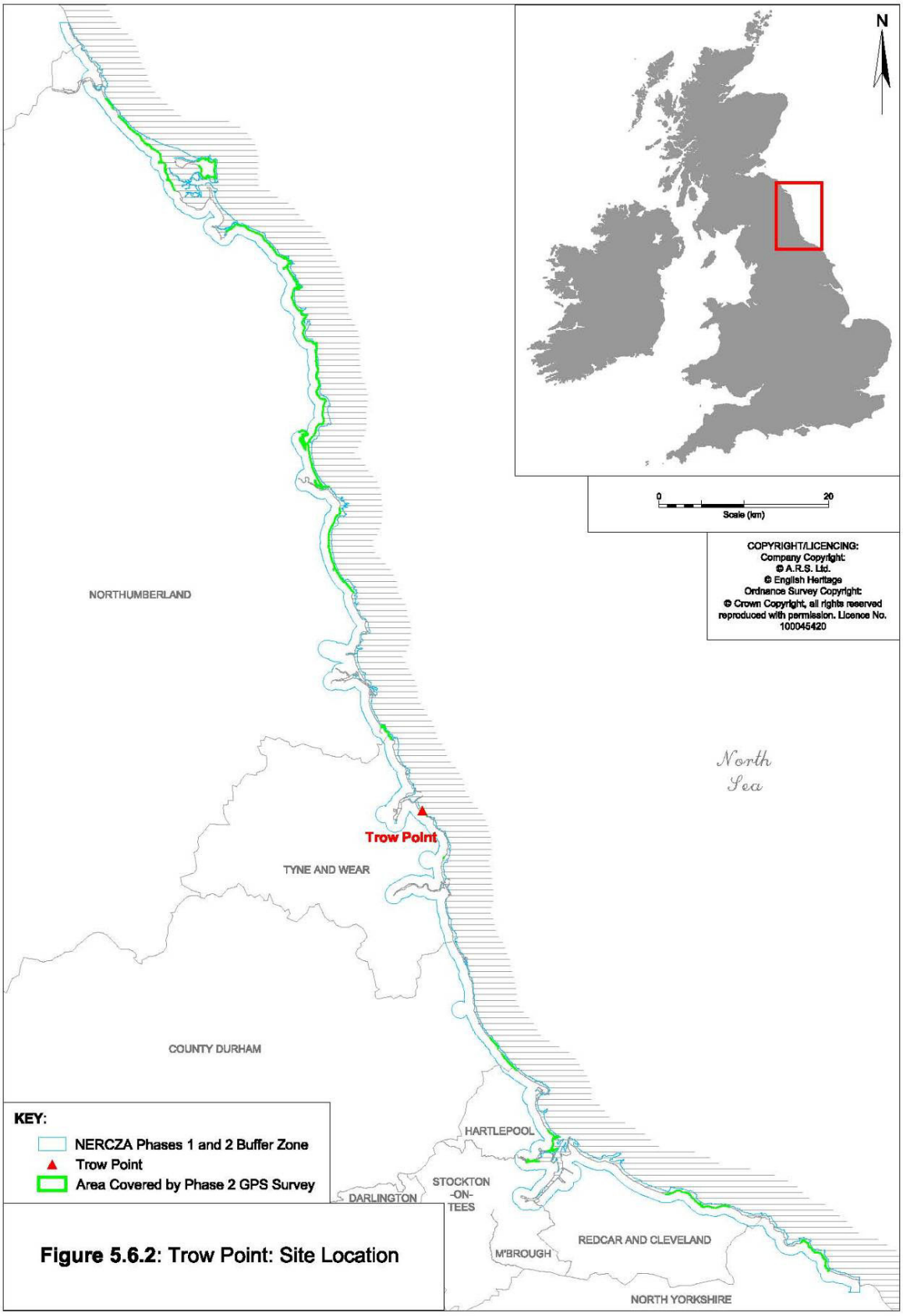


Figure 5.6.2: Trow Point: Site Location

5.6.2 Location and geology

Trow Point is a promontory located at NGR NZ 383 665, (SMP PU 2.3 – 3.2) flanked by two sandy beaches, with low cliffs to the south and dunes to the north. The landward side of the promontory has been mostly removed by the extensive workings of Trow quarry which can be seen directly to the west and south of Trow Point. The solid geology of the area is Upper and Lower Magnesian Limestone of the upper Permian age. The Upper Magnesian Limestone is shown to be present beneath the majority of the site (Cooper *et al* 2006). Trow Quarry is in the lowest division of the stratigraphic unit, the Concretionary Limestone. This consists of finely laminated dolomitic limestone. It is grey/brown crystalline limestone with subordinate creamy yellow oolitic or finely granular dolomite.

The limestone exposed at Trow Point is from the middle of the Concretionary Limestone and is characterised by varied calcite concretions (BGS). The area around Trow Quarry lies on the Upper Magnesian Limestone over Durham Lower Boulder Clay. This is overlain by the Tyne-Wear Complex. In addition to the natural geology around Trow Quarry, the quarry itself has been in filled with demolition waste and burnt domestic waste. A layer of Made Ground is therefore overlying the Upper Magnesian Limestone.

5.6.3 Previous research

There has been no detailed research into the remains at Trow Point, however antiquarian investigation recorded the existence of a barrow on the point which was eroded and contained a Cist burial this apparently has subsequently completely eroded away or been removed by continuing quarrying.. The exact location of this burial has now been lost although there is the recorded find of a bronze socketed axe found on the shore below Trow Point in 1867 (Tolan-Smith 2008). This is now stored in South Shields Central museum.(Hart 2004). There has also been summary of the archaeology and history of the coastline between South shields and Whitburn undertaken by the Arbeia Society and this deals with the barrow, disappearing gun, and quarry remains although no field survey was undertaken as part of this exercise (Hart 2004).

5.6.4 NERCZA Phase 2 Archaeological Investigation

5.6.5 Prehistoric

The survey revealed no definitive evidence of prehistoric activity. There was one sub-circular earthwork recorded (132) on the southern edge of the point, however this was highly truncated by military earthworks surrounding and could relate to quarrying activity or earlier military activity rather than the remains of a barrow. This earthwork is only a tentative proposal for the location of the barrow recorded in the 19th century as a more likely explanation is that the location of the barrow is now completely lost.

The 1st edition Ordnance Survey map shows the location of an OS trigonometric point (trig point). These were often constructed on the highest flattest point, and upstanding prehistoric barrows were ideal candidates for these structures, indeed OS trig points are often seen constructed on top of prominent barrows or cairns. The location of this trig point is now lost, and so it is possible that the barrow is also lost, this is as the trig point represents a likely candidate for the barrow's

former location. Another possibility is that the barrow has been removed by the quarrying in the early 19th century.

Fig 5.6.4 Truncated sub-circular earthwork, the only surviving candidate for a possible barrow on Trow point.

5.6.6 Romano British onwards

No Romano British, early medieval or medieval features were identified during the course of the survey

5.6.7 Post Medieval

The most prominent feature on Trow Point is the Victorian gun emplacement (119) (Foster 2004). The gun that can be seen at Trow Point now is a later replacement of an experimental Victorian gun known as the disappearing gun. The gun was initially hidden from view in an underground chamber, this would then be pumped full of water in the event of an attack, causing the gun to rise up as a result of the water pressure. This system would have required a system of water pipes and pumping system to control it and although most of this has now been removed, in one area a short section of piping is visible (131) which could relate to this pumping system. The disappearing gun system was found to be impractical and during the Second World War the defences were moved to Frenchman's battery just to the south. However, Trow Point was used as a hilltop redoubt with pillboxes, weapons pits and trenches constructed (see section 5.6.11). The limestone cliff immediately in front of the disappearing gun is eroding at a rate of 0.1m per year and the site as a whole will become increasingly threatened over the coming years.

Fig 5.6.5 The Location of the disappearing gun at Trow Point.

The other component of post-medieval archaeology visible in the area is Trow Quarry. This large limestone quarry has left a huge scar in the landscape, making Trow point even more prominent in the landscape (fig. 5.6.1). The survey recorded the extent of the quarry earthworks (700) and also a possible related feature, rock cut steps (Fig 5.6.6) (137) that lead from the quarry base up to the top of Trow point. There is no definitive way to date these but it is logical to associate them with the quarry as they lead from the quarry base. An exact date is not possible at this point. The steps are heavily worn and have clearly been used extensively over a long period of time, excluding the view that they are a more recent feature.

Fig 5.6.6 Rock Cut steps at Trow Point.

5.6.8 20th Century

On Trow Point there are numerous well-preserved earthworks dating to the Second World War. These comprise weapons pits, fire trenches and the remains of several fortified gun positions. There is also evidence for two other bases for large calibre guns and these are rapidly being exposed. The main visible component of the earthworks consists of four trenches (121, 126, 128 and 136) (Fig 5.6.14 and 5.6.8) and six weapons pits (120, 124, 125, 127, 133 and 134) (Figs 5.6.14 and 5.6.7). These are well-preserved and can clearly be seen across the top of the point. The concentration of defensive earthworks here is probably intended to defend a key point on the promontory, although this does not relate directly to the disappearing gun as this was not in use during the Second World War, but a later mounting for a First World War coastal defence gun, possibly still in use during the Second World War (122 and 123) (Fig 5.6.9).

The coastal gun position consists of two surviving mountings, 122 and 123. These are circular concrete bases 4m in diameter with central fixed pivots to rotate the gun. The proximity of the two positions means that two guns could not effectively be operated at the same time as they could not fully rotate. It is likely that these were used as reserve positions onto which a gun could be moved to get a better arc of fire where it was needed. An earthwork 'pit', now filling with windblown sand which is stabilising and supporting grass, can still be seen surrounding these two mountings slowly covering the surface area of concrete.

Fig 5.6.7 The position and depth of one of the weapons pits with one of the WW1 gun positions visible in the foreground.

Fig 5.6.8 Recording one of the trenches on Trow Point

Fig 5.6.9 One of the two gun mountings 122 and 123 on Trow Point.

The other component of military defences surviving at Trow Point is the remains of four small pillboxes and other earthwork evidence of their original positions (129, 130, 131, 135, 138 and 139). These are not true pillboxes as seen elsewhere at key defensive points but more defended and reinforced defensive positions. They are small and built to defect small arms fire and not large blasts or direct hits. It is unlikely that all of them were originally roofed. They are rapidly constructed defences built on a prominence along the coast to defend the beaches, but also to defend from a flanking manoeuvre behind Trow Point, through the old quarry towards Frenchman's battery. One of these positions (139) has slumped down onto the beach and is being eroded, but its original position (138) can still be seen on top of the cliff (Fig.5.6.14)

Fig 5.6.10 One of the eroding reinforced gun positions (129) overlooking the beach at Trow Point.

Fig 5.6.11 The gun position 139 on the beach having fallen from the top of the cliff on to the beach.

The other large surviving military components dating to the Second World War are the extensive earthwork remains of Frenchman's Battery (140). Here, the main gun positions and a series of subsidiary buildings can all be seen preserved as earthworks, although heavily overgrown. This was effectively the replacement of the single gun at Trow Point and the sister to the Tynemouth and Blyth batteries further north. The site would benefit from further detailed survey to fully understand the extent of what remains prior to its eventual loss to erosion.

Fig 5.6.12 The surviving overgrown earthwork remains of Frenchman's Battery south of the view looking north towards Trow Quarry

5.6.9 Threat from erosion

The base line rate of erosion at Trow Point has been calculated at 0.2m per year.SMP2 for North East England) However, the increase in periodic storm activity means that over time there are significant erosion events that lead to the destabilisation of the cliff edge at Trow Point (Fig 5.6.13). This can be seen by the loss of the pillbox, trig point and possible barrow on the south east corner of the point. The ongoing erosion can also be seen by the recent collapse and slumping of another gun position on the north western edge of the point. The wave action is battering the front of the point, however the most serious and rapid erosion seems to be on the north western and south eastern edges close to where the point joins the mainland. This can also be seen by looking at the coastline as mapped by the Ordnance Survey first edition, which shows a retreat of between 5 and 11m in these areas since they were first mapped on the OS 1st edition 1:2500 map in 1858.

5.6.10 Summary and conclusions

The long term policy for Trow Point is 'managed realignment' (Table 5.6), as little can be done at present to significantly stop the ongoing erosion. The site of the Victorian disappearing gun could be considered significant as it is a unique and nationally significant structure. However, the gun on site now is not the

original and the mechanism controlling the gun does not survive, so the survival of original remains is limited. The other earthworks and remains surrounding the gun are not in themselves exceptional but combined together they present a well-preserved and virtually complete collection of Second World War defences. The two gun positions that have already been lost to erosion do not detract form the fact that this is an exceptionally well-preserved prominent redoubt and a story of the development and reasoning for these defences can be built up by the study of these remains.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA2	Trow Point (north)	2.3	R	MR	HR	Maintain longer term control function
MA3	Trow Point (south)	3.1	R	MR	HR	As required for MA2
MA3	Trow Quarry	3.2	HTL	MR	HR	Subject to detailed appraisal

Table 5.6 The SMP 2 policy for Trow point and its environs.

When considering in Frenchman's Battery and the now lost observation post at Graham's Sands into the story a complete picture of the development of coastal defence in this area can be built up. The Phase 2 survey has highlighted for the first time many features not previously recorded in the HER. A detailed Level 3 survey of the remains of Frenchman's Battery would preserve it through record although it is not currently directly threatened by erosion.

Fig 5.6.13 The cliff directly underneath the gun emplacement at Trow Point.

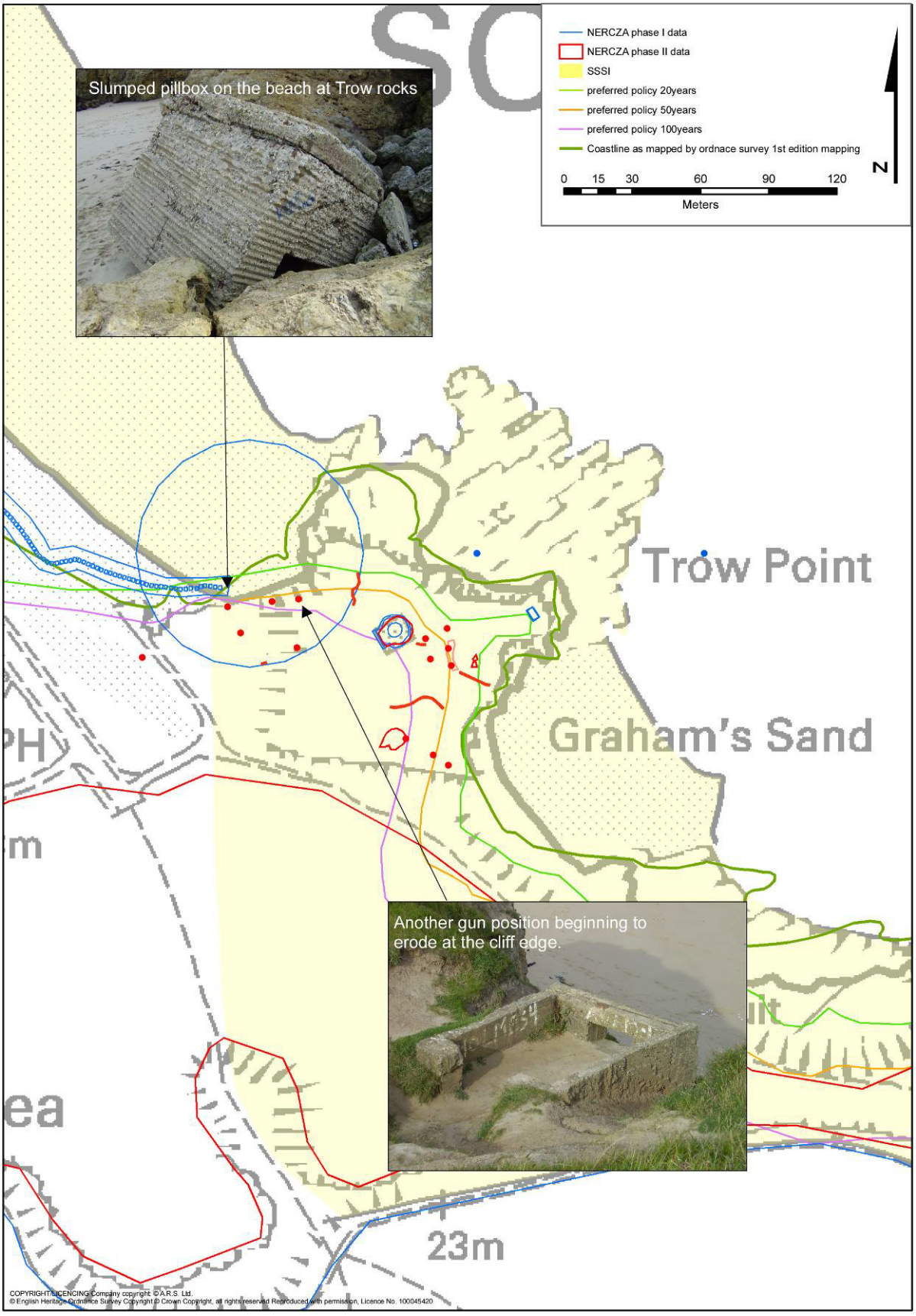


Fig 5.6.14 Archaeological features recorded by NERCZA Phase 2 at Trow Point

5.7 Robert's Battery, Northumberland.

5.7.1 Background

The remains of Robert's Battery represent an example of a multi-period gun battery, situated at Hartley, just south of Seaton Sluice on the Northumberland coast (NGR. NZ 3425 7612) (SMP PU 24.1-24.2). The site consists of a preserved encampment and command post, which dates from the First World War (now a private residence known as Fort House) and a later Second World War battery which was never fully finished. The battery itself was mostly buried underground with apertures for the guns protruding just above the cliff. The remains face ongoing threat from cliff retreat and collapse but this is disguised by the fact that the only visible remains of the emplacement, which date to the Second World War emplacement, are those that remain on the surface in pasture field. The subterranean element of the complex is now inaccessible as it has been sealed with backfilled rubble for safety purposes.

Fig 5.7.3 The former Officers Quarters and Observation Post at Robert's Battery.

The site is a rare example of an exceptionally well-preserved First World War facility with the latrines, water tower and storage blocks all still maintained by a sympathetic owner. Fort House itself retains many original period features and this, along with the other buildings present on site, represents a chance to investigate the original function and use of the site.

Further survey work was undertaken to the south of the battery, where the remains of a firing range were clearly visible, and also to the north in the vicinity of Seaton Sluice. This allowed further military features to be recorded and additional context to be added to what survived in the fields surrounding Fort House.

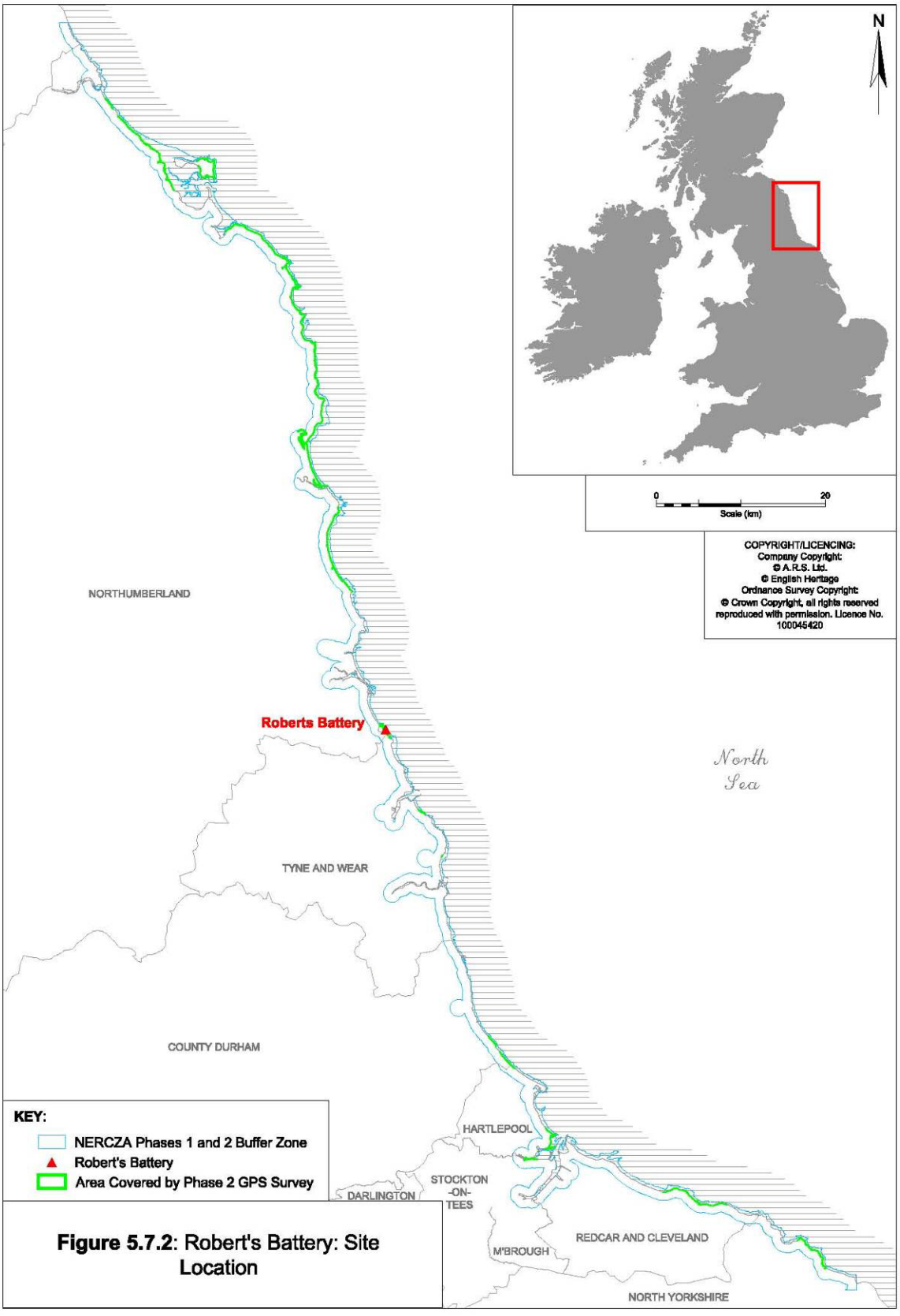


Figure 5.7.2: Robert's Battery: Site Location

5.7.2 Location and geology

The site of the battery is located in southern Northumberland and the area is generally characterised by gently undulating land incised by river valleys and tributaries. Carboniferous Coal Measure rocks create this landform, stretching from south-east Northumberland through to Co. Durham, which comprises of shale and soft sandstones with numerous coal seams. Permian rocks overlying the Coal Measures then outcrop as cliffs at the coast. There are also glacial lake deposits of fine silts and clays.

Fig 5.7.4 View south to St Mary's Island from the Observation Post surviving on top of Fort House

5.7.3 Previous research

No formal investigation of Roberts's Battery has been undertaken; however, the site has been subject to research by the Fortress Study Group and a local history society. Both have investigated the history and remains of the battery although there has been no formal dissemination of the information. Reference has been made to the site in an overview of the North-East coastal defences undertaken by the Fortress Study Group (FORT 12, 1997 pp97-104.) The site has also been opened up regularly for Heritage Open Days, by the current owner, so that people could visit the site and look around.

5.7.4 NERCZA Phase 2 Archaeological Investigation

5.7.5 Prehistoric onwards

No prehistoric, or early medieval features were identified during the course of the survey

5.7.6 Medieval

The extent of medieval archaeology was contained within one field, which contained heavily graded, broad, medieval ridge-and-furrow. This is currently

occupied by horses and is set directly inland from the field containing the upstanding remains of the battery.

Fig 5.7.5 Earthwork remains of medieval ridge-and-furrow ploughing.

5.7.7 Post-Medieval

The only visible post-medieval archaeology is the field system which surrounds Fort House. This represents an enclosure field system with later alterations and additions as the settlement at Seaton Sluice grew and developed over time.

5.7.8 20th Century

The archaeology of the First World War appears to be rare along the North East coast for two reasons; it has been lost to erosion and the sites of First World War defences were redeveloped in the lead up to and during the Second World War. The surviving remains at Fort House represent the best preserved example of a First World War facility surviving on the North East coast. The water tower (438) and store buildings (439 and 441), are exceptionally well preserved and, although the original barrack blocks have long since been demolished, the current owner has built two modern garages to the original design and on the location of the former barracks, although they are aligned differently. The site therefore retains some of its original feel and character.

Fig 5.7.6 The WW1 water tower and store rooms underneath.

The associated buildings, such as store facilities (441) and a brig (439), sit within a larger surviving enclosure (436), which has been modified in some parts but as a whole retains the original outline of the camp. At the north west corner of this enclosure there is the only surviving example of a defended First World War latrine block (440). According to the owner of the property and military historians from the local history society the only other known surviving example is thought to be located in the Sudan, althougth this has not been confirmed. This makes this structure potentially extremely rare and significant, which is something the owner is aware of and he advocates its preservation.

Fig 5.7.7 The defended latrine block (440) with blocked up loopholes now visible.

Fort House (443) itself, although now a private dwelling, was originally the Officers and Non-Commissioned Officers quarters, the kitchens, the Officers mess, Commander's Office and Battery Observation Post. Much of this is still preserved in the internal layout of the building. The mess room and main corridor boast elaborate original features, an echo of earlier British army traditions, and the mess still has a large service hatch to allow food to be passed through which shows the massive thickness of the structure's walls.

Fig 5.7.8 Exterior of Fort House looking north.

Fig 5.7.9 Internal features including the chandelier, indicating the higher status of the Officer's Mess and a view of the corbelling in the main corridor.

Fig 5.7.10 The serving hatch, showing the thickness of the interior walls.

The house also has some other interesting visible features inside. On the upper floor, inside a recently constructed cupboard, an original wartime map of the United States can be seen on the original wall. It is possible that this was a larger map of the world, as not the entire map is visible. It could have been placed as a reminder of home for American troops who were stationed here during the Second World War. The original layout of the upper level and Observation Tower is harder to ascertain as later partition walls have been erected to make the area more suitable as bedrooms. This is something the current owner is considering returning to its original open plan form.

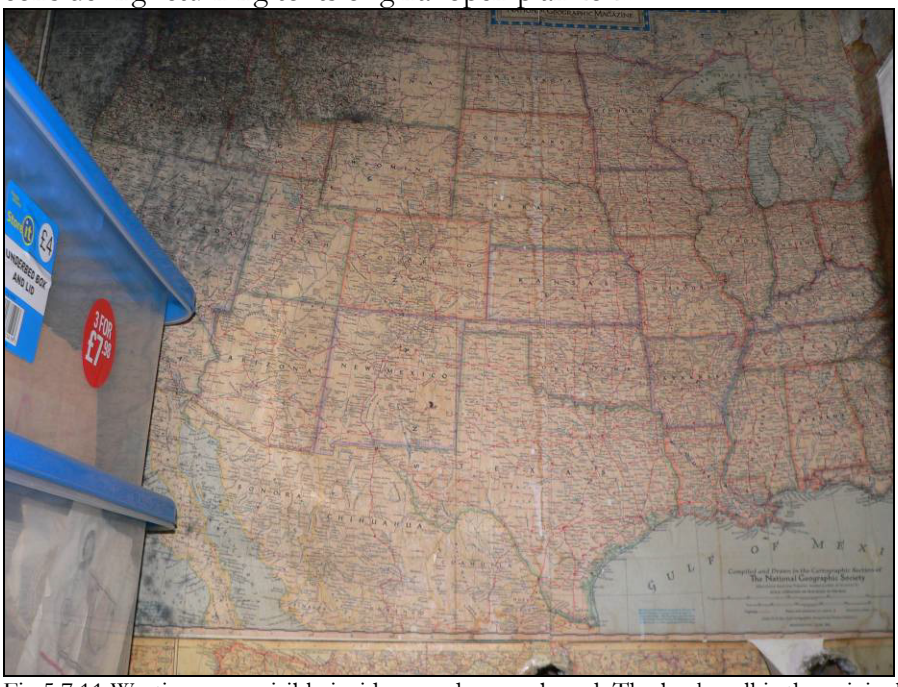


Fig 5.7.11 Wartime map visible inside a modern cupboard. The back wall is the original wall.

Fig 5.7.12 View north from the Observation Tower.

Other internal features include a basement level, presumed to originally have been a storage area for supplies and ammunition. There is a suggestion by the owner that there was a connecting tunnel between the house and the battery itself, although this is unconfirmed and no evidence of such a tunnel was seen during the survey. It would also be impractical to access such a tunnel due to the low ceiling level in the basement. The basement is accessed through a hatch underneath the entrance in the seaward side of the property.

Fig 5.7.13 Hatch leading into basement level with concrete stairs.

Fig 5.7.14 The basement level.

Other miscellaneous features can be seen in the garden of Fort House and these are presumably related to the original First World War camp. A ventilation pipe (437) of unknown function can be seen against the south wall of the garden. This would appear to be contemporary with or to pre-date the wall of the compound but its precise function remains unknown. Elsewhere in the garden there is evidence of low graded earthworks which could be the position of former features within the camp. The most prominent of these is (442).

Fig 5.7.15 Possible ventilation pipe 437 against the inside of the south wall.

Another outcome of the survey of Fort House was the discovery of documents held by the owner which include plans, aerial photographs, records and historical information relating to the site. One particularly interesting document is the elevation drawings and plan of the original building at Fort House showing all of the described features and entitled "Tyne Defences Hartley".

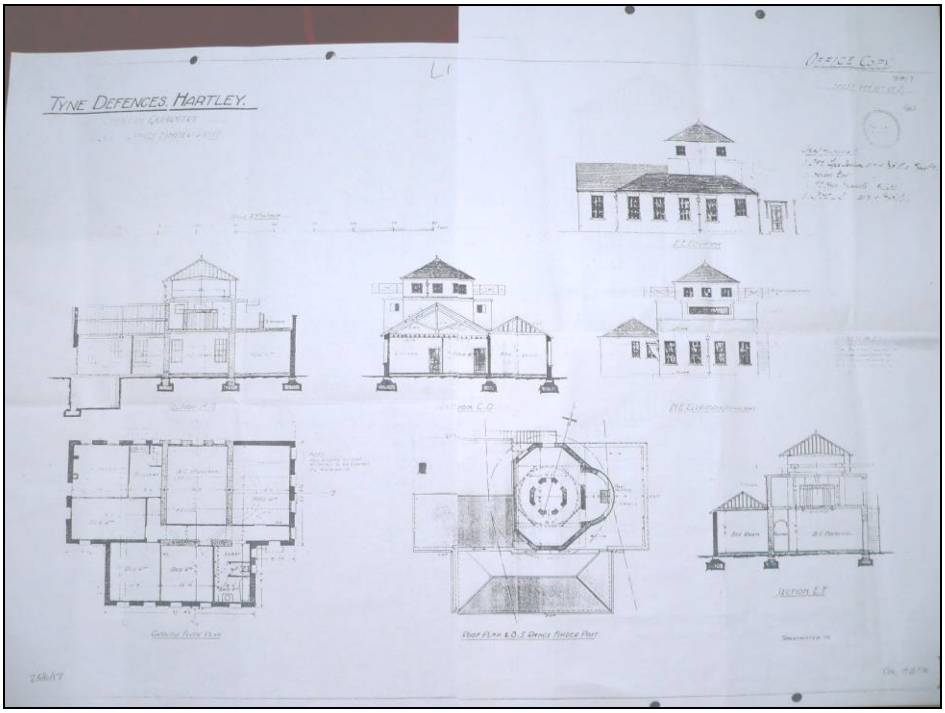


Fig 5.7.16 The original plans and elevations of Fort House as held by the owner.

Other features can also be seen in the area surrounding the battery. Along the cliff-top path several trenches, weapons pits and other features can be seen. These were clearly constructed to defend the perimeter of the battery. One trench in particular (444) is eroding as the cliff retreats and slumps. Other features include metal fittings and fixtures (447 and 528) which could relate to military activity but remain uncertain in their interpretation.

Fig 5.7.17 eroding trench (444) on the cliff edge with Fort House in the background.

Further to the south of Fort House are the earthwork remains of a firing range (503). Although the range itself is now lost within the current field system, the three large earthwork banks that held targets still remain (fig). The current Post Office long-distance transmitting masts are situated next to the former firing range, however concrete bases for at least 3 more masts, now removed, can also be seen. These could be military in origin, although there is no definitive evidence for this.

Fig 5.7.18 One of the three earthwork mounds surviving on the firing range.

Fig 5.7.19 The concrete bases of one of the removed radio masts.

The survey also investigated locations further to the north at Seaton Sluice. Here there is significant evidence for the Second World War defences Comprising two upstanding pillboxes (506 and 505), two weapons pits (507 and 508) and also the remains of a foundation platform for a pillbox (509). All of these are concentrated on Sandy Island in Seaton Sluice, presumably to defend the bridge and the sluice or harbour.

Fig 5.7.20 Circular pillbox (505) on Sandy Island, partially buried in sand.

Fig 5.7.21 Circular pillbox (506) showing brick-blocked aperture.

The upstanding remains of the Robert's Battery (451) are currently fragmentary and collapsing. The plan of the battery can still be observed, as well as graded earthworks that may represent subsidiary buildings. The underground remains are reportedly well-preserved, although these are presently too dangerous to access safely and so were not surveyed.

Fig 5.7.22 Location of Robert's Battery collapsed structures and earthwork remains.

5.7.9 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.2-0.4m per year (SMP2 for north East England).The most threatened and fragmentary remains are those of Roberts's Battery itself. The concrete rubble can still be seen protruding from a field north of Fort House, but these remains are collapsing on themselves. They still indicate the original layout of the battery but are currently unsafe to access. The erosion rate here is 0.2m per year and the upstanding remains will be at risk within 100 years. However the underground remains will be directly threatened much sooner. The underground facilities associated with the gun battery, including the gun emplacements will start to erode out of the cliff face as it retreats, as is already occurring on the cliff top, where the original defensive emplacements for the battery are already being destroyed.

5.7.10 Summary and conclusions

The SMP2 preferred policy for the Robert's Battery area is No Active Intervention and, although the erosion rate is not as severe as elsewhere on the Northumberland coast, there is a long term risk to the archaeological remains. Robert's Battery presents an opportunity for investigation of a unique military complex that has its origins in the First World War and was developed for use in the Second World War. However, it was never finished completely and was abandoned as it outlived its usefulness. This means that all of the remains of the battery date to a very specific period and would allow greater understanding of the early defence of the North East coast, particularly during the Second World War.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA24	Collywell Bay	24.1	HTL	HTL	HTL	
MA24	Crag Point to Currys point	24.2	NAI	NAI	NAI	Crag point headland to remain undefended, local intervention to replace Hartley Cove steps for use as an emergency access from the beach and allow access to view the unbroken coal measures.

Table 5.7 The Shoreline Management Plan 2 policy information for Seaton Sluice and Robert's Battery.

The area to the south is threatened by the lack of sea defences and it may be that the firing range is also at least partially lost within 50 -100 years. The surviving military archaeology will retain its intrinsic value as a single entity. If any one part is lost, or threatened with loss, the understanding of the whole site will suffer. This includes the earthwork and structural remains of pillboxes found at Sandy

Island. The rapid survey has recorded the location and condition of these defences and this is probably enough information to inform policy but the main battery would benefit from more detailed earthwork and architectural survey if possible safely.

Fig 5.7.23 The eroding cliffs at Hartley with St Mary's Island and lighthouse in the background.

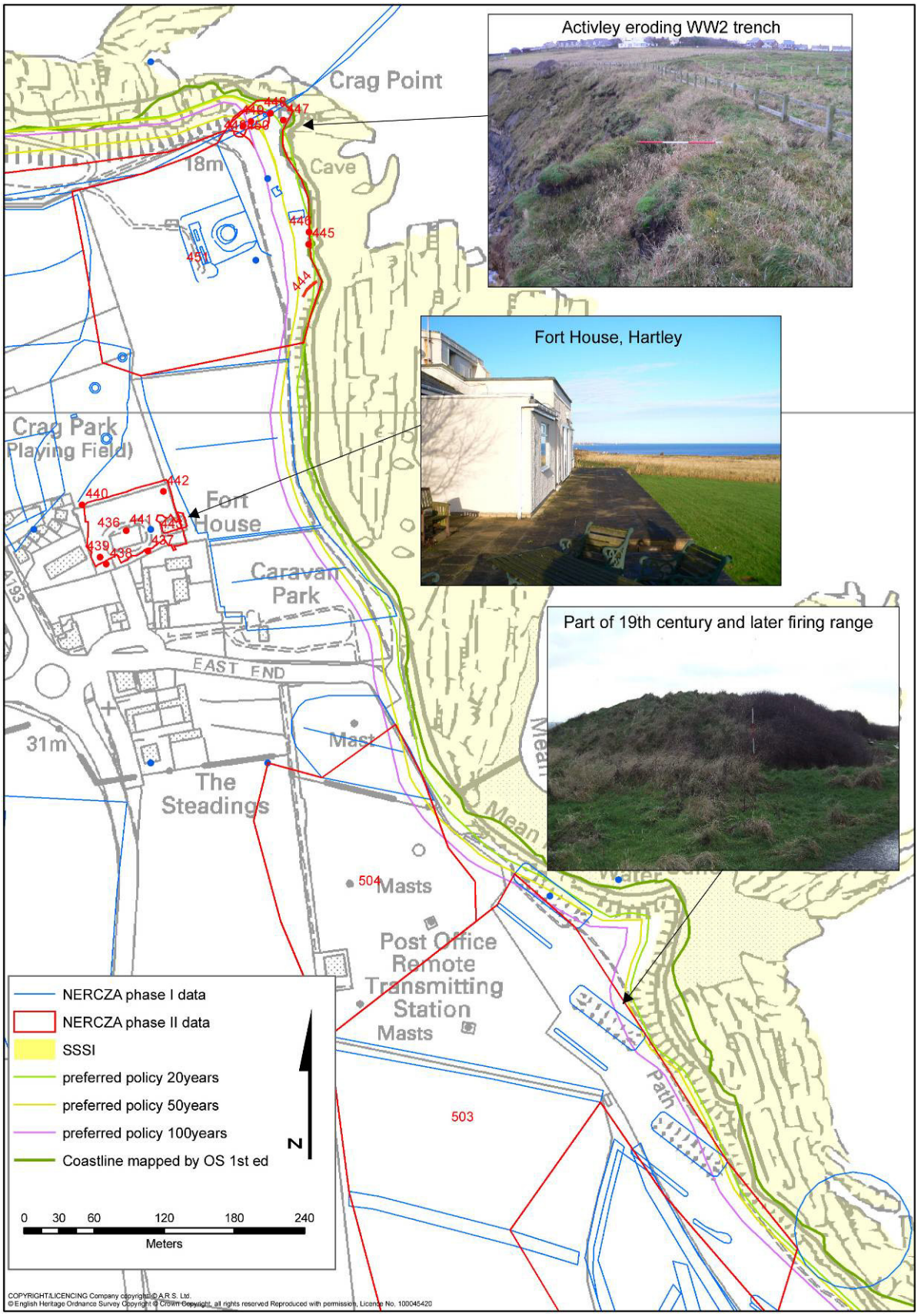


Fig 5.7.24 Archaeological features recorded at Robert's Battery

Fig 5.7.25 Archaeological features recorded at Seaton Sluice

5.8 Druridge Bay, Northumberland.

5.8.1 Background

The area of Druridge Bay (PU 17.1 – 17.5) is experiencing significant changes to its coastline. The central and southern areas of the bay are experiencing an accumulation of dunes and, while the northern end of the Bay is experiencing the effects of severe erosion. Both of these processes are causing rapid changes to the coastline. The dunes and cliff between Hadston Carrs and Low Hauxley are retreating and eroding at an extremely rapid rate. Behind the dune system is an area of low-lying agricultural land interspersed with wetland. These areas are former open-cast mining areas and this activity, combined with the ongoing dune and cliff erosion, means only a narrow strip of preserved archaeology survives.

The area has rich and varied archaeology which includes the medieval and Knights Hospitaller Preceptory Chapel at Low Chibburn, a tower house at Cresswell, varied multi-period industrial remains and also the significant prehistoric site at Low Hauxley, which is detailed in section 5.9. Druridge Bay was also one of the key sites identified as a possible invasion landing beach during the Second World War. Due to this fact there is a large quantity of well-preserved military archaeology, much of which is eroding and under imminent threat of destruction. As this was one of the key areas identified by the Ministry of Defence which resulted in the subsequent extensive and elaborate defensive emplacements being planned for construction Druridge Bay was highlighted for further rapid survey as part of Phase 2 of the NERCZA.

Fig 5.8.3 Druridge Bay viewed from Cresswell looking north towards Low Hauxley

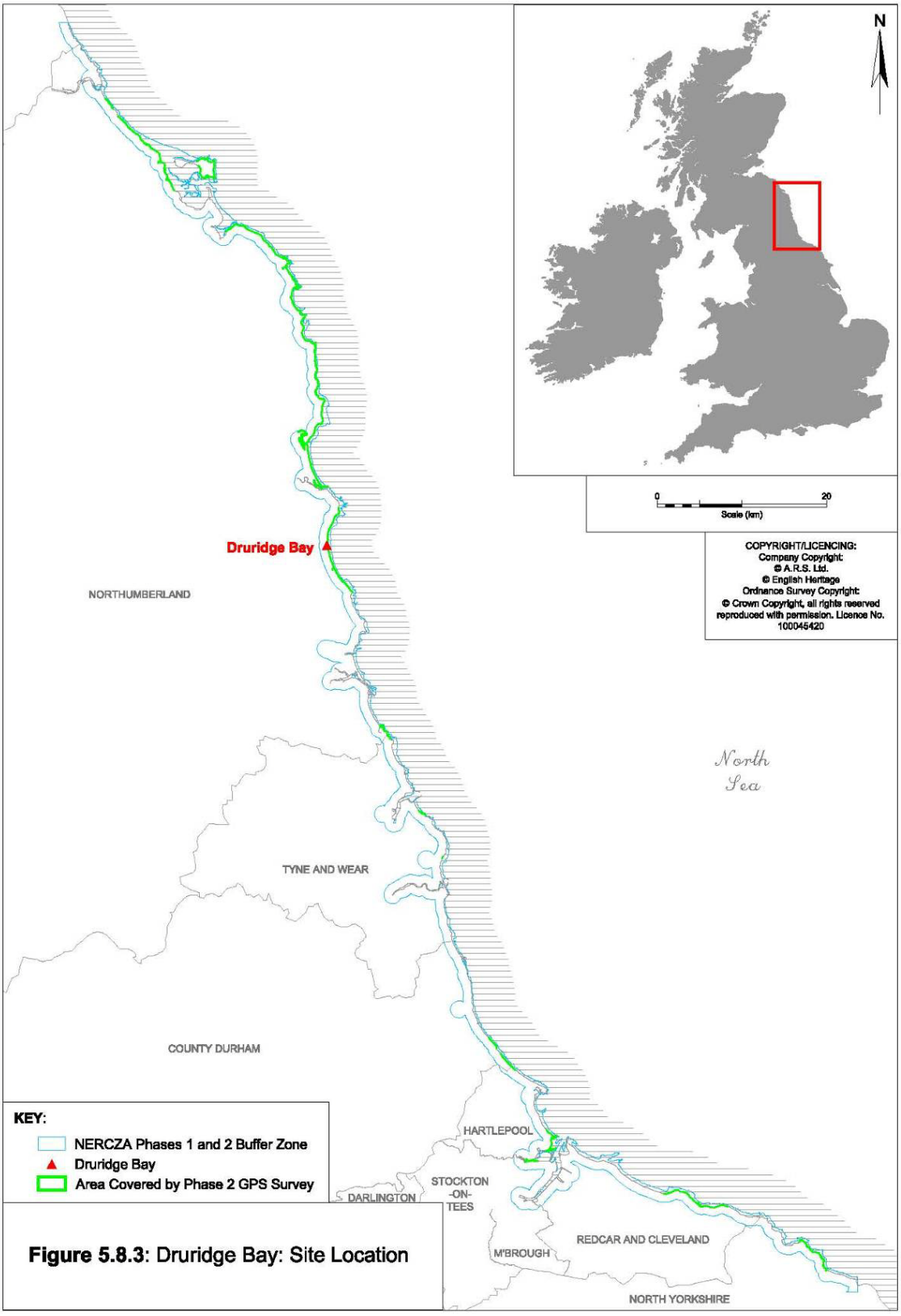


Figure 5.8.3: Druridge Bay: Site Location

5.8.2 Location and geology

Druridge Bay is located on the Northumberland coast and falls between Low Hauxley to the north and Cresswell at its southern end (Fig 5.8.2). It is 9.3km in length and the current foreshore in front of the dune system is comprised of interbedded sandstone, mudstones and coal, all of which outcrop in the inter-tidal and foreshore area. To the rear of the dune system a huge swathe of land has been exploited for open-cast coal extraction which has meant that a narrow strip of sand dunes is the only surviving band of archaeological remains in the central and northern part of Druridge Bay. This is under active and rapid erosion from the seaward side.

5.8.3 Previous research

There has been much previous research into the archaeology of Druridge Bay and the surrounding area, mostly focused on the Bronze Age remains around Low Hauxley. These are discussed in detail as part of section 5.9. Other research has been undertaken into the palaeoenvironmental and palynological evidence available at Druridge Bay, in particular at Cresswell (Innes 1988). This is also discussed further in section 5.9 as the Phase 2 NRECZA survey covered the Low Hauxley area in greater detail.

5.8.4 NERCZA Phase 2 Archaeological Investigation

5.8.5 Prehistoric

The only surviving prehistoric evidence form Druridge Bay that the survey recorded is localised to the Low Hauxley areas surrounding the outflow of the Bondicarr burn. This will be discussed in detail in section 5.9.

Fig 5.8.4 The dune and till cliff at Low Hauxley.

5.8.6 Romano British – Early Medieval

No Romano British or Early Medieval features were recorded during the course the survey.

5.8.7 Medieval

The only medieval feature recorded by the survey at Druridge Bay was the Preceptory Chapel at Low Chibburn (454). This was originally a small priory chapel, later converted into a dower house for Widdrington Castle, and then became a small farmstead in the post-medieval period. Subsequent to this the chapel as seen further alteration when it was converted to a Second World War defensive structure and even used as shelter by those working on the nearby open cast mining operations in the post war period.

The structure is designated as a scheduled ancient monument (SAM no 1106493) and is set 0.75km back from the dune system. It lies outside the Environment Agency flood zone (EA 2007) and is not under any imminent threat from coastal erosion.

The tower house at Cresswell (Listed Building number 238155) is a second medieval feature in this area but it is not at threat from erosion. The survey did not record this as part NERCZA Phase 2 as it has already been accurately mapped as part of the Phase 1 process.

Fig 5.8.5 Part of the original Preceptory at Low Chibburn, with Second World War alterations to windows.

5.8.8 Post-Medieval

At Cresswell the earthwork remains of at least four, and possibly five, post-medieval enclosures can be seen (258). The stone wall which faces the road still has the gateways to these visible. This part of the village was still occupied in the 1860s and was abandoned shortly after; these can be seen on 1st and 2nd edition of Ordnance Survey mapping. This small scale abandonment could be as a result of local people leaving small rural settlements to move to larger urban areas to find work in the later 19th and early 20th century.

Fig 5.8.6 One of post-medieval enclosures for a small house at Cresswell.

Other post-medieval structures can be seen eroding out of the cliff at Low Hauxley although these are considered to be military in origin (318, 332 and 360.) The preceptory chapel of Low Chibburn (454) was also altered in the post-medieval period, as discussed above.

Fig 5.8.7 The later Dower house at Low Chibburn

5.8.9 20th Century

Druridge Bay contains a large quantity of surviving Second World War military archaeology, even considering the recent open-casting activity and the ongoing erosion. Almost every aspect of coastal defence is covered between Creswell and Low Hauxley including observation posts, gun emplacements, pillboxes, and anti-tank defences. The most obvious and common military archaeology is the remains of lines of anti-tanks defences. These defences can be seen intermittently along the full length of Druridge Bay. They are less concentrated in the southern and central areas, but what can be seen is mostly *in situ*, whilst to the north more survive, but they have often been moved off the beach. An example of this can be seen at the outflow of the Bondicarr Burn.

Pillboxes frequently survive along the length of the Bay and the Phase 2 survey recorded the partial remains of 12 pillboxes, including a well-preserved, disguised pillbox on the road behind the dunes (253). Three structures previously thought to have been pillboxes (269, 266 and 300) were found to be observation posts for a former bombing range out in Druridge Bay itself. They can be distinguished by the very large entrance and apertures in the front of the structure. Pillboxes always have their entrance at the rear as they are easily defensible.

Fig 5.8.9 A line of 13 anti-tank blocks exposed in the mouth of a small burn.

In the dunes, especially in the area of Druridge Bay country park, there are substantial surviving earthworks of large anti-tank ditches (322, 296, and 299 as

well as others). These large ditches are preserved at the road side between Ladyburn Lake and Hadston Carrs. These are over 1m deep in places and at least 2m wide. They were designed to slow or trap a tank sufficiently so that infantry could place an explosive charge on the front of the vehicle.

Fig 5.8.10 One of the observation posts. Note the large blocked entrance and aperture at the front, distinguishing it from a pillbox.

Fig 5.8.11 Disguised pillbox located north of Blakemoor Farm.

As well as many of these larger structural elements, many earthwork components survive, particularly where the dunes have stabilised or around small settlements. In Cresswell there are a series of weapons pits preserved both on the village green (241) and along the roadside next to the caravan park (239). Such features are less well-preserved as most of the landscape is dunes, so ephemeral features such as weapons pits and trenches do not survive particularly well.
There are also the remains of a small military camp at Cresswell (244), close to the fragmentary remains of a battery located to its north (264). These are both at high risk of future erosion and are in locations were the dunes are slightly less stable than elsewhere in the Bay area.

Fig 5.8.12 Earthwork remains of military camp at Cresswell

The most surprising surviving remains were the earthwork remains of at least two bombing range markers (291 and 280). These features are unusual because what survive are not the structures themselves but the scars left from their removal. They would have original been a simple series of concrete blocks surrounding a painted, raised, wooden arrow indicating the direction of the bombing range. What survives now is the removal scars representing the position of the blocks and the base of the arrow. When recorded as part of the Phase 2 survey they corresponded exactly with what had been transcribed as part of the Phase 1 aerial photography transcription.

Several other structures were recorded including a searchlight base and a possible range finder base (Fig 5.8.13). The current survey represents a comprehensive catalogue of what survives from the Second World War at Druridge Bay.

Fig 5.8.13 Possible base for a range finder or searchlight

Fig 5.8.14 Part of the bombing range marker foundation (291)

5.8.10 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.1m per year (SMP2 for north East England).Coastline alteration by natural processes are occurring throughout Druridge Bay although the erosion at the north end of the bay is clearly having much more serious impacts upon the

archaeology than the sand dune formation to the central and southern areas. Comparison of the position of military archaeology recorded by Phase 2 with the position of the same features as recorded by Phase 2 was undertaken, as was done at Crimdon Dene. This showed that although serious erosion is ongoing in the north, the southern and central areas of Druridge Bay show accumulation of sand deposits. An example of this is the observation posts that originally overlooked the Bay are now located behind extensive dunes which obscure the view they would have originally commanded.

Fig 5.8.15 Pillbox exposed in dune in central Druridge Bay.

Localised destabilisation of the dunes is revealing various military features all the time and this places them at risk of slumping and collapse. The changeable nature of the dune landscape also means that the Phase2 survey may not have recorded all military archaeology that survives. New features are often revealed while others hidden by dumps of sand and dune blow outs, meaning that what was recorded by NERCZA is only a current condition statement for what was visible in Winter 2009.

Fig 5.8.16 eroding military structure.

5.8.11 Summary and conclusions

As discussed above the erosion at Druridge Bay is serious and ongoing. Apart from Low Hauxley and Cresswell, which are designated as Hold The Line the rest of Druridge Bay has a policy of Managed Retreat in SMP2. Little will be done to protect the exposed dune land archaeology and there is even investigation into managed tidal flooding to reduce impacts on other stretches of coast. These processes will have a serious detrimental impact on the heritage of this stretch of coastline

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA17	Beacon hill links	17.1	MR	MR	MR	Develop a progressive transitional approach to defence inline with erosion pressure to sustain defence to the main village and its access
MA17	Low Hauxley	17.2	HTL	HTL	HTL	With the probable need to realign the southern end
MA17	Druridge Bay north	17.3	MR	MR	MR	Develop drainage plan and access the southern end
MA17	Druridge Bay south	17.4	MR	MR	MR	Examine potential for tidal flooding inland
MA17	Cresswell	17.5	HTL	HTL	HTL	

Table 5.8 Shoreline Management Plan 2 policy plans for the Druridge Bay area.

Should this policy be adopted further monitoring of the condition of the military archaeology should be undertaken, particularly as it is not clear if the results of this survey includes all of the military features in the Bay area, as such features are being constantly exposed and hidden due to dune movement. If invasive coastal defences are implemented to flood the hinterland of the dunes further archaeological investigation should be undertaken to evaluate the resulting effects on the military archaeology of Druridge Bay as well as the prehistoric archaeology at Low Hauxley.

Fig 5.8.17 Druridge Bay looking south from Low Hauxley

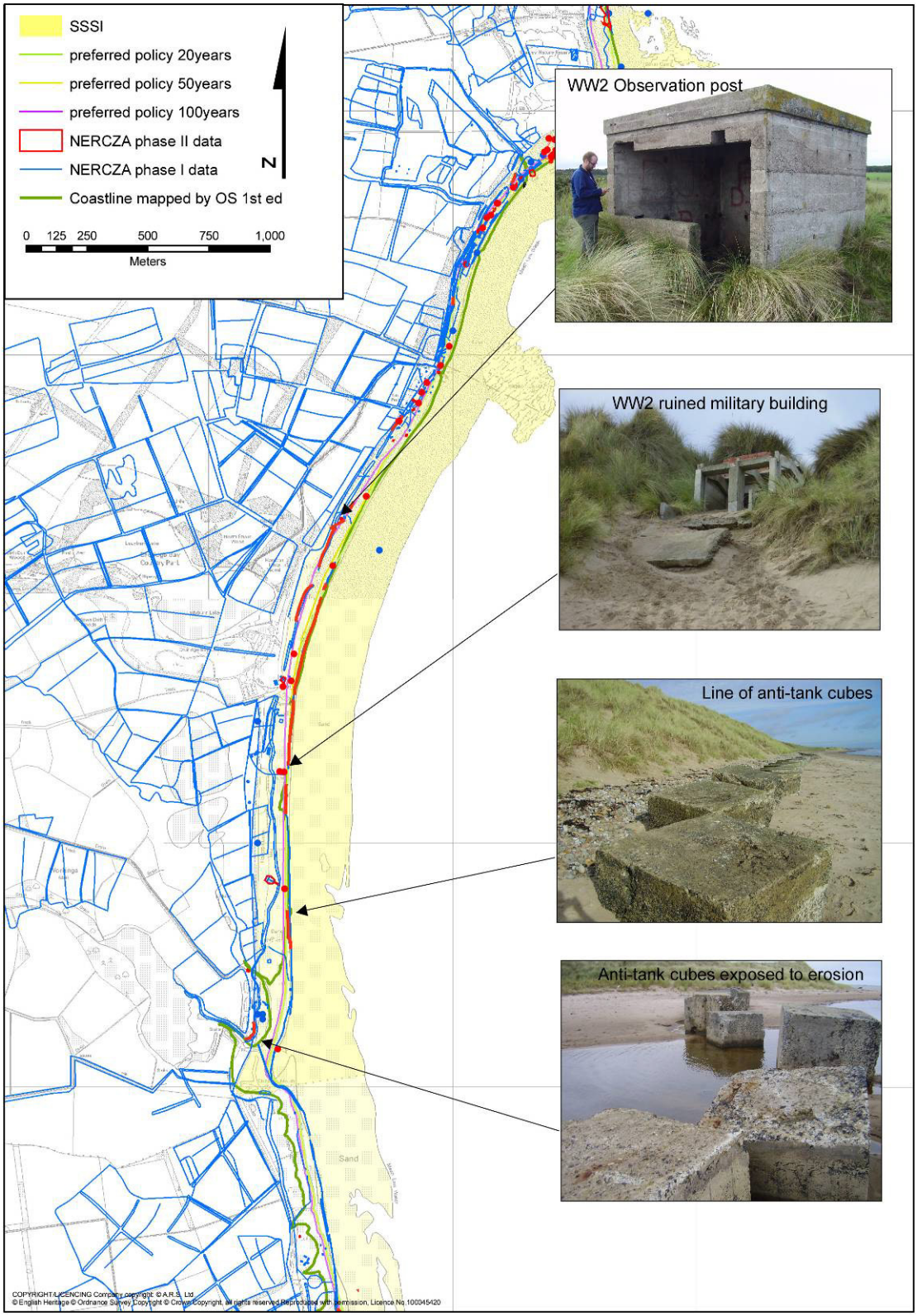


Fig 5.8.18 Archaeological features recorded at the North end of Druridge Bay

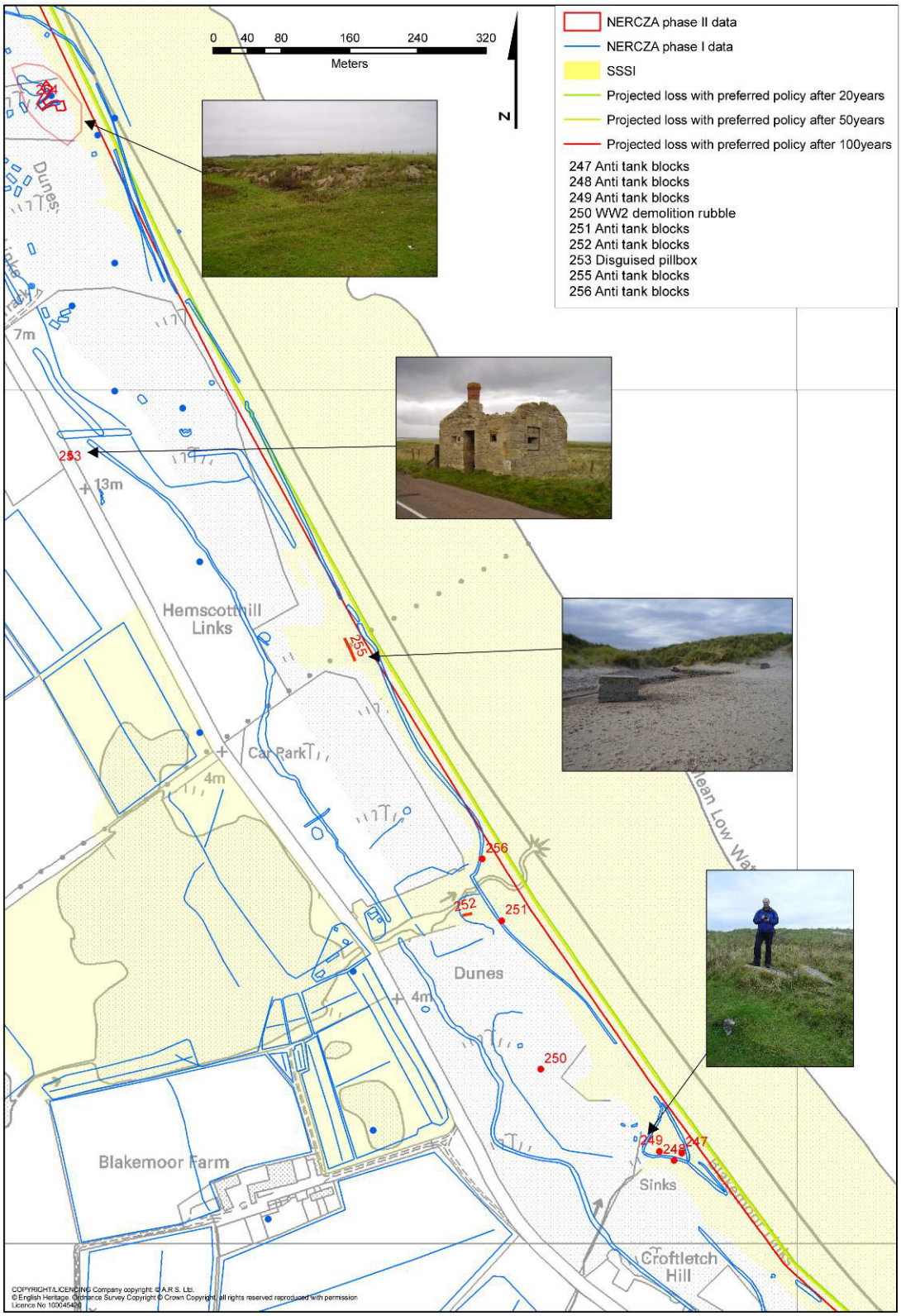


Fig 5.8.19 Archaeological features recorded at southern end of Druridge Bay

5.9 Low Hauxley, Northumberland.

5.9.1 Background

The Low Hauxley coastline has been identified as a high risk area for archaeological and palaeoenvironmental remains to be impacted upon by coastal erosion. As a result of earlier work (see previous work section below) and the North East Rapid Coastal Zone Assessment Phase 1 , Druridge Bay, and particularly its northern end around Low Hauxley, has been highlighted as requiring an urgent archaeological response.

The main archaeological site consists of a Beaker period-Early Bronze Age cairn cemetery and underlying Mesolithic site (HER number 5604), although other archaeological features are known to the immediate north and south of this site. The cliffs and foreshore at Low Hauxley are also designated as a Site of Special Scientific Interest (SSSI) on account of their importance to Quaternary studies represented by the exposure of bedrock, glacial till, peat and dune within the eroding cliff. The archaeological remains are not themselves designated in any way. However, any impacts on the archaeological remains will also cause an impact on the SSSI.

5.9.2 Location and geology

Low Hauxley is situated at the north end of Druridge Bay in mid-Northumberland 2.5km south-east of Amble. The Low Hauxley area has been severely affected by 'coastal squeeze' as open-cast coal mining has taken place over very extensive areas on the landward side of the coastal strip with on-going coastal erosion taking place on its seaward side. The sites at Low Hauxley occupy a localised natural high point which is flanked to the north and south by separate organic sediment units, usually described as 'peat', that appear to have started to form as wetlands during the Neolithic in the 4th millennium cal BC. The strip of surviving dune system in this area varies between 15m and 50m wide.

The geology of the Low Hauxley site consists of interbedded Carboniferous deposits of sandstone and coal measures overlain by glacial till. Immediately overlying the till is a sealed ancient land surface that dates to the Mesolithic period and upon which a Mesolithic occupation site survives. This ground surface appears to have accumulated in depth over time so that, by the Beaker period, burial pits were cut down through the land surface into the till below with cists constructed and cairns raised above them to form a cemetery. Subsequent to the on-set of dune formation in the Bronze Age the burial cairns and land surface were covered by 3-4m of wind blown sand. However, this accumulation did not take place as a single event as organic lenses can be noted at various heights in the sand dune cliff sections and these represent episodes of stability when a vegetation cover developed before further dune accumulation took place. Currently the dune system is stable and overlain by a thin soil with marram grass cover.

On the lower lying ground to either side of the high point, peat formation took place from at least as early as the Neolithic period in what appear to have been areas of lagoon. Dating samples from the top and base of each of these peat beds have been recovered for scientific dating as part of the Phase 2 NERCZA project. The peats contain an important palaeobotanical resource that includes a

variety of plant remains, invertebrates and pollen evidence together with flint tools, worked wood and, potentially, other archaeological material. Several hewn timbers have been reported from the peat beds further north (Low Hauxley A) where axe or adze marks have been noted (e.g. Jim Nesbitt pers. comm.). Other areas of discrete peat beds have been noted at Low Hauxley and the north end of Druridge Bay, including the new exposure noted at a lower elevation to the south of the cemetery site in the inter-tidal zone. This deposit hosts preserved human and animal footprints (see below).

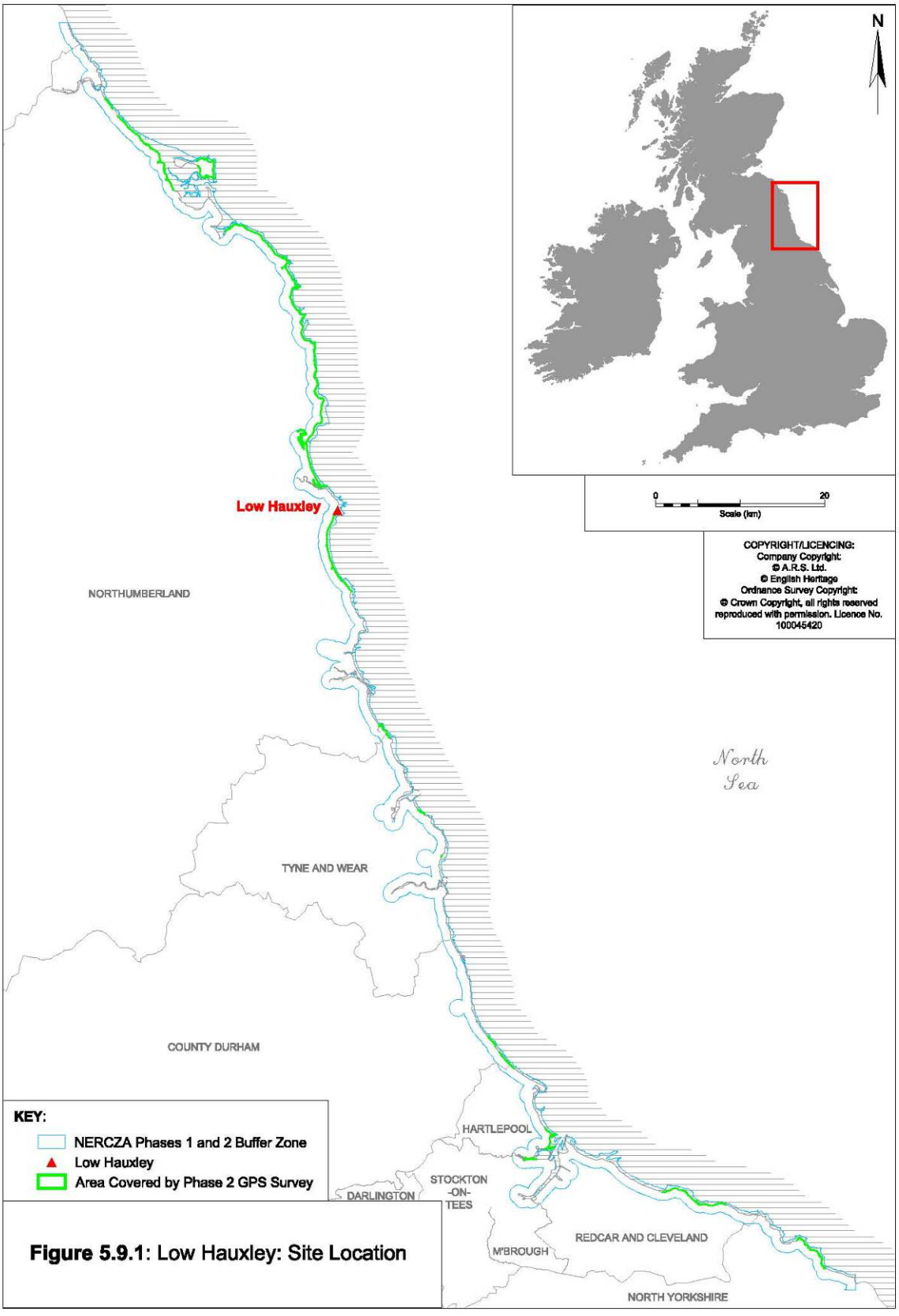


Figure 5.9.1: Low Hauxley: Site Location

5.9.3 Previous research

The various archaeological interventions are summarised in the following list:

1. 1983 - Excavation of an eroding cist and single inhumation by Steve Speak of Tyne and Wear Museums Service. One page text summary produced.

2. 1983 - Excavation at the cliff face by Clive Bonsall (Edinburgh University) of Bronze Age burials and Mesolithic flint scatter, bone and shell material. The burials came from below the same cairn as the burial excavated by Speak. Nothing published apart from a very short notice in Proceedings of the Prehistoric Society (Bonsall 1984).

3. 1993 - Excavation of two stone burial cists found eroding from the cliff face, also from beneath Bonsall's 'Cairn 1'. One cist contained a cremation and one an inhumation and each was accompanied by a very fine and well-preserved Beaker. Undertaken by Tyne and Wear Museums Service (TWMS). Stratigraphy report was produced.

4. 1994 - Evaluation excavation behind and off-set from the eroding face of the Bronze Age cemetery by Lancaster University Archaeological Unit. Detailed Archive Report and Appendix produced. Little archaeology was recorded apart from a flint assemblage, as well as more modern material. An assessment of the peat was also undertaken together with radiocarbon dating of the skeletal material from the Bonsall excavation.

5. 2007 - Photographic recording of an eroding stone-built structure sealed by the dune sand *c.*35m to the north of the cemetery site and photographic recording of rectangular rock-cut pits on the foreshore in front of the cemetery site by Jim Nesbitt. Photographs held by Northumberland HER and by Archaeological Research Services Ltd.

6. 2009 - Excavation of a small, badly-eroded stone cist holding a few fragmentary remains of a cremation in a newly eroded section of cliff face 2m north of the TWMS cist excavations, and therefore presumably from below part of 'Cairn 1' along with excavation of a second, separate, badly-eroded cremation in a pit burial located in a newly eroded section of cliff face 5m south of the TWMS cist excavations. The work was undertaken by Archaeological Research Services Ltd and an Archive report produced. Radiocarbon date obtained on cremation 2 and one for cremation 1.

7. 2010 - Photographic and rapid survey of the Druridge Bay coastline which has identified many previously unrecorded Second World War sites together with an area of human and animal footprints brought to ARS Ltd's attention by Jim Nesbitt. The footprints were found within a newly exposed peat bed 25m to the south of the Bondicarr Burn outflow. Precision survey of the extent of each peat exposure, sampling of the top and base of each for radiocarbon dating also took place and radiocarbon dates are awaited. A rapid photographic survey along the length of the Low Hauxley cliff line has also been undertaken.

   A series of palaeoenvironmental studies have been undertaken on the various organic deposits visible in the Low Hauxley cliff sections on the soils and sediments. These include the published work of Frank (1982), Innes and Frank

(1988) and Farrimond and Flanagan (1996) and the unpublished work undertaken as part of the Bronze Age cemetery investigations (Huntley 1995; Issitt *et al.* 1995; Payton and Usai 1995; Tipping 1994). At Amble Bay and Cresswell Ponds, both in Druridge Bay, Shennan *et al.* (2000) have cored for dating samples to provide past sea level index points whilst Wilson *et al.* (2001) have made a study of Late-Holocene dune development along the Northumberland coast including the dune system at Druridge Bay.

5.9.4 NERCZA Phase 2 Archaeological Investigation

5.9.5 Prehistoric

Excavation of two Bronze Age burial features was undertaken by Archaeological Research Services Ltd. in 2009 as part of the NERCZA Phase 2 work. This small-scale excavation recorded two graves. Burial 1 was a small stone-built grave box, or tiny cist, made from small sandstone slabs wedged into a pit that had been cut into the glacial till and then covered with a low stone cairn. A depth of 3.5m of sand dune accumulation has since built up above the cairn. Inside the grave box, or small 'cist', had been a cremation, traces of which still survived in the stone-lined cavity. This material was collected for analysis and dating. At the foot of the cliff immediately below the grave box was a small pile of cremated human bone and it is reasonable to assume that this is material that has fallen out from the grave box. However, this had been intermingled with the beach sand as successive tides had washed up to the cliff face. This material was not collected as its true provenance could not be ascertained. However, because the grave box was starkly visible in the cliff face the position of this cremation debris below the grave box is also consistent with an inverted ceramic vessel having been removed from the grave box by a light-fingered passer-by and the cremation material falling to the floor on removal. Although this is not known with certainty, the fact that a stone had been recently wedged across the cist to hide it from view led the excavators to believe this to be a likely scenario.

Fig. 5.9.2. The small cist containing a human cremation that also lay under Bonsall's Cairn 1.

Burial 2 was a grave comprising a pit burial that had partly eroded from the cliff face. This pit was not located underneath any observable cairn although there is a cairn to the immediate north of this burial which is probably Bonsall's 'satellite cairn' or Cairn 2. A pit had been cut into the glacial till and a plain Beaker had been placed inside containing a human cremation, together with a dump of the pyre debris that had been scraped up. This pyre debris was very black and contained much charred debris and grey ash that was probably still hot when it was deposited as the heat has turned part of the Beaker pot a pale grey colour. A few Mesolithic flints had been scraped up with the pyre debris and deposited in the pit with this material which implies that the funeral pyre was situated on the ground and the gathering up of the remains included the scraping up of material from the underlying Mesolithic ground surface. Single-entity, long bone fragment, radiocarbon dating samples were submitted for each burial. Cremation burial 2 has returned an Early Bronze Age date of 1890-1690 cal BC at 95% confidence while Cremation burial 1 has returned an early Bronze Age date of 2140-1890 cal BC at 95% confidence (see Table 5.9.1)..

Intervention	**Sample**	**laboratory code**	**$\delta^{13}C$ (‰)**	**Radiocarbon age (BP)**	**Weighted Mean**	**calibrated date range (95% confidence)**
Bonsall 1983	Burial 1	OxA-5553	-20.6	3615 ±45	3621 ±34	2140-1890 cal BC
Bonsall 1983	Burial 1	OxA-5553	-20.8	3630 ±55		
Bonsall 1983	Burial 2	OxA-5553	-20.5	3410 ±55	3420 ±38	1880-1640 cal BC
Bonsall 1983	Burial 2	OxA-5553	-20.6	3430 ±55		
ARS Ltd 2009	Burial 2 [011] - cremation	SUERC-27330	24.7	3470 ±30	-	1890–1690 cal BC
ARS Ltd 2009	Burial 1 [009]- cremation	OxA-22476	-25.3	3569 ±28	3569 ±22	2010–1875 cal BC
ARS Ltd 2009	Burial 1 [009]- cremation	SUERC-28741	-24.5	3570 ±35	-	-

Table 5.9.1. Summary of radiocarbon dates from the various archaeological interventions at Low Hauxley.

During the survey work at Druridge Bay amateur archaeologist Jim Nesbitt drew to the attention of the project team a freshly exposed inter-tidal peat lying immediately south of the Bondicarr Burn outflow. In a tightly defined area of this peat an abundance of human and animal footprints could be observed pressed quite deeply into the peat surface. This peat lies at a lower level than the peats that flank the cemetery site and so was thought to be potentially earlier. Samples from the top and base of this thin peat horizon were taken and the following radiocarbon dates were returned. 5330-5210 cal BC (basal) and 5220-4990 cal BC (top), a detailed discussion of these dates is contained in section 6.3 of this report.

Archaeological Research Services Ltd surveyed the extent of the footprint area during a rising tide that was depositing sand back over the peat. The sand has now accumulated to a depth of *c.*0.5m and the peat is currently buried with no surface remains visible except for the occasional tree stump that protrudes through the sand. Accurate recording of these footprints remains an urgent priority next time the surface is scoured clean after a storm event. A sample of wood was also retrieved from this deposit and upon cleaning and further analysis was observed to have cut marks, potentially made by a stone tool (Taylor 2010). This sample is also discussed in section 6.3 and an assessment of its significance is made in Chapter 7.

Fig. 5.9.3 Human footprints filled with sand and pebbles deeply impressed within the peat that survives as a thin layer within the inter-tidal zone.

Fig. 5.9.4. Examples of some of the animal footprints that can be seen amongst the human footprints.

A full photographic survey of the cliff face was undertaken (Fig 5.9.5), providing a full visual record of the eroding peat in one continuous section that can provide a bench mark against which future erosion can be compared and assessed.

Fig 5.9.5 An excert from the full section of photographed peat layers.

Fig 5.9.6 Location of the Tyne and Wear interventions at Low Hauxley

The recording also included dune accumulation over the possible wider extent of the Low Hauxley burial ground. These included the earthwork remains of 6 possible locations for cairns (344, 345, 346, 347, 348 and 349). This interpretation is however uncertain and confirmation of this would have to be established through evaluation trenching. Several pieces of worked flint were also collected from the top of areas of exposed peat. It is unclear whether they were eroded out of the cliff face or simply exposed from the erosion of the lower peat deposits (326 and 330).

Fig 5.9.7 Mapping the visible peat at Low Hauxley

5.9.6 Romano British period onwards

No Romano British, early Medieval, or Medieval features were recorded during the course of the survey along this stretch of coastline.

5.9.7 Post-Medieval

Several post-medieval features were exposed in the cliff face, including a stone wall revealed on the cliff top edge (360). Very little of this is currently revealed and the wall appears to be of hand-hewn sandstone. It could be a wall, or possibly a small structure, but so little is extant that a definitive interpretation is impossible.


Fig 5.9.8 recording the extent of sandstone wall 360.

The other features identified at Low Hauxley that are presumably of post-medieval date are a series of square and rectangular rock cut features. These are of unknown date or function but are probably related to the fishing industry. They could be Bratt holes or Hulleys (see section 5.3), used for the storage of bait and used to keep a catch fresh. Alternatively, they could be fishing traps of some description or used to store fishing equipment, although the latter is unlikely due to their positioning in the inter-tidal zone.

Fig 5.9.9 One of the square rock cut features at Low Hauxley

5.9.8 20th Century

The twentieth century archaeology visible at Low Hauxley, as with many of the other sites surveyed, mostly dates from the Second World War. The majority of visible surviving remains are anti-tank blocks. They survive both *in situ* and moved out of context, most notably to form part of the outflow of the Bondicarr Burn (322). Many of these anti-tank blocks are heavily eroded and barely recognisable, apart from their basic shape and construction material (316). This is in sharp contrast to those visible at the southern end of Druridge Bay where they survive intact and *in situ*.

Fig 5.9.10 Anti-tank blocks used as part of the outflow of the Bondicarr Burn.

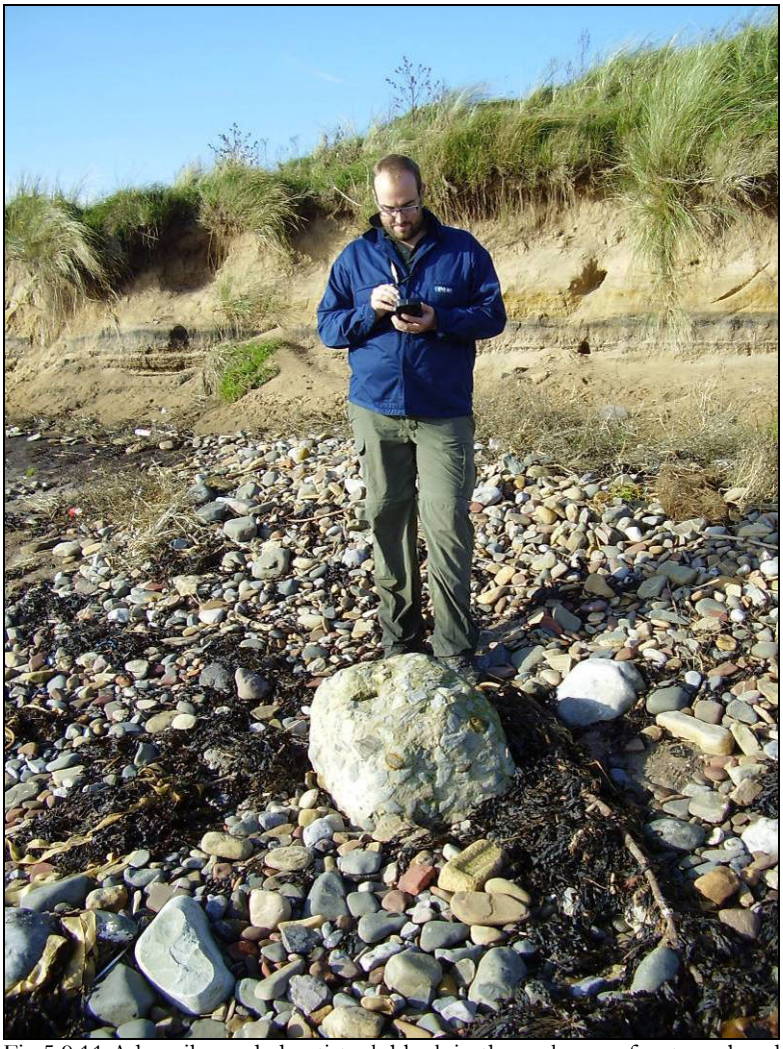


Fig 5.9.11 A heavily eroded anti-tank block in the make up of a storm beach at Low Hauxley.

A series of more ephemeral Second World War earthwork features were also seen at the top of the cliff. Although not as extensive as elsewhere along the coast several weapons pits were visible (350). Second World War archaeology could also be seen eroding on to the beach, where pieces of picket wire and barbed wire could be seen (361).

Fig 5.9.12, Section of picket wire found eroded onto the beach.

5.9.9 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.4m per year (SMP2 for north East England). The coastal strip at Low Hauxley, where the eroding archaeological remains have come from, lies in Policy Unit 17.3 'Druridge Bay North' (formerly 32 under SMP1) of DEFRAs Shoreline Management Plan 2 (SMP2). The preferred Policy Recommendation for this policy unit is "Managed Realignment" up to the years 2025, 2055 and 2105. The term 'Managed Realignment' is defined in SMP2 as "Allowing the shoreline to realign, landwards or seawards, sometimes with management to initiate and control change" (Guthrie *et al.* 2009, ii). Given that the land to the rear of the existing dune system has been removed by opencast coal mining there is limited scope for dune roll back to take place in this section of the coastline, and such roll back would itself give rise to the destruction of the archaeological and palaeoenvironmental deposits.

The SMP2 report also contains estimates of baseline erosion rates at various points. These are based on existing data and may be expected to increase with sea level rise. Accordingly, the figures presented in Table 5.9.2 below should be taken as a minimum. The erosion over the last year alone at Low Hauxley as recorded by the NERCZA survey is considered to vary between 0.5m-1.5m as the erosion has been particularly acute over the last 18 months and there is no sign that this rate is decreasing. The eroding cemetery area is situated in the Bondi Carrs section according to the table below.

Location	NGR (approximate)	Rate per year	Over 100 years
Low Hauxley	NU287028	0.4m	85m
Bondi Carrs	NU286020	0.5m	80m
Hadston Carrs	NU280010	0.5m	70m
Druridge Bay	NZ277960	0.1m	15m

Table 5.9.2. Rates of coastal erosion taken from SMP2 report (Guthrie *et al.* 2009, 190).

The rates of erosion produced for this table are based on assumed seal level rise rates of 0.05m to year 2025, 0.26m to year 2055, 0.8m to year 2105. However, the latest minimum sea level rise estimates forecast in the official UK Climate Projections published by DEFRA are for a rise of 0.5m – 2m by 2050 for Northumberland. If this new estimate is accurate, and it is widely acknowledged as a minimum, then the annual erosion rates need to be revised upwards by at least twice as much. On such a basis the cemetery site and peat exposures can be expected to erode at a rate of around 1m per year and this is in keeping with the observations made during the course of the NERCZA project during 2008-2010. The threats to the site can be characterised as:

- Direct erosion by wave action of the exposed peat and Mesolithic settlement/Bronze Age cemetery site

- Direct erosion of the Mesolithic Peat and the remains of Mesolithic human and animal footprints and a large worked assemblage

- Indirect erosion by wave action caused by undercutting of the dunes and then slumping from above. This is how the earlier cists were exposed and all deposits are at risk from this form of erosion.

- Many people know the exact location of the cemetery site and both the author and amateur archaeologist Jim Nesbitt, the latter of whom monitors the site regularly, are convinced that some remains have been robbed from the site. This was suggested by the circumstances of discovery of ARS Ltd's Burial 1 where a cist stone that had fallen to the ground had been clearly wedged back in to cover the void where the cremation had been to hide it from view. A deposit of cremated material immediately below the cist appears to have been dragged out or to have fallen out of an inverted pot that was extracted from the cist.

None of these threats face any real prospect of being able to be controlled and so evaluation of what still survives on the site followed by a programme of area or targeted excavation and/or further monitoring remain the most viable options. However, the weakness of the monitoring approach is that it leaves costs and commitments open-ended, creates a highly fragmented and limited archaeological record, as well as missing material removed by erosion and robbing of the site.

5.9.10 Summary and conclusions

Mesolithic activity is documented along the entire length of the North-East coast but the evidence consists mostly of surface flint scatter sites, and no Mesolithic ground surface hosting a lithic scatter, animal bone and marine shell has been found anywhere else apart from at Low Hauxley. Such sites are also rare nationally. The survival of *in situ* archaeological deposits of this period make Low Hauxley nationally important on account of the Mesolithic archaeology alone. It is possible that Mesolithic structural remains may also survive, such as hearth pits or evidence for a structure, and, having been sealed by the Beaker period and Bronze Age burial cairns and subsequently the dune deposits, the Mesolithic archaeology remains relatively undisturbed and *in situ*. The Mesolithic deposits are covered by calcareous dune sand which has an alkaline bias and which the various interventions have already demonstrated allows for good preservation of organic material, including fish bone. Thus, the site can be ascribed national importance on the grounds of period, rarity, preservation, condition, vulnerability as well as the diversity of the site, given that it also contains a pristine Beaker/Early Bronze Age cemetery and stratigraphically associated organic sediments to either side.

The Beaker/Bronze Age cemetery comprises a group of stone cairns of unknown number overlying cist and pit burials that have already exhibited a range of mortuary practices including crouched inhumation and cremation. Burial monuments of this period are relatively common in the archaeological record of the region, although they are usually heavily robbed and many have been disturbed or robbed by antiquarian and illicit diggings. The cemetery at Low Hauxley is of special importance because the cemetery survives as an intact group on what appears to have been a small island or headland raised up above a surrounding wetland/marsh. Moreover, as the cairns have been completely sealed by wind blown sand of up to 4.5m depth, the cemetery that survives is preserved in pristine condition. Not only do the structural features appear intact but the calcareous nature of the sand has meant that survival of bone and other organic material is excellent. The Beaker pots also show a remarkable condition of preservation. To find such a well-preserved and sealed Bronze Age cemetery is a discovery of national importance on the grounds of preservation, condition, vulnerability and potential, as well as the diversity of the site given that it also contains a Mesolithic site and is stratigraphically associated with contemporary organic sediments to either side.

As far back as 1995 the Lancaster University Archaeological Unit made the following point in their report on the site in the opening paragraphs of their Recommendations section,

"The point should be forcibly made that the constant and escalating threat to this site, namely coastal erosion, will not lessen without human influence, and that the site will be destroyed in the near future."

This statement is even more prescient now than it was in 1995.

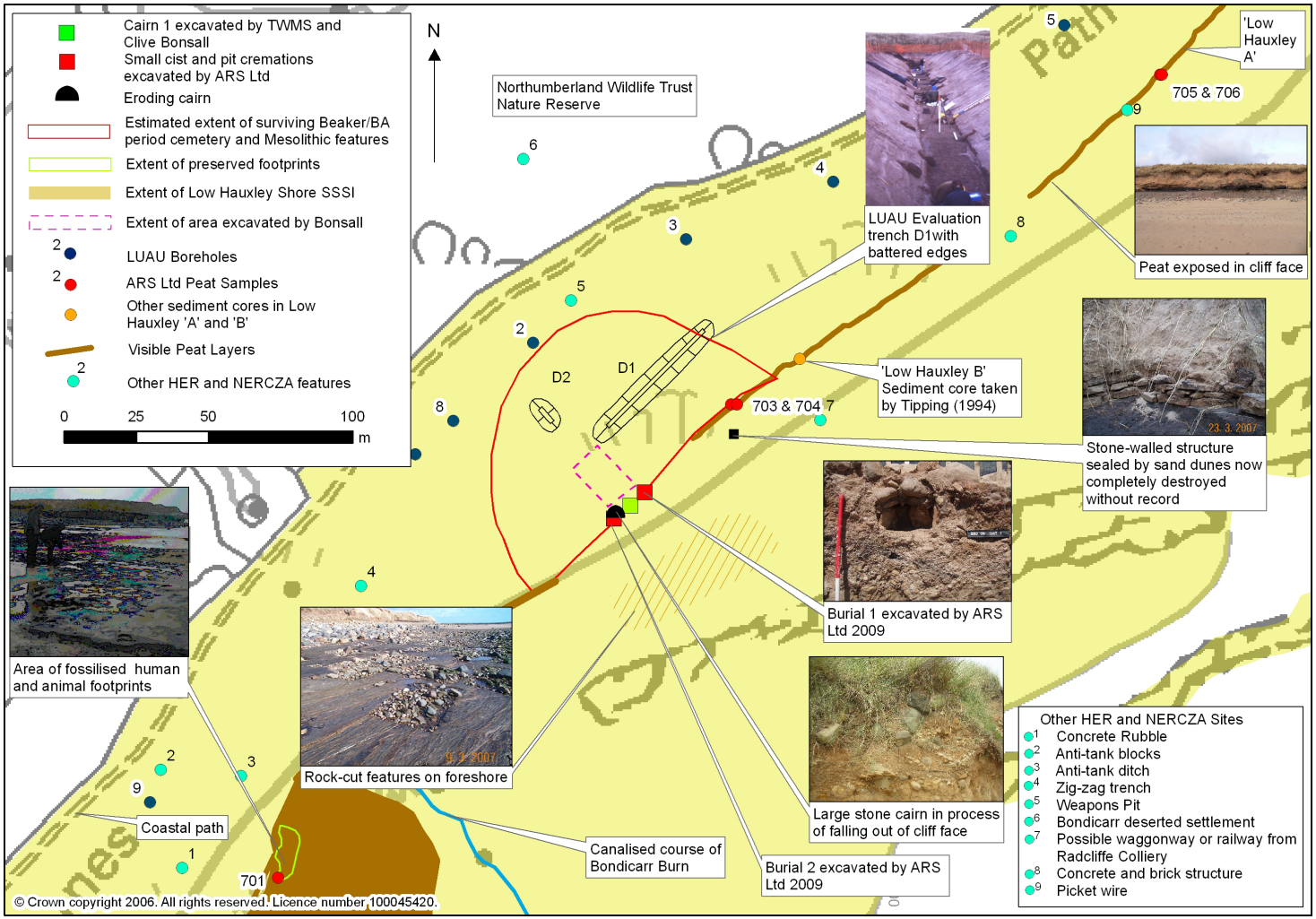


Fig 5.9.13 Summary map of archaeological features and previous interventions recorded at Low Hauxley.

5.10 Alnmouth, Northumberland.

5.10.1 Background

The HER records that a quantity of slaggy material has been noted eroding out of the sides of an embanked promontory known as 'Pan Close' beside the River Aln at Alnmouth. A number of mounds to the east have been identified as sleeching tips and the area is marked as 'Saltings' on the 1:10,000 OS Map. This site is being eroded by the river and the SMP2 data show the whole area to be at risk of flooding. The 'Preferred Strategic Option' here is to 'Selectively Hold The Line' and as a result these sites could be at risk from construction work.
The oyster beds which lie adjacent to the Alnmouth salt working site are subject to the same threat. It was the aim of the rapid survey to:

- Photograph, measure and record the oyster ponds.
- Ascertain whether the sites are suffering active erosion.
- Ascertain the nature of any damage to the features by current processes of erosion.
- Evaluate both the present level of threat to those sites and the nature of those threats.

Also the environs and wider landscape was investigated to add context to the survey. The scheduled enclosure (SAM number 8180) on the hilltop to the north of Alnmouth were investigated, along with the south bank of the Aln and additional Second World War archaeology including a guano storage building converted into a section post/pillbox.

Fig 5.10.3 Recording the location of one of the oyster beds

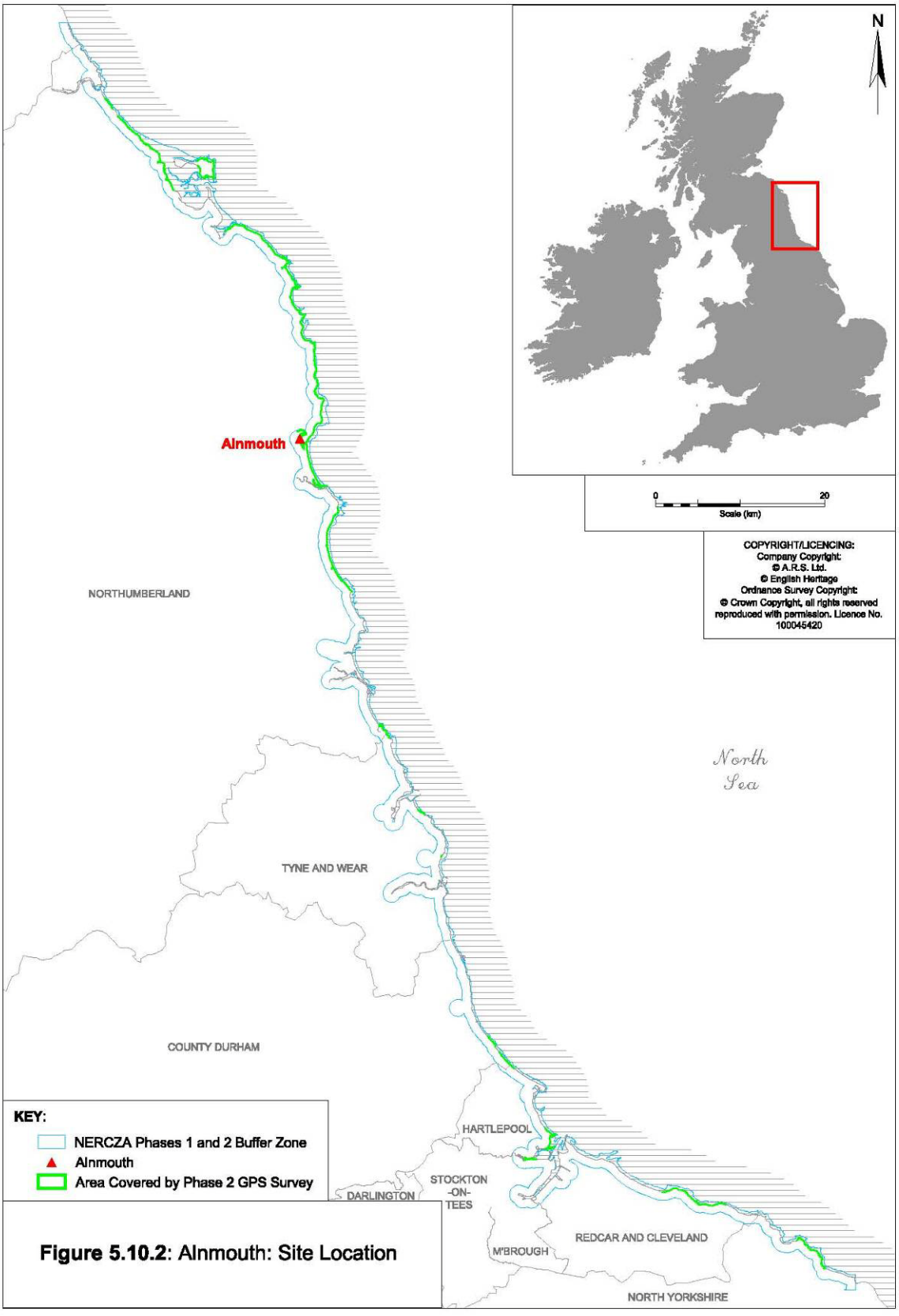


Figure 5.10.2: Alnmouth: Site Location

5.10.2 Location and geology

The town of Alnmouth is located on the North Sea coast at the mouth of the River Aln, 31 miles south of Berwick-upon-Tweed and 29 miles to the north of Newcastle (NU 243099) (PU 13.1-13.9). The settlement lies along a spur of land between the estuary of the River Aln and the North Sea, at the very southern end of a series of low hills. The local superficial geology is predominantly boulder clay which overlies solid geology of Carboniferous limestone. This forms the hilly, rolling landscape which runs down the North Sea coast from the Anglo-Scottish border and includes Alnmouth. The estuary of the Aln has been historically prone to change. The most notable alteration to the course of the river in historic times occurred during a great storm on Christmas Day 1806, when the river broke through to the North Sea in an area of low fields to the south of the town and north of Church Hill. The shape of the estuary has fluctuated ever since. On the south side of Alnmouth the dune systems are also shifting as wind-blown sand creates and destroys high dunes behind the beach. Both wind and sea are significant threats to archaeological remains in the area. (Willaims, 2007).

Fig 5.10.4 Modern cross on top of Church Hill, overlooking Alnmouth. In the foreground is the foundation of a removed hexagonal pillbox.

5.10.3 Previous research

Much research has been undertaken into the town of Alnmouth itself and its evolution over time. This is particularly significant when considering the fluctuating course of the River Aln. Local history groups and several antiquarian articles have been published on the development of the town along with the oyster beds. However no modern, detailed study of the archaeology has been undertaken.

The surviving traces of these 'oyster beds' (ponds) were first noted in the modern era in the unpublished research work of G. Bettess 1994, whilst brief descriptions, survey data and a basic chronology were subsequently published under the authorship of G. and F. Bettess, 2004.

Bettess (2004) noted that, of the five 'Oyster Ponds' recorded as extant in 1865, the remains of only the two could still be detected around a century later. No accurate date for the installation of these surviving ponds was established, although they clearly pre-date the 1st edition O.S. maps published in 1865. It was recorded that the operations there 'did not last long, and the project had to be abandoned because silt and mud built up around the beds'. This conclusion seems to have been based upon the remarks of George Tate (1805-1871) published by the Berwickshire Naturalists Field Club (BNFC) in 1877 (Osler 2009). There is also a record of an 'Oyster house' overlying one of the ponds, although the exact form and location of this building is unknown (Osler 2009). There has also been investigation into the hilltop enclosure known as the Nightfold on Beacon Hill. This unusual hilltop enclosure is a Scheduled Ancient Monument (SAM/OCN No Northumberland 31) and was subject to geophysical survey in 1993 and, prior to this, limited excavation in 1969. Both of these failed to find any definitive evidence of occupation.

The main piece of work has been an extensive urban survey undertaken by English Heritage for Northumberland County Council. The report summarised the development of Alnmouth from documentary, cartographic and archaeological sources. It also assessed the detailed archaeological potential of the town and how any future development could impact on the significant archaeological resources. The project did this with reference to the national and local planning process and its regard to archaeology.

Fig 5.10.5 The enclosure bank at Beacon Hill.

5.10.4 NERCZA Phase 2 Archaeological Investigation

5.10.5 Prehistoric

The NERCZA survey did complete a rapid assessment of the enclosure at Beacon Hill, previously thought to be Iron Age. This enclosure has been heavily disturbed by later activity, including the construction of at least one bunker and a

green for Alnmouth golf course. However the shape and location of the enclosure do not seem to relate to an Iron Age settlement. A more likely interpretation is that there are 3 separate elements to the earthworks. There is a track (220), still in use that relates to a quarry to the east (221), which is presumed to be post-medieval in date. However the quarry track forms the southern bank of the Iron Age enclosure and it does not appear to cut or ride over the eastern edge of the enclosure (218), which appears to end naturally. This means that the southern edge of the enclosure as previously defined is incorrect.

Also the enclosure is in the incorrect position for a traditional Iron Age or other prehistoric enclosure as the hilltop would make a more suitable location rather than the base of a slope, where it is located. It is more likely that this enclosure (218) is a medieval or earlier boundary that actually continued to the north-west following the same contour, but has now been lost to the north of the road due to later ploughing. This could be the boundary to different land holdings or possibly to medieval parkland. If this was an enclosure a significant boundary would not be needed on the south side as there is a steep drop into a stream valley. The internal features of the enclosure (351 and 219) represent a golf course green and bunker respectively and are much later additions.

Fig 5.10.6 The termination of the boundary (218)

The clearest evidence for 218 representing an earlier field boundary is on Thomas' Wilkins map of 1794 (Williams 2007). This shows the northern boundary of Shepherd's Hill and the eastern boundary of Innt Close (also marked on Wilkin's map) could be linked with the boundary formed by 218. This could indicate that this is not a prehistoric boundary but a medieval or early post-medieval field boundary. Further work needs to be undertaken to establish the true date and function of these earthworks.

5.10.6 Romano British onwards

No Romano British or early medieval features were identified during the course of the survey

5.10.7 Medieval

Proximal to the Alnmouth oyster beds, enclosed by the original post-medieval retaining wall (209), is an area of graded broad ridge and furrow (210), visible from the path alongside the retaining wall. Another area can also be seen on the west side of the Aln Bridge. The visible remains have a clear reverse 'S' alignment and can be broadly dated as medieval as a result. Here the salt marsh encroachment respects the former field of medieval ploughing and pronounced ridges can still be seen. This demonstrates the significant effect the change in course of the River Aln has had on the surrounding landscape.

Fig 5.10.7 Remnant medieval ridge and furrow still clearly visible in a field behind the post-medieval wall.

The evidence of saltings can also be seen on the Ordnance Survey mapping in the place name evidence and it seem likely that the surrounding earthwork mounds represent medieval or post-medieval saltings. Other features in the vicinity, such as the chapel at the foot of Church Hill, may have their origins in the medieval period but what survives now is the remains of the post-medieval rebuild after the catastrophic change in the course of the River Aln in the 18th century. The position of the original church is visible Thomas' Wilkins map of 1794.

Fig 5.10.8 The post medieval chapel at Church Hill.

5.10.8 Post-Medieval

The most significant post-medieval remains are the upstanding posts that represent the remains of the oyster beds. Two complete sub-rectangular beds (223 and 224) are visible and a third is partially exposed (225). Also visible are two more fragmentary post alignments (226 and 227) which are less coherent. All of these relate to oyster beds mapped on the 1st edition Ordnance Survey map and their interpretation as such is certain (Osler 2009). The oyster beds probably relate to industrial activity during the early 19th century as they are not visible on Thomas' Wilkins map of 1794, which pre-dates the realignment of the River Aln and shows other detail, such as the former church at Church Hill. The oyster beds also most likely post-date the storm event which realigned the river as they are visible on the 1st edition Ordnance Survey map of 1860. This broadly dates these structures to having been implemented between 1794 and 1860 and having a relatively short lifespan.

Fig 5.10.9 The extant Oyster Beds

Other post-medieval archaeology was also recorded by the survey, most of which was structural in nature. The dilapidated, roofless Chapel at the foot of Chapel Hill is now set within National Trust. The architectural detail and main structure (232) survives along with a hollow way (234) that leads up from what was formerly the river bank prior to the River Aln's realignment.

Fig 5.10.10 The chapel and hollow way viewed from the east

Other post-medieval structural remains included that of a Victorian gun battery (214) on the hill overlooking Alnmouth golf course. This structure survives exceptionally well in its original form. There are some obvious later Second World War modifications but the core original structure still survives. Other earthworks (215 and 216) also survive and could relate to other element s of the battery or could be Second World War features. A precise date for the battery can be gained from the preserved dedication stone which cites:

"This battery was erected by His Grace, Algernon, Duke of Northumberland K.G for the use of the Percy Artillery Volunteer. Completed 12th March 1861"

Fig 5.10.11 The dedication stone on Alnmouth gun battery

Local stories recount the competitive nature of gunnery practice between Alnmouth battery and the Amble rocketery battery. One specific tale says that upon defeat by the Alnmouth gunners the Amble team rioted in the streets of Alnmouth.

Fig 5.10.12 Alnmouth battery showing original features and later loop holes.

To the south of the River Aln a long, narrow barn-like structure survives (237) and is thought to be a storage building for imported guano. The building survives along with the earthwork remains of a former access road (238). As with the battery above Alnmouth links there are Second World War alterations to this building. Loopholes have been punched into this structure to make it more defensible.

Fig 5.10.13 Former guano storage shed south of the River Aln.

5.10.9 20th Century

As with elsewhere along the coast the largest percentage of surviving archaeological remains in the area of Alnmouth relate to the Second World War defence of the coast. Anti-tank blocks (212, 222 and 235), remains of pillboxes (233 and 215), a road block (213) and alterations to earlier structures (237 and 214) can all be seen. The earthwork remains of military buildings also survive (236 and 215).

Fig 5.10.14 A Second World War loophole placed in the wall of the post-medieval guano shed.

All of these features are in stable condition with the exception of the anti-tank blocks which are mostly exposed on the beach. However, a dilapidated gun emplacement below Chapel Hill (230) is facing a much greater degree of threat. This structure is in a poor condition, at risk from flooding and could represent a disguised pillbox or gun emplacement. A positive identification of the structure has not been possible as a result. It is able to discern that the structure was constructed out of concrete and there is also evidence for loopholes and other military features. However, it appears that there has been some attempt to disguise the windows as they have been created to look like those of the chapel, although they are made from cast concrete. If this structure was a disguised pillbox or anti-tank battery it could potentially be an important lost military feature.

Fig 5.10.15 Fragmentary remains of a military building, possibly disguised, south of the River Aln.

5.10.10 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.1m per year (SMP2 for north East England) although the make up of the dunes makes this figure variable. The threat from erosion at Alnmouth is considerable in certain areas, especially with the added risk of flooding and the fluctuating course of the River Aln. This places the oyster beds at high risk of further degradation. They are well within the flood zone mapped out by the Environment Agency in 2007 (SMP2 Northumberland). However, the remains on the south bank of the Aln are also under threat from flooding and all recorded archaeology in this area, with the exception of the pillbox on top of Chapel Hill, are within the Environment Agency flood zone. To the north of the river, as most of the recorded remains are on higher ground, the threat is less in the short term. However, increased tidal levels and storm events will also increase the rate of coastal retreat and place monuments such as the Alnmouth battery under threat in the longer term.

5.10.11 Summary and conclusions

The archaeology of the Alnmouth area is mostly post-medieval and later in date. This is certainly true of the most threatened archaeological features in the inter-tidal zone and in the flood zone projected by the Environment Agency in 2007. The oyster beds are particularly at risk as they will be covered by the River and eventually be completely silted up. At the moment they are exposed and eroded by the tide so perhaps this is the best way to preserve them. They have now been accurately mapped and photographed so there is some preservation through record of these features.

Management Area		Policy unit	Policy Plan			Comment
			2025	2055	2105	
MA13	North Links	13.1	MR	MR	MR	Maintain and adjust bank with groynes
MA13	Golf Links	13.2	MR	MR	MR	Re-shape frontage to retain sediment
MA13	Alnmouth Corner	13.3	HTL	HTL	HTL	To maintain estuary shape
MA13	Estuary Outer North	13.4	HTL	HTL	HTL	Maintain flood defence
MA13	Bridge frontage	13.5	HTL	HTL	HTL	
MA13	Estuary Inner	13.6	MR	MR	MR	Local flood defence
MA13	Estuary Outer South	13.7	NAI	NAI	NAI	
MA13	Church Hill	13.8	HTL	HTL	HTL	To maintain estuary shape
MA13	Buston Links	13.9	NAI	NAI	NAI	

Table 5.10 Shoreline Management Plan 2 polices for Alnmouth area

The SMP2 preferred policy at the key point where the oyster beds are located is Hold The Line, although other than maintenance of the flood defence there are no further specifics on how this is to be achieved. Also this presumably refers to the retaining wall set back 100m to the landward side of the oyster ponds so any flood defences do not protect them. Again where slaggy material has been seen eroding out of the shore the policy is to Hold The Line although the SMP refers to the bridge frontage and not to the area where archaeological remains are eroding. It is difficult to see how further mitigation could be undertaken without directly disturbing archaeological remains so perhaps a more detailed programme of recording is necessary to monitor these as they erode and record any new features that become visible.

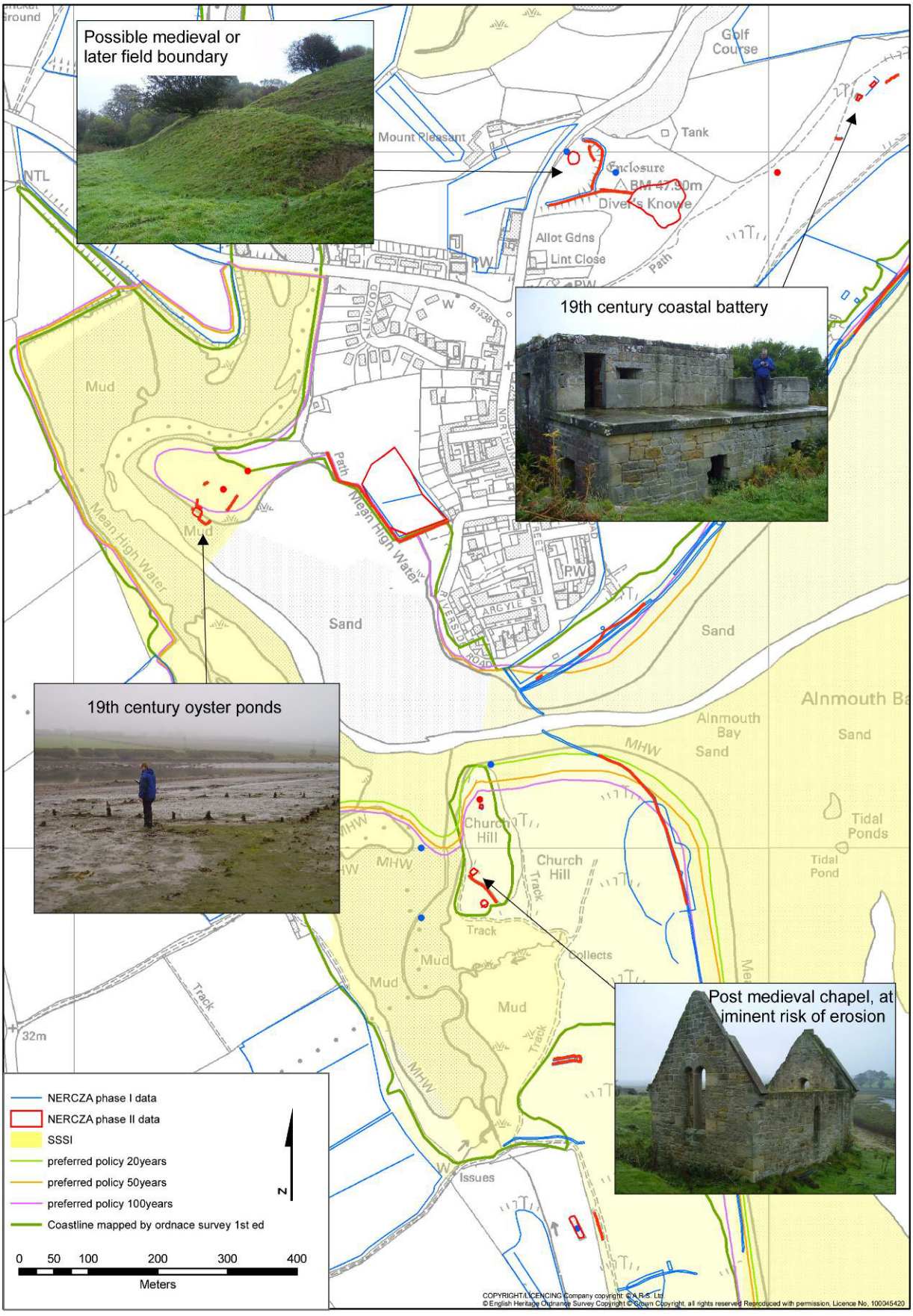


Fig 5.10.16 Archaeological features recorded at Alnmouth

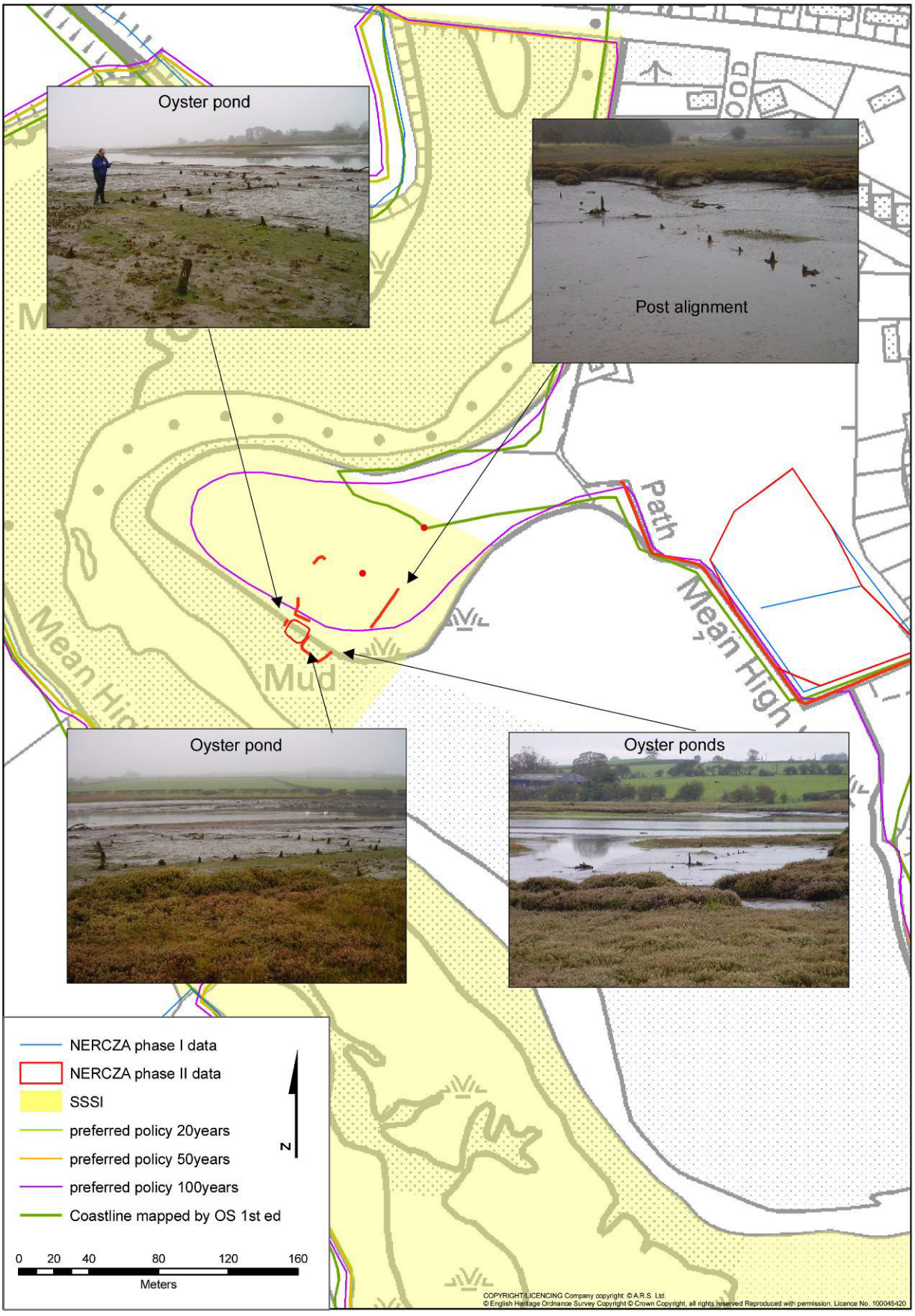


Fig 5.10.17 Archaeological features of the Alnmouth Oyster ponds

5.11 Amble, Northumberland.

5.11.1 Background

The Amble hulks lie in the zone between LAT and MHWS and are vulnerable to every tide. They lie within SMP2 Policy Unit 15.2 for which The 'Preferred Strategic Option' is 'Managed Retreat'. The hulks lie in the inter-tidal zone within an area of special conservation and are clearly visible at low tide. The hulks are clearly under threat from natural processes and could be further threatened by construction works designed to protect the coastline. The information gathered as a result of this survey provides the necessary level of detail for decisions to be made such as designation, and will provide a baseline against which future damage from erosion can be measured.

Fig 5.11.3 One of the larger hulks visible at Amble

5.11.2 Location and geology

Amble is located at the northernmost tip of the south-east Northumberland Coastal Plain (NGR NU 264049) (PU15.2). This area is characterised by sedimentary limestone, shale and Carboniferous sandstones including local deposits of coal. This has resulted in a gently undulating plain with the occasional sandstone outcrops along the sandy coast and modest sandstone cliffs threaded with beds of coal and shale, where the rivers and streams have cut through them. The Amble hulks are located on the north bank of the River Coquet in the area of the former harbour of Warkworth. This has since silted up and much of the former harbour is now salt marsh, with the Amble marina now being the principal harbour serving both Amble and Warkworth. The hulks are thought to be contemporary with or date to just after the abandonment of the old Warkworth harbour and may relate to the former coal industry, being used as inshore shipping vessels for the transport of coal.

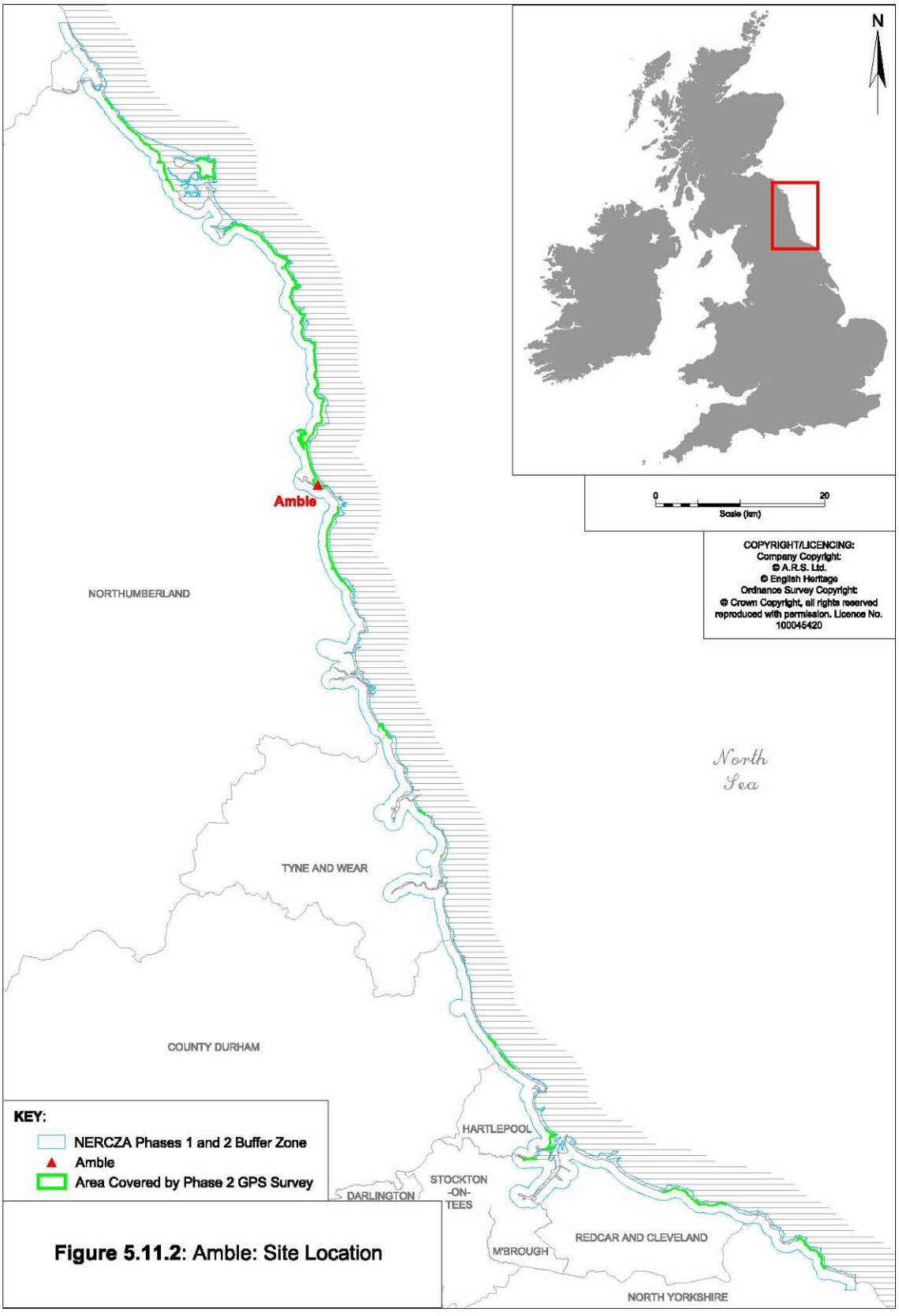


Figure 5.11.2: Amble: Site Location

5.11.3 Previous research

Little archaeological research has been undertaken in the Amble area although the hulks have been subject to previous investigation and are recorded in the NMR (907646 – 907649). Although not comprehensive there has been some limited sketched survey by Adrian Osler (2009) and his notes depict the form and position of the hulks, although they do not present a full measured survey. There has also been the suggestion that these may be abandoned herring boats (Parry 2006) although the local view is that they were coal lighters. The NERCZA Phase 2 survey did not undertake a plank-by-plank survey of the hulks but did go further than previous work by recording basic measurements of the hulks and general photography.

5.11.4 NERCZA Phase 2 Archaeological Investigation

The Hulks

The Amble hulks can be split into two broad categories, comprising three smaller boats (357, 358 and 359) and five larger, broader hulks (352, 353, 354, 355 and 356). Also recorded by the survey was a short stretch of what was presumably part of the former Warkworth harbour, comprising a line of protruding wooden posts (453). Looking at the general form of the larger vessels, it would superficially appear that they are all similar to a type of vessel called a wherry, a ship commonly used for transporting coal and other goods up and down estuaries and along the coast. Similar vessels have been seen along the Tyne at Newburn, as recorded by Alan Williams and Paddy Taylor (Taylor 2009). It would seem likely that similar vessels could be seen in the Amble area relating to the nearby colliery and that, upon the decline of Amble as a coal port, they were simply abandoned on the north shore of the River Coquet.

The larger vessels are all between 18 -19m in length and between 7 – 8m in width at the broadest point, although they are also mostly fragmentary so these may not be the exact original dimensions. The only exception to this is vessel 352, which is 21m in length and 10m wide, and would seem to be of slightly different construction. The four largest hulks (353, 354, 355 and 356) are all clinker-built vessels however the largest and easternmost (352) is carvel built. This slightly different construction method could suggest that this vessel is slightly earlier than the others and not a typical wherry.

Fig 5.11.4 The rudder of vessel 352

Fig 5.11.5 The hold of the largest vessel 352

It is possible that all the larger vessels where abandoned upon the decline of the coal port at Amble / Warkworth. However the presence a possible earlier vessel

could indicate that the hulks where abandoned from different owners at different periods and that they all had individual lineage. Therefore they will all date to slightly different times, demonstrating abandonment over a longer period. Despite this it would appear that the hulks where all more or less abandoned during the same period due to the consistent rate of decay and the spatial positioning of the two vessels recorded as 354 and the position of 355 butting up against the former harbour wall 453.

Fig 5.11.6 Examining the details of carvel built hulk 352

The smaller vessels (357, 358 and 359) seem to be have been more recently abandoned, although again no precise date can be confirmed. They are all small fishing vessels, averaging 10m long and 2m wide. Their construction is small scale clinker as they are not for longer journeys like the larger hulks and they are presumably later than the hulks abandoned on what was formerly the harbour edge but is now inter-tidal mud. They are generally located closer to the shore and are more likely to relate to the fishing industry unlike the wherries and carvel. A 115m long line of upright wooden posts, right on the edge of the lowest extent of the inter-tidal zone, is also visible. Hulk 355 butts against this and a probable interpretation is that this is the edge of the old Warkworth harbour wall that went out of use in the 19th century.

Fig 5.11.7 Vessel 355 lying against the former harbour wall 453

Fig 5.11.8 One of the smaller, and presumably later, fishing vessels

The hulks at Amble represent an easily accessible assemblage of roughly contemporary vessels, presumed abandoned as a result of the decline of Warkworth and Amble as a coal port. Although the survey has recorded basic measurements and photographed the site a detailed survey, not possible within the scope of the NERCZA Phase 2 would increase the understanding of the origins of these vessels. Alan Williams and Paddy Taylor have undertaken a similar survey of the inter-tidal hulks at Newburn on the River Tyne (Taylor 2009). However the Amble hulks represent a better preserved example at a higher level of risk than the Newburn hulks.

5.11.12 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.1-0.3m per year with variation over 100 years leading to a loss of between 30 and 40m (SMP2 for north East England).The Amble hulks face a significant threat from both the direct wave action of every tide as they are almost completely submerged twice day. Also the hulks are located well within the Environment Agency flood zone, outlined in 2007. They face a direct threat from ongoing erosion and rising sea levels which will eventually destroy them completely.

5.11.13 Summary and conclusions

The SMP2 preferred policy in the area where the Amble hulks lie is Managed Realignment, or Managed Retreat. The area behind the hulks between Castles Dikes and the caravan park is currently wetland and a special conservation area. This will be the buffer for further flooding and rising sea levels, effectively creating a lagoon behind the dunes. This policy assessment does not seem to take the hulks into account as being of historical significance. They are not referenced in SMP2 which only considers Scheduled Ancient Monuments as significant.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA15	Inner Estuary	15.2	MR	MR	MR	Maintain and enhance habitat

Table 5.11 The Shoreline Management Plan 2 policies for the area the hulks lie in.

Fig 5.11.9 The hulks as they appear at low tide.

As previously stated the potential significance of the Amble hulks as a collection of contemporary vessels means that their loss to rising sea levels should be prevented. The NERCZA Phase 2 survey, whilst undertaking photography, basic measurements and providing a preliminary identification, has not answered fundamental questions regarding the vessels age and function. Additional and

more detailed survey to produce accurate measured drawings of all key features should be undertaken in order to gain a positive identification of the vessels form and function. The differences between the hulks, with three types of vessels identified, should also be further explored to ascertain the function of the different vessels, their relationship to the harbour at Amble and the dating of their abandonment.

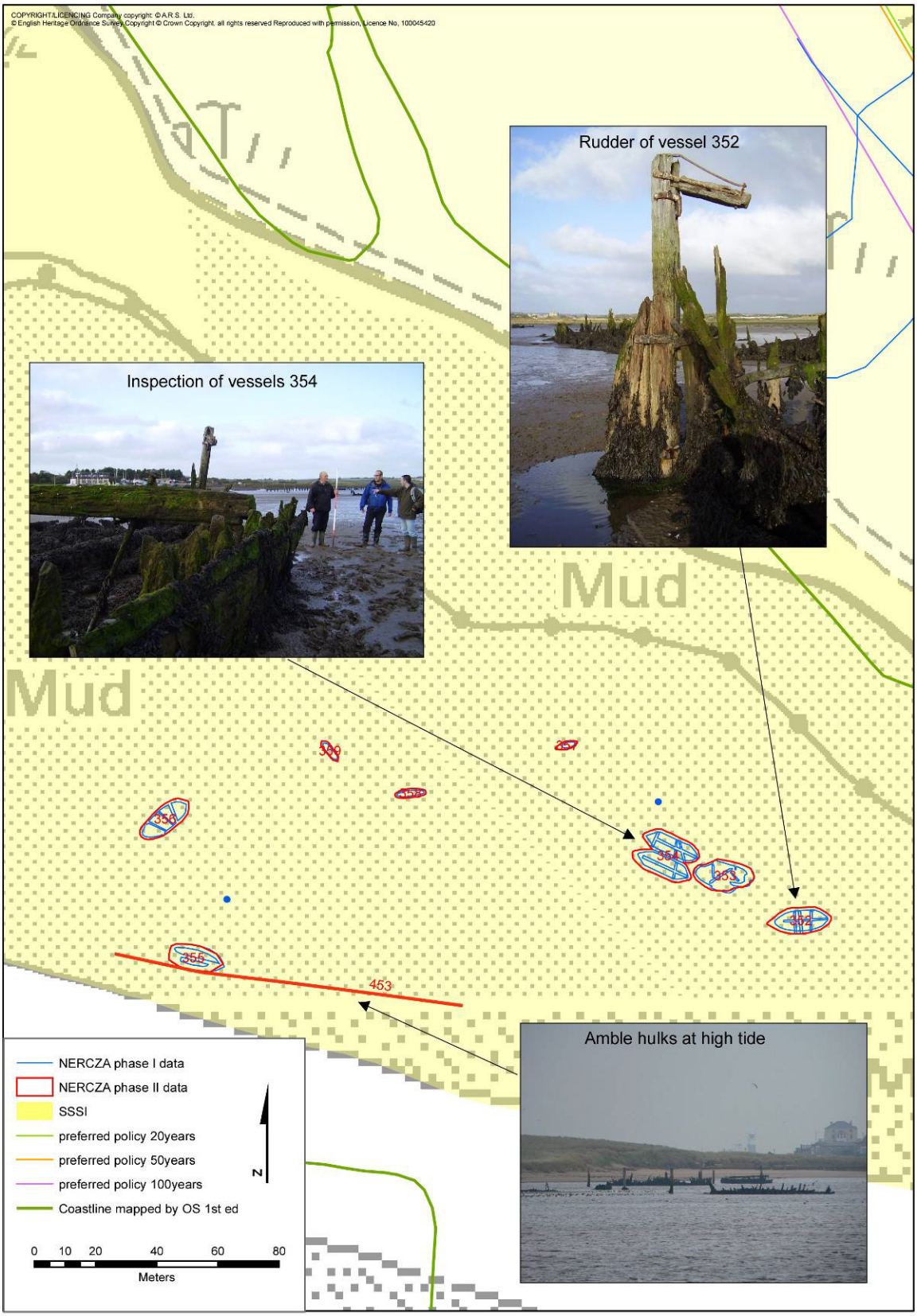


Fig 5.11.10 Archaeological features recorded surrounding the Amble hulks

5.12 Scremerston, Northumberland.

5.12.1 Background

At the lowland fort of Scremerston the eastern side of the site has been lost to erosion of the cliff by wave action and the remaining, surviving crop marks are bisected by the East Coast Mainline. The NERCZA Phase 1 desk based assessment has identified both this fort and the fort at Fenham (see section 5.13) to be of 'high regional significance'. These features were again targeted for survey with a view to:

- Photograph, measure and record any visible earthworks.
- Ascertain the nature of any erosion.
- If the erosion has revealed a section of the earthworks record a section of the feature and collect any eroding artefacts that will assist in characterising and dating the features.
- Ascertain whether the sites are suffering active erosion.
- Evaluate both the present level of threat to those sites and the nature of those threats.

The threat to the archaeology at Scremerston is the same as with the palisaded enclosure at Fenham, namely ploughing and further coastal erosion (see section 5.13). However the presence of the main line railway at this location makes it more likely that there will be further sea defence work in order to preserve the railway line. The railway line will also have caused considerable damage to archaeological deposits of the enclosure.

Fig 5.12.3 The field containing the crop marks (right side of photo) of the Scremerston enclosure, demonstration proximity to railway cutting and coast (left side).

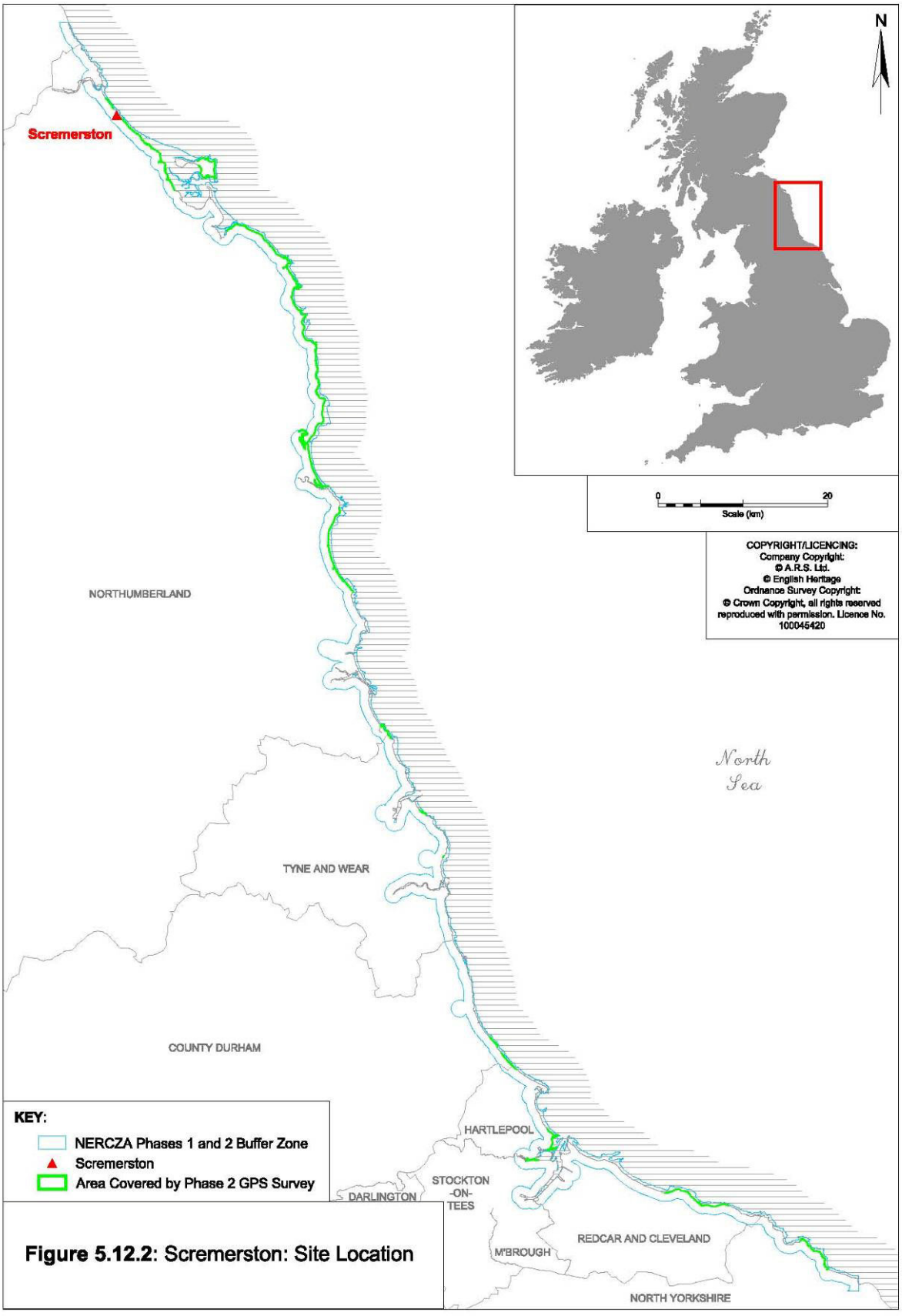


Figure 5.12.2: Scremerston: Site Location

5.12.2 Location and geology

The fort at Scremerston is located at NGR NU 0183 4968 (PU 3.1) on a low-lying, rolling plain running down to cliffs in the east. The site is approximately 1.8km south of Spittal, south of Berwick upon Tweed. The land surrounding the site is heavily-ploughed arable fields. The geology is glacial till overlying limestone of the Alston formation, with sandstone, siltstone and mudstone deposits. The East Coast mainline runs very close to the cliff top along this stretch of coast, passing within 10m in some places. The crop marks themselves are located in arable fields on either side of the East Coast mainline. Almost the entire eastern side of the fort has been lost to erosion with only a small fragment surviving in the fields to the east of the railway.

5.12.3 Previous research

The Scremerston multivallate fort was known prior to the NERCZA phase 2 investigations; however no detailed study has been made of it. In 1922 a cist burial containing flints, a female skull and beaker fragments was found at Scremerston (Tolan-Smith 2008) and in 1948 a second cist burial was found containing two Beakers (Craw 1919-1922, 383-384). Other than these small-scale investigations no recorded archaeological work has been undertaken in the area and nothing at all in the vicinity of the multivallate fort.

5.12.4 NERCZA Phase 2 Archaeological Investigation

5.12.5 Prehistoric

The investigation of the fort did not reveal any surface evidence of archaeological remains. Unlike the field at Fenham (see section 5.13) there are no remnant earthworks or other features visible. There are also no features visible in the cliff face and, although there must be some remains surviving given the results of the aerial photographic survey, nothing is visible in section due to slumping of the cliff top. No archaeological evidence for the crop marks recorded by aerial photographic transcription could be seen on the ground and the survey produced no other evidence for prehistoric activity in the area.

Fig 5.12.4 The field containing the crop marks. No surface evidence of the enclosure was visible.

5.12.6 Romano-British onwards

No Romano-British, Early medieval, or medieval features were identified during the course of the survey

5.12.7 Post Medieval

The survey did record several post-medieval features in the landscape around Scremerston. The proximity of the railway to the edge of the cliffs mean that a number of features associated with it can be seen. Most obvious of these is the former route of the railway along the edge of the cliff (469) which was clearly visible surviving as an earthwork. This is cut by the modern route of the railway but can be traced west, along field boundaries and a footpath.

Fig 5.12.5 The former railway cutting, showing the modern route of the line behind the stone wall.

There are further remains approximately 1km to the south where extensive earthwork and structural remains of a limestone quarry (465) and an associated kiln (458) are located. The kiln is eroding. A second kiln is overlain and altered by a Second World War gun emplacement (465). This structure is in a dilapidated state and at extreme risk of collapse in the near future. It is exposed to wave action at high tide and is being undermined, adding to the destabilisation.

Fig 5.12.6 Kiln 458 on the cliff edge, is being eroded.

5.12.8 20th Century

The archaeology of the Second World War is also visible at Scremerston. Here a previously unidentified radar station with structures (466) identical to those of the well-known Craster radar station were identified. Phase 1 of the NERCZA project had not highlighted these buildings, although it did record the position of a radio antenna just to the north. The buildings have been previously recorded as military but their exact function had not been identified.

Fig 5.12.7 The Transmitter/Receiver block at the Scremerston radar station.

The gun emplacement on top of the lime works south of Scremerston (465) was also recorded. Although well-known this structure had never been examined in detail before. Upon closer inspection it was found to be a potentially important structure and is one of only two 6 inch gun emplacements built on this scale in the country, the other being at Budle Bay to the south. The internal fittings and scale of the build is impressive and it may even be based on German designs, although there is no direct evidence for this at present.

Another possibly defensive structure made up of concrete sandbags was also recorded on the foreshore (459). This was eroding out of the cliff face, and its precise form and function was not apparent due to the level of damage to the structure.

Fig 5.12.8 Gun battery 465 south of Scremerston

Fig 5.12.9 eroding concrete structure built utilising concrete sandbags, possibly of Second World War date.

5.12.9 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.1-0.2m per year (SMP2 for north East England).The threat of erosion at Scremerston is significant and the remains recorded by the survey are under serious threat from erosion at the base of the cliffs. This causes slumping and rock fall and will eventually lead to the loss of significant archaeological material associated with the multivallate fort. All the cliff top remains, including that of the enclosure are at risk from eventual collapse and the retreat of the cliff.

5.12.10 Summary and conclusions

As the East Coast mainline runs in close proximity to the cliff edge there is significant reason to maintain the current cliff alignment. The financial implications of redirecting this line weighed against investment in coastal defence mean that this stretch of coastline is more likely to be eventually protected.

Management Area		Policy unit	Policy Plan			Comment
			2025	2055	2105	
MA3	Scremmerston Cliffs	3.1	NAI	NAI	NAI	

Table 5.12 The Shoreline Management Plan 2 policy for Scremerston.

Despite the high level of threat to the known and potential archaeological remains and the current and planned SMP2 policy of No Active Intervention it is unlikely that future management policy will move to further protect this area if needed. This said, the lack of knowledge about the state of what survives beneath the ground at the Scremerston enclosure; means that further investigation, such as geophysics or limited excavation would be preferable and add to our understanding of these lowland multivallate sites. It would also preserve what is left through record prior from any further change along the coast.

Fig 5.12.10 The foreshore and cliffs to the south of Scremerston

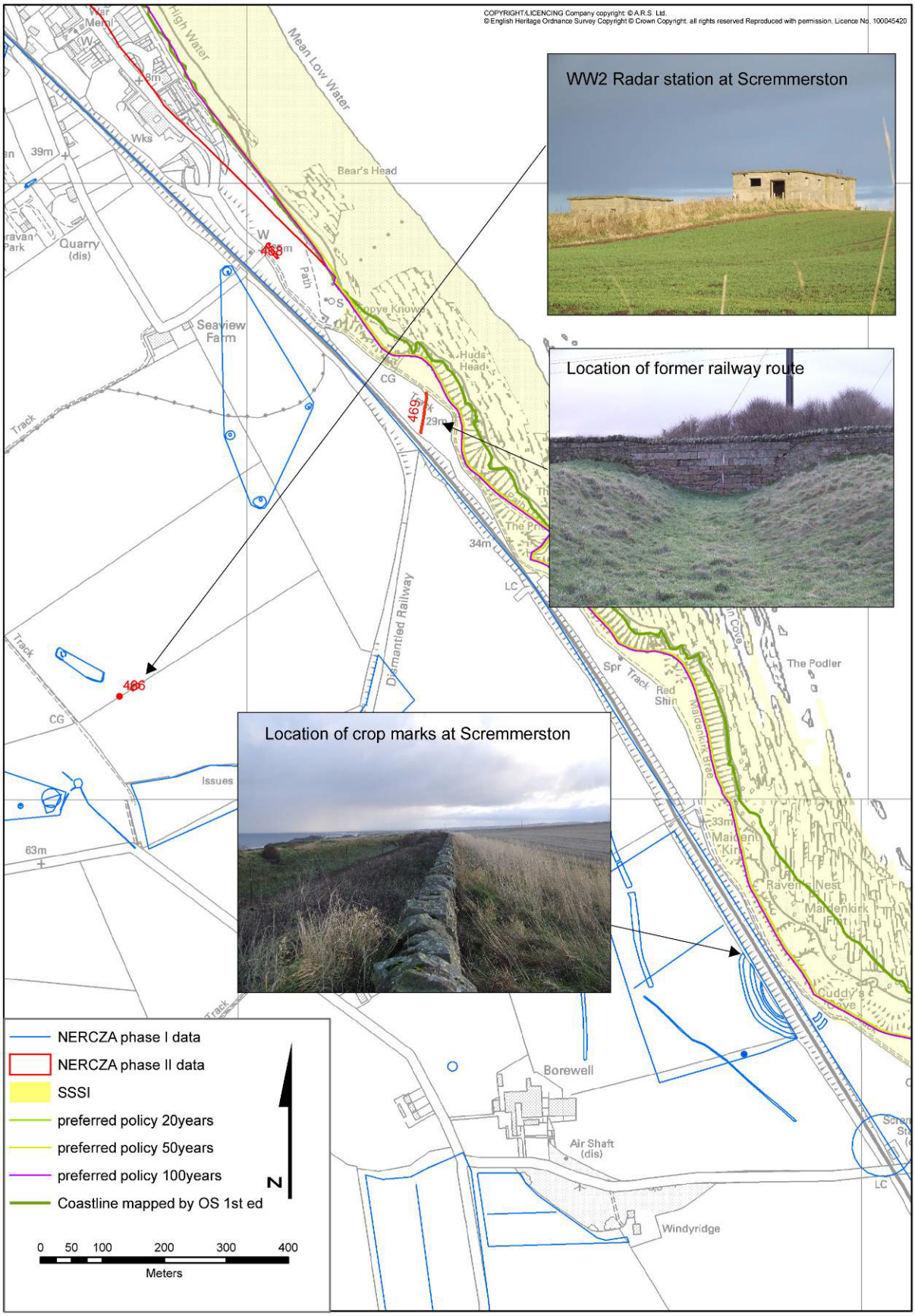


Fig 5.12.11 Archaeological features recorded at Scremerston North

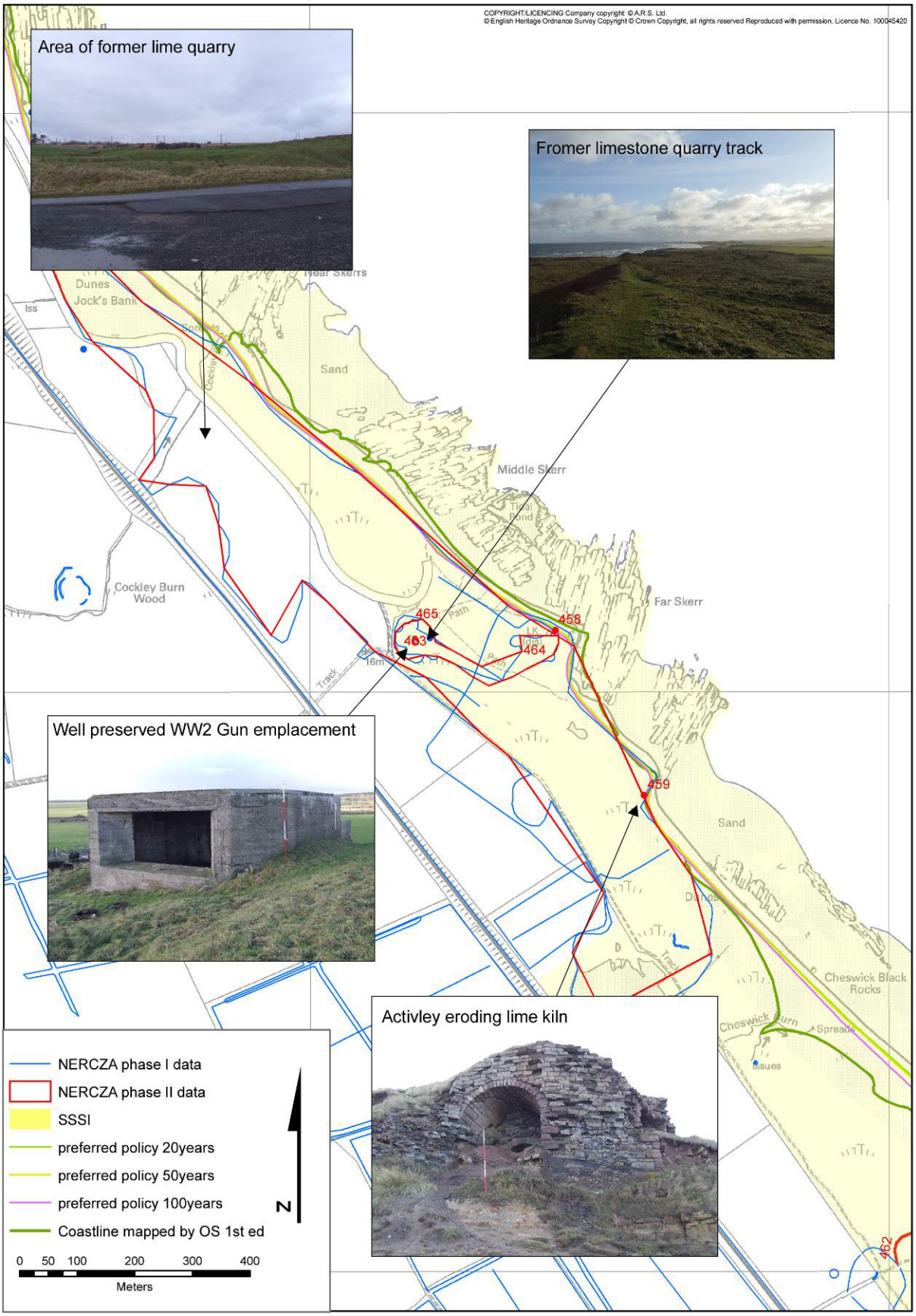


Fig 5.12.12 Archaeological features recorded at Scremerston South

5.13 Fenham, Northumberland.

5.13.1 Background

The paisaded enclosure identified from crop marks at Fenham, Northumberland has already been partly destroyed by ploughing and erosion. The surviving remains are very close to a low cliff, about five metres high, immediately above MHWS. This site is likely to be further damaged as the cliff continues to erode. Approximately 50% of the enclosure has already been lost and there is evidence of recent and ongoing landslips on the cliff below. Although the cliff base is protected by salt marsh and wetlands, the cliff is vulnerable to tidal surges and storm events and faces a long-term threat from increased erosion occurring due to a rise in sea level.

The remains of a former medieval grange of Lindisfarne priory, later a manor house complex, also survive in the hamlet of Fenham and there are several other features surrounding this which the survey recorded. There is also evidence of surrounding military features dating to the Second World War, particularly extensive anti-tank defences to the north of Fenham, between the hamlet and the Holy Island causeway.

Fig 5.13.2 One of the cliff face slumps below the Fenham enclosure

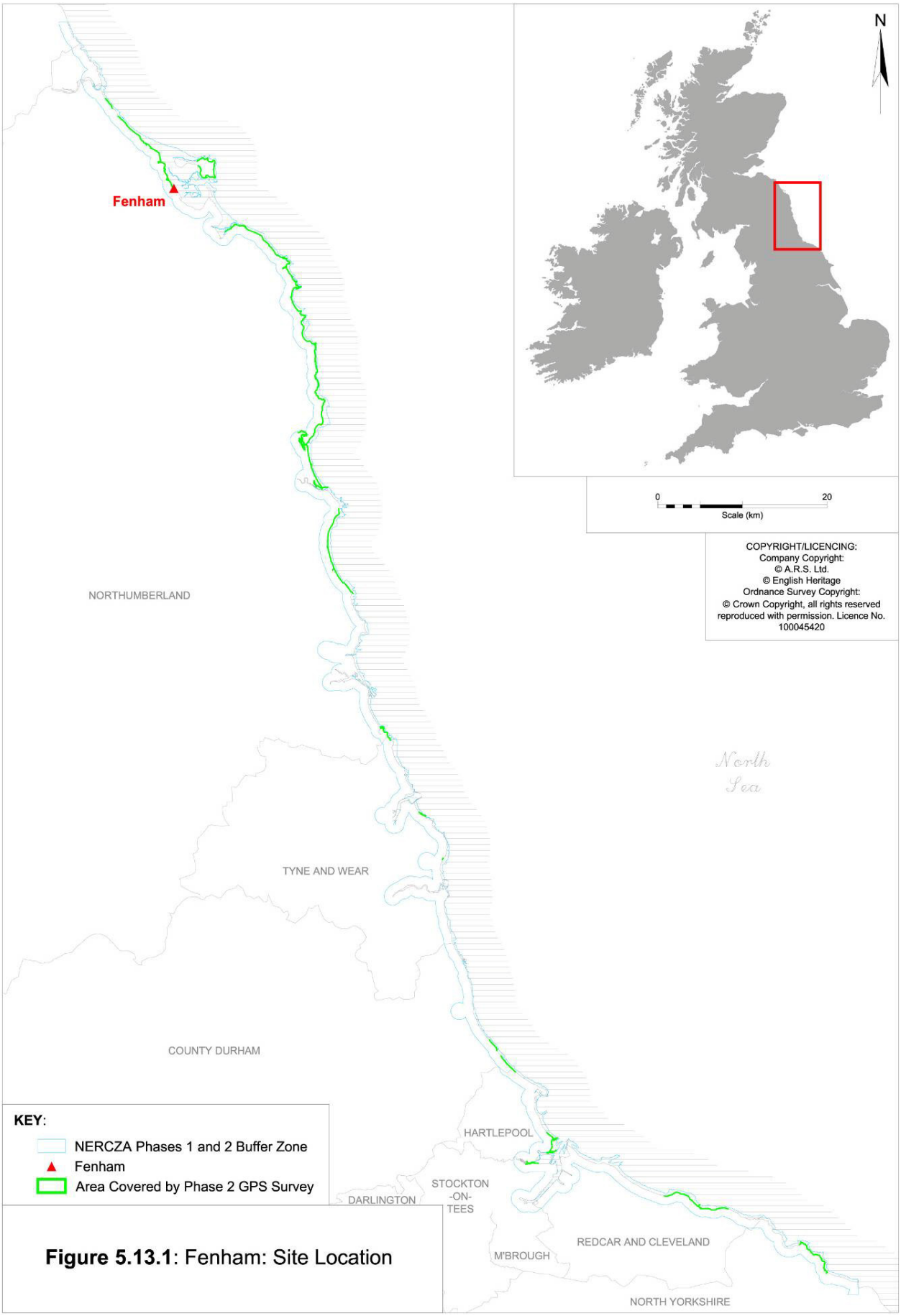


Figure 5.13.1: Fenham: Site Location

5.13.2 Location and geology

Fenham is a small hamlet located on the mainland opposite Holy Island approximately 2.1km south of the Holy Island causeway (NGR NU 08664 40812) (PU 4.3) . The hamlet is built around the remains of a former medieval grange of Lindisfarne priory, which later became a manor house. The crop mark remains of a multivallate enclosure have been noted a further 0.7km to the south on the cliff edge. The geology at Fenham is glacial till overlying Yoredale Group limestone with subordinate sandstone and argillaceous rocks (BGS). The rolling hills descend to the coast where they form low till cliffs with limestone outcropping at the base. The coastal environment is mostly wetland and salt marsh, formed by the construction of the Holy Island causeway in the 1950s.

5.13.3 Previous research

The enclosure at Fenham was recorded for the first time as part of Phase 1 of the NERCZA project. It had been previously recognised on aerial photography but no HER or NMR record existed for it. The focus of previous research has been into the earthworks of the grange at Fenham, protected as a Scheduled Ancient Monument (number 6502), although this has not been extensive either. There has been a basic level of investigation as part of the English Heritage scheduling process. Other interesting features in the surrounding landscape have not been investigated in detail.

Fig 5.13.3 The field containing the crop marks of a multivallate enclosure at Fenham

5.13.4 NERCZA Phase 2 Archaeological Investigation

5.13.5 Prehistoric

The focus of the NERCZA Phase 2 investigation was the enclosure identified on aerial photography as crop marks by Phase 1 of the project. The field survey aimed to identify the nature and extent of any surviving remains on the ground or exposed in the cliff face. Upon examining the field containing the crop marks

it was clear that it had been extensively ploughed, probably from the medieval period onwards, considering the proximity to a known grange and the lack of extant ridge and furrow.

Despite the long period of ploughing a closer examination of the exact position of the crop marks revealed possible earthworks and the enclosure is located on the natural high point along the cliff edge (NGR NU 09154 40128). Standing on this point looking inland it is possible to see a slight but regular break of slope set into the natural fall of the land. This regular break of slope (472) was recorded and found to follow almost precisely the line of the inner ditch recorded on aerial photography (Fig 5.13.14). This survival of a slight earthwork (Figs 5.13.5 and 5.13.7) could indicate that below ground survival or archaeological deposits could be very good despite the heavy ploughing. This can be seen elsewhere, such as the promontory fort of Boltby Scar, where the eastern edge of the rampart was completely destroyed but a similar break of slope could be traced and was found to relate exactly to the line of the former ditch (Oswald and Burn 2009, Powesland 2009). The survival of below ground archaeology here was also found to be very good and a complete ditch section survived (Powesland 2010).

Fig 5.13.4 The view from the centre of the multivallate enclosure looking south

Fig 5.13.5 View north from the prehistoric enclosure at Fenham. Ranging pole marks the centre of the surviving remains.

The cliff face is destabilising below the enclosure and has slumped considerably (fig 5.13.7). However this has hidden the upper layers of the exposed cliff face so no archaeological deposits can currently be seen in section. However, with each slump and the associated ongoing erosion, archaeological deposits associated with the fort must be being lost.

Fig 5.13.6 The cliff face below the enclosure. The ranging pole is roughly parallel to the centre of the enclosure.

5.13.6 Romano-British onwards

No Romano-British or Earl medieval features were identified during the course of the survey

5.13.7 Medieval

The remains of a medieval manor, dating to the 14th century, and an earlier, 13th century monastic grange where also observed. However, there was not the time or resources to undertake a detailed survey of the earthworks as part of this project. The earthworks appear to be in excellent condition and would be suitable for a Level 3 earthwork survey (Ainsworth *et al* 2007). They have been accurately mapped from the air but other features, not visible on aerial photography, will be present and further investigation would be beneficial. However, this is not an immediate concern as the remains are not under immediate threat from erosion or rising sea levels, as they are located 50m inland from current MHWS. The NERCZA Phase 2 survey recorded the extent of earthworks still visible (470).

Fig 5.13.7 The earthwork remains of the manor and grange at Fenham looking south from the hamlet.

5.13.8 Post-Medieval

The post-medieval archaeology at Fenham, other than that associated with the development of the hamlet itself, is negligible. Two shooting butts (474 and 471) are visible on the foreshore and these have clearly been rebuilt recently, possibly as a result of collapse encouraged by tidal surges. The main area of post-medieval archaeological remains is a small lime kiln and associated quarry, preserved as earthworks (475), to the north of the settlement. Although much of the original area of the quarry has been ploughed away the northern most extent survives and has been mapped by the survey.

Fig 5.13.8 One of the two shooting butts on the foreshore.

Fig 5.13.9 The remains of a small quarry and associated kiln preserved as earthworks north of Fenham

5.13.9 20th Century

As with elsewhere along the coast the most regularly encountered surviving remains date to the Second World War. Most surprising of these can be seen along the cliff edge in the vicinity of the Fenham enclosure. Here barbed wire and picket wire can be seen all along the upper cliff edge for a length of approximately 100m (473).

Fig 5.13.10 Picket wire and barbed wire, seen on the left of the picture not the fence in the foreground, exposed on the cliff edge at Fenham.

Also visible to the north of Fenham is a long, double line of anti-tank blocks that run all the way to the Holy Island causeway. These blocks are generally well-preserved and present an interesting, possibly wartime, modification. Between the gaps in alternate blocks (every second gap) small brick walls have been constructed. These could have two different explanations. They could be wartime modifications to give firing positions for troops between the cubes. This is possible as they appear to be contemporary with the blocks. However they could also be post-war additions to create shooting butts overlooking the wetlands as they would not afford a soldier much cover.

Fig 5.13.11 Anti-tank blocks at Fenham with a small brick built shooting butt or defensive wall clearly visible.

The other clearly visible defensive structure is the anti-glider poles visible on Fenham Flats and Goswick Sands. These rows of posts (496) were designed to prevent gliders landing on the wide, open sands, which were conducive to this form of attack in wartime. This area was mostly open tidal sands as the causeway had not been constructed at the time and the current area of salt marsh was not as extensive.

Fig 5.13.12 Row of anti-tank blocks north of Fenham

Fig 5.13.13 The anti glider poles on Goswick Sands and Fenham Flats

5.13.10 Threat from erosion

The Shoreline Management Plan estimates the cliff retreat along this part of the coastline at 0.2-0.4 m per year (SMP2 for north East England).The threat from erosion to these sites is ongoing, especially in the cliffs at Fenham were slumps and collapse are clearly visible. Here, although the cliff is protected by the wetlands, rising sea levels will increase the impact of tidal surges. SMP2 projected coastline shows that a further 15% of the Fenham enclosure will be lost to erosion within 100 years. This will leave relatively little scope for further investigation of the monument.

5.13.11 Summary and conclusions

The situation at Fenham may improve, although the policy of the SMP2 is No Active Intervention, with the encouragement of natural defences to take place. This encouragement of the wetland environment will help to protect the site in the intermediate term; however long-term threat from rising sea levels as well as the immediate threat of slumping will continue to erode the site.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA4	Fenham flats	4.3	NAI	NAI	NAI	Encourage the development of inter-tidal natural defence to rising hinterland

Table 5.13 Shoreline Management Plan 2 Policy for the area of Fenham.

Although as much as 50% of the fort has been lost to coastal erosion what survives is potentially in a very well-preserved condition. There is an immediate

threat to the remains from the ongoing effects of slumping of the cliff face, which will be directly affecting the archaeological deposits in the ditches and internal features of the fort. However it could be argued that as 50% of this monument has already been lost to erosion it may be seen as already too damaged to provide further archaeological information. There are much better preserved examples of this type of enclosure, one of which was highlighted by Phase 1 of this project for the first time at NU 105 374 in Northumberland of which crop mark remains of a hut circle set within three ditches and a palisade slot are visible (Tolan Smith 2008). This example could be a much better target for further investigation as it is in a better state of preservation set back 1km inland and is not currently threatened by coastal erosion.

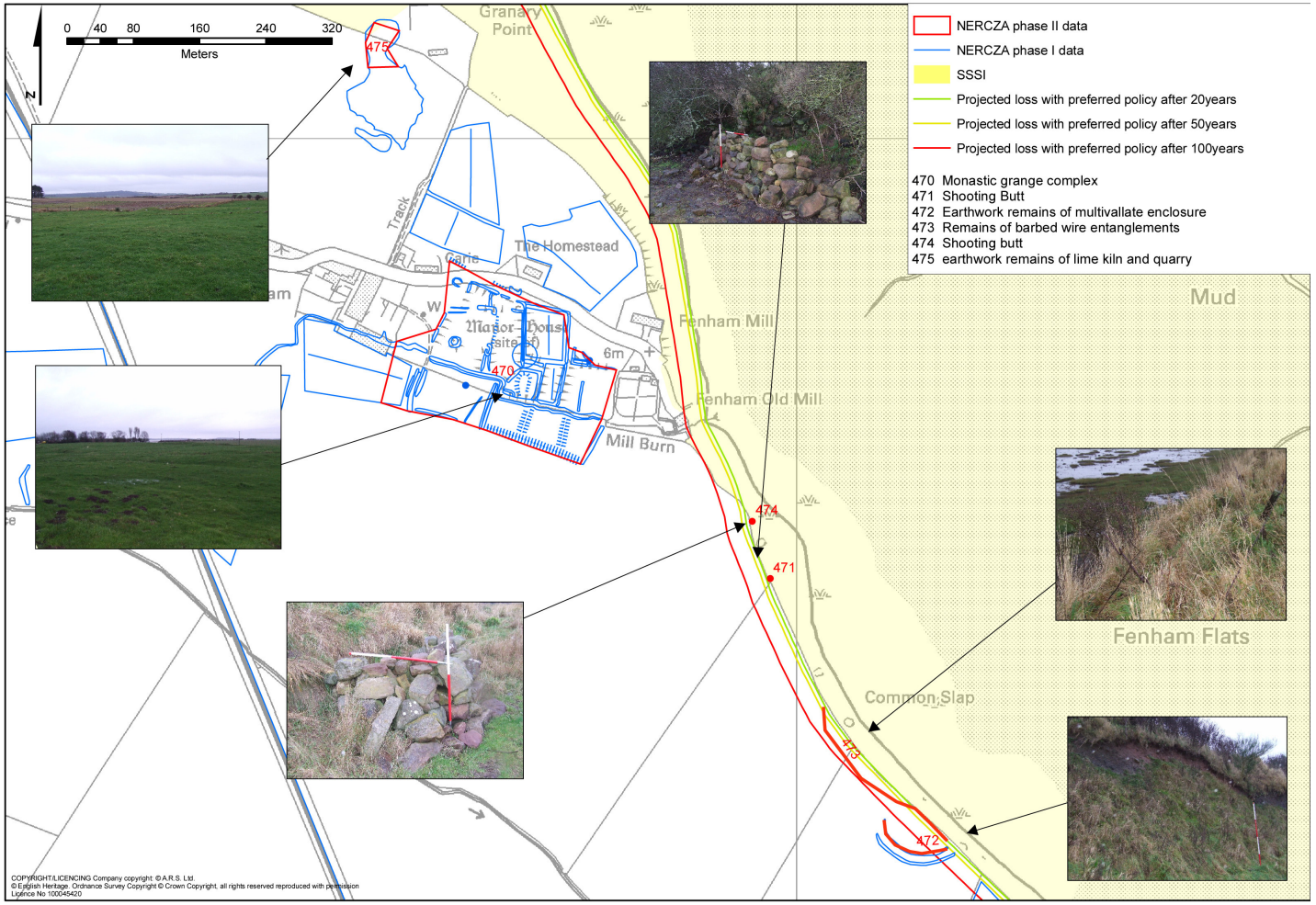


Fig 5.13.14 Archaeological features recorded by NERCZA Phase 2 at Fenham

5.14 Nessend, Holy Island, Northumberland.

5.14.1 Background

The Mesolithic lithic scatter at Nessend Quarry on Holy Island is significant as finished tools only account for 1.7% of the assemblage (O'Sullivan and Young 1995). The remainder represents debitage and manufacturing waste. This analysis suggests that the site was primarily used to locate and collect material to produce tools that were then used elsewhere. The assemblage is made up of nearly 2000 items and there is also the presence of bevelled pebbles, usually associated with the processing of seal skins, so other activities may have been undertaken at the site.

The NERCZA survey aimed to:

- Record the visible extent of the lithic scatter
- Identify any visible worked flints
- Quantify any erosion taking place
- Assess the level of threat the site faces

The survey also widened the survey to include the chapel on St Cuthbert's Isle, due to the high level of threat from erosion faced by the surviving remains. Other features already visible on the rest of the island were also recorded in the course of the walkover survey. This allowed a wider assessment of threatened sites allowing the ongoing erosion at Nessend to be placed into a wider context.

Fig 5.14.3 The earthwork and structural remains of the chapel on St Cuthbert's Isle

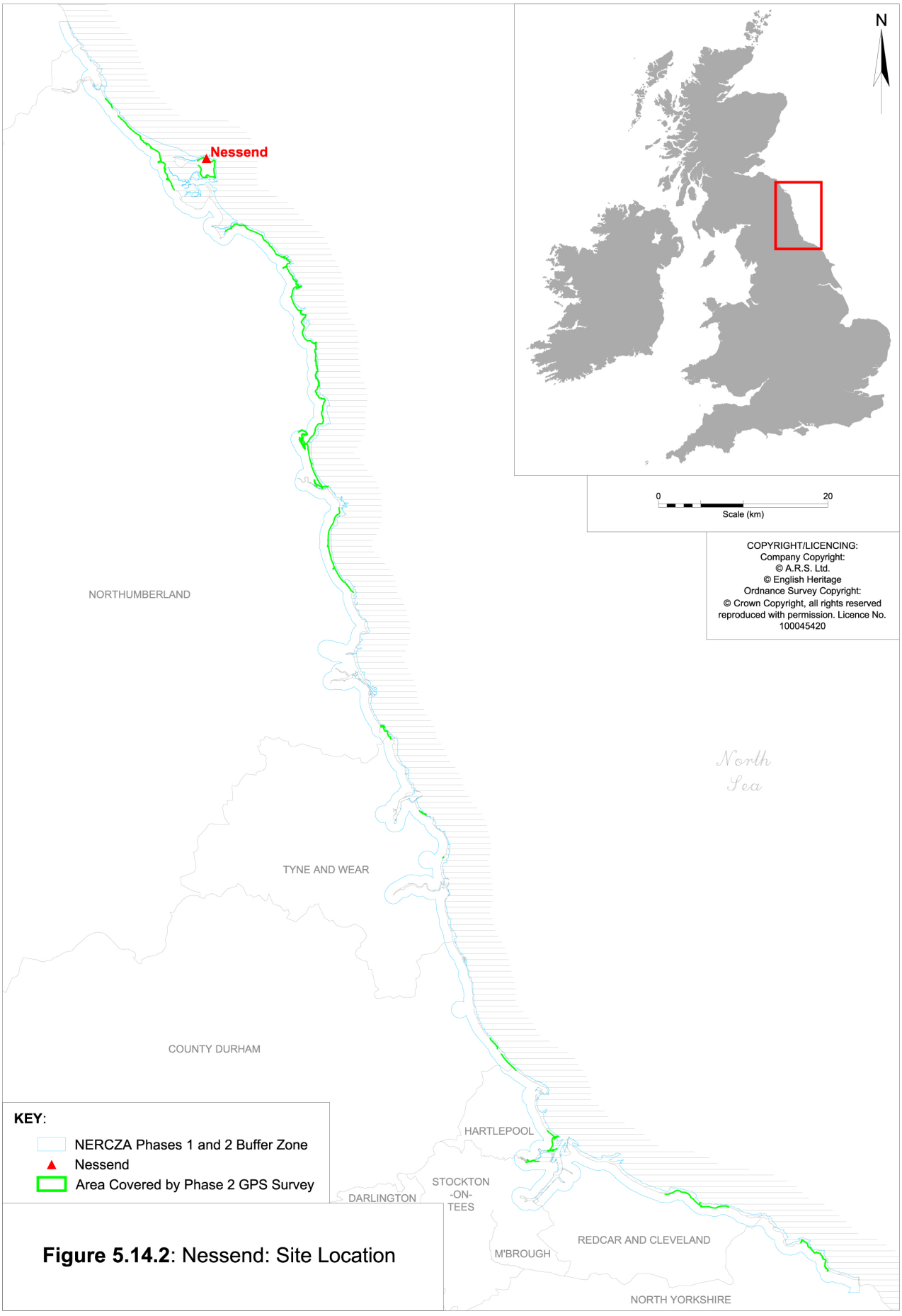


Figure 5.14.2: Nessend: Site Location

5.14.2 Location and geology

Holy Island is a tidal island, 1.7km offshore from the mainland, and is connected via an artificial causeway constructed in the 1950s. The quarry at Nessend is located on the north side of Holy Island (NU 12935 43669) (PU4.7-5.2). The site of the Mesolithic flint scatter at the quarry, recorded in 1987, is being eroded on the surface by storm event erosion and run off into the quarry. The geology is glacial till and wind-blown sand overlying limestone of the Alston formation, with sandstone, siltstone and mudstone deposits.

5.14.3 Previous research

The Ness End lithic scatter was the target for archaeological field walking and accurate survey of its extent in 1987. This work catalogued 2000 flints, predominantly debitage, although there were some flint tools and some bevelled pebbles possibly intended for the working seal skin (O'Sullivan and Young 1995). The site has not been further investigated since the initial study.
Other sites on Holy Island have been the focus of detailed archaeological investigation, including Lindisfarne Priory, Lindisfarne Castle, the early medieval settlement of Green Shiels and the town of Lindisfarne itself.

5.14.4 NERCZA Phase 2 Archaeological Investigation

5.14.5 Prehistoric

Upon investigation the extent of the flint scatter was found much as described in the Book of Lindisfarne: Holy Island (O'Sullivan and Young 1995). Several pieces of flint debitage were seen across the area of the original survey, which comprised an area of exposed clay just south of Nessend Quarry. The area of exposed clay is being eroded by wind blown sand scouring the exposed clay surface and collapse of the land surface into the quarry. In the long term the area will also be affected by coastal retreat. The survey identified an area of exposed clay (518) 155m x 139m in area with at least 2 worked flints (518;1 and 518;2) recorded and retrieved and several more possible flints observed. The area would benefit from continued monitoring and regular field walking of the freshly exposed areas. This could be implemented by involving motivated local archaeology groups under the supervision of a professional archaeologist to regularly visit the site and make notes on its condition. The value of a local motivated individual or group can be seen at Low Hauxley where Jim Nesbitt has identified many important archaeological features as a result of regular monitoiring.

Fig 5.14.4 Part of the exposed area of the lithic scatter

5.14.6 Romano-British

No Romano-British features were identified during the course of the survey

5.14.7 Early Medieval

There is a well-known, previously recorded example of an early medieval settlement located at Green Shiels (408) (NU 12154 43642) (SAM no 7787). The site is made up of a series of four longhouses set within an irregular-shaped enclosure. This site has been extensively excavated and surveyed and was recorded rapidly as part of the NERCZA Phase 2 survey in order to gain a current condition statement. The site is well-protected in a stable dune system, and signage interprets the site for visitors. The structures themselves are well-preserved with internal features like hearths and doorways surviving.

Fig 5.14.5 One of the early medieval long houses at the Green Shiels settlement.

Fig 5.14.6 A stone hearth surviving in the centre of one of the long houses at Green Shiels.

5.14.8 Medieval

St Cuthbert's Isle is a small tidal island located 194m offshore and to the south of Lindisfarne. The island contains the earthwork and structural remains of a medieval hermitage and chapel (SAM no 7797), which survived well enough to enable an accurate plan of the structures to be recorded. The chapel (386) comprises two rooms, forming a T-shaped layout with the larger room to the west. The other structure (388), possibly accommodation or storage, is on the

east end of the island and forms a rectangular structure with two (or possibly three) rooms. These structures are directly threatened by coastal erosion and this is especially visible at the west end of the chapel were the eastern wall has been partially lost to wave action. The site is threatened every high tide in all but the calmest weather. Archaeological deposits are clearly visible in the section as a result of the erosion and these will continue to disappear as the erosion continues.

Also visible next to the remains of the chapel are several earthwork features, the most distinct of which is a stone lined drain (387), which may be cut into rock on the east side of the island. A possible spoil heap was also recorded, which probably relates to the excavations of the remains in the 19th and 20th centuries. This sub-circular mound (391) is located just to the north of the chapel and could represent the remains of a monastic cell, although this seems unlikely given the form of the earthwork. Also recorded where the remains of a slipway (392) and several later mooring fittings (389 and 390).

Fig 5.14.7 The eroding section of the chapel (388) on St Cuthbert's Isle

Fig 5.14.8 The main standing remains of the chapel, with Lindisfarne Priory visible in the background.

Fig 5.14.9 The earthwork remains of a drain for the chapel and associated building.

The remains of another possible medieval long house were recorded, underlying the railway embankment connecting Castle Point with Ness End Quarry. This feature (405) is a rectangular earthwork protruding from beneath the embankment and may be the remains of a previously un-recognised longhouse. Detailed survey and or geophysics could provide more certainty to this interpretation.

Fig 5.14.10 Possible earthwork remains of a medieval or later longhouse.

5.14.9 Post-Medieval

There is extensive evidence of pos- medieval industrial activity on Holy Island, such as the famous Lime Kilns (403), which are situated below Lindisfarne Castle. These were recorded as they are under threat from wave action on the highest tides, being located on the foreshore. These are the most visible industrial features on the island, although there are also the remains of a holloway (399), an industrial railway (404), at least four quarries (406, 407, 519 and 410) and an extremely fragile and fragmentary pier to the south-west of Lindisfarne Castle (398). This pier is in very poor condition and exposed to erosion by wave action at every high tide.

Fig 5.14.11 The impressive Lime Kilns (403) below Lindisfarne Castle

Fig 5.14.12 The remains of a wooden and stone pier (398) south of Lindisfarne castle

Fig 5.14.13 The holloway (399) leading to pier (398), the posts seen in fig 5.14.12 can just be seen over the fence.

Substantial quarries are located at Ness End (519), Emmanuel Point (407), and at Castle Point. However, extensive remains can also be seen in the centre of the island where two 19th century lime kilns are located inside a large quarry (410). Here a line of earlier kilns, surviving as earthworks (411), can also be seen.

Fig 5.14.14 Two lime kilns preserved within the quarry (410)

There are also several defensive features dating to the post-medieval period surviving on Holy Island. The most well known of these features are Lindisfarne Castle and the Tudor period fort overlooking the harbour. The castle was not recorded as it has already been subject to topographic survey, undertaken on behalf of the National Trust. However the fort (396) is positioned on an eroding promontory and is in a poor condition and so was surveyed and photographed as part of the NERCZA Phase 2 survey.

Also visible in proximity to Lindisfarne castle was a small raised fire step and ramp (401). This could be a later industrial feature, related to the loading of material fro the quarry or lime kilns, however its position makes this function less likely. This feature is more likely to be part of the original fort at Lindisfarne Castle, as it is connected with a bank that encloses the rock outcrop. .

Fig 5.14.15 The stone built fire step, or loading bay and raised bank for the lime kilns.

Fig 5.14.16 The keep of the Tudor fort (396), overlooking the harbour

A further longhouse (409) was also recorded on the north side of the island, 200m west of the Green Shiels settlement. However this longhouse was occupied until the early 20th century, and was rebuilt in the post-medieval period. Despite this it is possible that this structure has medieval or even early medieval origins. This structure is gradually being buried by windblown sand.

Fig 5.14.17 Partially upstanding gable end of Longhouse (409)

5.14.11 20th Century

The archaeology of the Second World War is notable by its absence on Holy Island. The defensive features built along the shore on the landward side of the island seem to suggest the island was not considered defensible or practical to re-enforce and the bulk of the defences were built on the mainland.

5.14.12 Threat from erosion

The Shoreline Management Plan estimates the retreat along this part of the coastline at 0.1m per year (SMP2 for north East England).There are two key areas that face serious threat from erosion on Holy Island. The most obvious of these is the ongoing damage to the remains on St Cuthbert's Isle. The ongoing erosion here is seriously impacting upon known significant remains at every high tide and during every storm event. The effects on the lithic scatter at Ness End are harder to quantify but no less serious. Here the effect of wind blown sand is scouring the surface of the clay and eroding the land surface containing the flint. The area is not presently at threat from direct coastal erosion but there is evidence of slumping of the land surface into the 19th century quarry at Nessend.

5.14.13 Summary and conclusions

Holy Island is a site of archaeological, historical and environmental interest, with seven Scheduled Ancient Monuments on the island (including St Cuthbert's Chapel). The north shore of Holy Island is designated by SMP2 as No Active Intervention. However, there is a plan to maintain the natural dune system which protects this stretch of coast meaning it is not immediately under threat by direct coastal erosion. The site is however facing a threat from windblown sand and effects of run-off erosion.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA5	North Coast	5.1	NAI	NAI	NAI	Maintain natural dunes
MA5	East Coast	5.2	NAI	NAI	NAI	
MA4	Holy Island Cliff	4.7	NAI	NAI	NAI	
MA4	Holy Island Harbour	4.8	HTL	HTL	HTL	Maintain back defence to harbour

Table 5.14 Shoreline Management Plan policy for the area of Holy Island

On the south coast of Holy Island, and for St Cuthbert's Isle the SMP2 policy is No Active Intervention. This means that there will be no policy implemented to protect the remains at St Cuthbert's Isle. As a result, further archaeological investigation is crucial to preserve this monument through record. The only area where Hold The Line will be implemented is the harbour area, where the Tudor fort is located.

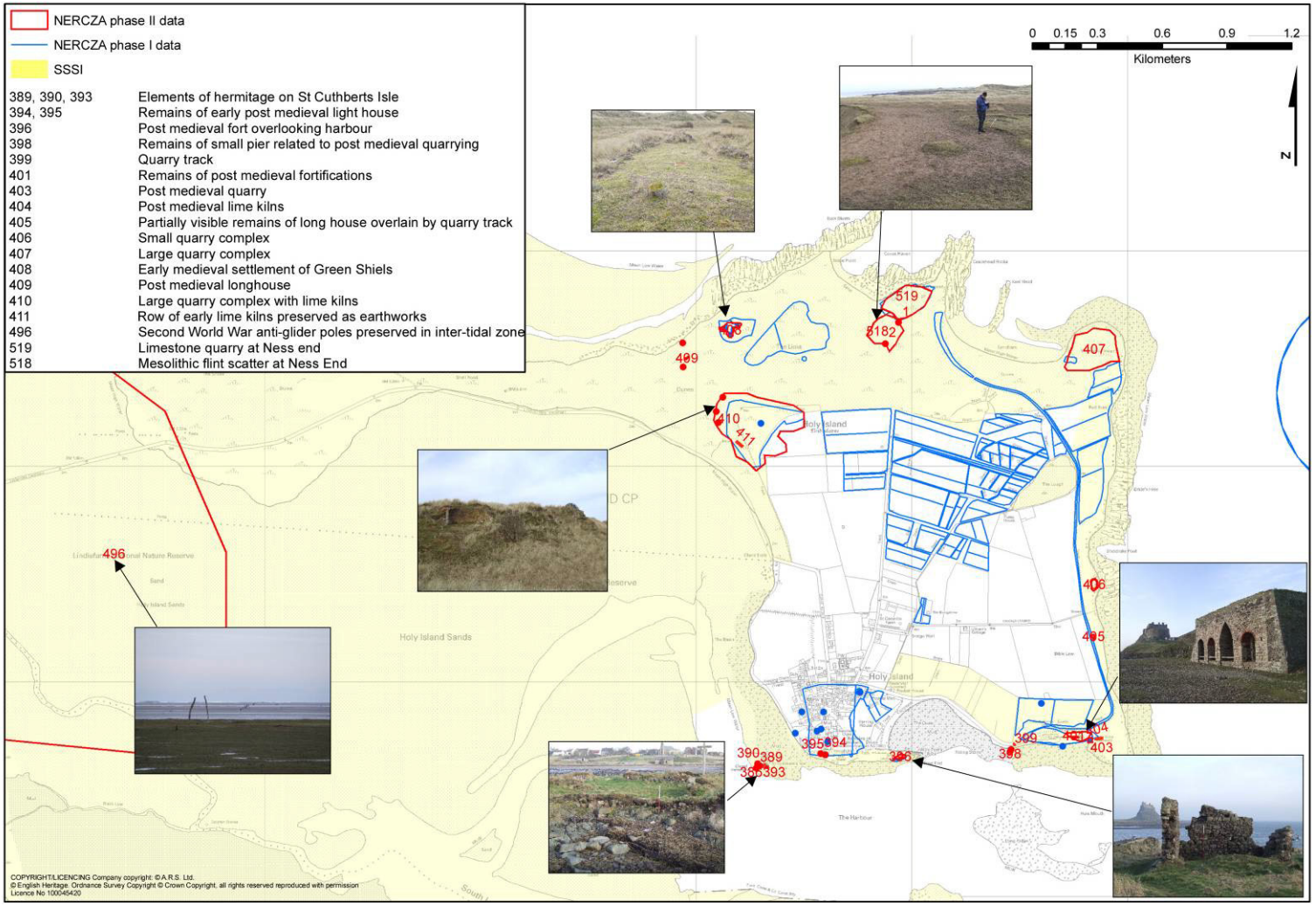


Fig 5.14.18 Archaeological features recorded by NERCZA phase 2 on Holy Island

5.15 Bamburgh, Northumberland

5.15.1 Background

The most notable visible landmark on this stretch of coastline is that of Bamburgh Castle itself. However, there are well-known and partially recorded remains of an early medieval cemetery to the south of the castle, at a location called the Bowl Hole. Here early medieval and prehistoric remains have been observed, revealed in a large dune blowouts. The Bamburgh Research Project have excavated and investigated the area of the burial ground for 9 years. The results of the excavations are now in the process of being analysed and a publication will follow.

The site is under direct threat of erosion from dune blowouts. The continued investigation into the area by the Bamburgh Research Project means that much work has already been undertaken at the Bowl Hole, and for this reason the principal aim of the survey was to quantify the effects of erosion in that area and also to investigate the area around Bamburgh to record any other features that may be visible in the surrounding landscape.

Fig 5.15.3Bamburgh Castle viewed from the village, looking east.

An extensive network of military features, including trenches, pillboxes and anti-tank defences are located around Bamburgh. As these were observed to be quite extensive it was decided to record them so they could be incorporated into the wider survey of the military archaeology of the Northumberland Coast AONB (see section 5.16).

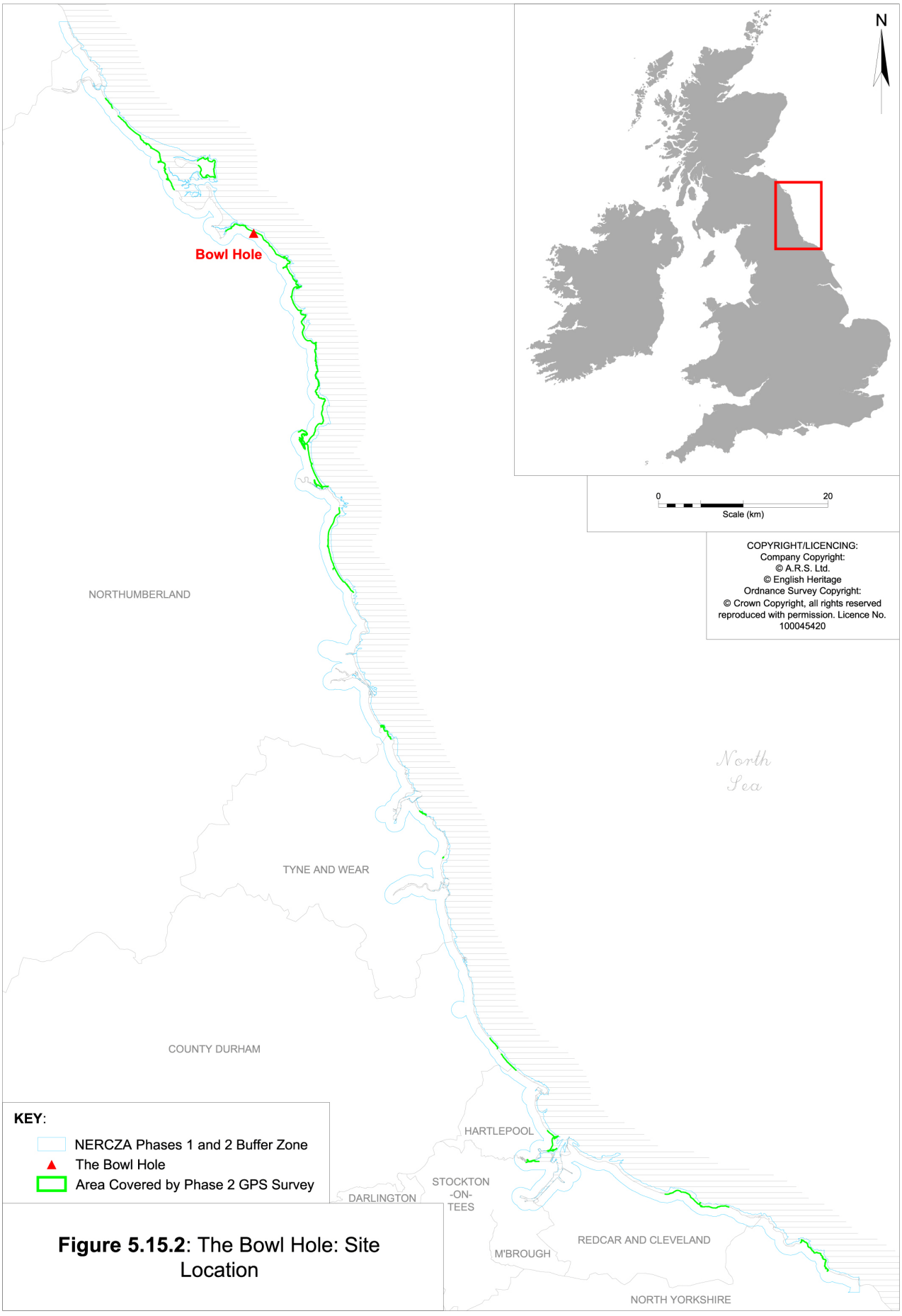


Figure 5.15.2: The Bowl Hole: Site Location

5.15.2 Location and geology

Bamburgh is located on the north Northumberland coast north of Seahouses. The landscape comprises low rolling hills with occasional basalt rock outcrops, such as the one on which Bamburgh Castle sits. The coastal setting is one of wide sandy beaches with dunes behind; to the north of Bamburgh a rock outcrop forms a shore platform to the south of the beach of Budle Bay. The geology is comprised of till and windblown sand overlying the basalt which occasionally outcrops.

Fig 5.15.4 The beach and dunes with Bamburgh Castle in the background, looking south.

5.15.3 Previous research

Extensive research has been undertaken around Bamburgh by the Bamburgh Research Project (BRP). They have investigated the burials in the dunes, history and archaeology of the castle and the surrounding environs. For the purposes of this rapid examination of the archaeology some of the results are summarised below.

The first excavations within the castle occurred in the 1960s and 1970s undertaken by Dr Hope-Taylor, who discovered the gold plaque known as the Bamburgh Beast, as well as the Bamburgh Sword. The results of these excavations were never published. In 1996 the Bamburgh Research Project was formed, with the aim of investigating the site using modern archaeological techniques to continue to research the archaeology of the castle and town (Young 2006).

The Bowl Hole burial ground was initially lost in the later medieval period but was revealed by a violent storm in 1817 (Young 2006). It subsequently became the subject of various antiquarian investigations. More recently the site has been excavated by the Bamburgh Research Project between 1998 and 2007. In June 2006 a three year project began between the Bamburgh Research Project and

Durham University to fully analyse the bone from the Bowl Hole excavations, the results of which are due to be published shortly.

5.15.4 NERCZA Phase 2 Archaeological Investigation

5.15.5 Prehistoric and Romano British periods

No Prehistoric or Romano British features were identified by the phase II survey

5.15.6 Early Medieval

The Bowl Hole burial site has been investigated in detail over the past 9 years by the Bamburgh Research Project. Although the area excavated is overlain by windblown sand the extent of the burial ground seen so far comprises a generally flat topography. However the NERCZA Phase 2 work has surveyed several low mounds which, although made up wind-blown sand, do not fit into the rest of the pattern of the dune build up surrounding them. It is possible that these low mounds are dunes "artificially" created by wind-blown sand collecting around and overlying pre-existing mounds. These could therefore represent burial mounds relating to the early medieval cemetery.

The site is in an area considered as being geomorphologically stable, however there is still the possibility of serious dune blow out, which could destabilise a large area of dunes and expose more of the burial ground to the elements. The area is monitored as part of the Bamburgh Research Project and so if any serious threat arises and places archaeological remains in danger of erosion they will be able to respond.

Fig 5.15.5 One of the possible burial mounds at the Bowl Hole.

5.15.7 Medieval

The castle and other medieval features were photographed but not accurately plotted with the GPS as part of the rapid survey as they are already well-known

and understood monuments, not at imminent risk of coastal erosion. The sites are also covered in some detail as part of the NERCZA Phase 1 survey report.

5.15.8 Post-Medieval

No industrial or obvious post-medieval features were observed during the course of the NERCZA Phase 2 survey.

5.15.9 20th Century

A concentration of Second World War military features survive in Bamburgh. These survive to the south of the castle and can be seen along the beachfront as well as being set back in the dune system. All are exposed to various forms of weathering and the effects of coastal erosion. These are discussed as part of the Northumberland Coast AONB military archaeology survey discussed in detail in section 5.16. However the remains will be discussed in brief here.

Fig 5.15.6 A hexagonal pillbox in the dunes at Bamburgh.

The concentration of upstanding military remains at Bamburgh includes three well-preserved pillboxes (370, 372, and 375). These pillboxes, combined with anti-tank defences and trenches, form a defensive pocket around a low-lying beach with a small knoll behind on which the trenches are positioned (see below)

Fig 5.15.7 The front aperture of one of the pillboxes.

Fig 5.15.8 The rear entrance of the same pillbox.

Pillbox 370 is actually a 6 inch gun emplacement, set in the same dune system, and this can be distinguished because of its large aperture and the fitting for a much larger gun mount. Pillboxes did not have these features and were of a much simpler construction. This is a very well-preserved example of such a gun position and is set within a more stable area of the dunes.

Fig 5.15.9 The front of the 6 inch gun emplacement (370)

Fig 5.15.10 The same emplacement looking head on at the gun aperture.

Fig 5.15.11 The concrete mounting for a 6 inch gun which would have been overlain by a metal mounting for the gun to swivel on.

As can be seen elsewhere on the coast there are earthwork remains of trenches and weapons pits around the defences at Bamburgh. Weapons pits (373) can be clearly identified around the central pillbox (375). These features occupy a low knoll defending the flanks of the pillbox (375) creating a natural defensive redoubt. Three additional trenches (376, 377 and 457) are brick lined, a very unusual construction type. This could simply be due to a surplus of bricks and some skilled labour locally. Alternatively, this could be a post-war training feature, for example re-enforcing the trenches as the Cold War began.

Another surviving element of the Second World War archaeology is anti-tank defences, which can be seen along the beach at Bamburgh. The wide open beaches were obviously conducive to amphibious assault and so the concentration of defences here is not surprising. However, to the south of Bamburgh Castle many have been removed, while on the beaches to the north larger quantities survive. Some have also been painted as dice (fig 5.15.13) and this re-working of the emplacements, while a commonly seen activity in the south of England, is not a common occurrence on the Northumberland coast.


Fig 5.15.12 One of the brick lined trenches (376) found around Bamburgh.


Fig 5.15.13 Anti-tank blocks painted as dice to the north of Bamburgh Castle.

The survival of a larger number of defensive structures to the north of the castle in comparison to the south could be explained by a number of factors. The land to the south is owned by the Bamburgh Estate and so may have been cleared to

improve the area for holiday makers. The northern part was perhaps not considered as important, or may have been in different land ownership at some point since the Second World War. Also the defences to the south simply may not have been as extensive as the defences to the north during the Second World War, although given the nature of the wide beach here this seems unlikely.

5.15.10 Threat from erosion

The Shoreline Management Plan estimates the retreat along this part of the coastline at 0.3-0.4 m per year (SMP2 for north East England).The threat faced by these remains from erosion is not as serious as elsewhere on the coast, although ongoing erosion of the dune system is constant. The wide sandy beaches and dune system protect most of the archaeological remains recorded from the most of serious effects of erosion at present. The anti-tank blocks seen on the beach to the north of Bamburgh Castle represent some of the most exposed archaeological remains but seem to be stable as there is little evidence of active erosion, such as has been seen elsewhere along the coast.

Elsewhere the main threat to archaeological remains comes from severe dune blowouts such as the one seen in 1817. There is no evidence to suggest that there is a high likelihood of future blowouts, although if they were to happen, either in the dunes where the military archaeology survives or the vicinity of the Bowl Hole, then archaeology could be exposed and placed at risk of erosion.

5.15.11 Summary and conclusions

The archaeology at Bamburgh is varied and incredibly significant, ranging from an early medieval Northumbrian royal stronghold, through to extensive Second World War military archaeology. It has a long history of research and investigation by various organisations and archaeologists. There is no doubt about the importance of the resource which survives at Bamburgh and it will be the focus of future research, not least by the Bamburgh Research Project. However the SMP2 policy for the area is No Active Intervention, so no plans are in place to prevent further erosion. The only comment in the SMP is to potentially realign the road if it becomes necessary.

Management Area		**Policy unit**	**Policy Plan**			**Comment**
			2025	**2055**	**2105**	
MA6	Bamburgh and St Aidens Dunes	6.1	NAI	NAI	NAI	Potential realignment of road in the long term

Table 5.15 Shoreline Management Plan 2 policy for Bamburgh

For this reason continued monitoring of the long-term effects of erosion on the archaeological sites at Bamburgh should be maintained. This will most likely be done through the continued work of the Bambrugh Research Project which could monitor erosion events and respond effectively to any increased threat to archaeological remains.

Fig 5.15.14 Anti-tank blocks exposed on the beach at Bamburgh.

5.16 NORTHUMBERLAND COAST AREA OF OUTSTANDING NATURAL BEAUTY MILITARY ARCHAEOLOGY SURVEY

5.16.1 Summary

In January 2010 a rapid archaeological survey and field investigation of surviving Second World War defences within the Northumberland Coast Area of Outstanding Natural Beauty was undertaken by Archaeological Research Services Ltd. The aim of the survey was to better understand the nature of the surviving earthwork and structural remains and record any previously unrecorded or unknown military or defensive remains within the AONB. This data could then be used to implement better interpretation of what survives and inform future management. A secondary aim of the project was to suggest possible ways of carrying out this interpretation. The survey utilised rapid walkover methodology with extensive photography, notes and accurate positional information utilising mapping grade Global Positioning System equipment.

The survey provided detailed condition statements for over 100 surviving remains along with photography, descriptive text and an assessment of any threat to the monument. This was collated within a GIS database along with additional data from Phases I and II of the North East Rapid Coastal Zone Assessments for this area of Northumberland. This allowed a comparison with what was known to previously exist with what remains are currently visible. This produced a complete record of Second World War remains within the AONB along with the current condition statements for each individual monument.

The survey revealed beach defences such as pillboxes and anti-tank blocks in situ and moved from their original positions, and these are clearly visible due to their size, frequency and construction. Several civil defence structures such as air raid shelters were also identified. Many of the identified remains were also reused later and Cold War Observer Corps monitoring posts were also recorded due to their Second World War components. The survey also uncovered more subtle and ephemeral features such as weapons pits and fire trenches still surviving as earthworks along the coast. Many of these features were recorded for the first time developing the knowledge of what survives of the defences for this part of the country during the Second World War.

The extent of surviving remains within the AONB has provided key areas that could be considered for further interpretation to the public. These include guided walks, self-guided walk leaflets, signage, Heritage Open Days, community workshops, oral history projects, and possible guide publications. All of this could help to promote and explain the surviving archaeology within the AONB to the public. Key sites such as Dunstanburgh, Craster, Boulmer, Budle and Goswick were identified as being prime targets for interpretation due to the concentrations of surviving military archaeology and the range of monuments that can be seen from the Second World War

By targeting these sites and utilising the detailed survey data from the fieldwork an effective program of interpretation of the Second World War military remains that survive within the AONB could easily be undertaken. This will develop local understanding and also help visitors to the area understand the military archaeology they can see around them.

5.16.2. Introduction

In January 2010 Archaeological Research Services Ltd was commissioned by the Northumberland Coast Area of Outstanding Natural Beauty to undertake a rapid survey of archaeological remains dating from the Second World War that survive within the AONB, the results of which are incorporated into the wider NERCZA Phase 2 report here. The survey methodology was the same as that employed for the larger scale survey (see section 4.2), although it only focused on the military remains. The main objective of the survey was to record and interpret any surviving Second World War remains within the AONB. The results of this would then provide possible areas and sites for interpretation of the remains for those visiting the AONB.

Fig.5.16.1 Pillbox constructed of concrete sandbags south of Dunstan Steads.

The project area encompassed the whole of the AONB meaning that the total area to be surveyed was 138km^2. The ultimate aim of the project was to provide potential targets for further interpretation to the public so, due to the large size of the project area, those locations with public access already in place were prioritised. Despite this the survey achieved excellent coverage of the AONB and 141 records of surviving military and related features from the Second World War were entered into the project GIS. Additional data from Phase 1 of the North East Rapid Coastal Zone Assessment was also incorporated, adding a further range of Second World War sites that were already known to have existed.

The compilation of these records, along with detailed condition statements and photography, provide a useful land management tool for the AONB. This will allow for a more informed knowledge base for managing these important assets in the future. This data can then also be used to plan public interpretation of the remains, based on location, access, condition and risk to the remains.

5.16.3. Location

The Northumberland Coast AONB extends from the River Coquet, to just south of Berwick at Scremerston. It encompasses the settlements of Bamburgh, Seahouses, Dunstanburgh, Craster, and Alnmouth and is 138km^2 in area (Fig 5.16.2). There is considerable geological variation within this area, although the bedrock is primarily limestone and sandstone. The AONB also contains a range of different landscape types including salt marsh, dune systems, wetlands and hard rock cliffs as well as arable fields and a range of foreshore types. Land use is mostly arable agriculture with some areas surviving as pasture. There is also evidence of former industrial activity including creation of quarry complexes and open cast coal mining.

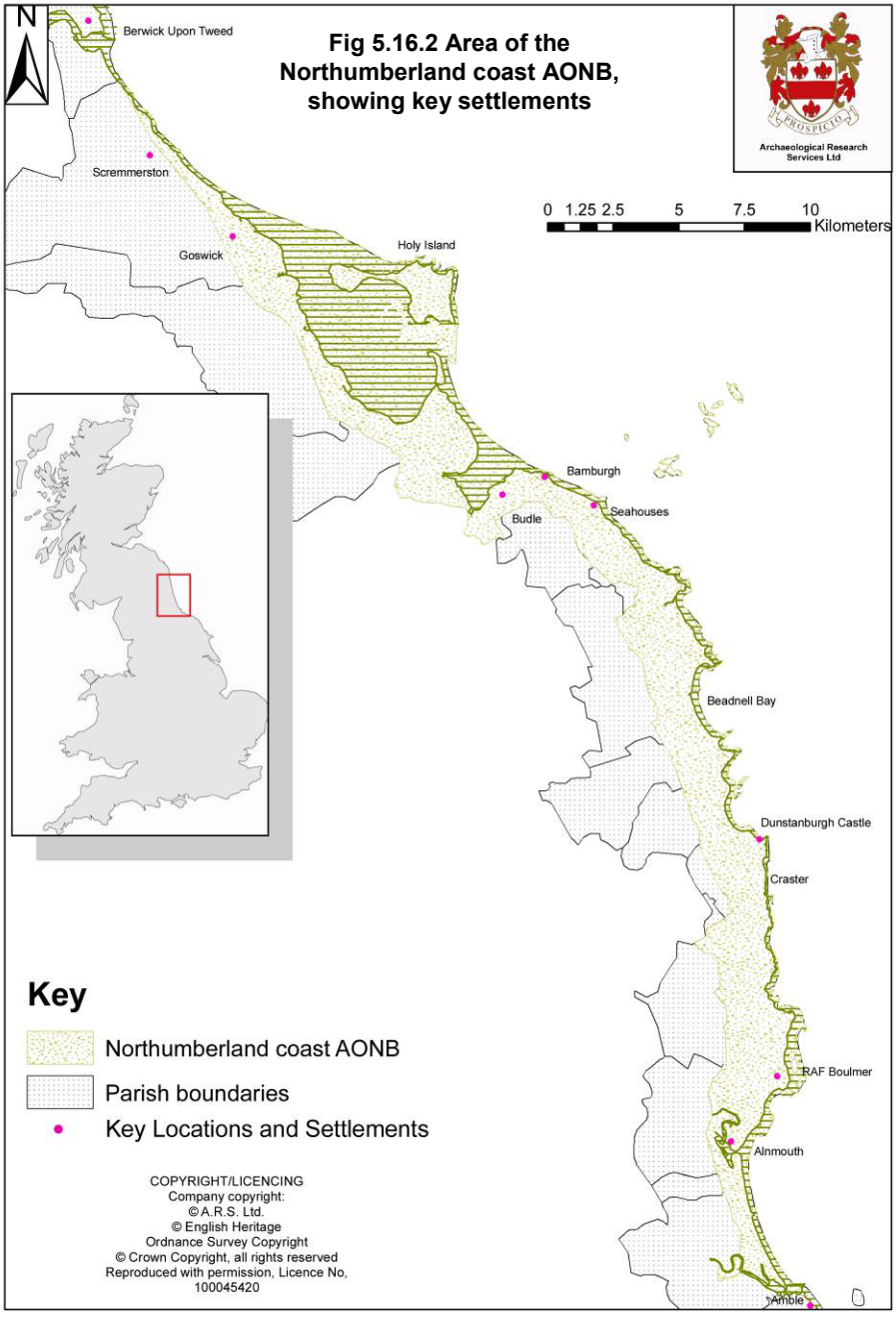


Fig 5.16.2 Area of the Northumberland coast AONB, showing key settlements

5.16.5 Previous Archaeological research

Although much archaeological research has been undertaken within the Northumberland Coast Area of Outstanding Natural Beauty, none of this work has been undertaken to look specifically at the surviving Second World War remains. This project has collated the available evidence from documentary sources and aerial photography, together with extensive field survey, for the first time.

Other work, undertaken at a national level, includes the Defence of Britain Project commissioned by the Council for British Archaeology. This project produced a database of 20,000 military sites nationwide. However it was far from a complete record of what now survives on the ground as both aerial photographic survey and field investigation of the North East coast as part of the NERCZA project has revealed that much more survives than was recorded by the D.O.B project.

Between 2003 and 2006 English Heritage undertook a multi-disciplinary investigation of Dunstanburgh Castle and its environs (Oswald *et al.* 2006). This study involved historical investigations, as well as architectural and earthwork surveys; it also involved study of high-quality aerial photography from 2003. Although the investigation covered all aspects of the archaeological narrative of the area, a particular focus was made on the evidence surviving from the Second World War. Pillboxes, beach defences, weapons pits and a mine field were all recorded in the area surrounding the castle and local people's testimony was also incorporated to build up more social history of the area during the Second World War. The wider area was also investigated to put the Second World War defences into context which recognised the depth and complexity of known defences, but not all existing earthworks and structures were recorded due to the scale of investigation.

English Heritage undertook a detailed earthwork survey of Craster Radar Station between 2003 and 2005, producing a Research Series report in 2006 (Hunt and Ainsworth 2006). This report covered the nature and extent of upstanding remains within the area of the former radar station and also provided a detailed historical background to the site and the development of radar technology.
The Second World War military archaeology of the Northumberland coast has been enthusiastically investigated by highly motivated amateur groups and individual over the years and several pieces have been published in recent editions of the Archaeology in Northumberland magazine produced by Northumberland County Council.

5.16.6 Description of Surviving Remains

The survey recorded many types of monument. For ease of interpretation and reference they have been grouped here into nine main groups. Detailed typologies have not been included in favour of a more interpretive approach which also considers management issues and any threats faced. Although the distribution of surviving sites across the AONB is fairly regular there is more survival closer to the coastline. Agriculture, industry and settlement have removed some of the military archaeology further inland where as sites survive along the less well-developed coastal area. Several key locations with concentrations of military archaeology were identified, such as RAF Boulmer,

Dunstanburgh Castle, and the area around the Holy Island causeway including Goswick Sands. (Fig. 5.16.27). The exact nature of what remains at these locations is described below.

5.16.6.1Pillboxes

Pillboxes are the most easily recognizable surviving structures from the Second World War. The combined NERCZA Phase 2and AONB survey recorded 37 pillboxes surviving in some form within the AONB (Fig. 5.16.5), all of different construction and size. Although the Ministry of Defence produced many different standard types of pillbox during the Second World War (Fig. 5.16.4 and 5.16.6) in reality there are many more as they were constructed to suit the requirements and setting of each individual location in an *ad hoc* manner by many different groups around the country. For this reason a type 23 pillbox in Northumberland will differ considerably from a type 23 pillbox in Suffolk. The range and complexity of pillbox types has been covered in detail by other publications (e.g. Osbourne 2008) and so will not be discussed here. The current report will not attempt to distinguish each individual type recorded as this is not of immediate practical use, except to the interested military researcher, but will concentrate on the survival of the remains and management issues which are of more benefit to the AONB.

Pillboxes are located at weak points in the coastal defence. The mainstay of the defences would have been barbed wire entanglements, anti-tank blocks, fire trenches, and weapons pits. The pillboxes are often thought to be the main part of the defence when in fact they were merely reinforcing the defence infrastructure which is now less visible. The pillboxes today represent key indicators of areas where more surviving remains could be found. This is especially true in the area around Dunstanburgh and Embleton where the pillboxes (of various types) are all located in proximity to surviving earthworks of trenches and weapons pits.

Fig 5.16.3 Pillbox located in dunes at Dunstanburgh (scale = 2m)

Fig 5.16.4. Pillbox constructed of concrete sandbags south of Dunstan Steads

Most pillboxes extant within the AONB are very well-preserved, with most surviving along the coast or at road edges. Examples at Dunstanburgh and Craster (633. 635, 636, 637,640, 645, 658, 657) are exceptionally well-preserved although those on the edge of the dune system face the threat of erosion from the sea. Other less well-preserved pillboxes can be seen, such as one in the dunes between Bamburgh and Seahouses (672) (Fig. 5.16.21), which has been deliberately destroyed by explosives in the post-war period. The blast damage is still in evidence and the pillbox is now at risk of collapse, both as a result of the original blast and due to natural slumping.

Management of these structures appears to be straightforward as most are set within agricultural land, form part of field boundaries or are next to tracks. Therefore they do not generally interfere in the current land use and face little threat of demolition or removal. Those along the coast are at more threat from natural causes and several are eroding or slumping as a result of erosion. These historic assets are protected in line with the prevailing Shoreline Management Plan policy unit and little can be done at present to change the level of threat. Despite the level of threat to the pillboxes along the coast, these structures are all along public rights of way or permissive paths. These paths make them easily accessible and these pillboxes therefore lend themselves to exploration by the public.

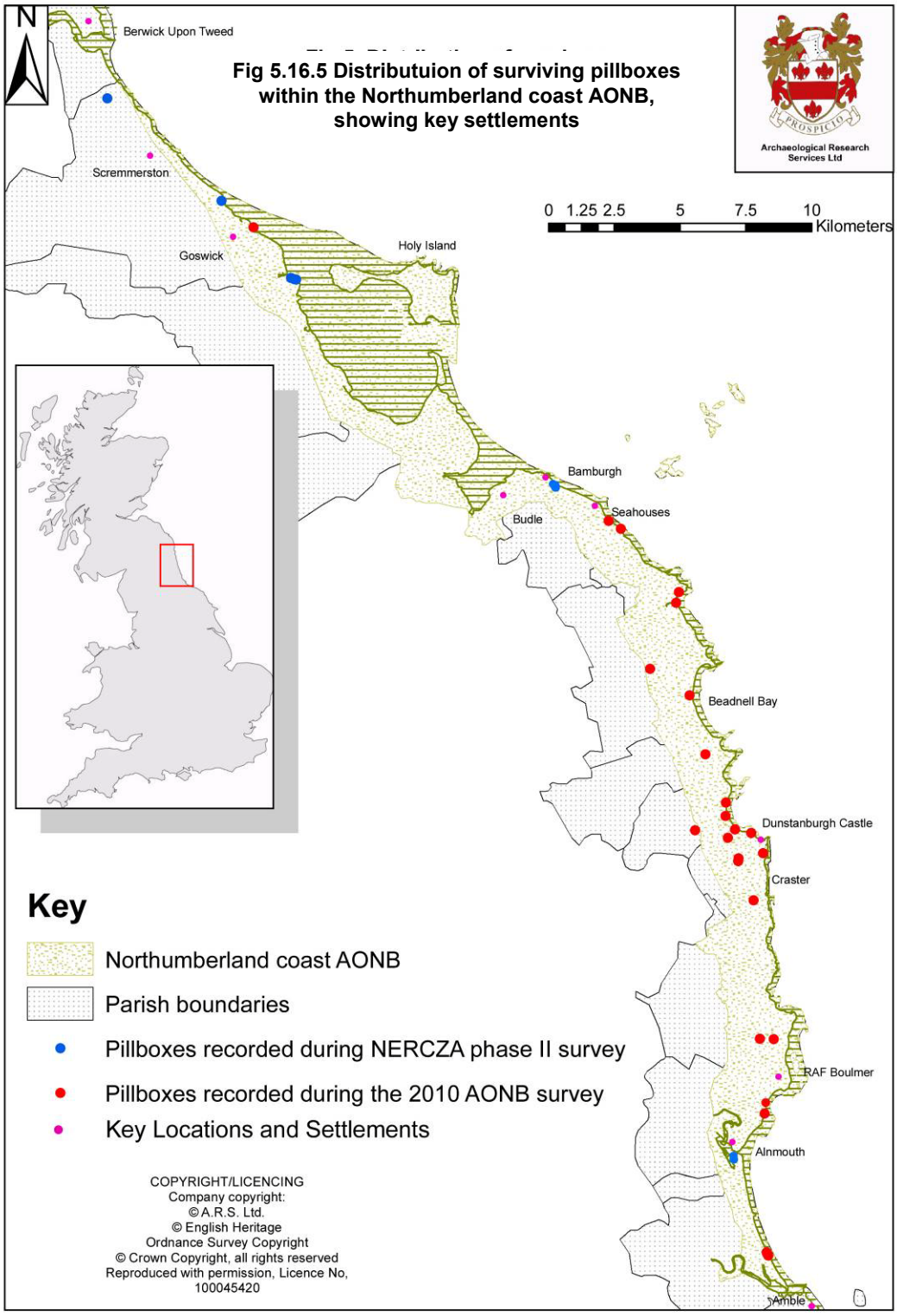
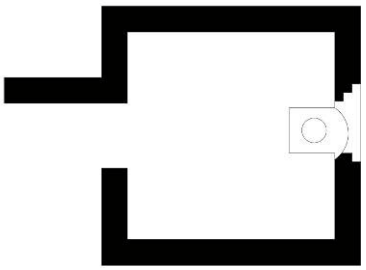


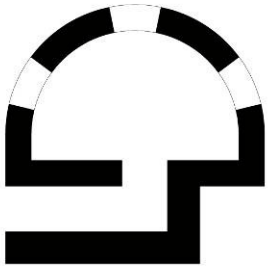
Fig 5.16.5 Distributuion of surviving pillboxes within the Northumberland coast AONB, showing key settlements

Figure 5.16.6: Schematic plans of Pillbox types found in Northumberland

Machine-Gun/Anti-Tank Position, Bamburgh

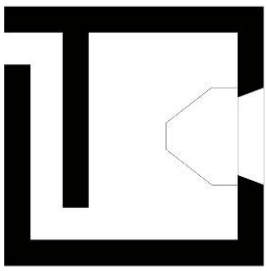


Pillbox, Dunstan Square



Pillbox, Embleton Bay

Machine-Gun Position, Embleton Bay



5.16.6.2 Trenches and Weapons pits

As mentioned above, although pillboxes are perhaps the most commonly visible surviving defensive structure from the Second World War the bulk of the manned defences would have been hand-dug trenches and weapons pits, with pillboxes reinforcing weak points. This defence infrastructure was extensive and the extent of trenches and weapons pits in existence during the war was plotted by the aerial survey element of Phase 1 of the North East Rapid Coastal Zone Assessment. This produced detailed transcription for the Northumberland Coast AONB area and this was utilised during the Phase 2 NERCZA field survey and the AONB survey.

Fig 5.16.7. Weapons pit preserved as an earthwork, directly south of Dunstanburgh castle.

The temporary nature of these defences has led to the common assumption that they have either been filled in or no longer exist. Field survey has revealed that these monuments frequently survive as earthworks at several locations along the Northumberland coast. Within the Northumberland Coast AONB the best survival can be seen around Dunstanburgh Castle. The strip of stable dunes between Dunstanburgh Castle and Embleton contain some of the best-preserved examples. These are located in a narrow strip between the golf course and the beach where the lack of development and agriculture have left these earthworks untouched since the Second World War. Other locations with surviving remains of earthwork defences include Budle, Bamburgh, Benthall, Boulmer and Alnmouth.

Fig 5.16.8. Recording a Second World War Fire Trench, preserved as an earthwork north of Dunstanburgh Castle

Surviving earthwork defences have not been recognised inland from the coast within the AONB as part of this survey (Fig.5.16.9), and this is not surprising. The combined factors of open-cast mining and arable agriculture will have obliterated any trace of these sometime ephemeral features. This makes the examples that survive on the coast potentially more important as they form the main surviving remains from the defensive infrastructure and they are at a greater risk from active erosion and long-term coastal retreat.

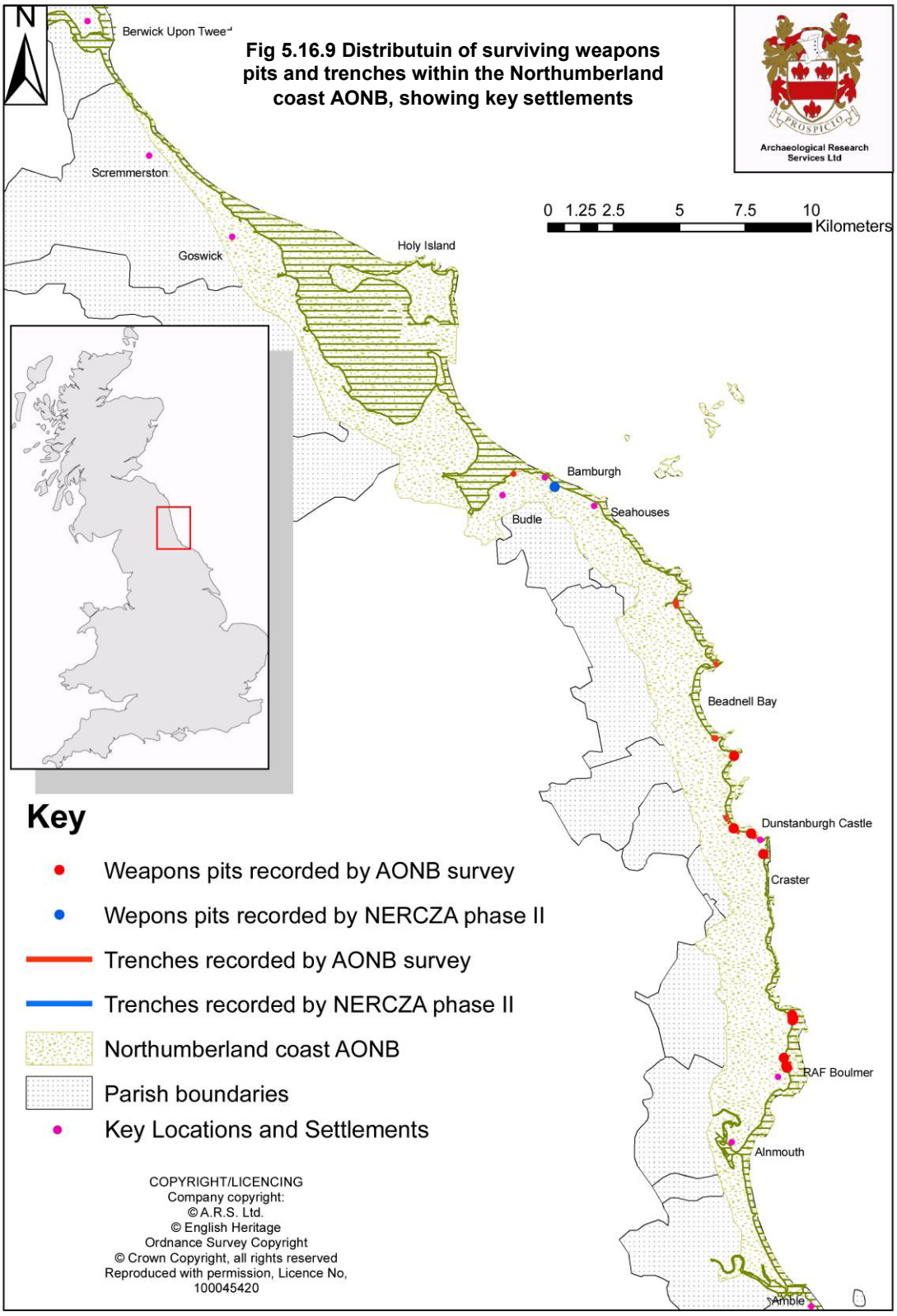


Fig 5.16.9 Distributuin of surviving weapons pits and trenches within the Northumberland coast AONB, showing key settlements
N
Berwick Upon Tweed
Scremmerston
Goswick
Holy Island
Bamburgh
Seahouses
Budle
Beadnell Bay
Dunstanburgh Castle
Craster
RAF Boulmer
Alnmouth
Amble
0 1.25 2.5 5 7.5 10
Kilometers
Archaeological Research Services Ltd
Key
Weapons pits recorded by AONB survey
Wepons pits recorded by NERCZA phase II
Trenches recorded by AONB survey
Trenches recorded by NERCZA phase II
Northumberland coast AONB
Parish boundaries
Key Locations and Settlements
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5.16.6.3 Anti-tank Defences

Anti-tank blocks are another common sight along the beaches of the North East coast. They represent another common surviving form of Second World War monument due to their size, construction and the scale of deployment (Figs 5.16.10 & 5.16.11). Designed to impede tanks progressing inland from landing beaches they are sometimes known as Dragons Teeth, however this term usually refers to the more triangular blocks, of which none were recorded along the Northumberland coast. The types seen in Northumberland are commonly referred to simply anti-tank cubes or blocks.

Originally the area of anti-tank blocks deployed would have been much more extensive and this can be seen from 1940s aerial photography. The anti-tank blocks that are visible now (Fig. 5.16.10) are only a fragment of the original deployment. This can be attributed to several key reasons. Firstly, many of the anti-tank defences were removed in the immediate post-war period; they cluttered up beaches and access routes and had outlived their usefulness. Secondly, they were moved from their original position to form new anti-erosion defences and this can be seen around Boulmer where the anti-tank blocks have been incorporated into a sea wall defence a distance from their original position. The third reason is natural; many anti-tank blocks have actually encouraged dune growth as they have gradually trapped sand around them. This can be seen in areas around Fenham and Goswick were new dunes have built up around the anti-tank blocks which have helped to stabilise the area surrounding them, accumulating sand and protecting the coast from erosion. This has meant that many lines of anti-tank blocks have disappeared from direct view but the former line of them can be traced in unusually straight and angular dune systems, with the occasional block visible.

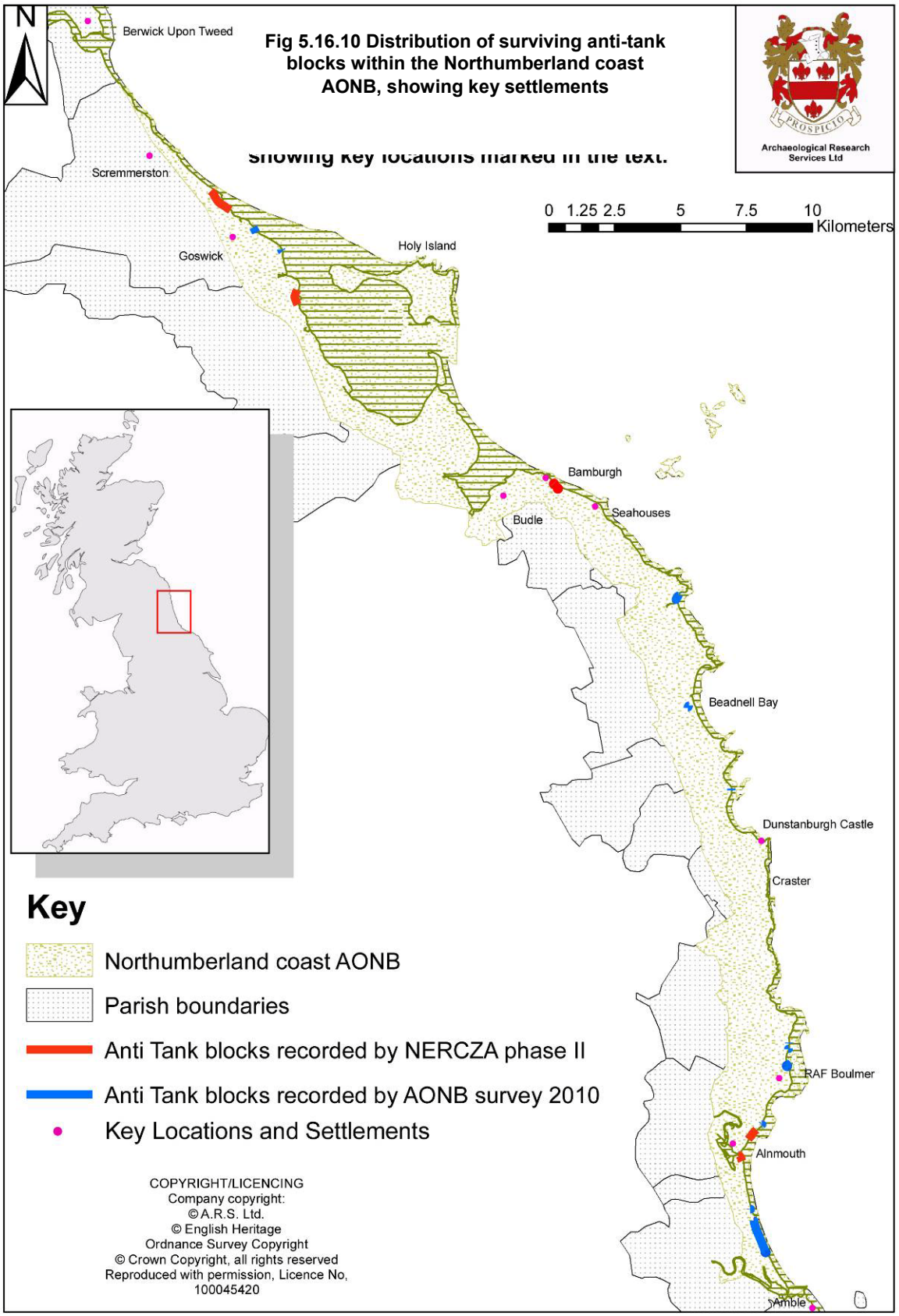


Fig 5.16.10 Distribution of surviving anti-tank blocks within the Northumberland coast AONB, showing key settlements

showing key locations marked in the text.

Fig 5.16.11. Anti-tank blocks on the beach directly north of the mouth of the River Coquet.

The main threat to anti-tank blocks is from removal by those responsible for managing the land. Due to their large number they are often not considered to be important, however the key role they played in defending the coast should not be underestimated as they are an important part of the story. They are also often highly exposed to coastal erosion on beaches and eventually face being broken up by wave action. This is the case at Boulmer were the few *in situ* anti-tank blocks are at risk from erosion.

5.16.6.4 Gun Emplacements

There are two main types of gun emplacement still existing within the Northumberland Coast AONB. Large coastal battery sites, of which two still exist, and machine gun emplacements which are more numerous. The coastal battery sites within the AONB, which originally housed large calibre guns for anti-naval defence (Fig.5.16.12), are located at Budle (500) and Goswick (463). These two sites are very similar in construction and location, both being situated on a high point and defending a potential landing beach. The site at Budle differs slightly from that at Goswick in that there are also well-preserved subsidiary structural remains of unknown function associated with the gun battery (502).

Fig 5.16.12. Coastal battery gun emplacement covering the potential landing beach at Goswick (463).

The two coastal gun emplacements at Goswick and Budle are clearly impressively built structures. They were built to house 6 pound guns, something evident from their size and the remaining fittings on the floor of each emplacement However 6 pound emplacements are usually simpler structures, similar to those seen at Bamburgh, made with thin concrete walls. The Goswick and Budle emplacements also have interesting internal features such as storage for shells built into the walls utilising drain pipe sections. These drain pipe sections are angled outwards and have scratch mark evidence of stoppers used to prevent the ammunition sliding out. This, along with the scale of construction, is very unusual and there is nothing known which is directly comparable nationally. It is even possible that they are based on German designs although there is no direct evidence for this except the visual similarities.

Fig 5.16.13 Budle battery (500), clearly demonstrating scale of construction.

Fig 5.16.14. Machine gun emplacement exposed in dunes south of Beadnell.

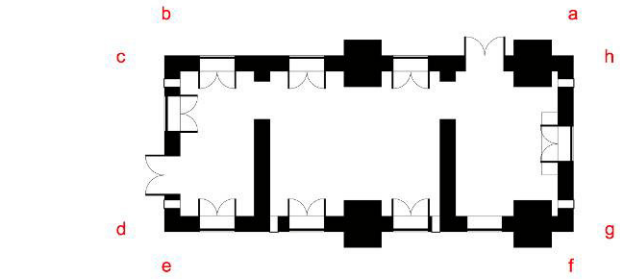
The more numerous type of gun emplacements are the machine gun sites. These are easily mistaken for pillboxes but can be distinguished by their larger apertures and the existence of a mounting base for a machine gun (Figs 5.16.13 and

5.16.14). Machine gun emplacements were usually placed to defend key areas on landing beaches and good examples can be seen at Beadnell Bay (657) and Bamburgh (370). The machine gun emplacements face the same management issues as pillboxes due to their similar nature and position. The larger coastal batteries are less at risk due to their larger size and more massive construction.

5.16.6.5 Radar Stations

Within the Northumberland Coast AONB only one Second World War Radar Station is extant. This is located on the Heugh at Craster (634) and is already well-known and recorded. This site was part of the Chain Home Low sites which were positioned all around the East and South coast during the Second World War. The two principal buildings, the transmitter/receiver block and the standby set block, survive. There are also numerous earthwork remains relating to the defence of the station and also the later use of the site as a Prisoner of War camp. The site was subject to a Level 3 detailed survey from 2003 – 2005 and this recorded the earthwork and structural remains in great detail. This survey also suggested the use of the site as a POW camp from 1944 onwards. This was previously based on local testimony only but the survey revealed some physical evidence including cultivation terraces and the existence of a possible exercise area (Hunt and Ainsworth 2006).

Fig 5.16.15. Surviving buildings at Craster Radar Station, later used to house Prisoners of War.



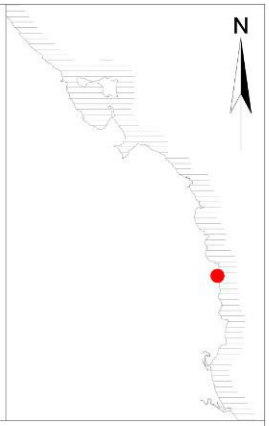
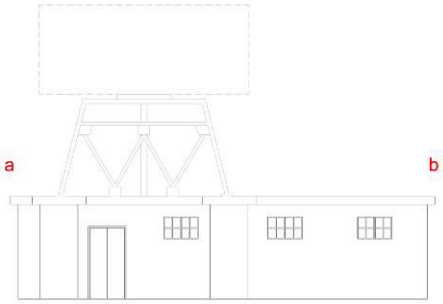
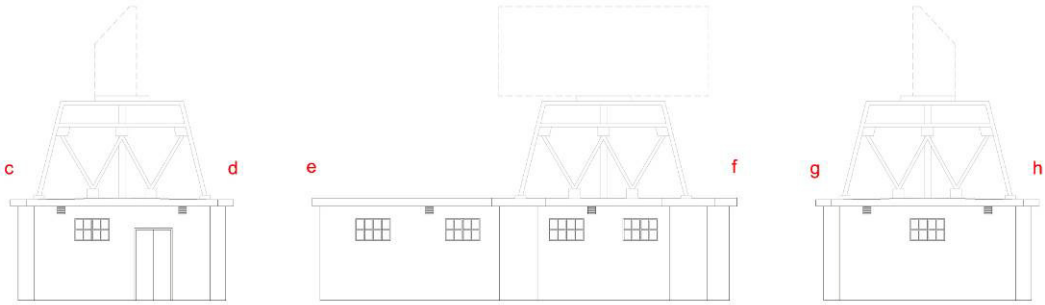


Fig 5.16.16: Plan and Elevations of Craster Coast Defence/Chain Home Low Transmitter/Reciever Block





CD/CHL Transmitter Receiver Block, Craster

5.16.6.6 Airfields

The only Second World War Airfield surviving within the AONB is RAF Boulmer (612). This is still used by the RAF as a base for operating the Sea King search and rescue helicopters and as a Radar Station. This site occupies two separate sites, the Ops site located to the west and the Main site to the north of what was the former RAF Bomber Command station during the Second World War. The site originally was a bombing decoy, used as a decoy for RAF Lesbury, but when this smaller station closed the decoy at Boulmer became a real airfield.

Fig 5.16. 17. The surviving remains of the former runway at RAF Boulmer looking north-west from the road.

The site grew and the current main site of RAF Boulmer currently occupies the bulk of what was the Second World War air base. Several Second World War structures can still be seen in the trees opposite the main entrance to RAF Boulmer and a pillbox is visible to the east of these. On the ground much of the infrastructure surrounding the old runways is still visible in pastoral and arable fields. Most striking is the line of the old runway, obviously unsuitable for arable farming due to the concrete construction, left as pasture in a long, linear field (Fig. 5.16.18).

Several buildings are visible in the fields surrounding the old runway but these are not easily accessible as they are set within privately owned fields with little or no access. These surviving structures are set on field boundaries or next to tracks so, as with the pillboxes seen elsewhere; they face little threat of removal due to their location. The structures that would be under threat in most cases have already gone. This can be seen by a comparison of the field survey data with the data from aerial photographic survey of NERCZA Phase 1 (Fig. 5.16.19).

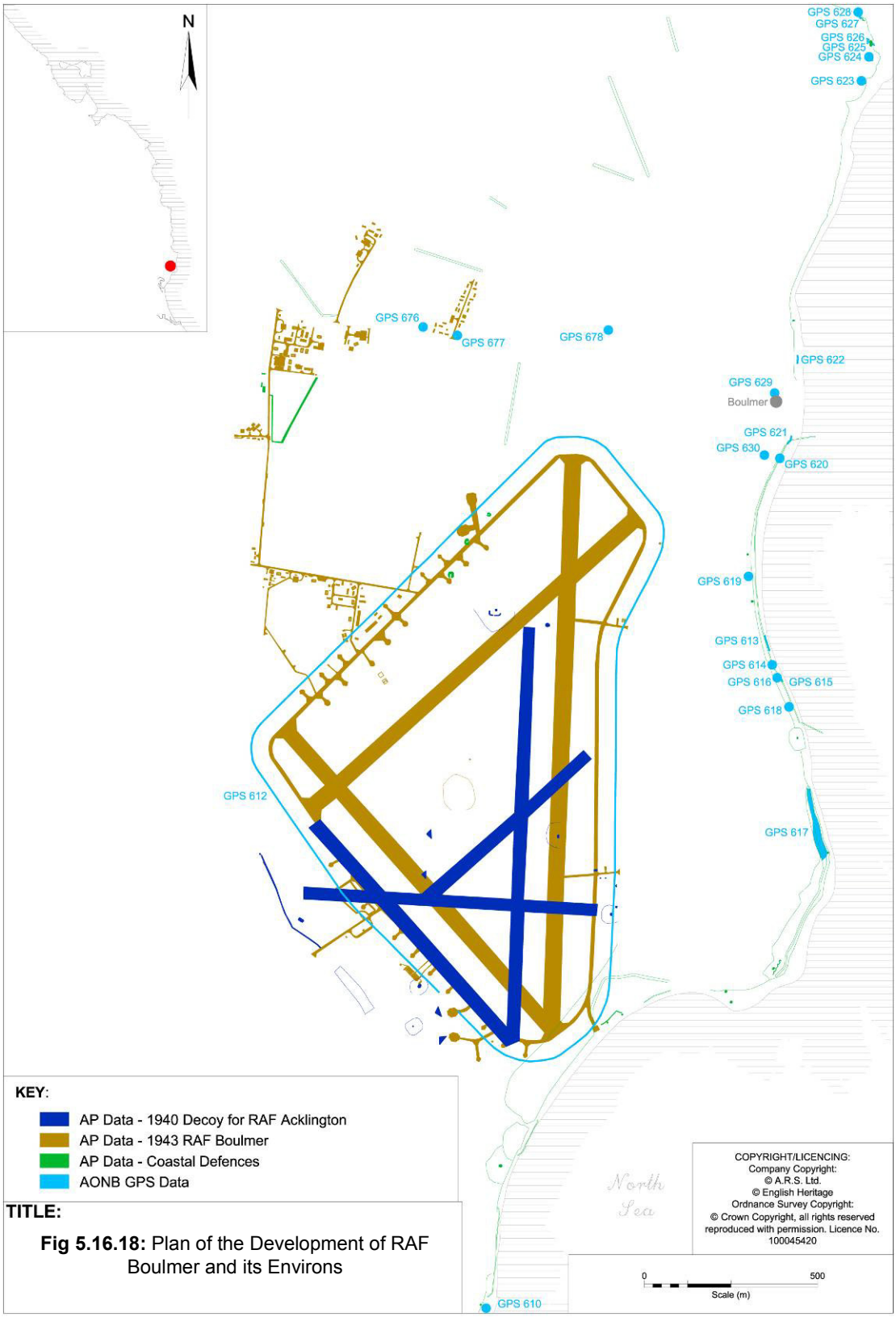


Fig 5.16.18: Plan of the Development of RAF Boulmer and its Environs

5.16.6.7 Civil defence structures

Civil defence structures such as air raid shelters do not often survive in urban areas due to development since the Second World War. However, in more rural areas they are less frequent due to the lower threat from bombing. In Boulmer itself, two air raid shelters survive. These brick built structures can still be seen in the yard of the church (629) (Fig. 5.16.19) and the front garden of the former coastguard watch building (630). These are fairly unusual structures to survive in such a location and could be related to the initial use of RAF Boulmer as a bombing decoy. There is evidence from Second World War aerial photography that there were bombs dropped in the vicinity, as bomb craters can be seen north of Boulmer itself.

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Fig 5.16.19. Air Raid Shelter (629) in the churchyard at Boulmer. The sunken entrances are still visible at both ends.

Fig 5.16.20. Stanton air raid shelter in garden of the Old Rectory, Howick.

The explanation for the location of the two air raid shelters can be seen from the use of the proximal buildings. The church was originally used as a school house as well and this is exactly the kind of civilian building that would have had an air raid shelter despite a rural location. The other building was a coastguard lookout house and probably would have had Royal Observer Corps connections as well, again necessitating an air raid shelter.

Another type of air raid shelter was seen to the rear of the Old Rectory at Howick (Fig. 5.16.20). This type of shelter is a Stanton shelter identifiable by its curved concrete roof. It is now used as a storage building and has had a window broken through at the rear.

5.16.6.8 Removed / Rubble remains

Some of the sites recorded consisted of defences that had been removed, destroyed or eroded by the sea. The remains of these usually survive as concrete rubble eroding out of dunes or cliffs (Figs. 5.16.22 & 5.16.23) and the original form and function of these structures has been lost. Some interpretation can be applied to these sites by utilising NERCZA Phase 1 data which has already positively identified military sites by using period aerial photography. This data can be interrogated to apply a possible interpretation to fragmentary or rubble remains and this has been done within the GIS. Although in most cases definitive identification is not possible it does highlight that there are still many possible sites buried in dune systems that may survive in some form.

Fig 5.16. 21. Destroyed pillbox (672) in the dunes between Seahouses and Bamburgh.

Fig 5.16.22. Concrete of Second World War date eroding out of the cliff base on the beach near Boulmer.

Fig 5.16.23. Probable pillbox eroded onto the beach near Seahouses; there are many such examples along this stretch of coast.

5.16.6.9 Miscellaneous

Many more ephemeral and unusual earthworks and structures were recorded, some of which have not yet been positively identified. Earthwork remains of three minefields were recorded, at Birling, Dunstan (Fig 5.16.24) and also at Dunstanburgh beneath Scrog Hill. The last of these had previously been recorded by English Heritage in 2003 – 2005. Most other earthwork features were identified as anti-glider trenches or as possible platforms for buildings. Other structures visible around the Holy Island causeway have been identified as anti-glider poles deployed during the Second World War. These simple lines of wooden posts seen to the north of the causeway were used to prevent an enemy glider landing on the sands at low tide and deploying infantry. They survive today in fragmentary form although some clear lines can still be seen.

Fig 5.16.24. Evidence of the former minefield between Dunstanburgh and Beadnell. This is one of several craters created by the removal of the mines

Unusual concrete structures at Budle (502) (Fig 5.16.25) have previously been associated with the battery structure. Although clearly associated with the coastal battery (500), this feature is actually part of an earlier industrial complex associated with a quarry several kilometres to the south. The Budle battery (500) is constructed on top of an embankment for bringing quarry tucks filled with stone to the site. The miscellaneous concrete structures are actually the remains of winding gear and machinery to transfer the stone to the pier to the east.

Fig5.16.25 Concrete base for winding gear for the quarry 2km to the south.

5.16.7 Discussion and Conclusions

The Northumberland Coast Area of Outstanding Natural Beauty has a large range of archaeology within it. The archaeology of the Second World War represents the period with the most commonly surviving evidence yet it is one of the least understood. The defences of the coastline represent temporary structures and earthworks which, unless preserved, promoted and interpreted will pass out of living memory very soon. This will make it harder to interpret and to understand in the future once the last generation surviving from the 1940s is gone.

The fact that these remains are now mapped and interpreted allows strategies to be devised for interpreting what remains to the public and also for their future management. Now that the importance and fragility of the more ephemeral earthwork remains such as trenches and weapons pits has been recognised land management polices can take these monuments into consideration as significant archaeological remains.

Building on this, the interpretation of the Second World War remains to the public will help to inform management. Once land owners and the public begin to understand the significance and function of the Second World War remains in their area they can begin to get more involved in protecting them. This is true of the Second World War more than any other period of archaeology as the events that caused the construction of these defences are still within living memory. This means that the connection to the recent past, through family members and friends, is still there which provokes an interest. This is something that was evident talking to many landowners and local residents during the course of the

field survey. Further interpretation can only be beneficial and lead to local interest growing and the attraction of new visitors to the AONB.

Many of these military remains are under direct threat of erosion, preserved between the former area of open-cast mining and the ongoing erosion along the coast. Although one of the most recent periods of archaeology observed during the course of the wider NERCZA project they represent some of the most threatened and poorly understood remains. In many cases this is a direct relationship, the lack of understanding from land owners and managers cause these important remains to be dismissed due to their relatively recent origins. However this does not take away from their potential importance, especially when considering the unique nature of remains such as the Budle and Goswick gun emplacements which are singularly important regionally and potentially nationally.

Fig 5.16.26 The track for the quarry leading to the winding gear base at Budle

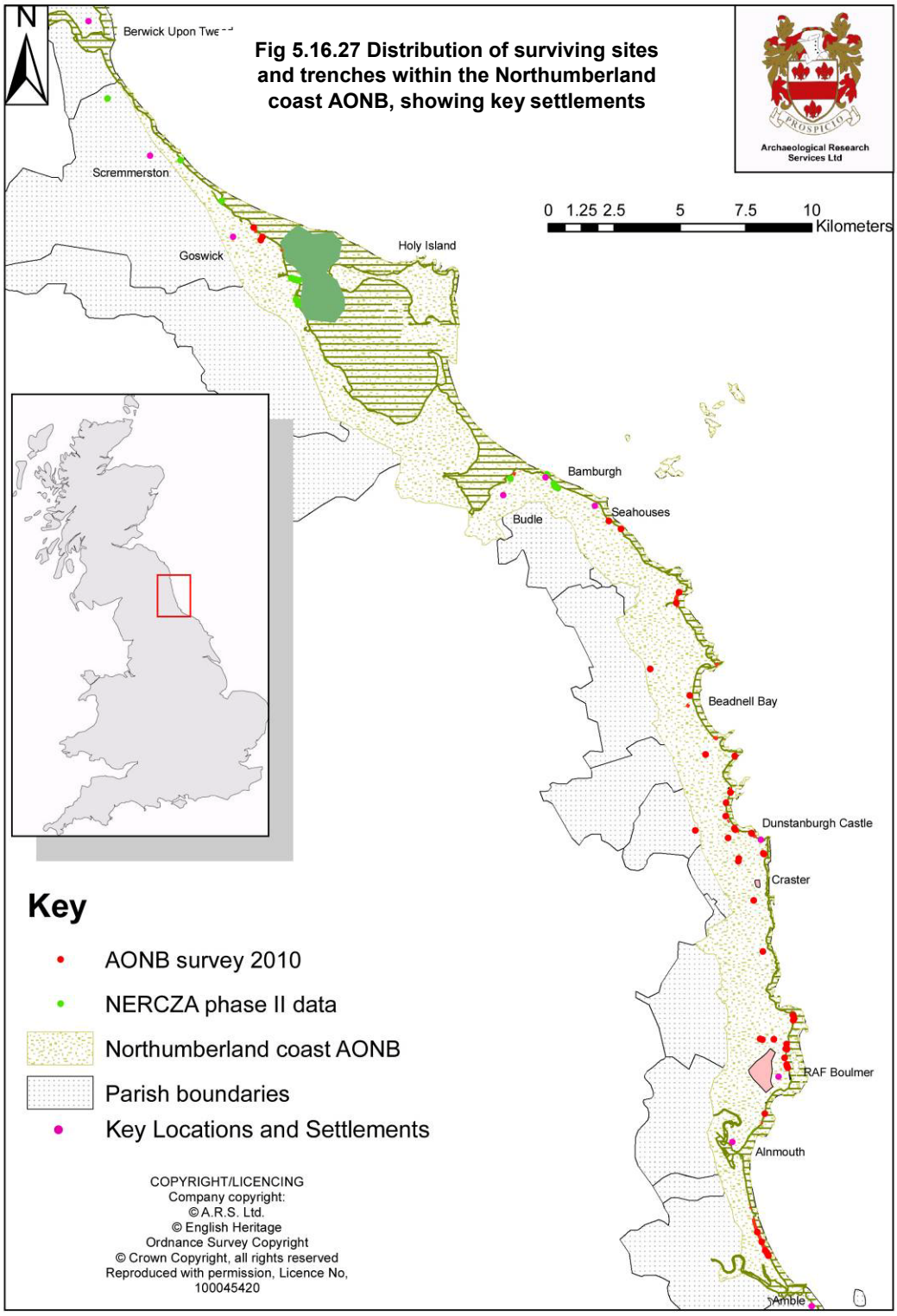
Fig 5.16.27 Distribution of surviving sites and trenches within the Northumberland coast AONB, showing key settlements
Archaeological Research Services Ltd
N
0 1.25 2.5 5 7.5 10
Kilometers
Berwick Upon Tweed
Scremmerston
Goswick
Holy Island
Bamburgh
Budle
Seahouses
Beadnell Bay
Dunstanburgh Castle
Craster
RAF Boulmer
Alnmouth
Amble
Key
AONB survey 2010
NERCZA phase II data
Northumberland coast AONB
Parish boundaries
Key Locations and Settlements
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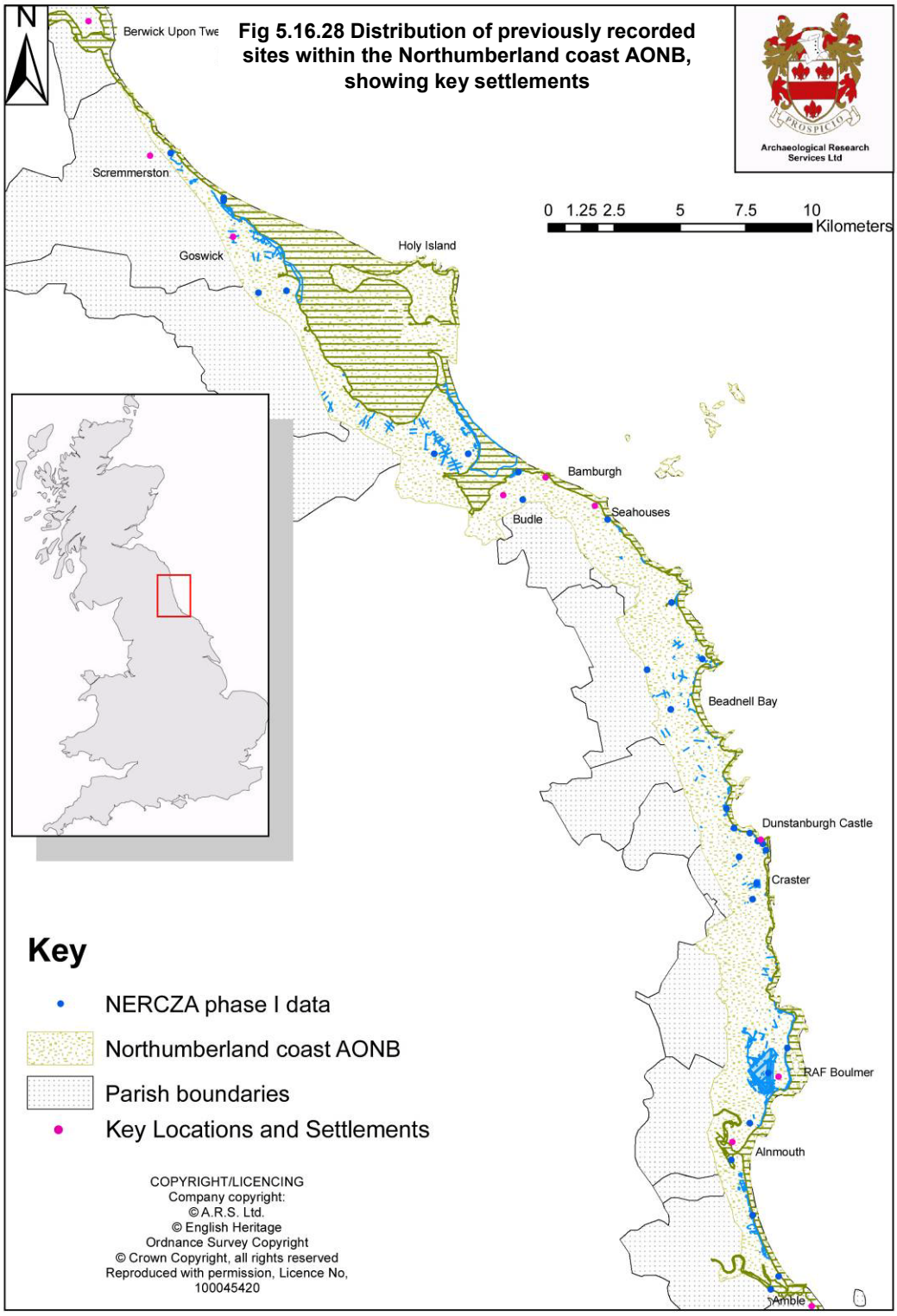
Fig 5.16.28 Distribution of previously recorded sites within the Northumberland coast AONB, showing key settlements
Archaeological Research Services Ltd
N
0 1.25 2.5 5 7.5 10
Kilometers
Berwick Upon Twe
Scremmerston
Goswick
Holy Island
Bamburgh
Budle
Seahouses
Beadnell Bay
Dunstanburgh Castle
Craster
RAF Boulmer
Alnmouth
Amble
Key
NERCZA phase I data
Northumberland coast AONB
Parish boundaries
Key Locations and Settlements
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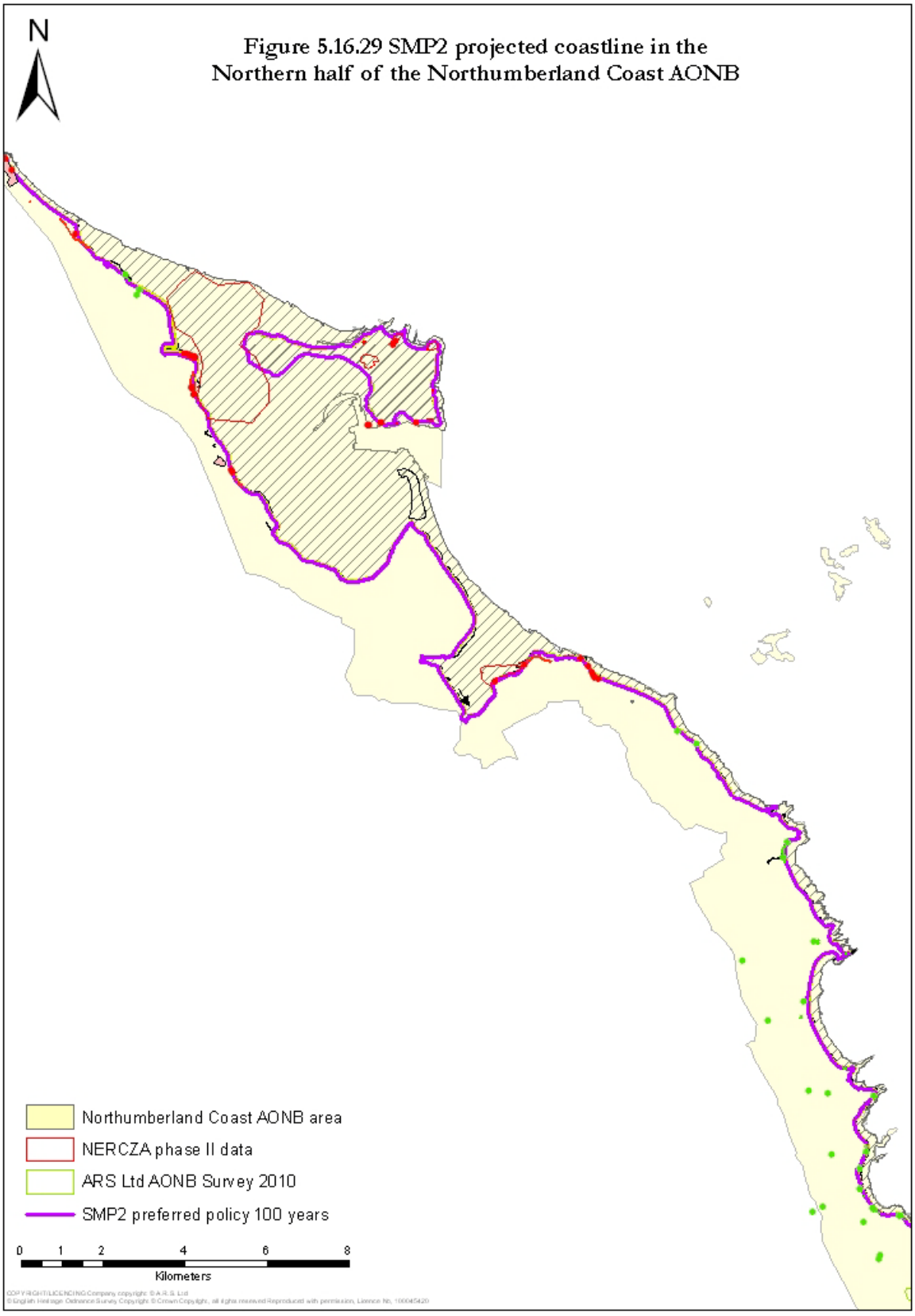
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Figure 5.16.29 SMP2 projected coastline in the Northern half of the Northumberland Coast AONB
Northumberland Coast AONB area
NERCZA phase II data
ARS Ltd AONB Survey 2010
SMP2 preferred policy 100 years
0 1 2 4 6 8
Kilometers

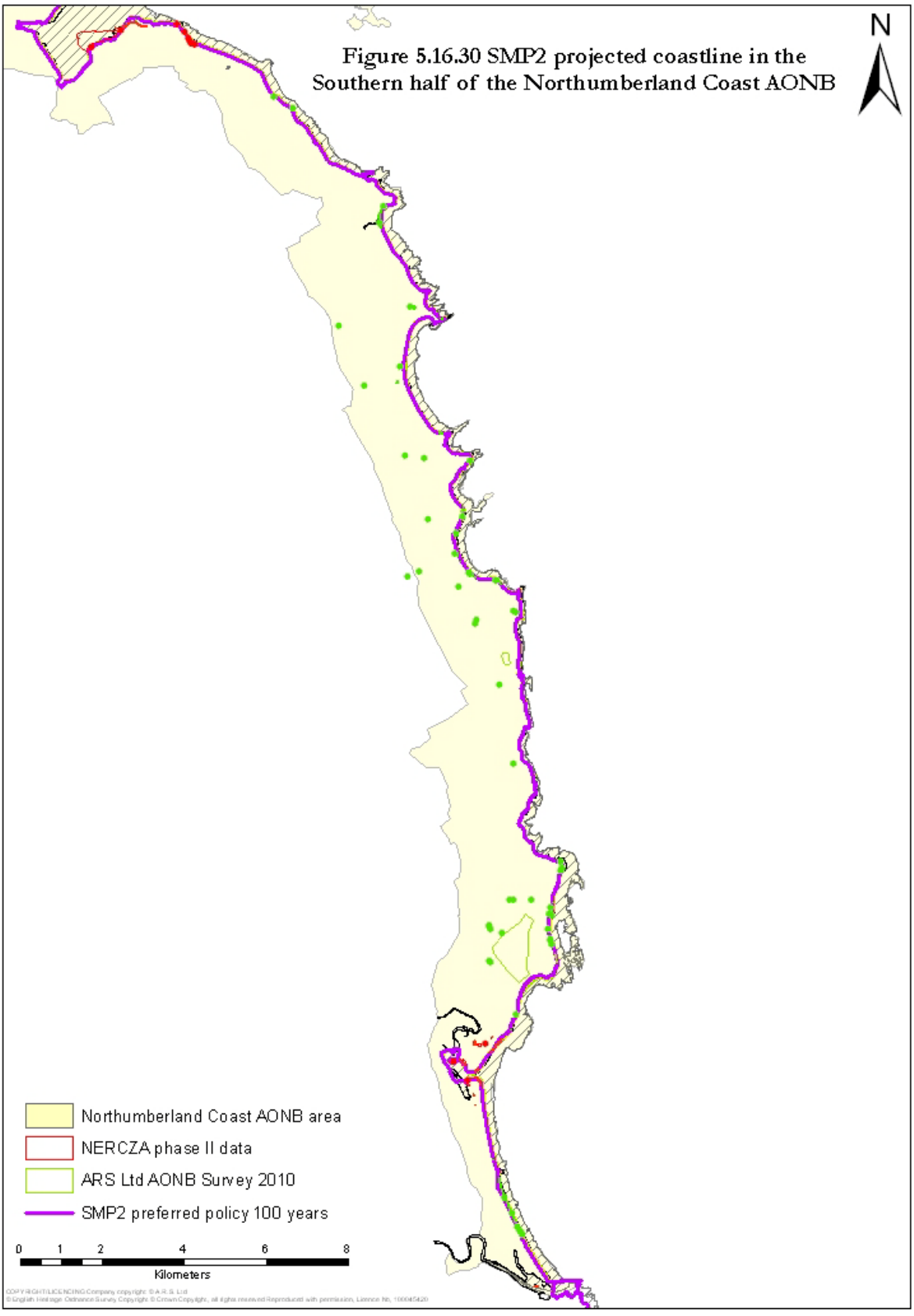
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Figure 5.16.30 SMP2 projected coastline in the Southern half of the Northumberland Coast AONB
Northumberland Coast AONB area
NERCZA phase II data
ARS Ltd AONB Survey 2010
SMP2 preferred policy 100 years
0 1 2 4 6 8
Kilometers

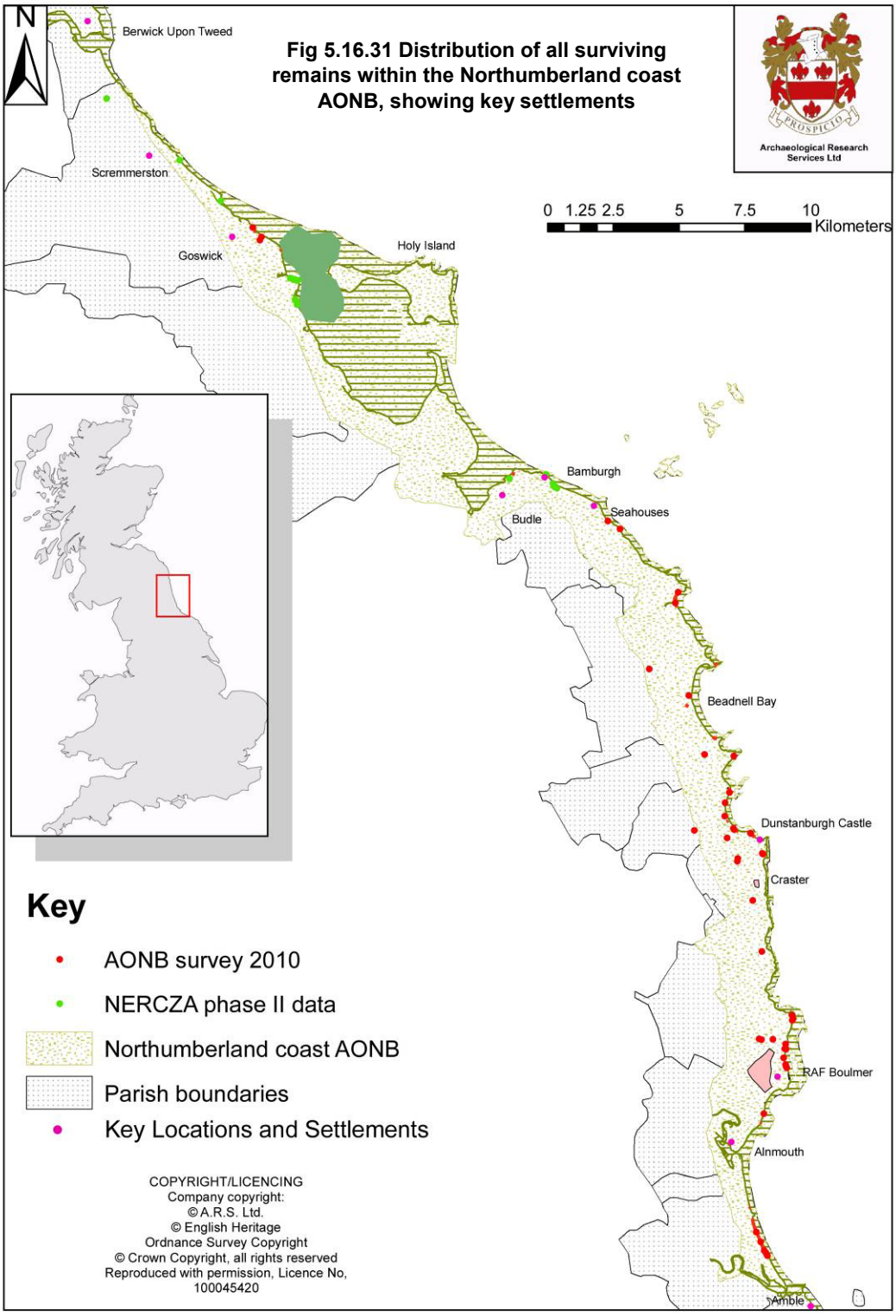

Fig 5.16.31 Distribution of all surviving remains within the Northumberland coast AONB, showing key settlements

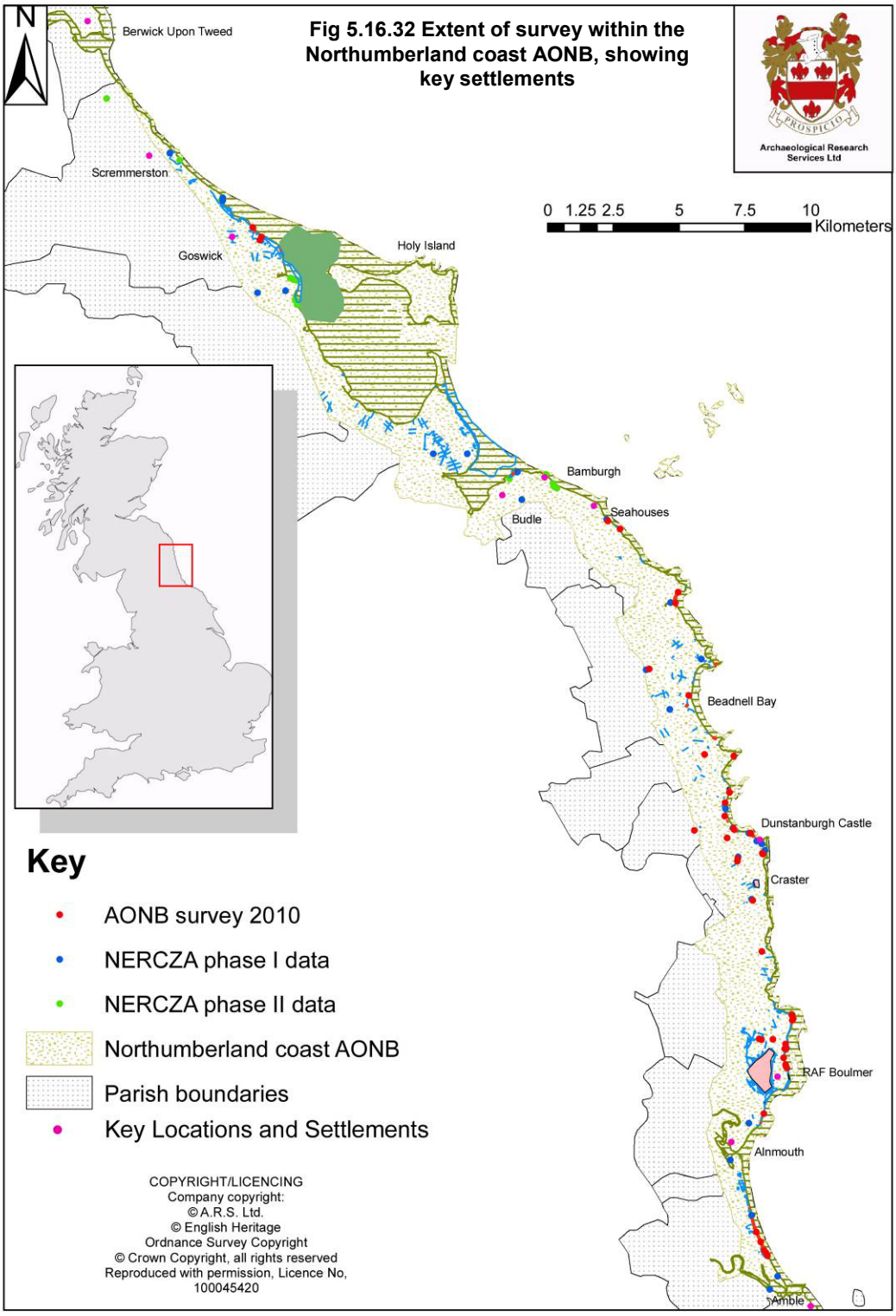
Fig 5.16.32 Extent of survey within the Northumberland coast AONB, showing key settlements
Archaeological Research Services Ltd
N
Berwick Upon Tweed
Scremmerston
Goswick
Holy Island
Bamburgh
Budle
Seahouses
Beadnell Bay
Dunstanburgh Castle
Craster
RAF Boulmer
Alnmouth
Amble
0 1.25 2.5 5 7.5 10
Kilometers
Key
AONB survey 2010
NERCZA phase I data
NERCZA phase II data
Northumberland coast AONB
Parish boundaries
Key Locations and Settlements
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5.17 Summary of Archaeological survey results

5.17.1 Supplementary sites

The NERCZA Phase 2 survey also covered the site at Whitburn south of Newcastle (NZ 41026 61257). Here a full survey was not undertaken but one site, identified from observation on Google Maps and highlighted by English Heritage's Regional Science Advisor, Jacqui Huntley, was added to the record. This was initially identified as a possible break water, however further investigation of the shape and location of the feature suggests it is a large, stone-built, fish trap. The construction is very similar to those seen at Budle Bay, and it is currently thought that those structures are related to a monastic grange of Linisfarne Priory and date to the medieval period. The feature at Whitburn was recorded and added to the record but no detailed assessment of the surrounding environment was undertaken as with the other sites surveyed within NERCZA Phase 2. Other supplementary sites have also been included within the other NERCZA surveys and are discussed in the previous sections.

Fig 5.17.1 The Whitburn fish trap as seen on the ground from the west.

5.17.2 Summary of results

The NERCZA Phase 2 survey has covered 142km of coastline and identified 609 archaeological sites. However as the foreshore, dunes, cliff tops, wetlands and hinterlands surrounding each survey area have also been investigated a larger landscape context around the individual sites has also been covered. A huge variety of coastal landscapes with many different, specific management issues were covered, including SSSIs, AONBs, and nature reserves. Each of these has a current record highlighting the nature and extent of the remains at each site but also their current condition and any threat from erosion. The survey therefore has provided much more than a simple statement on what remains and how it is threatened at fourteen locations, it has added depth to what was already known and also provided detail of new archaeological sites never before recorded.

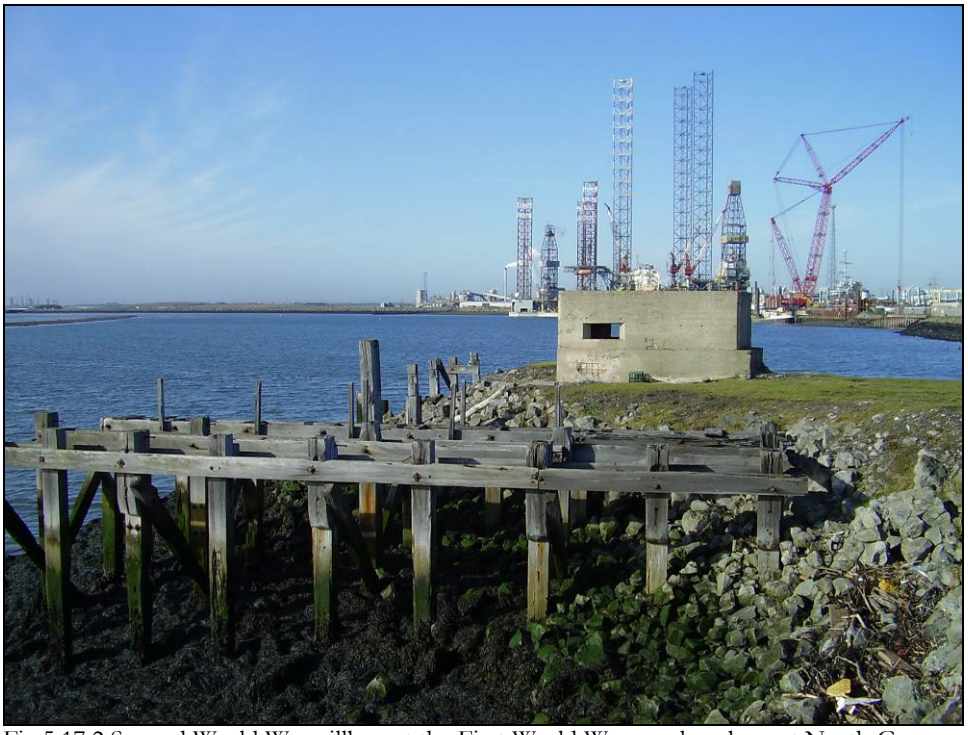

Fig 5.17.2 Second World War pillbox at the First World War seaplane base at North Gare, Teesside.

The majority of these new sites have been military in origin and this is for two main reasons. The archaeology of the Second World War has only recently started to be added to the historic record. It has been known about previously but no large scale work has been undertaken to include the data in either the NMR or local HERs For this reason a lot of previously known, but unrecorded, sites have been added to the record for the first time. Many more have been recorded by surveys such as the Defence of Britain project and the location or interpretation of sites identified has subsequently been modified by Phases 1 and 2 of the NERCZA.

It is important to note the Phase 1 aerial photographic survey has meant the recognition of many of these military for the first time. However, Phase 2 has also identified a large quantity of more subtle features associated with these sites, such as trenches and weapons pits, that show them to survive much more extensively than previously thought. As a result of this the majority of new sites recorded by the Phase 2 survey are Second World War military features proximal to or set within the boundary of these previously known locations.

Fig 5.17.3 The quarry at Loftus Alum works, North Yorkshire, viewed from above.

Although the project has identified many military sites and these make up the largest proportion of newly discovered sites, all other periods have been represented as well. The NERCZA Phase 2 field survey has recorded sites from the Mesolithic, Iron Age, Romano-British, Early Medieval, Medieval, Post-Medieval, First World War, Second World War and Cold War periods.
There is now a database of all records which will allow informed management of these sites based on their current condition, and future threat. This will allow any possible future projects to go back and monitor these sites and inform management policy further according to changing conditions and rates of erosion using the NERCZA Phase 1 and 2 data as a baseline dataset. The outlines and proposals for management of the archaeological sites, plus a tabulated list of the most threatened archaeological sites, are included in Section 7 of this report. This summarises the main management options and issues highlighted by the NERCZA Phase 2 survey.