

4.9 PDZ 9 Saltwick Nab to Hundale Point

4.9.1 Policy Development Analysis

DESCRIPTION

Physical

The zone covers a length of some 23km. The coast is orientated generally along a north northwest to south southeast axis. There is a slight shoulder at Ness Point, just north of Robin Hood's Bay, the effective bite out of the coastline that is the bay itself, running again to a shoulder at Ravenscar and continuing down to the slightly more abrupt promontory of Hundale Point. Here the coast again changes orientation to fall away more sharply to the south, towards Scarborough. Within the zone the physical character may be described principally as three sections; from Saltwick Nab to Ness Point, Robin Hood's Bay and then Ravenscar through to Hundale Point.

In the first of these, the coast comprises steep cliffs above a generally wide rock platform foreshore; although this diminishes to become a narrower boulder strewn fringe to the coast south of the Whitby Lighthouse, re-emerging at Oakham Beck and continuing down to the shoulder of Ness Point. This change reflects changes in the underlying geology and in the detailed development of the coastal shape and overall orientation. Only at Saltwick is there a narrow sand beach to the toe of the cliff, indicating the potential for sand movement along the frontage and more probably the potential interchange between the shoreline and the sandy seabed in the nearshore zone. To the crest of the cliff the hinterland is a relatively flat plateau, cut by small stream valleys which overflow the cliffs as falls, rather than cutting deep gorges. Land use is typically agricultural with no significant settlements close to the coast. Only at Saltwick is there a caravan park approaching the cliff edge but even here the site is slightly set back. At Whitestone Point are the old Whitby Fog Station and Whitby High Light Lighthouse. Both these structures are close to the edge of the cliff, and monitoring of cliff erosion and potential land movement has recently been started by British Geological Survey (BGS) as part of the Coastal Geoscience and Global Change Programme.

Robin Hood's Bay does not really exhibit the coastal process driven attributes of many of the other bays such as seen further north at the Tees or Whitby, or further south at Scarborough or Filey. The bay is almost as if the open coast has just been set back. Although Ness Point and Ravenscar clearly form the limits within which this set back has occurred, they do not in any real sense control the shape of the overall bay between. The definition of the bay is, therefore, primarily determined by the differential hardness of the coastal face. As might then be expected there is little in terms of beach sediments, although very locally there are small sandy beaches at the toe of the cliff. Predominantly the foreshore comprises exposed rock scar. At the northern end the coast comprises a steep but sloped scree covered cliff face down to the rock platform. At the abrupt northern corner of the bay a more nearly vertical cliff face is exposed reducing in height towards the south and overlain with glacial till; above which is the upper village of Robin Hood's Bay. As the vertical toe cliff reduces in height, so the till behind has, through past slope failure, formed a steep but well vegetated series of terraces. The road to the lower part of the village runs close to the crest over this section and a rock revetment has recently been constructed along the toe of the lower cliff.

The densely developed lower village is built on shoulders of land to either side of the Kings Beck valley; the easterly, seaward, shoulder is protected at the coast by a high concrete wall, running through to the slipway at the southern end of the village. The westerly, inland, area of the village is constructed at the base of a sloping till slope, rising to high cliffs to the rear. Here, protection has been provided directly to the Quarterdeck, or the southern-most nose of the village; forming a slight promontory to the coastal shape, and, by a recently constructed rock revetment, stabilising the till slope further to the south.

The steep till cut slopes continue to the south, with the basal vertical rock cliff re-emerging at Boggle Hole. Here the Mill Beck cuts a gorge through till and rock to emerge as a steep-sided heavily wooded valley at the coast. There are properties set back within this valley.

The near vertical toe cliff, with the upper sloped till deposits continue along the face of the bay through to the topographically complex headland of Ravenscar. Settlement is limited to small clusters or individual properties, such as Stoupe Bank Farm and Stoupebrow Cottage Farm on the southern shoulder of the Stoupe Beck valley and the old Alum works at Low Peak. The village of Ravenscar and the Ravenscar Hotel are situated on the high headland of Ravenscar.

The coast to the south of Ravenscar is typified by a lower rock cliff with a width of slumped, terraced

and well vegetated slope to a higher cliff behind. This complex coastal slope consolidates to a more vertical cliff at Heyburn Wyke and along the coast south to the lower cliffs of Hundale Point at the southern limit of the zone. The only settlements, in this southern section, are set quite well back from the cliff and the immediate hinterland is principally agricultural. Over the whole of this section, there is a rock strewn foreshore over a narrow width of rock outcrop, with the nearshore area falling steeply away to deeper water.

Environment

The majority of the coastline including the whole length of Robin Hood's Bay is designated SSSI. The coast from just south of Robin Hood's Bay Village to just north of Hundale Point is designated as a SAC. The whole section of coast falls within the jurisdiction of the National Park and is part of the Heritage Coast. The coast is therefore essentially important for its natural character, its ecology and most especially for its geological significance. In addition to the broader designations are the specific features defined by GCR sites of which there are seven along this part of the coast. The National Trust own a considerable area of the coast at Saltwick Nab, to the north of Robin Hood's Bay and much of the coast from Ravenscar through to Hundale Point.

The Cleveland Way coastal path runs the whole length of this section of the coast and Robin Hood's Bay is the western termination of the east to west Coast to Coast route from the Cumbria coast.

In this overall natural context is the village of Robin Hood's Bay. Its character and cultural heritage form an important aspect of the coast, important both to the tourist industry of the whole regional and as a vital and sustainable coastal community. An additional part of this heritage and culture is the archaeology reflected in the Palaeontological interests but also in the more recent mining interests, such as found in the scheduled monument at the Low Peak Alum works.

KEY PRINCIPLES

- To contribute to sustainable development and support and integrated approach to land use planning.
- To avoid damage to and enhance the natural heritage.
- To support the cultural heritage.
- To minimise reliance on defence.

KEY OBJECTIVES (a full list of objectives for this zone is presented in Appendix E)

- To sustain the community of Robin Hood's Bay.
- To advise on possible timing of loss to local archaeological features.

PHYSICAL CHARACTERISTICS

Water levels

MLWS	MHWS	HAT	1:10yr	1:20yr	1:50yr	1:100yr	1:200yr
-2.20	2.60	3.10	3.47	3.6	3.68	3.8	3.88

Determined at Whitby. Levels are to Ordnance Datum Newlyn. Chart Datum is approximately 3.0m below Ordnance Datum. Source (tidal levels): Admiralty Tide Tables (2005) for main and secondary ports, with other values interpolated between. Source (extreme water levels): Whitby Coastal Strategy, Sandsend to Abbey Cliff. HR Wallingford (2002)

Wave climate

Return Period (1:X years)	Wave Height Hs (m)*
0.1	3.71
1	4.79
10	5.79
100	6.73
200	7.39
500	7.81

* Determined at 8m OD contour at Whitby.

Source: Whitby Coastal Strategy, Sandsend to Abbey Cliff. HR Wallingford (2002)

Baseline Erosion Rates

Saltwick Nab	0.7m per year
Northern Coast	0.1m per year
North Cheek	0.1m per year
Robin Hood's Bay Village	0.3m per year
Robin Hood's Bay	0.3m per year
Ravenscar	0.2m per year
Beast Cliff	0.1m per year
North of Hundale Point	0.1m per year

All the above rates are based on existing evidence and are likely to increase with sea level rise. A factor of 2.5 has been used to allow for this over 100 years. Where defences exist it is generally assumed that if they fail erosion rates would initially be greater, subject to other control features in the area.

Evolutionary Trend

Existing Processes:

The shape of the coast is held by its geology with the positions of the various bays and headlands determined by their differential hardness. Only significantly within Robin Hood's Bay are there major areas of glacial till exposed at the toe of coast and even here their erosion is constrained by the harder rock foreshore or by the basal harder rock cliff. While it is primarily the coastal exposure and wave exposure which is driving the slow retreat of the frontage, there is little overall geomorphological coastal processes limiting or shaping the long shore plan evolution. This may be seen in the very sharp changes in plan shape, as seen between straight sections of scree covered cliff to the north of Robin Hood's Bay and the abrupt change in orientation and different character in the cliff running south along the village frontage. In effect, the bay is open to the dominant wave direction such that the main wave energy runs straight along the northern cliff face, removing little of the scree, and impacts almost directly on to the face of the village frontage. Clearly in elevation, or sectional profile, of the cliff line, geomorphological influences are significant.

Far more locally, within Robin Hood's Bay there is some geomorphological control influencing the shoreline. To the southern end, the Ravenscar Headland reorientates the coast such that any potential net drift to the shore is quite possibly from east to west. The section of coast between the

area of the village to the north and Ravenscar to the south is generally in net alignment with wave action, and would with greater actual drift of sediment along the coast as a whole, act as a sink. In fact there are intermittent sections of sand above the rock platform and local sections where slightly harder (less erodable) sections of the frontage allow the formation of very shallow bays.

There is believed to be movement of sediment over the nearshore zone, with a net trend of sediment movement to the south. There is little evidence of significant sediment transport along the actual shoreline, although clearly there is the potential. The small areas of highly intermittent sand beach indicate this capacity to move material and for material to be retained by local shoreline features.

The overall consequence of this is that, to a large degree each section of coast may be seen as being quite independent in terms of coastal processes, although influenced by the relative hardness of adjacent sections.

The whole coast is retreating but, even with the continuing differential rates of erosion, over the period of the SMP, the significance in influence between sections of the coast will not change. It is, therefore, not the situation that allowing sections of the coast to retreat will tend to establish a more naturally stable plan shape.

Unconstrained:

In the absence of the main man-made control features the coast would continue to retreat. The only significant man-made works are at Robin Hood's Bay and here they are really only acting to reduce the rate of erosion of the toe of the cliff, acting to stabilise the upper slopes. If they were not present the coast line would continue to erode at the toe, destabilising the coastal slope above, with major landslips and retreat of the crest of the slope and, in the case of Robin Hood's Bay Village, loss initially of the access and progressive loss of properties and much of the lower village.

MANAGEMENT

Current Policy

SMP1

The SMP 1 defines the coast in 14 management units, the policies for these are:

MU13B, MU14, MU15, MU17A and B, MU18A and B, MU19A, B, C and D.

MU16A, B and C

Robin Hood's Bay – Coast Protection and Cliff Stability

The study examines the specific problems associated with the village and makes recommendation which have subsequently been carried out.

Policy

Do Nothing

Hold the Line

Hold the Line

Baseline scenarios for the zone.

No Active Intervention (Scenario 1):

Over much of the coastline this scenario also describes the present management policy. Only at Robin Hood's Bay are there defences. Under this scenario all sections of the coast would be allowed to erode, as at present or as defences fail.

Over the northern section of the zone there would be expected losses at Saltwick Nab in terms of the Saltwick Alum works scheduled monument and in terms of loss of land to the Caravan Park. These losses might be expected to occur between 50 to 100 years time. Works to protect either feature would be quite extensive. Further south the Whitby Fog Signal buildings are at risk as is the High Light. As above these would not be expected to be threatened in the next fifty years. This area is being monitored. There are no other specific assets at risk until Robin Hood's Bay Village, and under this scenario the coast will continue to slowly erode.

To the south of Robin Hood's Bay village there would potentially be loss of the properties at Stoupe Bank farm but only to the end of the SMP period, and at Ravenscar upper cliff instability may threaten buildings seaward of the Hotel. South of here no specific assets are likely to be lost. There would be loss in terms of heritage on the northern flanks of Ravenscar; to the Jet Holes and the Alum Works, but even here this is likely to be later in the 100 years.

It is to Robin Hood's Bay village that the principal threat exists. Under this scenario, in the area of the Quarterdeck, defences might deteriorate to such an extent over the next 100 years that the slope is destabilised and significant number of properties would then be lost. Potentially, earlier, the high concrete wall would reach the end of its functional life. Its failure would again result in significant loss to the lower part of the village, possibly even resulting in abandonment of this section of the village. The slope between lower and upper sections of the village is protected at its toe with a revetment; this is likely to remain functional over much of the SMP period so that, even under this scenario, this would allow the instability of the slope beneath the main access route to the lower village to be managed. The small gap in defence between the wall and the revetment is protected by the slight extension of the revetment and is not seen as causing any problems. There would be some loss to properties in the short to medium term in the area of Mount Pleasant through to Mount Pleasant North, but this would be relatively slow with no major slippage expected.

<u>MDSF Evaluation</u>		<i>PValue Damages</i>
<i>Erosion</i>	Loss of potentially 150 commercial and residential properties, the majority in the 2055 to 2105	£1,960,000
<i>Flooding</i>	Potential flooding to commercial interests in village	£1768,000
<i>Other information</i>	Study suggests potential losses of the order of £20M due to probability of landslides above presently defended sections of Robin Hoods Bay Village	
<u>Assessment of key</u>	<ul style="list-style-type: none"> • Avoids damage to and allows natural evolution of the coast. 	

<u>objectives</u>	<ul style="list-style-type: none"> • Fails to fully support the cultural heritage. • Sustains only in part the community of Robin Hood's Bay. • Minimises reliance on defence
<p>Current Management (Scenario 2): Under the current policy for defence little would change from the above apart from improvement to defences at Robin Hood's Bay Village. The works to the quarterdeck may need to be enhanced in the future but this could be carried out effectively. The concrete wall continues to suffer abrasion but can be repaired or strengthened. The value of this would have to be examined in detail at the local level but in principle this defence does act to provide an important element of defence to the village. The revetment to the north of the village may require some improvement over time but again this should be manageable. As such the defence of the village is seen as sustainable.</p> <p>The value of further extending the defence to cover the northern end of the upper village is not proposed under this scenario.</p>	
<i>PValue Damages</i>	
<u>MDSF Evaluation</u>	
<i>Erosion</i>	9 properties lost
<i>Flooding</i>	Not assessed under this scenario
<i>£260,419</i>	
<u>Other information</u>	
<u>Assessment of Key objectives</u>	<ul style="list-style-type: none"> • Generally avoids further damage to the natural heritage. • Generally supports the cultural heritage but fails to protect key features in the long term at Saltwick Nab, at Whitby High Light Lighthouse and to the north of Ravenscar, all again tending to be in the longer term. • Generally sustains the community of Robin Hood's Bay Village. • No further defence proposed but still reliant on current defences.

DISCUSSION AND DETAILED POLICY DEVELOPMENT

The key difference in scenarios is the question of defence to the Village of Robin Hood's Bay. In the recent studies there has been shown to be significant economic benefit in maintaining these defences and continuing to do so is not seen as being unsustainable. Continuing with the defence will require works to be done in the future but in comparison with the benefits associated with this, such works are not likely to become disproportionate. As such, present management policy is not so much transferring a problem on to future generations as maintaining an asset, a vital coastal community, which will add value for future generations.

While it is accepted that the fundamental objective applying to this section of the coast is to allow natural processes to continue, the equally important specific objective relevant to this section is to sustain existing coastal communities; this is felt to override the broader objective in this case. Having argued this, however, there are concerns that defence in this area should be based on the aim to sustain the village and its function as a single entity. This is what the existing defences aim to achieve. Therefore, further extension of defences to address the need of specific properties rather than The Village, would not be felt to be appropriate to the area in the context of the broader objective. There are properties to the northern end of the village which are likely to be lost during the period of the SMP. Both in terms of economics, but more fundamentally in terms of reducing the impact of defence on the natural coastline, these properties would not specifically be protected.

The same argument would apply over the whole of this section of the coastline. Unless there were significant regional or higher level benefits in intervening on the coast, the coast should be allowed to develop naturally. On the information provided to the SMP there are no other areas of this section of the coast which should be protected. This principle clearly needs to be applied with appropriate regard to scale of any proposed intervention. At a the very local scale, for example, in a specific location such as Boggle Hole, local works to maintain access or reduce flooding to the Youth Hostel, although most unlikely to be funded as Coast Protection, would not, it is felt, to be constrained by a policy of No Active Intervention for this section of Robin Hood's Bay.

MANAGEMENT AREAS

The intent of management is to maintain a natural coastline, with the specific need to protect Robin Hoods Bay Village as an exception within the underlying intent. As such the whole zone is seen as being one management area. Furthermore, within this context the policy unit for the village is considered as being perched within a single policy unit for the whole zone, rather than being as a unit dividing the coast.

A policy statement or summary is presented for the management area in the following sheets.

4.9.2 MANAGEMENT AREA POLICY STATEMENT (MA25)

Location reference:	Saltwick Nab to Hundale Point
Management Area reference:	MA25
Policy Development Zone:	9

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN: The overall management intent for the area is, in accordance with the strong environmental and natural heritage objectives for this section of the coast, to recommend no active intervention. At a more local scale the objectives set for the area have highlighted the importance of the coastal communities and, therefore, the SMP recommends a hold the line policy for the Village of Robin Hood's Bay, but only to the extent that it is the village rather than individual properties that is being sustained. At a far more local scale, it is recognised that private works may be proposed along the shore. Such works are unlikely to have any major strategic impact on the management of the coast but would have to be viewed in the contexts of the overall policy for no active intervention.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day:	Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.
Medium term	As above
Long-term	As above

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025.	2055	2105	Comment
25.1	Saltwick to Hundale	NAI	NAI	NAI	
25.2	Village of Robin Hood's Bay	HTL	HTL	HTL	this policy is a local exception to the general policy for this larger section of the coast.
Key: HTL - Hold the line, A - Advance the line, R - Retreat or Realignment, NAI – No active intervention					

CHANGES FROM PRESENT MANAGEMENT

No fundamental change in policy beyond the possible change in overall intent that this area should be seen as principally an area of no active intervention, within which there is a policy for holding the line of protection to the village of Robin Hoods Bay.

IMPLICATION WITH RESPECT OF BUILT ENVIRONMENT

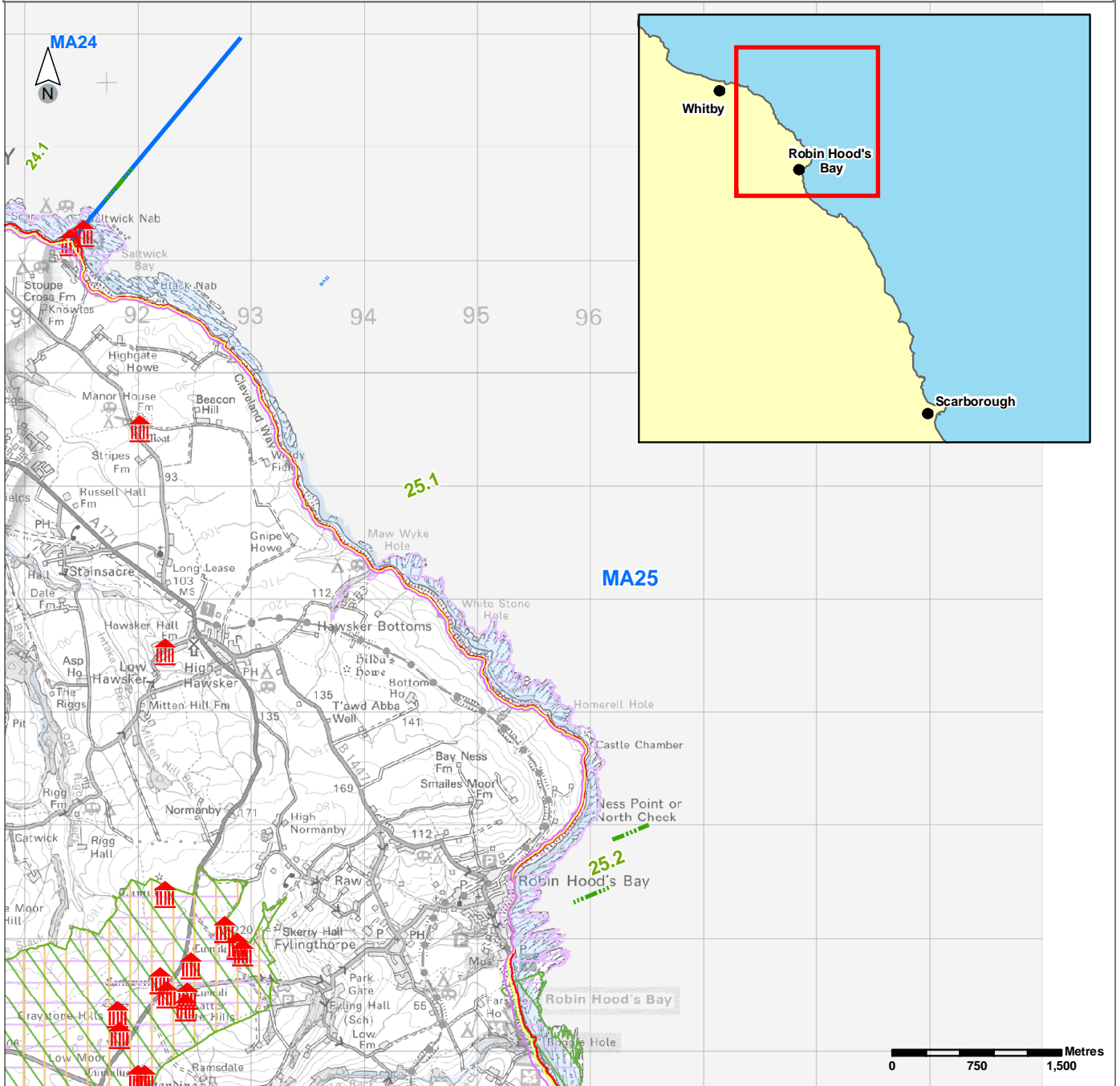
Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	1,005	1,095	2,528	3,728
	Preferred Plan Damages £k PV	147	81	33	260
	Benefits £k PV	858	1,014	2,495	3,468
	Costs of Implementing plan £k PV	150	20	10	180
Costs based on strategy. Description of damage and benefits under preferred plan: <ul style="list-style-type: none"> The plan provides protection to the village of Robin Hoods Bay but there would be loss of property to the northern end of the village. 					
Heritage	This section of coast has significant archaeological interests which are likely to be at risk towards the end of the SMP2 period. The features are not considered individually to be of specific value that would warrant protection.				
Amenity	The amenity value of the village is maintained. The value of the coast as an important natural heritage feature is maintained.				

POTENTIAL WATER FRAMEWORK DIRECTIVE ISSUES (see Appendix F for details)

Impact on water quality	No
Impact of geomorphology and hydrodynamics	No

* Note: Predicted shoreline mapping is based on a combination of monitoring data, analysis of historical maps and geomorphological assessment with allowance for sea level rise. Due to inherent uncertainties in predicting future change these predictions are necessarily indicative. For use beyond the purpose of the shoreline management plan reference should be made to the baseline data.

**River Tyne to Flamborough Head Shoreline Management Plan
Management Area MA25a
Policy Units 25.1-25.2**



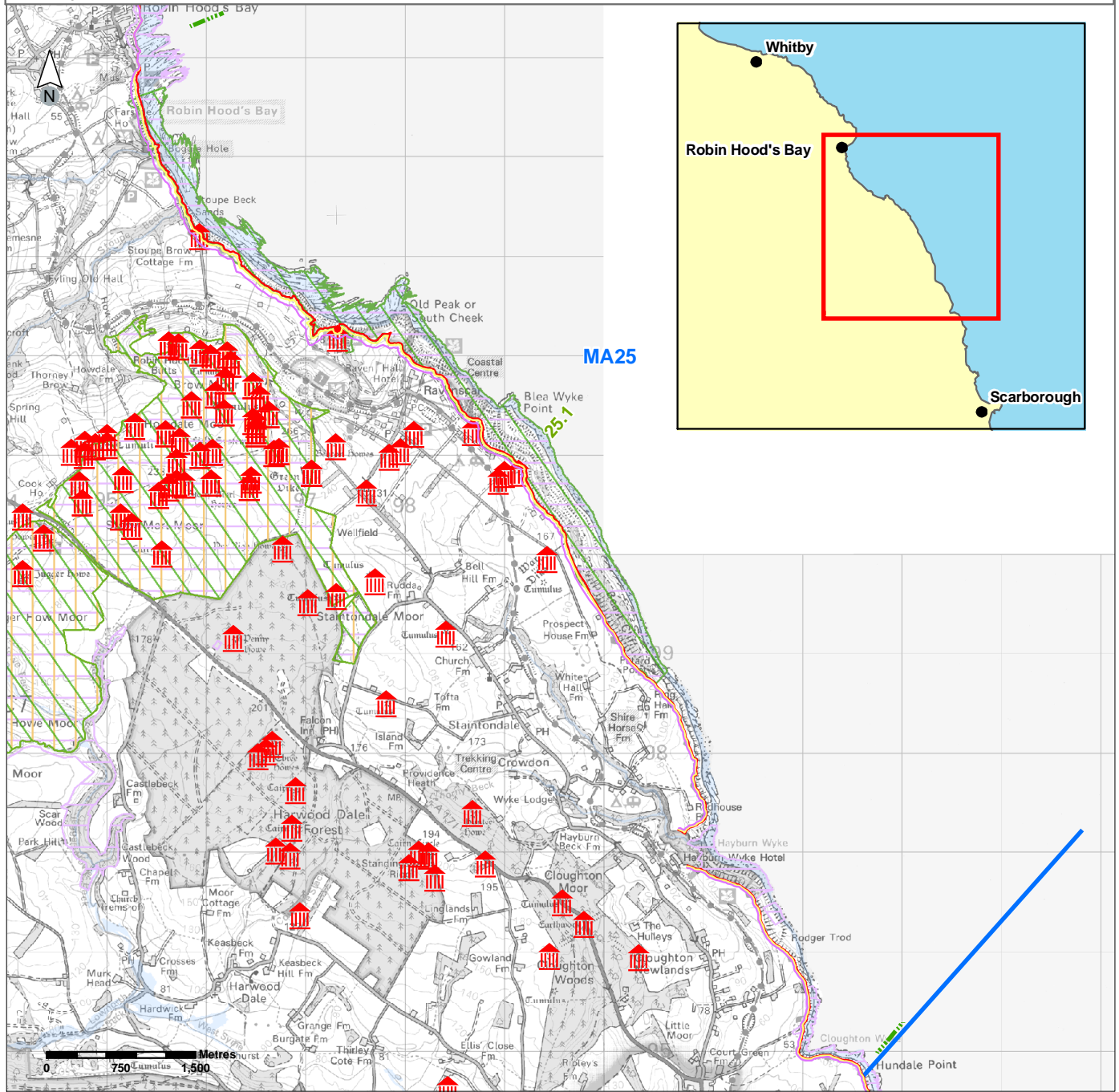
POLICY (FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT)

From Present Day:	Medium - Term:	Long - Term:
Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.	Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.	Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.

Key:	Predicted Shoreline Mapping*	Management Areas	SPA
	Preferred Plan	Policy Units	RAMSAR
	20 Years	NNR	SAC
	50 Years	SSSI	Scheduled Ancient Monuments
	100 Years	EA Flood Zone - Sept 05	



**River Tyne to Flamborough Head Shoreline Management Plan
Management Area MA25b
Policy Units 25.1**



POLICY (FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT)

From Present Day:	Medium - Term:	Long - Term:
Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.	Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.	Hold the existing line of defence to the Village of Robin Hoods Bay. With No active intervention elsewhere.

Key: Predicted Shoreline Mapping*

- Preferred Plan
- 20 Years
- 50 Years
- 100 Years

- Management Areas
- Policy Units
- NNR
- SSSI
- EA Flood Zone - Sept 05

- SPA
- RAMSAR
- SAC
- Scheduled Ancient Monuments



ENVIRONMENTAL ASSESSMENT – PREFERRED PLAN

MANAGEMENT AREA: MA25			
	Description of Designation	Effect of Preferred Plan	Measures to offset effects /impacts Compensation/Mitigation/Alternative Solution
International	Beast Cliff-Whitby SAC (vegetated sea cliffs)	No impact	None proposed. However, any local scale management of the coast in this area, for example surrounding the Cleveland Way, should be sympathetic to the NAI policy.
National	Robin Hoods Bay (Maw Wyke to Beast Cliff SSSI) – Geological, maritime habitats and flora. Iron Scar and Hundale Point to Scalby Ness SSSI (Geological) Hayburn Wyke SSSI (Geological)	Continued presence of hard defences obscuring SSSI interests	None proposed
Local	none	N/A	N/A

ACTION PLAN MANAGEMENT AREA 25

Action	By when	Responsibility	Cost £k
Review Strategy	2010	Scarborough BC	30
Monitoring plan <ul style="list-style-type: none"> • General strategic monitoring 	2006	Scarborough BC	1pa
Schemes: Preventative maintenance as recommended by strategy	2010	Scarborough BC	150