Archaeological excavation of burial deposits at Low Hauxley, Druridge Bay, Northumberland

Fragments of a Beaker containing a cremation in a grave pit eroding from the cliff face

ARS Ltd Report No. 2009/90
December 2009

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Executive Summary

The cliff edge at Low Hauxley has been eroding for several decades and archaeological remains have been recorded during several archaeological interventions in the past, firstly by Clive Bonsall of Edinburgh University, then by Tyne and wear Museums Service and subsequently by the then Lancaster Archaeological Unit.

The work described in this report was prompted by the discovery by Jim Nesbitt, a local amateur archaeologist, of a small grave box, pit and possible midden material actively eroding out of the cliff edge in 2007. He also photographed an eroding stone-built structure, similar in form to a small stone-walled roundhouse, a hundred metres or so further to the north of the burial site and covered by the same dune deposits, but this has since been completely removed by coastal erosion. These discoveries were brought to the attention of Clive Waddington in June 2009 and this led to the immediate recording work described here.

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

Burial 2 was a grave comprising a pit burial that had partly eroded from the cliff face. A pit had been cut into the glacial till and a plain Beaker had been placed inside containing a human cremation together with a dump of the pyre debris that had been scraped up. This pyre debris was very black and contained much charred debris and grey ash that was probably still hot when it was deposited as the heat has turned part of the beaker pot a pale grey colour. A few Mesolithic flints had been scraped up with the pyre debris and deposited in the pit with this material which implies that the funeral pyre was situated on the ground and the gathering up of the remains included the scraping up of material from the underlying Mesolithic ground surface.

Single entity long bone fragment radiocarbon dating samples were submitted for each burial returning determinations of 2010-1875 and 1890–1690 cal BC for cremation burials 1 and 2 respectively.

No midden material was visible during the excavations. Examination of the area where the stone structure (possible roundhouse) had been revealed no further traces of this or any other associated deposits. Several thin turf horizons could be identified within the dune sequence above the burials indicating that there has been previous episodes of dune stability since the Bronze Age and these horizons could also be of archaeological and palaeoenvironmental interest. A series of peat deposits are located along this stretch of Druridge Bay and delimiting their extent and obtaining range-finder dates for these deposits are being undertaken as part of the NERCZA Phase II.

On the foreshore in front of the Low Hauxley Beaker period cemetery are a series of rectangular rock-cut hollows. The purpose of these archaeological features remains unknown and under-researched. These features are sometimes covered by beach sand or can be fully exposed depending on the behaviour of the tides.

1. Introduction

1.1 In June 2009 Archaeological Research Services Ltd excavated two burial deposits at Low Hauxley at the north end of Druridge Bay in Northumberland. The burials, which consisted of one cist (Burial 1) and one cremation pit (Burial 2), were eroding out of the cliff face and were easily accessible to the public as well as being under active daily erosion.

1.2 This section of the North East coastline is designated as a Special Site of Special Scientific Interest on account of its geology and birdlife. It lies to the immediate south of the Northumberland Coast Area of Outstanding Natural Beauty. The land is owned by Northumberland County Council and the Northumberland Wildlife Trust have a nature reserve abutting the site. The beach is very popular with local residents, the users of the nearby caravan park and visitors. There is a Visitor Centre at the nearby Druridge Bay Country Park and another smaller centre at the Northumberland Wildlife Trust reserve. At the latter site the original sandstone slabs of one of the previously excavated Beaker period cists has been reconstructed next to the car park. The National Cycle Path No. 1 runs along the back of the site behind the sand dunes. Former very extensive open cast coal workings butt up to the dune system from the landward side along much of the length of Druridge Bay.

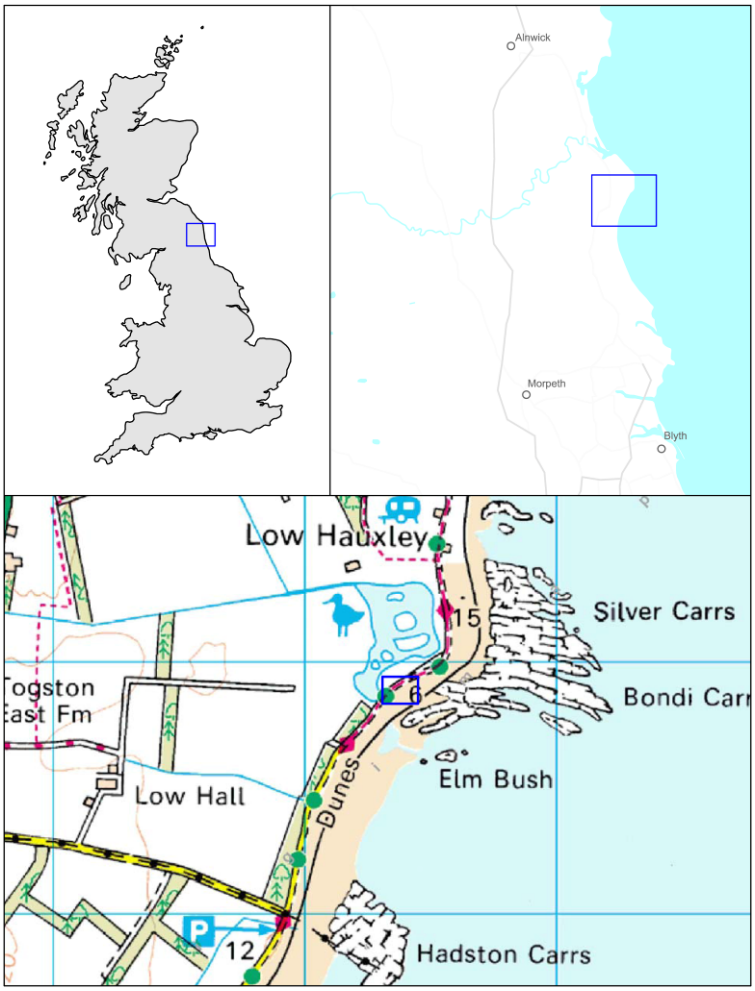


Fig. 1 Location map of the site (Reproduced from the Ordnance Survey Landranger 1:50,000 Series by permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office. ©Crown Copyright. All rights reserved. License Number 10042450).

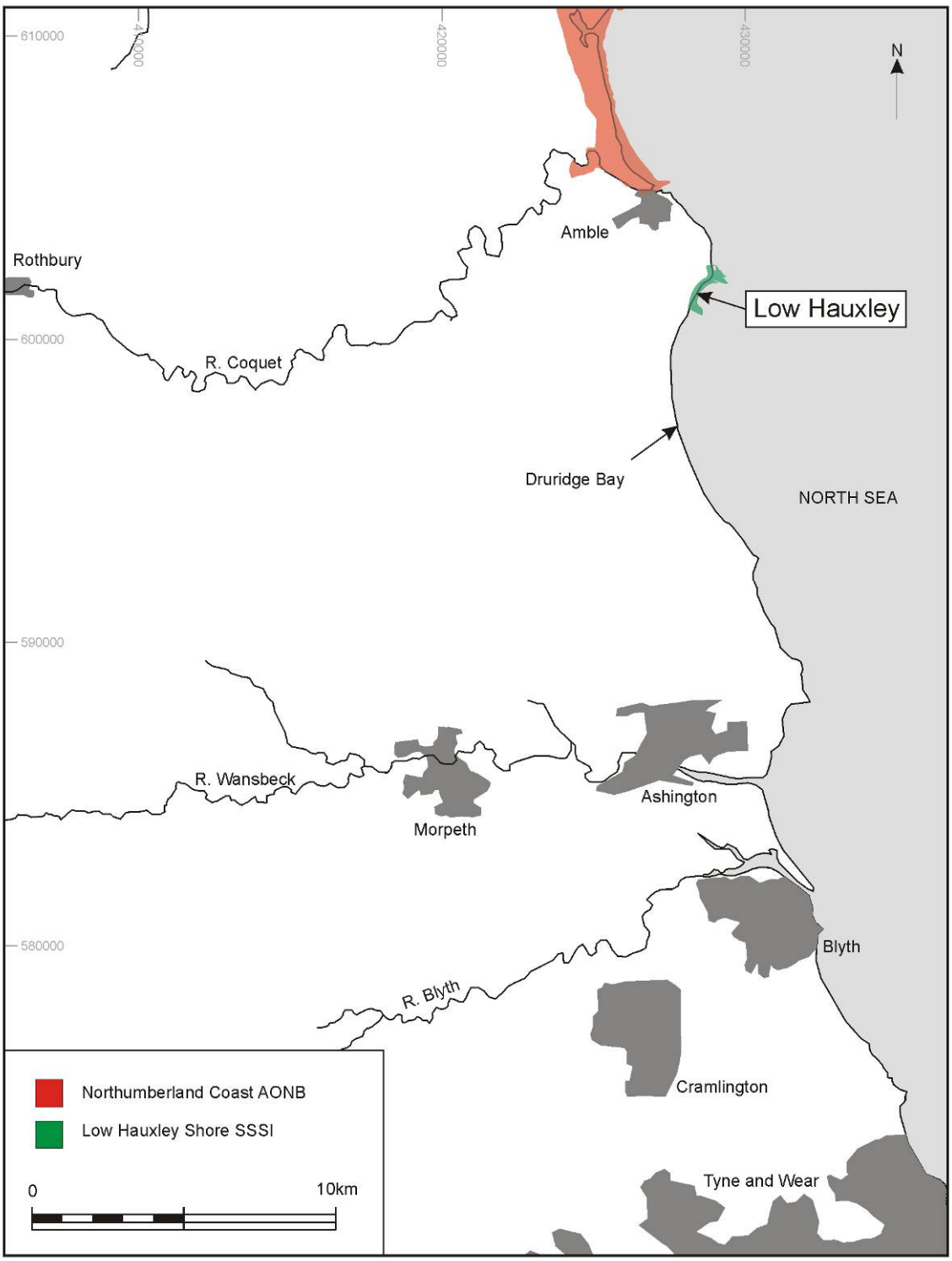


Fig. 2 Map showing the location of the Low Hauxley SSSI in relation to South-East Northumberland.

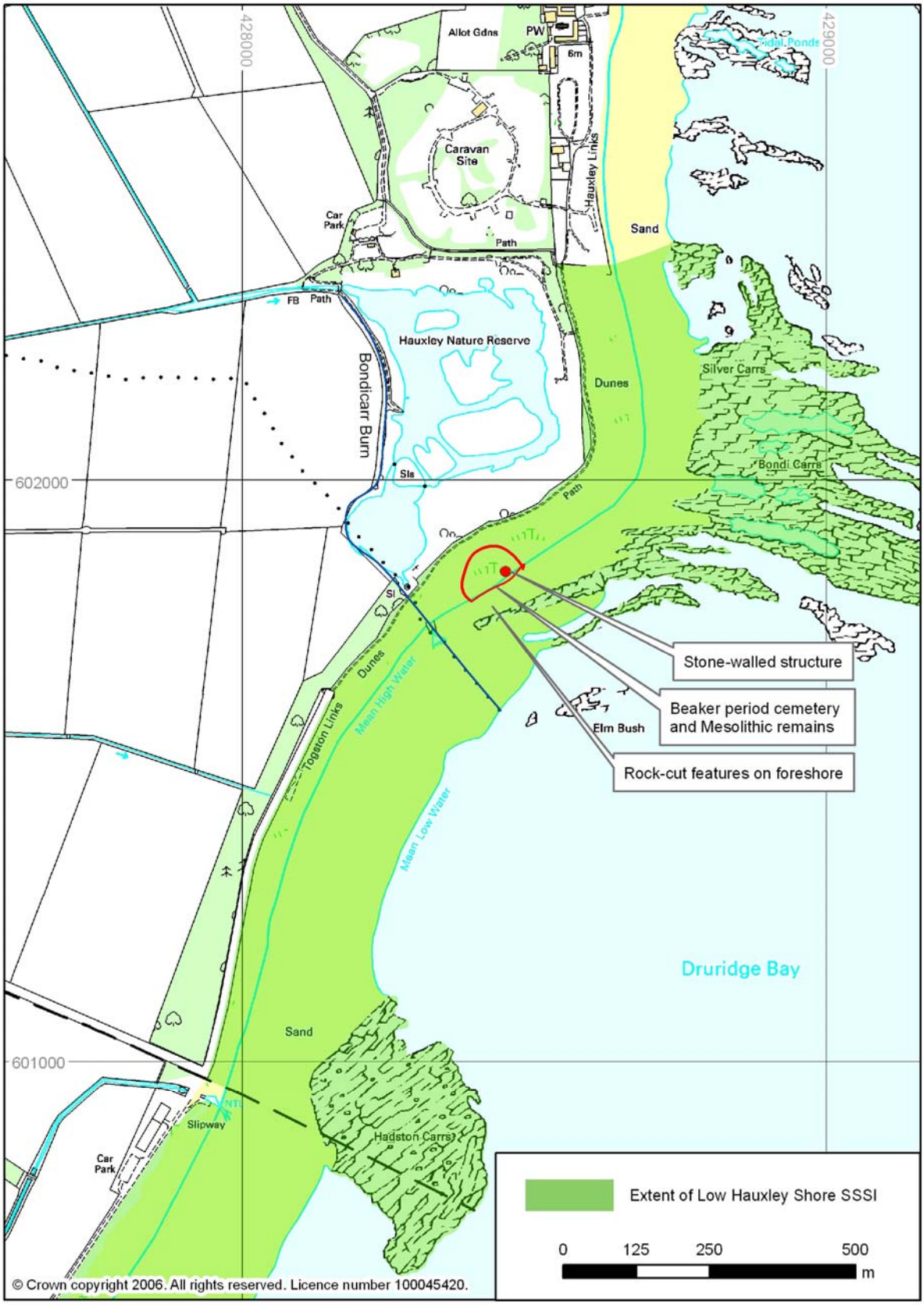


Fig. 3. The Low Hauxley Bronze Age cemetery at Druridge Bay showing the extent of the SSSI, the extent of the cemetery and their position in relation to the Low Hauxley Nature Reserve.

2. Location and Geology

2.1 The burials reported here form part of a cemetery that has produced Beaker pottery associated with inhumations and cremations. There are a variety of burial forms evident at the site including those in large cists, small cists and those in pits with most, but not all, lying beneath substantial stone cairns. Since this period there has been a considerable accumulation of dune sand across the cemetery 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.

Figure 4. View along the cliff face at Druridge Bay with a recently eroded block of peat collapsed onto the foreshore (June 2009).

2.2 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. 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. 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 archaeological remains in the central and northern part of Druridge bay, but it is under active erosion from the seaward side. A Devensian blue-grey weathered till, which varies in depth along the coast, directly overlies the solid geology (Innes and Frank 1988). The cemetery that is the subject of this report was positioned on a localised high point approximately 100 metres north of the Bondicarr Burn that debouches into the North Sea. Both of the burials reported here were found in features cut directly through a weathered land surface and into the till. Overlying the burials and the land surface was a windblown sand dune system above which lay modern soil and turf. The sand had an average depth of 3.5m although this varied between 3m and 4m depending on where the measurement was taken. 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. These buried soils represent the top of the dune system during earlier periods before additional dune sand was deposited.

2.3 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 peats', though in the case of Low Hauxley they are probably most accurately described in most cases as in-filled lagoons. These thick bands of peat, typically up to 1m in thickness, are the subject of earlier work (Frank 1982; Innes and Frank 1988; Farrimond and Flanagan 1996 and Wilson *et al.* 2001) and an ongoing study as part of the North East Rapid Coastal Zone Assessment project and are not described further here, other than to say that they contain the visible remains of old trees and have produced archaeological material including chipped flintwork. One of the peats close to the Low Hauxley cemetery is known to span the Neolithic-Early Bronze Age periods (Drury 1995) and the long peat exposure at the northern end of Druridge Bay has been estimated at having built up over a *c.*1900 year period (Frank 1982; Farrimond and Flanagan 1996).

Figure 5. Area of shell midden exposed in cliff face immediately above the till deposit. This had been eroded away by the time of the 2009 excavation.

2.4 It was observed during the excavation that the upper layer of the till deposit had a low clay content while the lower layer contained a much greater volume of clay as well as larger, more angular, stones. The upper level of till also contained charred lenses which may be organic, may have occurred due to a natural process or may have archaeological significance. In addition to this, fragments of chipped flint were recovered from an old weathered land surface immediately overlying upper layer of the till just below Burial 1. The material includes diagnostic Mesolithic material belonging to the 'narrow blade' tradition and is directly comparable to the Howick material (see also lithic report below).

2.5 On the foreshore in front of the cemetery rectangular rock-cut pits can be observed cut into the rock steel. These survive as rock-filled cavities. No work has been undertaken to record

or study these features to date. They are regularly covered over with beach sand deposits and so are only visible on those occasions when the rocky foreshore has been scoured clean of sand. Photographs were taken of these features by Jim Nesbitt and Clive Waddington (Figure 6).

Figure 6. At least eight of the rock cut rectangular features are visible as cobble-filled hollows on this view of the foreshore in front of the eroding beaker period cemetery.

3. Circumstances of discovery

3.1 The earliest recorded intervention at the site took place in 1983 when a cist was found weathering out of the cliff face. Later, two burial cairns were discovered sealing a possible Mesolithic midden and these were excavated by Clive Bonsall but remain unpublished other than a short note in Proceedings of the Prehistoric Society (Bonsall 1984).

3.2 In 1993, Tyne and Wear Museums Archaeological Service carried out a small scale excavation for Northumberland County Council (Griffiths and Speak 1993). The excavation was initially prompted by the discovery of a Bronze Age cist that had been seen eroding from the cliff face. The cist was centred at NU 284 018 and, when found, was in danger of not surviving the next major storm. The discovery of a second cist extended the excavation from four days to seven. The first cist was constructed of four sandstone slabs that created a box measuring 0.6 x 0.35m and had been filled with bone fragments, none of which appeared to be human, to a depth of 0.03m. In the north-east corner of the cist, a complete beaker was found on its side lying on top of the bone fragments. A slab of sandstone that measured 0.15m in depth was laid over the cist when it was first found. The remains of a pot containing cremation debris was also discovered during the initial stage of the excavation of Cist 1. While Cist 1 was being cleaned for a final photograph, a second cist was discovered 0.7m to the west of the first. The cist measured 1.2 x 0.5m internally and contained the remains of a young adult, with the skull at the eastern end of the cist, and a complete beaker.

3.3 In 1994 a third phase of excavations coupled with examination of the peat deposit to the north of the burial complex was carried out by Lancaster University Archaeological Unit at the request of English Heritage and Northumberland County Council (Drury 1995). During excavations a stone cairn was discovered eroding from the cliff face and this was seen as a group of rounded stones which measured 13m across. Titled as 'Cairn 1' this substantial feature has so far revealed three cists and produced two inhumations, four cremations and two Beakers. Human bone from this cairn has provided a date of 3621 ±34 BP (OxA-5554) while a human bone sample from a single inhumation from the 'satellite cairn' provided a date of 3420 ±38 BP (OxA-5555) (Drury 1995, 41).

3.4 In recent years an amateur archaeologist, Jim Nesbitt, had been monitoring the section of coastline at Low Hauxley and he identified the eroding burial deposits that are the subject of this report. In particular, Mr Nesbitt had noticed the rapid pace at which the cliff line has been eroding. On the 23rd of March 2007, Mr Nesbitt photographed a shell midden that was also eroding from the same section of the cliff face at Low Hauxley. The midden was centred at NU 28410 01818, between the Cist 1 that was excavated in 1993 and Burial 1 that was excavated in June 2009, and was within the same level of the till as Burial 1. The rapid rate of erosion has unfortunately meant that the midden has now been completely removed. Another feature that no longer survives from the same area of coastline is a stone-built circular structure (Figs. 4 and 5). Centred at NU 28439 01843, the structure survived as an arc of built dry stone walling made from sandstone. It had been constructed on top of a peat deposit and overlain by dune sand of 3m-4m depth and so was in a stratigraphically similar position to the Beaker period burials. The structure measured approximately 5m in diameter and the interior appeared to have been cut down into the peat to create a sunken floored building. Within the structure the peat had been cut into again to create a depression in the centre that is thought could be the position of a hearth pit. The structure was photographed on the 9th of March 2007 however, but by the time it was drawn to the attention of CW in May 2009, the structure had been completely eroded away.

Figure 7. The arc of sandstone dry stone walling that could represent the remains of a stone-founded roundhouse covered by the same sand dune system as the Beaker-period burials. These remains are now totally eroded and no other record survives.

Figure 8. Close up of the section of the wall for the dry stone-walled structure.

4. Aims and Objectives

4.1 The excavations carried out at Low Hauxley were a straightforward case of rescue archaeology in advance of ongoing coastal erosion. The purpose was to record what remained as effectively as possible before any more of the remains were removed by wave action or cliff-collapse. If the burials had not been excavated they would have eroded from the cliff and would have been removed from the coastline altogether. Therefore it was important to establish the nature, date and significance of the burials before they were lost.

4.2 The objectives of the excavation were to record the eroding burials in the hope of assessing the extent of the erosion and how this will impact on the other archaeology that still survives on the site. This will assist in informing the wider NERCZA project of the issues, threats and management options for dealing with eroding coastal sites in this region as well as providing baseline information to inform a future archaeological strategy for the site within the context of its SMP policy of 'managed retreat'.

5. Methodology

5.1 Before excavation of the burials could begin, the sand overburden from the dunes had to be removed, however, there was a risk that the sand from above would collapse. The dunes directly above Burial 1 were over-hanging and the risk of them collapsing increased as the sand was removed. As little sand was removed as possible to make room for sheets of plywood to be placed upright and secured with wooden stakes driven into the underlying till to prevent further collapse while work was in progress. The excavation was carried out from below and not above the cist as much as possible to avoid risk from collapsing dunes. The planning of the feature was undertaken briskly and from the ladders for the same reason.

Figure 9. Burial 1 being rapidly recorded before further collapse.

5.2 Once the area had been secured the remaining sand from above Burial 1 was trowelled off to expose the stones that had formed a small cairn above the stone grave box. Once photographed and drawn, the stones were removed to uncover the top of the cist. The flat cist stones were carefully taken out and the dark soil surrounding them was removed with a trowel until the original cut of the burial had been exposed. The dark lens of cremation debris that lay across the base was also removed with a trowel and transferred to a labelled bag.

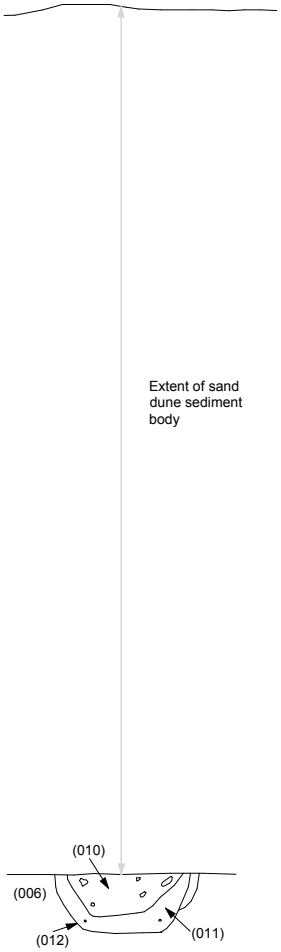
5.3 The same method used for Burial 1 was employed for Burial 2 although plywood boards were not used as there was no direct overhang from the sand dunes as they sloped back in this section of the cliff. The remaining sand from above the pit was removed with trowels until the cut of the pit could be clearly seen. Once it had been drawn and photographed the pit was excavated and recorded. From the section it was clear that there were two distinct fills. The upper fill was removed flotated with graded sieves, the smallest being a 5 micron mesh. The basal fill contained a large amount of burnt bone and cremation debris as well as the partial remains of a Beaker which had evidently held the cremation. The burnt bone was very fragile and was removed carefully from the pit using a plasterer's leaf. The soil and stones surrounding the pot were removed until it came away easily and then it was wrapped in bubble wrap and placed in bags within a padded container.

5.4 Both fills from Burial 2 were flotated on site and placed in bags for environmental sampling once they had dried. All features and deposits on site were recorded on pro-forma context sheets and were photographed and drawn. All finds were given a unique finds number and were placed in bags that had the site information written on them. Delicate finds were first wrapped before being bagged.

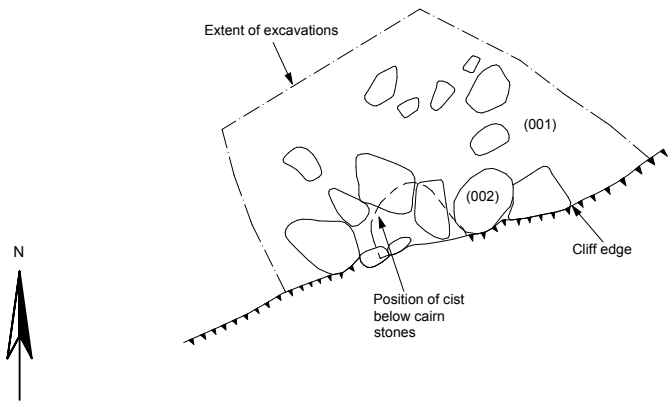
6. Excavation Results

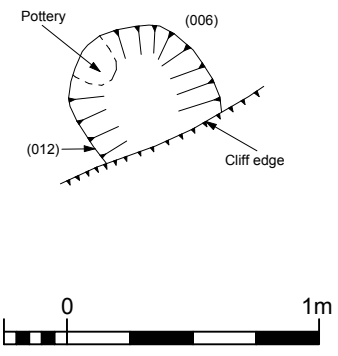
6.1 Burial 1 consisted of a stone-lined burial box or 'cist' containing cremation debris and was visible in the cliff face. It was centred at NU 28409 01821 and was located approximately 1m above the modern beach deposit. The burial was initially excavated from above by removing the dune sand in a small rectangle above the feature and using thick plywood with wooden stakes to hold it to shore up the surrounding dune sand (001) from around the cairn stones (002). During the removal of the sand a scattering of limpet shells was found between the cairn stones. Once the larger of the cairn stones had been removed, a dark brown (7.5 yr 3/2) sandy silty soil (003) matrix was encountered containing the cist box stones (004). Within this soil and between the flat stones, a number of small cremated bone fragments were discovered. Once the bone had been removed and bagged the remaining stones were removed until the original cut of the cist (005) could be seen. The pit that the cist had been constructed within had been cut directly into an old ground surface (006) and into the underlying till deposit (008). The cut for the cist box was approximately 0.5m deep. A thin layer of small and highly fragmented cremation debris (009) was recorded on the base of the cist box and this material was carefully recovered and bagged.

Cremation Cist (Burial 1)



Cremation Pit (Burial 2)





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Site Code:
Date: Dec 2009
Drawn: PC, JB
Scale: 1:30@A4

Figure 10

6.2 Burial 2 consisted of a pit cut down through the old land surface (006) and into the underlying till (008) that was visible in section in the cliff face and had been severely truncated so that what is thought to be less than half of the pit survived. The pit could be observed approximately 0.7m above the current beach deposit in the cliff face. It was centred at NU 28401 01813 and was located approximately 10m south of Burial 1. What remained of the pit was semi-circular in plan, measured 0.54 x 0.48m and was 0.23m deep. A number of flints was found amongst the dark brown (10 yr 3/4) sandy silty soil (013) that lay directly above the pit. The upper fill of the pit was a dark brown/grey (10 yr 4/2) silty sandy soil (010) and also contained some pieces of flint. The lower fill of the pit was a dark grey (10 yr 4/1) sandy silty soil (011) and also had lenses of black burnt material within it. Towards the base of the pit a large number of burnt bone fragments were found and a fragmentary Beaker vessel was found in the north-western corner of the pit that had cremation material adhering to its inner surface but which fell away easily. This material was bagged together with the other cremated material that had evidently been spread from this vessel as it had become fragmented. When found, the vessel was inverted, although it is not clear whether it was originally placed this way in the pit. It had already suffered considerable damage and was very fragmentary.

7. Small Finds

Flints

An assemblage totalling 38 pieces was recovered from the land surfaces through which Burials 1 and 2 were cut and from the cairn material of Burial 1 and the fill of the pit for Burial 2.

The only chronologically diagnostic pieces in the assemblage is material of Mesolithic date. Most of these pieces are partly or wholly patinated which emphasises the antiquity of these pieces. The Mesolithic pieces include a small microblade core, a tiny end scraper and several blades and blade segments. The few flints that had sufficient surviving cortex to attribute a provenance for the raw material were beach pebble flint indicating the local acquisition of this material, at least during the Mesolithic. This is consistent with the flint from Mesolithic assemblages from elsewhere on the Northumberland coast and in particular the settlement site at Howick (Waddington 2007).

Several of the pieces are burnt indicating that they were affected by the funeral pyre. However, most of the material came from the weathered land surface into which the burial structures had been cut (006 and 013) and the finding of these Mesolithic pieces in this horizon suggest that this is a buried Mesolithic land surface. The Mesolithic material from within the burial deposits is clearly residual and cannot have been produced as part of the Bronze Age burial activity. It seems likely that the funeral pyre took the form of a bonfire laid directly on to the ground surface. Once the pyre had burnt out and collapsed the human remains were scraped up from the ground and in the process Mesolithic flints from the underlying Mesolithic land surface were scooped up with the human remains and this mix of pyre material and scorched soil from the underlying ground surface were then deposited in the grave cist and pit. If this is the case then it also argues for the significance of the Mesolithic deposits that appear to survive below Beaker period remains as an important in-situ Mesolithic archaeological resource.

The majority of the assemblage comprises debitage that includes flakes, blades and chips. In addition to this material there were a single core and a single abrupt tiny scraper typical of

the Mesolithic and directly comparable to similar forms found at the Howick site (Waddington 2007).

Figure 11. Mesolithic chipped stone artefacts from Low Hauxley (scale = 10cm). From left to right: platform beach pebble core with microblade detachments, tiny end scraper with abrupt retouch, blade with abrupt removal scars, blade segment with eroded echinoid on left hand side, blade segment made from mudstone or shale with triangular section.

Table 1. Lithics Catalogue for Low Hauxley

SF No.	Context	Material	Colour	Provenance	Type: General	Type: Specific	Core RS	Period	L (mm)	W	T	Notes
4	3	flint			blade			mes?				broken narrow bladelet segment with triangular section
1	6	flint			flake	debitage	sec					broken and patinated white
2	6	flint			chip	debitage	sec					broken and burnt
3	10	flint	med grey		flake		sec	mes?	23	13	7.5	patinated and prob a residual Mesolithic flake from a core
25	10	flint			flake	debitage	sec					burnt and broken
26	10	flint	light grey		blade		sec					broken and light patina development
27	10	flint			scraper	end	ter	mes	20	13	9	patinated end scraper with abrupt retouch and typical of Mesolithic tiny scrapers from coastal sites such as Howick
28	10	flint	med grey		flake	debitage	sec					broken
29	11	flint			flake	debitage	sec					broken and burnt
5	13	flint			flake	debitage	sec					broken and patinated white
6	13	flint			flake	debitage	sec					broken and patinated white
7	13	flint			flake	debitage	sec					burnt and broken
8	13	flint	med grey	beach?	flake	debitage	prim					broken
9	13	flint	light grey		blade				19	13.5	2.5	possibly utilised
10	13	flint			blade	debitage	sec	mes	25	13	7	core flake patinated white with narrow blade detachments on dorsal side consistent with Mesolithic chipping tradition
11	13	flint	light grey		flake	debitage	sec					broken and patinated white
12	13	flint			flake	debitage	sec		16	10	4	patinated white
13	13	flint	light grey		blade		sec					broken
14	13	flint	red-brown	beach	flake	debitage	prim					broken cortical flake

15	13	flint	med grey		chip	debitage	sec					broken chip
16	13	flint	light grey		blade		sec		13	9	2	
17	13	flint		beach	flake	debitage	prim					broken and burnt flake
18	13	flint			flake	debitage	sec					broken and patinated white
19	13	flint	med grey		blade	debitage	sec					broken and patinated white
20	13	flint			edge-trimmed blade		ter	mes				broken and appears to be both patinated and burnt with eroded out echinoid
21	13	flint	light grey		flake	debitage	sec					broken and patinated white
22	13	flint	med grey		flake	debitage	prim					broken
23	13	flint		beach	flake	debitage	prim		37	31	10	patinated cortical flake
24	13	flint	light grey		flake	debitage	sec					broken fragment
71	13	flint			flake	debitage	sec					broken and patinated white
72	13	flint	med grey	beach	flake	debitage	sec					broken
73	13	flint	light grey		blade	debitage	sec		21.5	6.5	2.5	
74	13	flint	dark grey	beach	core	pebble core	sec	mes	18	24		microblade beach pebble core and presumably residual
75	13	flint			chip	debitage	sec					broken, patinated white
76	13	Mudstone/shale		beach?	blade			mes				broken blade segment with triangular section
77	13	flint			flake	debitage	sec					broken and burnt
80	13	Mudstone/shale	dark grey	beach?	flake	debitage						broken flake from a previously polished volcanic piece, poss a flake from a stone axe head
83	13	flint			flake	debitage	sec					broken and patinated white

Ochre

The ochreous material from Low Hauxley consisted of two pieces of ochreous material retrieved from within the stone cairn material above the cist of burial 1 (context 002). The type of ochreous material appears to be a micaceous sandstone, which may have been available locally. The ochreous material is predominantly red-brown with some yellow. The pieces have a combined weight of 384.2g with the largest having maximum measurements of 118mm by 55mmm by 47mm. The smaller piece has maximum measurements of 54mm by 43mm by 40mm. Neither of the pieces show signs of having been shaped or used but their presence in connection with the burials suggests a link between this potential pigment source and the funerary process.

Other cist burials that have ochreous material associated with them include the ochre nodules found placed in the upper layer of the cist capping stones of the cist cemetery at Howick (Waddington *et al.* 2003), the ochreous coating found on a pebble in cist H at Levan, Fife (Sheridan 2004, 34) and lumps of ochre were found in several cists around Kilmartin, Argyll (Craw 1929, 160, 162). The placement of the Low Hauxley pieces suggests they had been purposefully placed immediately on to the cist covering when the interments were made and the cist sealed.

Ochre is occasionally found associated with Bronze Age burials and it may have had some symbolic and or ritual purpose. This association has not yet been explored in detail and the cemetery at Low Hauxley provides an opportunity to investigate this practice further.

Figure 12. The two ochre fragments from within the cairn material above Burial 1 (scale = 10cm).

Ceramics

Sherds from an incomplete and crushed single ceramic vessel was recovered from the lower pit fill of Burial 2. This vessel is of plain Beaker form with a pinched-out and flattened rim. There is no evidence for any decoration on the vessel. It has a relatively thin fabric averaging 6mm thick. There are crushed limestone inclusions evident that erupt from the

inner and outer surfaces, some of which appear to have dissolved out. These inclusions can measure up to 5mm across. The fabric is on the whole an orange brown colour and is evenly fired. However, a part of the vessel appears to have been subsequently heat affected and is a pale-medium grey colour. This has probably resulted from being directly heated, and perhaps stained, by the hot pyre debris with which it was deposited. Although there is a small fragment of base sherd in the assemblage it is not possible to reconstruct the lower part of the vessel and so it is not clear if it tends towards a bowl or bipartite form. The Beaker contained human cremation material and burnt pyre debris and this was carefully removed and bagged for analysis with the other burnt bone and pyre debris from immediately around the crushed Beaker in the lower pit fill. The sherds recovered have a combined weight of 240.4g.

Figure 13. Beaker pot from Burial 2 with rims sherds at the top and base sherds at the bottom (scale = 10cm).

8. Burial Report

By Alexandra Thornton

The first deposit, Burial 1, came from a small stone-lined cist which contained a layer of cremation debris on its base and small fragments of burnt bone were also recovered from between the cist stones. Burial 2 was from the lower fill of a cremation pit and directly associated with a fragmentary ceramic vessel that had clearly contained the cremation but which had been spread from the breakage and disturbance of the vessel.

Each deposit contained human cremated remains only. In order to analyse and record the remains the applied methods correspond to those recommended within Brickley and McKinley's '*Guidelines to the Standards for Recording Human Remains*' (2004). Cremated bone was recovered from three contexts at Druridge Bay. For Burial One cremated bone was recovered from a dark soil surrounding the cist stones (context 003) and from a layer of

cremation debris on the base of the cist (009). Burial Two was a cremation pit and bone was found in the lower fill (context 011).

Methods

The recovered bone was highly disturbed and more fragmentary than would be expected from a complete cremation deposit. Bone fragmentation was ascertained by weighing the total amount of bone and the weight from three sieve fractions (10mm, 5mm and 2mm). This was undertaken using an ADAM PGW 2502e scale. The largest fragment of bone was also measured.

Skeletal inventory

Skeletal elements from a cremated bone assemblage are more difficult to identify than those from an unburnt assemblage as they are fragmentary and warped. However, wherever a fragment could be distinguished, particularly as a specific element such as humerus rather than just upper limb, a skeletal inventory was produced. Generally the fragment of bone most often identified from a cremated collection is part of the skull due to its clearly discernible features. The skeletal inventory was used to determine the minimum number of individuals within each burial context.

Demographic data

Wherever possible, the age of the bone fragments was determined as either adult or juvenile from analysing the level of fusion of the epiphyses. If nothing distinguished the bone as juvenile and the fragment was of a typical length, thickness and fusion for an adult, it was assumed to be adult. The fragments were then analysed more precisely by using the most appropriate ageing and sexing techniques for the skeletal element (see Brinkley and McKinley 2004).

Pathology

The fragmentary and incomplete nature of a cremated assemblage renders the normal recording procedures for pathological data inadequate or misleading, and yet, it is still important to describe any lesions observed upon the bone (Brinkley and McKinley 2004). Upon analysis of the assemblage, however, no pathology was observed on the bones. It cannot be assumed that the individuals deposited within the contexts were healthy or pathology free as the lack of observable lesions is inconclusive on such small and incomplete samples.

Colour

The degree of oxidation of the organic component of cremated bone varies depending on the temperature of the pyre. As the oxidisation of the bone affects the way light is reflected, the degree of oxidisation is related to the colour of the cremated bone (Brinkley and McKinley 2004, 11). Therefore the colour, or combination of colours, of the cremated bone can be used to estimate the temperature of the pyre. Cremated bone can range in colour hues from 'brown/orange (unburnt), to black (charred; *c.* 300ºC) to blue and grey (up to *c.* 600ºC) to the fully oxidised white (>*c.* 600ºC)' (Brinkley and McKinley 2004, 11) and these colours represent the pyre temperature. For the Low Hauxley assemblage, the percentage

and colour of bone which was a variation of the typical white of cremated bone was noted and used to estimate the temperature of the pyre.

Dehydration
Any abnormal warping or twisting of the bone was recorded as this provides evidence for the amount of dehydration that has occurred during burning.

Burial One
The heavy erosion of the site has almost certainly disturbed the bone and advanced bone fragmentation. The stones covering the front of the cist were missing and may have been removed by a member of the public potentially causing further disturbance to the deposit. It is unclear as to how much bone has been lost from the original burial but without the rescue excavation the burial may have been destroyed completely.

The total weight of the cremated bone from context (003) was 22.6g and for context (009) was 104.84g. The combined weight of cremated bone from Burial 1 was 127.44g.

For context (003), the percentage of cremated bone which was over 5mm in size was 92%. The rest of the bone was between 2mm and 5mm. The size of the largest fragment of bone was 45mm by 19.5mm by 1mm.

For context (009) 98% of the bone was larger than 5mm in size. Cremated bone measuring between 2mm and 5mm made up 2% of the assemblage and there was a trace of bone which was less than 2mm in size. The largest fragment of cremated bone from Burial 1 was 75mm by 12mm by 7mm. It is extremely difficult to recover all the bone from a cremation during an excavation which may explain the bias towards larger fragments of bone.

Figure 14. Cremated bone from Burial 1.

Two fragments of skull from context (003) were the only fragments that were identifiable in this context. The rest of the bone was long bone, indistinguishable as either upper or lower long bone. The identifiable skeletal elements from context (009) were six skull fragments, one fragment of mandible and a phalanx from the hand. As with the other context, the rest of the bone was long bone and none of the bones could be sexed.

None of the bone from either contexts in Burial 1 had unfused epiphyses or other signs that the bone was juvenile and therefore it can be assumed to be adult. The bone could not be sexed.

The minimum number of individuals from Burial 1 was one.

95% of the fragments of the bone from both contexts of Burial 1 were completely white demonstrating that the pyre was burning at a temperature of around 600ºC. The 5% which was of a different hue were small fragments of a bluey-grey colour. This alternative colour indicates that part of the pyre was burning at a lower temperature than *c.*600ºC.

Burial Two

A fragmentary ceramic vessel was found containing some of Burial 2 suggesting that the cremation pit had undergone a large amount of disturbance. Although there were no obvious recent breaks on the bone, the burial conditions will have affected the level of fragmentation of the bone. It is possible, therefore, that much less bone was able to be collected during the excavation than was originally buried. Although similar to Burial 1, it is unclear as to how much bone has been lost or how much the disturbance and erosion has affected the fragmentation of the bone.

The total weight of the cremated bone from the lower fill (011) was 37.6g. For (011) all of the bone was over 5mm in size. The largest fragment was 59.5mm by 18mm by 1.5mm.

Figure 15. Cremated bone from Burial 2.

The only fragments of bone which could be specifically identified were four fragments of femur, two fragments of pelvis, the right mastoid process from a skull and the first mandibular molar. The only bone which could be sexed was the mastoid process which was identified as a probable male. None of the bones nor the tooth could be aged beyond that they were adult. The minimum number of individuals for Burial 2 was one.

All of the bone from the lower fill (011) of the cremation pit were completely white indicating that the pyre was predominantly around 600ºC.

None of the cremated bone from either Burial 1 or Burial 2 was abnormally warped or fissured.

No pathological lesions were identified on any of the cremated bone but this does not necessarily signify that the cremated individual was disease free.

Discussion

Burial 1 and Burial 2 have a minimum number of individuals of one each as none of the skeletal elements were duplicated. Usually the weight of the cremated bone in each deposit is used to estimate the number of individuals in the assemblage. If the weight is over c.2000g it is assumed to be a multiple burial (McKinley 2000). For the Low Hauxley assemblage this theory has been used tentatively due to the high likelihood that much of the bone is missing from recent erosion and disturbance of the site.

In all likelihood the individuals from Burial 1 and 2 were adult as there is no evidence for the contrary. There were no distinguishing bones to determine the sex of the cremated individual in Burial 1. However, the presence of a mastoid process from the lower fill (011) of the cremation pit suggests that the individual from Burial 2 was probably a male. None of the bone had pathological lesions, although this does not confirm that the individuals were completely healthy and free of disease.

Both burials have probably been heavily disturbed by the erosion of the cliff side and by post-depositional bioturbation and animal action. This will have affected the amount of bone which remains in the deposits. Most of the fragments of bone from the contexts were over 5mm in size but this bias is almost certainly due to the ease of recovery of larger fragments of bone during excavation.

The colour of the bone fragments from all of the contexts was predominantly white indicating that the pyres on which the bone was cremated were all of around 600ºC in temperature. Small amounts of the bone had hues of grey or blue and therefore burnt in sections of the pyre which blazed at slightly lower temperatures. It is clear that the bone from both burials was treated in a similar fashion during burning, supporting the view that they date from the same period.

9. Botanical macrofossils

By Jacqui Huntley

Samples were taken from the two fills of the Burial 2 pit. Flotation of these samples was undertaken on site and the flots were submitted for analysis of the charcoal within them. Cremated bone was sorted from the samples prior to submission. A further sample of hand-collected 'charred material' from above the cist was also submitted.

The two flots were sieved and all charcoal retained on the 4mm sieve was identified by comparison with modern reference material belonging to the author. Transverse sections were primarily used as the material was easily recognisable. The 'charcoal' from above the cist was all coal.

Upper fill of pit (010)

Flotation was undertaken on 25 litres of material from the upper pit fill. The flot comprised a large mat of modern roots but with moderate numbers of charcoal fragments in both >4mm and the finer fraction. 100 pieces from the >4mm fraction were identified and all were *Fraxinus* (ash) – a clear ring porous wood with "neat" and tightly defined vessels. All pieces were flakes or small chunks of heartwood with no curvature apparent. It is not possible to say anything about the type (branch or trunk) of wood utilised.

Basal fill of pit (011)

Flotation was undertaken on 10 litres of material from the basal pit fill. As with the other flot there were mainly modern roots in this flot. Charcoal was very limited in both fractions with only 15 in the >4mm fraction. Eight of these were *Corylus* (hazel), five *Fraxinus* and 2 indet cindery fragments. It was not possible to identify any from the <4mm fraction as they were all too small to fracture and simply turned to dust when this was attempted. As before the *Fraxinus* comprised flakes and small chunks. The *Corylus* produced one fragment from a piece of very slow grown roundwood but was otherwise small chunks of heartwood.

Discussion

Although the numbers of fragments from the lower pit fill were limited they do indicate about half and half hazel and ash compared with only ash in the upper pit fill. The relatively small sizes are not likely to account for such a discrepancy, especially as the smaller assemblage has the greater variety, and therefore it is suggested that the two samples could represent different burning events. Given that calcined/cremated bone was only retrieved from the basal pit fill the difference between the assemblages is of interest. The hazel fragments would be suitable for AMS if required. Given the small size of all the fragments little may be said about the trees from which they originated. Both species would have been present at the suggested date with the ash suggesting probable secondary woodland, it being a pioneer species in many instances.

10. Radiocarbon Dating

By John Meadows

The samples were dated by Accelerator Mass Spectrometry (AMS) radiocarbon dating at the Oxford Radiocarbon Accelerator Unit, whose technical procedures are described by Brock *et al* (2010) and Bronk Ramsey *et al* 2004), and at the Scottish Universities Environmental Research Centre (SUERC) were processed following Lanting *et al* (2001), Vandeputte *et al* (1996), Slota *et al* (1987) and Xu *et al* (2004). The laboratories maintain continual quality assurance procedures, in addition to participating in international inter-comparisons (Scott 2003; Naysmith *et al* 2007). These tests indicate no significant offsets and demonstrate the validity of the precision quoted.

The results are conventional radiocarbon ages (Stuiver and Polach 1977), quoted according to the international standard set at the Trondheim convention (Stuiver and Kra 1986). The radiocarbon age has been calibrated with data from Reimer *et al* (2009), using OxCal (v4.1) (Bronk Ramsey 1995; 1998; 2001; 2009). The date ranges given in the table and figure were calculated by the maximum intercept method (Stuiver and Reimer 1986). They are quoted in the form recommended by Mook (1986), rounded outwards to 10 years. The probability distribution of the calibrated date (below) was obtained by the probability method (Stuiver and Reimer 1993).

It is possible, in theory, that these radiocarbon ages are subject to reservoir effects due to diet rich in fish or other marine foods, but this is unlikely, as the structural carbonate in cremated bone is derived from the whole diet (unlike collagen, which is derived solely from dietary protein), so any reservoir effect would be minimal unless the diet consisted largely of fats and proteins from marine food chains.

Previously a sample from another bone fragment of Cremation 1 was submitted, which failed because it apparently contained no structural carbonate. The two results were obtained on a single bone fragment in which structural carbonate is clearly present. The difference in preservation between the two bone fragments is curious, and it remains speculative as to what this could mean, perhaps it is related to a difference in firing temperature.

In any case, we can use Ward and Wilson's (1978) method to obtain a weighted mean radiocarbon age for Cremation 1 (3569 ±22BP), as the two results are statistically consistent (T'=0.0, T'(5%)=3.8, ν=1; Ward and Wilson 1978). The calibration of the weighted mean (2010–1875 cal BC) is the best estimate of the calendar age of Cremation 1. When we compare the weighted mean (3569 ±22BP) with the radiocarbon age of Cremation 2 (3470 ±35BP), the two individuals must be of different dates (T'=7.1, T'(1%)=6.6, ν=1; Ward and Wilson 1978).

Sample	laboratory code	$\delta^{13}C$ (‰)	radiocarbon age (BP)	calibrated date range (95% confidence)
Cremation 1 [009]A	OxA-22476	-25.3	3569 ±28	
Cremation 1 [009]B	SUERC-28741	-24.5	3570 ±35	
Cremation 1 [009]	weighted mean		3569 ±22	2010–1875 cal BC
Cremation 2 [011]	SUERC-27330	-24.7	3470 ±30	1890–1690 cal BC

Table 2. Radiocarbon determinations and calibrated date ranges for the two Low Hauxley cremations.

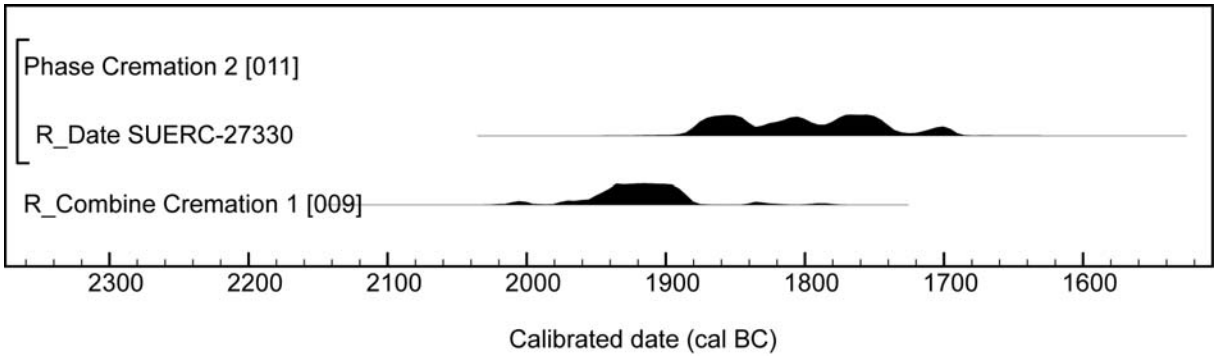

Table 3. Graphical presentation of the calibrated date ranges for the two Low Hauxley cremations.

11. Discussion

The erosion of Beaker period burials at Low Hauxley has been taking place over a period of at least 26 years as a result of wave erosion and slumping of soft sediment cliff deposits. Both of the burials had already suffered extensive damage by the time archaeologists arrived on site with Burial 1 perhaps also suffering from human damage by robbing of a possible ceramic vessel. It is worth noting that all the previous burials recorded from the Low hauxley cemetery have been accompanied by a ceramic vessel. The original full extent of Burial 1 and 2 remains unknown due to the erosion that had already taken place and it is possible that each could have contained more than one burial. The peat beds are also under constant, daily erosion as a result of wave action. This investigation forms only the latest in a series of archaeological interventions that have each recovered evidence for separate burials. Currently a substantial stone cairn can be observed eroding from the cliff face and, judging by the observation of mounds in the surface relief above the burial area, the remains of what is left of an entire burial cemetery is subject to this on-going erosion. At current rates, and given estimates for sea level rise over the next forty years, it is likely that these archaeological remains will be entirely removed within a few years.

The two burials recorded at Low hauxley and reported here were both cremations although they had been deposited in different ways suggesting variation in burial practice. One had been placed in a Beaker vessel which had been placed in a pit whilst the other may have been placed in a ceramic vessel, but this can only be guessed, and this was placed in a small stone-sided cist placed in a pit. Slightly unusually for Beaker period burials in Northumberland, the two corpses had been cremated. No grave goods were found other than the placing of two pieces of ochre within the cairn material above Burial 1. A quantity of small limpet shells had also been sprinkled over the cairn material of Burial 1, perhaps as part of a final offering. The practice of placing Beaker period cemeteries, including cist cemeteries, by the coast is a phenomenon noted elsewhere in Northumberland and the placing of ochre with these burials has also been noted and has been discussed recently in a separate publication on the cist cemetery at Howick (Waddington *et al.* 2006). The burials are clearly of different date and it is interesting to note that the two dated phases of burial correspond with the two phases of burial that can be identified by the radiocarbon dates for two separate inhumation burials excavated by Bonsall (Drury 1995).

In addition to the Beaker period material further evidence for Mesolithic remains was recorded by this investigation. Mesolithic chipped stone artefacts were recovered from the sealed land surface through which the Burial structures were cut. Being further sealed by

cairn material and the sand dune accumulation, this horizon could be of considerable archaeological significance. Given the calcareous bias of the dune sand environment it is clear that organic material preserves well and so it is reasonable to anticipate that Mesolithic faunal, floral and other organic deposits will survive in this buried land surface. Furthermore, if any structures were built on the site then the potential for their preservation is even greater than that recovered further north at Howick – a site that has proved to be of international significance.

The direct association of the peat bed deposits with the archaeological remains, as seen with the unrecorded stone built structure built on to one of the peats (Figs. 7 and 8), and their known potential to host chipped stone lithics, worked timber as well as the environmental record contained within them, provides considerable attention for gaining a highly detailed and unusually complete record of past human activity during the Mesolithic-Beaker periods.

The intellectual value and rarity value of these remains is very high and would normally be sufficient to recommend for designation as a Scheduled Ancient Monument.

The erosion of these remains is severe and on-going with clear evidence for the cutting back of the cliff face on a month by month basis.

The challenge facing the historic and natural environment managers of this section of coastline is deciding how to act to record these remains before they are lost.

12. Publicity, Confidentiality and Copyright

9.1. Any publicity will be handled by the client.

9.2. Archaeological Research Services Ltd will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act (1988).

13. Statement of Indemnity

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14. Acknowledgements

11.1 Archaeological Research Services Ltd would like to thank all those involved with this work, in particular Jim Nesbitt for his recording work and bringing the site to our attention, Jacqui Huntley, Peter Murphy and Peter Marshall of English Heritage, Liz Williams and Sara Rushton from the Conservation Team at Northumberland County Council and Mike Jeffries the Countryside and Access Manager at Northumberland County Council and Graham Mitcheson the Druridge Bay Country Park Site Manager.

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APPENDIX I – CONTEXT & FINDS REGISTERS

Context Register

Context No.	Description	Small Finds?	Charred Material?	Environ. Sample?
001	Dune sand			
002	Cairn stones above cist	✓	✓	
003	Dark soil matrix surrounding cist	✓		
004	Flat cist stones			
005	Cut of pit for cist			
006	Weathered land surface above till	✓		
007	Dark lens within till (006)			
008	Till			
009	Cremation debris on base of cist	✓		
010	Upper fill of cremation pit	✓		✓
011	Basal fill of cremation pit	✓		✓
012	Cut of cremation pit (010)			
013	Layer of silty sand above pit (010) forming band of sealed earlier land surface	✓		
014	Modern turf horizon			

Finds Register

Find No.	Context No.	Description
1	006	Flint
2	006	Flint
3	010	Flint
4	003	Flint
5	013	Flint
6	013	Flint
7	013	Flint
8	013	Flint
9	013	Flint
10	013	Flint
11	013	Flint
12	013	Flint
13	013	Flint
14	013	Flint
15	013	Flint
16	013	Flint
17	013	Flint
18	013	Flint
19	013	Flint
20	013	Flint
21	013	Flint
22	013	Flint
23	013	Flint
24	013	Flint
25	010	Flint
26	010	Flint
27	010	Flint
28	010	Flint
29	011	Flint
30	011	Pottery – all sherds

		from the single Beaker vessel
54	002	Shell fragments
71	013	Flint
72	013	Flint
73	013	Flint
74	013	Flint
75	013	Flint
76	013	Stone tool
77	013	Flint
80	013	Stone tool
84	002	Two pieces of ochre

APPENDIX II - PHOTOGRAPHIC REGISTER

Film 1: Black and White Print

Shot No.	Direction	Scale	Description	Taken By
1	NE	0.25m	Cairn stones above cist	PC
2	N	0.5m	Cist (Burial 1)	PC
3	N	1m	Cist and surrounding cliff face	PC
4	NW	0.25m	Cremation pit (Burial 2)	PC
5	NW	0.25m	Cremation pit (Burial 2)	PC
6	NW	0.25m	Cremation pit containing vessel	PC
7	NW	0.25m	Cremation pit after excavation	PC

Film 2: Colour Print

Shot No.	Direction	Scale	Description	Taken By
1	NE	0.25m	Cairn stones above cist	PC
2	N	0.5m	Cist (Burial 1)	PC
3	N	1m	Cist and surrounding cliff face	PC
4	NW	0.25m	Cremation pit (Burial 2)	PC
5	NW	0.25m	Cremation pit (Burial 2)	PC
6	NW	0.25m	Cremation pit containing vessel	PC
7	NW	0.25m	Cremation pit after excavation	PC

APPENDIX III – HARRIS MATRIX