

## 4.12 PDZ 12 Filey Spa to Flamborough Head

### 4.12.1 Policy Development Analysis

#### DESCRIPTION

##### *Physical*

The zone covers a length of some 21km from Filey Brigg through to the southern limit of the SMP at Flamborough Head. While in detail the coast may be subdivided into many different sections with different local characteristics, in terms of its broader physical description it may be seen as principally two fundamentally different sections: the classical spiral shaped bay; controlled by the promontory of Filey Brigg and held by the massive chalk cliffs south of Speeton; cut back in the soft till cliffs between, and the rugged chalk cliffs themselves running through to Flamborough.

Filey Brigg, an outcrop of hard Jurassic rock overlain by tills, extends nearly 800m almost due east and creates the abrupt change in coastal orientation at Filey Spa. To the northern side the coast runs almost west to east and is exposed to the dominant north easterly wave climate; south of the Brigg the coast is running north south over the northern section of Filey Bay. Over the initial 600m south of the Brigg is largely undefended steep glacial till cliffs, with a plateau above comprising generally open recreational land, cut in the centre by one of the steep narrow valleys typical of this section of coast line and the coast to the south. This short section of coast ends where Church ravine cuts to the coast, with the main settlement of Filey Town to the southern side of the ravine.

At the coast is the historically important Cobble Landing, with its boat parking and launching areas and its general tourism facilities. The defence of this area is set some 50m in front of the natural coastal slope and comprises a major seawall. The sea wall, open promenade and lower platform to the town of Filey runs a further 1km. south, maintaining this width of 50m to 100m between the defence line and the main coastal slope to the back. To the rear of the platform, at the toe of the main slope, is a near continuous row of large seafront properties, with smaller clusters of properties and facilities associated with the typical holiday use of the frontage located along the promenade. Far from being a straight line of defence, the main section of seawall curves with the general curve of the bay and has small promontories creating very local bays, particularly at the southern end. While the beach; all the way from the Brigg, along the promenade and on some 5km to the south, comprises a consistently flat sandy foreshore of some 200m to 250m width, in the vicinity of the promenade there is significant variation in levels at the toe to the wall suggesting quite significant local interactions with the differing alignment of the defence. Immediately south of the promenade the coast cuts back some 35m to steeply sloped cliffs, with a smattering of rock revetment placed to stop outflanking of the return wall to the promenade.

The steep till cliffs continue for a further 1.5 km south of Filey, with a generally steep scarped toe, indicative of general slow erosion, and simple slumping, or landside to the cliff face. Within the section, and just south of the Primrose Valley ravine, there is a small collection of holiday chalets close to the crest of the slope. This is the start of a larger development of private housing and the major holiday and caravan park extending over 1km inland and continuing some 1km to the south along the coast. While the simple landslip cliffs extend 500m to the south of Primrose Valley, the character of the cliffs then change in front of Flat Cliff. Here there has been more major complex failure of the coast creating a series of narrow terraces from the high cliff behind through to a much lower, but still eroding slope to the beach. The initial 500m of this area has been developed since the 1900's as an estate of some 40 properties. There is in addition a sewage pump station providing service to both the community of Flat Cliff and the holiday park to the rear. The properties generally lie within, or more correctly upon this area of former major coastal cliff failure but the access road to the properties and the pump station lies with the transition between this and the more simple land slip section of coast to the north.

The southern limit of the terraced failure zone is defined by the Flat Cliff Gill. Beyond here the cliff form reverts to steeper simple slumping cliffs, in front of the village of Hunmanby Gap; which is set back to the landward side of the Reighton Gill valley, some 100m behind the crest of the coastal cliff, and then through to the Holiday Village of Reighton Sands. As at Flat Cliff much of the coastline in front of the Holiday Village comprises complex landslips forming a width of some 150m between the shoreline and the crest of the cliff. Immediately past this area, however, and still in front of the Holiday village is an area of large simple slips extending right up to the high cliff crest. Beyond this area is a section where slippage extends back over 250m from the shore to the rising hinterland at the transition between till and the emerging chalk cliffs.

The second main section of the coast comprises these high vertical chalk cliffs continuing through to Flamborough Head. Characteristically, there is a deposit of chalk boulders to the toe of the cliff with little foreshore width. In places there is virtually no foreshore width with deep water at the base of the cliff. Only within the bay at North Landing and the small bay immediately to the north of North Landing and finally in the small bay to the north of Flamborough Head is there any evidence of a beach. At North Landing there is a short length of defence associated with the slipway and lifeboat house. Along virtually all this length there are only isolated properties anywhere near the cliff and only at North Landing and at Flamborough Head do these fall within an area potentially affected by erosion.

### **Environment**

The full extent of the rock cliffs down to Flamborough Head is designated as a SAC. Extending further north is designated SSSI covering the large slippage area of cliffs to the south of the till backed bay at Reighton Sands. Filey Brigg is also designated an SSSI. While the main till backed bay has no international designations, all the undeveloped length, together with most of the wooded valleys are Local Sites of Importance for Nature Conservation (SNICs). The whole area to the south also falls within the Heritage Coast and while the Cleveland Way coastal path ends just north of Filey Brigg, there are footpaths along sections of the coast further south. The Flamborough Head Coastal Path also runs along the crest of the chalk cliff line.

The Filey frontage is part of a conservation area and there are many culturally important buildings to the town and to the seafront, not least of which is the feature of Cobble Landing, which is a recognised important tourism feature. Over the main bay there are limited heritage sites but Flamborough Head is well populated with important sites including the Scheduled Ancient Monument of Danes Dyke running from the north to south coasts of the headland.

The main settlements are Filey, Flat Cliff, Hunmanby Gap and Reighton Gap. Associated with the areas of Flat Cliff and Reighton are also large holiday centres, including the extensive area of the Amtree Park development. These together with the high tourism value of Filey and the wide open sand bathing beaches around the whole bay make this one of the key visitor areas of the region, with close and important links to the National Park and the Scarborough Town centre to the north. These holiday parks are important to the regional economy.

There is, therefore, a close interaction between the evident landscape value, the internationally and locally important natural heritage, the traditional visitor attraction and cultural centre of Filey, and the economically important holiday resource and beach use of the area. Coupled to this is the significance of individual settlements as residential areas, with the infrastructure supporting these. In terms of the character of the area there needs to be a careful balance in all of these values, and that loss in this balance would result in loss throughout this overall system.

### **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 maintain the high visual appeal and value of the natural coast.
- To sustain the Town of Filey and local settlements on the frontage.
- To support the cultural heritage.
- To maintain the quality of the bathing beaches.
- To maintain the economically important tourism resource.
- Maintain access to and along the coast.

## PHYSICAL CHARACTERISTICS

### **Water levels**

MLWS	MHWS	HAT	1:10yr	1:20yr	1:50yr	1:100yr	1:200yr
-2.30	2.50	3.10	3.57	3.72	3.81	3.95	4.04

Determined at Filey Bay. 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): Filey Bay Coastal Defence Strategy, October 2002 (Halcrow)

### **Wave climate**

Return Period (1:X years)	Wave Height Hs (m)*
1	5.1
10	7.2
50	8.1
100	8.1
200	8.1

\*Determined at Filey Town (North). Source: Filey Bay Coastal Defence Strategy, October 2002 (Halcrow)

### **Baseline Erosion Rates**

Filey Brigg	0.25m per year
North Cliffs	0.5m per year
Filey	0.25m per year
Muston Sands	0.25m per year
Hunmanby Sands	Cliff instability resulting in various widths of crest retreat
Speeton Sands	1.5m per year
Flamborough Head cliffs	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 process and development over the northern half of the zone is controlled both in plan shape and locally in the profile of the coastal cliffs by geomorphological features and factors. In terms of overall plan shape, the classic spiral curve of the bay is dominated by the shelter provided by Filey Brigg and by the southern massive control feature of the chalk cliffs. Modelling of sediment movement has indicated that there is a net drift from the north to south over most of the bay and, just north of the hard rock cliffs, slightly from south to north. Basically, in terms of net orientation, the shape of the bay is principally in line with the net wave energy; the curve of the bay being shaped as waves from the northerly sectors are diffracted in the lee of Filey Brigg.

However, because of the wide range of wave approach directions (from north through to the southeast, although dominantly from the northeast sector) the beach and movement along the beach is highly variable; given any specific offshore wave direction. This is seen in the sudden reductions in beach levels, often down to the basal clays of the foreshore. It has also been identified that high energy, low frequency storms can rapidly remove beach sediments exposing the toe of defences and the natural soft clay cliffs to erosion. The modelling does suggest that much of the sediment movement tends to occur over the mid and lower foreshore areas. Quite probably, sediment movement at the crest of the beach primarily activated during more significant storms.

In profile the cliffs tend to be destabilised by erosion at their toe or increased water permeating from the land above. As such the cliffs may remain relatively stable for long periods of time, with sudden

and, in some locations, quite major movement. This is seen at the southern end at Speeton but is also evidenced by the level terraces on the cliff face such as at Flat Cliff. Not only is much of the failure of the cliff line, therefore, episodic (relatively large sections of cliff failing suddenly after periods of stability) but the erosion at the toe of the cliff can be equally sporadic. There may be periods when the storm climate is relatively low with little overall erosion. Sudden changes in the level of wave activity, particularly over surge events can then result in short periods of quite rapid erosion.

During consultation the erosion rates at Flat Cliff were queried because over the last several years local observation had suggested very little change. This is quite reasonable. However, over a longer period of time the cliff line has quite clearly eroded (otherwise the area would be stood well proud of the general line of the bay). An apparent lack of change must therefore be viewed as a temporary respite, with an appropriate storm condition, or series of storms in effect making up for lost time.

Sediment supply to the bay is very low. There is an indicated loss from the southern end of the bay moving south and beyond Flamborough Head. There is also some suggestion that there may be a supply returning along the nearshore zone from south of the headland, but the main continuing source of sediment to the area is from continued erosion of the cliffs. It has been suggested that the balance of sediments within the bay is finely balanced. Any significant loss of supply could result in significant impact on beach levels.

In general terms, sediments moved from the north, north of Filey Brigg, will tend to be driven by wave action and tidal flows into an offshore stream bypassing the bay. The bay and the nearshore area of the bay tends, therefore, to act as an effectively closed system. There are records of movement of material from the shore in to the nearshore area. Under other conditions these sediments are brought back on shore. There would then be a division between the offshore system, where offshore activity is independent from the system within the bay, and an area of the nearshore where there are critical sediment deposits which act in a very interactive way with the shore.

At the actual cliff line, processes of cliff response are critically dependent on the nature of the cliff, its composition, its level and the drainage. To the north and immediately south of Filey, the cliff failure mechanism tends to be that of simple surface slides. Erosion of the toe and the rate of retreat of the crest of the cliff are closely interlinked. In many areas, particularly just north of Flat Cliff, the cliff is over steepened and major slippage is anticipated in the near future. In the area of Flat Cliff itself, there has been, in the past, a more complex system of slides, creating the terraced effect in the cliff profile. Erosion at the front face, while tending to be seen as merely initiating slides on the front face, is likely to allow progressive slipping over the whole area. In this area it has been indicated that further erosion, potentially in the order of 5m would set off failure slides extending back to the rear, higher cliff line. Based on typical erosion rates this occurrence could be within a 10 to 20 year period, but because of the episodic erosion of the toe could be sooner.

Further south the cliffs would appear to act in a manner similar to the north, but because of their position along the bay and, therefore, greater susceptibility of wave attack, these cliffs tend to be more generally active. Further south still at Reighton Gap, there is the possibility of more major failures of the whole cliff profile.

Along the whole cliff line, drainage and water tables are critical, so that periods of heavy rain may destabilise slopes earlier than might be anticipated from mere erosion rates. The development of the land to the crest of the cliff is important in this, in that large runoff from areas of hard development or drainage of land may be critical in terms of cliff stability.

In all this, change in sea level, change in wave climate and change in rainfall could substantially impact on the development and underlying relative stability of the bay and in development of cliff profiles. Certainly, sea level rise will tend to allow increased wave action to the toe of the cliffs and the bay will attempt to readjust by deepening (eroding back). Change in frequency of storms will similarly tend to cause more occasions when the cliff line is cut back.

Over the Flamborough Headland and cliffs, erosion will continue slowly. The cliff produces little beach building sediment and with the exception of the few bays, material will not be retained at the shore.

*Unconstrained:*

Despite the underlying near stable plan shape of the bay, there is an ongoing adjustment which means that erosion of the cliffs will continue. At no point has the past cliff retreat been sufficient that a stable upper beach has been able to develop. Therefore, in this unconstrained situation, as is the current case for most of the bay, there will be continued erosion. The forward position of Cobble Landing does at present tend to retain some material to the north. Without defence in this area there

would be both a rapid erosion of the promenade area, with the reactivation of the coastal slope behind and a tendency for increased loss of sediment from the area to the north. While this would contribute to the overall volume of material free within the overall bay system, this would not substantially change the general process of erosion over the whole frontage. The hard rock cliffs to the south will continue to erode as they are already unconstrained.

## MANAGEMENT

### **Present Policy**

#### SMP1

The SMP1 divided the coast into 13 management units. The policies are:

MU28A, MU30B, MU31A, B, C and D  
 MU27, MU29A, B and C, MU30A, MU31D  
 MU28B

Policy

Do Nothing  
 Retreat  
 Hold the Line

#### Filey Bay Coastal Defence Strategy

The strategy has undertaken an examination of potential cliff failure scenarios identifying areas at risk. Based on a strategic benefit cost analysis the study concludes the benefit of maintaining defence to Filey but in all other areas to undertake no active intervention.

### ***Baseline scenarios for the zone.***

#### ***No Active Intervention (Scenario 1):***

The most significant development under this scenario would be the failure of the Filey seawall over the next 40 to 50 years. Failure is likely to arise from out flanking far earlier; potentially over the next 10 years, with subsequent general deterioration and potential undermining in the longer term. This would result in quite rapid erosion of the promenade and properties directly associated with the lower platform but in the longer term is likely to result in destabilisation of the coastal slope with possible loss, in total, of some 250 properties, in addition to the loss of the key sea front area of the town, facilities associated with the fishing fleet, tourism and amenity for the area.

Prior to this there would be losses elsewhere on the frontage. The short section of defence to the sailing club, to the north of the town, is already in poor condition. This defence does not extend over the full extent occupied by the club and erosion of the cliff toe will result in loss of this facility in any event. The general erosion of this cliff line will affect the site of the Roman Signal station at the root of Filey Brigg and car parking, open recreational land and the miniature golf course to the top of the cliff. As the walls in front of Filey fail, erosion of the toe to this northerly section of cliff is likely to become worse, as sediments partially retained by the forward position of Cobble Landing erode.

To the south of Filey, there will be continued erosion to the open cliff. The defences immediately south of Filey only providing a limited degree of protection in the short term. This will affect the south Golf Course, further reducing amenity to the area. Of more significance would be the losses along the Hunmanby Sands. There would be loss of the front line properties at the Fold, just south of Primrose Valley, over the next 20 to 50 years, and further loss to chalets further back during the 100 years of the SMP. The main village at Primrose Valley, to the rear, is unlikely to be affected.

The access to the Flat Cliffs is at risk within the next few years. The slope has a very low factor of safety and any change in water levels could result in immediate failure. In the short term further erosion of the cliff toe will bring about failure of the slope. The factor of safety over the main area of Flat Cliffs is slightly better but the potential erosion of the toe brought about by a single major storm could reduce this to a critical level. Even based on average erosion rates, the whole area could be subject to failure over the next 10 to 20 years. Over the 100 year period of the SMP it is likely that more major failures could arise affecting considerable areas above the higher cliff, taking out a major section of the caravan park's support infrastructure. Services to both the residential community and to the holiday

park will also be affected and with the loss of the pump station within the Flat Cliffs area these will be affected sooner than much of the area provided with these services.

At Hunmanby Gap there would be an anticipated loss of 3 properties to the fore of the village with potential further loss to the northern end of the main village over the 100 years. At Reighton Gap the front row of properties, together with the holiday properties at the Larches are likely to be lost within 20 to 50 years. A far larger number of properties and somewhere in the order of two thirds of the Holiday Park will be lost over the 100 year period. Further south at Speeton there would be no anticipated loss of property, although clearly erosion and recession rates in this complex cliff area would need to be monitored and this assessment reviewed over time.

Along the chalk cliff frontage there would be no anticipated loss of property except in the area of North Landing, and possibly at Flamborough Head itself. In the first of these two areas there could be the loss over the long term to the Lifeboat House and almost certainly to the slipway and access to the cove. This would have a significant impact on the area in that North Landing is the sole access point to the sea on this northerly section of the coast and as such would fundamentally alter the character of the area. At Flamborough, the threat is to the Light House, and again this is would alter the character of the area as a whole.

In general, therefore, this scenario results in major change, having significant impact on the integral character of the area, principally within Filey Bay but also to the area of Flamborough Head. The use of the bay, its amenity value as a tourism holiday area, would be lost. Access to the beaches would be severely disrupted and the holiday parks would have to adjust both to this and to adapting to loss of land and loss of facilities. Nominally, since natural processes would be allowed to function unhindered, it might be argued that there would be benefit to the natural environment. However, in reality there would be little enhancement in terms of biodiversity, with basically the same extent of eroding cliff.

Visually the impressive sweep of the bay and the natural development of the chalk cliffs would be maintained. However, there would be loss in terms of the conservation area of the Filey coastal slope and promenade and to a degree due to the likely reduction in the number of people using the area, and certainly the number of people residing on the coast, the actual enjoyment value of the landscape would be reduced.

<u>MDSF Evaluation</u> <i>Erosion</i>	154 properties potentially lost	<i>PValue Damages</i> £3,455,000
<i>Flooding</i>	No flooding identified	
<i>Other information</i>	The strategy indicates far more significant damages amounting to £6.8M, due to subsequent cliff instability,	
<u>Assessment of key objectives</u>	<ul style="list-style-type: none"> <li>• Maintains the high visual appeal but reduces landscape value of the natural coast.</li> <li>• Avoids damage to the natural heritage.</li> <li>• Fails to sustain the Town of Filey and local settlements on the frontage.</li> <li>• Fails to support the cultural heritage.</li> <li>• Fails to maintain the quality of the bathing beaches with regard to safe access and facilities.</li> <li>• Minimises reliance on defence.</li> </ul>	
<b><i>With Present Management (Scenario 2):</i></b>		
<p>The policy developed from the strategy over Filey Bay, which only considers the next 50 years, is to hold the line at Filey but in all other areas to adopt a policy of no active intervention. At Filey, initial works to reduce the threat of outflanking are proposed with the longer term intent to maintain the sea wall. This approach has been demonstrated to have</p>		

a good economic basis and the need for thought as to how the management of the ends of the defence in creating a suitable transition between this area and the natural development of the coast to either side is recognised. The strategy's outline proposal for future works to maintain the wall is for a rock revetment. While this may reduce the general rate of erosion to the beach, which could occur in front of the wall, there is still likely to be some continuing loss in sand as the frontage becomes more advanced of the natural coastline.

To the north of Filey, the strategy identifies that the sailing club will be lost and therefore argues that maintenance of the defence of the launching access area is unsustainable.

For the rest of the till backed frontage the policy is for no active intervention in terms of defences. However, the strategy recognises the real and quite immediate threat to the areas of Flat Cliffs, particularly the access slope, and Hunmanby Gap, and recommends that Rapid Response Monitoring is put in place to allow evacuation of residential areas. As recognised by the strategy, monitoring does not, of itself, provide any protection but rather is mitigation in reducing risk to life and possessions under a no active intervention policy.

As such, the existing policy scenario for the area is the same as the no active intervention policy set out in Scenario 1, with the exception of the Filey frontage. This will, however, result in a slightly different situation for the area north of Filey.

Holding the existing line at Cobble Landing and undertaking works to create a transition between this and the coast to the north can allow better retention of sediment over the northern frontage, potentially to the point where the erosion rates to the cliff immediately to the north may be reduced, thereby better sustaining assets such as the miniature golf course at the crest of the cliff. It is unlikely to significantly affect the shore sufficiently far to create a more sustainable situation at the sailing club.

Management of this area will have only minor impact on provision of sediment to the frontage as a whole and is unlikely to impact significantly on the general movement of sediment, which the strategy indicates works largely over the lower section of the beach.

The present policy for the Flamborough Head area is to allow natural development of the coast but to take action as appropriate in maintaining the function of North Landing.

<u>MDSF Evaluation</u>		<i>PValue Damages</i>
<i>Erosion</i>	96 properties potentially lost	£1,928,000
<i>Flooding</i>	No flooding damages identified	
<i>Other information</i>	Strategy indicates damages of £1.7M.	
<u>Assessment of Key objectives</u>	<ul style="list-style-type: none"> <li>• Maintains the high visual appeal and value of the natural coast.</li> <li>• Avoids damage to the natural heritage.</li> <li>• Sustains the Town of Filey.</li> <li>• Fails to sustain local settlements on the frontage.</li> <li>• Supports to a degree the cultural heritage.</li> <li>• Generally maintains the quality of the bathing beaches but there will be sand loss to Filey and loss of access elsewhere.</li> <li>• Generally minimises reliance on defence.</li> </ul>	

## DISCUSSION AND DETAILED POLICY DEVELOPMENT

In both scenarios the recommended policy for the Flamborough Head section of the zone is for no active intervention. There is generally no requirement for intervention and the extremely high natural value of the frontage is recognised in the environmental designations which apply. The more local defence issues with respect to Flamborough Light House and North Landing should be considered within this context. At North Landing there are no significant sustainability issues in relation to maintaining the basic function within the cove and it is not anticipated, given the overall setting and the importance in terms of the cultural value, that works to sustain existing use of the area would be in conflict with the broader internationally important designations of the area. Detailed study would be needed to determine to what degree works in this area could be justified as required under the Coast Protection Act, but even if this were not the case, and subject of course to proper environmental assessment, there would be no grounds, in terms of impact on coastal processes, not to undertake works to maintain structures in this area. In a similar manner the issue of the Flamborough Head Light House would need to be considered in more local detail. In fact the real threat to this structure needs to be better defined through monitoring. On this basis, it is felt that local policy in these areas should be to hold the line, but that these very local policy areas are within a broader policy of no active intervention for the whole length between Speeton Cliffs and the southern limit of the SMP area.

The strategy upon which scenario 2 is based recommends holding the line along the Filey town frontage. While this has impacts on the coast to the north and will require future works to maintain the defence line, the economic, cultural and amenity damage which would otherwise arise, is considered unacceptable in terms of the objectives for the area. The whole length of the bay is in relative terms, near equilibrium. The coast to either side will continue to erode but, despite this frontage becoming further in advance of the natural line of the shore, its maintenance is not considered fundamentally unsustainable. Whilst the immediate issues would appear to be the outflanking of the town defences at either end, any solution to this problem should consider how this integrates with a longer term management approach looking at the whole frontage. Structures could potentially be designed, for example, that could achieve a solution to both the issue of outflanking and the general low beach levels along the frontage. While recognising that the strategy has only attempted to provide a nominal approach to the future defence of the length, in terms of considering the economic case for maintaining the structure, alternatives beyond that of purely constructing a rock revetment to the face of the wall have to be considered further at the time of considering detailed response in terms of dealing with the threat of outflanking.

The issues relating to the areas of Flat Cliff and to a lesser degree Hunmanby Gap and Reighton Gap are recognised to be very difficult, both in terms of the residential communities and in terms of the broader value to the region of the large holiday parks. In the longer term, over the 100 year period, and beyond, hard linear defence of these areas, which is what would be required to stabilise the cliff and prevent any property loss, would be considered unsustainable. This area is significantly further outwith the direct influence of Filey Brigg than is the Filey Town frontage and as such, to hold this position over time would require increasingly more effort, with increasingly greater influence on the whole development of the bay. In effect, heavy protection of Primrose Valley and Flat Cliffs would have the effect of creating a totally separate bay system, virtually independent of that created by the influence of Filey Brigg. Protection in this area may, over the longer term actually increase rates of erosion at Hunmanby Gap as the coast adjusts to a new line of equilibrium. Therefore, despite the significant economic loss at Flat Cliff and the impact on the Holiday Village, the long term policy for the area should be one of no active intervention. To achieve this, but still

allow adaptation in respect of both residents and the more general land use of the area, requires prompt realistic thought and discussion as to how the threat to people, property, infrastructure and business is to be managed; over the next few years in terms of access to the properties of Flat Cliff, over the next 5 to 20 twenty years with respect to the actual loss to properties and the management of safe access between the cliff top and the beach and over the longer term as to the impact and future operation of the holiday park.

The strategy has determined over a 50 year time span only a very marginal benefit cost ratio for long term defence of the Flat Cliff area and, certainly, the approach of a substantial rock revetment would tend to drive management of the frontage along a longer term policy of defence and unsustainability. Other options for a more temporary approach to defence were also considered by the strategy. While over the short term it was not considered that minor works would have any significant impact on the natural environment, a view accepted by the SMP2, such works were found to have virtually no economic benefit and would not be justified in terms of public funding. A continuing concern with such an option would also be the recognised difficulty of gaining strict acceptance to the concept that such work would provide only temporary additional protection. Extension of protection over the medium term and long term would then have an increasing impact on the management of the bay. The strategy made recommendations for rapid response monitoring covering the area of the access to Flat Cliffs.

While associated with the monitoring is a recommendation that the council develop an evacuation contingency plan, a more broadly based management approach is felt to be more appropriate. It is recommended that this be considered by the community of Flat Cliff.

The actual implications of abandoning property within the relatively short period of time allowed for by the monitoring needs to be established in more detail with residents. The need to maintain an important access to the beach associated with the holiday use of the area and the longer term needs of the holiday park also needs to be considered from a planning perspective. Furthermore discussion is needed with respect to the continued access to and operation of the pump station and pipe line.

The current approach of monitoring is felt to provide, potentially, only limited warning time and those affected by failure of the coastal slope need, therefore, to realise that this is likely to provide merely an immediate warning of failure of the over-steepened access length.

The short term policy from the SMP is for no active intervention, confirming the policy of the previous SMP policy and that concluded from the strategy.

The medium term and the long term policy is similarly for no active intervention.

Similar future problems potentially exist further south along the shore at Hunmanby Gap and Reighton Sands. The same basic argument applies. The SMP, therefore, recommends no active intervention in these areas. As such plans should be developed on the realistic probability that properties will be lost in these areas over the period of the SMP. The SMP recommends monitoring of the bay as a whole and these areas in particular so as to assist people in planning for the the eventual loss of property.

## **MANAGEMENT AREAS**

Recognising that there are continuing sediment process linkages along the frontage, and that these need to be taken into account in terms of managing the whole bay, it is still felt appropriate to divide the zone into three basic management areas:

- The Filey frontage from Filey Brigg to Muston Sands
- The Hunmanby Sands frontage from Muston Sands down to Speeton
- Flamborough

In the last of these areas the dominant theme is maintaining the natural development of the area. As such small policy units (for North Landing and Flamborough Head itself) are defined within a larger policy unit, providing the context for management within the local areas.

Policy statements or summaries are presented by management areas in the following sheets.

#### 4.12.2 MANAGEMENT AREA POLICY STATEMENTS (MA31-MA33)

<b>Location reference:</b>	Filey Brigg to Muston Sands
<b>Management Area reference:</b>	MA31
<b>Policy Development Zone:</b>	12

##### SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

**PLAN:** The overall management intent for the zone is to allow the coast to develop as naturally as possible without prejudice to essential aspects of Filey Town. This would include maintaining the regionally important interests of Filey but with a policy of no active intervention to the north and immediate south. Clearly, while these policy apply in intent the boundaries between units would depend on the detailed defence approach taken in defence of Filey. To the north of Filey the natural erosion of the coast would be allowed to continue.

<b>PREFERRED POLICY TO IMPLEMENT PLAN:</b>	
<b>From present day:</b>	Hold the line at Filey investigating options for addressing the issue of outflanking in a manner to provide maximum opportunity to maintaining a level of beach in front of the wall. No active intervention elsewhere.
<b>Medium term</b>	Develop a defence approach at Filey to maintain as far as possible beach levels. No active intervention elsewhere.
<b>Long-term</b>	Maintain the defence at Filey

##### SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025.	2055	2105	Comment
31.1	North of Filey	NAI	NAI	NAI	Affected by works to stop outflanking of Filey
31.2	Filey	HTL	HTL	HTL	Looking to long term overall management.
31.3	Muston Sands	NAI	NAI	NAI	Affected by works to stop outflanking of Filey
Key:		HTL - Hold the line, A - Advance the line, R - Retreat or Realignment, NAI – No active intervention			

### CHANGES FROM PRESENT MANAGEMENT

No Change from SMP1 policy.

### IMPLICATION WITH RESPECT OF BUILT ENVIRONMENT

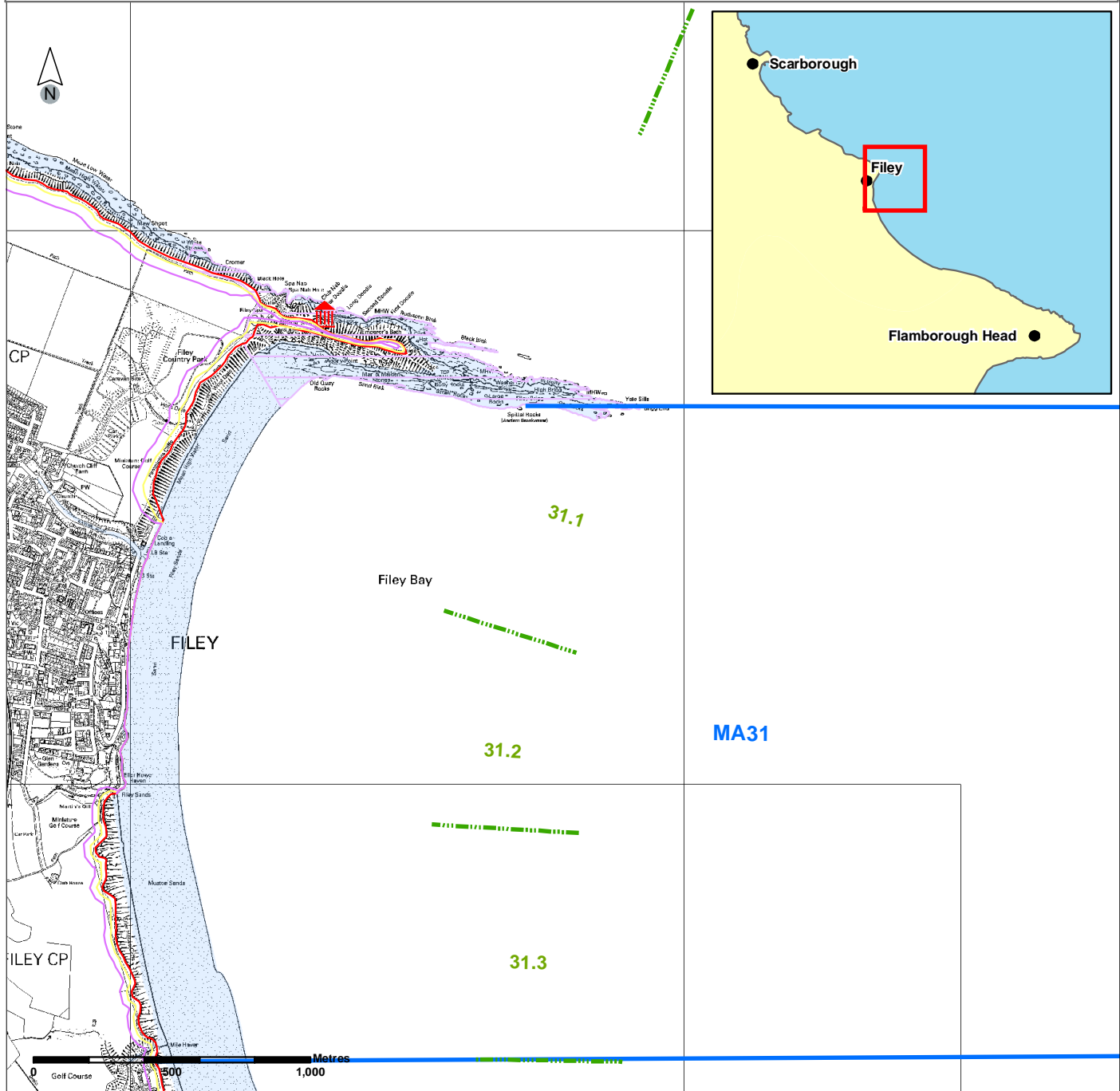
Economics		by 2025	by 2055	by 2105	Total £k PV
<b>Property</b>	Potential NAI Damages/ Cost £k PV	239	4,791	83	5,113
	Preferred Plan Damages £k PV	0	0	0	0
	Benefits £k PV	239	4,791	83	5,113
	Costs of Implementing plan £k PV	178	1,086	14	1,278
Costs based on strategy with additional cost in year 40 along main wall. damages based on strategy but extended over 100 years. Description of damage and benefits under preferred plan: <ul style="list-style-type: none"> <li>Loss to sailing club to north.</li> </ul>					
<b>Heritage</b>	No heritage loss				
<b>Amenity</b>	Potential loss to golf courses to north and south.				

### 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 MA31  
Policy Units 31.1-31.2**



**POLICY (FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT)**

From Present Day:	Medium - Term:	Long - Term:
Hold the line at Filey investigating options for addressing outflanking in a manner to provide maximum opportunity to maintaining a level of beach in front of the wall. No active intervention elsewhere.	Develop a defence approach at Filey to maintain as far as possible beach levels. No active intervention elsewhere.	Maintain the defence at Filey

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	



**ENVIRONMENTAL ASSESSMENT – PREFERRED PLAN**

<b>MANAGEMENT AREA: MA31</b>			
	<b>Description of Designation</b>	<b>Effect of Preferred Plan</b>	<b>Measures to offset effects /impacts Compensation/Mitigation/Alternative Solution</b>
<b>International</b>	none	N/A	None proposed
<b>National</b>	Filey Brigg SSSI (Geological and ornithological)	No active intervention – this policy will allow continued action of coastal processes on the Brigg. The proposed defence works are considered unlikely to affect movement of beach material within the SSSI.	None proposed
<b>Local</b>	none	N/A	None proposed

### ACTION PLAN MANAGEMENT AREA 31

Action	By when	Responsibility	Cost £k
Develop strategy recommendations for outflanking defence, taking account of long term management to main wall.	2008	Scarborough BC	25
Monitoring plan <ul style="list-style-type: none"> <li>• beach levels</li> <li>• defence condition</li> <li>• strategic monitoring of cliffs</li> </ul>	2006	Scarborough BC	3pa
Schemes: Outflanking defence	2010	Scarborough BC	164

<b>Location reference:</b>	Muston Sands to Speeton
<b>Management Area reference:</b>	MA32
<b>Policy Development Zone:</b>	12

### SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

**PLAN:** The overall management intent for the zone is to allow the coast to develop as naturally as possible but encouraging the development of plan for adaptation to this policy. The policy from the short term onward over the period of the SMP2 is for no active intervention. It is recognised that to achieve this thought needs to be given to address the current expectations and use of the frontage in terms of the important regional issues of the residential communities and tourism.

#### PREFERRED POLICY TO IMPLEMENT PLAN:

**From present day:** Develop a plan for abandonment of areas of settlement at risk in Flat Cliffs, Hunmanby Gap and Reighton Gap.

**Medium term** No active intervention

**Long-term** No active intervention.

#### SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025.	2055	2105	Comment
32.1	Hunmanby Sands	NAI	NAI	NAI	Consideration of long term management of frontage, access and hinterland.
32.2	Hunmanby Gap	MAI	NAI	NAI	Consideration of long term management of frontage
32.3	Reighton	NAI	NAI	NAI	Consideration of long term management of frontage
Key: HTL - Hold the line, A - Advance the line, R - Retreat or Realignment, NAI – No active intervention					

### CHANGES FROM PRESENT MANAGEMENT

There is only a notional change from SMP1 from managed retreat to one of no active intervention. This was the longer term intent of the SMP1 and in effect the period between SMP1 and SMP2 has been used to consider the area in more detail through the development of the strategy and allowing, to a degree a period for adaption.

### IMPLICATION WITH RESPECT OF BUILT ENVIRONMENT

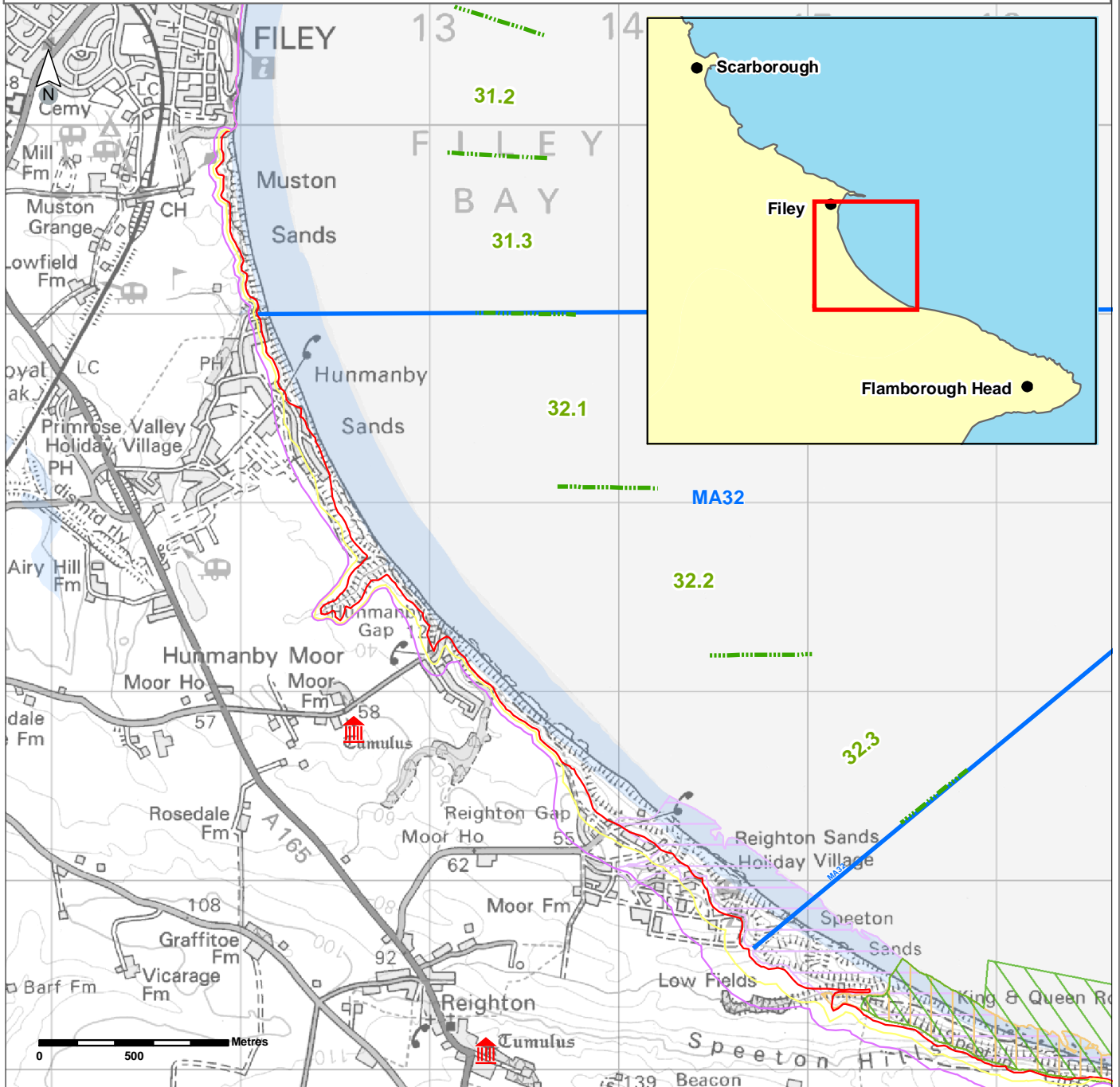
Economics		by 2025	by 2055	by 2105	Total £k PV
<b>Property</b>	Potential NAI Damages/ Cost £k PV	294	543	1,091	1,928
	Preferred Plan Damages £k PV	294	543	1,091	1,928
	Benefits £k PV	0	0	0	0
	Costs of Implementing plan £k PV	0	0	0	0
Description of damage and benefits under preferred plan:					
<ul style="list-style-type: none"> <li>Loss of Flat Cliff over the initial 20 years</li> <li>Losses to Hunmanby Gap and Reighton Gap over the longer term</li> </ul>					
<b>Heritage</b>	No specific losses				
<b>Amenity</b>	Potential loss of access to the beach.				

### 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 MA32  
Policy Units 32.1-32.4**



**POLICY (FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT)**

From Present Day:	Medium - Term:	Long - Term:
Develop a plan for abandonment of areas of settlement at risk in Flat Cliffs, Hunmanby Gap and Reighton Gap	No active intervention	No active intervention

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



**ENVIRONMENTAL ASSESSMENT – PREFERRED PLAN**

<b>MANAGEMENT AREA: MA32</b>			
	<b>Description of Designation</b>	<b>Effect of Preferred Plan</b>	<b>Measures to offset effects /impacts Compensation/Mitigation/Alternative Solution</b>
<b>International</b>	Flamborough Head SAC (reefs, vegetated sea cliffs and submerged/ partially submerged sea caves) Flamborough Head and Bempton Cliffs SPA (Breeding Kittiwake and sea bird assemblage)	No actions planned but potential pollution impacts associated with loss of pump station and pipeline.	The production of the Scarborough Borough Local Development Framework should be used as an opportunity to establish a clear policy framework which facilitates the roll back of assets from eroding cliff lines. Alternative options for sewerage required.
<b>National</b>	Flamborough Head SSSI (Geology, coastal geomorphology, cliff top flora and ornithology)	No actions planned but potential pollution impacts associated with loss of pump station and pipeline.	As above
<b>Local</b>	SINC from Hunmanby Sands to Reighton Sands	No actions planned but potential pollution impacts associated with loss of pump station and pipeline. Potential enhancement associated with development fo access.	As above

**ACTION PLAN MANAGEMENT AREA 32**

<b>Action</b>	<b>By when</b>	<b>Responsibility</b>	<b>Cost £k</b>
Develop evacuation plan for Flat Cliff area. Develop long term management plan for area to allow adaptation of land use to long term retreat	2006 2006	Residents Scarborough BC	
Monitoring plan <ul style="list-style-type: none"> <li>• beach levels</li> <li>• Strategic monitoring of cliffs</li> </ul>	2006	Scarborough BC	2000 pa
Schemes: None			

<b>Location reference:</b>	Speeton to Flamborough Head
<b>Management Area reference:</b>	MA33
<b>Policy Development Zone:</b>	12

### SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

**PLAN:** The overall management intent for the area is very clearly maintaining an overall policy of no active intervention along the Flamborough Head frontage in support of the overriding natural value of this section of the coast. Within this overall policy, the intent would be to allow works necessary to sustain operation of the North Landing. The policy for Flamborough Head, would similarly be for local management based on improved monitoring of erosion rates.

<b>PREFERRED POLICY TO IMPLEMENT PLAN:</b>	
<b>From present day:</b>	No active intervention. This would not preclude appropriate action being taken at North Landing and Flamborough Head.
<b>Medium term</b>	As above.
<b>Long-term</b>	As above

### SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025.	2055	2105	Comment
33.1	Speeton	NAI	NAI	NAI	Allow natural development of coast.
33.2	Flamborough Head	NAI	NAI	NAI	Over arching policy for the whole area
33.3	North Landing	HTL	HTL	HTL	Within the context of the above policy
33.4	Flamborough	not defined			Reviewed following monitoring.
Key: HTL - Hold the line, A - Advance the line, R - Retreat or Realignment, NAI – No active intervention					

### CHANGES FROM PRESENT MANAGEMENT

No substantial change from SMP1 policy.

### IMPLICATION WITH RESPECT OF BUILT ENVIRONMENT

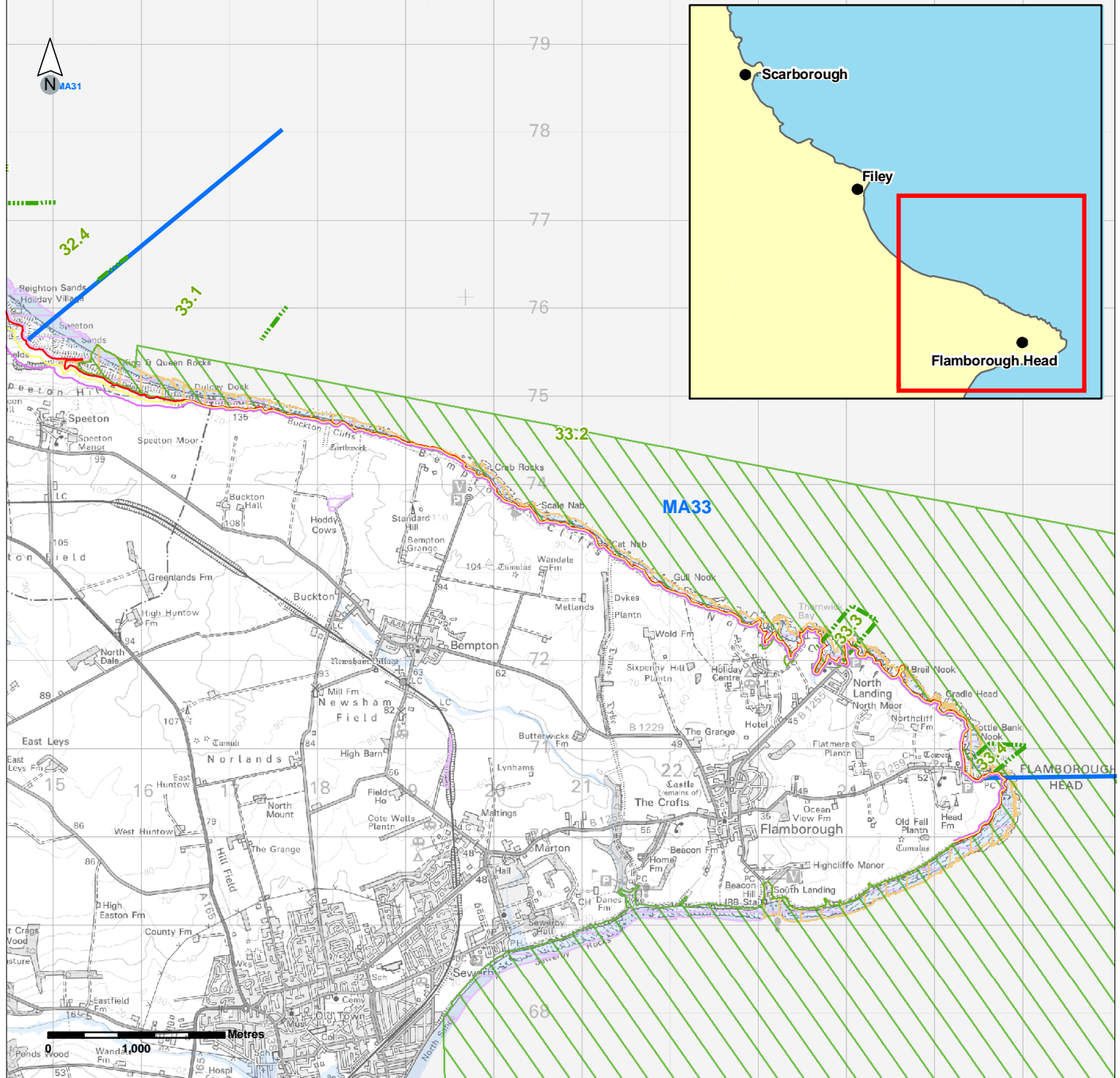
Economics		by 2025	by 2055	by 2105	Total £k PV
<b>Property</b>	Potential NAI Damages/ Cost £k PV	132	90	51	273
	Preferred Plan Damages £k PV	132	90	51	273
	Benefits £k PV	0	0	0	0
	Costs of Implementing plan £k PV	0	0	0	0
damages based on loss of land. Local costs and damages not recorded. Description of damage and benefits under preferred plan: •					
<b>Heritage</b>	No specific heritage loss				
<b>Amenity</b>	Maintains coastal path				

### 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 MA33**  
**Policy Units 33.1-33.4**



**POLICY (FOR FULL DETAILS SEE RELEVANT POLICY STATEMENT)**

From Present Day:	Medium - Term:	Long - Term:
No active intervention. This would not preclude appropriate action being taken at North Landing and Flamborough Head.	No active intervention. This would not preclude appropriate action being taken at North Landing and Flamborough Head.	No active intervention. This would not preclude appropriate action being taken at North Landing and Flamborough Head.

**Key:**

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



**ENVIRONMENTAL ASSESSMENT – PREFERRED PLAN**

<b>MANAGEMENT AREA: MA33</b>			
	<b>Description of Designation</b>	<b>Effect of Preferred Plan</b>	<b>Measures to offset Effects /impacts Compensation/Mitigation/Alternative Solution</b>
<b>International</b>	Flamborough Head SAC (reefs, vegetated sea cliffs and submerged/ partially submerged sea caves) Flamborough Head and Bempton Cliffs SPA (Breeding Kittiwake and sea bird assemblage)	Generally none. HTL at North Landing could result in localised impacts to SAC features but the overall significance of this is likely to be small in comparison with the cultural importance of the area.	None proposed
<b>National</b>	Flamborough Head SSSI (Geology, coastal geomorphology, cliff top flora and ornithology)	As above	None proposed
<b>Local</b>	None	N/A	None proposed

**ACTION PLAN MANAGEMENT AREA 33**

Action	By when	Responsibility	Cost £k
Monitoring plan <ul style="list-style-type: none"> <li>• Strategic monitoring of cliff erosion</li> </ul>	2006	East Riding/ Scarborough BC	2 pa
Schemes:			