CHAPTER 6

Whitby West Pier to Blackhall Rocks (Block 1 NMP)

6.1 Introduction

The area covered extends from the west bank of the River Esk at Whitby to Blackhall Rocks on the Durham Heritage Coast. It falls into three major topographical units, the uplands of the North York Moors, the estuary of the River Tees and low lying coastal zones to the east and north, including Hartlepool Bay, and the most southerly section of the Magnesian Limestone cliffs of County Durham. Accordingly, this survey of the heritage assets has been undertaken with reference to the HERs maintained by North Yorkshire County Council, The North York Moors National Park Authority, Tees Archaeology and Durham County Council. This existing base of data has been enhanced by the transcription of aerial photographs (APTE) held by the NMR and carried out to the standards of the NMP.

The coastline from Whitby to Saltburn has been designated as 'Heritage Coast' while extensive sections of the County Durham coast is similarly designated. In addition, substantial sections of the coast and large areas of the Tees Estuary have been designated as SSSIs. From Crimdon Dene to Blackhall Rocks the coastline is a National Nature Reserve. The National Trust manages several properties in the area consisting of sections of coast to the north of Runswick Bay, from Beacon Hill to High Lingrow at Port Mulgrave, Cowbar Nab at Staithes, an area east of Skinningrove, and Warsett Hill, Saltburn. However, substantial sections of the coast in this area are extensively built-up, which has implications for the survival of heritage assets.

6.1.1 Soils and landuse

The solid geology of this section of the coast is described in Chapter 3. However, throughout most of the coastal zone this solid geology is mantled by varying thicknesses of glacial drift and other superficial deposits of Pleistocene and Holocene age. The Tees Estuary is dominated by the sand, silt and clay deposits of the tidal flats and similar deposits also underlie the built-up area of West Hartlepool. Along the coast west of Saltburn and as far as Crimdon Dene are ridges of blown sand forming dunes inland from the sand and gravel beach deposits. North of the Tees Estuary, and also extending as far Crimdon Dene is a zone of undifferentiated raised marine deposits of Quaternary age overlying sandstones. It is these superficial deposits that give rise to the principal soil types found along this section of the coast (Table 6.1).

The patterns of landuse that characterise these soil types are an important consideration in evaluating the survival of heritage assets and the degree of threat arising from normal farming practices. Clearly, ploughing for arable cultivation will have had a major bearing on the survival of and the extent to which, once levelled, sites can be identified on aerial photographs. Plough damage to archaeological sites is not a recent phenomenon but before the Medieval period the scale and intensity of ploughing cannot be considered significant. However, the development of ridge-and-furrow cultivation in the open fields of the Medieval and post-Medieval periods was on a sufficient scale to pose a serious threat to existing features. This is born out by the fact that most of the pre-medieval sites identified in this study lie within areas not affected by ridge-and-furrow cultivation (fig. 6.10).

Table 6.1 Soil and landuse in Block 1

Deep loam	Stock rearing and dairying with some cereals
Deep red loam	Cereals, sugar beet and potatoes with some short term grassland
Seasonally wet deep loam	Dairying and stock rearing on permanent or short term grassland with some cereals in drier areas
Seasonally wet deep red clay	Dairying on permanent grassland with some cereals in drier districts
Seasonally wet deep loam to clay	Grassland in moist lowlands with some arable in drier areas
Seasonally wet deep clay	Winter cereals, sugar beet, potatoes and field vegetables
Dune sand	Recreation and some coniferous woodland

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6.1.2 Coastal erosion

There are historical records of landslips and cliff falls along this section of coast from at least the early C19 and mapping by the British Geological Survey has recorded landslips at nine locations affecting 6.2km of coastline. Coastal erosion and inundation through sea level rise represent a significant threat to heritage assets.

This section of the coast falls within Cell 1d of the Shoreline Management Plan (SMP). This is divided into 19 Management Areas each of which is subdivided into a number of Policy Units that offer an assessment of threat posed by coastal erosion over the next century. Block 1 spans Management Areas 11 to 23.

Coastal erosion poses two kinds of threat to the historic environment:

1. The erosion of the coast itself caused by the action of the sea leading to the destruction or truncation of assets.
2. Damage to assets caused by various mitigation strategies.

Five main types of mitigation are proposed:

1. 'Hold the Line' entailing construction works such as the provision of rock armour at the foot of eroding cliffs and the construction of sea defences (HTL).
2. Advance the line (A).
3. Managed Realignment (MR).

4. Hold the line on a retreated alignment (HR).
5. Retreat (R)

The alternative to these approaches is 'No Active Intervention' (NAI).

The coast extending west from Whitby to Saltburn is dominated by high cliffs backing wide foreshore platforms of Redcar Mudstone broken at intervals by narrow gorges such as that of the Skinningrove and Staithes. The two kilometres of beach at Runswick Bay and the westerly portion of Whitby Bay, extending east from Sandsend, are the only significant low lying sections of coast between Whitby and Saltburn, although the latter is punctuated by the rock outcrop at Upgang. Between Saltbrun and Crimdon Dene the coast is low lying and in the vicinity of Teesmouth much of it is barely above present sea level.

The authors of the SMP have produced estimates of baseline erosion rates at various points. These are based on existing evidence and may be expected to increase with sea level rise. Accordingly, the figures presented in the following table should be taken as a minimum.

Table 6.2 Rates of coastal erosion in Block 1 recorded in the SMP

Location	NGR (approximate)	Rate per year
Blackhall	NZ464400	0.3m
Crimdon Dene	NZ485370	0.3m
North Sands	NZ500358	0.3m
Hartlepool Headland	NZ530340	0.3m
Seaton Sands	NZ526295	0.4m
Coatham Sands	NZ575260	0.2m
Redcar	NZ610252	0.4m
Marske	NZ640228	04m
Saltburn	NZ665217	0.4m
Huntcliff	NZ690218	0.1m
Cattesty Cliff	NZ705205	0.3m
Boulby	NZ760192	0.1m
Cowbar	NZ780189	0.025m
Penny Steel - Runswick	NZ80174	0.1m
Runswick Bay	NZ814155	0.2m
Kettleness	NZ835158	0.1m
Sandsend Cliffs	NZ860130	0.1m
Sandsend	NZ863127	0.25m
Upgang Cliffs	NZ870122	0.25m
Whitby West Cliff	NZ899117	0.2m

The maps accompanying the SMP use these data to predict the position of the coastline at 20, 50 and 100 year intervals. A number of responses have been proposed on the basis of these predictions.

Table 6.3 SMP proposed responses to predicted coastal change in Block 1

Location	SMP unit	2025	2055	2105
Crimdon Dene	11.1	NAI	NAI	NAI
North Sands	11.2	HTL	HTL	MR
Hartlepool Headland	11.3	HTL	HTL	HTL
Hartlepool	12.1	HTL	HTL	HTL
Seaton Carew North	12.2	HTL	HTL	HTL
Seaton Sands	13.2	NAI	NAI	NAI
North Gare	13.3	HTL	HTL	HTL
North Gare Sands	13.4	NAI	MR	MR
Bran Sands	13.5	NAI	NAI	NAI
South Gare	13.6	HTL	HTL	HTL
Coatham Sands	13.7	NAI	NAI	NAI
Coatham East	14.1	HTL	HTL	HTL
Redcar	14.2	HTL	HTL	HTL
Redcar East	14.3	HTL	HTL	MR
Red Howes	15.1	NAI	NAI	NAI
Marske	15.2	HTL	HTL	MR
Marske Sands	15.3	NAI	NAI	NAI
Saltburn	15.4	HTL	HTL	HTL
Saltburn-Huntcliff	16.1	NAI	NAI	NAI
Cattersty Sands	17.1	R	NAI	NAI
Skinningrove	17.2	HTL	HTL	HTL
Hummersea	17.3	NAI	NAI	NAI
Boulby	18.1	NAI	NAI	NAI
Cowbar Cottages	19.1	HTL	HTL	HTL
Cowbar Nab	19.2	NAI	NAI	NAI
Staithes	19.3	HTL	HTL	HTL
Old Nab	20.1	NAI	NAI	NAI
Port Mulgrave	20.2	R	R	NAI
Lingrow	20.3	NAI	NAI	NAI
Runswick Village	21.1	HTL	HTL	HTL
Runswick Bay	21.2	NAI	NAI	NAI
Kettlesness	21.3	NAI	NAI	NAI

Sandsend Cliffs	22.1	NAI	NAI	NAI
Sandsend Village	22.2	HTL	HTL	HTL
Coastal road	22.3	HTL	R	R
Upgang Beach	22.4	NAI	NAI	NAI
Upgang Beck	23.1	HTL	R	R
Whitby West Cliff	23.2	HTL	HTL	HTL
Whitby Harbour	23.3	HTL	HTL	HTL

Whereas in the eastern section of this coastline the recommendation is that there should be 'No Active Intervention' it can be seen from the above table that 'Hold the Line' is the preferred for a significant part of the coast west of Saltburn. This no doubt reflects the fact that this part of the coast is extensively developed and that coastal change poses a significant threat to a large population and several major industries. The policy recommended for dealing with coastal erosion also has major implications for heritage assets and these will be considered on a case-by-case basis where threats are apparent.

6.2 Terrestrial Landscapes

6.2.1 Early Prehistory

Although Block 1 was entirely over run by ice during the Last, Devensian, Glaciation the possibility of an earlier human presence cannot be entirely ruled out on two counts. First, there are a number of records of pre-Devensian faunal remains from the vicinity of Hartlepool, Teesside and Redcar, such as the *Hippopotamus amphibious* from a gravel pit near Stockton-on-Tees (Sutcliffe 1959). Accordingly, these must imply the presence in the region of pre-Devensian deposits and the sand and gravel beds of the local coastline are sealed by Devensian boulder clay. Second, there are two finds from the region that have been tentatively interpreted as pre-Devensian artefacts.

At Limekiln Gill, Blackhall Rocks (NZ47623816, Durham 155) in 1927 Trechmann (1928) found what he believed to be an implement (fig. 6.2) in gravel below about 20m Devensian boulder clay. It is of yellow quartzite and measures 88mm by 76mm by 38mm. It is said to have six distinct flakes removed from each side and was stated to be 'definitely human' by Reginald Smith and Reid Moir of the British Museum. It is very rolled, but if accepted as a genuine artefact it appears to be an attempt to make a biface, and as such should be ascribed to the Lower Palaeolithic period.

This potentially interesting and unusual find has hitherto escaped the attention of writers on the Palaeolithic period in Britain and it does not feature in Wymer's gazetteer of Lower Palaeolithic Sites in Britain published in 1996. However, that volume does include details of a retouched flake from Newbiggin Farm, Whitby (NZ840077), said to have been found at a depth 1.3m in glacial till while further south in Lincolnshire authenticated bifaces have been found in deposits below glacial tills. In the light of these finds, the possibility that the Limekiln Gill find might also be authentic should be born in mind.

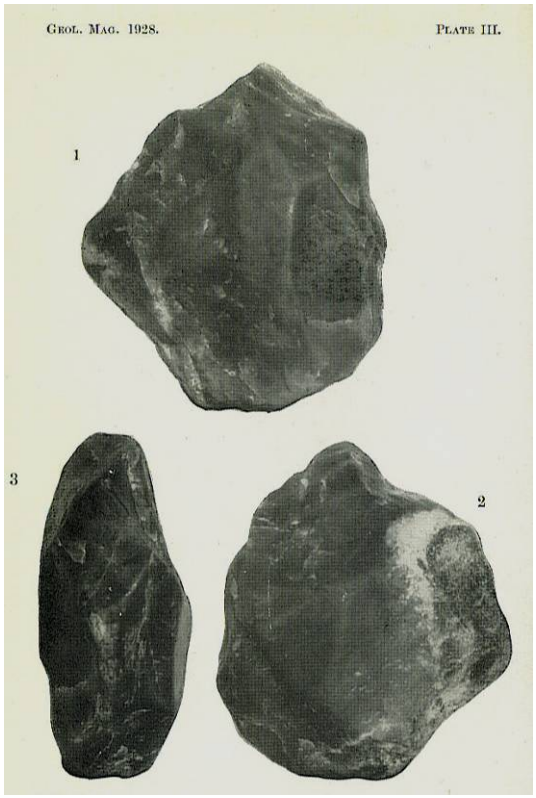

Figure 6.1 The putative Lower Palaeolithic biface from Limekiln Gill, County Durham (Trechmann 1928, Plate III)

Support for this view may be provided by the recent discovery of part of another biface (fig.6.3) on the beach at the South Gare Breakwater, Redar (Rowe *pers comm.)*. While this may have originated from sand and gravel beds which are locally sealed by Devensian boulder clay it could equally easily have originated in a load of ballast brought to Teesmouth by a collier returning from the south. However, even if genuine, these isolated finds can tell us little about the early human settlement of the NE coast beyond demonstrating the presence in the region of early humans.

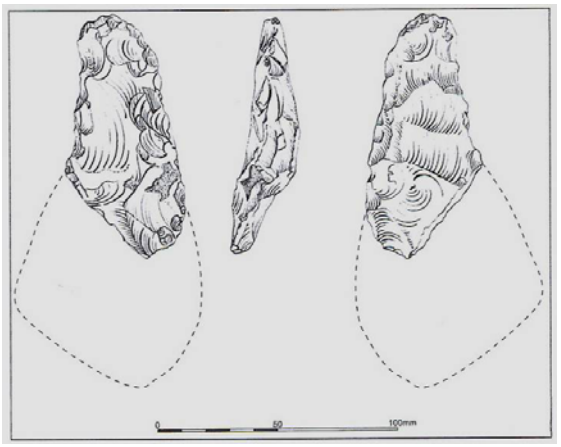

Figure 6.2 The putative Lower Palaeolithic biface from South Gare Breakwater, Teesmouth (Peter Rowe)

6.2.2 The Mesolithic period

While this section of the coast lay within the realm of continuous human settlement from at least 10000 BC the only unequivocal evidence of a human presence east of Saltburn before the construction of the Neolithic long mounds at Street Houses and Lingrow Howe is the recovery of some Mesolithic flints found during the course of the excavations at Street Houses. However, given the nature of Mesolithic hunter-gatherer activity this can be taken as indicating a Mesolithic presence throughout the coastal zone, a fact confirmed by finds to the west and north.

Further Mesolithic finds have been recorded from field walking exercises to the NW of Hartlepool. The most southerly of these ***flint scatter sites*** is that in field 206 at Hart (NZ47803644, Tees 2680). This site is situated at about 50m OD and lies about 700m to the SW of a major Mesolithic site at the mouth of Crimdon Dene (NZ48583681, Durham 118 and 154). Flints have been recovered from this location over a number of years and the NGR cited should be regarded as a general indication. More than 9000 artefacts have been collected, most of which are waste flakes and debitage which enable Crimdon Dene to be identified as a production centre. As well as cores and microliths the assemblage also includes leaf-shaped and barbed-and-tanged arrowheads indicating that activity extended from the Mesolithic period into the Neolithic period and Bronze Age, a common characteristic of flint scatter sites in the area. The Crimdon Dene site is described as occupying a low, flat topped spur of boulder clay partly covered by blown sand (Raistrick *et al* 1935).

About 1.25km NW of Crimdon Dene and at about 50m OD lie the flint scatters known collectively as Filpoke Beacon (NZ47483750-NZ47603733, Durham 109 and 120). Here, excavations during the 1930s at two locations recovered an assemblage of nearly 2000 artefacts including cores and microliths in addition to flint knapping waste. The microltihs are of distinctly narrow blade Late Mesolithic types and hazel nut shells associated with the assemblage have been dated to 8760± 140 BP ((Q-1474) (Jacobi 1976 and Young 1977).

Three further assemblages of Mesolithic flints have been recorded at Blackhall, 1.5km to the north of Filpoke Beacon (Durham 114, 115 and 112). They cannot be precisely located but lay in the general area of NZ 472389. Originally referred to as Neolithic, this material was identified by Raistrick as Mesolithic (Trechmann 1912 and Raistrick 1933a).

The last in this group of Mesolithic sites is an assemblage reported from Blue House Gill (NZ46393961, Durham 8276).

Table 6.4 Mesolithic flint scatter sites identified in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ47803644	Hart 206	Tees 2680	11.1	Low	Low
NZ48583361	Crimdon Dene	Durham 118 & 154	11.1	High	High
NZ47483750-NZ47603733	Filpoke Beacon	Durham 109 & 120	11.1	High	Low
NZ472389	Blackhall	Durham 112, 114 & 115	11.1	Low	Low
NZ46393961	Blue House Gill	Durham 8276	11.1	Low	Low

Whereas the Filpoke Beacon sites are situated well inland from the present shoreline the main Crimdon Dene site is close to the MHWS limit while the Blackhall sites are on the cliff edge. This section of the coast lies in SMP Management Areas 10.1 and 11.1 where the recommended policy is 'No Active Intervention'.

6.2.3 The Neolithic period

Neolithic axe heads are reported from Hart Lane, Hartlepool (NZ50463310, Tees 1455) and Hartlepool Headland (NZ52893345, Tees 4821) while Crimdon Dene flint scatter also includes some Neolithic items. More substantial evidence for terrestrial human activity in the coastal zone during the Neolithic period is provided by the ***long mounds*** at Street Houses and Lingrow Howe.

The mound at Street Houses, a shallow plough damaged earthwork about 6m in diameter, was excavated between 1979 and 1981(Vyner 1984) when it was found to be a complex, multi-phase structure. Initially, an east facing timber façade of closely spaced posts fronted a narrow mortuary structure set between low banks of earth and stone behind which lay a sub rectangular enclosure defined by a low stone kerb. The mortuary structure contained the burnt remains of several individuals. Radiocarbon dates suggest that the structure was initially constructed in the mid fourth millennium BC but was subsequently converted into a low trapezoidal mound. Further funerary activity took place at this site in the Bronze Age and will be considered below.

Comparatively little is known about the mound at Lingrow Howe which today survives only as a cropmark in an arable field. It is approximately 42m long and 10m wide and is oriented SW-NE. Human remains are reported to have been found in the past.

In addition to the two long mounds, a group of three enclosures, recorded as cropmarks on an aerial photograph taken in 1940 may also date from the Neolithic period. They are situated about 150m from the cliff edge above Overdale Wyke (NZ85451426). The enclosures vary in size, the largest being oval in shape and 42m by 39m with three breaks in the circuit, two of which may be the result of ploughing. Alongside this enclosure and a little to SE lies a 'U' shaped feature about 8m across while 55m to the E lies a penannular enclosure with a diameter of 24m and a 10m wide opening to the east. These features are difficult to interpret on the evidence available, but a local parallel might be provided by the Late Neolithic and Early Bronze Age palisaded enclosure at Street Houses (see below).

These sites provide a very limited basis on which to assess the terrestrial landscapes of the Neolithic period in the coastal zone. They do, however, attest the presence of stable, long term communities. Neither long mound is under threat from coastal erosion though both have been severely denuded by ploughing, while the Overdale Wyke enclosures survive only as cropmarks. The most easterly of these latter sites lies within 100m of the present cliff edge and could become vulnerable in the event of cliff collapse or landslip.

Table 6.5 Neolithic sites in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ73671933	Street House	Tees 545	18.1	Low	Low
NZ80371703	Lingrow Howe	NYMNP 7448	20.3	Medium	Low
NZ85451426	Overdale Wyke enclosures	NMR1453229	21.3	High	High

The HERs list sixteen assemblages of stone tools but none are precisely dated and could belong to Mesolithic, Neolithic or Bronze Age periods, or include material spanning all three.

Table 6.6 Flint scatter sites in Block 1

NGR	HER	SMP	Importance	Risk
NZ46713942	Durham 9632	11.1	Low	Low
NZ46783933	Durham 9632	11.1	Low	Low
NZ47273893	Durham 9632	11.1	Low	Low
NZ47213864	Durham 9632	11.1	Low	Low
NZ47413790	Durham 963	11.1	Low	Low
NZ47513759	Durham 959	11.1	Low	Low
NZ47233758	Durham 960	11.1	Low	Low
NZ47203748	Durham 961	11.1	Low	Low
NZ47903654	Tees 2861	11.1	Low	Low
NZ48253639	Tees 2862	11.1	Low	Low
NZ60272538	Tees 4869	14.2	Low	Low
NZ48603639	Tees 2866	11.2	Low	Low
NZ68002200	Tees 4348	16.1	Low	Low
NZ73481932	Tees 1741	18.1	Low	Low
NZ73921963	Tees 1742	18.1	Low	Low
NZ85231436	NYMNP 4662	21.3	Low	Low

6.2.4 The Bronze Age

This period is mainly represented by burial mounds or ***round barrows*** and ***cairns***, of which 30 either survive or are recorded. These fall into four distinct groups, each occupying areas of high ground. The most easterly group consists of five barrows that are part of an extensive group on Whinny Hill, most which lie outside the coastal zone. A number of these barrows have been excavated, beginning with work by Greenwell at several sites in the Whinny Hill group in the late C19, though it has not been possible to establish that any of the mounds he opened lie within the study area. More informative are the records of a number of excavations undertaken by W Hornsby and JD Laverick in the period between the two world wars (Hornsby and Laverick 1920).

At the Whinny Hill cemetery they excavated the Butter Howe barrow in 1918 where they uncovered a cremation and an inhumation, the latter associated with what they described as 'Anglian' pottery. They also uncovered a platform of stone slabs and the stump of an oak post, interpreted as a gallows. The mound is constructed of earth and stones and still stands about 1m high.

The Hornsby and Laverick campaign concentrated on a group of barrows extending from Rockcliff Hill across Boulby Bank, eight mounds being examined in all. The first to be described (mound no.1) was one of a group of three mounds on Beacon Hill

(NYMNP 2772.02). As well as seven cremations, the excavators recovered about 300 worked stones from within the mound, some decorated with cupmarks. This mound stands about 4m high and has a diameter of 15m, though its lateral extent has been truncated by ploughing, which has also levelled the other two barrows in this group.

Three barrows were excavated on Boulby Bank (Tees 44, 45 and 46). At Tees 44 (mound no.6) they found an empty cist together with a cremation accompanied by a cup marked stone, a slate pendant and some flint flakes They described Tees 45 (mound no.4) as composed of sandstone overlain by a layer of greenstone and capped with earth. It had a kerb of upright stones and in the centre was an inverted urn surrounded by greenstones. The urn covered a cremation and 3m SW of the centre a further cremation was found accompanied by a broken vessel. As with other barrows in the area, finds included cupmarked stones. In the centre of mound no.7 (Tees 46) was a collared urn inverted over a creation.

Excavations have also taken place at one of the Rockcliff Beacon barrows (Tees 33). This mound is approximately 20m in diameter and stands about 1.7m high. It is constructed of earth and stone. Excavations in 1923 uncovered a stone-lined cist set in the old ground surface below the mound. The remains of two cremations were identified as well as several cupmarked stones.

A number of other barrows in the group seem to have been subject to excavation or disturbance in the past, but details of finds, other than references to 'cremations' and 'collared urns' are not available.

The recent archaeological excavations at the Street Houses long mound established that the final phase of activity was the erection of a Bronze Age round barrow over the eastern half of the long mound. Secondary burials were represented by four collared urns, while a deposit of 20 jet buttons was inserted into the tail of the long mound (Vyner 1984).

This is a clear indication of at least some level of continuity between the Neolithic period and the Bronze Age, a situation confirmed by the excavations at the nearby Late Neolithic and Bronze Age palisaded structure, the so called 'Wossit'. This complex monument, which lies outside Block 1, dates from the late 3rd millennium BC. Finds here also include Grooved Ware and jet buttons (Vyner 1988).

The most westerly group lies on Warsett Hill. This features in the HER has two records (Tees 11 and 1049) at NZ69162135 and NZ69202140 but details in the NMR refer to six or seven mounds, some of which had been disturbed before the end of the C19 (Elgee 1930).The two recorded mounds lie on the edge of an area of ironstone workings and this may be responsible for the loss of some of the others.

A further barrow is recorded at NZ66922154 (Tees 15) and the NMR entry has a report of an excavation in 1913 which uncovered a cremation.

Table 6.7 Round barrows and ring ditches in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ66922154	Saltburn	Tees 15	15.4	Low	Low
NZ69162135	Warsett Hill	Tees 11	16.1	Low	Low
NZ69202140	Warsett Hill (2-6)	Tees 1049	16.1	Low	Low
NZ73671933	Street House	Tees 548	18.1	Low	Low
NZ74611917	Rockcliff Hill	NYMNP 4967	18.1	Medium	Low
NZ74641899	Rockcliff Hill	NYMNP 4966	18.1	Medium	Low
NZ74931916	Rockcliff Hill	Tees 32	18.1	Medium	Low
NZ74781918	Rockcliff Hill	Tees 3446	18.1	Medium	Low
NZ74821905	Rockcliff HIll	Tees 3447	18.1	Medium	Low
NZ74851936	Rockcliff Beacon	New record	18.1	Medium	Low
NZ74901932	Rockcliff Beacon	Tees 495	18.1	Medium	Low
NZ74961943	Rockcliff Beacon*	Tees 33	18.1	High	Low
NZ74951912	Rockcliff Hill	Tees 494	18.1	Medium	Low
NZ75151918	Boulby Bank	Tees 43	18.1	Medium	Low
NZ75341918	Boulby Bank	Tees 44	18.1	Medium	Low
NZ75561912	Boulby Bank	Tees 40	18.1	Medium	Low
NZ75641894	Boulby Bank	Tees 45	18.1	Medium	Low
NZ75801888	Boulby Bank	Tees 46	18.1	Medium	Low
NZ79321781	Beacon Hill*	NYMNP 2772.02	20.2	High	Low
NZ79351782	Beacon Hill	NYMNP 2772.01	20.2	Medium	Low
NZ79311780	Beacon Hill	NYMNP 2772.03	20.2	Medium	Low
NZ82501500	Whinny Hill	NYMNP 7458	21.2	Medium	Low
NZ82731512	Butter Howe*	NYMNP 7446	21.2	High	Low
NZ83031476	Whinny Hill	NYMNP 7400.07	21.3	Medium	Low
NZ83121489	Cow Hill*	NYMNP 7400.06	21.3	High	Low
NZ83331465	Whinny Hill	NYMNP 7400.14	21.3	Medium	Low

None of these sites appear to be threatened by coastal erosion but all have been affected by ploughing. In some cases this has modified the shape of the mound while in others the mound has been levelled and the site survives as a cropmark. Barrows indicated with an * are Scheduled Ancient Monuments.

The Durham HER has records of two crop mark sites which, from their size and shape, are more likely to date from Neolithic or Bronze Age periods than later. The Blackhall Rocks 1 cropmark (NZ46553935, Durham 8281) is oval in shape and about 10m across while the Blackhall Rocks 2 site (NZ46923921, Durham 8282) is circular and about 8m in diameter. The function of neither site has been identified though the second site may be a ring ditch marking the site of a ploughed out barrow. Neither site was identified during the APTE. A potentially Bronze Age find is a ***cist*** found at Brow Quarry (NZ75671882, Tees 496). When first discovered in 1875 this was regarded as Roman.

Table 6.8 Putative Neolithic or Bronze Age sites in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ46553935	Blackhall Rocks 1	Durham 8281	11.1	Medium	Low
NZ46923921	Blackhall Rocks 2	Durham 8282	11.1	Medium	Low
NZ75671882	Brow Quarry cist	Tees 496	18.1	n/a	n/a

6.2.5 The Iron Age and Romano-British Periods

In the later prehistoric period the evidence for human activity in the coastal zone is mainly in the form of settlement remains, in particular ***farmstead enclosures*** of various shape and size. Unlike the remains of earlier periods which are predominantly funerary or ritual in character, these enclosures appear to be mainly domestic.

A cropmark at Street Houses, Loftus, appears to record three sides of a sub- rectangular enclosure about 100m across on the surviving axis. In addition to the missing fourth side, there are two breaks in the circuit, either or both of which could be entrances. Approximately 1km to the east are the cropmarks of another rectangular enclosure near the summit of Rockcliff Beacon. Only two sides of this feature survive, 85m and 94m long respectively and joining at a right-angle. Within the angle are the cropmark traces of an oval ring ditch marking the site of a ploughed out barrow.

Four further enclosures have been identified from the records. These consist of ditched enclosures at Runswick Bank Top and East Row, an embanked enclosure also at East Row and an enclosure recorded in the Tees HER at Warsett Hill. None of these enclosures have been dated but they are of a type commonly attributable to the Iron Age or Romano-British period.

Table.6.9 Iron Age and Roman-British enclosures in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ69282137	Warsett Hill	Tees 4779	16.1	Low	Low
NZ73871951	Street House	Tees 1269/5229	18.1	Low	Low
NZ74961944	Rockcliff Beacon	Tees 6237	18.1	Low	Low
NZ80361592	Runswick Bank	NYMNP 4399	20.3	Low	Low
NZ86861223	East Row	NYCC MNY8836	22.3	Low	Low
NZ87791182	East Row	NYCC MNY4441	22.4	Low	Low

In addition to the above enclosures there are also records of six ***bee-hive querns*** from within the study area. These substantial items can be dated to the Iron Age or Romano-British periods. Two come from the immediate proximity of the Street Houses enclosure and a further two from within 500m to the SW. A fifth example is from the area of Beacon Hill, while the sixth was found during the excavation of the Roman Signal Station or fortlet at Goldsborough.

Table 6.10 Bee-hive querns from Block 1

NGR	Name	HER
NZ73501920	Street House	Tees 1015
NZ73741930	Street House	Tees 546
NZ73791950	Street House	Tees 1297
NZ73791946	Street House	Tees 1004
NZ79181769	Beacon Hill	NYMNP 3103
NZ83521514	Goldsborough	NYMNP 7444.05001

The presence of querns implies arable cultivation but the HERs do not have any records of pre-Medieval field systems within this part of the coastal zone. However, research elsewhere in Northern England has shown that later, Medieval, field systems sometimes respected pre-existing features that can be revealed by retrogressive analysis (Tolan-Smith, M.1997)

The Roman period is also represented by a number of isolated finds from the Hartlepool area. The main group of finds comes from the foreshore and will be discussed in the section dealing with coastal/maritime landscapes. Other Roman finds in the area include two coin hoards (NZ51003199, Tees 788 and NZ52773358, Tees 689) and a double inhumation (NZ50803375, Tees 1201). This burial was accompanied by coarse pottery and a necklace of jet and glass beads dated to the late C4 or C5.

6.2.6 The Early Medieval Period

The main site of Early Medieval date in Block 1 is the Hartlepool Headland where archaeological research over more than a century has revealed traces of St Hilda's C7 monastery and several Anglo-Saxon cemeteries.

The monastery site was located in Church Close (NZ52843374, Tees 335) and consisted of the postholes and wall trenches of a succession of rectangular timber buildings. Four phases of occupation were identified and a series of radiocarbon dates spans the period from the mid C7 to the mid C8. Historical accounts recall that the monastery was founded by Hieu in AD 640 who was succeeded by St Hilda in AD 649. It appears to have been destroyed in the late C8, an early victim of the Viking raids (Daniels 1988).

Two hundred metres to the north of Church Close lies the Gladstone Street Anglo-Saxon cemetery (NZ52833394, Tees 714 and 1371). Excavations here in 1964 recovered the remains of 29 inhumations. The Baptist Street Anglo-Saxon cemetery (NZ52993361,Tees 703 and 3559) lies 185m to the SE of the Church Close site while further Anglo-Saxon burials have been recorded at South Terrace (NZ53023353, Tees 4721, 4725 and 4726) 100m to the south and on the cliff edge. Anglo-Saxon remains have been found at a number of other locations on the Headland and Hartlepool was clearly an important centre during this period.

An individual Anglo-Saxon burial has been recorded from Blackhall Rocks (NZ47103881, Durham 526). This consisted of a stone cist within which was the inhumation of a child accompanied by a solitary bead.

A collection of Anglo-Scandinavian sculptural fragments from St Oswald's Church, Lythe (NZ85011316), found during restoration work in 1910, are said to date from the C10 or C11 (NYMNP 7471). These include fragments of five hogback grave covers and three cross fragments.

The church of St Hilda at Hinderwell is an C18 and C19 structure but said to be on a site with Saxon origins, while St Hilda's Well, a Scheduled Ancient Monument, (NYMNP 2774.02001) lies in the churchyard and provides the origin of the village name from the Old English *Hildewella,* meaning Hilda's Well. Another potentially early site is Three Crosses Well at Loftus (NZ75601854, Tees 4672-4) and excavations at Marske Sands are reported to have uncovered Anglo-Saxon deposits.

Table 6.11 Early Medieval sites in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ52843374	Hartlepool Monastery	Tees 335	12.1	High	Low
NZ52833394	Glastone St cemetery (Hartlepool)	Tees 714 & 3559	12.1	Low	Low
NZ52993361	Baptist St cemetery (Hartlepool)	Tees 703 & 3559	12.1	Low	Low
NZ53023353	South Terrace Burials (Hartlepool)	Tees 4721, 4725 & 4726	12.1	Low	Low
NZ47103881	Blackhall Rocks cist	Durham 526	n/a	n/a	n/a
NZ85011316	St Oswald's Church sculptural frags.	NYMNP 7471	n/a	High	Low

6.2.7 The Medieval Period

The walled town and port of Hartlepool was the most important centre in Block 1 during the Middle Ages and while the port facilities will be considered below as pertaining to the coastal/maritime landscape the town itself served a wide terrestrial hinterland and its main heritage assets will be dealt with in the context of terrestrial landscapes. The historic centre lies on the Headland and the main features that survive from the medieval period are the town walls and St Hilda's church.

The Hartlepool Headland, extending to nearly 1km SE into the North Sea and rising several metres above the low lying land to the west, offered a rare opportunity for creating a defensive stronghold along this exposed section of coast. On the NE and SE sides low but steep cliffs provided adequate defence but on the SW side and to the NW across the landward approaches, the Headland was provided, between 1326 and 1344, with a wall consisting of a curtain provided with towers or bastions and gates. The extant section of the wall (Tees 704) runs from near the southern extremity of the Headland in a north-westerly direction for about 500m (NZ52753353 to NZ52353374), including the Sandwell Gate (NZ52703359,Tees 5506) and three bastions (NZ52623363, Tees 5505; NZ52403371, Tees 5503 and NZ52363378, Tees 5501). At this latter bastion the wall turned NE and ran for 650m across the neck of the Headland to the cliff above Fairy Cove (NZ52633433). This section of the wall is no longer extant, some of it having been destroyed by the construction of the Victoria Harbour, but the HER has records of nine

bastions (Tees 5488, 5489, 5490, 5491, 5492, 5493, 5496, 5497 and 5500) and two gates, The North gate (Tees 5494) and The Water gate (Tees 5495), while excavations have revealed a ditch outside the wall (Tees 5484) (Daniels 1986). This section of the wall actually spanned the entrance to the medieval harbour (NZ52383381) which was protected by a boom chain slung between two boom towers (Tees 5498 and 5499).

The church of St Hilda (Tees1404) occupies the highest point on the Headland at 10m OD (NZ52843367). The present church, which is not the first on the site, dates from the early C13. Other medieval ecclesiastical establishments include the Franciscan Friary, dating from 1240 to 1538, which was situated to the NE of St Hilda's (NZ52963389, Tees 692) and St Helen's Chapel and Well (NZ52423422, Tees 694 and 695), which lay outside the North Gate. Excavations at various locations on the Headland have recorded medieval deposits and a cemetery has been identified at Francis Street (NZ52543411, Tees 716).

> *The coast of the Hartlepool Headland lies within SMP Management Units 11.3 and 12.1, in both of which the recommended policy is one of 'Hold the Line'. This may entail an enhancement of existing sea defences which could have a bearing on the surviving section of the town wall, which is virtually on the foreshore.*

Excavations in 1938 established that the present church of St Germain, Marske, although an early C19 structure, stands on the site of a late C12 predecessor (Tees 274). Tees 537 records a C13 wayside cross at St Mark's Church, Marske and some C14 and C15 architectural fragments are recorded in All Saints church, Hartlepool (Tees 487). The Wishing Chair Cross at Whitby (NZ88491098; NYCC MNY 8759) is a Medieval cross base comprised of a block of local sandstone with an oblong depression cut into the top to serve as a socket. The north edge of the socket has broken away to form what looks like a chair. The cross probably marked the bounds of Whitby Abbey.

Documentary sources raise the possibility of two further medieval religious establishments in the area. A deed of 1216 refers to *"Meum heremitorium de Salteburne super ripar de holdbec*" implying a small hermitage at Saltburn, the site of which has been located on the Hob Hill side of Holebeck. However, the site is reported as overgrown with no surface traces (Hornsby 1913).

Similarly, a chapel of St Thomas a'Becket is recorded at Seaton Carew as having been founded *circa* 1200 but ruinous by 1622. It has been suggested that it was located near an inlet which is named as Chapel Open on the 1st edition OS map of 1861. However, the NGR obtained for this identification lies between MHWS and LAT (Page 1928, 376).

Other medieval features in Block 1 include a rabbit warren recorded at Hart (NZ48993599, Tees 3641), and a few isolated finds from the foreshore at Seaton Carew (NZ51763197, Tees 1276, 1291 and 1474).

The deserted Medieval settlement of Old Boulby (NZ76161828; Tees 288) was excavated in 1969 in advance of development of the Boulby potash mine. Finds indicated occupation from the C13 and abandonment by the C16. Excavations also took place at the nearby site of Old Boulby Hall which was found to have been occupied from the C15 to C18.

The terrestrial landscapes of the Medieval period in Block 1 are dominated by the traces of arable cultivation in the form of parcels of ***ridge-and-furrow***. While HERs include many records of ridge-and-furrow, these are mostly as individual points and the most comprehensive record has been provided by the APTE. Traces of ridge-and-furrow, surviving as earthworks or crop marks, are virtually ubiquitous throughout most of this section of the coast, the only significant gaps in the pattern being where evidence has been removed by housing development in the hinterland of the principal urban areas at Redcar, Seaton Carew and Hartlepool, and there appears to be little distinction in respect of soil type. Unsurprisingly, traces are lacking from the dune sands and the seasonally wet deep clay, with the exception of an area of slightly higher ground to the south of Seaton Carew.

6.2.8 The Industrial period

Although a number the industries that became prominent in the area in the C18 and C19 may have begun production earlier, few early traces survived later developments. The earliest of these industries is likely to have been the mining of jet.

Jet has been a highly prized commodity from prehistoric times to the present day and the Whitby Mudstone formation of the Early Jurassic epoch is the main British source of jet. As a raw material, jet may be obtained by collecting broken slabs at the base of cliffs after a storm or landslip, by the excavation of short drifts or tunnels cut into the cliff or by the digging of pits from above. The Whitby Mudstone outcrops in the cliffs east of Saltburn facilitating the first and second of these two methods while the extensive overburden of drift deposits means that there were few opportunities of obtaining material by working directly from the surface.

The HERs have recorded extensive evidence for jet mining, mostly extracted from the 1st edition of the Ordnance Survey 25 inch sheets. These records probably refer to C19 drift mining. The main areas recorded are between Hummersea Bank and Rockhole Hill (Tees 6012, 6014, 6019 and 1164), between Staithes and Port Mulgrave (NYMNP 4748), around Runswick Bay to Kettleness (NYMNP 7315, 7316, 7450 and 7454) and from Kettleness to Deepgrove Wyke (NYMNP 7456). This latter record refers to a more than 3km long zone of artificial caves at or near the base of the cliffs.

> *Given that all these sites are located within or at the base of the cliffs they are clearly vulnerable to coastal erosion and the British Geological Survey has identified two areas in the Kettleness to Deeprove Wyke zone that are particularly susceptible to landslip.*

Alum, from aluminium sulphate, is a chemical important in the tanning and dyeing industries. In the Middle Ages it had to be imported from the Continent but in 1607 suitable deposits were discovered within the Jurassic Shales at Belman Bank, Guisborough and this led to the foundation of the Yorkshire alum industry.

The quarried shales were calcined by burning in heaps up to 15m high and 30m across covered in brushwood and gorse. The calcined shale was then steeped in water to extract sulphates of iron and alumina. The resulting liquor was sent to the alum works or 'house', boiled and had an alkali added, which might be potash from burnt seaweed or urine, the latter being collected on a commercial basis from surrounding communities. As the liquor evaporated the alum crystallized allowing the iron salts to be pumped off. From 1700 the main fuel used was coal and as supplies of suitable quality were not

available locally, it had to imported. Elements of these various processes form the archaeological record of the alum industry in North Yorkshire. The alum industry throughout the area collapsed in the late C19 when the chemistry of the industry was finally understood and it was found that alum could be extracted from colliery waste. The most successful quarries were those at Sandsend which were in production from 1733 until the 1870s. An extensive area of alum quarries is recorded to the north of Sandsend and extending to Deepgrove (NYMNP 7460). This area is a Scheduled Ancient Monument and includes features associated with the alum industry such as a steeping pit at NZ85761392 (NYMNP 7460.1) and cisterns at NZ85931328 (NYMNP 7460.2).

To the south of the quarrying area lie the remains of the Sandsend Alum House (NZ86921293 NYCC DNY478). This was located on the north side of Sandsend Beck and is now partly covered by a car park, with only the front wall surviving. This is constructed of rubble and pierced by two large entrances. A map of 1849 shows the alum works covering the whole area of the car park. The alum house operated from 1733 and processed raw alum liquor produced from the alum quarries to the north. The liquor was transported through wooden channels known as liquor troughs directly to the alum house. Alum production ceased in the late C19 when the nearby alum quarries closed. The site of the Sandsend Alum House is a Scheduled Ancient Monument.

The remains of the Kettleness alum works (NZ83301593, NYMNP 7452) occupy a promontory projecting into the North Sea, 7.5 kilometres northwest of Whitby. The works comprised quarries, an alum house plus associated processing and transport facilities. The works operated intermittently from 1727 to 1871 and was amongst the last alum works in the region to be opened and the last to close. Quarrying started at the northern end of the promontory and progressed southwards, creating by 1871 a north-facing working face up to 400 metres long and 50 metres deep, from which the grey alum shale was extracted. The first alum house lay on the foreshore in the south-east corner of Runswick Bay and was destroyed in a landslip in December 1829. A new alum house was constructed in 1830 within the quarry and the workers' housing was moved to the cliff top SW of the works (the present Kettleness hamlet). The alum house was demolished in 1875. Processing of the shale took place within the quarry, where calcining places, steeping pits, a liquor-trough tunnel, various conduits and gutters, and a number of buildings, tracks and spoil heaps all survive. The remains within the quarry area are a Scheduled Ancient Monument.

Figure 6.3 Kettleness alum works (author)

The remains of the Boulby Alum Quarries and associated features extend for about 3.5km along the coastline from NZ73292010 to NZ76221896. The workings originally extended further north, but substantial areas have been lost to coastal erosion. The Boulby alum works were started in 1672 and continued in production until 1871. There are two discrete areas of quarrying, the earliest being at the east end at Rockhole Hill where a large quarry scoop with three terraces survive. This was served by the alum house at Boulby (NZ76161903, NYMNP 4968). In the C18 the works thrived and in 1784 expanded westward with the opening of the New Works (NZ75181967, NYMNP 4968.42), situated in Loftus Parish. Surviving large mounds of shale are the remains of the calcining clamps and fragments of steeping pits protrude from the cliff face (NZ74032009, Tees 6024 and NZ73832009, Tees 6018). Extending west to east are the remains of a stone culvert which supported a wooden liquor trough. Some cisterns (NZ73452016, NYMNP 7329), reservoirs (NZ76051900 and NZ76021893, NYMNP 4968.2 and 4968.3), tunnels (NZ76151909, NYMNP 4968.11) and shafts (NZ76131905, NYMNP 4968.10) also survive as ruined structures. Excavations in the 1960s found several structures including three roomed buildings which are thought to be laboratories or a blacksmiths workshop. There has been a survey by RCHME and part of the Rockhope Hill complex is a Scheduled Ancient Monument.

The last major complex to be mentioned in the context of the alum industry is the alum house at Hummersea Bank (NZ72641997, Tees 6004). This was built c1800 and is recorded on the 1st edition Ordnance Survey sheet for 1857.This particular alum house is believed to have been the third which served the Boulby/Loftus alum quarries. The structural remains consist of a kiln-type structure, a row of 4 arches and what appears to be the housing for a large metal pan. These remains are visible in the cliff face at Hummersea, some 8m above sea level. The buildings would originally have been located on a platform, to avoid the tides. The structures have been engulfed by a landslip from the cliff above, hence the fragmentary remains in the cliff face. The HER also has records of C17 alum working sites at Saltburn (NZ66592120, Tees 4415 and NZ67452064, Tees 4416).

Table 6.12 Sites of the North Yorkshire alum industry in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ8513	Sandsend	NYMNP 7460, NYCC DNY478	22.1	Medium	High
NZ8315	Kettleness	NYMNP 7452	21.2/3	Medium	High
NZ7320-7618	Boulby	NYMNP 4968, 7329, Tees 6018, 6024	18.1	Medium	High
NZ7219	Hummersea Bank	Tees 6004	18.1	Medium	High
NZ6621	Saltburn	Tees 4415-6	15.4	Medium	High

Although the alum industry was in decline by the third quarter of the C19 something of a reprieve for the industrial communities of the area was provided by the discovery in 1850 of the Main Seam of the Cleveland Ironstone, often exposed at the same location as the beds of shale worked for alum. While nodules of ironstone had been quarried on the foreshore since the 1830s it was the mining of the Main Seam that laid the foundations of the ironstone industry. Maximum production was achieved in 1883 and the seam continued to be mined until the 1960s.This outcrops in the cliffs to the east of Staithes

and from Runswick Bay to Kettleness, and most evidence for ironstone mining and quarrying in this area is concentrated close to the cliff edge. To the west of Staithes evidence occurs rather more inland following the trend of the geology.

The evidence for the ironstone industry in Block 1 consists of mines and quarries, iron working locations and their associated infrastructure.

Table 6.13 Ironstone mines in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ65252160	Old Haven Ironstone Mine	Tees 3563	15.3	Low	Low
NZ68932181	Huntcliff Ironstone Mine	Tees 1120	16.1	High	Medium
NZ69572165	Huntcliff Ironstone Mine	Tees 5959	16.1	Low	Low
NZ71341946	Skinnigrove Ironstone Mine	Tees 1141	17.3	Low	Low
NZ70101968	Craggs Hall Mine	Tees 1170	17.1	Low	Low
NZ70851929	North Loftus Ironstone Mine	Tees 5975	17.1	Low	Low
NZ71231925	Loftus Ironstone Mine	Tees 1130	17.3	Low	Low
NZ70961917	Carlin Howe Ironstone Mine	Tees 1131	17.2	Low	Low
NZ73402000	Hummersea Bank Ironstone Mine Mine	Tees 1170	18.1	Low	Low
NZ75981941-76021808	Boulby Ironstone mine	Tees 1114-5	18.1	Low	Low
NZ78911879	Un-named mine	NYMNP 2777.01	18.1	Low	Low
NZ78441878	Un-named drift mine	NYMNP 2777.01006	18.1	Low	Low
NZ79291838	Un-named drift mine	NYMNP 2777.021	18.1	Low	Low
NZ79861775	Port Mulgrave Ironstone Mine	NYMNP 2777.03	20.1	Low	Low
NZ80481731	Un-named mine	NYMNP 2777.04	20.2	Low	Low
NZ80941667	Victoria/Albert Iron and Cement Works	NYMNP 7451.01	20.3	Medium	Medium
NZ82891559	Un-named mine	NYMNP 7453	21.2	Low	Low
NZ83261622	Foreshore quarrying	NYMNP 4576	21.2	Medium	High
NZ83491518	Kettleness Ironstone Mine	NYMNP 7332	21.3	Low	Low
NZ85791329	Sandsend Ironstone Mine	no HER record	22.1	Low	Low

The Huntcliff Ironstone Mine commenced operations in 1872 and closed in 1906. The surviving remains include an exhauster house for a Guibal ventilating machine, now a Scheduled Ancient Monument.

The Skinningrove Mine is recorded on the 1st edition of the Ordnance Survey of 1857 while the other four mines in the Skinningrove area do not appear until the 2nd edition of 1898. The North Loftus Mine is known to have been in production from 1874-1937 while the maximum period of production at the Loftus Mine was the period from 1865 to 1875. This is now the site of the Cleveland Ironstone Mining Museum.

The remains of the Victoria Iron and Cement Works lie on the cliffs above the north end of Runswick Bay. This mine first opened in 1856 but was destroyed by a landslide in 1858. It reopened in 1862, renamed as the Albert Works and continued in production until c.1865. Quarrying on the foreshore at Runswick Bay is said to dated to *circa* 1838-1842 and from 1854-1866.

The evidence for ironstone mining is confined to the eastern portion of this section of the coast, coinciding with the outcropping, near the surface or in the cliffs, of the Cleveland Ironstone. Evidence for the ironstone industry to the west consists of a number of records of C19 iron working sites in the Middlesborough and Redcar area, though most early features will have been lost in more recent developments. This group includes the Coatham Iron Works at NZ57412503 (Tees 5709) and the Lackenby Iron Works at NZ55652232 (Tees 5659).

Table 6.14 C19 iron working sites at Middlesborough, Redcar and Hartlepool

NGR	Name	HER	SMP	Importance	Risk
NZ57412503	Coatham Iron Works	Tees 5709	13.7	Low	Low
NZ55652232	Lackenby Iron Works	Tees 5659	n/a	Low	Low
NZ49992115	Middlesborough Ironworks	Tees 3861	n/a	Low	Low
NZ50702095	Victoria Works	Tees 4007	n/a	Low	Low
NZ50742050	Un-named site	Tees 3996	n/a	Low	Low
NZ50832136	Port Clarence	Tees 4183	n/a	Low	Low
NZ51042070	Tees Ironworks	Tees 3949	n/a	Low	Low
NZ51272064	Ormsby	Tees 3948	n/a	Low	Low
NZ51792070	Normanby Ironworks	Tees 3843	n/a	Low	Low
NZ52202065	Cargo Fleet Ironworks	Tees 5606	n/a	Low	Low
NZ52023374	Middleton Iron Works	Tees 4538	n/a	Low	Low
NZ51803456	Millbank Forge	Tees 4517	n/a	Low	Low

The infrastructure associated with the alum and ironstone industries consisted of tramways and rutways. The former were mainly a feature of the ironstone industry and linked the mines to the ironstone works and linked these to the harbours at Skinningrove and Port Mulgrave. The rutways are found on the foreshore and serviced both the alum and ironstone quarries. These consist of parallel grooves cut into the Redcar Mudstone at about the width of a cart axle (1.32m/4‘4“). They appear to have been designed to assist the movement of carts across the uneven surface of the mudstone and would have made it possible to continue working even when the surface was partially covered by the tide. The rutways appear to be mainly associated with the loading and unloading of vessels that used small docks (see below) or simply beached themselves at the base of the cliffs. These vessels brought in fuel and alkali for the alum works and transported ironstone ore from the foreshore quarries to the smelters.

It was noted above that the first phase of the Kettleness Alum Works was destroyed by a landslip in 1829 and this whole area has been highlighted by the SMP as being under threat of coastal erosion. The Victoria Ironworks experienced a similar fate in 1858 and the close proximity of most other sites on the section of the coast east of Saltburn to the present cliff edge implies a degree of vulnerability

to the effects of coastal erosion. It has also been pointed out that quarrying on the foreshore may have compromised the stability of the cliff line at other locations. Rising sea level also poses a threat to features on the foreshore through increased erosion and, ultimately, by restricting access.

Evidence for a number of other industrial processes is also to be found in Block 1 including quarrying for sandstone and the burning of limestone in limekilns, the kiln at NZ86111252 (NYCC DNY 11834) being a Grade II Listed Building. Immediately to the south of this limekiln lies the Roman Cement Mill (NYCC DNY 11689), which is also listed at Grade II. This cement works comprised a cement kiln and a water-powered grinding mill. It was in operation from 1811 until 1936.

Teesside is well known today for the chemical industry and the HER has records of four C19 chemical works.

Table 6.15 C19 Chemical works at Teesside

NGR	Name	HER	SMP	Importance	Risk
NZ50442026	Jones & Sadler Chemicals	Tees 3940	n/a	Low	Low
NZ50622138	Port Clarence Soda Works	Tees 4312	n/a	Low	Low
NZ50702148	Port Clarence Chlorine Works	Tees 4310	n/a	Low	Low
NZ53972181	Antonien Agro-chemical Works	Tees 5624	n/a	Low	Low

It is noticeable that the first three works in Table 6.14 lie close to the sites of C19 salt works (considered below) and a degree of continuity between these industries may be inferred.

The ironworks and chemical works of the Tees estuary all occupy very low lying locations and are vulnerable to even a modest rise in sea level. Although they lie outside the area covered by the Shoreline Management Plan they also lie within areas of high residential or industrial development and the policy adopted is likely to be one of 'Hold the Line'.

Ship building is also an industry historically located within the Teesmouth and Hartlepool areas and this will be dealt with in the section dealing with coastal/maritime landscapes.

A final feature to be mentioned in the context of the terrestrial industrial landscapes of Block 1 is the Saltburn to Whitby branch line (NYMNP 7455 and Tees 5884). Construction on this route, which was a branch of the North Eastern Railway's (NER) Darlington Section, was approved by act of parliament in 1866. Work began 1871 but was not completed until 1883 partly due to need to move the original route at Kettleness which was found to be too close to the cliff edge. The new route took the line through a tunnel. The cost on maintenance and the dwindling numbers of passengers led to the line being closed in 1958 and dismantled in in the early 1960s. Sections of the line can still be traced near the cliff top as can the entrances to the tunnel. Also, the station at Kettleness survives in use as an outdoor activities centre.

Figure 6.4 Kettleness station (author)

6.3 Coastal/maritime landscapes

6.3.1 Prehistory

The configuration of the coastline to the east of Saltburn, with its high cliffs, was not conducive in the prehistoric period to the development of economic strategies in which foraging on the foreshore played an important part. To the west the coastline is different and characterised by broad sandy beaches backed by dune systems and the wide expanse of salt marsh and mud flats of the Tees estuary.

The southern portion of Hartlepool Bay adjoining Carr House Sands is well known for the extensive submerged forest remains lying between MHWS and LAT and this site has been designated as an SSSI. Since the mid C19 archaeological finds in the form of stone tools, human remains and modified animal bones have also been recovered from these deposits (Tees 785, 786 and 1489) (Trechmann 1936 and 1947; Waughman *et al* 2005). These include cores, blades, flakes, microliths and a tranchet axe that can be dated to the Mesolithic period. The status of this material within the context of this project, whether it represents terrestrial or coastal/maritime activity needs to be considered.

The sequence of landscape development at this site can be artifacts as follows. An early Post Glacial mixed deciduous forest established itself on the boulder clay which overlay the Permian sandstones of the bedrock. With rises in the water table consequent upon rising sea level the character of this forest changed first to one of alder carr fen and freshwater peat bog and then, with continuing sea level rise, to a zone of salt marshes and creeks. Paleoenvironmental studies have established that the period down to about 6000 BP saw a more-or-less consistent rise in sea level whereas from then down until about 2000 BP the area experienced a series of low amplitude fluctuations, transgressive phases alternating with short term regressions (Waughman *et al* 2005, 123).

The Mesolithic finds are reported as having been recovered at the junction between the peat and the underlying boulder clay and, accordingly, represent activity taking place within the forest. The finds appear to be mainly 'industrial' in nature reflecting the collection of raw material and the manufacture of stone tools. The few diagnostic items all suggest a later Mesolithic date which is supported by a C14 date of 8700 ± 180 BP (BM-80)**[cal]** for a worked red deer antler (Waughman *et al* 2005, 8 and Appendix 3).

Neolithic and Bronze Age material has also been recovered from the Hartlepool Bay submerged forest deposits including flint artifacts (Tees 1454), and fish traps (Tees 3284). A burial (Tees 789) with a radiocarbon date of 4680 ± 60 BP (HV 5220) was recovered from a freshwater pool and it has been suggested that this might be a ritually deposited 'bog burial (Waughman *et al* 2005, 133).

> *While finds of prehistoric material have been recovered from the Hartlepool Bay submerged forest beds for over a century recent research has been conducted within the context of work on the sea defences which took place been 1990 and 2003. As a consequence of this work, patterns of sand movement and accumulation within the bay have changed leading to the burial of the submerged forest beds. However, this section of coast lies within SMP Unit 12.2 where the recommended policy is one of 'Hold the Line' in the face of continuing sea level rise. It is suggested that this could eventually have a negative impact on the inter-tidal peat deposits through an increase in exposure to wave action. This might have to be addressed by reducing the slope of the coastal defence barrier, in effect retreating the crest.*

While the beaches might offer few opportunities other than for beachcombing, tidal estuaries may be considered to be arenas of abundance from the forager's perspective and it is surprising that the HER has only a single record of a prehistoric site within the whole Teesmouth complex. This site is the ***midden*** within Cowpen Marsh (NZ50502460, Tees 1309). Middens are features of the archaeological record from the Mesolithic period onwards and the Cowpen Marsh site is in a classic situation for an early prehistoric midden. Finds from this site include worked flints and the bones of domesticated animals and probably imply a Neolithic of Early Bronze Age date (Stallibrass 1988 as reported by Waughman *et al* 2005, 137.

> *Cowpen Marsh benefits from multiple designations. It is an SSSI, and a Special Protection Area (SPA). It lies just outside the SMP area but adjoins SMP unit 13.4 to the east. From Table 6.003 it can be seen that the policy recommended for this unit is initially 'No Active Intervention' followed in the middle and long term by 'Managed Retreat' which may entail the construction of sea defences. From a nature conservation perspective rising water levels will have a positive effect but the effect on the archaeological deposits is likely to be negative.*

Table 6.16 Pre-Roman coastal/maritime sites in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ5232	Hartlepool Bay inter-tidal peats and submerged forest beds	Tees 785, 786 & 1489	12.2	High	High
NZ5232	Neolithic flint scatter site	Tees 14554	12.2	High	High
NZ5232	Neolithic fish trap	Tees 3284	12.2	n/a	n/a
NZ5232	Neolithic bog burial	Tees &89	12.2	n/a	n/a
NZ50502460	Cowpen Marsh midden	Tees 1309	n/a	High	High

6.3.2 The Roman Period

The Roman period is also represented by a number of isolated finds from the Hartlepool area. The main group of finds comes from close to the foreshore at the southern end of Carr House Sands (NZ52263117). These finds are described as coming from a 'midden' and testify to occupation in the vicinity. The finds include pottery (Tees 1305), brooches (Tees 660, 712, 801, 1289 and 1290) and coins (Tees 242, 725), one of the reign of Domitian (Swain 1986).

> *The Roman deposits at Carr House Sands occur in a similar situation to the submerged forest beds and are similarly vulnerable to the effects of wave action and coastal erosion.*

Other Roman finds in the area include two coin hoards (NZ51003199, Tees 788 and NZ52773358, Tees 689) and a double inhumation (NZ50803375, Tees 1201). This burial was accompanied by coarse pottery and a necklace of jet and glass beads dated to the late C4 or C5.

The Roman ***signal stations*** at Goldsborough and Huntcliff are the earliest substantial structures erected within the coastal zone with a specifically coastal/maritime focus. These structures were thought to be part of a series of signal stations along the coast from Flamborough Head to the mouth of the Tees. They date from the later C4 and were part of the Theodosian reorganization of the defences of the province and were thought to provide advanced warning of attack from the sea. However, the lack of evidence for a significant naval force in the area raises doubts about this and an alternative interpretation is that they were simply small fortlets.

The Goldsborough Roman Signal Station (NZ83521513, NYMNP 7444) is situated at 131m above sea level and 500m from the cliff edge with commanding views along the coast to NW and SE. It survives as a square mound about 40m across and up to 1.4m high with rounded corners and a roughly level top. Excavations at this site and others in the series have shown they were built to a common design with a central stone tower 30m high surrounded by a stone wall enclosing an area about of $90m^2$ beyond which was a 'V' shaped ditch. Excavations in 1918 recovered over 300 coins and it is on the basis of these that the site has been precisely dated to AD 368 to 395. Other finds included animal bones, offering an insight into the diet of the garrison, while a well in the enclosure contained three human skulls, one from a woman. Two skeletons were also found within the ruins of the tower and this has been taken to imply that the occupation of the site came to a violent end. The Goldsborough site is a Scheduled Ancient Monument.

The Huntcliff Signal Station (NZ68662198, Tees 16) lay about 16km to the west of Goldsborough. The site was first identified in *circa* 1862 and by the time it was excavated by Hornsby and Stanton in 1911-1912 only the southern half survived, the remainder having been lost to coastal erosion. It was presumably a similar structure to the one at Goldsborough. In 1953 it survived as a circular depression at the cliff edge but an aerial photograph taken in 1979 confirmed that it had been completely lost.

The excavations recovered 25 coins suggesting an occupation from AD 370 to 390. A well within the enclosure contained the remains of 14 adults and children, presumably the victims of a raid on the site, a similar experience to that noted at Goldsborough

(Hornsby and Stanton 1912).

The Huntcliff site, at about 90m OD, lay to the west of and below the summit of Warsett Hill. As there is no line of sight between Huntcliff and Goldsborough it is probable that another signal station must have lain inbetween. The most likely location for such a site, on topographical grounds, is the summit of Boulby Bank but this area has been much disturbed by alum quarrying and has been subject to landslips and no trace of a signal station has been reported.

Table 6.17 Roman coastal/maritime sites in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ52263117	Carr Sands midden	Tees 242, 660, 712, 725, 801, 1289, 1290 & 1305785, 786 & 1489	12.2	High	High
NZ51003199	West Hartlepool coin hoard	Tees 788	12.2	Low	Low
NZ52773358	Hartlepool Headland coin hoard	Tees 689	12.1		
NZ50803375	West Hartlepool double inhumation	Tees 1201	12.1	n/a	n/a
NZ83521513	Goldsborough Signal Station	NYMNP 7444	23.3	High	Low
NZ68662198	Huntcliff Signal Station	Tees 16	16.1	n/a	n/a

6.3.3 The Medieval Period

The principal port in Block 1 during the Middle Ages was at Hartlepool where the magnesian limestone promontory of the Headland provided a sheltered anchorage from the gales of the North Sea. Excavations have located the remains of a C12 quay and a dock was added during the reign of Edward II while, as noted above, these early harbour works were included within the town defences and protected by a boom chain slung between two towers.

The production of salt from sea water has been recorded from late prehistoric times and in parts of England constituted a major industry in the Roman and Medieval periods. The HER records three extensive complexes of ***salt works*** or ***salterns*** in the Teesmouth area, one at Coatham Marsh, another at Cowpen Marsh and Greatham Creek and the third at Sneaton Snook. From documentary sources it appears that most of these salterns were monastic, with Durham Priory having the major interest on the north bank of the Tees and the several Yorkshire monasteries developing sites on the south bank, though precisely which it is difficult to determine from the documents. The documents in question are mostly C12 cartularies recording grants of existing salterns to the monasteries and these sources can be treated as providing a *terminus ante quem* for the initiation of salt making on Teesside (Cranstone *pers.comm.*).

The production salt from sea water could be effected through a number of processes which varied between regions. On Teesside the preferred method was sleeching. In this method salt-encrusted surface deposits from the inter-tidal zone were leached in salt

water and the resulting salt-rich brine boiled in lead pans. Archaeologically, these activities are mainly represented by salt mounds, the debris from the production process. Occasionally, traces of the saltcote, the building in which the boiling took place, may survive.

The remains of the salterns at Coatham Marsh lie in a zone about 500m wide and extend from the outskirts of Redcar (NZ59162479) 2.7km to the SW (NZ56692339). The HER has records of 34 salt mounds in this area, 23 of which actually lie outside the study area. Most of these mounds have been plotted during the course of the APTE from which they can be seen to be of two types, compact but irregular mounds up to 100m across and elongated mounds which might be as much as 370m long and 60m wide, though the latter may have arisen from the coalescence of several irregular mounds. Although there is documentary evidence of salt working in this area during medieval times, sectioning of two mounds suggested that some might be natural features.

However, place name evidence lends strong support to the saltern interpretation, as the following list of names for mounds in this area indicates:

> Saltcoat Hill (Tees 1810), South Coat Hill (Tees 3774), White Hill (Tees 3772), Salt House Hill (Tees 3768), Great Souk Hill (Tees 3776) and Little Souk Coat Hill (Tees 3762).

The Cowpen Marsh and Greatham Creek salterns lie opposite Coatham Marsh on the far side of the estuary. Cowpen Marsh has already been referred to as the site of a prehistoric midden, and the C12 cartularies indicate that this was the main site of the Durham Priory salterns. The HER records 27 salterns in this area and although none were identified during the aerial photograph transcription exercise LIDAR coverage shows most of them to be compact irregular mounds similar to those recorded at Coatham Marsh, though rather smaller being on average about 50m across. Several can be described as 'horse-shoe' shaped, generally opening towards the NE (Tees 1718, 1719, 1724, 1725 and 1726). Mound 1713 was excavated in 1993 revealing three hearths and clay lined hollows for steeping silt scraped up from the foreshore (Nenk *et al* 1994, 198). Dating evidence was provided by a single sherd of C13 pottery. Tees 1714 is recorded as Cotehill.

> *The marsh benefits from multiple designations. It is an SSSI and a Special Protection Area (SPA). It lies just outside the SMP area but adjoins SMP unit 13.4 to the east. From Table 6.3 it can be seen that the policy recommended for this unit is initially 'No Active Intervention' followed in the middle and long term by 'Managed Retreat' which may entail the construction of sea defences. From a nature conservation perspective rising water levels will have a positive effect but the effect on the archaeological deposits is likely to be negative.*

The Seaton Snook salterns lie immediately inland from the North Gare Breakwater at Teesmouth. The HER records 20 mounds here, all but three of which were also recorded during the APTE. However, four additional small mounds were also noted on the aerial photographs and a complex of what appears to be contiguous mounds to the SW of the main group. From the aerial photographs and the LIDAR coverage these mounds seem to be mostly irregular in shape and between 50m and 100m across. Tees 1644 has similarities with the 'horse-shoe' shaped mounds at Cowpen Marsh. None of these have been excavated and no individual place names are recorded. However, their morphological similarity to the other Teesmouth salterns suggests that they also are

Medieval in date.

6.3.4 The early Post-Medieval period

The main features of this period are the series of C17 ***gun batteries*** sited on the Headland at Hartlepool during the course of the Civil War. Originally garrisoned for the King, Hartlepool was peacefully occupied by the Scots on behalf of the English Parliament from 1644 to 1658.

Table 6.18 C17 gun batteries at Hartlepool Headland

NGR	Name	HER	SMP	Importance	Risk
NZ52733436	North Battery	Tees 4753	11.3	High	Medium
NZ52803430	Low Soft Cliff Battery	Tees 4754	11.3	High	Medium
NZ53063408	High Soft Cliff/Gun Cove Battery	Tees 4755	11.3	High	Medium
NZ53103398	Cup and Saucer Battery	Tees 4756	11.3	High	Medium
NZ52873340	Crofton House/South Battery	Tees 4757	12.1	High	Medium

6.3.5 The Industrial Period

6.3.5.1 The chemical industry

Teesside is well known as the location of a number of major chemical industries, some of which were noted in the section dealing with terrestrial landscapes. The production of salt from sea water is a chemical process and the Medieval salterns can be regarded as marking an early phase in the Teesside chemical industry. A somewhat later phase is represented by the C19 saltworks, five of which are listed in the HER.

Table 6.19 C19 Saltworks on Teesside

NGR	Name	HER	SMP	Importance	Risk
NZ50002115	Cleveland Salt Works	Tees 3980	n/a	Low	High
NZ50492139	Clarence Salt Works	Tees 4308	n/a	Low	High
NZ50962166	Port Clarence Salt Works	Tees 4314	n/a	Low	High
NZ51032137	Port Clarence Salt Works	Tees 4313	n/a	Low	High
NZ52042090	Middlesborough Salt Works	Tees 3844	n/a	Low	High

A degree of continuity between salt making and the later chemical industry may be implied by the fact that Port Clarence was also the location of soda and chlorine works in the C19.

6.3.5.2 Shipbuilding

Another major industry on the NE coast was shipbuilding with the scale of operations ranging from the construction of fishing boats on any suitable strand to that of major merchant vessels and warships in the shipyards of the Tyne and Wear. Few traces of the

early stages of this industry survive in that they were either too ephemeral or have been superseded by later developments. An exception is provided by the 1998 discovery in Church Street, Whitby of a stone built dry dock dating from the mid C18.

Unlike the Rivers Tyne and Wear the River Tees below the transporter bridge is not especially noted for shipbuilding and the HER records only a single C19 shipyard at NZ50502095 (Tees 3934), The Cleveland Iron Ship Yard situated on the same site as the Victoria Ironworks. Two C19 shipyards are recorded in the HER at Hartlepool, the Punshon Denton Shipyard (NZ52083389, Tees 4530) and the Long Shipyard (NZ52123382, Tees 4531) while two C19 graving docks are recorded at NZ51173312 (Tees 4546 and 4547).

6.3.5.3 Harbour facilities

The rutways cut into the Redcar Mudstone of the foreshore have already been mentioned and it was noted that their function was to facilitate the use of carts in loading and unloading vessels at the foot of the cliffs. During the early stages of industrial development vessels would simply come in at high tide and then 'take the ground' as the tide fell, ready to sail off again on the next rising tide. In other cases natural breaks in the rock platform, or 'wykes', were used as small docks, some of which were modified.

The HERs have identified seven small docks of this type along the coast from Hummersea Bank to Brackenberry Wyke, each associated with a nearby alum or ironstone works. Several have been studied in detail.

The dock at Hole Wyke (NZ76211919, Tees 3596) lies just below the first alum house of the Boulby Alum Works. Production began here in the late C17 and continued until 1871. The dock may date from the period before 1784 when the works were extended to the north and west. The dock is a natural cleft cut into the wave cut platform of the Redcar Mudstone that appears to have been expanded by explosives. It slopes gently up from low water mark to the base of the cliffs. Sets of postholes, still retaining the stumps of posts, have been noted to either side of the dock. These may have served as seamarks to facilitate navigation into the dock or may be mooring posts pre-dating the development of the dock.

At the foot of the cliff below the Gallihowe Quarries of there are the remains of a second dock (NZ74342021, NYMNP 7327) associated with the Boulby Alum Works. The dock does not have any stonework defining its edges, but it is created by a broad cut in the bedrock of Redcar Mudstone. Four post holes were recorded in its eastern edge. The date of this dock is not known but lying below the westward extension of the Boulby Alum Works it is unlikely to be earlier than the late C18.

About 1km to the west of this site is 'The Old Gut' (NZ73402018, NYMNP 7328), a dock which also served the westward extension of the Boulby Alum Works. The eastern edge of the dock is lined with a number of substantially sized stones laid on end, forming a 'wall' some 52m long. As with the dock below Gallihowe, this dock is unlikely to have been needed before the C18 and it is believed to have functioned until c1820.

A new alum house (NZ 71 NW 29) was constructed at Hummersea c1800, and this was provided with its own dock, known as 'The New Gut' (NZ72722017, Tees 3684). This dock, which measures about 80m by 65m does not have any stone revetment and is

merely a broad cut in the Redcar Mudstone. Up to 6 post holes have been recorded at the edge of the New Gut.

The three further features of this kind lie to the east of Staithes Harbour. The first is recorded immediately east of the east pier below Hartle Loop (NZ78581896, NYMNP 2777.01004), while two others are recorded close together at Old Nab (NZ79391884, NYMNP 2777.02002 and NZ79421872, NYMNP 2777.02003).

Table 6.20 'Docks' associated with the North Yorkshire alum and ironstone industries

NGR	Name	HER	SMP	Importance	Risk
NZ76211919	Hole Wyke	Tees 3596	18.1	Medium	High
NZ74342021	Gallihowe	NYMNP 7327	18.1	Medium	High
NZ73402018	The Old Gut	NYMNP 7328	18.1	Medium	High
NZ72722017	The New Gut	Tees 3684	18.1	Medium	High
NZ78581896	Hartle Loop	NYMNP 2777.01004	20.1	Medium	High
NZ79391884	Old Nab 1	NYMNP 2777.02002	20.1	Medium	High
NZ79421872	Old Nab 2	NYMNP 2777.02003	20.1	Medium	High

Where it was not possible to modify a natural feature to create a small dock alternative arrangements had to be made for the unloading of incoming raw materials and the outward movement of the products of quarries and mines. In some cases simple timber ***staithes*** were erected.

Table 6.21 Timber staithes associated with the alum and ironstone industries in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ86931235	Sandsend	NYMNP 7462.01	22.3	Low	High
NZ86011318	Sandsend	NYMNP 4657	22.1	Low	High
NZ83131596	Kettleness	NYMNP 7318	22.1	Low	High
NZ80181723	Port Mulgrave	NYMNP 2777.04401	20.3	Low	High

Elsewhere, the needs of vessels were met by the construction of more substantial harbours protected by stone piers.

There was a West Pier at Whitby (NYCC DNY12112) in the C16 but this was rebuilt and lengthened between 1734 and 1814. It is listed at Grade II. The harbour at Port Mulgrave (NYMNP 2777.0312 and 7313) was built in the 1880s to serve the local ironstone mines. It was partly demolished in WW II as an anti-invasion measure and further damaged by storms in1953.

Staithes Harbour is provided with two C19 piers (NYMNP 2777.01007) while the single surviving west pier at Skinningrove (Tees 5982) is also a C19 structure. The 1857 OS 1st edition also records an east pier at Skinningrove (Tees 3565).

Figure 6.5 Skinningrove Harbour (author)

Table 6.22 Small harbours in Block 1

Name	HER	SMP	Importance	Risk
Whitby	NYCC DNY12112	22.3	High	High
Port Mulgrave	NYMNP 2777.0312	20.2	Low	High
Staithes	NYMNP 2777,01007	19.3	Low	High
Skinningrove	Tees 5982 & 3565	17.2	Low	High

As has already been noted Hartlepool was an important port in the Middle Ages but its main period of growth was in the C19 and it is from this period that most of the existing harbour facilities and docks date, the Victoria Dock (Tees 4522) opening in 1840.

> *All the works on the foreshore are, to varying degrees, under threat from coastal erosion and sea level rise. The more ephemeral features, such as the docks and their associated posthole arrangements and rutways are particularly vulnerable.*

6.3.5.4 Aids to Navigation and Safety at Sea

The lighthouse on the Heugh at Hartlepool (Tees 713), dating from 1847 and the lighthouse at the end of the West Pier (NYCC DNY 12113), Whitby dating from 1831, are both Grade II Listed Buildings. The 1875 Lifeboat House at Staithes (NZ78231895, NYMNP 1449) is also listed at Grade II.

Figure 6.6 The lifeboat house at Staithes (author)

6.3.5.5 Shipwrecks

The vessels that plied this section of the coast were an important, if mostly transitory, feature of the coastal/maritime landscape. There are numerous records of shipwrecks but most of these are in deep water and cannot be precisely located. However, a few lie above LAT. Shipwrecks are not always systematically recorded in the HERs so the following records are referenced with respect to the numbers in the NMR.

Figure 6.7 Wreck of an C18 colliery brig at Seaton Carew (Gary Green)

Most of these records are based on documentary sources and the physical remains of wrecks above LAT are rare, although a number have been recorded during the course of the APTE.

Table 6.23 Shipwrecks recorded above LAT in Block 1

NGR	Name of vessel	Date lost	NMR	SMP
NZ71432018	British steam trawler *Ruthin Castle*	1917	937920	17.3
NZ79331826	English ketch *Star of Bethlehem*	1890	938694	20.1
NZ81211571	Norwegian cargo vessel *Ellida*	1917	938414	22.1
NZ83131617	Un-named metal vessel	?	1385804	22.1
NZ83721591	Un-named metal vessel	?	1385806	22.1
NZ85661461	Swedish cargo vessel *Lucy*	1930	909219	22.1
NZ89291107	Swedish steamer	1915	909210	23.2
NZ89931068	English snow *Magdalene*	C18	984141	23.2
NZ63602286	*Southwick*	1860	1311295	15.1
NZ60802539	*Fleece*	1825	936611	14.2
NZ61322618	HMS *Fairplay*	1940	908828	14.3
NZ54212731	*Wallsend*	1903	908832	13.6
NZ54842783	*Stockton Packet*	?	908835	13.4
NZ52873448	*Rising Sun*	c1860	908867	11.3
NZ47513870	*Impel*	1875	94426	11.1
NZ47243901	*Newcastle*	1867	73179	11.1

It will be noted that the *Magdalene* is about 1km upstream from the mouth of the River Esk.

Table 6.24 Remains of shipwrecks recorded above LAT in Block 1

NGR	Location	Type/name	HER/NMR	SMP
NZ60222567	Coatham Pier	Unknown vessel	Tees 572	14.2
NZ60172550	Coatham Pier	Brig *Mowbray* 1834	Tees 1264	14.2
NZ52992956	Seaton Carew	C18 collier brig	NMR 1312495	13.1
NZ48213770	Crimdon Sands	Scattered timbers	Durham 8318	11.1
NZ53712721	North Gare Sands	10m by 4m hulk	NMR 1459341	13.4
NZ53782727	North Gare Sands	10m by 4m hulk	NMR 1459342	13.4
NZ53762755	North Gare Sands	10m by 4m hulk	NMR 1459343	13.4
NZ54072725	North Gare Sands	27m by 10m hulk	NMR 1459344	13.4
NZ53982756	North Gare Sands	17m by 10m hulk	NMR 1459346	13.4
NZ54192841	North Gare Breakwater	40m by 15m hulk	NMR 908179	13.3

In addition to these wrecks, remains of two vessels were found in the Church Street dry dock at Whitby during the 1998 excavation. One, a more or less complete clinker built coble was found lying on top of the dismantled timbers from a larger vessel which may have been a collier brig.

6.4. Military coastal defence

6.4.1 C18 and C19

As we have seen coastal defence has been an issue since Roman times and a large number of features identified in the coastal zone have arisen from the need to counter an attack or forestall an invasion. Although the great majority of the features of this kind date from the two World Wars, a number of sites identified in Block 1 date from the C18 and C19.

The threat of a French invasion and the activities of privateers such as John Paul Jones in the late C18 led to the re-establishment of the North Battery on Hartlepool Headland. A chart of 1782 marks the position of batteries at either end of the West Pier at Whitby, that at the landward end mounting five 18 pdr guns with five in reserve and a further five in a battery at the end of the pier (*Admirality Library Manuscripts Collection:* Vz 11/29).

The gun batteries at Hartlepool Headland were also renewed in the C19. The HER records batteries at Fairy Cove (NZ52733430, Tees 4758), The Heugh (NZ53173380, Tees 698) and the Lighthouse Battery (NZ53213379, Tees 4760). The latter two were established during the Crimean War and the Lighthouse Battery was also known as the Sebastapol Gun.

The Redcar Battery (NZ61252458, Tees 3588) is recorded as a C19 gun emplacement while a magazine is recorded 70m to SE on the 1898 6 inch OS map (Tees 4984). The area was the site of coastal defence features dating from both WWI and WWII.

Table 6.25 C18 and C19 gun batteries in Block 1

NGR	Location	HER	SMP	Importance	Risk
NZ52733436	North Battery, Hartlepool, C18	Tees 4753	11.3	High	Medium
NZ899117	West Pier, Whitby, 1782	*	23.3	High	Medium
NZ899116	West Pier, Whitby, 1782	*	23.3	Low	Medium
NZ52733430	Fairy Cove, Hartlepool, C19	Tees 4758	11.3	Medium	Medium
NZ53173380	The Heugh,, Hartlepool, C19	Tees 698	11.3	High	Medium
NZ53213379	Lighthouse, Hartlepool, C19	Tees 4760	12.1	Medium	Medium
NZ61252458	Redcar, 1898	Tees 3588	14.3	Medium	Medium
NZ45564279	South Gare, 1890	Tees 3562	13.6	High	High

* not recorded in the HER

A second C19 gun battery was sited towards the seaward of the South Gare Breakwater (Tees 3562) and this site has been identified by the APTE at NZ455642799. Aerial photographs taken between 1940 and 1952 reveal a complex group of remains of more than one period, the main features of which are three gun emplacements one of which is said to date from *circa* 1890.

6.4.2 World War I

Few WWI features survive and this is probably because many sites and installations were also occupied during WWII. An example of this situation is provided by the remains of the Royal Flying Corps airfield at Marske (NZ62102280, Tees 467) which lie to the NW of the more extensive but built over remains of the WWII airfield. A further example is provided by a group of WWI pillboxes recorded by the NMR as projecting from the retaining wall of the Redcar Promenade (NZ61302490, Monarch 611338). A WWII pillbox and a weapons pit are also recorded at this location.

Several C19 gun batteries also saw service during WWI. The South Gare Battery mounted two 4.7 inch guns, the Lighthouse Battery at Hartlepool a 6 inch gun and the Heugh Battery at Hartlepool two 6 inch guns. This latter site gained distinction on 16th December 1914 when it engaged three battle cruisers of the German High Seas Fleet then in the process of bombarding the town. An aerial photograph taken in July 1948 shows the Heugh Battery to consist of an oblong enclosure measuring 100m N-S by 46m E-W with emplacements for two guns and ranges of building along its west wall. However, this may record the WWII arrangements as the battery remained in commission until 1956. The Heugh Battery is a Scheduled Ancient Monument.

An important WWI feature on this section of coast is the sound mirror at Boulby Barns (NZ75361910, NYMNP 1445). This consists of a 'U' shaped concrete structure 4.5 metres high and forming a concave bowl in both the horizontal and vertical planes. In front of the structure are the remains of a trench, possibly where the listener would have sat. It was built in 1916 and was designed to give early warning of approaching enemy Zeppelins, other aircraft and attacks from ships threatening important industrial complexes in the NE. Whitby and Hartlepool had been a target of the German battle cruisers on the morning of 16th December 1914 and the Skinningrove Iron Works was bombed on numerous occasions. The Boulby Barns sound mirror was part of a chain of acoustic devices located on the NE coast extending from the Tyne to the Humber. The mirror is one of only four known surviving examples in the NE. It is a Scheduled Ancient Monument and a Grade II Listed Building. One other WWI feature of note in this area is the Seaton Carew Seaplane Station (NZ53252676, NMR 956723) of which a jetty and a slipway remain immediately to the east of the Hartlepool Power Station.

Two of the shipwrecks listed in Table 6.24 appear to be WWI casualties. The *Ruthin Castle* struck a mine and the *Ellida* was torpedoed, both in 1917.

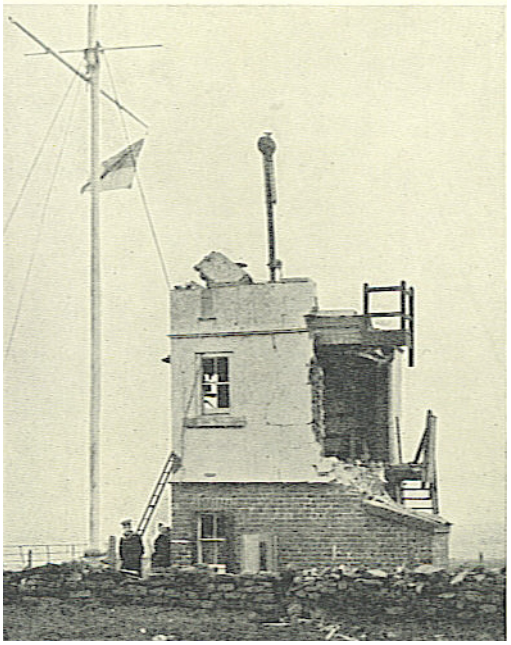

Figure 6.8 The coastguard station at Whitby after the German bombardment on 16th December 1914

6.4.3 World War II

The majority of coastal/maritime features in Block 1 date from WWII and the approach followed here is that set out in Chapter 5 of NERCZA. Major sites which survive whole or in part are described in detail with minor, ephemeral and destroyed sites being recorded in tabular form. The WWII military features in the coastal zone can be divided into two groups according to whether their role was mainly or to defend against bombardment, from the sea or from the air, or to confront a possible invasion, although the two categories are not mutually exclusive.

6.4.3.1 *Coastal defence batteries*

The coastal defence batteries were intended to respond to coastal bombardment and were the first line of defence in the event of an attempted landing. Eleven facilities of this kind have been identified in Block 1.

The only coastal defence battery recorded on the coast east of Saltburn is a brick and concrete structure (NZ71502010, NMR 1320424) to the east of Skinningrove Harbour and facing north out to sea. It has now been cleared but a photograph dating from 1993 shows that it consisted of a semi-circular gun emplacement with an oblong structure to the rear. There is no HER record for this site but photographs in 1993 show that was still extant then.

The Pasley Coastal Defence Battery is recorded at NZ57602540 (NMR 1459754, Tees 760). Details of this site have been transcribed from an aerial photograph from which it can be seen as an irregular five-sided enclosure measuring about 200m by 100m within which are a number of buildings. This battery is recorded as mounting one 9.2 inch gun. This site lies immediately NE of the Redcar Steel Works and LIDAR coverage suggests that elements of it may still be traceable on the ground, though a number features have

been removed.

The C19 century coastal defence battery on the South Gare Breakwater was brought back into commission during WWII when it is recorded as mounting two 6" guns (NMR 900075). The extensive and complex remains are difficult to interpret from the aerial photographs but in addition to the gun emplacements, include a number of military buildings, trackways and barbed wire fences

The South Gare Breakwater Battery provided cover for the mouth of the Tees. This was supported by a further battery for a 4 inch gun at Redcar Jetty (NZ55532567 NMR 1425096). The transcription of an aerial photograph enables a number of features in addition to the gun emplacement to be identified. These include three searchlight batteries, two command posts, two weapons pits and various other military buildings with track ways and barbed wire obstructions. This site now lies under the Redcar Steel Works.

A further gun battery is recorded overlooking North Gare Sands (NZ53502732, Tees 993). Details of this site are not available and it has been built over. However, its situation in relation to the mouth of the river is similar to the battery at Redcar Jetty and it may have fulfilled a similar role.

Further north, two 6 inch guns were mounted at Seaton Carew (NZ52293073, NMR 1467010) while both the Lighthouse and the Heugh Batteries at Hartlepool Headland mounted 6 inch guns. The APTE has recorded a further gun emplacement west of the Headland at NZ51293483 (NMR 1460807). This appears to consist of two 'horse-shoe' shaped earthworks each about 12m by 14m and facing towards the shore. A number of military buildings are also recorded on the site.

Table 6.26 WWII coastal defence batteries in Block 1

NGR	Name & calibre	HER	SMP	Importance	Risk
NZ71502010	Skinningrove, ?	NMR 1320424	17.2	Medium	High
NZ57602540	Pasley, 1 x 9.2 inch	Tees 760	13.7	High	High
NZ45564279	South Gare, 2 x 6 inch	Tees 3562	13.6	High	High
NZ55532567	Redcar Jetty, 1 x 4 inch	NMR 1425096	13.5	n/a	n/a
NZ53502732	North Gare Sands,?	Tees 993	13.4	n/a	n/a
NZ52293073	Seaton Carew, 2 x 6 inch	NMR 1467010	13.1	n/a	n/a
NZ53213379	The Heugh, 2 x 6 inch	Tees 698	11.3	High	Medium
NZ53173380	Lighthouse, 2 x 6 inch	Tees 4760	12.1	High	Medium
NZ51293483	?, 2 x 6 inch	NMR 1460807	11.2	n/a	n/a
NZ50603527	Palliser, 1 x 9.2 inch	NMR 1461762	11.2	n/a	n/a

The last feature of this type to be recorded in Block 1 is the Palliser Battery (NMR 1461762) situated in the western outskirts of Hartlepool (NZ50603527) and now built

over. This battery mounted a single 9.2 inch gun, the emplacement for which can be seen in an aerial photograph taken in 1940 along with an observation post and accommodation for the gun crews. The calibre of this weapon suggests that it was the northern equivalent of the Pasley Battery which covered the southern approaches to Teesmouth.

With memories of the consternation caused by the German East Coast raid of December 1914 Whitby was provided, in 1939, with a battery of two 6 inch guns at the east end of the Marine Parade (NZ89691147, NYMPN 58893), sited either side of the Captain Cook monument and surrounded by barbed wire. This appears to have been a temporary facility.

6.4.3.2 *Anti-aircraft batteries*

During WWII, once the likelihood of a sea borne invasion had passed by the end of 1941 aerial bombardment posed greatest threat. To combat this threat major installations and ports were provided with batteries of heavy anti-aircraft guns. Although no such features are recorded in the HER or NMR the APTE has identified two; an emplacement of four guns at Redcar (NZ62212372, NMR 1425107) and a further emplacement for four guns SW of Tees Dock (NZ 54532294, NMR 1459189). The photographs of the latter site show a number of associated facilities including a radar station, searchlight battery, a barrage balloon site and five weapons pits. Both batteries were serviced by small army camps. None of these features are extant.

6.4.3.3 *Searchlight emplacements*

Both anti-aircraft and coastal defence batteries were supported by search lights, either situated within the main battery complex or at separate, independent, locations. The APTE has recorded eight independently located searchlight batteries.

Table 6.27 Searchlight batteries in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ74261990	Boulby	NMR 1458656	18.1	Low	Low
NZ64072259	Marske	NMR 1459508	15.2	Low	Low
NZ54112278	Tees Dock	NMR1459189	n/a	Low	Low
NZ52953406	Hartlepool Headland	NMR 1460766	11.3	Low	Low
NZ48313664	Crimdon	NMR 1461570	11.1	Low	Low
NZ74101910	Street Houses	NYMNP 58753	18.1	Low	Low
NZ74311985	Gallihowe	NYMNP 58781	18.1	Low	Low
NZ83421455	Goldsborough	NYMNP 58826	21.3	Low	Low

6.4.3.4 *Bombing decoys*

As an alternative to shooting enemy aircraft down or forcing them to fly higher pilots could be misled by the use of decoys and a decoy for the Skinningrove Iron Works is recorded at NZ80201680 near High Lingrow (NYMNP 58102) (Dobinson 2000, 285).

Three bombing decoys are also recorded at Teesmouth at Bran Sands (NZ55902360, Tees 4365), at Seal Sands(NZ51302460, Tees 4366), both 'QL/QF' sites and the Greenabella 'QF' site (NZ51082580, Tees 4375). The latter site was identified during the APTE which noted the presence of a generator house and site shelter. These three sites appear as numbers 2(b), (c) and (d) in Dobinson's gazetteer which also lists seven other decoys in the area all of which lie outside the coastal zone.

A final bombing decoy in Block 1 listed by Dobinson as having been established at Hart (NZ494364) but this has not been recorded during the APTE.

6.4.3.5 *Beach defence batteries*

Once an enemy was on the beach the heavy calibre weapons of the coastal defence batteries were of little use and responsibility fell to the infantry to hold the beach and prevent an incursion inland. Commanders sought to accomplish this through the use of a range of strong points designed to accommodate different calibre weapons consisting of rifles, machine guns and anti-tank guns. They may have been simple earthworks, quickly thrown up, or more substantial structures of concrete.

The Hotchkiss 6 pdr MKII anti-tank gun was one of the main weapons used in beach defence, mounted either in beach defence batteries or specially designed pillboxes. The HER has records of two emplacements for 6 pdr Hotchkiss anti-tank guns covering Coatham Beach at Redcar. That nearest to the beach was sited at the junction between Majuba Road and the Promenade (NZ59202530, Tees 3589) while the second site lay 45m north of Warrenby Bridge (NZ58802509, Tees 3590). Both sites are currently undeveloped. To the east of Redcar the APTE had identified a beach defence battery at Redcar (NZ61262487, NMR 1458414) as a horse-shoe shaped earthwork 8.5m across with an opening to the east, while at Sandsend beach is the site of an emplacement for a 6 pdr Hotchkiss anti-tank gun (NZ86191280, NYMNP 58909).

There are also HER records for two beach defence batteries to the north of Teesmouth. These are at Seaton Snook (NZ53102881, Tees 3582) and to the SE of Seaton Carew (NZ52692910, Tees 3583). These were sited behind the dunes that lay at the back of Seaton Sands - a classic situation for the deployment of anti-tank weapons. The latter site has also been identified during the APTE as a rectangular pillbox, probably of Type 28, which was suitable for the Hotchkiss 6 pdr MKII.

The Durham HER records a gun battery at the head of the foreshore at Crimdon Dene (NZ48913658, Durham 8303). From its low lying situation it is likely that site was a beach defence battery. This structure was visited in September 1997 as part of the *Defence of Britain* project which has recorded the following field description.

> "Rectangular in nature the whole structure measures 3.9m x 7.1m. The height is indeterminable due to burial by sand. The entrance, despite entry not being possible, is clearly apparent that it would have been via the top of a concrete tower built onto the back of the structure. By looking through the very large gun emplacement embrasure it can be seen that there are two connected rooms inside. These

rooms correspond to a split in the roof levels. The walls of this gun emplacement are much thicker than encountered before being 1.1m. It must be stated that this thickness was measured at the gun embrasure and may not be representative of the whole structure. What can be seen of the building seems to be in a relatively good state of preservation, but there are signs of deterioration starting to show."

Table 6.28 WWII beach defence batteries in Block 1

NGR	Name	HER	SMP	Importance	Risk
NZ59702530	Majuba Rd., Redcar	Tees 3589	14.1	Medium	Medium
NZ58802509	Warreny Bdge, Redcar	Tees 3590	14.1	Medium	Medium
NZ61262487	East Redcar	NMR 1458414	14.3	Medium	Medium
NZ86191280	Sandsend	NMR 58909	22.2	Medium	High
NZ53102881	Seaton Snook	Tees 3582	13.2	Medium	High
NZ52692910	Seaton Carew	Tees 3583	13.2	Medium	High
NZ48913658	Crimdon Dene	Durham 8303	11.1	Medium	High

Beach defence batteries were a major component in the anti-invasion defences which formed an almost continuous barrier along the low lying coast from Saltburn to Seaton Carew. In addition further strong points were provided by concrete ***pillboxes*** tactically sited along lines of obstacles designed to impede the movement of tanks and other armoured fighting vehicles. The most common obstacle still encountered today are concrete ***anti-tank blocks*** although the APTE has also recorded a range of other barriers such as earthwork ditches and banks and ***minefields*** surrounded by strands of barbed wire. ***Weapons pits*** were more *ad hoc* facilities designed to meet local tactical needs such as the defence of a gun emplacement or the perimeter of an army camp. While many pillboxes and numerous anti-tank blocks survive most of the weapons pits and earthwork barriers have been levelled and the minefields cleared. For this reason no attempt is made to provide an exhaustive account of this material, although the full data are retained in files accompanying the APTE and tables are presented below of the main types recorded. However, using surviving features and APTE records, it is possible to document how parts of the system of anti-invasion defences functioned.

The best example in the Teesmouth area is provided by the Greatham Creek (NZ5025) Defence Area, recorded as number 33 in the study by William Foot (nd). This system consisted of a number of pillboxes and 'V-shaped' concrete ***section posts*** positioned so as to make maximum use of the system of drainage ditches and embankments that criss-cross the area. The hub of the defensive complex appears to have been at NZ59652532 where three section posts are located. Each of these is of the 'V-shaped' pattern, with the apex of the 'Vs' pointing in a different direction. That pointing SE has 18 loopholes, that pointing SW has 13 loopholes and that pointing NE eight loopholes. Records of this site exist in both the HER and the NMR although the details vary. The NMR has both a single record for all three (NMR 1315594) and individual records for each (SE post NMR 956728; SW post NMR 1420552 and NE post NMR 956729) while the HER has a single record (Tees 986). Moving east the next site in this group is another section post situated at NZ51232542 recorded as Tees 4648 and NMR 1418926. This site no longer survives so its precise form is unknown. Moving east again three further 'V-shaped' section posts survive along the north-south embankment overlooking Seal Sands. In each

case these features face east. The most northerly is situated at NZ51662533 and is recorded as NMR 1443947. The central site in the group is at NZ51642515 and is recorded as NMR 1443948. At both of these posts the embrasures are obscured by earth banks. The third post, recorded as NMR 1443950 lies at NZ51582486. Eighteen embrasures have been noted in the east and SE faces.

Moving clock-wise around the Greatham Creek Defence Area the next site encountered is a large rectangular pillbox at NZ50722532, situated on the top of an old railway embankment and recorded as NMR 1420554. This structure is about 12.5m square with ten embrasures in each face and with a central well of unknown function but possibly for a light anti-aircraft gun and therefore a variant of Type 27. About 50m to the north along the embankment lies a second, smaller pillbox, rectangular in shape and 5m by 3m (NZ50932501, NMR 1420553, Tees 985). This has small embrasures in the west and east faces and a large embrasure, probably for a machine gun, in the north face.

This is a very interesting group of features the significance of which can best be expressed by quoting William Foot's summary from the *Defence Areas* CD.

> "Although the reason for placing a defended locality here can be understood, the intensity of the defence indicated by the groups of section posts may appear surprising. It has to be realised, however, that what has survived here is a unique transformation into concrete of the infantry earthworks that would usually have been dug at other defended localities, which have long since been infilled. Provision was evidently made to defend the locality at company strength, with fields of fire criss-crossing the defended area. The unique nature of this defence area, and its importance, cannot be overstated." (Foot, W. *Report on Greatham Creek Defence (Defence Area 33)*, 7).

The marsh benefits from multiple designations. It is an SSSI, a Special Protection Area (SPA) and a Ramsar Site. It lies just outside the SMP area but adjoins SMP unit 13.4 to the east. From Table 6.003 it can be seen that the policy recommended for this unit is initially 'No Active Intervention' followed in the middle and long term by 'Managed Retreat' which may entail the construction of sea defences. From a nature conservation perspective rising water levels will have a positive effect but the effect on the archaeological deposits is likely to be negative.

A second, more typical, example is provided by the barrier of anti-tank blocks that ran for 1.7km along the dunes from North Gare Breakwater to Seaton Carew (NMR 1459371). This barrier was breached at intervals to allow access to-and-from the beach and punctuated by pillboxes (NZ 52872927, 52912934 and 53132893). To the south the barrier terminated at a group of three section posts and a Type 28 pillbox at the landward end of the North Gare Breakwater (NMR 1459382). Many of these anti-tank blocks survive, particularly towards the northern end of the barrier while others have been noted in the dunes to the south.

6.4.3.6 *Anti-glider obstacles*

Added to the threat of a sea borne invasion the possibility of an enemy arriving by air, either by parachute or the landing of troop carrying gliders, had to be considered. The latter concern was addressed by the construction of ***anti-glider obstacles*** at likely landing sites. The APTE has identified three types of obstacles in Block 1, none of which appear to have been recorded previously.

The simplest variety consisted of single or parallel groups of ditches and mounds upto150m long and 10m wide. When set in groups, ditches were about 100m apart.

Variations on this arrangement included ditches dug in discrete segments and ditches with a 'dog-leg' bend in the middle. Examples of this simple type of anti-glider obstacle have been recorded either side of the historic centre of Marske, (NZ64362171 NMR 1424706; NZ64092229 NMR 1458475 and NZ62922296 NMR 1424698) though some have been built over and others filled in. Two other groups of simple anti-glider obstacles have been located north of Teesmouth at North Gare Sands (NZ53582762 NMR 1459319) and Seaton Snook (NZ52332899 NMR 1459319). Both areas are undeveloped and the ditches can still be detected on the Lidar coverage.

A more complex variety of anti-glider obstruction consisted of an arrangement of intersecting ditches and mounds forming a regular lattice pattern, the lattice being about 150m square. These systems were quite extensive, the Bran Sands system (NZ56692429 NMR 1424699) being 2200m NE-SW by 600m while two lattice systems north of the Tees are 1000m E-W by 500m (Greythorpe, NZ52642745 and 1500 SW-NE by 730m (Greatham Marsh, NZ51712645).

A third system consisted of a combination of simple and lattice arrangements but also incorporated enhanced natural features. A good example being recorded at the north end of Seaton Snook (NZ52732846). All five systems north of the Tees have been recorded as NMR 1459319.

In addition to the ditches and mounds anti-glider obstacles were supplemented with other components designed to damage or ensnare incoming aircraft such as concrete blocks and poles supporting a mesh of wires as recorded in the Greatham Marsh lattice system (NMR 1421318).

The APTE recorded a large number of other features that can be classified as anti-invasion defences for which basic details are provided in the following tables.

6.4.3.7 *Radar stations*

Three radar stations have been identified. One was part of the Tees Port anti-aircraft battery noted above and another north of the Tees at Seaton Snook (NZ52232772). This latter site already has an HER record (Tees 4740) but the APTE record is more extensive (NMR 1459295). The third was at Goldsborough (NZ84091488, NYMNP 59111).

The APTE recorded a large number of other features for which basic details are provided in the following tables.

Table 6.29 Pill boxes in Block 1 identified on aerial photographs

OS Sheet	Eastings	Northings	NMR	HER	SMP Unit
NZ 43 NE	464	397	1461282	Durham	10.1
NZ 43 NE	4597	3984	1461284	Durham	10.1
NZ 43 NE	454	392	1461287	Durham	10.1
NZ 43 NE	4682	3941	1461296	Durham	10.1
NZ 43 NE	4706	3916	1461298	Durham	10.1
NZ 43 NE	471	387	1461303	Durham	10.1,11.1
NZ 43 NE	4776	3800	1461538	Durham	11.1
NZ 43 NE	4813	3723	1461555	Durham	11.1

NZ 43 NE	4828	3653	1461571	Durham	11.1
NZ 43 NE	478	369	1461592	Durham	11.1
NZ 43 NE	491	364	1461606	Tees	11.1
NZ 43 NE	496	360	1461614	Tees	11.1
NZ 43 NE	4977	3593	1461633	Tees	11.1
NZ 43 NE	4997	3569	1461724	Tees	11.2
NZ 43 NE	4795	3780	1461781	Durham	11.1
NZ 52 NE	5558	2742	900047	Tees	13.6,13.7
NZ 52 NE	5925	2537	1424479	Tees	14.1
NZ 52 NE	557	276	1424496	Tees	13.6
NZ 52 NE	558	267	1424501	Tees	13.5,13.7
NZ 52 NE	561	258	1424507	Tees	13.5
NZ 52 NE	557	282	1424516	Tees	13.6
NZ 52 NE	55861	26662	1424668	Tees	13.7
NZ 52 NE	5551	2737	1425093	Tees	13.6
NZ 52 NE	5566	2752	1459454	Tees	13.6
NZ 52 NE	557	268	1459510	Tees	13.5,13.7
NZ 52 NE	5572	2664	1459521	Tees	13.5
NZ 52 NE	5601	2633	1459543	Tees	13.7
NZ 52 NE	5640	2655	1459718	Tees	13.7
NZ 52 NE	564	256	1459746	Tees	13.7
NZ 52 NE	5677	2547	1459760	Tees	13.7
NZ 52 NE	57033	25169	1459765	Tees	13.7
NZ 52 NE	5950	2526	1459773	Tees	14.1
NZ 52 NE	5882	2516	1459774	Tees	13.7
NZ 52 NW	532	267	1421321	Tees	13.4
NZ 52 NW	51663	25331	1443947	Tees	13.4,13.5
NZ 52 NW	51637	25150	1443948	Tees	13.5
NZ 52 NW	5350	2810	1459360	Tees	13.3
NZ 52 NW	532	288	1459371	Tees	13.1,13.2,13.3
NZ 52 NW	538	283	1459382	Tees	13.2,13.3
NZ 52 SE	5831	2400	1424696	Tees	15.1
NZ 52 SE	578	247	1459784	Tees	13.7
NZ 52 SE	5900	2456	1459785	Tees	14.1
NZ 53 NW	5033	3555	1461760	Tees	11.2
NZ 53 SW	5227	3356	1460728	Tees	12.1
NZ 53 SW	5139	3487	1460810	Tees	11.2
NZ 62 SE	678	217	1424416	Tees	16.1
NZ 62 SE	663	218	1424426	Tees	15.3.15.4
NZ 62 SE	6565	2192	1424873	Tees	15.3
NZ 62 SE	6517	2224	1458455	Tees	15.3
NZ 62 SE	6533	2210	1458461	Tees	15.3
NZ 62 SE	6530	2217	1458462	Tees	15.3
NZ 62 SE	6573	2196	1458543	Tees	15.3
NZ 62 SE	659	219	1458544	Tees	15.3
NZ 62 SE	6533	2180	1458546	Tees	15.3
NZ 62 SE	672	215	1458563	Tees	16.1
NZ 62 SE	692	214	1458600	Tees	16.1

NZ 62 SE	686	219	1458605	Tees	16.1
NZ 62 SW	649	223	1424439	Tees	15.3
NZ 62 SW	639	228	1424454	Tees	15.3
NZ 62 SW	6371	2299	1425226	Tees	15.2
NZ 62 SW	6295	2283	1458474	Tees	15.1
NZ 62 SW	6483	2235	1458532	Tees	15.1
NZ 62 SW	6277	2350	1458534	Tees	15.1
NZ 72 SW	71796	20035	1424388	Tees	17.3
NZ 72 SW	704	205	1458645	Tees	16.1,17.1
NZ 81 SE	8594	1301	1453234	NYMNP	22.1
NZ 81 SE	8694	1232	1453241	NYCC	22.3
NZ 81 SE	8747	1180	1453248	NYCC	22.4
NZ 81 SE	8843	1156	1458579	NYCC	23.2
NZ 81 SE	8758	1208	1458584	NYCC	22.4

Table 6.30 Anti-tank obstacles in Block 1 identified on aerial photographs

OS Sheet	Eastings	Northings	NMR	HER	SMP Unit
NZ 43 NE	4813	3723	1461555	Durham	11.1
NZ 43 NE	486	367	1461572	Durham	11.1
NZ 43 NE	4886	3657	1461603	Durham	11.1
NZ 43 NE	494	361	1461609	Durham	11.1
NZ 43 NE	4986	3578	1461612	Durham	11.1,11.2
NZ 52 NE	5558	2742	900047	Tees	13.7
NZ 52 NE	555	271	1459509	Tees	13.5,13.6
NZ 52 NE	578	251	1459747	Tees	13.7
NZ 52 NW	532	267	1459282	Tees	13.4
NZ 52 NW	5371	2785	1459347	Tees	13.4
NZ 52 NW	5358	2817	1459350	Tees	13.3
NZ 52 NW	532	288	1459371	Tees	13.1,13.2,13.3
NZ 52 NW	538	283	1459382	Tees	13.2,13.3
NZ 53 NW	5036	3539	1461763	Tees	11.2
NZ 53 NW	5092	3508	1461765	Tees	11.2
NZ 53 SW	5211	3112	1460712	Tees	13.1
NZ 53 SW	5227	3356	1460728	Tees	12.1
NZ 53 SW	5315	3399	1460752	Tees	11.3
NZ 53 SW	5139	3487	1460810	Tees	11.2
NZ 62 NW	6072	2521	1458395	Tees	14.2
NZ 62 SE	6626	2180	1424616	Tees	15.3
NZ 62 SE	6620	2178	1424618	Tees	15.3
NZ 62 SE	6570	2200	1424620	Tees	15.3
NZ 62 SE	6687	2162	1424688	Tees	15.4
NZ 62 SE	6685	2160	1424692	Tees	15.4
NZ 62 SE	6696	2156	1424774	Tees	15.4
NZ 62 SW	6490	2225	1424623	Tees	15.3
NZ 62 SW	6461	2240	1424624	Tees	15.3
NZ 62 SW	6447	2248	1424625	Tees	15.3
NZ 62 SW	6358	2289	1424629	Tees	15.2

NZ 62 SW	6346	2298	1424631	Tees	15.1
NZ 62 SW	6283	2344	1424633	Tees	15.1
NZ 62 SW	6263	2357	1424634	Tees	15.1
NZ 62 SW	6210	2400	1424638	Tees	14.3
NZ 62 SW	6183	2412	1424639	Tees	14.3
NZ 62 SW	6153	2440	1424760	Tees	14.3
NZ 62 SW	6162	2432	1424761	Tees	14.3
NZ 62 SW	6195	2398	1424762	Tees	14.3
NZ 62 SW	6186	2408	1424763	Tees	14.3
NZ 62 SW	6208	2390	1424764	Tees	15.1
NZ 62 SW	6147	2473	1458416	Tees	14.3
NZ 62 SW	6123	2495	1458422	Tees	14.2
NZ 62 SW	630	232	1458487	Tees	15.1
NZ 62 SW	6333	2305	1458498	Tees	15.1
NZ 62 SW	6412	2267	1458509	Tees	15.2
NZ 62 SW	6473	2238	1458511	Tees	15.3
NZ 62 SW	6486	2232	1458521	Tees	15.3
NZ 71 NE	782	188	1424597	NYMNP	19.1,19.2
NZ 72 SW	7130	2010	1424598	Tees	17.2
NZ 72 SW	715	200	1424604	Tees	17.2,17.3
NZ 81 NW	814	155	1424596	NYMNP	22.1
NZ 81 SE	8710	1220	1424595	NYCC	22.3,22.4
NZ 81 SE	8850	1150	1424687	NYCC	23.1,23.2
NZ 81 SE	8607	1286	1453239	NYCC	22.1
NZ 81 SE	8754	1207	1458583	NYCC	22.4
NZ 81 SE	8817	1193	1458585	NYCC	23.1
NZ 81 SE	86231	12510	1458592	NYCC	22.2

Table 6.32 Barrage balloon moorings in Block 1 identified on aerial photographs

OS Sheet	Eastings	Northings	NMR	HER	SMP Unit
NZ 52 SW	543	228	1459189	Tees	13.5

Table 6.33 Air raid shelters in Block 1 identified on aerial photographs

OS Sheet	Eastings	Northings	NMR	HER	SMP Unit
NZ 43 NE	455	395	1461286	Durham	10.1
NZ 43 NE	454	392	1461287	Durham	10.1
NZ 43 NE	471	387	1461303	Durham	10.1,11.1
NZ 53 SW	5190	3347	1460726	Tees	12.1
NZ 53 SW	5306	3388	1460743	Tees	11.3
NZ 53 SW	5242	3428	1460796	Tees	11.3
NZ 62 SW	614	241	1458464	Tees	14.3