# 6. PALAEOENVIRONMENTAL INVESTIGATION

## 6.1 Introduction

The NERCZA Phase 1 report highlighted four threatened sites that have been previously recorded as the location of inter-tidal peat deposits. These sites were identified at Hartlepool Bay, Whitburn, Cresswell and Low Hauxley. Each of these sites was surveyed during the course of the field survey and all visible inter-tidal peat deposits mapped using the same methodology as that adopted for the archaeological features (see Chapter 4). Investigation at Whitburn and Cresswell found no evidence of visible peats, which had been recorded in antiquarian records at Whitburn and in recent palaeoenvironmental studies by Ian Shennan beneath the active dunes at Cresswell. This is because the peat layers at these sites are currently covered by a substantial layer of sand. Exploratory coring was undertaken at these locations but no evidence of the previously recorded peats was found.

At Hartlepool, the area of exposed peat at the south end of the bay at Seaton Carew has been recorded, mapped and dated and a detailed report produced (Waughman *et al.* 2005). As a result of this further work on this peat was not undertaken in favour of attempting to map the northerly extent of what was described as a submerged forest by Trechmann (Trechmann 1936). Exploratory coring at the north end of Hartlepool Bay found an organic layer which could be the edge of a desiccated peat layer, located at the western edge of the Hartlepool headland to the east of the docks.

Fig. 6.1 A band o f exposed peat in the eroding cliff section at Low Hauxley, Northumberland, at low tide. Wave action is currently undercutting the soft cliff sediment (till) resulting in the collapse of the peat layers and dune sand above. Material is lost on most tides.

The peat beds exposed at Low Hauxley are some of the most exposed and best known on the North East coast. They have already been discussed in the context of the Mesolithic-Bronze Age archaeology associated with them in section 5.9. Although two separate 'peat' beds had been recognised before (e.g. Tipping 1994), this survey has established at least five separate peat beds at Low Hauxley (A-E below), one of which was previously unknown, and the visible bands that can be seen within the cliff section do not form one continuous sediment unit. These different units have been accurately mapped as part of this study and those peats that have not previously been subjected to radiocarbon dating have been dated. The new peat bed identified at low Hauxley has human and animal impressed footprints surviving on its surface and this thin organic horizon has been dated to the Late Mesolithic.

Samples were also taken from an organic deposit initially thought to represent a possible early land surface that was observed at Crimdon Dene, and which appeared spatially related to the position of the prolific flint scatter described Raistrick and Westoll (1933). However this surface ultimately proved to be a modern deposit (see radiocarbon results below).

Fig. 6.2 Excavation and recording of the test pit at Crimdon Dene.

### 6.1.1 Aims and Objectives

The aim of the palaeoenvironmental survey was to accurately survey areas of inter-tidal peats and organic sediments and to collect and submit material suitable for radiocarbon dating at those sites for which no dating evidence was available, as well as to assess the potential of each peat to contain palaeoecological remains suitable for understanding past environments.

At Hartlepool the aim of the investigation was to establish the depth, extent and date of the peat bed at the north end of Hartlepool Bay. This would help in

understanding the significance of the peat and whether it has the potential to contribute to palaeoenvironmental reconstructions.
At Low Hauxley some dates had already been obtained on peat exposures to the north of the Mesolithic-Bronze Age site but the other peats are of unknown age and so it is currently difficult to assess the relative significance and value of each peat bed and how, if at all, they relate to each other. Furthermore, the earlier dates are from samples with generally large age ranges. A targeted programme of accurate survey and dating was required to disentangle this complex suite of geomorphological deposits.

Crimdon Dene was not initially identified for sampling, however upon identification of the possible buried land surface during the field survey further investigation was deemed necessary. Although no worked flint was retrieved from the layer, if it proved to date from the Mesolithic period this would help not only in identifying Trechman's prolific lithic site but would also help establish the relative significance of this organic deposit. Further investigation to relocate and accurately map the position and extent of the lithic scatter could then be undertaken.

### 6.1.2 Methodology

At each site samples were collected using a sand auger with an open chamber, and samples were placed directly into plastic finds bags. These were then labelled, double bagged and kept in plastic tubs. Each sample was catalogued and refrigerated until sent for specialist pollen and macrofossil assessment and sub-samples taken for radiocarbon dating. Suitable samples from the targeted peat were selected for dating in a meeting with John Meadows from English Heritage's Scientific Dating Team and Jacqui Huntley, the English Heritage Regional Science Advisor.

The samples from Crimdon Dene were collected differently, being sampled by excavation of a test pit through the dune sand (Fig 6.2). The same collection and storage methodology was followed. This was also true of the sampling of the peat layer containing the footprints at Low Hauxley where a larger sample was taken in order to give the best chance for retrieval of datable material, as the peat had been re-covered in beach sand when the sampling took place.

## 6.2 Radio-Carbon Dating

By John Meadows and Clive Waddington

Each sample, other than OxA-22797 (Table 6.1, 6.2 and 6.3), consisted of a single waterlogged plant macrofossil, identified by Charlotte O'Brien of Durham University. Dana Challinor re-examined the Hartlepool Bay wood fragments to select those with minimal intrinsic age. The samples were dated by Accelerator Mass Spectrometry (AMS) radiocarbon dating at the Oxford Radiocarbon Accelerator Unit (technical procedures are described by Bronk Ramsey *et al.* (2002; 2004), and at the Scottish Universities Environmental Research Centre in East Kilbride (SUERC; technical procedures are described by Vandenputte *et al.* (1996), Slota *et al.* (1987), and Xu *et al.* (2004)). Internal quality assurance procedures at both laboratories and international inter-comparisons (Scott 2003) indicate no laboratory offsets, and validate the measurement precision given.

The BP results reported in Tables 6.1, 6.2 and 6.3 are conventional radiocarbon ages (Stuiver and Polach 1977), quoted according to the format known as the Trondheim convention (Stuiver and Kra 1986). Their calibrated date ranges have been calculated by the maximum intercept method (Stuiver and Reimer 1986), using the program OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2009) and the IntCal09 data set (Reimer *et al.* 2009), and are quoted in the form recommended by Mook (1986), rounded outwards to decadal endpoints. Fig 6.3 shows the calibration of these results by the probability method (Stuiver and Reimer 1993), again using OxCal 4.1 and the IntCal09 calibration data. The probability that a sample dates to a particular calendar date corresponds to the height of its probability distribution at that date.

Comparison of the radiocarbon results from each peat exposure sampled at Low Hauxley has been undertaken using Ward and Wilson's (1978) test of statistical consistency. This produces a test statistic, T', which should be less than 3.8 in 95% of cases where two samples are of the same radiocarbon age (which they will be, when they are of the same calendar age). Thus the two results from Low Hauxley A (711) are statistically consistent (T'=0.3), as are the two from Low Hauxley C (713) (T'=0.0). In these cases, we have no reason to believe that the two fragments dated are different in date, and we would tend to accept the results as indicative of the date of deposition of the sediment sampled and therefore the date after which peat accumulation commenced.

By contrast, neither the pair of results from Low Hauxley D, 7 (715) (T'=506.2), nor those from Low Hauxley E, 13 (750) (T'=7.8), are statistically consistent, and it is not clear which, if either, result is the better estimate of when the sediment sampled was deposited. Ordinarily we would use the later result as a *terminus post quem* for sedimentation. In the case of the peat with the human and animal footprints, Low Hauxley E, there is only a small difference in date between OxA-22735 and SUERC-30015 and this is probably due to the effects of compression in this thin peat lens, or the time taken for a few cm of sediment in this sample to accumulate. The Late Mesolithic date, in the last centuries of the 6$^{th}$ millennium cal BC, provides a significant new dimension for understanding human activity and natural coastal change at Low Hauxley in a period that did not appear to be encompassed by the previously dated peats. The dating of this peat bed is of further significance as it contains not only human and animal footprints but also worked timbers, one of which has shown evidence for having been worked with stone tools.

The difference between OxA-22734 and SUERC-30008 from Low Hauxley D, 7 (715), at the base of this sediment unit is considerable, perhaps as much as1500 years, and it is probably better to regard the latest of the two dates as a *terminus post quem* for the commencement of sediment accumulation until further dates are available. The stratigraphically later *Iris* seed from the top of the sediment unit (SUERC-30014) dates to the early Iron Age, indicating that peat formation ceased at this time before subsequent dune sand accumulation.

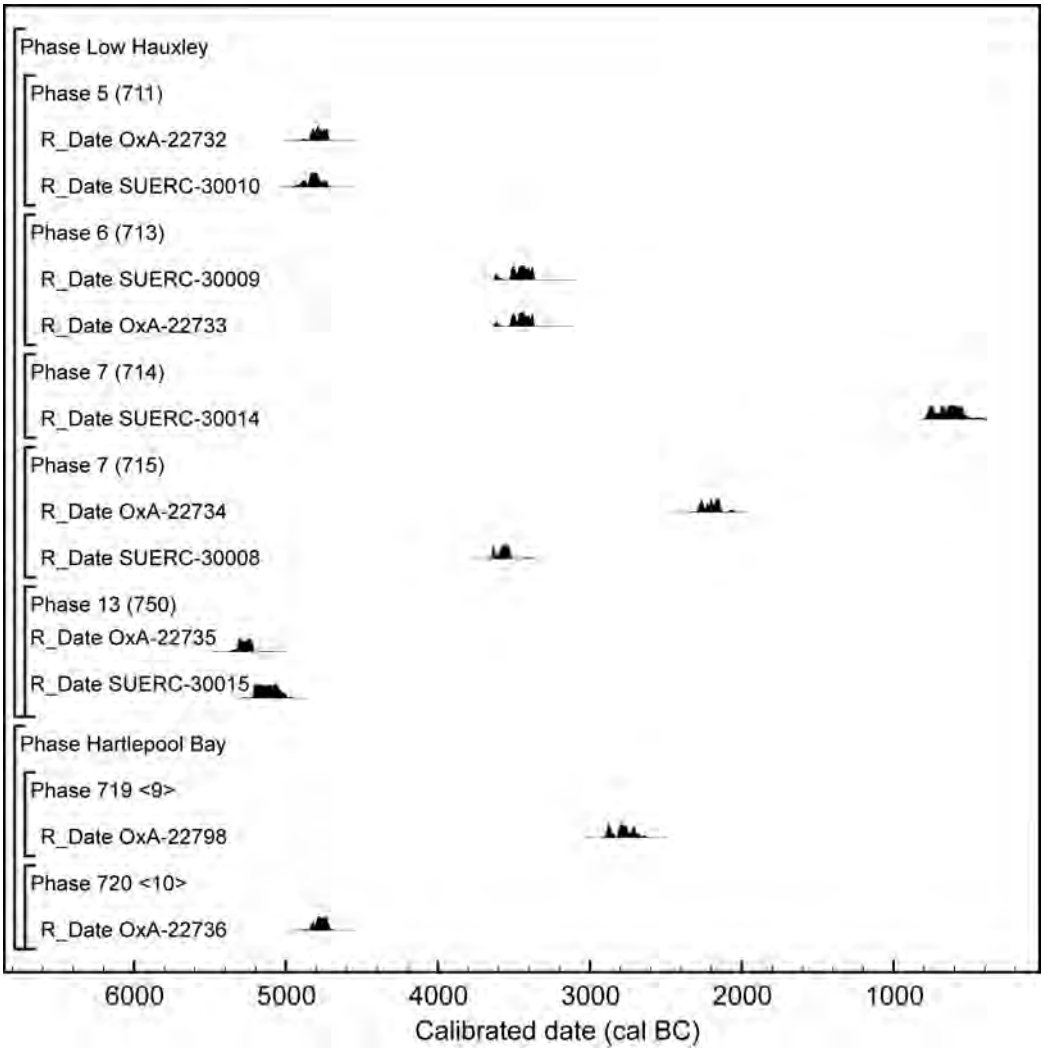


Fig. 6.3 Calibration of the Low Hauxley and Hartlepool Bay radiocarbon results by the probability method (Stuiver and Reimer 1993), using the IntCal09 calibration data (Reimer *et al.* 2009).

The Hartlepool Bay samples (from two points at the top of a buried organic deposit) are both prehistoric and clearly of different date, which suggests that if the samples are more or less *in situ* and the buried land surface between them is continuous, parts of it must have been substantially truncated, perhaps by dredging activities.

The $F^{14}C$ ('fraction modern') results are from samples with elevated radiocarbon contents, due to the 'bomb spike' in atmospheric $^{14}C$ levels caused by atmospheric nuclear testing in the 1950s and early 1960s. Kueppers *et al*'s (2004) calibration data has been used to convert these to calendar date ranges in Table 6.2 (Stuiver and Reimer 1986) and Fig 6.4 (Stuiver and Reimer 1993). The Crimdon Dene peat deposit thus appears to have formed in the late 1950s (or possibly in the mid-1990s). The two results from spit 1, taken for statistical consistency, have not been tested as the 'bomb spike' is so extreme in this period that leaves growing months apart would give inconsistent radiocarbon ages.

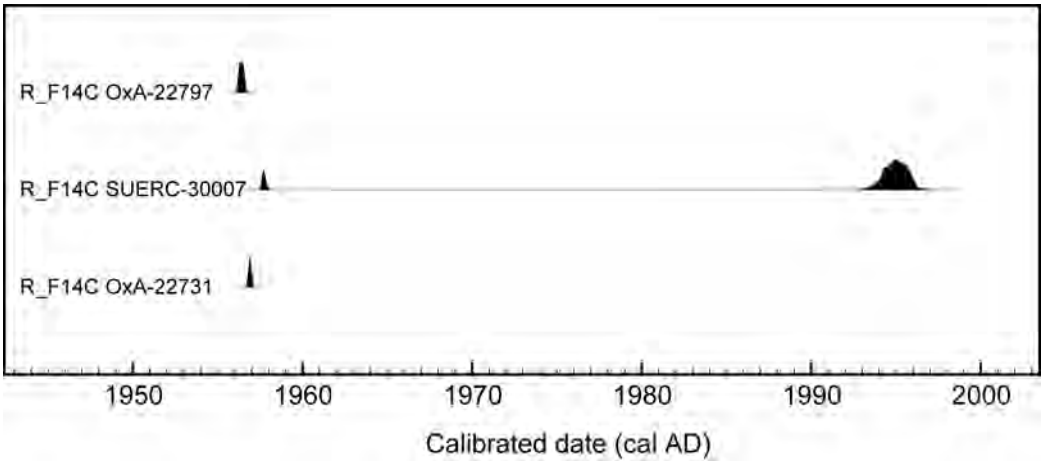


Fig. 6.4 Calibration of the Crimdon Dene radiocarbon results by the probability method (Stuiver and Reimer 1993), using the Kueppers et al (2004) calibration data.

Each of the sites that have been successfully sampled and dated as part of this project are discussed in greater detail below.

## 6.3 Hartlepool Bay

### 6.3.1 Location and background

The samples at Hartlepool Bay were taken from the North side of the bay between the headland and the harbour (NGR: NZ 5662 3357). The landscape is a small embayment with a sandy beach overlying the edge of the rock outcrop of the headland.

Fig. 6.5 The small embayment east of Victoria Harbour from where samples were collected.

### 6.3.2 Previous research

There is a long history of research and investigation of the submerged peats at Hartlepool Bay in the area around Seaton Carew. Samples taken from these peat beds and these have produced two sets of dates dating to the Early Bronze Age (Waughman *et al.* 2005). The report complied by Tees Archaeology details the results of all of these interventions and sampling programmes. Previous sampling was also undertaken as part of a commercial evaluation of Victoria Harbour which revealed similar organic deposits (O'Brien 2006).

### 6.3.3 Threat from erosion

The area subject to survey is not currently threatened by direct erosion due to a substantial covering of sand. However, during periods of storm activity this could easily be removed, as has been seen elsewhere along the coast, placing the deposits at risk. The deposits could also be threatened by any future development of the harbour entrance.

### 6.3.4 Pollen analysis

*By Charlotte O'Brien*

Pollen was poorly preserved in the samples from Hartlepool Bay. A few *Quercus*, *Corylus*, and Chenopodiaceae (goosefoot family) pollen grains, and fungal and fern spores were recorded (O'Brien 2010).

### 6.3.5 Radiocarbon dating results

| Sample | laboratory code | $\delta^{13}C$ (‰) | radiocarbon age (BP) | calibrated date range (95% confidence) |
|---|---|---|---|---|
| 719 top of peat | OxA22798 | -28.3 | 4199±36 BP | 2900-2660 cal BC |
| 720 top of peat | OxA22736 | -26.5 | 5901±33 BP | 4850-4700 cal BC |

Table 6.1 Radiocarbon results from Hartlepool Bay.

### 6.3.5 Summary and conclusions

Samples were taken from an organic layer identified as a possible desiccated peat from six separate cores. Two of the cores (719 and 720) provided suitable material for pollen analysis and C14 dating from the top of the sample. However, the sample was very wet and the lower portion of the samples had dropped from the chamber so samples from the base of any unit were unable to be obtained.

Sample 719 produced a date ranging from 2900-2660 cal BC and dates to the later Neolithic period. Sample 720 produced a date of 4850-4700 cal BC and dates to the Late Mesolithic. This broad date range comes from two samples of what was initially thought to be the same organic, possibly desiccated, peat layer as both samples were located within 10m of each other. This could indicate differential accumulation of separate organic deposits along this stretch of the coast, as several of the cores produced no material at all.

However, it is possible that these samples represent a continuous peat bed or land surface, and if this is the case it means that the peat that produced the Late Mesolithic date from the top of its profile must have been heavily truncated – having lost the Neolithic material above but that still survives in other locales of the bay as indicated by the other dated core. The truncation could have been caused by the construction of the harbour, the medieval town walls or by subsequent dredging activities.

Despite being truncated, these sediments represent a valuable historic asset as they contain material that can inform upon the coastal Late Neolithic and earlier environment. Coastal peats dating to this period have not yet been found elsewhere in the Tees region and so they represent a significant palaeoenvironmental resource that would repay further and more detailed investigation and recording. The sediment is currently protected by a thick layer of sand and as a result is not at any immediate threat of erosion, but may eventually be exposed and placed at risk as a result of rising sea level.

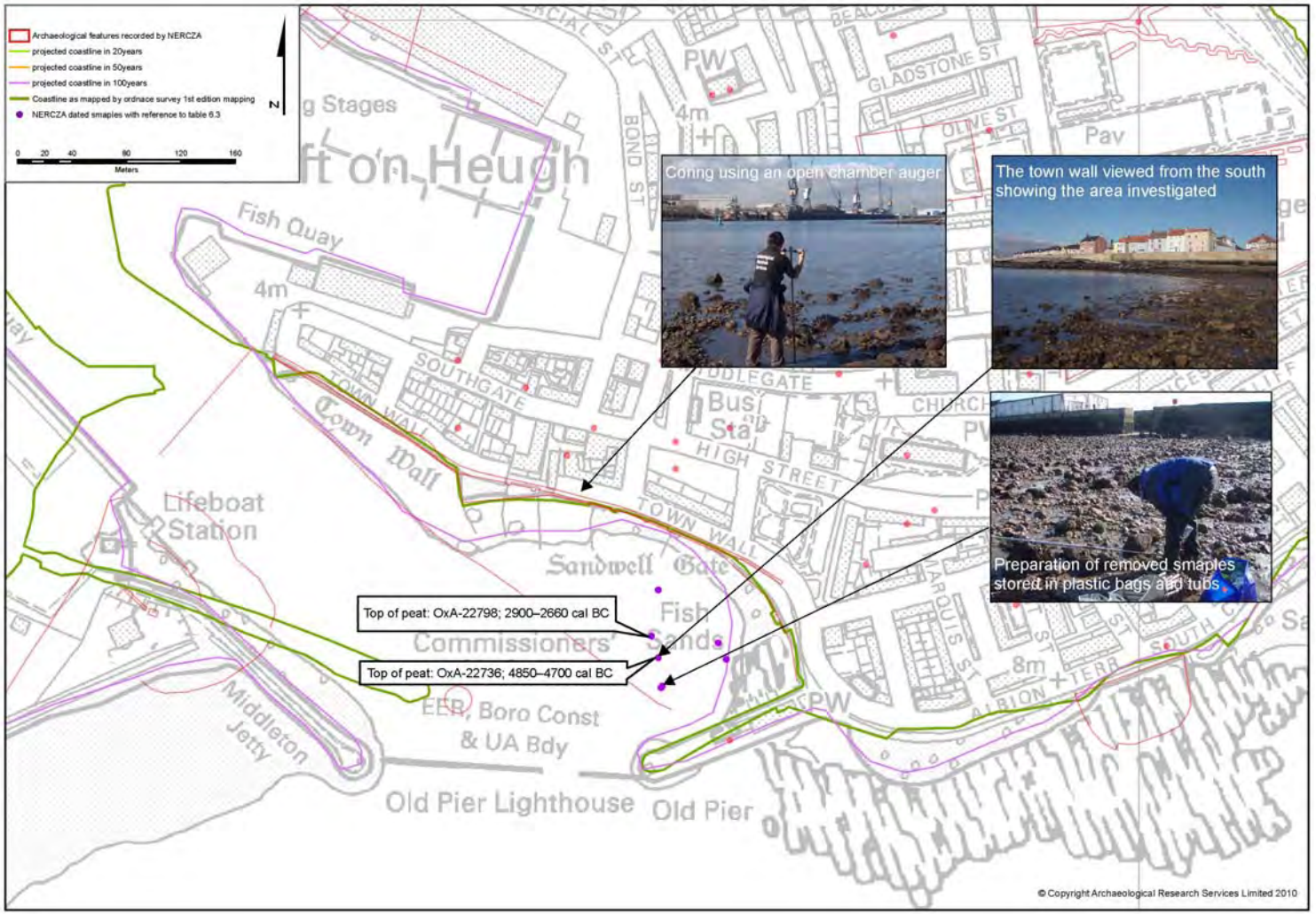


Fig. 6.6 Location of samples recovered from Hartlepool.

## 6.4 Crimdon Dene

### 6.4.1 Location and background

Crimdon Dene is located on the Durham coast north of Hartlepool (NGR NZ 48913 36566). The geology of the area is Magnesian Limestone overlain by boulder clay. The coastal cliffs are broken by narrow, deeply incised valleys, or 'Denes', that wind their way to the coast.

### 6.4.2 Previous research

Although the lithic scatter site and 'forest bed' at Crimdon Dene has been seen and recorded previously (Raistrick and Westoll 1933), no palaeoenvironmental sampling has previously been undertaken in the area. The details of the previous archaeological research and current field survey are provided in section 5.5 of this report.

Fig. 6.7 Crimdon Dene viewed from the cliff to the south of the estuary mouth.

### 6.4.3 Threat from erosion

There is an ongoing risk of erosion and destabilisation of the dune cliff, combined with erosion caused by the cutting back of Crimdon Beck and this has led to a high rate of retreat. This is described in detail in section 5.5.12.

### 6.4.4 Pollen analysis

*By Charlotte O'Brien*

Pollen was not recorded in Spits 1, 3 and 4 from Crimdon Dene, and the only pollen noted in Spit 2 was a *Pinus* (pine) grain. A few diatoms and fungal spores were noted in Spit 1 (O'Brien 2010).

### 6.4.5 Radiocarbon dating results

| Sample | laboratory code | $\delta^{13}C$ (‰) | radiocarbon age (BP) | calibrated date range (95% confidence) |
|---|---|---|---|---|
| Spit 1 | OxA-22731 | -25.4 | 1.06020±0.00294 $F^{14}C$ | Cal AD 1957 |
| Spit 1 | SUERC-30007 | -26.9 | 1.1209±0.0045 $F^{14}C$ | Cal AD 1957-96 |
| Spit 2 | OxA-22797 | -30.6 | 1.03979 ±0.00328 $F^{14}C$ | Cal AD 1956-7 |

Table 6.2 Radiocarbon results from Crimdon Dene.

### 6.4.5 Summary and conclusions

The deposit sampled at Crimdon Dene is clearly a modern deposit and is therefore not related to the flint scatter as was initially thought possible. Despite apparently fitting the location, as described by Coupland in 1936, the deposits observed were most likely formed in the 1950s or even as late as the 1990s. This could indicate that the layer observed by Coupland in the 1930s has been subsequently buried by episodes of dune creation and stabilisation. An alternative explanation is that the visible extent of organic material observed as containing worked flint in the 1920s and 30s has now been eroded away through natural processes. Further work could usefully be undertaken to try and relocate and record the potential location of the flint scatter as sea level rise and coastal retreat continues.

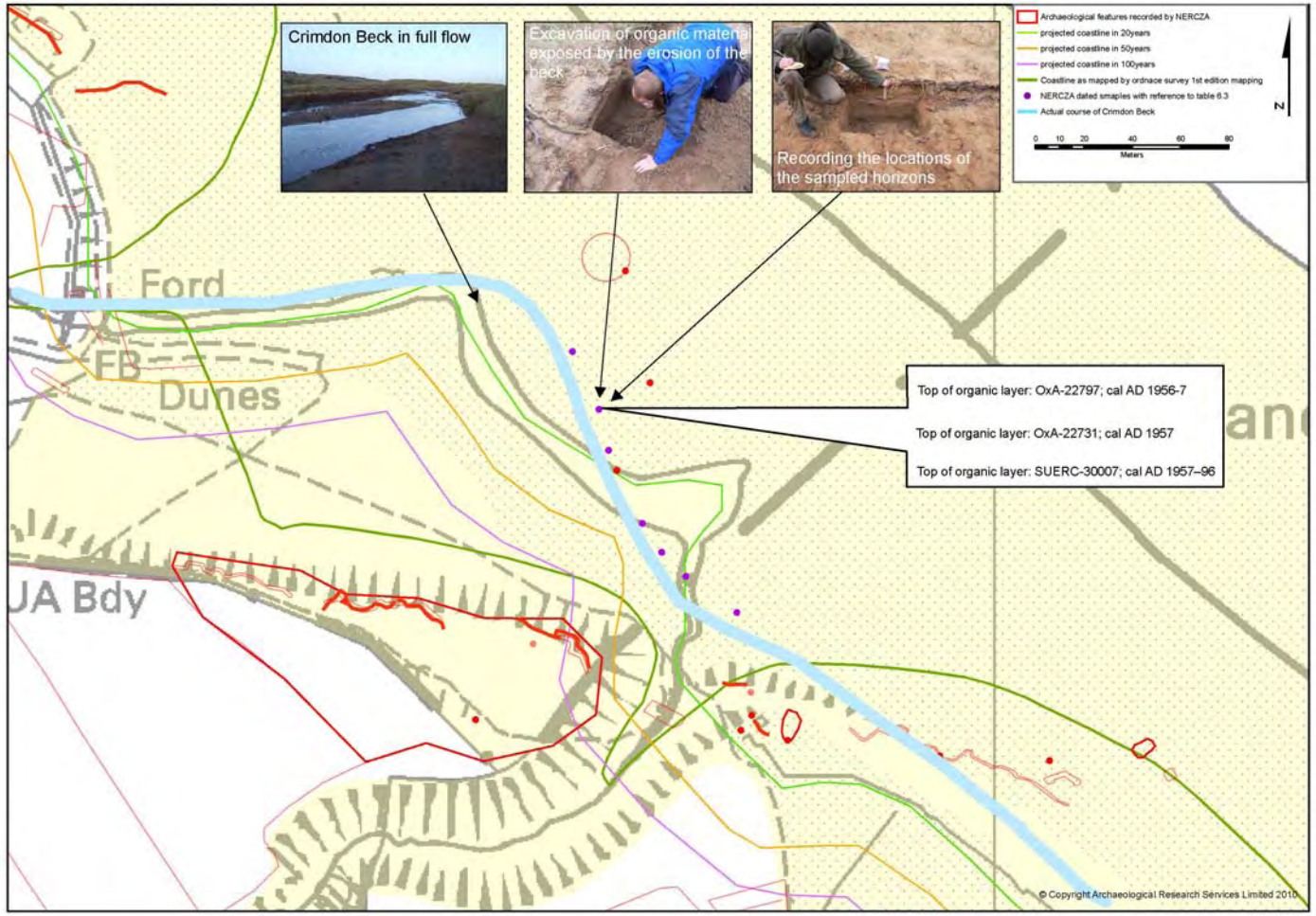


Fig 6.8 Location of samples collected from Crimdon Dene

## 6.5 Low Hauxley

### 6.5.1 Location and Background

The main archaeological site at Low Hauxley comprises an area of locally high ground that forms a small hillock or knoll. The archaeological remains on this knoll include a Mesolithic occupation site and a Beaker-Early Bronze Age period cemetery. Since this period there has been a considerable accumulation of dune sand across the site and this has been subject to a complex sequence of geomorphological processes (Innes and Frank 1988). These processes have meant that the landscape has seen a number of significant changes since the beginning of the Holocene.

To either side of the knoll are 'peat' beds that can be followed along the cliff section for several hundred metres to the north. However, not all the peat layers are from the same sediment unit and so each unit has been carefully mapped and photographed (see Fig 6.1). Some of the units have been investigated before, Low Hauxley A and B, and the priority of this survey was to record and date those peats that had not previously been examined. This included the newly discovered peat at a lower elevation that contained the remains of human and animal footprints (Low Hauxley E).

Fig. 6.9 View along the cliff face at Druridge Bay with a recently eroded block of peat collapsed onto the foreshore from peat formation Low Hauxley B (June 2009).

The site looks directly out on to the North Sea. The sea has evidently cut back into the dune system since the Bronze Age meaning that the cemetery is now a coastal site, although when it was originally in use it would have been set back from the shore on a knoll surrounded in full, or in part, by coastal wetlands or lagoons. The current foreshore in front of the dune system comprises a rocky foreshore with interbedded sandstone, mudtsones and coal, all of which outcrop in the inter-tidal and foreshore area, depending on the amount of beach sand cover at any one time. To the rear of the dune system a huge swathe of land has been exploited for open cast coal extraction which has meant that the strip of sand dunes is the only surviving band of natural surficial deposits, and which seals an extremely rich palimpsest of archaeological remains, especially in the central and northern part of Druridge Bay (see also separate 'Review of

archaeological interventions and site condition' by Waddington 2010). Currently this precious and well-preserved resource is now under active and severe erosion from the seaward side (SMP 2).

A Devensian blue-grey weathered till, which varies in depth along the coast, directly overlies the solid geology (Innes and Frank 1988). The cemetery, at which a rescue excavation took place as part of this project (Waddington and Cockburn 2009), is positioned on a localised high point approximately 100m north of the Bondicarr Burn where debouches into the North Sea. The dune sand that seals the prehistoric archaeology and peat deposits along this section of coastline have an average depth of 3.5m, although this varies between 3m and 4m. Within the sand dunes are thin lenses of organic material which represent old land surfaces and turf lines (palaeosols) that have formed during episodes of dune stability since the Early Bronze Age and thus show the potential of the dune system to provide palaeoenvironmental information on later periods as well. These buried soils represent the top of the dune system during earlier periods prior to further accumulation.

Inset within the glacial till, and below the dune system, are organic peaty deposits. These deposits are sometimes described as 'ancient forest bed' or 'inter-tidal peat', though in the case of Low Hauxley they are probably more accurately described in most cases as in-filled lagoons. These thick bands of peat, typically up to 1m in thickness, have been the subject of earlier work (Frank 1982; Innes and Frank 1988; Farrimond and Flanagan 1996 and Wilson *et al.* 2001). They contain the visible remains of old trees and have produced archaeological material including chipped flints from Low Hauxley B (Jim Nesbitt pers comm.). One of the peats close to the Low Hauxley cemetery, Low Hauxley B, is known to span the Neolithic-Early Bronze Age periods (Drury 1995) and the long peat exposure at the northern end of Druridge Bay, Low Hauxley A, has been estimated at having built up over a *c.*1900 year period (Frank 1982), although dating as part of this project suggests the origin of this peat is earlier than previously thought and in parts has accumulated over a *c.*3000 year period.

Fig. 6.10. Area of shell midden, possibly Mesolithic in date, exposed in the cliff face immediately above the till deposit. This had been eroded away by the time of the 2009 excavation.

### 6.5.2 Previous research

A full review of previous archaeological and palaeoenvironmental research and investigation can be seen in the accompanying report (Waddington 2010).

### 6.5.3 Threat from erosion

The threats faced by the resource at Low Hauxley are discussed in detail in section 5.9.9 of this report.

### 6.5.4 Pollen analysis

*By Charlotte O'Brien*

Pollen was present in all of the samples from Low Hauxley except context (1000). *Alnus* (alder) pollen was abundant in several, for example contexts (706), (709), (711), (713) and (715), while *Sphagnum* spores were predominant in contexts (705) and (708). Other species noted were *Quercus* (oak), *Corylus* (hazel), *Salix* (willow), ferns including *Polypodium* (polypody), Poaceae (grasses), Ericaceae (heathers), *Betula* (birch), *Pinus* (pine) and herbaceous taxa including *Plantago lanceolata* (ribwort plantain), Fabaceae (pea family) and Apiaceae (carrot family) (O'Brien 2010). The various peats at Low Hauxley have all shown good preservation of botanical macro and micro fossils with the collective potential to inform on palaeoenvironmental reconstruction from the Late Mesolithic through to the Early Iron Age, as well as hosting archaeological remains dating from all of these periods.

### 6.5.5 Radiocarbon dating results

| Sample | laboratory code | $\delta^{13}C$ (‰) | radiocarbon age (BP) | calibrated date range (95% confidence) |
|---|---|---|---|---|
| 711 (Low Hauxley A) | OxA-22732 | -26.2 | 5915 ±31 BP | 4850–4710 cal BC |
| 711 (Low Hauxley A) | SUERC-30010 | -28.8 | 5940 ±35 BP | 4930–4720 cal BC |
| 713 (Low Hauxley C) | SUERC-30009 | -28.5 | 4675 ±35 BP | 3630–3360 cal BC |
| 713 (Low Hauxley C) | OxA-22733 | -26.8 | 4674 ±30 BP | 3630–3360 cal BC |
| 714 (Low Hauxley D) | SUERC-30014 | -28.9 | 2505 ±35 BP | 790–510 cal BC |
| 715 (Low Hauxley D) | OxA-22734 | -27.8 | 3776 ±29 BP | 2290–2050 cal BC |
| 715 (Low Hauxley D) | SUERC-30008 | -28.7 | 4790 ±35 BP | 3650–3510 cal BC |
| 750 (Low Hauxley E) | OxA-22735 | -25.5 | 6296 ±34 BP | 5330–5210 cal BC |
| 750 (Low Hauxley E) | SUERC-30015 | -28.1 | 6160 ±35 BP | 5220–4990 cal BC |

Table 6.3 Radio carbon results from samples collected at Low Hauxley.

### 6.5.5 Summary and conclusions

The dated samples from the various peat exposures at Low Hauxley reinforce the view of these organic units being separate geomorphological entities, with each formed at a different time period, although in most cases with periods of overlap.

For ease of identification each of the visible peat layers at Low Hauxley has been given a letter A-E (Fig 6.11 and Table 6.3 above). A trend, perhaps significant, that can be noted from the dating of the deposits is that the on-set of peat accumulation gets younger from North (A) to South (D), with the exception of layer E, which is the earliest and most shortlived of all the deposits, but which is at an altogether lower altitudinal level.

Low Hauxley E has provided the earliest dating evidence (sample 750 in table 6.3), and this is in line with expectations given that the layer is at a lower elevation than the other observed peat layers. The dates of 5330–5210 cal BC and 5220–4990 cal BC, show that this peat formed during the late Mesolithic period in the final centuries of the 6$^{th}$ millennium cal BC. This layer also contained worked timber showing cut marks, apparently made by stone tools, and the impressions of human and animal footprints were also observed on its surface. Although the sample only provided dates for the basal deposit, the deposit is very shallow being only 6cm thick, and so was probably only shortlived as a wet peaty deposit. In order for the footprint impressions to have survived the peat must have been soft and damp when they were made and then become dried out, and perhaps covered in sand, very shortly afterwards. Therefore, it is difficult to entertain a scenario whereby the footprints could be much later than the *terminus post quem* provided by the Late Meoslithic dates from the base of the deposit. This makes both the peat, the footprints and the substantial quantity of worked wood surviving in this deposit highly significant historic assets, and extremely rare ones, which are undoubtedly worthy of further investigation (see section 7.3.2), particularly as this is a section of coastline under continuous and severe erosion due to rising sea levels. This peat layer has high potential to yield further archaeological material and dating evidence for this significant period of human history about which little is known from this region. Furthermore, it has the opportunity to shed light on much bigger questions relating to the final drowning of the North Sea, the Mesolithic coastal settlement of northern England as well as details of how people lived, procured resources and adapted to and manged their environment. These are questions of national and international significance and this site, which is under severe and continuous erosion, has the ability to contribute significant information to these questions. . The layer is currently protected by up to 1m of sand in places, however this is removed during storm events and the peat layer exposed and further eroded. As a result once this peat layer becomes exposed again, usually in the winter months, further recording and sampling should be undertaken. This is discussed in further detail in section 7.3.2.

Low Hauxley A was the next oldest dated layer, returning dates from the base of the layer of 4850-4710 cal BC and 4930-4720 cal BC. This immediately post-dates the layer containing the footprints and also started to form in the Late Mesolithic. Investigation of this layer has revealed numerous protruding tree trunks and logs indicating that it has the potential to produce worked timber similar to that retrieved from Low Hauxley E. Mesolithic flints have also been reported as coming from this layer (Jim Nesbitt pers comm.). The upper lens of this sediment unit was dated to the Late Bronze Age 1060-840 cal BC during an earlier study by Innes and Frank (1988). This is evidently another significant prehistoric resource of high palaeoenvironmental and archaeological potential. This peat is currently exposed in the cliff face and is actively eroding. This layer can be seen along with the other exposed peat layers and knoll site at Low

Hauxley, as the most threatened group of archaeological resources on the North East Coast (see section 7.2). By comparing the accurately surveyed positions of these peat layers and the Mesolithic-Early Bronze Age archaeological site on the knoll with the SMP2 projected coastlines, the SMP projection data can be seen as woefully inadequate. The current position of the exposed peats are already beyond the projected 20 year and 50 year shoreline projections and are only just within the 100 year projected future coastline (see Fig 6.9). Clearly, the SMP2 study has underestimated the rate of coastal erosion along this stretch of coast and it is in need of urgent review.

Low Hauxley B has already been dated in some detail by Tipping (see Drury 1995) and so no samples were submitted for dating from this unit. This unit is under the same ongoing threat as Low Hauxley A. This peat has a basal date of 3650-3350 cal BC and a date form the top of the horizon of 710-210 cal BC, ie. Neolithic-Iron Age date (see review document, Waddington 2010).

Low Hauxley C has returned dates of 3630-3360 cal BC and 3630-3360 cal BC from the base and this consistency between the two dates shows a formation period for the peat in the Early Neolithic broadly contemporary with the formation of Low Hauxley B. This layer has also been observed to contain flintwork and is threatened by ongoing and rapid erosion as with Low Hauxley A and B.

Low Hauxley D is located directly south of Low Hauxley C and has returned dates of 2290-2050 cal BC and 3650-3510 cal BC at the base of the deposit and a single date of 790-510 cal BC from the top of the deposit. If the earlier date is correct then it would again indicate a date of formation co-eval with Low Hauxley B and C. However, the later, Beaker period date, could suggest that the earlier date is from residual material. Given that this sample is from a natural deposit though, it is equally possible that it is the sample producing the later of the two dates that is intrusive. Currently it is not clear either way which date more accurately reflects the on-set of peat accumulation at Low Hauxley D. Either way it appears that peat formation ceased in the Early Iron Age. This layer also contains significant sized logs and tree stumps that can be seen protruding from the deposit. This excellent survival indicates the potential for the presence of more worked timber, as with all the other peat beds at Low Hauxley.

The dating programme undertaken by this project has provided a much more detailed understanding of the various peats and their formation and cessation dates at Low Hauxley. They have provided date ranges from the Mesolithic through to the Iron Age, with one peat, Low Hauxley A, appearing to encompass the Mesolithic-Neolithic transition. The extent of survival of archaeological and palaeoenvironmental remains along the coast at Low Hauxley providess a unique opportunity to investigate the development and change of a prehistoric landscape through Late Mesolithic – Iron Age times. Additional evidence, such as the preserved human and animal footprints and timber worked with stone tools that have only been recently discovered, shows the high potential for further remains and discoveries to be made, as well as the undoubted significance of these palaeoenvironmental and archaeological resources. The level of threat, especially to the north of the Bondicarr Burn (Fig 6.9), can be seen as extremely high with

many significant archaeological and environmental deposits experiencing ongoing destruction.

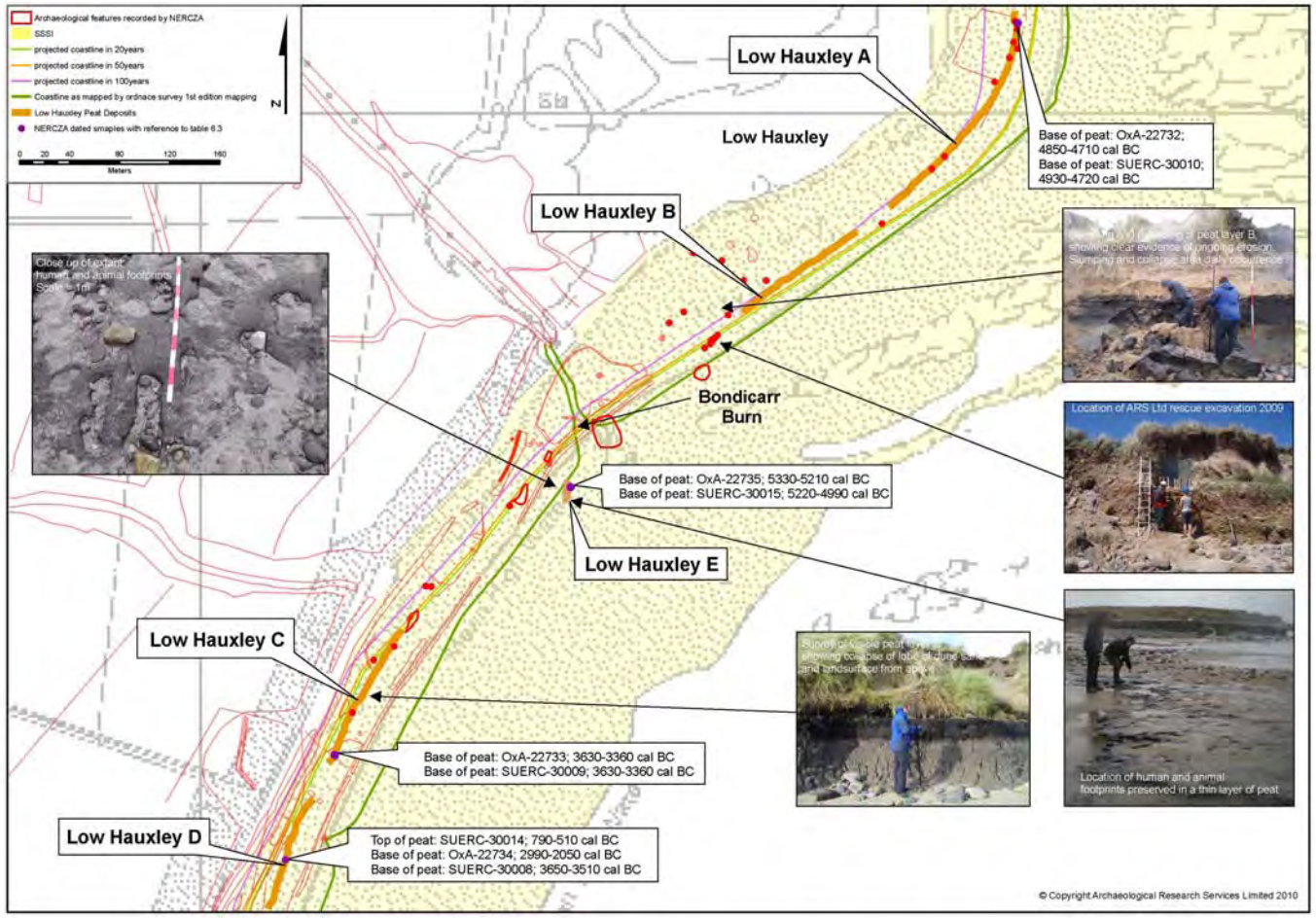


Fig. 6.11 Location of peats and dated samples at Low Hauxley.

# 7. MANAGING THE RESOURCE

## 7.1 Introduction

This chapter deals with coastal heritage management issues, in the light of the results of the NERCZA project to date, and the special interest of the sites identified. The assessment of site significance and prioritisation is inevitably partly subjective and is based on the professional judgement of Archaeological research Services Ltd staff in consultation with other stakeholders, although it is based on the results of consistent and objective survey. The prioritisation of sites for archaeological intervention, as outlined below, and the discussion related to each of them, are intended to provide a starting point for discussion and consideration of how best to manage sites and target resources. Given that the coastline is such a dynamic environment the condition of sites will change, as will knowledge of certain types of sites, and as a consequence the list of prioritised sites should also be revised in the light of such changes. Consequently, the priority list, and this chapter generally, should be considered a 'live' document that will change subject to further discussion across the curatorial sector and in the light of physical changes on the coastline. It is, therefore, not intended as a definitive statement but rather an aid to discussion and subsequent decision-making and actions.

In some cases archaeological features have been assessed individually and, where appropriate, others have been assessed as a group. For example, the surviving Second World War military features at Alnmouth have been assessed as a group, but considered separately to the 19th century oyster beds recorded at the same location. Each set of records has been assessed on the basis of their condition and level of special interest (see below), and their value as a group of surviving archaeological features also considered. Where appropriate, single features have been assessed, for example an isolated feature of high archaeological significance that is under threat from erosion or removal. Examples of this can be seen with the Budle Bay and Scremerston Second World War batteries in Northumberland.

A list of sites ranked by level of threat, condition and special interest has been produced and is displayed in Table 7.1, and the top quartile of most significant sites under threat (a total of 13) are discussed in further detail in Section 7.2. There is duplication of the numbering of policy units in the North East and Northumberland SMP2 documents and so each has been colour coded in table 7.1 to distinguish between them.

The assessment of each of the ranked sites shown in Table 7.1 has been based on five criteria. These criteria are: threat from erosion, condition, significance, potential for further investigation and rarity. Each of these criteria has been scored out of ten using the principals set out in DCMS guidance for Scheduled Ancient Monuments http://www.culture.gov.uk/images/publications/ScheduledMonuments.pdf (formerly Annexe 4 of PPG 16) and reflects the professional opinion of the ARS Ltd project team. The scoring is based upon data collected during the NERCZA project including that from the desk-based assessment, aerial photograph transcription, field survey and consideration of current and future sea level models.

The potential for some of these sites to be proposed for consideration for designation has also been reviewed. This is not scored but stated as Yes/No/Already designated within the table. The attribution given for these sites remains the opinion of the NERCZA project team and not the current position of English Heritage.

The scoring of the various criteria gives a total out of fifty. The table lists sites in their rank order with the site considered to be at most threat and greatest significance ranked number 1. All sites listed in the table are of special interest and face some risk from erosion, and a low ranking does not mean that the site is of low significance. It is only sites of special significance that have made it on to the list in the first place, as many hundreds of recorded features have been excluded as they are not considered to be at risk in the short or medium term. The criteria for assessing each site are discussed in more detail below.

**Threat:** This comprises the perceived level of threat to the site from coastal erosion or other ongoing erosion. It includes consideration of land use and the potential for the site to be removed artificially. A highly threatened site facing multiple types of erosion would score 9 or 10 while a site located in a stable location with little threat from erosion over the next 100 years would score 1. SMP2 predicted shorelines for 2025, 2055 and 2105 where also used in conjunction with the project GIS to assess the possible long term threat to each site. If the archaeological site was to be lost within 20 years using these predictions the threat would score higher, whereas if the shoreline projection indicated that it could survive for a further 100 years the score would be lower.

**Condition:** This score is based on the current condition of the site in question; a site which is an exceptional example of its type which survives mostly intact would score highly, while a site that survives in fragmentary form, or is mostly destroyed, will have a low score. The context of a site was also considered in this assessment. An archaeological site removed from its original context by later development would score lower than a site which has survived in its original context. This means that a well-preserved military site surviving *in situ* would score higher than a ploughed out Second World War crop mark site.

**Significance:** Assessment of significance has been based on the professional judgement of the project team with reference to the known information value, status, or historical significance of a site. This has been guided with reference to some of the criteria set out in the DCMS guidance for Scheduled Ancient Monuments http://www.culture.gov.uk/images/publications/ScheduledMonuments.pdf (formerly Annexe 4 of PPG 16). A highly significant site will have rare archaeological features with considerable information potential and may contain components from multiple periods. A less significant site will typically comprise a single, more common archaeological feature.

**Potential:** This is the potential for the site to yield further knowledge or evidence which will make a significant contribution to our understanding. A site which survives intact, and is rare, may contribute more than a site that is already well known and has been extensively investigated. The score is an overall assessment of how beneficial further archaeological work would be to furthering

understanding and contributing to place-making and public enjoyment/well-being.

**Rarity:** This is the assessment of how common the site type is, while also considering its degree of preservation and integrity. Here a standard pillbox which survives intact will score slightly lower as there are numerous examples surviving along the North East coast, however a barrow or a prehistoric monument, such as the enclosures seen at Fenham and Overdale Wyke, will score more highly as there are many fewer examples.

**Potential for Designation:** Sites in highly threatened locations may be less likely to be considered, however significant they are. Very significant sites in stable locations are more likely to be put forward for consideration. Sites that are already designated are also highlighted. This assessment is not a direct proposal for designation but an indicator of what sites could usefully be considered for putting forward for designation, based on the opinion of the NERCZA project team. It is important to note that even sites in extremely threatened positions may still be considered for proposal for future designation and this has been taken into consideration when putting forward the opinion of the project team.

Table 7.1 sets out the key heritage assets of special interest within the study area displayed in ranked order of priority as evaluated by the project team. The sites have been divided into a hierarchy of colour-coded quartiles with red being those sites considered under 'imminent risk', orange being those considered to be under 'high risk', yellow being those considered at 'intermediate risk' and green being those sites at 'low risk'. Sites at 'imminent risk' are discussed individually in more detail within section 7.2 with specific reference to the threats faced.
Sites considered to be at imminent risk are those scoring 40 or higher in the assessment. Those sites that scored between 30 and 40 are considered to be at high risk. Those scored between 20 and 30 are considered to be at intermediate risk and those lower than 20 are considered to be at low risk. Imminent risk is considered to be where there is an immediate or on-going threat to the surviving remains recorded on site and where there is also a clear need for further work. High risk is where the archaeological resource is threatened but the threat may not be as immediate, the site only being imminently threatened within the 20 year SMP2 coastline predictions. Intermediate risk sites are threatened in the long term and will only be directly threatened within the 20 – 50 year SMP2 coastline predictions. Low risk sites are those which will become threatened in the long term, the 50 – 100 year SMP2 coastline predictions, or possibly not at all using current data.

However by comparing the SMP2 predictions with the coastline as recorded by the NERCZA project the limitations of using the SMP can be seen. Using Low Hauxley as an example, the SMP2 predicted shorelines can be seen as woefully inadequate along this stretch of coast. The current line of the shore, in particular the location of the surviving peat layers known to contain archaeological material, can be seen to be further inland than the SMP2 predictions for the shoreline in 50 years time (Fig 7.2) (See also Chapters 5 and 6). This huge discrepancy demonstrates the limitations of using this data in assessing the threat to heritage assets, certainly in this part of the North east coastline, and an urgent review of the SMP2 shoreline predictions for this area is required. It would seem that the

current data can only be used as a rough guide as to what will happen in the future.

## 7.2 Priority sites of special interest at 'imminent risk'

Table 7.1 Prioritised list of threatened heritage assets on the North East coast of England based on the results of the NERCZA Project.

| Position | Site Name | Site Type | NERCZA UID | Policy Unit | Policy | Threat | Condition | Significance | Potential | Rarity | Potential to Designate Yes/No/Already Designated | Total /50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Low Hauxley | Mesolithic and Bronze Age Site | 332 | 17.3 | MR | 10 | 10 | 10 | 10 | 10 | No | 50 |
| 2 | Low Hauxley | Prehistoric footprints and other peats | 700 | 17.3 | MR | 8 | 10 | 10 | 10 | 10 | No | 48 |
| 3 | St Cuthbert's Isle | Hermitage | 386 | 4.7 | NAI | 10 | 9 | 9 | 10 | 10 | Yes | 48 |
| 4 | Fenham | Late prehistoric enclosure | 472 | 4.3 | NAI | 10 | 8 | 9 | 9 | 9 | Yes | 45 |
| 5 | Budle Bay | Gun Emplacement | 500 | 4.5 | HTL | 8 | 10 | 9 | 8 | 9 | Yes | 44 |
| 6 | Trow Point | Possible Bronze Age burial | 132 | 3.1 | NAI | 10 | 7 | 8 | 9 | 9 | No | 43 |
| 7 | Amble | 6 Hulks of coal wherries | 352-356 | 15.2 | MR | 10 | 7 | 9 | 9 | 8 | Yes | 43 |
| 8 | Scremerston | Late prehistoric enclosure | 4526 | 3.1 | NAI | 10 | 7 | 8 | 8 | 9 | No | 43 |
| 9 | Scremerston | Gun Emplacement | 463 | 3.1 | NAI | 6 | 10 | 9 | 8 | 9 | Yes | 42 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | Budle Bay | Fish traps | 520 | 4.5 | HTL | 10 | 8 | 8 | 8 | 8 | Yes | 42 |
| 11 | North Gare | WW1 Seaplane base | 201 | 13.4 | NAI | 10 | 6 | 9 | 8 | 9 | No | 42 |
| 12 | Hartley | Roberts Battery | 451 | 24.1 | HTL | 10 | 9 | 7 | 7 | 8 | Already designated | 41 |
| 13 | Holy Island | Lithic Scatter | 518 | 5.1 | NAI | 8 | 8 | 9 | 7 | 8 | No | 40 |
| 14 | Hartley | Fort House | 443 | 24.1 | HTL | 7 | 7 | 9 | 8 | 8 | No | 39 |
| 15 | Alnmouth | Oyster Ponds | 223-228 | 13.4 | HTL | 10 | 6 | 7 | 7 | 8 | No | 39 |
| 16 | Goldsbrough | Military camp | 417 | 21.3 | NAI | 9 | 8 | 7 | 8 | 8 | No | 38 |
| 17 | Hummersea | Alum works | 52 | 17.3 | NAI | 10 | 8 | 7 | 7 | 7 | Already designated | 38 |
| 18 | Alnmouth | 19th Century Battery | 214 | 13.1 | MR | 6 | 8 | 8 | 9 | 7 | Already designated | 38 |
| 19 | Loftus | Alum works | 195 | 17.3 | NAI | 10 | 8 | 7 | 7 | 7 | Already designated | 38 |
| 20 | Sandsend | Alum works | 415 | 21.3 | NAI | 10 | 8 | 7 | 7 | 7 | Already designated | 38 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Overdale Wyke | Prehistoric enclosures | 170 | 21.3 | NAI | 7 | 6 | 9 | 7 | 9 | No | 38 |
| 22 | Kettleness | Alum works | 426 | 21.3 | NAI | 10 | 7 | 7 | 7 | 7 | Already designated | 38 |
| 23 | Trow Point | 19th century disappearing gun and WW2 defences | 119 | 3.1 | NAI | 9 | 7 | 8 | 6 | 7 | Already designated | 37 |
| 24 | Whitburn | Fishing Trap | 419 | 6.2 | HTL | 7 | 7 | 8 | 8 | 7 | No | 37 |
| 25 | Alnmouth | Chapel | 232 | 13.8 | HTL | 8 | 8 | 7 | 7 | 7 | Yes | 37 |
| 26 | Greatham Creek | WW2 Decoy site | 198 | 13.5 | NAI | 7 | 7 | 8 | 6 | 8 | No | 36 |
| 27 | Newton Point | WW2 Radio station | 666 | 9.1 | NAI | 7 | 10 | 7 | 6 | 6 | No | 36 |
| 28 | Kettleness | Mineral railway | 422 | 21.3 | NAI | 7 | 7 | 8 | 7 | 7 | Already designated | 36 |
| 29 | Saltburn | Rutways | 27 | 16.1 | NAI | 8 | 7 | 7 | 7 | 7 | No | 36 |
| 30 | Saltburn | Rock cut features | 29 | 16.1 | NAI | 8 | 7 | 7 | 6 | 7 | No | 35 |
| 31 | Saltburn | Alum works | 23 | 16.1 | NAI | 10 | 6 | 6 | 6 | 7 | Already designated | 35 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | North Gare | Medieval Salterns | 184 | 13.3 | NAI | 5 | 8 | 8 | 7 | 7 | Already designated | 35 |
| 33 | Druridge Bay (North) | WW2 Defences | | 17.4 | MR | 9 | 7 | 7 | 6 | 6 | No | 35 |
| 34 | Druridge Bay (South) | WW2 Defences | | 17.3 | MR | 8 | 7 | 7 | 6 | 6 | No | 34 |
| 35 | Bamburgh | Early Medieval burials | 378 - 385 | 6.1 | NAI | 3 | 7 | 9 | 7 | 8 | Yes | 34 |
| 36 | Dunstanburgh | WW2 military complex | 640-660 | 10.1 | NAI | 7 | 7 | 8 | 6 | 6 | No | 34 |
| 37 | Craster | WW2 Radar station | 634 | 10.1 | NAI | 5 | 8 | 7 | 8 | 6 | Already designated | 34 |
| 38 | Ross Links | WW2 Military remains | 800 | 4.5 | HTL | 6 | 7 | 8 | 8 | 5 | No | 34 |
| 39 | Sandsend | Railway | 416 | 21.3 | NAI | 8 | 7 | 6 | 6 | 7 | No | 34 |
| 40 | Druridge Bay | Gun Emplacement | 264 | 17.4 | MR | 8 | 5 | 7 | 7 | 7 | No | 34 |
| 41 | Goldsbrough | Roman signal station | 429 | 21.3 | NAI | 2 | 7 | 8 | 7 | 9 | Already designated | 33 |
| 42 | Sandsend | WW2 Defences | 433 | 22.1 | HTL | 7 | 6 | 6 | 7 | 7 | No | 33 |
| 43 | Budle Bay | Quarry complex | 502 | 4.5 | HTL | 8 | 6 | 7 | 6 | 6 | No | 33 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | Greatham Creek | WW2 Defences | 141-152 | 13.5 | NAI | 7 | 7 | 6 | 7 | 6 | No | 33 |
| 46 | Holy Island | Fort | 402 | 4.8 | HTL | 5 | 8 | 6 | 8 | 6 | Already designated | 33 |
| 47 | Bamburgh | Military complex | 363 - 374 | 6.1 | NAI | 7 | 7 | 6 | 7 | 6 | No | 33 |
| 48 | North Gare | WW2 Defences | 153 -190 | 13.2 | NAI | 7 | 7 | 6 | 6 | 7 | No | 33 |
| 49 | Skinningrove | WW2 Defences | 30 | 17.2 | HTL | 7 | 7 | 6 | 6 | 7 | No | 33 |
| 50 | Boulmer | WW2 Airfield + Defences | 612 | 11.2 | NAI | 6 | 7 | 7 | 6 | 6 | Yes | 33 |
| 51 | Fenham | Grange | 470 | 4.3 | NAI | 4 | 8 | 7 | 8 | 6 | Already designated | 33 |
| 52 | Seahouses | WW2 Trench Network | 670 | 7.1 | NAI | 9 | 7 | 6 | 5 | 6 | No | 33 |
| 53 | Crimdon Dene | WW2 Defences | 81-113 | 11.1 | MR | 8 | 6 | 7 | 6 | 6 | No | 33 |
| 54 | Skinningrove | Ironstone mine | 19 | 17.1 | NAI | 7 | 5 | 7 | 6 | 7 | Already designated | 32 |
| 55 | Frenchmans Bay | WW2 Defences | 140 | 3.2 | NAI | 6 | 6 | 6 | 8 | 6 | No | 32 |
| 56 | Trow Point | WW2 Defences | 120 - 139 | 3.1 | NAI | 8 | 7 | 6 | 6 | 5 | No | 32 |
| 57 | Scremerston | WW2 Radar Station | 467 | 3.1 | NAI | 4 | 7 | 7 | 6 | 7 | Yes | 31 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58 | Druridge Bay | Bombing range markers | 259, 292 + 280 | 17.4 | MR | 8 | 4 | 7 | 4 | 8 | No | 31 |
| 59 | Embleton Bay | WW2 military earthworks | 640-660 | 9 | NAI | 7 | 5 | 6 | 6 | 7 | No | 31 |
| 60 | Beadnell | WW2 Trench Network | 662 | 8.2 | HTL | 7 | 6 | 6 | 6 | 6 | No | 31 |
| 61 | Holy Island | Quarry | 519 | 5.1 | NAI | 9 | 7 | 5 | 5 | 4 | Already designated | 30 |
| 62 | Budle | Lime Kiln | 497 | 4.5 | HTL | 9 | 7 | 5 | 6 | 4 | No | 30 |
| 63 | Scremerston | Lime Kiln | 458 | 3.1 | NAI | 9 | 6 | 5 | 6 | 4 | No | 30 |
| 64 | Alnmouth | Post medieval barn | 237 | 13.8 | HTL | 6 | 6 | 6 | 4 | 7 | No | 29 |
| 65 | Alnmouth | Disguised pillbox | 230 | 13.8 | HTL | 9 | 4 | 5 | 2 | 8 | No | 28 |
| 66 | Crimdon Dene | Mesolithic flint scatter | 99 | 11.1 | MR | 10 | 4 | 9 | 5 | 9 | No | 27 |
| 67 | Scremerston | Defensive position | 459 | 3.1 | NAI | 10 | 3 | 5 | 4 | 4 | No | 26 |
| 68 | Scremerston | Pillbox | 460 | 3.1 | NAI | 8 | 6 | 3 | 3 | 2 | No | 22 |
| 69 | Alnmouth | Enclosure | 218 | 13.1 | MR | 4 | 5 | 4 | 4 | 4 | No | 21 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | Whitburn | WW2 AA battery | 550 | 6.1 | HTL | 2 | 5 | 5 | 1 | 7 | No | 20 |
| 71 | Sandsend | Former Railway Station | 406 | 22.1 | HTL | 2 | 10 | 2 | 1 | 4 | No | 19 |
| 72 | Whitburn | Rifle range | 561 | 6.1 | HTL | 2 | 10 | 2 | 1 | 3 | No | 18 |
| 73 | Kettleness | Former Railway station | 415 | 21.2 | HTL | 2 | 8 | 2 | 1 | 4 | No | 17 |
| 74 | Kettleness | 18th century church | 418 | 22.1 | HTL | 4 | 6 | 2 | 2 | 3 | No | 17 |
| 75 | Cresswell | WW2 Military remains | 236 | 17.5 | MR | 1 | 4 | 1 | 5 | 5 | Yes | 17 |
| 76 | Alnmouth | Possible later medieval stock enclosure | 219 | 13.8 | HTL | 2 | 4 | 1 | 3 | 4 | Yes | 14 |
| 77 | Embleton (town) | WW2 military remains | 612 | 9.1 | NAI | 2 | 3 | 2 | 2 | 3 | No | 12 |
| 78 | Alnmouth | Beacon | 216 | 13.8 | HTL | 1 | 2 | 1 | 2 | 2 | No | 8 |
| 79 | Greatham Creek | Possible military buildings | 139 | 13.5 | NAI | 2 | 1 | 2 | 1 | 1 | No | 7 |
| 80 | Seahouses | WW2 military fragmentary remains | 632 | 7.1 | HTL | 2 | 1 | 1 | 1 | 1 | No | 6 |

| | | |
|---|---|---|
| 3.1 | | SMP2 Policy Unit for Northumberland |
| 3.1 | | SMP2 Policy Unit for North East |
| Druridge Bay | | Imminent Risk |
| Druridge Bay | | High Risk |
| Druridge Bay | | Intermediate Risk |
| Druridge Bay | | Low Risk |

Table 7.2 Key to colours used in table 7.1

## 7.3 Sites assessments

The following is a site by site discussion of the sites identified as being at 'imminent risk' in the ranked assessment shown in Table 7.1. The reasons for the scoring of each site are discussed and possible management options for the threatened archaeological remains are identified and discussed and placed in order of preference.

As three separate archaeological elements at Low Hauxley scored high enough to be included they have been grouped into two in this discussion according to their geographic position either side of the Bondicarr Burn.

### 7.3.1 Low Hauxley Mesolithic site and Beaker-Bronze Age burials

Low Hauxley; Mesolithic site and Beaker-Bronze Age cemetery (NU 28412 22705)
Druridge Bay, Northumberland
**Policy Unit 17.3**
**Managed Retreat**

The archaeological asset comprising the Mesolithic occupation site and Beaker-Bronze Age burial site at Low Hauxley is especially significant. The potential for further investigation and the potential for that to further our understanding of Mesolithic settlement and Beaker period – Early Bronze Age burial, together with questions of colonisation and immigration in prehistory, makes the significance and rarity of this site score maximum. The condition of the archaeological resource that survives, being sealed under calcareous sand dunes, is excellent even when considering the ongoing effects of erosion on the archaeology. On this evidence the site scores maximum on potential and condition criteria. However, it is not known how much more of the site survives given the quantity of material that has already fallen out. Therefore, there is a need to establish in more detail what still survives on the site. In addition to the archaeology there is a sequence of inter-tidal peats immediately adjacent to this site that have considerable palaeoenvironmental, geoarchaeological as well as archaeological potential. The series of radiocarbon dates for the peat layers retrieved as part of this project demonstrate that the earliest of these sediment units formed during the Late Mesolithic and they continue to at least the Late Bronze Age in the area to the north of the Bondicarr Burn. The peats represent an archaeological resource of high significance containing Mesolithic flints and are sealed by dune sand that has revealed evidence for many other archaeological features including a pristine Late Bronze Age rapier and a circular stone-built structure, probably a roundhouse, that has now been destroyed and washed away. These peat layers are under daily erosion, and given that they are known to be, in part, contemporary with the activity represented at the Mesolithic-Bronze Age site, present a resource of considerable potential. The combination of archaeological and palaeoenvironmental deposits together at the same location ensure the site is of high significance.

The threat to the archaeological resource is serious and ongoing (Fig 7.1), with destabilisation of the cliff (Fig 7.2) a daily occurrence. In addition, the site is also under threat by robbing from members of the public as evidenced by the

wedging of a side slab for one of the small cists back into position after human bone material had been scooped out and dropped below – it is thought that a pottery vessel is likely to have been removed by this action (see chapter 5.9). Here the threat level has also scored maximum. The threat to the site is so bad that there is considered little point in designating a site that only has a few years left before its inevitable removal, and designation will not assist in its survival.

Fig. 7.1 Location of a previous archaeological excavation trench backfill (above the black plastic sheet) eroding out of the cliff at Low Hauxley.

**Management options**

The management options for the site are listed in order of preference, with the first being the most preferable strategy.

- Archaeological evaluation to assess scale and cost of rescue works, followed by an appropriate level of excavation and recording in conjunction with a parallel programme of palaeoenvironmental investigation. This could be combined with recording and investigating Peat E, its footprints and worked timber. In addition, further monitoring and recording of the peats and eroding remains, with community involvement, as part of the wider "Coal and Coast" project.
- Ongoing regular monitoring of exposed archaeological sediments to assess if any more significant archaeological features are exposed and record what one can of them as they fall out.
- Do nothing and allow for loss.

The favoured option of the project team is the highest possible level of recording as this would provide the most information and preserve the resource through record before its removal due to natural processes. The significance of this site, combined with the complex multi-period archaeology, requires the attention of a structured archaeological evaluation in the first instance undertaken by

professional archaeologists with community support. This could involve community groups and schools and outreach allowing local people to engage with their coastal heritage and enhancing the experience of visitors, whilst also allowing possible access to wider sources of funding to allow this work to be undertaken.

### 7.3.2 Low Hauxley Footprints

Low Hauxley Prehistoric footprints and worked wood (NU 28302 77257)
Druridge Bay, Northumberland
**Policy Unit 17.3**
**Managed Retreat**

The human and animal footprints identified at Low Hauxley, Northumberland, are visible in the inter-tidal zone, in a thin layer of intermittently exposed peat, Low Hauxley E (Fig 7.3). Their extent has been recorded and a sample of worked wood was retrieved (see section 5.9 and section 6) together with a peat sample that has produced Late Mesolithic calibrated date ranges of 5330-5210 cal BC and 5220-4990 cal BC for the on-set of peat formation (see also Chapter 6). Given the shallow depth of this peat it is clearly a relatively short-lived sediment and is likely to have only been accumulating for a short period and therefore the footprints, which would have had to be formed when the sediment was still very soft and wet, are likely to date to the final wet phase of the sediments before it dried out. Therefore, it is considered very likely that the footprints also being to the Late Mesolithic period although radiocarbon dates from the top of this sediment unit are still required to provide a more accurate date for the footprint formation.

The peat containing the footprints represents a newly identified sediment unit at a lower elevation, and of an earlier date, than the other previously known peats, and therefore is extremely important in its own right as it contains a wealth of environmental evidence concerning the immediate Late Mesolithic environment in this area. Considering the existence of abundant worked wood within the layer, which was seen when the footprints were recorded, the importance and potential of the site as a resource for gaining further knowledge about human activity and the environment during the latter stages of the Mesolithic is great. The presence of human and animal footprints impressed into this layer is also extremely important as there are only three other examples of preserved prehistoric footprints in Britain, at Formby on the Lancashire coast (Cowell 2001), the Severn estuary (Allen 2004) and Hartlepool Bay (Waughman 2005).

This site scored very highly in the table as it is of very high rarity and significance, being one of only four known sites where such footprints survive. The presence of abundant worked wood within the sediment layer, together with the potential of the peat for further plant micro and macro fossils only increases the significance of the site, and inspection of the peat showed that there was a huge quantity of timber surviving within it that could shed light not only on human activities, technology and woodland management, but also a rare and detailed insight into the type of vegetation and landscape setting in this area at the time the footprints were made. The dating of this layer to the Late Mesolithic indicates that it could be contemporary with the Late Mesolithic occupation site below the

Bronze Age cairn cemetery at Low Hauxley (see above) that was radiocarbon dated by Bonsall (1984) to a similar time bracket ("A single radiocarbon determination on a sample of shells from the midden suggests an age of about 5000 bc"), although the latter date has never been fully published. If the two sites are contemporary, as seems possible, then the group value of these remains is even higher and provides a very rare opportunity to understand a Mesolithic occupation site in relation to a submerged peat, with clear evidence for human activity within it, as well as human interaction with the environment in terms of woodland management and associations with animal activity. This site could provide a counterpart to Star Carr, except in this case it would provide an unparalleled level of detail on human activity in the Late Mesolithic prior to the introduction/adoption of farming and in a coastal setting.

The threat to the site from coastal erosion is significant as the peat layer is scoured clean of the overlying sand during storm events and the site scored moderately high as a result of this assessment, despite it being sometimes covered by beach sand - that protects the resource during the calmer summer months. When revealed again the peat in which the footprints and wood are preserved is very shallow and would be prone to erosion from the tide and beach walkers as it is situated within the inter-tidal zone. During a storm event this peat could be scoured away completely removing the evidence of the footprints, and probably the entire layer of peat and worked timbers altogether.

The potential to propose the site for consideration for designation is low as it is difficult to see how any kind of designation would help the site in terms of its survival, given that it is being affected by an inexorable natural process.

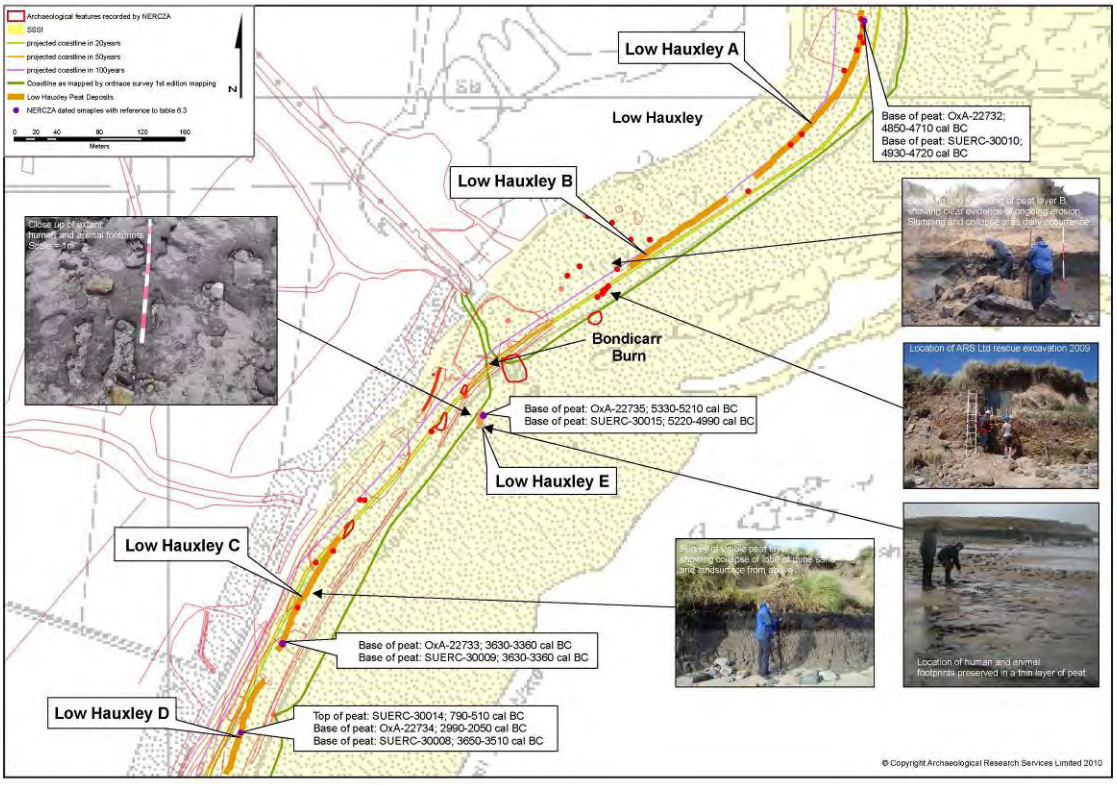


Fig. 7.2 Location of Footprints and samples at Low Hauxley.

Fig. 7.3 The briefly exposed footprints at Low Hauxley showing how much of the sediment has already been eroded away, and the position of the worked wood find, with the Bondicarr Burn outflow in the background, looking north (Scale = 2m).

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being considered the most preferable strategy.

- Full recording of the footprints next time they are revealed, utilising an accurate GPS plot of the full extent together with a full, hand drawn plan of the whole peat layer at a scale of 1:50 and detailed drawings, measurements and photographs for each footprint at 1:20. As well as this recording strategy, casts of some of the best-preserved footprints could be taken and a full photographic survey of their visible extent made. This would allow analysis on the direction of travel, the number of individuals, and possibly even ages, sex, as well as the species of animals and approximate number of individuals. Further samples of wood should be taken to allow more detailed analysis of woodland management and woodworking techniques (Taylor 2010) with the wood specialist involved on site in selecting samples for analysis. This would undoubtedly contribute to the understanding of prehistoric life in this part of Britain as there are very few examples of prehistoric worked timber known from the region, and from this period more generally. Further samples of the peat to be taken for environmental assessment and examination fro archaeological residues such as worked flints and suitable radiocarbon dating samples from the top of the peat layer and any other significant parts of the sediment unit or deposits within it.

- Ongoing monitoring of the visible extent of the footprints and basic recording to assess their condition and any increase/change in the nature of the threat faced in this location.
- Do nothing and allow the resource to be lost.

The favoured option of the project team is the highest possible level of recording as this would provide the most information and contribute significantly to our understanding of the Late Mesolithic period both at a regional scale, and nationally/internationally, whilst also preserving the resource through record before it is lost as a result of natural processes. If time and funding does not allow for full recording then the next best approach is to utilise and encourage motivated local amateur archaeologists, such as Jim Nesbit, to continually monitor the exposure and condition of the site. The least favourable option is to do nothing as the sediment unit will eventually be completely exposed and removed through natural process, losing a nationally valuable archaeological resource.

### 7.3.3 St Cuthbert's Isle

St Cuthbert's Isle; Hermitage (NU 12289 772568)
Holy Island, Northumberland
**Policy Unit 4.7**
**No Active Intervention**

The site comprises the surviving structural remains of a hermitage, believed to have been the site initially occupied by St Cuthbert in the 7th Century AD. What is visible now represents a later medieval structure built on the site. The site is thought to have been initially occupied by the saint who eventually settled on Farne Island near Bamburgh. However, the site is still of historical significance as there is a possibility of well-preserved medieval archaeology relating to a small early medieval hermitage as well as the later chapel that still survives in ruinous state on the site. For this reason the site is potentially highly significant and, considering the threat faced by its location (Fig 7.5), can be seen to be placed at high risk. There are also well-preserved remains of at least two small buildings and associated earthworks, and the site therefore scored very highly on condition, potential and significance.

The possible link to St Cuthbert adds considerable significance and potential importance to the site, and justifies the high rarity value score. The threat to the site is also very high as archaeological deposits are being actively eroded at every high tide (Fig 7.4), with part of the western wall of the structure on the isle already having been lost. This is the reason for the site scoring a maximum in this category.

Fig. 7.4 Actively eroding archaeological remains on St Cuthbert's Isle, Northumberland, viewed at low tide looking east.

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy of the project team.

- Full Level 3 detailed survey of above ground remains on St Cuthbert's Isle at an appropriate scale, followed by rescue excavation of the western limits of the monument already being lost to erosion and ongoing monitoring of future erosion. There is also potential for geophysical survey, test-pitting and full excavation if the threat increases, possibly as a part of a wider community project.
- Level 3 survey of the whole of St Cuthbert's Isle at a scale of 1:500 and on-going regular monitoring of exposed archaeological sediments to assess if any significant archaeological features are exposed.
- Do nothing.

The favoured option of the project team is the highest possible level of recording as this would provide the most information and important knowledge gain whilst preserving the eroding resource through record, prior to its removal by natural processes. The site is exposed and archaeological remains are rapidly being eroded away, making at least Level 3 survey and recording of the exposed section a priority. If full survey or archaeological excavation cannot be undertaken in the near future some form of ongoing monitoring to evaluate the situation must be undertaken. This could be done by a local group, or island residents, as it would only require regular photography passed on to the local authority and English Heritage. However, without the scope to react to further erosion the monitoring would in itself be of little value. It would only serve to highlight a problem, raise expectations and local feeling, only for it to be dashed by no action being taken and the remains left for their inexorable removal.

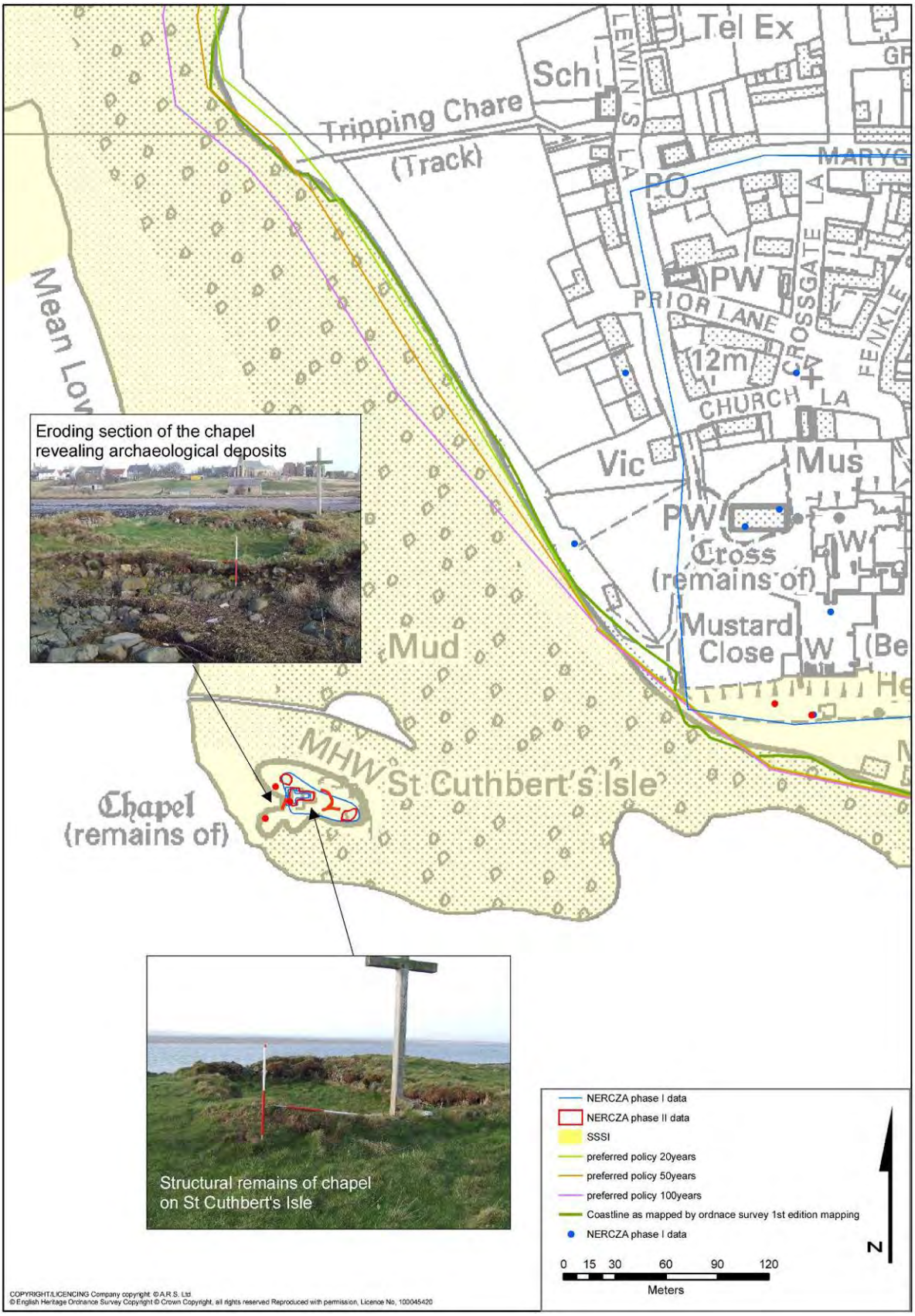


Fig. 7.5 Location of St Cuthbert's Isle, off the south coast of Holy Island.

### 7.3.4 Fenham Prehistoric Enclosure

Fenham, Northumberland (NU 42705 46881)
**Policy Unit 4.3**
**Hold the Line**

The degraded earthwork remains at Fenham of a prehistoric enclosure, probably a substantial 'palisade' site, warrant further investigation. Although the upstanding remains are slight the importance of the site and the imminent nature of the erosion mean that this is an archaeological resource of high potential and rarity value. The site could yield significant information about lowland enclosures, settlement and farming activities during later prehistory as well as help address the problem of the dating of palisaded sites in northern England, important objectives of the regional research framework. The site is, therefore, of high regional significance and although its surviving condition remains broadly unknown, though it evidently has substantial cut features surviving given the cropmark formation, the threat and significance increase the score of this monument. Furthermore, a significant portion of this large site has already been lost to the sea and the site is continuing to erode. There is potential for this site to be considered for putting forward for designation.

Fig. 7.6 The location of a slump below the Fenham enclosure. The ranging pole shows the location of the original centre of the enclosure bank which can be seen as a slight upstanding earthwork on the ground surface above (Scale = 2m).

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being considered the most preferable strategy.

- Detailed level 3 field survey of surviving earthworks, followed by close-spaced fieldwalking and geophysical survey, targeted evaluation trenching and cutting back of the cliff section through the defences to gain a better idea of what survives, the condition of preservation and assess the date of the monument and its ability to answer key research questions. Production of report followed by on-going monitoring and further works if necessary.
- Continued monitoring of the cliff face and environs of the site to assess the effects of erosion.
- No further work.

The favoured option is the level 3 recording as this would provide the necessary information to gain some understanding of the date of these features, how the site was built and how it functioned, before further erosion degrades the integrity of this large complex. Here, a sensitive archaeological approach is required so as not to further destabilise the cliff edge. Fieldwalking and geophysical survey followed by targeted evaluation to gain further information on the preservation and extent of what remains is considered a priority. The site should at least be subject to ongoing monitoring to assess the extent and nature of any archaeological deposits that are exposed in due course. This site could provide a useful counterpart to the well-known sites in East Lothian, such as Broxmouth and Dryburn Bridge, and shed light on later prehistoric coastal settlement in North East England. The latter two sites were similar lowland enclosures under the plough and in near coastal locations, and these sites have added very significantly to the understanding of later prehistory in the region, as well as revealing evidence for being far more complex multi-period sites than the first impression of the cropmark remains suggested.


Fig. 7.7 Location of the late prehistoric enclosure at Fenham.

### 7.3.5 Budle Bay gun emplacement

Budle Bay, Northumberland, NU 16112 28151.
**Policy Unit 4.5**
**Hold the Line**

The site at Budle Bay comprises a small military battery formerly served by a small camp, now a caravan park (Fig 7.11). The surviving remains comprise a post-medieval industrial complex serving a quarry located on the golf course at Bamburgh, with a Second World War gun emplacement (Fig 7.10) constructed on top of it. It is this structure that is the subject of this assessment. The military building survives extremely well and has several unusual features that make this structure one of only a pair on the North East coast, the other being located at Scremerston, that are unparalleled elsewhere in the country. For this reason the condition, significance and rarity scores for this structure are high. These structures are far bigger and more complex than any other emplacements that can be seen to house the same calibre gun. For some reason greater emphasis and attention was paid when constructing these particular emplacements. There is also a possibility that these are based on German military designs, although this remains to be confirmed. The reason for the substantial nature of these positions is not currently clear from their location alone.

Fig. 7.8 The large gun emplacement at Budle Bay viewed from the south (1m scale visible).

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy.

- Architectural, photographic and Level 3 standing building survey with associated Level 3 earthwork survey of the environs of the site including the quarry and kilns. This to be followed by proposal of the site for

consideration for future designation. Also, continued monitoring of the site over the long term with the assistance of volunteers.

- Photographic and basic Level 1 building recording survey, followed by continued monitoring of the site.
- No further work.

The favoured option is the Level 3 standing building survey and on-going monitoring as this would provide an adequate information base for a very rare monument in advance of future coastal erosion encroaching into this area. If this is not possible the remains should be at least subject to Level 1 recording to allow direct comparison with other examples of gun emplacements. Continued monitoring could be undertaken by groups, such as the Fortress Study Group, which comprises a motivated and knowledgeable group of enthusiasts.

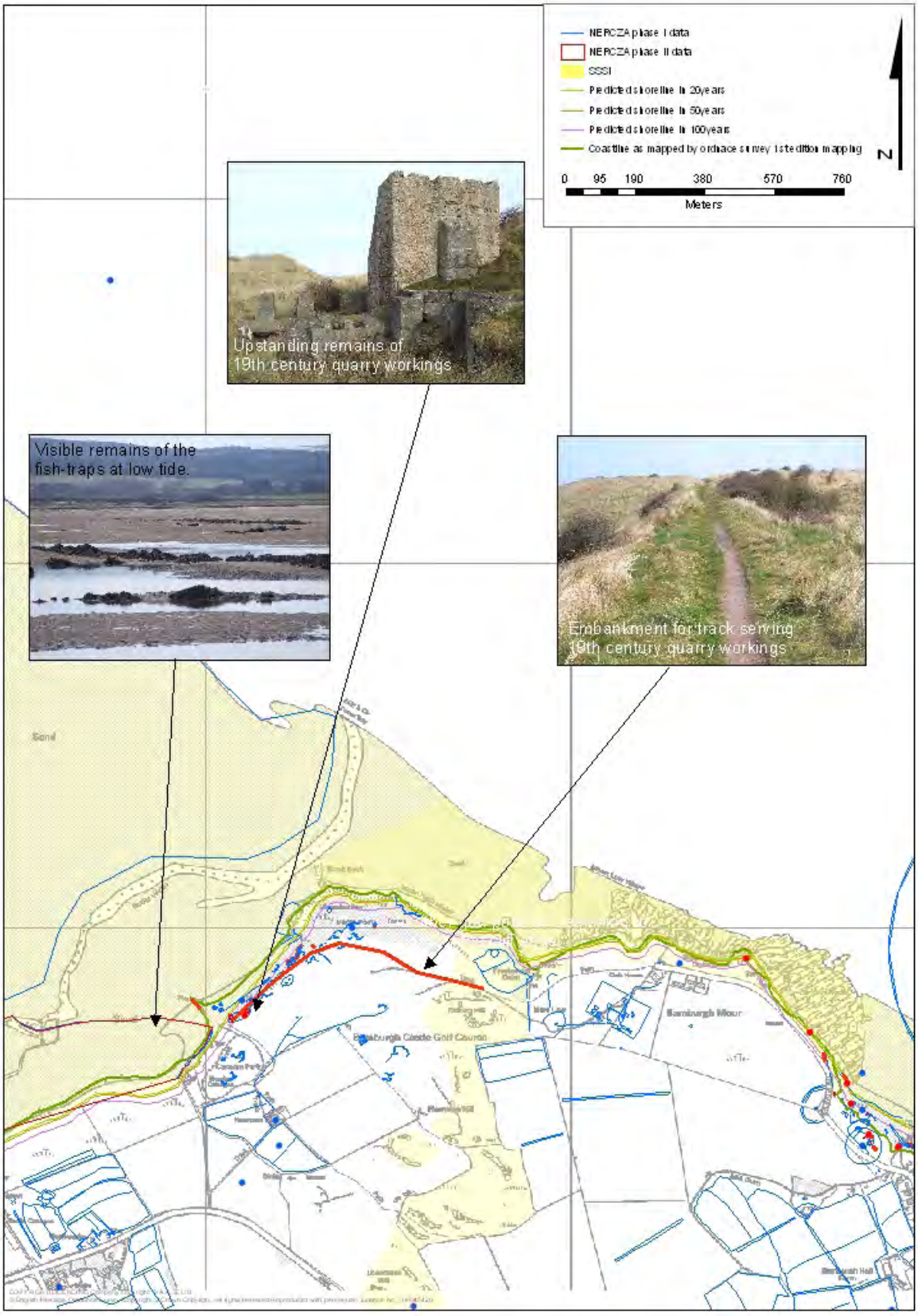


Fig. 7.9 The features surrounding the Budle Bay battery and fish traps.

### 7.3.6 Trow Point Barrow and Military Remains

Trow Point, South Shields (NZ 38361 72439)
**Policy Unit 3.1**
**No Active Intervention**

The whole of Trow Point is threatened by ongoing coastal erosion, and although the Second World War military remains face the same threat they are not as rare as the possible barrow. However, the nineteenth century 'disappearing gun' is a rare military monument, although only a small fragment of the original Victorian structure survives, it having been subject to later alteration. The gun that is currently visible at Trow Point is a much later twentieth century replacement that has been placed there to aid public interpretation. The presence of a surviving Bronze Age barrow has not been confirmed but the NERCZA survey has put forward a sub-circular earthwork, truncated by later features, as a possible candidate (Fig 7.6). It is positioned at the escarpment edge at the rear of the point and faces the threat of cliff collapse due to wave action destabilising the cliff edge to the north and south, which will lead to complete collapse over time (Fig 7.7). The potential significance of this monument is high, as it was thought to have been lost to quarrying, and is known to have produced a cist burial with a socketed Late Bronze Age axe head found nearby. The site, therefore, scored highly on threat, significance, potential and rarity. Having multi-period remains on the site, including those from WW1 and WW2, adds to the significance of the site which is being battered by wave action on a daily basis.

Fig. 7.10 Trow Point viewed from the west, the possible barrow is located on the high point to the right of the gun position.

The condition of the monument is currently unknown but is likely to be truncated due to antiquarian investigation and later impacts from the construction of military features. For this reason the condition scored lower.

Given that this is an actively eroding site it is not thought practical to propose this site for consideration for designation.

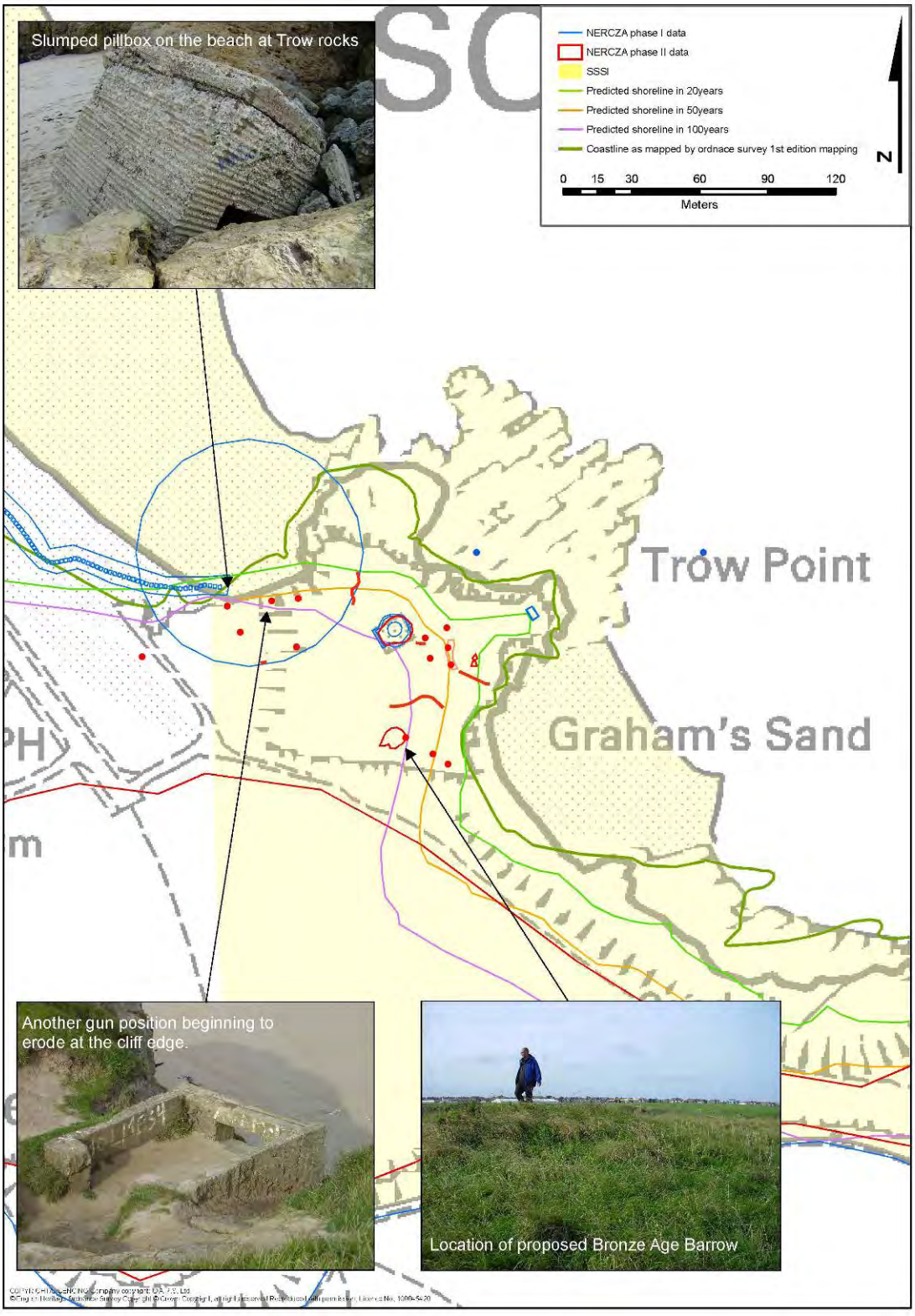


Fig. 7.11 Trow Point and its archaeology showing projected loss of archaeological features.

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy of the project team.

- Level 3 archaeological survey and investigation of all of the remains on Trow Point, followed by targeted test pits and/or small evaluation trenches to evaluate the potential survival of prehistoric and wartime remains. To be followed by continued assessment of impacts of ongoing erosion and monitoring of the remains with volunteers. It is not thought that geophysics would be a suitable technique at this site given that there is so much metal around the site due to wartime activity.
- Continued monitoring of the site to assess the effects of erosion based on the NERCZA field survey. Further investigation of the potential barrow utilising test pits and evaluation excavation.
- Ongoing monitoring of effects of erosion. No further archaeological work

The favoured option is the intrusive investigation approach as this would provide an appropriate evidence base upon which to devise future management options for the site and to establish the status of the possible barrow site. One way to achieve this is to construct a community-based research, monitoring and interpretation project based on community involvement, in co-operation with the National Trust, who currently manage the site. This could involve training in archaeological techniques and monitoring as well as the production of suitable interpretation and outreach opportunities for local schools which would assist in the local community taking some ownership of its historic assets and also helping to access funding streams.

### 7.3.7 Amble 19th century hulks

Amble, Northumberland, 19th century hulks (NU 26382 97995)
**Policy Unit 15.2**
**Managed Retreat**

The Amble hulks are located in the inter-tidal zone of the estuary of the River Coquet in Northumberland (Figs. 7.12 and 7.13). They have been the subject of a limited programme of research and are still poorly understood. The NERCZA field survey identified them as being threatened by every high tide and, although photographed and accurately located with basic measurements taken, a detailed survey of these inter-tidal hulks still has not been undertaken. There are many sites in Britain where inter-tidal hulks have been recognised, however there is no comparable assemblage of hulks from a similar period which survive to this extent along the North East coast. Others have been seen at Newburn on the River Tyne, but these do not survive as well and have already been surveyed (Taylor and Williams 2009). For this reason the Amble hulks scored highly against the significance, rarity and condition criteria.

The threat faced to these vessels by every high tide, and the build up of inter-tidal mud, has led to what remains being scored highly in terms of the threat criteria. They are also well within the Environment Agency flood zone (Environment

Agency 2007), and could eventually become permanently submerged with rising sea levels. For these reasons the threat level also scored highly.

In order to more fully understand the nature of these vessels detailed work needs to be undertaken, including detailed measured survey and analysis by experienced maritime archaeologists or historians. This would add to the public's knowledge of the historical maritime industry in the North East and help to tie down the exact function and date of the vessels. For this reason the hulks also scored highly against the 'potential' criterion. However, the potential to designate is currently considered low until the results of any further work are analysed. This consideration may change in the light of any future information.

Fig. 7.12 Three of the hulks in the inter-tidal muds in the Coquet estuary, Amble.

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy.

- Detailed measured survey of each of the hulks at Amble, followed by detailed study and comparison of them with other similar vessels regionally and nationally. Production of a report and assessment on these findings followed by ongoing monitoring utilising volunteers if possible.
- Continued monitoring of the site to assess the effects of erosion.
- No further work

The favoured option is the detailed recording as this would provide the most information and preserve the resource prior to erosion or burial by inter-tidal mud. This is considered the most appropriate approach as the remains are still relatively poorly understood despite having been subject to rapid survey. Monitoring could be undertaken by suitably experienced individuals. Two experienced archaeologists, Alan Williams and Patrick Taylor, have already expressed an interest in recording these remains and have already surveyed similar remains at Newburn on the Tyne. They could be included in a project to

further record and investigate the remains and manage their long-term monitoring.

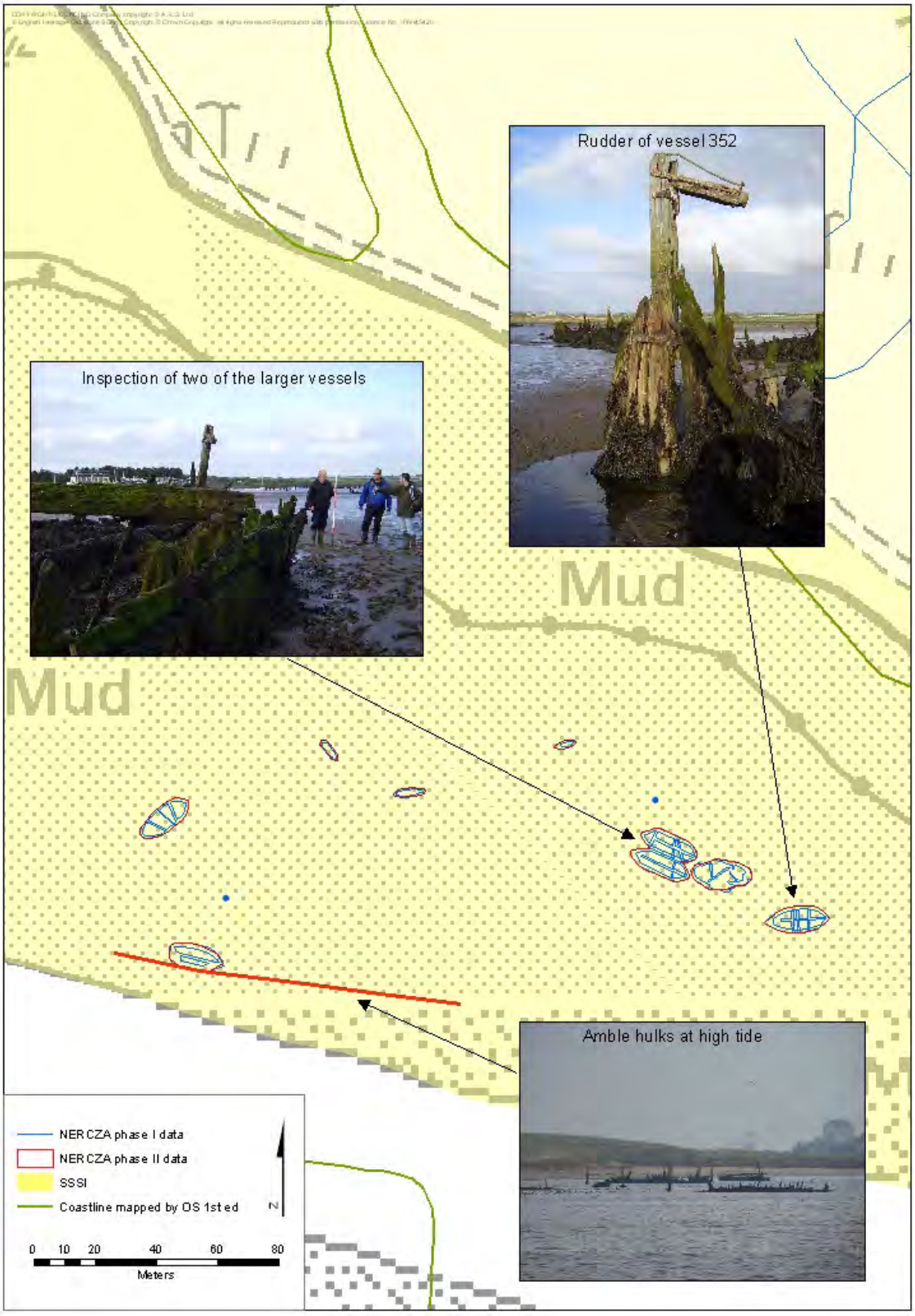


Fig. 7.13 The location of the Amble hulks in the mouth of the River Coquet.

### 7.3.8 Scremerston late prehistoric enclosure

Scremerston, Northumberland (NU 03177 72173)
**Policy Unit 3.1**
**No Active Intervention**

The late prehistoric enclosure identified at Scremerston as a cropmark was not visible on the surface as part of the field investigation. The current condition of this monument is therefore unknown and as a result the site warrants further investigation. If significant below ground remains do survive the site could provide valuable information concerning lowland enclosures, settlement and farming activities during later prehistory as well as help address the problem of the dating of such sites in northern England, important objectives of the regional research framework. The site is of high regional significance and although its surviving condition remains unknown, it evidently has substantial cut features surviving given the cropmark formation. The threat and potential significance increase the score of this monument. A significant portion of this site has already been lost to both the sea and the cutting for the East Coast mainline (Fig.14). The site is also continuing to erode as can be seen from the small section surviving to the north of the Railway (Fig.15). However the presence of the East Coast mainline will most likely lead to investment in sea defences along this stretch of coastline, ultimately protecting the enclosure although it has heavily truncated the monument.

Fig. 14 Location of the Scremerston late prehistoric enclosure, viewed looking South.

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being considered the most preferable strategy.

- Close-spaced fieldwalking and geophysical survey, targeted evaluation trenching and cutting back of the cliff section through the defences to gain a better idea of what survives, the condition of preservation and assess the date of the monument and its ability to answer key research questions. Production of report followed by on-going monitoring and further works if necessary.

- Continued monitoring of the cliff face and environs of the site to assess the effects of erosion.
- No further work.

The favoured option is geophysical survey as this would provide the necessary information to gain some understanding of the survival of below ground features, how the site was built and how it functioned, before further erosion degrades the integrity of what survives. Here, a sensitive archaeological approach is required so as not to further destabilise the cliff edge and avoid any impact upon the railway cutting. Fieldwalking followed by targeted evaluation to gain further information on the preservation and extent of what remains is considered a priority. The site should at least be subject to ongoing monitoring to assess the extent and nature of any archaeological deposits that are exposed to the east of the railway cutting in due course.

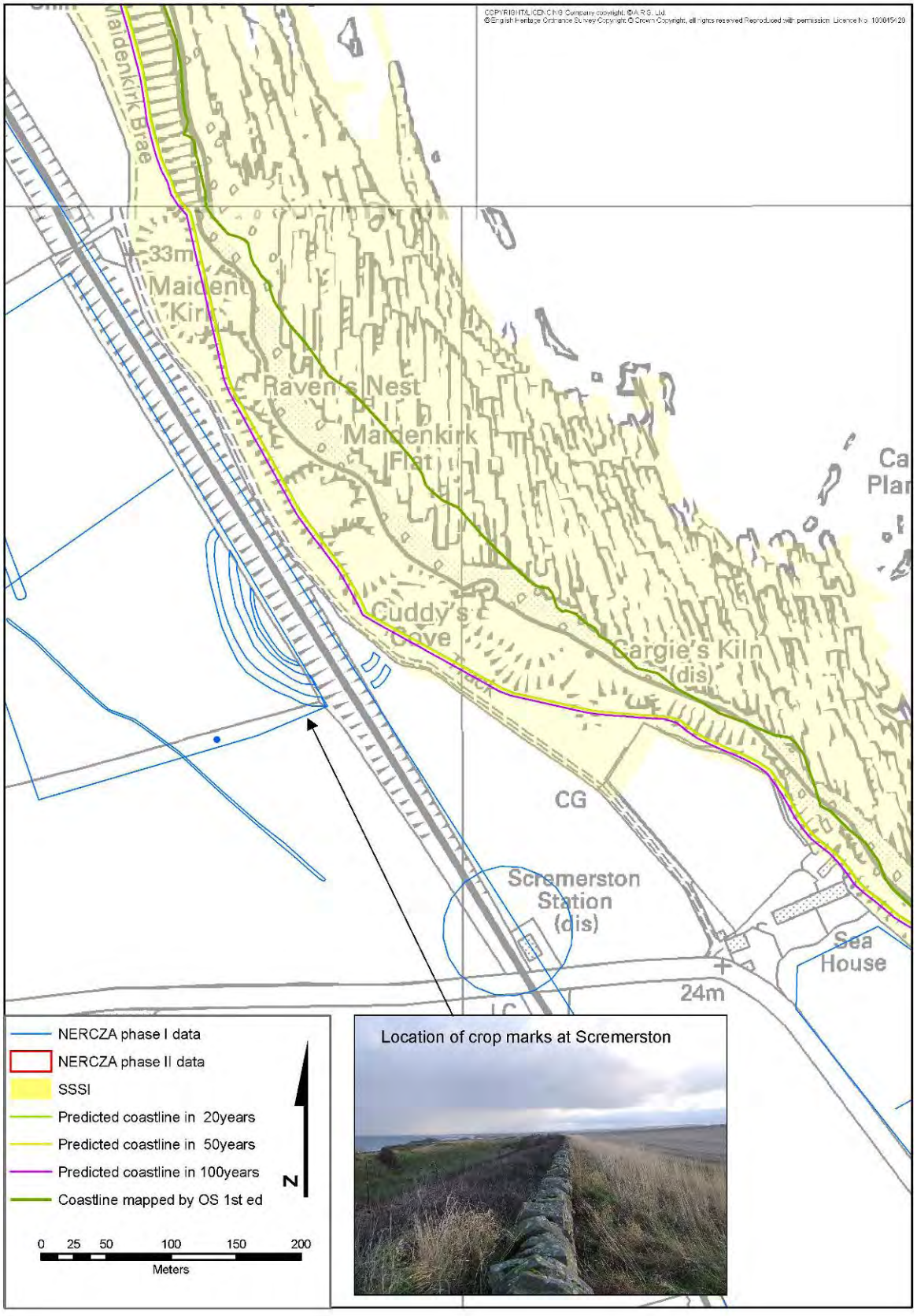


Fig 7.15 Location of late prehistoric enclosure at Scremerston

### 7.3.9 Scremerston gun emplacement

Scremerston, Northumberland (NU 03177 72173)
**Policy Unit 3.1**
**No Active Intervention**

The Gun emplacement at Scremerston is built to the same specification as that at Budle Bay (Fig 7.16), although the setting at Budle Bay led to a slightly different final shape being used. As discussed in Chapter 5, these structures are the only two emplacements of this type built to this high standard seen in the country. They are more akin to German designs of the 1940s seen in Hitler's "Atlantic Wall". This has scored the same in most of the criteria as the emplacement at Budle and for the same reasons. However, there is slightly less direct threat to this monument from the effects of erosion (Fig 7.17), and it is less likely to be demolished and removed. This has led to the threat being scored slightly lower than the battery at Budle. The lime works and kiln upon which the battery is situated are also under threat of erosion. However the significance and rarity of these remains means they have scored lower than the surviving military archaeology.

Fig 7.16 Gun emplacement at Scremerston, built on top of a trackway associated with a limestone quarry and associated kilns (Scale = 2m).

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy.

- Architectural, photographic and Level 3 standing building survey with associated Level 3 earthwork survey of the environs of the site, including the quarry and kilns. To be followed by proposal to be considered for designation. Also, continued monitoring of the site in the long term with an appropriate volunteer group.
- Photographic and basic Level 1 building recording survey, followed by continued monitoring of the site.
- No further work

The favoured option is the Level 3 standing building survey and on-going monitoring as this would provide an adequate information base for a very rare

monument in advance of future coastal erosion encroaching into this area. The proposals are based on the same principals as those for the Budle Bay battery.

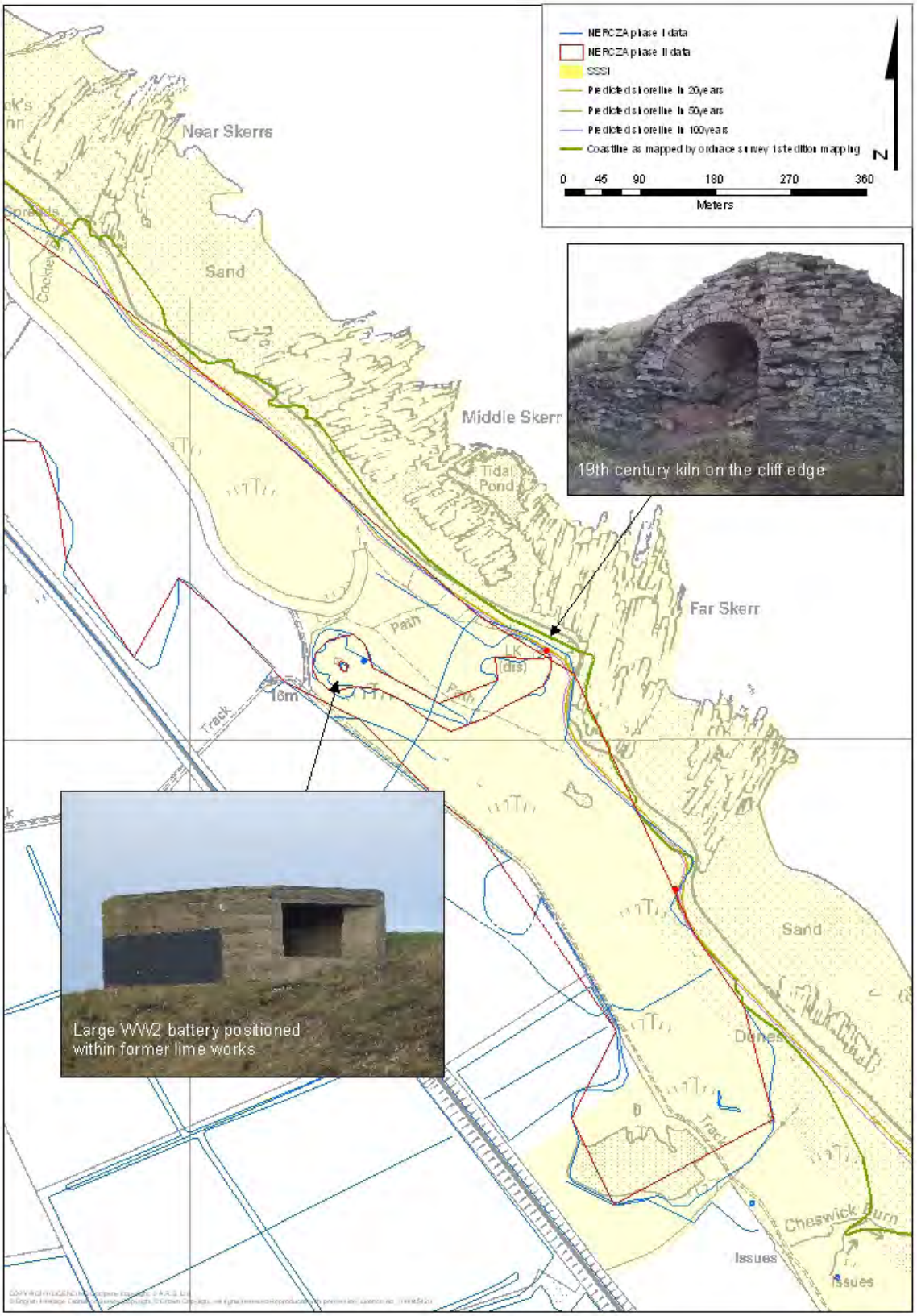


Fig. 7.17 The location of threatened features at Scremerston.

### 7.3.10 Budle Bay fish traps

Budle Bay, Northumberland (NU 16112 28151)
**Policy Unit 4.5**
**Hold the Line**

The fish traps at Budle bay (Figs 7.18 and 7.11) are potentially significant, as they could relate to a grange of Lindisfarne Priory, or to a nearby, but now deserted, medieval village. The remains appear to be wood and stone-built and are exposed to erosive wave action at every high tide. This places the remains high in terms of significance and threat. There are not many well-preserved examples of medieval fish traps nationally and no similar examples regionally. This means that this site scores high against rarity as well. There is potential to designate these remains as they lie within a very shallow protected embayment in an inter-tidal zone that has remained fairly stable for a considerable period of time.

Fig. 7.18 View of some of the surviving Budle Bay fishtraps at low tide.

There is certainly potential for further work including a baseline survey of each of the fish traps and possibly limited excavation and sampling to attempt to gain accurate dating information. In addition, the survival of the remains visible on the surface is also excellent. For this reason the site scored highly in the threat criteria.

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being considered the most preferable strategy.

- Detailed Level 3 field survey of surviving structural remains, followed by limited targeted excavation to gain accurate structural details and dating samples for the surviving structures, and to understand their construction

and how the traps are likely to have worked. Production of report and assessment of the survival of the site followed by on-going monitoring.
- Continued monitoring of the site to assess the effects of erosion.
- No further work

The favoured option of the project team is Level 3 recording and investigation as this would provide the necessary information to gain some understanding of the date of these features, how they were built and how they functioned before further erosion degrades the integrity of this large complex. As with other sites investigated, survey and targeted excavation of these features could be effectively facilitated as part of a community project in order to provide training opportunities as well as an outreach programme.

### 7.3.11 North Gare WWI seaplane base

North Gare, Seaton Carew, Teeside (NZ 53276 21480)
**Policy Unit 13.4**
**No Active Intervention**

The First World War seaplane base at Seaton Carew is a rare surviving example of one of these installations (Fig 7.19). Although much Second World War heritage survives, the First World War is not as well represented in the archaeological record. To find an undeveloped site with surviving earthwork and structural elements, including the slipway, is exceptional on the North East coast. For this reason the site scored highly against potential, significance, and rarity criteria.

The site has been demolished, but not flattened, as earthwork elements survive, along with two contemporary sheds close to the power station boundary. The condition, therefore, is only average but there is potential for further investigation below ground to locate buildings and perhaps produce a basic plan of the facility. For these reasons, however, there is limited potential to suggest the site for consideration for designation.

Fig. 7.19 The preserved slipway to the First World War seaplane base at Seaton Carew.

The threat to the site is clearly high with every high tide contributing to the gradual degradation of the slipway. The low-lying area of the remainder of the base is also at risk from rising sea levels and falls well within the Environment Agency flood zone (Environment Agency 2007). The threat to the site scores maximum as it is clearly under high and on-going threat.

**Management options**

Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy.

- Detailed Level 3 field survey of surviving earthworks and structural remains, followed by close-spaced geophysical survey and subsequent test-pitting/evaluation trenching of geophysical anomalies. Production of report, plan and in-depth desk-based assessment of the site followed by on-going monitoring utilising volunteers.
- Continued monitoring of site to assess the effects of erosion.
- No further work

The favoured option is Level 3 detailed survey and investigation as this would provide essential baseline information on this rare site in advance of the inexorable effects of coastal erosion. A project here could involve local communities, history groups and schools and reveal more information about a potentially significant site, with the added value of community engagement. The site should at least be monitored regularly to assess the rate of degradation. This could again be undertaken by motivated local people guided by an experienced archaeologist.

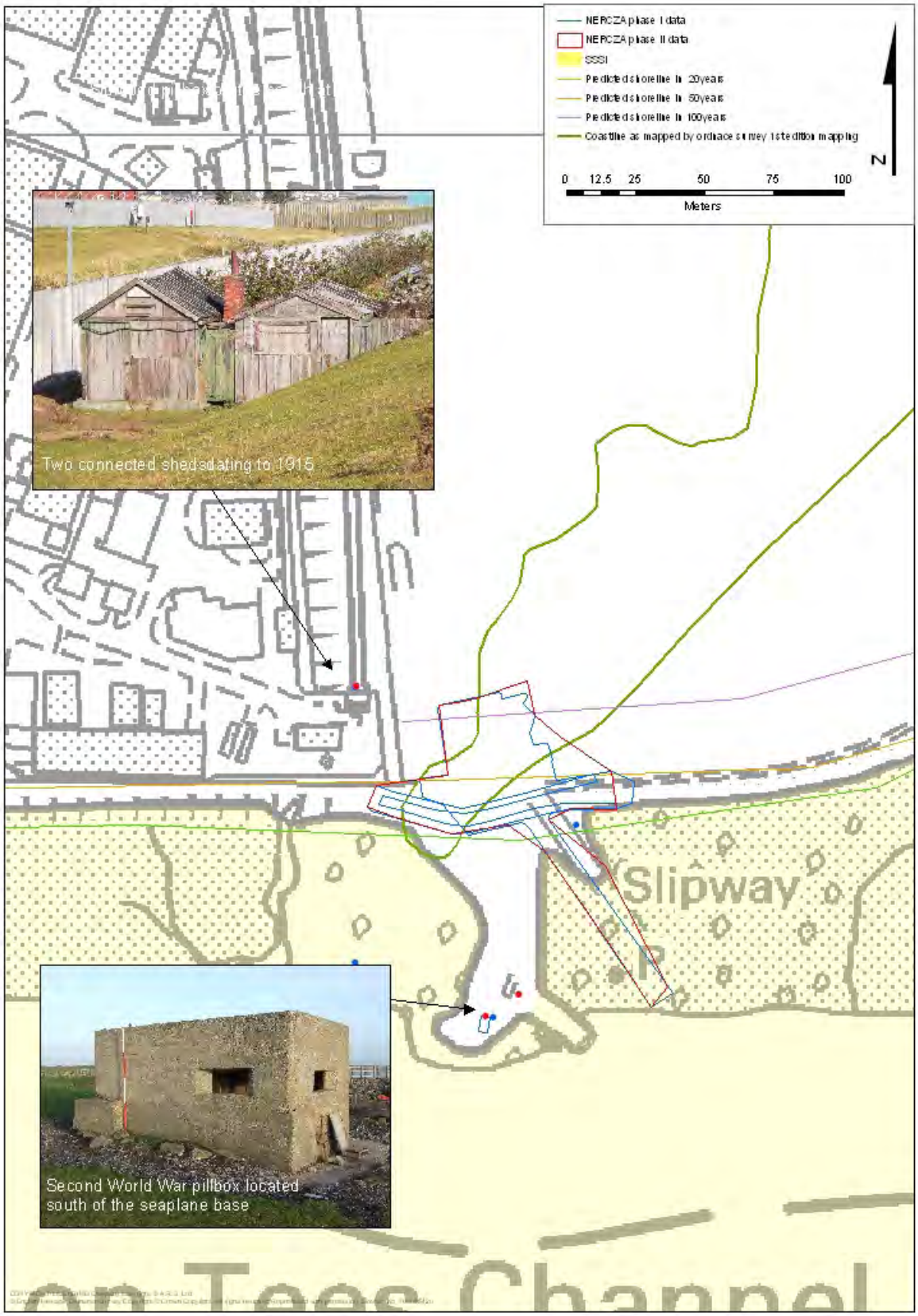


Fig. 7.20 Location of the WW1 seaplane base at North Gare.

### 7.3.12 Hartley; Roberts Battery

Seaton Sluice, Northumberland (NU 34266 76151)
**Policy Unit 24.1**
**Hold the Line**

The site at Roberts Battery contains the surviving remains of a military installation constructed between the First and Second World Wars. The visible structures and earthworks on the site have elements of both early defences, an encampment and a large-scale battery built in response to the German bombardments of the North East coast during the First World War (see section 5.5). The site comprises two main components, Fort House, and the remains of the battery itself. The most threatened area is the structural remains of the subterranean gun emplacements, which are very close to the cliff edge, and the only visible surface remains are fragmentary and heavily damaged. For this reason the site scored highly under threat despite the SMP2 policy being Hold the Line and scoring lower on condition.

Fig. 7.21 Location of Robert's Battery earthworks viewed looking North East from Fort House.

The site has scored highly for significance due to the rare elements that survive within Fort House, including a defended latrine block (see section 5.5). There is significant potential for developing the understanding of this type of site through further study of both Fort House and the battery complex. This is still the case when considering the relatively poor condition of the battery site on the surface as the condition of the below ground remains, currently inaccessible, is unknown at present. Establishing the condition of the subterranean element of the battery is key in developing a future management plan, and therefore further investigation of this part of the site would be preferable.


Fig. 7.22 Location of archaeological features recorded at Robert's Battery.

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable strategy.

- Detailed Level 3 field survey of surviving earthworks and structural remains, followed by close-spaced geophysical survey to locate the extent of subterranean features of the battery. Production of report and assessment of full survival of the site followed by on-going monitoring utilising volunteers from the local history group.
- Continued monitoring of site to assess the effects of erosion and the retreating cliff face utilising local history group and volunteers.
- No further work

The favoured option is Level 3 detailed survey as this would provide essential baseline information on this site in advance of the inexorable effects of coastal erosion. A project here could involve local history groups or interested military study groups (for example the Fortress Study Group) and reveal more information about a potentially significant site, with the added value of community engagement. The site should at least be monitored regularly to assess the rate of degradation. This could again be undertaken by motivated local people guided by an experienced archaeologist.

### 7.3.13 Nessend Lithic Scatter, Holy Island

Holy Island, Northumberland (NU 12877 43652)
**Policy Unit 5.1**
**No Active Intervention**

The Lithic scatter at Nessend is a potentially significant and threatened Mesolithic resource. The extent of the scatter has been previously recorded in detail (O'Sullivan and Young 1995) and has now been re-established as part of the rapid field survey (see section 5.14). The area faces two main threats; from erosion of the unstable edge of the former quarry and from run-off over the exposed clay surface into the quarry. The latter of these two processes is exposing the extent of the scatter which is subsequently being scoured by wind blown sand and eroded by run off after periods of rain. Consideration of these factors has meant that the site has scored highly on level of threat.

Fig. 7.23 The area of exposed clay at Nessend containing worked flints looking North.

The site is potentially significant due to the make up of the lithic assemblage (see section 5.14) and as such has scored highly against the significance and rarity criteria. There is potential for further close-spaced fieldwalking and re-mapping the precise extent of visible flints to provide comparative data which could be used in conjunction with the information on the extent of the scatter as described in O'Sullivan and Young (1995). This will allow any changes in the area exposed, and known to contain flintwork, to be accurately calculated. The NERCZA survey has established the approximate extent of the visible flint scatter, but on-site recording with a total station would be required to obtain more accurate locations for individual findspots as part of any further work.

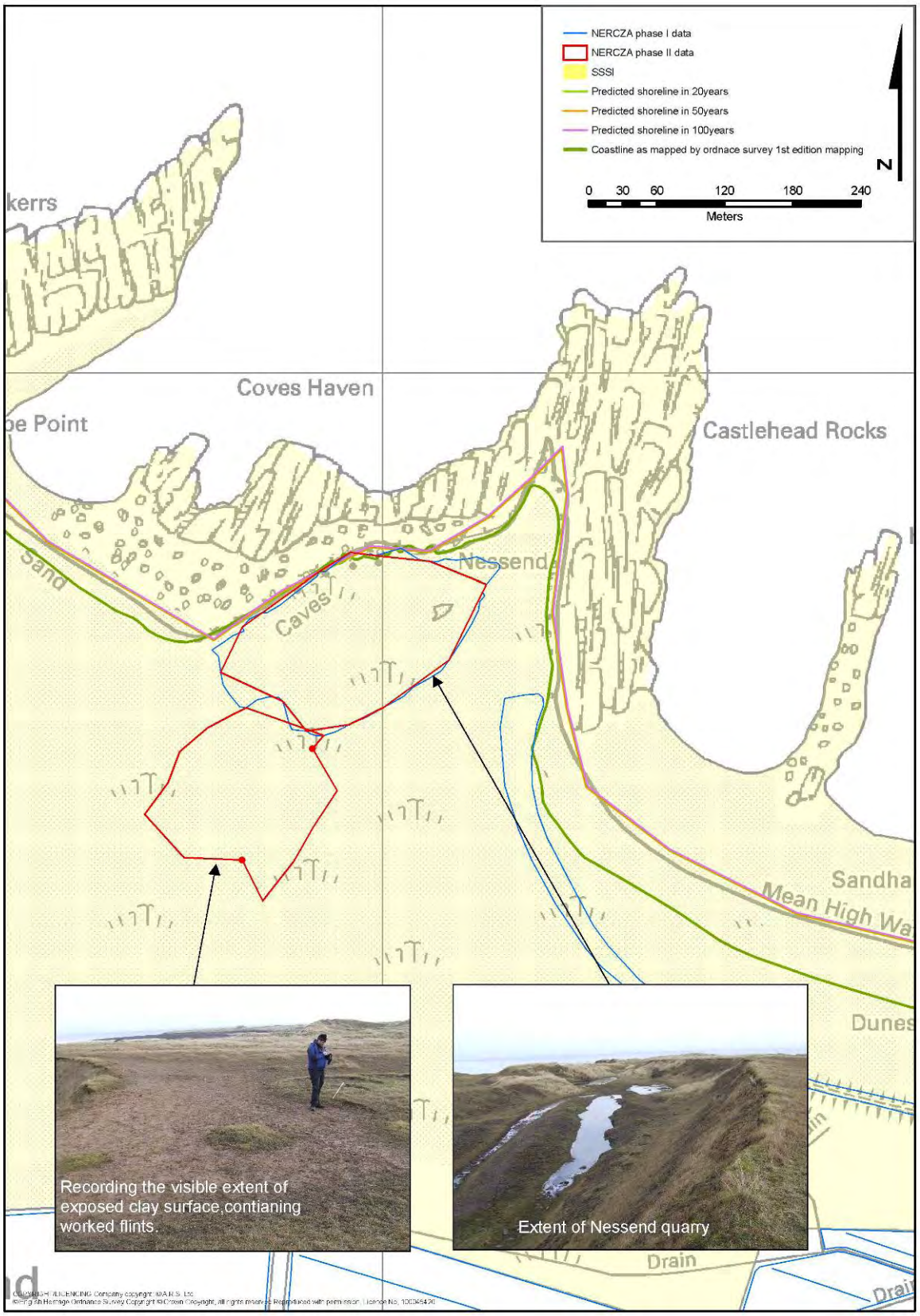


Fig. 7.24 Location and extent of Nessend lithic scatter.

**Management options**
Three possible recording strategies for the site are listed in order of preference, with the first being the most preferable.

- Close-spaced fieldwalking or gridded surface collection of the area of exposed clay surface followed by close-spaced geophysical and magnetic susceptibility survey, with subsequent targeted evaluation trenching or test-pitting based on the results of this. Production of report and assessment of full survival of the site followed by on-going monitoring utilising volunteers from a local history group, or the Borders Archaeological Society.
- Continued monitoring of the site to assess the effects of erosion on the retreating quarry face utilising local history group and volunteers.
- No further work

The favoured option is the first as this would assist in characterising the site and assessing its significance, as well as there are further remains surviving in addition to the lithic scatter, in advance of coastal erosion and damage to the site from surface water run off. A project here could involve local amateur archaeology groups and reveal more information about a potentially significant site, with the added value of community engagement. The site should at least be monitored regularly to assess the rate of degradation. This could again be undertaken by local people guided by an experienced archaeologist.

## 7.4 Conclusions

The NERCZA project has identified priority sites at risk from coastal erosion and has suggested various management options for those sites at 'imminent risk'. The assessment of interest and threat set out in Table 7.1 allows for the formation of management options for each of the sites on this priority register. This means that the raw data collected by the NERCZA project can be used as a management tool for forming positive archaeological strategies and actions. It can also be used for assessing condition, protection, recording, and where possible, preservation of archaeological sites.

This was one of the key overarching aims of the project and the value of the new data added to Historic Environment Records by both phases of the project has meant there is now a sound evidence base for future decision-making and actions. This exercise has produced a useful methodology to guide future monitoring of coastal assets that could be repeated at a local scale, at regular intervals, and at relatively low cost, particularly if volunteer groups were included under the supervision of a professional archaeologist. This could be achieved through a series of schemes designed to monitor and investigate the archaeology of the coast. This would allow local communities to further engage with their coastal heritage while contributing to the understanding, investigation and monitoring of heritage assets. Crucially, such projects would provide the necessary sustainability, particularly for monitoring work, into the future. Projects following this format would facilitate partnerships between professional archaeologists and volunteers through community inclusion, outreach and training. Such projects would not only help rescue remains from destruction without record, but they would also generate public interest, enjoyment and knowledge gain. Funding could be sought from a variety of organisations and could include the Heritage Lottery Fund, English Heritage, Defra, Natural England, Environment Agency, Leader Plus and perhaps maritime businesses such as North Sea oil companies.

Fig. 7.25 Rapid recording of an eroding pillbox at Warkworth in Northumberland.

The whole of the North East coastline could be broken down into chunks, perhaps based on the SMP policy unit areas, with an archaeological project set up to cover each area. Alternatively projects could be set up on a site by site basis according to need. Such projects would enable community engagement with coastal heritage, combined with ongoing monitoring of heritage assets. As an example, North Yorkshire and Teesside could effectively be covered by one overarching project, due to the overlap in the North Yorkshire Moors National Park and Teesside Historic Environment Records and the relatively small area concerned. This project could investigate the ongoing condition of the surviving alum works and expand on the work of the rutways survey project run by Tees Archaeology (Green 2009).

There is great potential for extensive community involvement in such projects, including local groups, schools, as well as visitors to the coast. Widespread involvement would aid in raising awareness amongst the public, capacity building within the heritage sector as well as locking in the volunteer sector. If such projects could be delivered then not only would the ongoing recording and monitoring of eroding assets continue into the future, but it would help maximise the benefit of such work to society whilst also reducing its cost.

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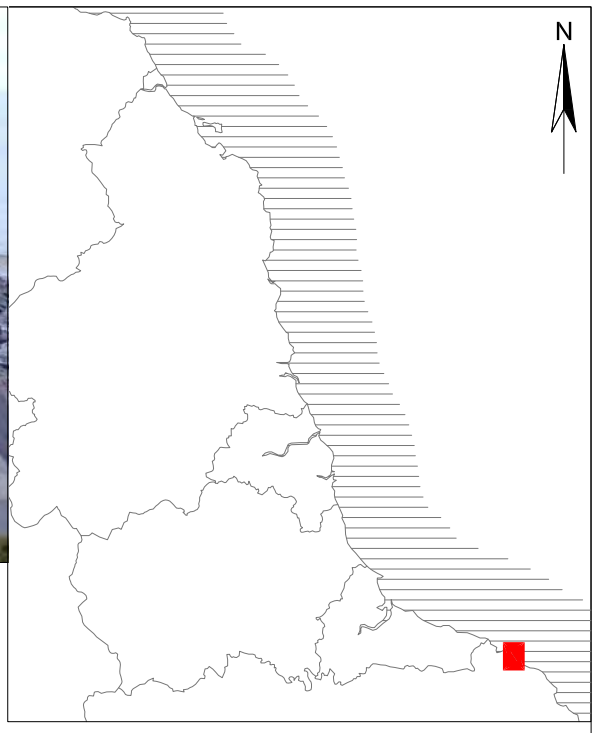
NERCZA2_0696: GPS 426. Kettleness Alum Works

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NMR 25904
NMR 1453227
GPS 417
GPS 418
Goldsborough
North Sea
NMR 909219
Overdale Wyke
NMR 1453229
GPS 430
NORTH YORKSHIRE
NMR 1118514
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GPS 511
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NMR 1453239
Sandsend
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NERCZA2_1915: GPS 419. WW2 Light Anti-Aircraft Machine-Gun Mounting

**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.2.1**: Sandsend to Kettleness (Including Overdale Wyke)



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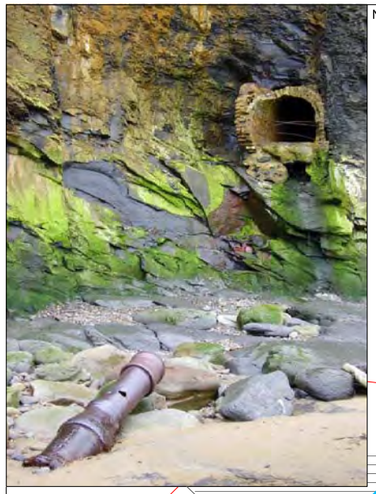
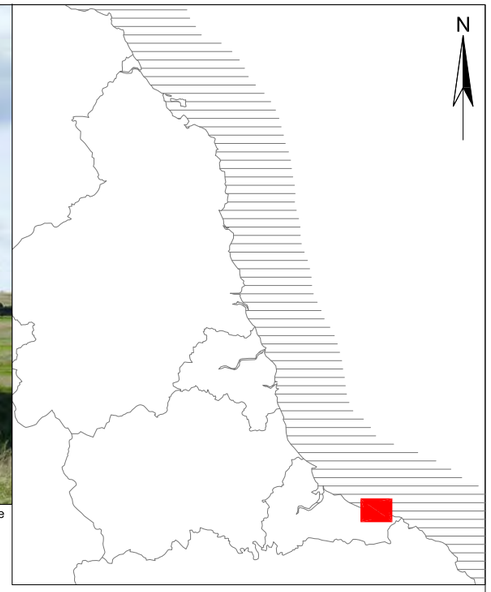


NERCZA2_0065: GPS 24-25. Outfall Sewer

NERCZA2_0032: GPS 19. Huntcliffe Ironstone Mine, Guibal Fan House

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**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.3.1:** Saltburn to Skinningrove (Including Loftus Alum Quarry)



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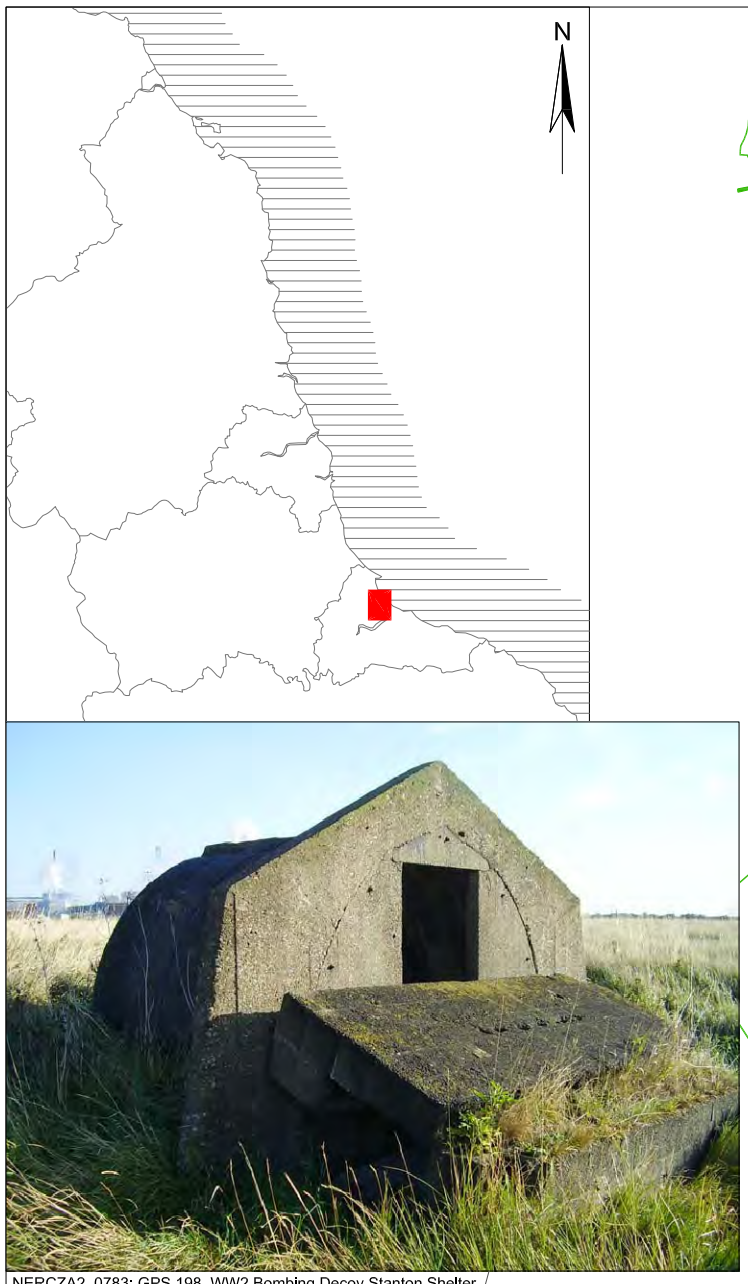

NERCZA2_0783: GPS 198. WW2 Bombing Decoy Stanton Shelter

NERCZA2_0811: GPS 201. WW2 Pillbox

North Sea

Hartlepool
DURHAM

Seaton Carew

Seaton on Tees Channel

NMR 1459333
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NMR 1459340
NMR 1459371
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NMR 1459382
NMR 1459350
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**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First/Second Edition 1853-1895 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

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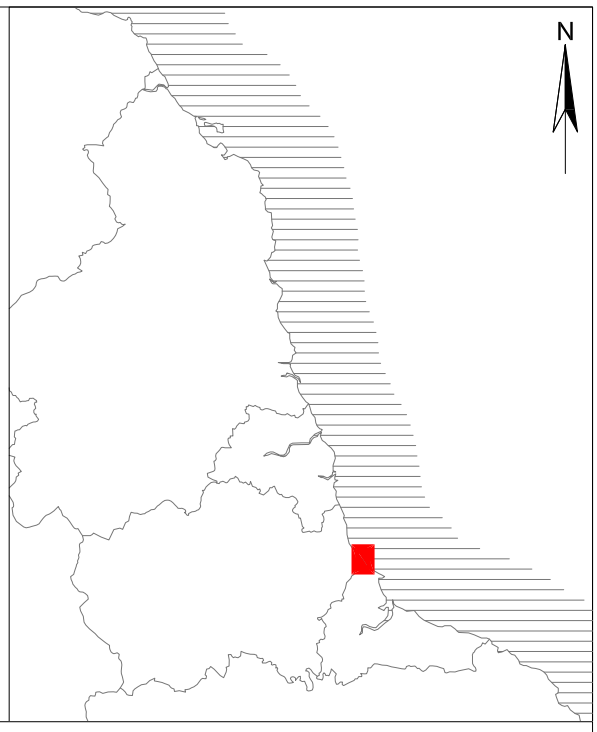
Scale (m) 1: 15,000 @ A3

**TITLE:**

**Figure 5.4.1**: Greatham Creek and North Gare

North Sea




NERCZA2_1982: GPS 83. WW2 Pillbox

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NMR 1034946
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NMR 1461292
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GPS 207
GPS 205
NMR 1461303
Blackhall Rocks
NMR 1461551
GPS 87
NMR 1461538
GPS 86
GPS 88
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GPS 110
NMR 1461603
GPS 116
NMR 1461594
GPS 114
GPS 115
1461570
NMR 1461571
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GPS 113
NMR 1461609
Hart Station
Hartlepool
DURHAM

NERCZA2_0341: GPS 82. WW2 PIllbox

**KEY:**

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- Intertidal Zone
- OS First/Second Edition 1853-1895 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.5.1**: Blackhall Rocks and Crimdon Dene



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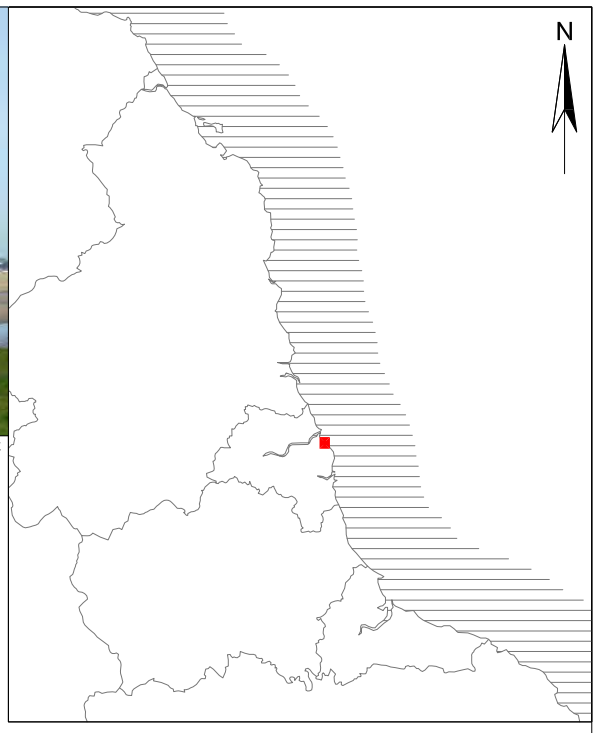
Scale (m) 1:14,000 @ A3

NERCZA2_0403: GPS 119. Victorian Gun Emplacement




Trow Point

North Sea

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GPS 135

NERCZA2_0377: GPS 130. WW2 Gun Post overlooking Herd Sand

GPS 140

NMR 1314370

Frenchman's Bay

South Shields
TYNE AND WEAR

**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.6.1**: Trow Point



0 100
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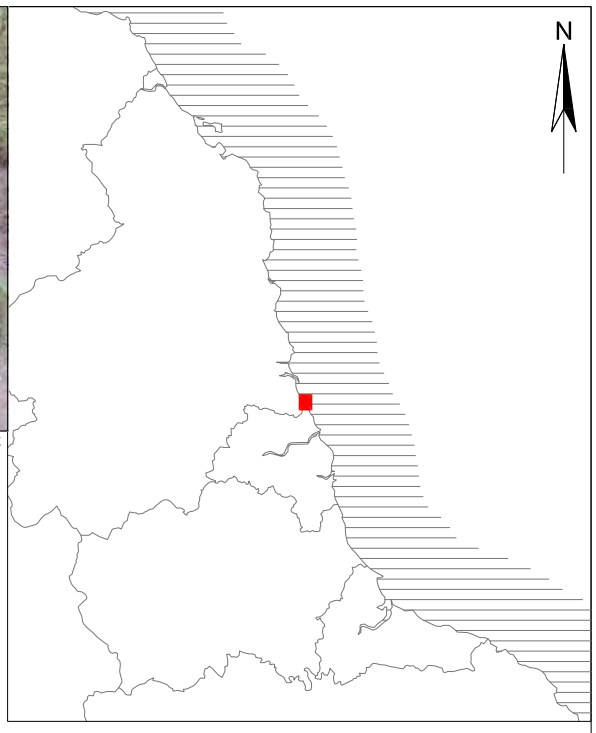
NERCZA2_2255: GPS 506. WW2 Pillbox




NMR 1427373

NMR 1427383

GPS 506

GPS 507

GPS 508

GPS 509

GPS 505

NMR 1427383

NMR 1465595

Seaton Sluice

North Sea

Collywell Bay

GPS 449

GPS 528

GPS 448

GPS 450

GPS 447

GPS 448

NMR 1314414

NMR 1465610

GPS 446

GPS 445

GPS 451

GPS 444

NMR 1465372

NORTHUMBERLAND

GPS 442

GPS 440

GPS 441

GPS 443

GPS 436

GPS 439

GPS 437

GPS 438

NMR 1465355

Hartley

NERCZA2_1845: GPS 443. Fort House

GPS 504

NMR 1414465

GPS 503

NMR 1465317

0 200

Scale (m) 1:5,500

**KEY:**

- NERCZA Phase 2 Buffer Zone
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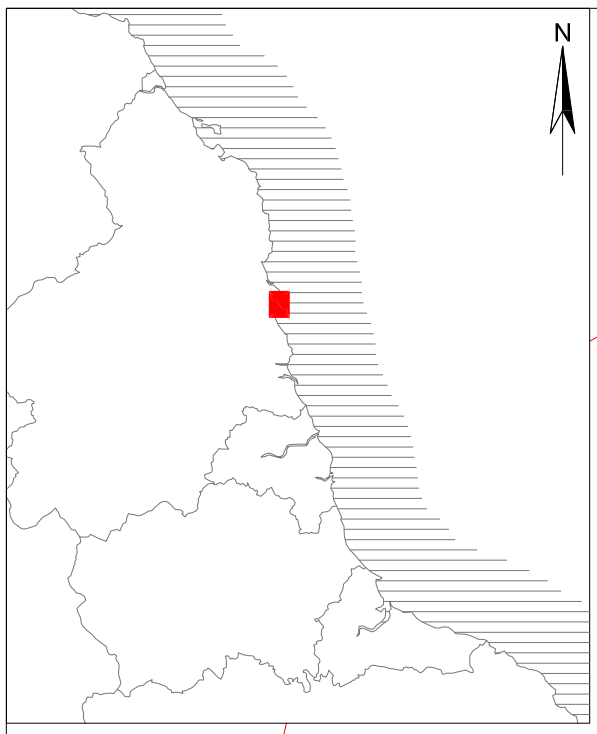
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.7.1**: Seaton Sluice (Including Robert's Battery)




NERCZA2_2067: Exposed Peat Deposits

NERCZA2_1239: GPS 300. WW2 Observation Post

NORTHUMBERLAND

North Sea

Druridge Bay

0 500

Scale (m) 1:12,500 @ A3

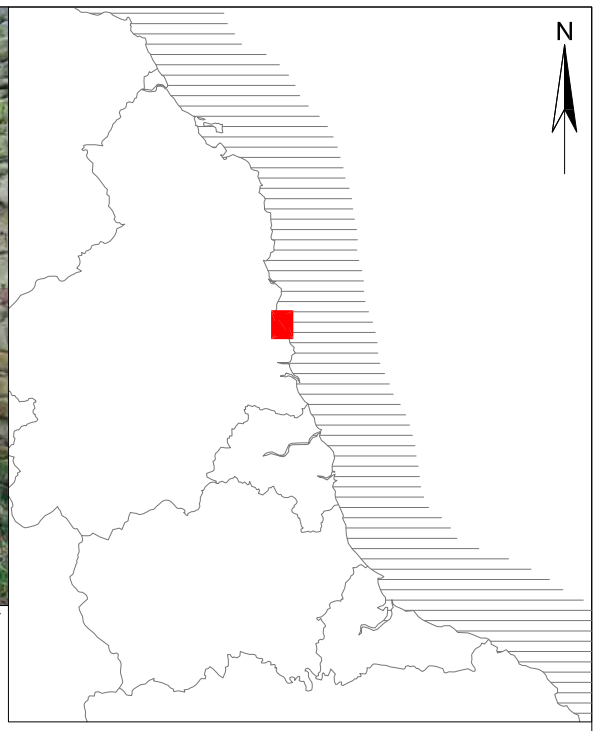
**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.8.1**: Druridge Bay (North) (Including Low Hauxley)

NERCZA2_2040: GPS 454. Low Chibburn Medieval Preceptory




NERCZA2_1067: GPS 253. WW2 Disguised Pillbox

NMR 1468991
NMR 1468630
1468645
GPS 277
NMR 1468409
NMR 1468920
NMR 1468648
NMR 1468238
NMR 1468414
GPS 284
NMR 1468238
GPS 271
GPS 272
NMR 1468707
NMR 1468412
GPS 456
NMR 1468899
NMR 1468910
GPS 269
NMR 1468907
GPS 273
NMR 1468697
NMR 1418884
NMR 1468920
GPS 455
GPS 454
NMR 1468905
NMR 1468903
GPS 266
267
268
GPS 274
275
NMR 1468896
NMR 1468901
NMR 25459
NMR 1468219
GPS 276
NMR 1468723
NMR 1468727
NMR 1468718
NMR 1443629
Druridge Bay
NMR 1468920
NMR 1443628
NMR 1413839
GPS 259
Druridge
NMR 1468867
GPS 265
NMR 1413840
GPS 260
NMR 1468893
NMR 1413838
NMR 1421553
GPS 261
NMR 1468866
NMR 1468352
1468391
1468895
1468398
NMR 1468864
NMR 1468891
GPS 262
GPS 263
NMR 1468864
GPS 264
NMR 1429255
NMR 1413861
NMR 1468920
NMR 1468848
NMR 1468391
NMR 1468855
NMR 1468852
NMR 1468861
NMR 1468379
NMR 1413862
Hemscott Hill
NMR 1470620
1421560
NMR 1468850
1470628
NMR 1468373
NMR 147063
GPS 253
NMR 1421444
NMR 1470629
NMR 1468763
NMR 1470632
NMR 1470635
GPS 255
NMR 1468705
NMR 1470636
NMR 1470639
GPS 256
GPS 252
GPS 251
NMR 1468716
NORTHUMBERLAND
NMR 1470642
NMR 1468763
NMR 1470674
NMR 1470986
GPS 250
NMR 1470683
NMR 1468722
GPS 247
NMR 1468763
248
249
NMR 1468784
NMR 1468763
NMR 1468774
GPS 246
NMR 1443915
GPS 245
GPS 257
NMR 1470645
NMR 1470669
GPS 258
GPS 244
GPS 241
NMR 1470665
Cresswell
GPS 242
GPS 243
NMR 1468619
GPS 240
NMR 1468814
NMR 1468790
GPS 239

0 500
Scale (m) 1:12,500 @ A3

**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.8.2**: Druridge Bay (South)

N

NORTHUMBERLAND

GPS 227
GPS 229
GPS 225
GPS 226
GPS 228
GPS 223
GPS 224
GPS 209
GPS 210

GPS 219
NMR 8180
GPS 351
GPS 218
GPS 220
GPS 221

GPS 215
GPS 216
GPS 214
NMR 1471025
NMR 1471006
GPS 213
GPS 217
NMR 1470417
NMR 1471011

NMR 1470348
NMR 1470422
NMR 1470417
NMR 1470351
Alnmouth

GPS 212
NMR 1470350
North Sea

GPS 211
NMR 1470417
Alnmouth Bay

NERCZA2_0928: GPS 223. Oyster Pond

NMR 1469547
GPS 234
GPS 233
GPS 235
GPS 232
GPS 231
GPS 230
NMR 1469727

NERCZA2_0973: GPS 235. WW2 Concrete Anti-Tank Blocks

GPS 236
NMR 1469552
NMR 1469550
NMR 1469556
NMR 1469547
GPS 237
GPS 238
NMR 1469553

0 200
Scale (m) 1:5,500 @ A3

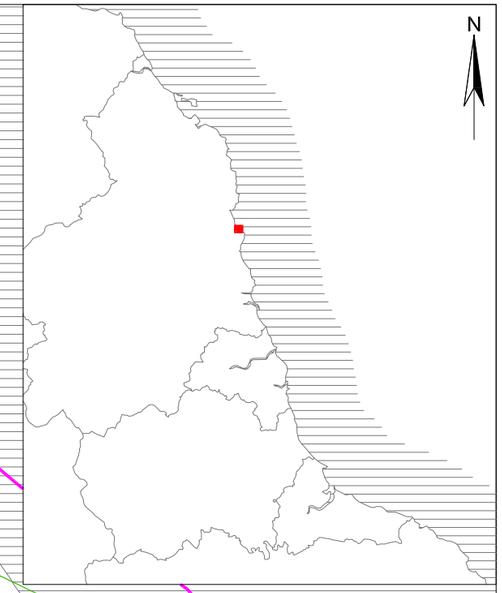
**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.10.1**: Alnmouth (Including Oyster Beds)

NERCZA2_1629: GPS 357-359. Hulks




River Coquet

NMR 1469577

NMR 1469571

NMR 1469577

GPS 359

NMR 1469582

NMR 1469582

GPS 357

NMR 907647

GPS 358

GPS 356

GPS 354

GPS 353

NMR 907649

GPS 352

GPS 355

NMR 907647

GPS 453

NERCZA2_1026: GPS 352. Hulk

Warkworth Harbour

NMR 1469712

0 100

Scale (m) 1:2,500 @ A3

**KEY:**

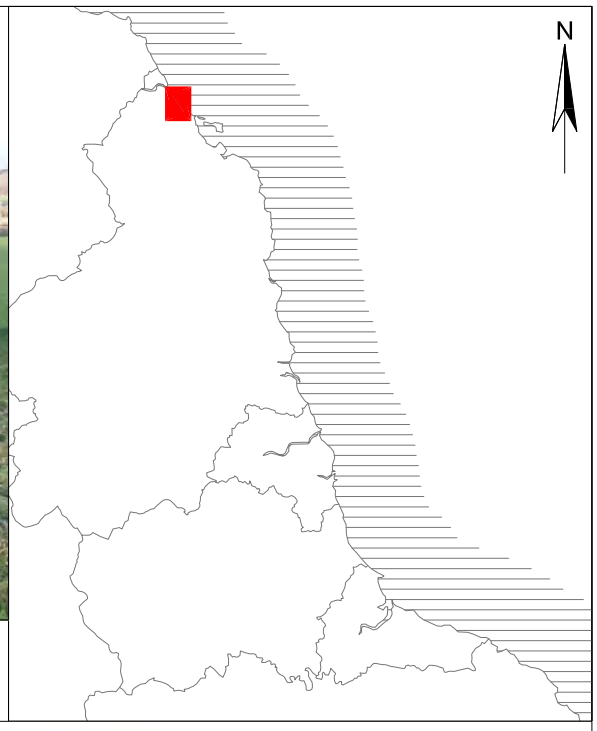
- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
- OS First Edition 1853-1874 Coastline
- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

NORTHUMBERLAND

**TITLE:**

**Figure 5.11.1**: Amble

NERCZA2_2127: GPS 463. Gun Emplacement




NERCZA2_2093: GPS 458. Lime Kiln

GPS 468
NMR 1384230
GPS 469
Redshin Cove
NMR 1384222
GPS 467
GPS 466
NMR 1472904
NMR 1384226
NMR 1472903
NMR 6483
NMR 1472904
Borewell
NMR 1473460
NMR 1472901
Scremerston
NMR 1472908
GPS 465
NMR 6484
GPS 463
GPS 458
NMR 1421615
GPS 464
NMR 1472957
NMR 1472878
GPS 459
NMR 1472908
NMR 1472962
NMR 1472876
NORTHUMBERLAND
North Sea
GPS 462
NMR 1472872
Cheswick
NMR 1421608
GPS 461
NMR 1421689
GPS 460
NMR 1472613

NERCZA2_2104: GPS 460. WW2 Observation Post and Pillbox

0 1
Scale (km) 1:17,000 @ A3

**KEY:**

- NERCZA Phase 2 Buffer Zone
- Intertidal Zone
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- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.12.1**: Scremerston

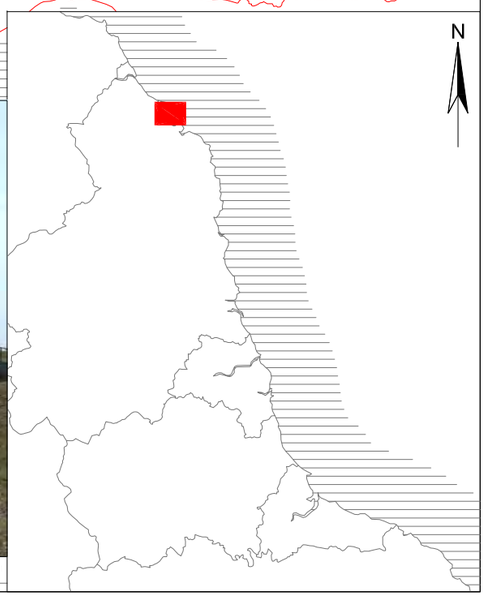
North Sea

NMR 1472674
NMR 1474738
NMR 1472665
NMR 1472653
GPS 496
GPS 485
GPS 486
GPS 484
GPS 479
GPS 477
478
487
488
489
480
481
482
483
NMR 1474728
NMR 1474720
NMR 1414070
GPS 476
GPS 490
NMR 1417828
GPS 491
GPS 492
493
494
495
NORTHUMBERLAND
NMR 1474779
NMR 1474769
NMR 1474691
GPS 475
NMR 1474710
Fenham
NMR 6502
GPS 470
GPS 474
GPS 471
GPS 473
GPS 472
NMR 1474811
NMR 1474595
Fenham-le-Moor

GPS 408
NMR 7792
GPS 409
GPS 410
GPS 411
NMR 1465651
GPS 519
NMR 1472108
GPS 518
GPS 516
GPS 517
GPS 407
NMR 1472112
NMR 7848
Holy Island
Lindisfarne
GPS 406
GPS 405
NMR 7835
NMR 7838
GPS 402
GPS 401
GPS 404
NMR 7848
GPS 403
GPS 386
387
388
389
390
391
392
393
GPS 394
GPS 395
NMR 7804
GPS 396
NMR 7797
GPS 396
GPS 399
400


NERCZA2_2586: GPS 396. 17th Century Fort


NERCZA2_2593: GPS 403. Castle Point Lime Kiln




0 1
Scale (km) 1:20,000 @ A3

**KEY:**

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- Intertidal Zone
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- NERCZA Phase 1 AP Data
- NERCZA Phase 2 GPS Data
- Projected Coastline with SMP Prefered Policy: 20 Years
- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

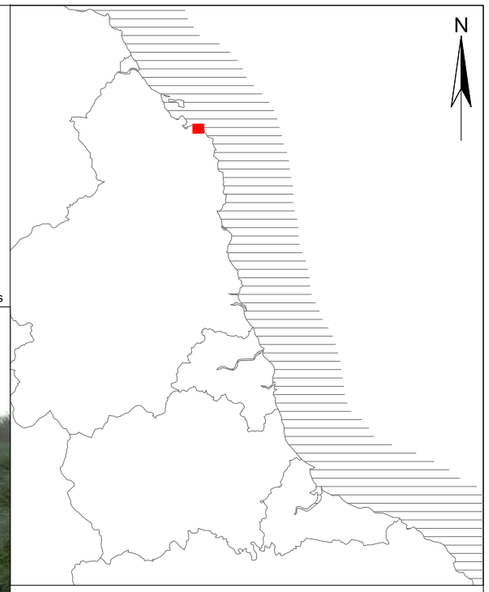
**TITLE:**

**Figure 5.14.1**: Fenham and Holy Island (Including Ness End)

NERCZA2_2076: GPS 457. WW2 Brick Reinforced Trench

North Sea

NERCZA2_1437: GPS 364. WW2 Concrete Anti-Tank Blocks



N

NMR 1472251
GPS 368
NMR 1472200
NMR 1472261
GPS 367
GPS 369
NMR 1472290
GPS 365
GPS 366
NMR 1472264
GPS 370
NMR 1472288
GPS 371
GPS 372
NMR 1472291
GPS 373
GPS 457
GPS 374
GPS 375
NMR 1421604
GPS 376
GPS 377
GPS 364
GPS 363
NMR 1472331
NMR 1472338
NMR 1472372
NMR 1472346
NMR 1472351
NMR 1472267
Bamburgh Castle
NMR 7536
NORTHUMBERLAND
Bamburgh
NMR 1471436
GPS 378
379
380
381
382
383
384
385

**KEY:**

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- NERCZA Phase 2 GPS Data
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- Projected Coastline with SMP Prefered Policy: 50 Years
- Projected Coastline with SMP Prefered Policy: 100 Years

**TITLE:**

**Figure 5.15.1**: Bamburgh (Including The Bowl Hole)



0 200
Scale (m) 1:4,500 @ A3

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