Suffolk SMP2 Sub-cell 3c

Policy Development Zone 3 – Easton Broad to Dunwich Cliffs

Suffolk Coastal District Council/Waveney District Council/ Environment Agency

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Version 9

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Policy Development Zone 3 - Easton Broad To Dunwich Cliffs

4.3.1 OVERVIEW

PRINCIPAL FEATURES (further details are provided in Appendix D)

Built Environment:

The market town of Southwold, together with Reydon, forms an important centre for the area. Closely associated with Southwold is the village of Walberswick to the south of the River Blyth. Further south is the smaller village of Dunwich. Southwold/Walberswick harbour lies at the mouth of the River Blyth. To the north of Southwold are properties at Southend Warren and at Easton Lane. Between these is Broadside Park Farm. The village of Blythburgh is sited within the estuary, some 6km from the mouth. The A12 runs on an embankment across the estuary at Blythburgh. The main road into Southwold is the A1095 which runs along the north side of the Blyth valley, crossing the Wolsey bridge behind Reydon Marshes. This road crosses Buss Creek and continues into Southwold. The main Sewage Works is located within the low lying valley of Buss Creek which runs between Reydon and Southwold. There is an operational Lighthouse on the Southwold Headland. Southwold has an important sea front promenade which includes Southwold Pier. With the exception of the towns and villages, most of the land within the zone is agricultural.

Heritage and Amenity:

There are numerous listed structures within Southwold highlighting its cultural significance. The historic port of Walberswick has been affected over the centuries by changes to the Blyth estuary, resulting in the earliest church site lying outside the present settlement to the south. Town and Robinson marches are examples of early land reclamation to the north of the village. Dunwich was a substantial port town, with surviving extra-mural scheduled ancient monuments at Greyfriars and the Maison Dieu hospital. Walberswick, including the harbour, is similarly of high potential archaeological importance covering Saxon and Roman periods. Robinson's Marsh within the estuary is also identified as being an area of potential historical importance. Southwold, Walberswick and Dunwich are all important for tourism and beach use. The Southwold/Walberswick harbour area is important for recreational water use and the beach at Dunwich supports fishing interests. The whole coast lies within the Suffolk Coast and Heath AONB, providing a rich mixture of unique and vulnerable lowland landscapes.

Nature Conservation:

The Blyth Estuary and the Walberswick marshes form part of the Minsmere-Walberswick Ramsar Site. The upland areas behind Walberswick and the Walberswick Marshes are designated as part of the Minsmere to Walberswick Heath and Marshes SAC, and much of the inner estuary, the heath land, Walberswick marshes and foreshore are designated within the Minsmere-Walberswick SPA. SSSI areas not within the SPA designation include Town Marshes to the south of Southwold and Easton Bavents to the coast north. Much of the area is covered by national and international designations reflecting its high conservation value.

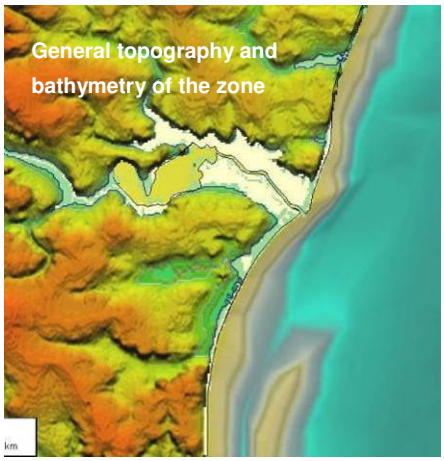
STAKEHOLDER OBJECTIVES (the development of objectives is set out in Appendix B based on objectives listed in Appendix E)

- To maintain Southwold, Reydon and Walberswick as viable commercial centres and tourist destinations in a sustainable manner;
- To develop and maintain Southwold's Blue Flag beach;
- To sustain recreational opportunities of beaches and associated facilities;
- To maintain the character, commercial and recreational activities, and navigation to Southwold Harbour and associated area;
- To maintain the cultural value of Southwold and the Blyth Valley;
- To support adaptation by the local coastal communities, including Dunwich;
- To maintain Dunwich as a viable community;
- To maintain the regional transport link and transport links throughout the area;

- To support adaptation of the agricultural interest;
- To maintain important heritage and archaeological value,
- To maintain biological and geological features in a favourable condition, subject to natural change and in the context of a dynamic coastal environment;
- To maintain or enhance the high quality landscape; and
- To support appropriate ecological adaptation of habitats.

DESCRIPTION

The zone extends southwards from the northern limit of the Easton Bavents Cliffs down to and including the northern section of cliffs at Dunwich.


General topography and bathymetry of the zone

A ridge of highland runs from Reydon to the coast at Easton Bavents and closely associated with this is the headland of Southwold. Between these two features is Southwold Ness, a slight forward projection of the nearshore area in front of the north entrance to the Buss Creek valley. Buss Creek runs to the rear of Southwold, entering the Blyth estuary upstream of the Town Marshes.

To the south of the Southwold headland is the main entrance to the Blyth estuary, a potentially wide mouthed inlet. This entrance has been controlled at the harbour mouth by the harbour structures and, within the lower estuary, by reclamation of the flood plain to the north and south constraining a narrow channel over the initial 3km. Immediately upstream and continuing to the A12 crossing at Blythburgh, defences have been abandoned and the estuary forms a wide area of intertidal mudflats. The tidal estuary channel continues inland within a narrowing valley through to Blyford, a further 3km upstream of Blythburgh. On the northern side of the estuary is a further low lying valley of the river Wang joining the main estuary at Wolsey Bridge, upstream of the defended Reydon Marshes. On the south side of the estuary, opposite Reydon Marsh, is Tinkers Marsh. These two defended areas lie upstream of the Bailey footbridge at the upstream end of the relatively straight Harbour Reach. To either side of the Harbour Reach are, to the north, the reclaimed Woodsend, Town and Havenbeach Marshes, and, to the south, the Robinson's Marsh. The north side of the Harbour Reach acts as the main quay for Southwold harbour; Walberswick quay being confined to an area nearer the mouth just upstream of where the Dunwich River enters the estuary to the seaward side of Walberswick.


Northern Harbour Arm


Blyth Estuary

The estuary mouth projects out beyond the obvious influence of the Southwold headland forming a small ebb tide delta. The projection of the nearshore contours north of the entrance suggests a possible projection of the geology of the headland into the nearshore area. However, there is no geotechnical evidence of this.


Easton Cliff

To the north of the estuary, and clearly held by the harbour structures, is a wide area of sand beach and low dunes. This connects to the extensively groyned frontage in front of the town itself, with

a narrow beach running through to the pier. A promenade runs at the back of the beach providing protection to the toe of the coastal slope up to the town centre. To the north of the pier, land levels drop to the Buss Creek or Easton Marshes valley. The front line sea defence, with the main sea front car park behind, is protected on the foreshore by newly constructed short rock groynes. This defence extends through to the higher ground of the Easton Cliffs and closes off the 400m width of Buss Creek. Private works in the form of an earth bund have been placed to the toe of the cliff to protect property above. This bund has now largely eroded. The cliff continues north towards Easton Broad. The properties at Easton Lane are towards the northern end of this section, some 1.5km north of the main town of Southwold.

To the south of the estuary, the village of Walberswick is set back some 250m from the dune foreshore. The dune ridge is backed by the channel of the Dunwich River. There are flood defences landward of this channel protecting the village of Walberswick. The village extends north to the Blyth with the main part of the village being on higher ground. There are only a small number of properties actually down at the quay. The outfall of the Dunwich River is controlled through a sluice which also provides limited access to an area used for car parking. Access is also provided to the collection of beach huts to the rear of the dunes.

The Dunwich River flows north from Dunwich behind the dune line running across low lying land behind the natural sea defence. The nature of the foreshore along this section changes from dunes to a narrow shingle bank within the first 1km south of the Blyth estuary. The marsh lands behind this shingle bank are extensive. To the northern end is Corporation Marsh and, further south, Reedland and Dingle Marshes, which extend down to Dunwich. To the back of Corporation Marsh is a second valley, the Westwood Marshes, extending inland for some 2.5km. At the seaward end of the ridge of higher ground separating the Westwood Marsh valley from the Dunwich River valley are Dingle Great Hill and Dingle Little Hill, with Dingle Fort and Dingle Great Farm situated on this ridge.

Dunwich Village is located at the southern end of this coastal marsh land and is built on rising land behind the Dunwich Cliffs. The main car park and tourism facilities to the village face on to the marsh to the north and just behind the southern end of the shingle ridge. One of the two roads to the village runs across the valley of the Dunwich River. The shore at Dunwich is a relatively wide shingle beach with a trial defence system comprising shingle filled geo-bags lying across and to the back of the beach. To the south of the village situated on the higher ground, some 70m back from the cliff, are the remains of the Greyfriars Priory, however the scheduled area is at immediate risk from erosion. The site of the Hospital of the Holy Trinity is located in the area of the car park. There are three properties closer to the cliff between the cliff and Beach Road.

PHYSICAL PROCESSES

TIDE AND WATER LEVELS (mODN)

Location	LAT	MLWS	MLWN	MHWN	MHWS	HAT	Neap range	Spring range	Correction CD/ODN
Lowestoft	-1.60	-1.00	-0.50	0.60	0.90	1.30	1.10	1.9	-1.5
Southwold		-0.8	-0.40	0.80	1.1		1.20	1.9	-1.3
Sizewell		-1.3	-0.80	0.40	0.8		1.20	2.1	-1.6

Extremes(mODN)

Location:	1:1	1:10	1:25	1:50	1:100	1:250	1:500	1:1000
Kessingland	2.04	2.58	2.79	2.96	3.12	3.33	3.49	3.65
Southwold	2.05	2.58	2.79	2.94	3.1	3.31	3.47	3.63
Dunwich	2.05	2.57	2.78	2.93	3.09	3.3	3.45	3.61

WAVE CLIMATE

Dominant offshore wave directions are from the north northeast and south southwest. There is a suggestion of better correlation between modelled offshore wave climates further to the south of the area than that modelled directly offshore to the east. As such there is potentially greater convergence of offshore wave climate towards the east (northeast sector waves tend to have more east in them; southerly sector waves tend to approach more south southeast). There can be significant wave action directly from the east and, although less frequent, there can be periods of high south easterly wave energy. The net wave energy at the shoreline tends to be from the east.

TIDAL FLOW

The tidal flows are relatively strong, reaching 0.8m/sec to 0.9m/sec on both the southerly flood and northerly ebb. There is a slight set towards the coast on the flood and away from the coast on the ebb.

PROCESSES

Control Features:

The main physical control features of the zone are the Southwold Headland, acting as a south downdrift control point of the coast to the north, and, just to the south of this, the entrance to the estuary. At the southern end of the zone, the cliffs at Dunwich anchor the sweeping curve of the bay across the Walberswick Marshes. Dunwich Bay, defined by the Southwold Headland and the cliffs at Dunwich, is strongly influenced over the northern section by the harbour mouth structures. These act as a surrogate updrift headland in place of Southwold. There is a slight ness feature at Southwold suggesting that the Southwold Headland also acts to push material offshore. This feature is reflected in the nearshore bathymetry, also suggesting some geological structure. More locally, with the strong variation in drift north and south across the Southwold frontage, the headland also influences development of Sole Bay to the north, close inshore.

Existing Defences:

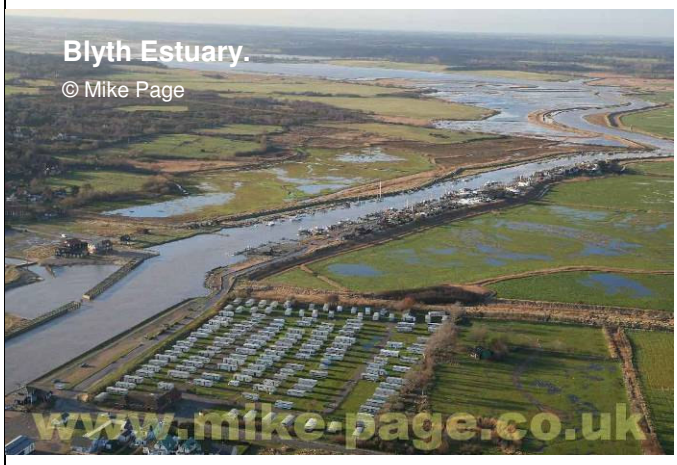
Much of the coastal frontage is undefended with the main shingle bank to the south forming the main defence to the marshes in this area. The defences to the Southwold frontage have recently been upgraded with new rock and timber groynes, improvements to the promenade wall and beach recharge. Between Gun Hill (the southern end of the Southwold Cliffs) and the Estuary is a high earth bank running down to the dunes. These have been formed within the influence of the northern harbour arm. This harbour structure is in reasonable condition with an anticipated life of greater than 20 years.

To the south side of the estuary, the southern arm is considered to be in poor condition with a residual life of 5 years. There is a short section of concrete wall to the root of the south harbour arm, but the

main defences in the area are the dunes. Behind the dunes are the control structures to the Dunwich River and various high, principally river type earth embankments protecting the village. At Dunwich, a trial scheme consisting of geo-bags is intended to be a local reinforcement of the beach. There are no other defences to the village, apart from management of the shingle bank locally to the north.

Returning to the Blyth Estuary, along the northern side of Harbour Reach, the various quays act as erosion protection. Towards the mouth there are piled and mass concrete structures. The management of these is being reviewed. Set back behind the harbour face at the seaward end are low earth flood embankments. Further upstream is a more major piled wall acting as a flood defence through to the Bailey Bridge. The standard of defence is assessed as being around 1:5 years.

To the south side of the harbour entrance there is an open piled training pier with a closed piled structure at Walberswick quay. The flood defence, set back from these, is an earth bank and raised sections of the road protecting properties within Walberswick. Adjacent to the quay there are properties raised above ground levels on the low lying harbour area. The main flood compartment to the southern side of the harbour reach is the Robinson's Marsh, defended by an earth embankment with a standard of 1:20 years at present. Robinson's Marsh is separated from Tinkers Marsh, upstream of the Bailey Bridge, by the raised track (Palmers Track) from higher ground to the bridge. This was recently breached but has since been repaired.



Above the Bailey Bridge, to the north side, is the defence to the back of Buss Creek. Additional works were undertaken within Buss Creek, associated with the main Southwold scheme, to protect the area between Reydon and Southwold. Upstream of the Bailey Bridge is the long length of defence defending Reydon Marsh. This structure has breached in the past and has a current standard of defence of about 1:5 years. Ground investigations indicate that this structure has poor foundations, making raising of the bank technically difficult. Recent works have been undertaken to provide a consistent level along the length of the bank. On the old meanders, along which the banks were constructed, there are areas where there is erosion on the channel side of the bank. To the northern end of this defence is the Wang Valley, defended at Wolsey Bridge. Immediately upstream of the Bailey Bridge to the south side of the estuary is Tinkers Marsh which breached in November 2007. The breaches have been repaired and the future management of this is currently being reviewed.

The A12 runs on an embankment across the estuary with the estuary channel held at Blythburgh Bridge. Upstream of the A12 are various lengths of defence to the north and south, some of which are breached and others in relatively poor condition.

The shingle ridge between Walberswick and Dunwich provides a flood defence to the low lying marshes behind. This ridge is no longer managed and is regularly overtopped. There are defences further within the marshes acting to protect the Westwood Marshes.

Processes:

There is a southerly net drift from the north of the zone with modelled rates varying between 20,000m^3/yr to 100,000m^3/yr. It has been assessed in the discussion of PDZ2, that there is likely to be erosion of the northern frontage adequate to meet this drift. It is concluded that over the period of the SMP, and probably some time beyond that, there will be a significant supply of material to the Southwold shoreline. Eventually, beyond the SMP period, this supply will reduce. Supply from the Easton Bavents Cliffs is quite modest in relation to this larger sediment supply from the north. As erosion of the Bavents cliffs frontage immediately north of Southwold is controlled further by the Southwold Headland, this contribution to the drift system will tend to reduce. This is likely regardless of any scenario for management at Southwold.

The control at Southwold extends beyond low water. The drift rates across the Southwold frontage tend to be net to the south, in the order of only 3,000m^3/yr, but with significant north and south drift under specific wave conditions. To the immediate south of Southwold, the net drift rate tends to increase but then reduces as the coast has built out to the north of the harbour structure. Therefore, Southwold acts as a partial shoreline barrier to drift from the north and has an area of net loss to the south, but with the coast then immediately realigning to a stable shape south of this. When sediment drift across the frontage is to the north driven by waves from the south, Southwold acts as an updrift headland to the coast to the north, potentially moving material away from the coast. The headland, under these conditions, also acts to provide some shelter to the Easton Bavents Cliffs, reducing wave energy approaching the cliffs to a slight degree. This does not prevent erosion of the cliffs. This dual nature of the headland has been long discussed and in 1907, during the evidence given in the Commission on Erosion, there were reports of varying opinion as to the position and length of various groyne systems used in defence of Southwold and the impact of this on the coast to the north.

The recent study of the area to the north indicates a significant pathway of sediment within the nearshore area, with a stronger net southerly trend. The Southwold Headland does not, therefore, act as a barrier to more general supply of material to the nearshore zone to the south. However, when material is moved north across the Southwold Headland, sediment can be deposited within this nearshore area, rather than being fed directly to the beach to the north. Under certain conditions this material may then be moved onshore, feeding the northerly shoreline. However, under other conditions, this nearshore deposit can be returned to the south rather than reaching the shore. The length of the new groynes is understood to have been designed with this process in mind and aims to minimise this influence on northerly movement, while retaining material at the actual shoreline. The most critical groynes with respect to this interchange between the shore and the nearshore area to the north, in terms of sediment moving north along the coast, would be those just north of the pier, being at the apex of the curving coastline. In terms of sediment moving along the shoreline from in front of Easton Bavents Cliffs, the more northerly groynes potentially have a greater influence. Thus, the management of defence around the area of the pier dictates the supply of sediment under northerly drift conditions. The management of the defence to the northern end of Easton Marshes

influences, more directly, the shape and retention of sediment in front of Easton Bavents.

With sea level rise, the line of the defence to the north of the pier, particularly with the convex shape to the northern end of the Easton Marshes defences, is going to be more difficult to manage with increased potential for erosion.

The defences in front of the town are always under some degree of pressure because of its position as a headland. This is managed at present through the use of groynes to restrict movement away from the frontage and by recharge of the beach. Management of the coast to the north is important in maintaining both the supply of sediment and in ensuring that a sediment pathway is maintained along the shore. Management of the coast to the south is important in that maintaining a healthy width of beach retains sediment that can on occasion move north to supplement the beach in front of the town.

A recent study has considered the frontage and the behaviour of the shingle bank to the south of the estuary. The study generally confirmed previous work that the curve of the shore is quite stable in terms of net wave energy and that there is only a limited net drift along the shore. Associated with this, however, is that there is little sediment supply of shingle, which is critical in making up the backshore. Considering the cross-shore profile, the study demonstrated that, while there would be natural roll back with sea level rise, there would also be increasing overwash, such that roll back would tend to be as a process of overwash fans, reconsolidation with retreat and further overwash. This will result in regular flooding and eventual inundation of the marsh land behind.

Dunwich cliffs act as a control point on the coast, anchoring the southern end of this shingle backed bay and allowing a build up of the volume of shingle at the southern end. This can be seen in the development of the more substantial banks in front of the Reedland Marshes, compared to the narrow ridge in front of the Corporation Marshes. The transition occurs somewhere in the vicinity of the Dingle Great Hill. There is some indication that the roll back rate of the shingle bank is greater than the rate of erosion of the Dunwich Cliff line. Since there is no significant discontinuity, it is suggested that over the longer term this progress of erosion will occur in a stepwise manner. As the cliffs become increasingly exposed by the progressive roll back of the shingle, they become more vulnerable to erosion. The cliffs go through periods of more rapid erosion, possibly triggered by more severe wave conditions.

Overall the coastal system south of Southwold is strongly controlled by the position of the estuary mouth, both to the north, in retaining the beach south of Southwold and in controlling the shape of the coast to the south, particularly over the section between Walberswick and Dingle Great Hill. This control is imposed by the structures of the harbour mouth. The direct influence on the coast of actual flows into and from the estuary is quite small due to the control of the existing structures. The more indirect impact is on the way in which management further up the estuary would influence management of structures within the harbour reach and at the mouth. The integrity of these structures

is strongly influenced by the tidal prism of the estuary. Management within the estuary, therefore, has significant importance in relation to the management of the coast.

Within the Blyth Estuary it has been shown that management upstream of the A12 has little overall influence on estuary behaviour (defence of this area has now effectively been abandoned). The abandonment of defences from the 1940s through to the 1960s over the inner estuary (in the area between Blythburgh and the Reydon and Tinkers Marshes), however, significantly increased flows through the two lower reaches. Interpretation of the hydrodynamics during the development of the recent Estuary Strategy suggests that the estuary became slightly ebb dominant. This imposed increased stress on the confined channel width between Tinkers and Reydon Marshes, between the north and south of the harbour reach and at the harbour mouth. This interpretation is contended by evidence assessing sediment deposition over the extent of the inner estuary intertidal marshes. This evidence is based on an assessment of current levels compared to levels indicated on the James Walker map of 1840 and supported by limited core samples around the upper areas of the marshes. Recent research suggests that the normal balance of flow within the channel may be slightly flood dominant, but that due to wind generated wave action this changes to a net loss of sediment from the estuary over the longer term.

A further study has since been undertaken (Ken Pye Associates Ltd. 2009). This involved taking a comprehensive number of core samples over the marsh and mud flat areas within the estuary. The conclusions of this study have demonstrated that there has been a significant increase in level over these areas since the defences were abandoned. The study concludes that the average vertical accretion of the marshes has kept pace with sea level rise over the whole period. As part of the study more recent data was used covering a period of some 13 years. This showed continuing accretion of the mud flats over the full period. The period over the last 5 years included within the 13 year period, however, showed a decrease. This apparent anomaly highlights the present difficulty in extrapolating data to the future behaviour of the estuary. There recorded in the report concern over the accuracy of the more recent data set, with the indication that the assessment over the 13 year period is probably a better indication of the current pattern of accretion. The study concludes that the estuary has the capacity to accrete fine sediment and that it is quite possible that *'average tidal flat accretion rates will increase from present levels in response to any acceleration in sea level rise'.* Fine sediment from the cliffs to the north of Southwold are considered by the study to be a significant supply to the estuary.

This study reconciles the some of the contradiction between the estuary modelling and the conclusion of the report, highlighting that it is possible to have ebb tidal flows within the main channels at the same time as having net accretion over the different conditions applying to the tidal flats.

Pressure on defence embankments within the upper estuary is not solely related to change in tidal prism. The low water channels have been constrained by defences and management of these defences. The natural process of change in the meanders of the channel will continue to create pressure points on the defences.

Abandoning defence of the marshes within the estuary would create a large increase in tidal volume. This would impose considerable pressure on the structures at the mouth of the estuary.

In terms of this influence on the coast, if the defences within the inner estuary are abandoned, the most significant influence on the tidal prism would be the flooding of the Reydon Marshes. This would increase flow rates by some 50% within the harbour reach. Its direct impact on coastal processes would be relatively low, potentially increasing the size of the ebb tidal delta. This would result in some

adjustment to the coast but this is relatively minor in comparison with the control imposed by the harbour structures at the entrance. Abandoning Tinkers Marsh would have a similar but smaller effect. Similarly, inclusion of Robinson's Marsh would have less impact but would still increase flow at the harbour mouth. Potentially abandoning the defences at Tinkers Marsh would relieve pressure on the Reydon defences but only significantly if this was accompanied by allowing realignment of the channel. Abandoning defences to the back of Buss Creek is unlikely to have a major impact on the estuary. Increased flood risk between Southwold and Reydon is controlled by the recent works and the sluice and penstock in the area.

As discussed earlier the main impact on the coast would arise from abandonment of the harbour control structures. The ability to manage these structures would depend on the pressure brought about by the increase in tidal volume. Removal of defences throughout the estuary system is considered within the unconstrained scenario below.

Unconstrained Scenario:
The unconstrained scenario assumes that all defences are removed. Although unrealistic, in terms of the residual impact of existing defences the scenario does highlight the natural pressures on the coast.

The most significant impact on the coast overall would be with respect to the Southwold Headland. With no defences there is likely to be increased erosion along Easton Bavents and exposure of the cliff to Southwold behind the pier. There would be some residual influence of the nearshore seabed, tending still to result in sediment being moved offshore from the north. The exposure of the cliffs would allow erosion of the headland with little sediment held as a beach to the base of the cliff. As the headland eroded back, its influence on the shoreline would decrease and the whole coast would effectively retreat. The erosion of the headland is likely to be slower than potential rates of erosion to the north and south and this cliff, after a period of adjustment, would still tend to control the general eroding coastline.

In the area of the Blyth Estuary, in the absence of control at the mouth, there would be an immediate response in the coast. The sediment held to the north would rapidly erode with some being fed into the larger ebb tide delta created by the significantly increased tidal prism of the estuary. It is probable that the estuary mouth would also infill such that there would be an area of low lying marsh covering the whole inlet mouth. The baseline of the coast would retreat significantly, although held forward to some degree by the ebb tide delta. There is potential for the coastal system to revert back to the situation of a southerly spit developing across the Blyth. However, the overall coastal shape has changed significantly over the last several hundred years, with major changes in sediment supply. The underlying shoreline shape is likely to retreat as far back as the village of Walberswick, with the coast to the south retreating over its full extent down to Great Dingle Hill. While with such retreat the shingle bank may indeed become more resilient, there would be regular inundation of all marshes behind, extending into the Westwood Marshes. Dunwich would still control the southerly point on the coast.

POTENTIAL BASELINE EROSION RATES

Base rates have been assessed from monitoring and historical data. The range of potential erosion is assessed in terms of variation from the base rate and sensitivity in potential sea level rise. Further detail on erosion rates is provided in Appendix C.

(Sea Level Rise assumed rates: 0.06m to year 2025; 0.34m to year 2055; 1m to year 2105)

Location	Base Rate (m/yr)	Notes	100yr. Erosion range (m)
Easton Bavents	2.6	Varying from north to south.	220 and 490
Southwold	0.5	Higher rates to north and south.	50 to 350
The Denes	2.9	Held forward by harbour structures.	50 to 550
Walberswick	3	Held forward by harbour structures.	130 to 440
Corporation Marshes	1.2	General roll back.	50 to 110
Reedland Marshes	0.5	General roll back.	15 to 30
Dunwich	0.6	Erodes intermittently.	25 to 103

4.3.2 PRESENT MANAGEMENT

Present Management is taken as that policy defined by SMP1, modified by subsequent strategies or studies. It should be noted that both in the case of SMP1 and that of many of the strategies undertaken before 2005, the period over which the assessment was carried out tended to be 50 years.

SMP1			REVIEWED POLICY		
MU	**LOCATION**	**POLICY**	**REF**	**LOCATION**	**POLICY**
BEN 5	Benacre Pump Station to Easton Marshes	retreat	S5 S5 P11	Easton Bavents Cliffs Easton Marshes Easton Marshes (25 years and review)	NAI HTL HTL
BEN 6	Southwold	HTL	S5	Southwold (confirmed by PAR)	HTL
BEN 7	The Denes and Harbour	HLT	P11 S5 S13	The Denes (50 years subject to Estuary Strategy) Blyth Estuary Blyth Estuary. Managed withdrawal of defences (under review)	HTL (then NAI) Subject to investigation NAI
MIN 1	Walberswick to Dunwich	Retreat	S5 S5 S5 S5	Walberswick Dunes Walberswick secondary line Walberswick to Dunwich Marshes Dunwich	NAI HTL MR Limited intervention

References:

S5	*Lowestoft to Thorpeness Coastal Study*
P11	*Southwold Coastal Frontage PAR*
S13	*Blyth Estuary Strategy*

The policy determined from the Catchment Flood Management Plan (2008) for the Suffolk Coasts and Heaths Area is set out below.

Policy two – reduce existing flood risk management actions (accepting that flood risk will increase with time). In the Suffolk Coast and Heaths we will accept that flood risk will increase in the future. The most vulnerable receptors to flooding are the environmental sites at risk. The risk to these sites now and in the future for a policy two response is not unacceptable. Under a policy two response 50 more people will be at risk (these are mainly in isolated properties) and economic agricultural damages will increase by £101,800. By adopting policy two the investment in flood risk management activities can reduce by £97,500.

Adopting policy two means that flood risk will remain acceptable in the future, despite the impact of climate change and urban growth. The existing level of flood risk is not considered to be unacceptable so we do not have to invest in an extensive effort in reducing flood risk from its current level either now, or in the future. The Environment Agency can accept that risks will increase in the future and they will not reach an unacceptable level. This policy is appropriate for this policy unit because:

- the current and future levels of risk are not deemed to be unacceptable;
- the small and acceptable level of risk under this option means that any additional measures the Environment Agency undertake would be disproportionate to the level of risk;
- investment into flood risk management will be reduced in the future. The scale of flood risk in the Suffolk Coast and Heaths is such that under this policy option the estimated properties damages are £2.4 million for a one per cent AEP event (an increase of £550,000), and agricultural damages are £484,300 (an increase of £113,600). The one per cent AEP event would affect approximately 12 more properties in the future and up to 50 more people will be at risk. Most of this increase in risk will be spread among Shottisham, Leiston, Therberton and Wrentham, but also among the more isolated areas and hamlets located in policy unit one. By scaling down our existing actions across this policy unit, the risks to society and the economy remain at an acceptable level over the next 100 years. There are 34 internationally and nationally designated environmental sites at risk in this policy unit. The greatest risk will be to the Stour-Orwell estuary Ramsar and SPA.

When this policy two is applied to a large area there could be some individual areas where a reduction in measures could not be adopted, because of unacceptable risks.

Baseline scenarios for the zone

No Active Intervention (Scenario 1):

Under this scenario there would be no further work to maintain or replace defences. At the end of their residual life structures would fail. Defences would not be raised to improve standards of protection.

The present scheme for Southwold aims to provide defence over the next 20 years but with the case made for continued protection over the next 100 years. There will be the need for groyne replacement and recharge in the future. The With Present Management approach would therefore continue defence. However, under this NAI scenario, failure of defences to Southwold would occur at the start of the second epoch. There would be progressive cliff failure as erosion occurred and the headland would retreat. Associated with this would be the failure of the defences to the north, increasing erosion pressure on the Southwold frontage as the cliffs at Easton Bavents erode back. Buss Creek would form a tidal inlet and there would be a tendency for shoreline sediment to infill in to the small bay created. There is unlikely to be a significant ebb delta and there would be an increasing discontinuity in the coast exposing the northern flank of the Southwold Headland as the coast to the north rolls back. There would be increasingly regular flooding to two major roads into Southwold and to property at Reydon and to the back of Southwold around the edges of Buss Creek.

There would be substantial loss of the sea front infrastructure (including the pier) and continued loss of properties at the crest of the cliff. Erosion could cut back as far as Stradbroke Road and Constitution Hill, including the loss of the Lighthouse. Potentially the set back line would include the town centre and beyond the period of the SMP erosion would continue. In effect, Southwold would cease to exist as a major town. To the south there would be the loss of Gun Hill and the area of the Denes. Significant erosion to these areas would occur as soon as the North Pier was lost in around 20 years time.

Regular flooding of the Havenbeach Marshes would be expected even within the second epoch as failure of defences within the inner estuary occurs. The most significant failure, in this respect, would be to the Reydon Marshes (within 5 years). This would significantly increase the tidal prism, increasing pressure along the harbour reach and undermining the harbour control structures (the

North Pier within 20 years, possibly the South Pier and Walberswick Quay earlier). On the Walberswick side, the coast would cut back, most probably to the secondary line of defence but possibly to include Ferry Road by the end of the second epoch (50 years). The higher ground around the village, in association with the influence of the estuary and its delta, would tend to reduce erosion over the final epoch of the SMP (dates 2055 – 2105) such that this set back line of erosion would only change slowly in the future. The initial changes would occur rapidly once the influence of the North Pier was lost. However, as Southwold continues to erode back there would be continued pressure on the whole coast into the future. The overall effect would be the loss of the harbour and flooding throughout the estuary as well as loss of the seaward end of Walberswick.

Within the estuary much of the area would become mudflat. There would be some accretion of the flooded areas, but potentially only gradually warping up to form saltmarsh on the estuary fringe as the estuary settles down to the sudden increase in flow arising from the inundation of the inner marshes. The loss of defence in the estuary would result in regular flooding to the Wang Valley and there would be substantial loss of the existing reed beds and grazing marsh. The A1095 would be subject to flooding. The A12 would also be regularly flooded and, as defences failed in this area, this would become increasingly frequent with sea level rise. The area above the A12 would flood regularly with the development of saltmarsh.

To the south of Walberswick the coast would roll back slowly initially, as at present, but there would be regular tidal flooding within all the marsh areas. Following the initial failure of the South Pier and then of the North Pier, roll back of the frontage would increase. Over the Corporation Marsh frontage, rather than the 20m to 30m erosion predicted in the Dunwich to Walberswick PAR (*Halcrow 2007*), the extent of erosion could well be between 100m and 300m. At Dunwich, there may be an initial benefit in terms of increased sediment supply due to the increased erosion to the northern area. However, this would be short lived. The system of shingle banks and cliff would continue to erode back. During the initial epoch, the Ship Inn may be threatened and this property, together with the visitor facilities, is likely to be lost over the next 50 years. It is not expected that the monastery would be lost over 100 years, although this remains a more extreme possibility. There would be increased risk of flooding to the road in the valley of the Dunwich River and to property facing the marshes.

With Present Management (Scenario 2):

The With Present Management scenario assumes that the policies either of the SMP1 or subsequent strategies apply. This does not necessarily imply a Hold the Line approach throughout the area. Furthermore, it has been assumed that WPM includes the approach set out in the Environment Agency Strategy for the Blyth Estuary, even though this is still under review. This strategy sets out a preferred option for withdrawal of flood defence management throughout the estuary. It is anticipated that the defences at Reydon Marsh and Tinkers Marsh will fail over the next 5 years and no action would be taken to repair these, that defences within the harbour reach will fail generally over the next 20 years and that defences above the A12 have, in effect, failed already. The defence to the back of Buss Creek may fail over the next 5 years, but works have been undertaken to protect against potential flooding to the back of Southwold.

With the failure of the defences within the Blyth, due to the increased flow through the entrance to the harbour, it would be unrealistic to maintain the harbour piers. The use of the harbour would become increasingly untenable and so within this scenario, it is assumed that the structures within the harbour will also fail progressively within the second epoch. The SMP1 policy for the North Pier is HTL which would demand that the northern pier is maintained. However, this would be inconsistent with the Estuary Strategy.

The strategy and study for the Southwold frontage allows for this eventuality in a nominal manner with the proposed construction of a control structure beneath Gun Hill. Such a structure would act to retain sediment to the north but a far more detailed examination of this would be required to develop this option. In reality, construction of a large groyne in this area is likely to be more difficult to maintain in the long term than the current control structure at the entrance to the Blyth. Under the Southwold strategy the substantial initial works, which have already been undertaken, assume defence of the Southwold Town frontage over the next 100 years. The strategy concludes that defence of the Easton Marshes is only maintained over the next 25 years with a review to follow this, although it assumes defence over the 100 years in justifying the recent scheme. A bund across Buss Creek was constructed in 2005 in anticipation of the Estuary Strategy possibly allowing the estuary defences to fail. The overall approach to holding the line at Easton Marsh recognises that this defence would be outflanked as the cliffs of Easton Bavents erode and allows for a return defence closing off the possibility of flooding to the marshes. All the above is taken as the WPM scenario.

A study was undertaken of the Walberswick Marshes which has concluded a policy of managed realignment (although this has not yet been confirmed). This does, however, conform with the previous policy determined by the Lowestoft to Thorpeness Strategy. The study recommends construction of a new sluice to the Dunwich River in the short term at Walberswick. The study is based on the assumption that control of the Blyth entrance is maintained and, therefore, under the WPM scenario defined above for the estuary; this recommendation for a new sluice would need to be re-examined. The Dunwich to Walberswick study further recommends improvement to the defence embankment to the back of the Dunwich River over the short term and construction of a new defence set further back to defend the Westwood Marshes. The study highlights significant loss of designated freshwater habitat affecting key species. While the study suggests that this should not be considered as part of a plan or project, the need for replacement habitat is still recommended.

At Dunwich cliffs, the policy is effectively No Active Intervention, although the current works to the foreshore have been allowed as a temporary trial measure. With respect to the defence along St James's Street, the Dunwich to Walberswick study recommends improved flood defence. This area

was not previously considered by the SMP1 or the Lowestoft to Thorpeness Strategy, but this policy for defence is taken as being within the With Present Management scenario.

The above discussion defines the With Present Management scenario as incorporating approaches taken by the various studies. Under this scenario, the most significant aspect is that the control imposed by Southwold remains. This provides a starting point in division of the coast such that sections of the coast to the north and south may be considered separately.

North of Southwold

To the north, defence would be maintained to the town and would provide protection against flooding. The properties at Easton Bavents to the north of the main town would be lost and the property in front of Broadside Farm would be lost within the first epoch, as would the seaward property at Easton Lane. The remaining properties at Easton Lane would be lost within the next 50 years. With respect to Broadside Farm and the properties at Southend Warren it is more difficult to assess when loss would occur. It is probable that, as general erosion cuts back, the policy of creating a return defence at the northern end of Easton Marshes would form a step in the coast of possibly some 50m before beach material was retained sufficiently to result in stability of the cliff. This would fail to provide protection to the properties immediately to the north. This may not provide sufficient protection to the farm over the longer period.

The corner of the defence would have to be reinforced considerably and the main wall, irrespective of the rock groynes, would have to be further protected along much of its length. The impact of the defence is also likely to be that material moving south tends to be thrown offshore to a greater degree, although whether this would then tend to feed back to the town frontage is uncertain.

South of Southwold

To the south of Southwold the loss of the harbour structures will have the most significant impact. In holding Southwold, this impact is likely to be greater than if Southwold were not held. The area to the south would tend to receive considerably less drift and this would affect the development at the mouth of the estuary. The following map shows the anticipated alignment of the coast following failure of the harbour mouth, but with a control point at Gun Hill.

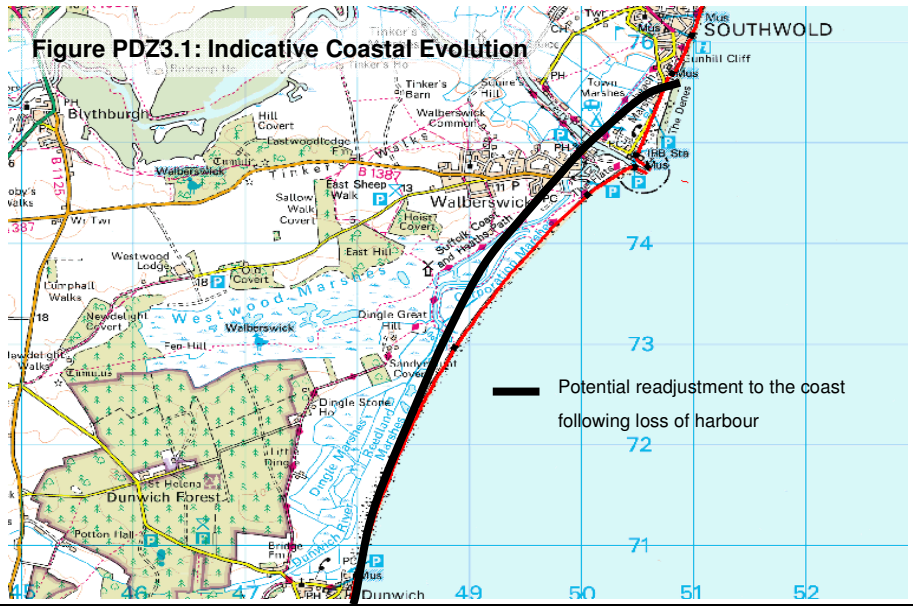


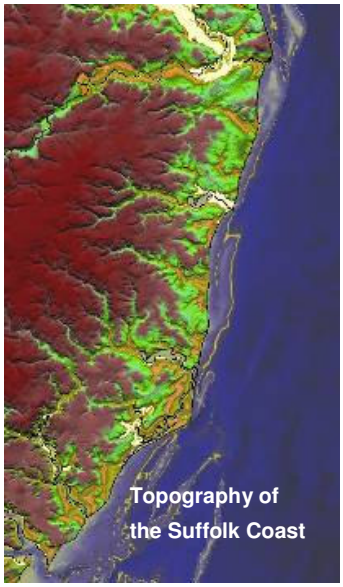
Figure PDZ3.1: Indicative Coastal Evolution

The estuary would still tend to develop an ebb tide delta and this would tend to hold the coast forward, but the pressure on the secondary flood defences at Walberswick would be considerable.

The WPM management policy here is to hold these defences, creating a further hard point in defence of the village. This may, on the northern side, then create the opportunity for more established growth at the estuary mouth and may in turn control the shape of the coast to the south. There would be considerable cost involved with upgrading these defences to Walberswick.

In developing the estuary policy, it has been assumed that the A12 would be defended by the Highway Authority. However, at Wolsey Bridge it may well be that the A1095 is abandoned. This would have both economic and environmental consequences. The Estuary Strategy would result in significant increase in mudflat and saltmarsh potential, as would WPM in terms of open coast management for the Walberswick Marshes. There would, however, be substantial loss of freshwater grazing marsh and reed beds. The Estuary Strategy identifies the need to recreate equivalent habitat elsewhere in the coastal area. This was an issue also highlighted by the CHaMP. Within the CHaMP, specifically within the Blyth, it was assumed that potential lay in the area upstream of the A12. It is now anticipated by the Estuary Strategy that this area would be opened up to tidal flooding.

WPM places an increased burden on identifying such habitat opportunities. Within the coastal area of the SMP the only significant areas identified by the CHaMP were within the three main estuaries or within the Kessingland Levels. It may be seen that the Suffolk coastal plain is very narrow, principally formed within small, relatively steep valleys. The opportunity for coastal fringe grazing marsh and freshwater areas is, therefore, severely constrained.



Topography of the Suffolk Coast

WPM at Dunwich would not be significantly different from the scenario of NAI. The current works on the shore provide a degree of additional resistance to the shingle beach in front of the cliffs. These works have not been fully tested under the more severe conditions which tend to cause cliff cut back. It is considered that, while potentially beneficial in the short term, these defences would not be robust enough to resist a major storm.

Overall, WPM would maintain the defence of Southwold but, under this baseline scenario, in a manner increasingly isolated from the way in which the coast elsewhere will behave. Of particular significance would be the increased difficulty of maintaining the harbour and the beach area in front of Southwold. Both these aspects would fail to sustain important values to the area. It is recognised that maintaining the defence to Southwold will involve significant future cost and that maintaining a suitable area of beach will become increasingly difficult. Loss of the Denes and loss due to coastal squeeze of the beach to the north would exacerbate this. Furthermore, the loss of use of the harbour would have a serious impact on tourism, affecting Southwold as a key tourist destination within the SMP area. Similarly at Walberswick there would be a significant overall loss of value both in terms of the harbour and the important area of beach associated with the village.

The above discussion also highlights the inherent dilemma when freshwater and coastal intertidal nature conservation interests are present in close proximity to one another and managing to benefit one of them will result in damage to the other.

Economic Assessment.

The following table provides a brief summary of damages determined by the SMP2 MDSF analysis for the whole PDZ. Further details are provided in Appendix H. It has been highlighted where further, more detailed information is provided by studies, this is highlighted. The table aims to provide an initial high level assessment of potential damages occurring under the two baseline scenarios.

MDSF ASSESSMENT OF EROSION DAMAGES

NAI		**Present Value Damages**
Location	*Assets at risk*	**(£x1000)**
Easton Bavents	11 No. property.	£789
	Agricultural land.	£61
Southwold and Walberswick	628 No. property.	£18,815
Dunwich	6 No. property.	£386
WPM		**Present Value Damages**
Location	*Assets at risk*	**(£x1000)**
Easton Bavents	7 No. residential property.	£557
	Agricultural land.	£61
Southwold and Walberswick	189 No. property.	£4,477
Dunwich	6 No. property.	£386

MDSF ASSESSMENT OF POTENTIAL FLOOD RISK

Southwold	Property to Buss Creek and Haven Beach.	£29,672
Walberswick including inner estuary	Property and agricultural land.	£37,214
Dunwich	Property.	£224

OTHER INFORMATION:
The Estuary Strategy estimated damages for NAI were assessed in the order of £96 million, reducing to £47 million for the preferred option based on withdrawal of maintenance.
The coastal strategy at Southwold gave potential NAI damages prior to implementation of the scheme of £60 million. This included £15 million contingent valuation and a potential £16.5 million flood damage within Buss Creek.

General Assessment of Objectives

The following table provides an overall assessment of how the two baseline scenarios impact upon the overall objectives agreed by stakeholders. These objectives are set out in more detail within Appendix E. The table aims to provide an initial high level assessment of the two baseline scenarios, highlighting potential issues of conflict. These issues are discussed in the following section, examining alternative management scenarios from which SMP2 policy is then derived.

STAKEHOLDER OBJECTIVE	**NAI**			**WPM**		
	Fails	Neutral	Acceptable	Fails	Neutral	Acceptable
To maintain Southwold, Reydon and Walberswick as viable commercial centres and tourist destinations in a sustainable manner						
To sustain recreational opportunities of beaches and associated facilities						
To maintain the cultural value of Southwold and the Blyth Valley						
To develop and maintain the Blue Flag beach						
To maintain the character, commercial and recreational activities, and navigation to Southwold Harbour and associated area;						
To maintain the regional transport link and transport links throughout the area						
To support adaptation of the agricultural interest						
To support adaptation by the local coastal communities, including Dunwich						
To maintain Dunwich as a viable community						
To maintain biological and geological features in a favourable condition, subject to natural change, and in the context of a dynamic coastal environment						
To maintain important heritage and archaeological value						
To maintain or enhance the high quality landscape						
To support appropriate ecological adaptation of habitats						

4.3.3 DISCUSSION AND DETAILED POLICY DEVELOPMENT

Taken over the whole zone, with the interdependencies between the individual approaches to management of frontages, neither NAI nor WPM delivers fully the stakeholder objectives. The area around Southwold, Walberswick and the Blyth Estuary is complex in terms of management, with significant interaction and detailed issues relating to anticipated use of the coastal zone. However, these issues are currently not in significant conflict. The main constraint identified in the Estuary Strategy was in terms of funding. Indeed, the Estuary Strategy identified a different policy for management which was considered to deliver a better environmental (human and nature conservation) outcome. This option for management was then rejected under the remit of the study on funding grounds.

In examining the appropriate policy for the zone, the SMP is tasked with developing an approach which allows sustainable management in the long term. The aim is then to look back from this in examining how management of current issues and expectations can be achieved to take management forward in an appropriate direction. Clearly there are individual sections of the coast and estuary where there will be considerable pressure in management of defences and where, individually, management of such areas in isolation might not be considered sustainable. However, because of the interaction within the zone, this has to be viewed over the whole area. This has to take account of the increased pressure and impact management of individual areas might impose on other dependent areas. The role of the SMP is in considering a clear approach or plan for the whole area, defining the intent of the coastal flood and erosion risk operating authorities and also providing guidance to other managers and communities in managing their interests.

In general terms it is evident that management within the estuary and management of the Southwold Headland impacts on sustainable management of the rest of the coast. Consideration of these features is addressed initially.

KEY INTERACTIONS IN TERMS OF MANAGEMENT POLICY

Feature 1 Southwold	
Influence	The headland influences the management decisions to both north and south along the coast.
Management Options	The recent strategy study identifies a clear case for maintaining defence to the town, although there is an identified need to review future defence to the north.
Discussion of High Level Policy Decision	
Any other decision than holding the line at Southwold would result in considerable local and regional damage. There is no advantage in retreating the line of defence as this would merely transfer pressure on to other frontages.	
High Level Policy: The policy for Southwold Town frontage is therefore Hold the Line.	
Feature 2 Flood defence of the Blyth Estuary.	
Influence	Management within the inner estuary, principally at Reydon Marsh, influences the sustainability of both harbour operations and the defence of the harbour mouth. This then influences the behaviour of the coast in relation to management to the north and defence of Walberswick.
Management	WPM assumes that the Reydon Marsh defence will fail in the next 5

Options	years. This makes sustaining the harbour area unrealistic within the next 20 years, with consequential loss of the harbour control structures. Maintaining Reydon Marsh would considerably improve options for maintaining the harbour and harbour mouth structures, although there could be increased pressure due to sea level rise, particularly at the actual mouth of the estuary. It is technically feasible, though potentially costly, to retain defence to Reydon Marsh (either through realignment of the estuary channel or through re-establishing the whole defence). In the longer term there would be increasing risk of overtopping. Because of the nature of the defence this is likely to cause failure. Economically Reydon Marsh has sufficient benefit to warrant defence over the medium term, but inadequate justification for funding under the current funding regime. In the long term, on its own Reydon is unlikely to be considered sustainable. Options have to consider the potential for abandoning these defences.

Discussion of High Level Policy Decision:

Locally, in the long term, Reydon Marsh would not be considered sustainable on its own. However, given its potential impact on the lower estuary and impact on management decisions for the Harbour and the open coast, loss of Reydon Marsh would transfer pressure to these areas. This would cause significant loss of opportunity for balanced sustainable management over a much wider area.

Two potential policies exist for management for Reydon Marsh in the long term:

- To abandon Reydon Marsh now and accept the subsequent loss of the harbour. This would mean accepting consequential increased pressure and costs associated with management of Walberswick and the increased difficulty in maintaining the key values of tourism in relation to Southwold. This imposes a potentially unsustainable position on the coast where there would be an increasing need for heavier defence at Walberswick in the long term and increased difficulty in management of the Southwold frontage. With this policy there is no realistic scope for adjustment at the coast. The policy imposes a sequence of events which would also result in loss of the harbour area.
- Abandoning Reydon Marsh in the future but adjusting the mouth of the Blyth, such that the estuary is able to accommodate increased flows.

Other approaches were considered by the Estuary Strategy but rejected during consultation.

In terms of coastal management, the first policy would be rejected because of the unsustainable position it imposes on the coast in fulfilling realistic stakeholder objectives to support Walberswick, use of the harbour and maintaining the important values of Southwold, in a manner that would not significantly impact on the other attributes of the coast. The alternative policy with respect to Reydon Marsh still imposes the additional pressure on the harbour in the future and would need to be accommodated by the future adaptation of the harbour entrance. How this could be achieved would be closely linked to development of the harbour and would require time to examine and develop such a plan. Given such time, this would allow adaptation retaining in a sustainable manner key values for the area. This approach would also allow scope for further defining the long term behaviour of the estuary with respect to sea level rise, this being based on long term monitoring. Associated with this would be the need to examine how the use of the harbour area needs to be adapted to address the increasing risk of flooding to its operational area.

High Level Policy: The initial scenario – that of withdrawal of maintenance defences – is driven by present funding constraints. This remains a real risk and despite failing to provide the basis for a long term plan for balanced sustainability for the area as a whole, remains the default position in the absence of further economic justification or additional funding.

The latter scenario provides appropriate opportunity for adaptation, consistent with the aims of the SMP subject to additional funding opportunity. This latter policy, involving maintaining defences at Reydon Marsh but also maintaining the general function and northern defence of the estuary, is recognised to be the aspirational policy for the SMP. The principal constraint in adopting this policy is funding and this would have to be addressed. This high level policy for management of the estuary and estuary mouth is taken forward in the further, more detailed discussion below.

SUB-DIVISION AND DETAILED ASSESSMENT

The above high level discussion allows the coast to be considered in three sections. Management of Southwold allows consideration in detail of the area north of Southwold. The proposed continued management of the estuary mouth imposes sufficient constraint in the area of the estuary that decisions to the south of Walberswick may be considered in relative isolation.

Southwold North

The main long term issue is in relation to defence of Easton Marsh. The strategy has justified defence of this area in the short term, with a need to review in the medium to long term. The role of the SMP is to look at the long term position that might arise under the two basic scenarios of holding the defence line or allowing some form of realignment.

In the first of these, in the long term, a step would be created in the coast with erosion back from the northern end of the existing defence of some 50m. This return would have been defended with the intention to continue the defence of Easton Marsh and prevent considerable flood damage to this area. This would create a significant headland at this point and most probably increase the need for control in front of the wall. There would be an inevitable loss of beach and the potential constraint of shoreline drift to the Southwold Town frontage. While demonstrated to be economically justifiable in the strategy, this would impose a considerable burden on defence of this forward position. There is likely to be an increased need for defence just north of the pier to retain recharge to the Southwold frontage. The impact on the cliffs to the north would be to eventually reduce erosion. This would not significantly affect the loss rate of properties at Easton Lane, but would reduce potential loss risk to the farm and may slightly reduce the rate of loss to some of the properties just north of the defences.

An alternative approach is that the defences to Easton Marsh are abandoned after 25 years and in the long term the flood defence is maintained more locally to properties around the back of the Marshes. With the erosion of the Easton Bavents Cliffs, which would tend to erode more rapidly initially, the area of the Marshes would continue to erode back, exposing the northern area of Southwold which would be defended and effectively transferring the control of the coast further south. This point, just north of the pier, would be more heavily defended and, as the coast to the north retreats, would tend to create greater difficulty in sustaining defence to the main town frontage. This would

result in loss of the ponds and marsh behind the pier but would create a more sustainable approach to management of the Easton Marshes frontage in the longer term. It would allow a more natural concave shoreline with opportunity for retaining a more natural bay to the north. The main issue relating to this approach would be with respect to the main town frontage. The potential exists for unmanaged retreat to the north to create a promontory of the main frontage with little sediment supply. Given the drift of sediment within the nearshore area and therefore the presence of sediment, a solution could be created that encouraged sediment supply from this area rather than as direct long shore drift. This would require a significant structure just north of the pier.

A sub-option to this approach would be to impose some control at the northern end of the existing defences, while still allowing realignment over the Easton Marsh itself. This would aim to control but not stop erosion of the cliffs to the north, maintaining existing rates of loss to properties to the north, but designed to effect a more natural transition between the cliffs and the opening of the Easton Marshes. This would provide increased protection to the Southwold headland, although still not preclude the need for protection north of the pier. This would reduce loss behind the pier and create opportunity for enhancing development of a natural beach which would develop. This would be, in effect, returning to the condition experienced prior to the construction of the defences to Easton Marsh. The principle difference would be that there would be some management of the area, supporting the development of a beach and shingle ridge across Easton Marsh, and there would be a policy to defend the areas of Reydon, Southwold and the road access to Southwold against flooding.

The control of the coast at this northern point would impact on part of the Pakefield-Easton Bavents SSSI and downdrift of the Benacre to Easton Bavents Lagoon Special Area of Conservation and Special Protection Area. The intervention may therefore have an effect on the dynamics and erosion of these designated sites. For this reason, a full assessment of the potential impacts of this policy under the Habitats Regulations (1994) is required as part of the SMP process. This is addressed in more detail in the Appropriate Assessment (Appendix J), but essential features in relation to coastal behaviour are highlighted below.

With this sub-option the intent would be to examine the best manner in which to provide a transition from the eroding coast to the north to the protected frontage in front of the town. The separation of shoreline management and flood defence is a key aspect of this, allowing greater scope and width within which to manage of the frontage. A potential option for achieving this is discussed below, but it is recognised that this would need to be developed more fully with different options being considered.

The existing end of the defences would be developed as a control point rather than as merely a return of defence, as proposed at present. The principal difference would be in the detailed position and shape of the defence, aiming quite specifically to encourage a transition in sediment build up to the north, rather than providing a returned line of defence following inland back from the corner of the existing wall. In terms of impact on processes, this approach would tend to slow erosion over the Easton Bavents cliff over the initial 200m but encourage sediment transfer across the defended section. The broader scale impact would, however, be similar to that proposed at present. In both cases the impact further north would tend to hold the general alignment of the coast some way forward of a NAI line in the future, in accordance with the overall policy for holding the line at Southwold. As a secondary consequence, this approach may provide an opportunity for increased protection to the properties local to the northern end of Easton Marshes.

The general concept and general line of the coast is demonstrated in the plan below.

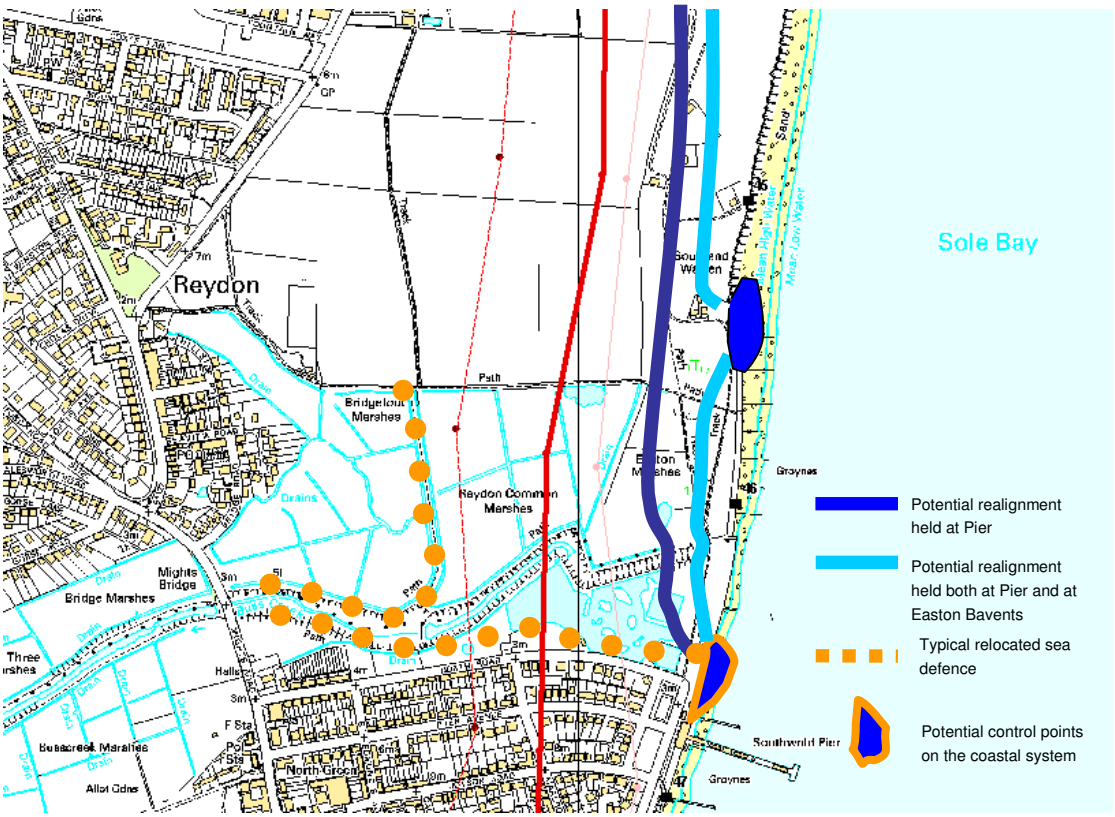


Figure PDZ3.2: Indicative Coastal Evolution with a Managed Approach

Realignment to Easton Marshes may be more costly initially, due to the need to remove the existing seawall and to improve a second line of flood defence to Southwold and Reydon. However, on balance, it is considered that this provides a more sustainable approach to long term management. The sub-option of managing the transition at the northern end of the existing defence would be feasible, providing the opportunity of improving the natural function of the coast between the erosion of the Easton Bavents Cliffs and the hard defence at Southwold.

The essential difference would be in the approach taken in managing the retreat of the cliffs in relation to the northern end of the defence. On balance, management of the Easton Marshes as a semi-natural defence with a secondary flood defence line protecting property and the road to the rear is considered to be the preferable approach to management. This would still maintain many aspects of the important sea front amenity. This would build in greater resilience to the flood defence function, moving the sea defence line away from the active pressure at the shore. This approach, however, needs to be considered in more detail. The overall intent of management would be to maintain a continuity of shoreline sediment drift and coastal shape, rather than a step in the coastline. To achieve this it is probable that the sub-option in managing erosion of the Easton Bavents Cliffs would be required. There would be loss to the existing car park area and there is still likely to be change in the natural values of Easton Marshes.

Concerns have been raised that in moving the flood defence to the back of the marshes, this would result in Southwold becoming and island. This is not the case. The intent of the approach is to ensure that there would be a continuity along the shoreline, between the eroding cliffs to the north and the hard defended frontage of the town. Inherent within the intent, therefore, is that a good beach and stable backshore area is maintained over the Easton Marsh frontage, similar to that across the broads to the north. This forward beach would be managed but in a manner that allows transfer of sediment through to Southwold. The flood defence to the rear would provide additional protection to property and assets to an appropriate standard.

In detail, the management of this area would need to be considered further. This would need to take in the management approach over the area north of Easton Marsh. Various techniques could be applied, including potentially the use of groynes, local low headlands or nearshore reefs. The detailed approach would then define the exact way in which the coast to the north evolves. The underlying aim is, however, to create a defence approach which maintains sediment transfer through to Southwold, providing this transitional approach, unconstrained by a linear flood defence within the active shoreline zone.

Various suggestions for management of the area have been put forward and there has been the example of the sacrificial defence of the Easton Bavents cliffs. Consideration of these in detail goes beyond the purpose of the SMP2 to review and set overall policy for management of the coast. However, the following comments made be made.

The concept of a long groyne, in the traditional sense of retaining up drift sediment, would not be supported in that this would restrict essential supply to the Southwold Town frontage.

Hard linear defence of the cliffs, extending defence beyond the present extent of the defences would increase the reliance on defences and in time would be subject to increasing pressure from erosion. It would, in effect, be exacerbating the very problem that the SMP policy is trying to avoid.

On their own, the defence of properties along the Easton Bavents Cliffs would not be economically justified in terms of flood and coastal erosion risk funding. However, as set out above, management of the whole frontage is needed to maintain sustainable defence to Southwold. The policy of managed realignment would not, however, preclude privately funded works where it could be demonstrated that such works contribute to the intent of maintaining appropriate sediment supply and drift to Southwold and managing the section of coast as a managed transition between the No Active Intervention policy defined for PDZ2, MA7. Any such initiatives would also need to meet the requirements of nature conservation interests in the area. This would include working within the intent to maintain the value of the Easton Bavents Cliff SSSI and to sustain the value of internationally designated habitats further north.

In defining policy over the area, but in recognising the change in nature of the frontage north of Southwold, the SMP defines two policy units: that section across the Easton Marshes and that section covered by the Easton Bavents Cliff. Both policies would be for Managed realignment. This recognises the need for specific management of the area of the marsh, to retain a substantial foreshore and to provide flood defence. In the case of Easton Bavents, the policy reflects the potential need to manage the foreshore further to the north in achieving the aims of defence of Southwold; the overall intent is not driven by need to defend assets in the immediate area.

The proposed change in approach from Hold the Line to one of managed realignment over the Easton Marshes frontage is proposed for the second epoch. The timing of this would be reviewed, subject to the behaviour of the shore over this area. Response to changes in behaviour, such as the need to provide a return to the northern end of the existing defence, would be viewed in light of the revised policy.

The Town Frontage

The approach to management of the town frontage has been defined in the recent study and is considered to be appropriate. As discussed above, a critical aspect of managing the frontage in a sustainable manner would be the maintenance of the supply of sediment to the frontage, avoiding defending Southwold as a promontory. This applies both to the north and south. The proposals to the north, set out above, aim to maintain a better supply of sediment. To the south, reliance on a significant control structure at the location of Gun Hill, while feasible, would tend to promote this isolation in terms of management of the town frontage. It would also result in the loss of the Denes. This aspect, together with the separation of management of the town from the coast to the south, would severely constrain future management options, result in the loss of a valuable length of shoreline and constrain beach use to that area immediately to the front of the town. While the sustainable management of the town frontage is established through the work undertaken by the strategy, the eventual detailed management of this depends on the decisions as to policy for the section of coast to the south. This is discussed below.

Southwold to Walberswick, including the Blyth Estuary

As discussed earlier, the Estuary Strategy concluded that the preferred environmental and socio-economic approach was to maintain defence to the north side of the estuary from the harbour mouth through to and including Reydon Marshes. This was found to be unaffordable based on the existing funding under flood risk management. The strategy is, therefore, proposing an overall policy within the estuary of withdrawal of maintenance to all defences, although consideration is being given to local or joint funding arrangements to maintain defences.

The SMP recognises this funding constraint. However, the policy for withdrawal of defence imposes significant difficulties in managing the coast in a manner that would achieve balanced sustainability. In particular it fails to address the concerns of those with interest in maintaining the function of the harbour and the associated importance of the harbour with respect to the Town and surrounding areas. The SMP has, therefore, to consider alternative scenarios for estuary management based on the information provided within the Estuary Strategy, but taking account of the broader impacts on the coast.

In considering these scenarios, in order to maintain the preferred control on coastal behaviour the North Harbour Pier would need to be maintained. The aim would also be to maintain the operation of the harbour and the integrity and defence of Walberswick. To the north, maintaining the North Pier would maintain the extended beach area to the south of Southwold and, considering the potential reduction on beach width to the town and further north, this may be critical. In managing this, the backshore defence to Havenbeach Marsh and the road access to the harbour could be managed in a sustainable manner.

During the late 1980s studies were undertaken into the potential development of the harbour mouth. They concluded that the existing configuration was appropriate in providing width to maintain the harbour entrance to allow navigation. However, these studies were based on similar flows as now with no consideration of potential realignment within the estuary or sea level rise. The main constraint for realignment within the estuary in the medium term is the potentially substantial increase in these flow rates. The Estuary Strategy presented an option for widening the estuary mouth but in relation to NAI intervention elsewhere. This option was rejected in preference for the option for management of the northern side of the estuary over the lower two reaches, even though this was then considered unaffordable. The strategy also highlighted that eventual abandonment of the defence to Robinson's Marsh would improve conditions along the harbour reach but that this, coupled to realignment elsewhere, would still impose unmanageable flow at the entrance. The South Pier has been given a residual life of no more than 5 years for the last 8 years, indicating that the structure is in a perilous state, merely waiting for the event which will result in its failure.

Blyth Harbour

Under an SMP scenario for realigning the entrance the question then comes as to what scope there is for widening the mouth.

Typically across this critical area the channel is some 60m in width. Crudely, this would need to be widened by a further 30m to maintain existing flow conditions if Reydon Marsh were to be eventually abandoned. The South Pier and the extension of this within the estuary mouth would need to be moved south by this distance.

Initially, if widened immediately, the mouth would be too wide. This problem might be further exacerbated if the estuary in its present condition continued to accrete. Irrespective of management decisions within the estuary, therefore, the approach to the harbour mouth needs to be able to be adapted. There is scope to allow this and the impact on the dunes to the south would be minimal. This adaptive approach needs to be built into management of and any repairs to the South Pier. In terms of policy, the intent would be to maintain the important navigational function of the Pier, adaption of the particular structures should be viewed from this perspective.

Further within the estuary the quay at Walberswick acts as a control point. Bathymetric surveys of the mouth have shown that there is a tendency for the deeper channel to be to the northern side of the channel. This is considered to be a contributory factor in the deterioration of the North Wall. With increased flows arising from a potential future abandonment of defences upstream, the impact of the Walberswick quay on the flow regime would increase. At present this quay is backed by open ground, with properties set back some distance. There is no reason to not consider setting back the quay structure to accommodate greater flow in the future, if this were found to be necessary. The scenario would need to be developed in considerably more detail in terms of the hydrodynamics, specifically in relation to future use and development of the whole harbour area. In respect to this, it is highlighted that both the quay and the operational area of the harbour (outside the existing flood defences) will be subject to greater depth and frequency of flooding. In future development of the harbour this needs to be addressed.

At the coast, change in the way in which the harbour entrance was taken forward could, potentially, have a beneficial effect on the sustainability of the forward line of dunes. There is the potential to increase the protecting provided by the ebb tide delta if flows from the estuary were increased or through design of a new South Pier. The costs associated with this scenario would be high and would need to be examined in relation to the anticipated value of maintaining and enhancing use of the harbour. These costs may, however, be offset to a significant degree by the potential reduced cost required for sustainable management of the coast. In addition, the approach, by giving long-term confidence in sustainable management of the harbour entrance, would in itself provide incentive for developing the harbour's potential, ensuring that less tangible socio-economic benefits could be derived.

Any associated flooding of Robinson's Marsh would need to be managed. In particular, there would be a need to examine local defence to property to the back of the marsh as identified in the Estuary Strategy. This option for abandoning defences at Robinson's Marsh is strictly at a strategy level rather than one of policy for the SMP. The opportunity in redeveloping the quay area in association with a retreat over Robinson's Marsh would need to accommodate replacement moorings and sustained operation of the ferry.

Under this scenario, therefore, the critical aspects would be the need to hold Reydon Marsh for a minimum of 10 to 15 years. This would need to be established within the plan for modification to the harbour. Over this period of time there would need to be studies of the hydrodynamic change to the harbour entrance and monitoring of the longer term behaviour of the estuary in determining the increase in tidal prism. This would feed back into the examination of how the harbour may be adapted.

From the above consideration of scenarios, it has to be appreciated that in reality the existing system of defences within the lower estuary (the harbour reach and the reach between Reydon and Tinkers Marshes) is unlikely to be sustainable in its current form. It is feasible to manage this and it is necessary to prevent a longer term problem of unsustainable defence at the coastline. The selection of an approach primarily hangs on the decision as to how the use of the harbour area is to be developed in the future, but also critically on the future behaviour of the estuary.

The threat to Reydon Marsh, however, is quite immediate. If Reydon Marsh were to breach, a decision would need to be made as to whether such a breach would be repaired. This would involve considerable cost and, if undertaken, would imply the intention to maintain defences in the medium term. If not undertaken, this would impose conditions further downstream that would make management of the harbour mouth unsustainable during the first epoch. This decision being made now is, therefore, critical in determining the future course of management of the whole lower estuary.

With respect to the upper estuary, the A12 has been identified as being essential for the economic well being of the region. This is the principal transport route through the area. Regular closure of the road due to flooding would have a significant impact on the region. It is concluded that the policy here would be to Hold the Line, but only in respect of the defence to the A12. The defences upstream of the A12 are subject to realignment or, in effect, abandonment at present. The only justification for reversing that decision would be

in relation to the possible need for this area with respect to freshwater habitat recreation. This has been discussed with Natural England and it has been concluded that the area above the A12 does not offer an appropriately sustainable location for maintaining critical freshwater habitat. This issue of replacement of freshwater habitat is significant with respect to the whole coast. Natural England is looking to the Environment Agency to identify suitable replacement areas through their regional habitat replacement programme.

In achieving a balanced sustainability – one where the overall values of the area are maintained – there is a need for managed change within the estuary. Following the findings of the Estuary Strategy, the SMP concurs that the option to maintain defence to the northern side of the lower estuary is the preferred plan, although recognising that this would not be achievable if relying solely on flood risk funding.

Associated with this preferred sustainability plan would be the recommendation that medium to long term management of Tinkers Marsh is an important aspect of this approach, providing potential scope for management of the risk to Reydon Marsh. Even with these changes an examination of how the estuary mouth can be allowed to adapt would still be needed.

The harbour entrance structures perform two functions:

- that of maintaining a sustainable defence to the section of coast to the north and, associated with this, maintaining the position of the southern coastline such as to provide protection to Walberswick,
- that of maintaining the use of the harbour.

From a coast protection perspective the first of these functions is considered very important and provides the greatest opportunity for sustainable management of the shoreline in terms of addressing protection needs and sustaining the essential beach use of the Southwold frontage. It is equally important with respect to risk management to Walberswick, creating a sustainable position through which to manage defence of the village. In terms of the principle role of the SMP the harbour structures are seen as providing an essential role in long term management of risk.

The second function is vitally important if the opportunity to sustain use and development of the harbour is to be maintained. It is recognised that future operation of the harbour need to be examined from a broader perspective. There is, however, a clear synergy between these two aspects relating to the harbour entrance structures.

The overall intent would be to maintain both functions of the harbour entrance, maintaining its important influence on the coast and sustaining the use of the harbour. This entrance, including structures to both north and south should, therefore, be considered as a unit with a policy to Hold the Line to achieve the above intent. This should not, however, be seen as a requirement to maintain all structures in their exact position. Indeed, there is a strong possibility that the position of individual structures would need to be adjusted to take account of future change in the estuary regime and to allow development of the potential of the harbour. It might be anticipated that the existing pier to the north of the estuary mouth would be maintained in its current position. There may be opportunity, as work is required to the South Pier and in the future as work is required to Walberswick Quay, to adjust the position of these structures. This would need to be considered together with respect to management of other areas within the estuary and in relation to the needs of the harbour. Any short term work to maintain the

South Pier needs to consider the potential for realignment in the future, so as not to constrain possible adaptation.

The funding issue has to be recognised. Without adequate funding the approach proposed by the strategy at present would form the default policy for the SMP. Furthermore, full funding is unlikely to be provided by the flood and coastal erosion risk management budget. In line with the recommendations of the national strategy 'Making Space for Water', a joint funding approach is required.

If the default position were necessary due to constraints on overall funding, the plan would be to abandon defences within the Blyth Estuary, in accordance with the EA strategy. Typically, this would result in loss of Tinkers Marsh as from present, loss of Reydon Marsh within 5 years and failure of the other defences over the next 20 years. Given the reduction in use of the harbour, the harbour piers would no longer be maintained. These structures would fail over the next 20 to 50 years. There would be erosion of the coast with the need for a structure potentially at Gun Hill to retain the beach at Southwold. There would also be loss of the dunes in front of Walberswick and the sustainability of the defences to the rear would need to be considered in detail. It is probable that erosion and flood defence of the village would be sustainable.

While the proposed management plan is realistic set against anticipated change, this will need to be monitored and reviewed. Notwithstanding the intent of the policy to manage the area, therefore:

- The uncertainty associated with the behaviour of this area needs to be taken into account in considering any policies and/or proposals for development in areas at risk of erosion or flooding.
- There will be continued risk of flooding on extreme conditions, in particular to the harbour buildings and work area, the public house and Walberswick Quay. Consideration in the longer term will need to be given here in terms of flood warning and emergency response, particularly in relation to safe access and egress.
- Ongoing monitoring and monitoring recommended by the SMP should reduce uncertainty. There remains the possibility that policy would need to be revised in the light of this monitoring. Any revision of policy would take account of potential damages to nature conservation interests and any indicated difficulty in maintaining defences.
- Local action has already been undertaken in sustaining defences and further local involvement in defence management is being discussed. It is indicated that the national priorities for FRM funds are such that areas within the estuary do not meet funding requirements. It is therefore likely that future works may have to continue to be funded via alternative sources and not necessarily government funding.

Walberswick to Dunwich

There is no sensible scenario other than allowing the shingle defence along much of the frontage to behave naturally. Such approaches as recharge or reprofiling of the shingle would, in the first case, be disproportionably costly and in the second create a situation that became increasingly vulnerable to sudden breach. This has been considered in the recent study and the SMP concurs with its findings. There are various defences within the rear marshes and, as recommended by the strategy, a more coherent approach is required to their management. This would provide the opportunity for sustainable management of a mosaic of transitional habitats, with freshwater habitats created at more

sustainable locations inland. Defences against flooding at Walberswick and Dunwich would need to be considered in detail. In both cases there would be significant loss to the overall integrity of the communities if the areas subject to flooding where allowed to flood on a regular basis. In the case of Walberswick, the erosion risk is addressed through holding the line of the mouth of the estuary. Flood defence in this area would not, therefore, be in an unsustainable position. In the case of Dunwich, although over the period of the SMP there would be loss of property along the shoreline, there is the opportunity for the community to adapt. Flood defence to properties along St James Street, and defence to the main access road, would not be in a position where there would be significant pressure. Loss of these properties and the road would significantly impact on the community. Clearly in the case of Walberswick there are issues relevant to the harbour management and estuary strategy.

Both the ruins of the Greyfriars Priory and the site of the Hospital of the Holy Trinity are important features of heritage and archaeology within the overall significant archaeological value of the village of Dunwich. The latter site is potentially at risk from flooding at present and this is being investigated further through the development of the strategy for the area. The need for management of this is recognised by the SMP. The site would also be affected the erosion and roll back of the shingle ridge.

The Priory lies within the predicted erosion line for the area, although this may only become critical in the third epoch. Even so, the overall interest in the whole area has to be considered and management plans for these interests need to be established.

Along the foreshore of Dunwich it is considered that while the trial defences in principle are sensible, they are not technically sustainable in their current form in relation to the type of major storm that might result in cliff erosion. The general long term process is seen as a roll back of the shingle bank, reducing sediment at the shore but not necessarily resulting in immediate erosion of the cliffs. However, this reduction in protection of the cliffs then makes the cliffs more susceptible to erosion under more severe conditions. The relatively free flow of sediment across the frontage is important in preventing any significant imbalance of the system. Greater reliance on defence would be increasingly difficult to maintain. The current low form of defence allows this relative balance to be maintained and it is purely the robustness of the materials that is in question. There is scope for allowing Dunwich to form as a slight headland, although not to the extent that it might need continued increasing defence and might prevent movement of supply to the south. Forming a more significant headland would in any event not be justified economically.

Subject to the longer term performance of the present trial, replacing these structures with similar, slightly more resilient low lying groynes would not be precluded within the SMP. Overall, however, the policy for Dunwich would be to allow natural erosion and not to significantly constrain sediment movement.

Management Areas

In summary, therefore, the zone is sub-divided into four management areas, these being:

- Southwold and Southwold North (three policy units).
- The Denes to Walberswick, including the mouth of the estuary (five policy units).
- The Inner Estuary (three policy units).
- Walberswick Marshes and Dunwich (four policy units).

The policy and intent of management is set out by management area in the following sheets.

PDZ3

SWD 08 - SOUTHWOLD AND SOUTHWOLD NORTH (CH. 21 TO 24)
BLY 09 - THE DENES TO WALBERSWICK INCLUDING THE MOUTH OF THE ESTUARY (CH. 24 TO 25.5)
BLY 10 - BLYTH INNER ESTUARY
DUN 11 - WALBERSWICK MARSHES AND DUNWICH (CH. 25.5 TO 30)

4.3.4 SWD 08 - SOUTHWOLD AND SOUTHWOLD NORTH

Location reference:	**SOUTHWOLD AND SOUTHWOLD NORTH (CH. 21 TO 24)**
Management Area reference:	**SWD 08**
Policy Development Zone:	PDZ 3

* 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.

The following descriptions are provided to assist interpretation of the map shown overleaf.

100 year shoreline position:
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Draft Preferred Policy" being put forward through the Shoreline Management Plan.

- In some areas the preferred policy does not change from that under the existing management approach. In some areas where there are hard defences this can be accurately identified. In other areas there is greater uncertainty. Even so, where the shoreline is likely to be quite clearly defined by a change such as the crest of a cliff the estimated position is shown as a single line.

- Where there is a difference between With Present Management and the Draft Preferred Policy this distinction is made in showing two different lines:

  With Present Management.
  Draft Preferred Policy.

- In some areas, the Draft Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

Flood Risk Zones

General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this Draft SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.

Indicate where over the 100 years the policy would allow increased risk of flooding.

The maps should be read in conjunction with the text within the Draft SMP document.


Policy Development Zone 3 - Easton Broad To Dunwich Cliffs
Management Area 8 - Southwold and Southwold North (Ch 21 To 24)
Key:
Policy Development Zones
Management Areas
Policy Units
Chainage
Scheduled Monuments
Kessingland
Wrentham
Southwold
Walberswick
Dunwich
PDZ2
PDZ3
21
22
23
24
SWD8.1
SWD8.2
SWD8.3
Sole Bay
SOUTHWOLD
SWD08
Reydon
SOUTHWOLD CP
Southwold Common
0
250
500 Metres
100 yr shoreline position:
Draft preferred policy would be the same as With Present Management
With Present Management where this differs from the Draft Preferred Policy
Draft Preferred Policy where this differs from the With Present Management
Indicative shoreline zone under Draft Preferred Policy
Note. Further explanation of these lines and zones is provided on the previous page.
Existing Indicative EA Flood Risk Zone
EA Flood Risk Zone where Draft SMP policy is for continued management of defence.
EA Flood Risk Zone 2 where under Draft SMP policy there would be increased probability of flooding.
ROYAL HASKONING

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN: The intent of the plan is to maintain the defence to Southwold in a sustainable manner, while maintaining the important nature conservation interests, reducing flood risk to assets within the main areas of development and maintaining the amenity value of the coast. In order to achieve this, the intent is to support policy which would maintain sediment drift from the north and to retain sediment to the south. The intent is not to treat the town frontage in isolation, creating a potentially exposed promontory. At the same time, looking to the adjacent frontage to the north, it is important not to place development pressure against a linear defence that would in the long term become unsustainable. Notwithstanding the important public use benefits behind this northerly defence, the key reason for managing this frontage in a highly linear manner is the need to provide flood defence to the area behind. Addressing this problem of flood risk by a set back defence creates greater opportunity for management of the shoreline. The plan is therefore to construct a retired flood defence to the back of Easton Marsh and to encourage more natural response and resilience at the shore. There is then the risk that the coast may retreat imposing increased pressure on the Southwold Town frontage. This may be addressed locally in the area of the pier but, more sensibly, through more extended management of behaviour of the coast to the north of the existing defences. The plan therefore recommends managed realignment of defence to Easton Marsh with a second line of defence and a transitional approach to defence at the north of this area, including options to prevent outflanking. This will require some form of control over the northern section of the frontage. Establishment of such control will need to take account of the coastal dynamics, which are important for geological SSSI interests and which support internationally important shingle habitats to the north and south.

Concern has been raised that managed realignment to Easton Marshes would, in effect, result in Southwold becoming an island and that access to the town would be impaired. Neither is the case. Quite specifically, management under the plan would provide defence to the principal access routes to the town. In addition, the plan would be to allow a more naturally functioning beach and backshore across the entrance to Easton Marshes, providing a more resilient shoreline, which could adapt to increasing sea level rise. This would form an essential consideration in taking the plan forward at strategy level.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Hold the Line to the Southwold Town frontage in line with the strategy for groyne replacement and recharge. Hold the Line of defence to Easton Marsh and undertake no works to the north.
Medium term	Hold the Line to the Southwold Town frontage in line with the strategy for groyne replacement and recharge. Review the approach to Easton Marsh, but with the intent to allow failure of the wall while developing a transitional approach to defence across the Easton Marsh frontage. This will involve management of the shoreline in front of the marshes and potentially to the north. Construct secondary defences around the rear of Easton Marsh and to the A1095.
Long term	Hold the Line to the Southwold Town frontage in line with the strategy for groyne replacement and recharge. Allow realignment within Easton Marsh, but to reinforce the north defence to Southwold and manage the natural realignment of the shoreline across Easton Marshes.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
SWD 8.1	Easton Bavents	MR	MR	MR	Managed realignment of this area is for the specific purpose of establishing a sustainable defence at Southwold. This would not preclude local private intervention in line with this intent, where it was demonstrated that works neither constrained sediment drift to the south nor had a material impact on nature conservation interests.
SWD 8.2	Easton Marsh	HTL	MR	HTL	Retired flood defence and transitional control at northern end
SWD 8.3	Southwold Town	HTL	HTL	HTL	
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

The current policy recommends review of defence at Easton Marsh after 25 years. The SMP policy for this area is for eventual managed realignment. The SMP policy for Southwold confirms that set out in the strategy.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	12,795	13,388	14,593	40,776
	Preferred Plan Damages £k PV	333	223	219	775
	Benefits £k PV	12,462	13,165	14,374	40,001
	Costs of Implementing plan £k PV	1,500	4,000	3,000	8,500

Strategic Environmental Assessment summary table for preferred policy MA COV 08

This is an excerpt from the **Strategic Environmental Assessment** undertaken for the Suffolk SMP – for the full assessment, please refer to **Appendix F** (**Strategic Environmental Assessment: Environmental Report**).

ISSUE	DETERMINATION
ISSUE - Maintenance and Enhancement of Biodiversity on a Dynamic Coastline	
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences – will SMP policy provide a sustainable approach to habitat management?	Designated sites in this Management Area are Pakefield to Easton Bavents SSSI. The Management Area seeks to enable natural development of the open coast to the north whilst protecting Southwold to the south. The features of the SSSI in this area require natural processes so this Management Area would therefore have a minor positive effect.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses – will there be no net loss of UK BAP habitat within the SMP timeline up to 2100?	The BAP habitat in this area includes: Maritime Cliffs and Slopes and Saline Lagoons. The Management Area promotes a natural movement of the coastline to the North of Southwold which will maintain the nature of the cliff/slope habitat. The epoch 2 realignment immediately to the north of Southwold may lead to the saline lagoons moving landward, but would create a more natural, sustainable area of coast. Therefore, the Management Area is considered to have a minor negative effect on this issue. Some BAP habitat may be lost but an equivalent amount of alternate habitat will be gained.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. For example, approximately 50 of 100 SSSI units assessed at the Minsmere-Walberswick Heaths and Marshes SSSI are in unfavourable condition, although the majority of these (36) are in an unfavourable recovering condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze – will SMP policy contribute to further SSSIs falling into unfavourable condition and address the causal factors of existing units which are in unfavourable declining condition (due to coastal management) wherever possible?	The SSSI in this Management Area is designated for coastal cliffs. The policy promotes natural coastal evolution which is necessary for the condition of this type of habitat. It is considered that this policy provides for a more natural development of the coast Therefore, the Management Area is considered to have a minor positive effect on this issue.
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life	
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements at estuary mouths	
The Suffolk coast is a complex system of dynamic and static shingle, beach frontages, urban areas and estuary mouths. The system has been maintained in recent years to provide relative	

ISSUE	DETERMINATION
stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	
Will SMP policy maintain an overall level of balance across the Suffolk coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	The Management Area provides the natural development of the coast in this undeveloped area to the north of Southwold whilst protecting the established settlement itself in a coordinated manner. Therefore the Management Area seeks to provide a level of natural balance. Overall, the Management Area will have a significant positive effect however due to the development of a natural coastal system.
Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	The Management Area will not lead to increased levels of erosion or flood risk. The overall effect therefore is neutral.
Will SMP policy commit future generations to spend more on defences to maintain the same level of protection?	The Management Area will not lead to any increased requirement for future defence works.
Does the policy work with or against natural processes?	The overall intent of the Management Area is to promote a natural evolution of the coast. The overall effect is therefore minor positive.
ISSUE - Maintenance of water supply in the coastal zone	
Agriculture on the Suffolk coast is dependent on the maintenance of a freshwater supply from groundwater aquifers. The delivery of this supply is threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion – will SMP policy maintain structures to defend water abstraction infrastructure and to avoid any exacerbation of levels of saline intrusion into freshwater aquifers.	The Management Area will lead to the natural development of this area, and will not lead to threats to aquifers or infrastructure. The effect of this Management Area is therefore neutral.
ISSUE - Maintenance of the values of the coastal landscape & Area of Outstanding Natural Beauty (AONB)	
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition and form.	

ISSUE	DETERMINATION
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Suffolk coastal landscape? Will SMP policy lead to the introduction of features which are unsympathetic towards the character of the landscape?	The Management Area will provide for the natural development of the coast to the north of Southwold whilst maintaining the iconic frontage adjacent to Southwold itself. The benefit is therefore expected to be minor positive. Apart from the shift in coastal form allied to the realignment in epoch 2, no new features are proposed by this policy.
ISSUE - Protection of historic and archaeological features on a dynamic coastline	
The Suffolk coast contains a range of historic settlements and harbours typically located on the open coast and mouths of estuaries (for example, Southwold - Walberswick, Aldeburgh, Shingle Street etc). These settlements may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast – will SMP policy maintain the fabric and setting of key historic listed buildings and conservation areas?	The Management Area provides protection for Southwold which contains a wide variety of listed buildings and conservation areas. The Management Area therefore actively secures the retention of these features.
The coastal zone in Suffolk contains a range of archaeological and palaeo-environmental features which may be at risk from loss from erosion within the timeline of the SMP – will SMP policy provide sustainable protection of archaeological and palaeo-environmental features (where appropriate) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	The Management Area provides an epoch before the realignment policy for the area to the north of Southwold, thereby providing adequate time for its study. The Management Area therefore may lead to the loss of features and this is therefore scored as neutral.
ISSUE - Protection of coastal communities and culture	
Protection of coastal towns and settlements	
The Core Strategies of Waveney Council and Suffolk Coastal District Council identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. These settlements are likely to face a higher level of risk from coastal flooding and loss due to erosion in response to sea level rise. There is a need therefore to ensure that the settlements below are protected for the duration of the SMP. Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation?	The Management Area promotes the natural development of rural coast and the protection of areas adjacent to Southwold. The Management Area therefore seeks to provide sustainable protection in a natural context and has a minor positive benefit.

ISSUE	DETERMINATION
Will SMP policy protect the coastal character of communities which have historically been undefended?	Easton Bavents Community has suffered loss in the past. Even so this community is not really typical of 'Living on the Edge'.
Protection of key coastal infrastructure	
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths (the primary footpath being the Suffolk Coasts and Heaths Footpath). The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Suffolk coastal area. Paths are often located close to the foreshore in areas at risk from coastal erosion (or within potential areas for managed realignment) – will SMP policy maintain or enhance levels of access along or to the Suffolk coast.	The coastal footpath in this area runs inland of the coast to the north, moving out and along the coast in the area suggested for realignment then moving along the coast in front of Southwold. The footpath would need to be realigned following realignment of the coast, but this would not seem problematic given the access routes landward of this area. The overall effect is therefore either neutral or marginally minor negative due to the loss of coastal frontage path on the site of the realignment.

APPROPRIATE ASSESSMENT - PREFERRED PLAN **MA 08**

This is an excerpt from **Appendix I** of the **Appropriate Assessment** undertaken for the Suffolk SMP – for a full description of the potential effects and any avoidance measures, mitigation or compensation required as a result of the policies, please refer to **Appendix J** (**Appropriate Assessment Report**).

Benacre to Easton Bavents SPA site features	**Article 4.1. During the breeding season the area regularly supports**: Bittern, Marsh Harrier & Little Tern	
Sub Feature(s) Vegetated Single Ridge Saline lagoons - these are a series of artificial system and natural bar built percolation lagoons representing a range of salinities. Benacre Broad is the most saline and Easton Broad is the least saline.	**Sensitivity** Sea level rise is causing loss of the lagoons through the landward movement of the confining shingle barrier. Disturbance of the shingle has led to colonisation of open areas by false oat grass, common mouse-ear and sea pea. Natural sea level rise will lead to more frequent saltwater inundation of the site. Whilst being beneficial to some habitats this will lead to loss of others. Natural processes if unchecked are likely over time to lead to the loss of these features. New lagoons have been created further back from the coast. The lagoons in this management area contain two marine species considered nationally rare or scarce - the starlet sea anemone and the lagoonal sand shrimp.	**Conservation Objective** To maintain*, in favourable condition, the habitats for the populations of Bittern (*Botaurus stellaris*) and Marsh harrier (*Circus aeruginosus*), with particular reference to swamp, marginal and inundation and standing water. Subject to natural change, to maintain* in favourable condition the habitats for the population of Little tern (*Sterna albifrons*), with particular reference to shingle and shallow coastal waters. * maintenance implies restoration if the feature is not currently in favourable condition.

Benacre to Easton Bavents Lagoons SAC site features	**Annex I habitats (as a primary reason for selection):** Coastal Lagoons (Priority feature*)	
Sub Feature(s) Coastal Lagoons - formed behind shingle barriers. Seawater enters the lagoons by percolation through the barriers, or by overtopping during storms and high spring tides.	**Sensitivity** The lagoons show a wide range of salinities; Easton Broad has extremely low salinity. The low salinity has resulted in specific vegetation types, including beds of spiral tasselweed Ruppia cirrhosa in brackish water and dense beds of common reed Phragmites australis in freshwater. The site supports a number of specialist lagoonal species. Sea level rise is resulting in erosion and landwards movement of the shingle barrier, leading to the reduction in area of each lagoon.	**Conservation Objective**

SWD 8.1 to 8.3

Potential effect of policy: It is considered that this Management Areas would not on consideration, have an adverse effect on the integrity of the international sites. There will undoubtedly be an effect in certain areas; however, no examples have been identified where this effect would be contributory towards an adverse effect on site integrity.

Implications for the integrity of the site: None

4.3.5 BLY 09 - THE DENES TO WALBERSWICK INCLUDING THE MOUTH OF THE ESTUARY

Location reference:	**THE DENES TO WALBERSWICK INCLUDING THE MOUTH OF THE ESTUARY (CH. 24 TO 25.5)**
Management Area reference:	**BLY 09**
Policy Development Zone:	PDZ 3

* 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.

The following descriptions are provided to assist interpretation of the map shown overleaf.

100 year shoreline position:
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Draft Preferred Policy" being put forward through the Shoreline Management Plan.

- In some areas the preferred policy does not change from that under the existing management approach. In some areas where there are hard defences this can be accurately identified. In other areas there is greater uncertainty. Even so, where the shoreline is likely to be quite clearly defined by a change such as the crest of a cliff the estimated position is shown as a single line.

- Where there is a difference between With Present Management and the Draft Preferred Policy this distinction is made in showing two different lines:

  With Present Management.
  Draft Preferred Policy.

- In some areas, the Draft Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

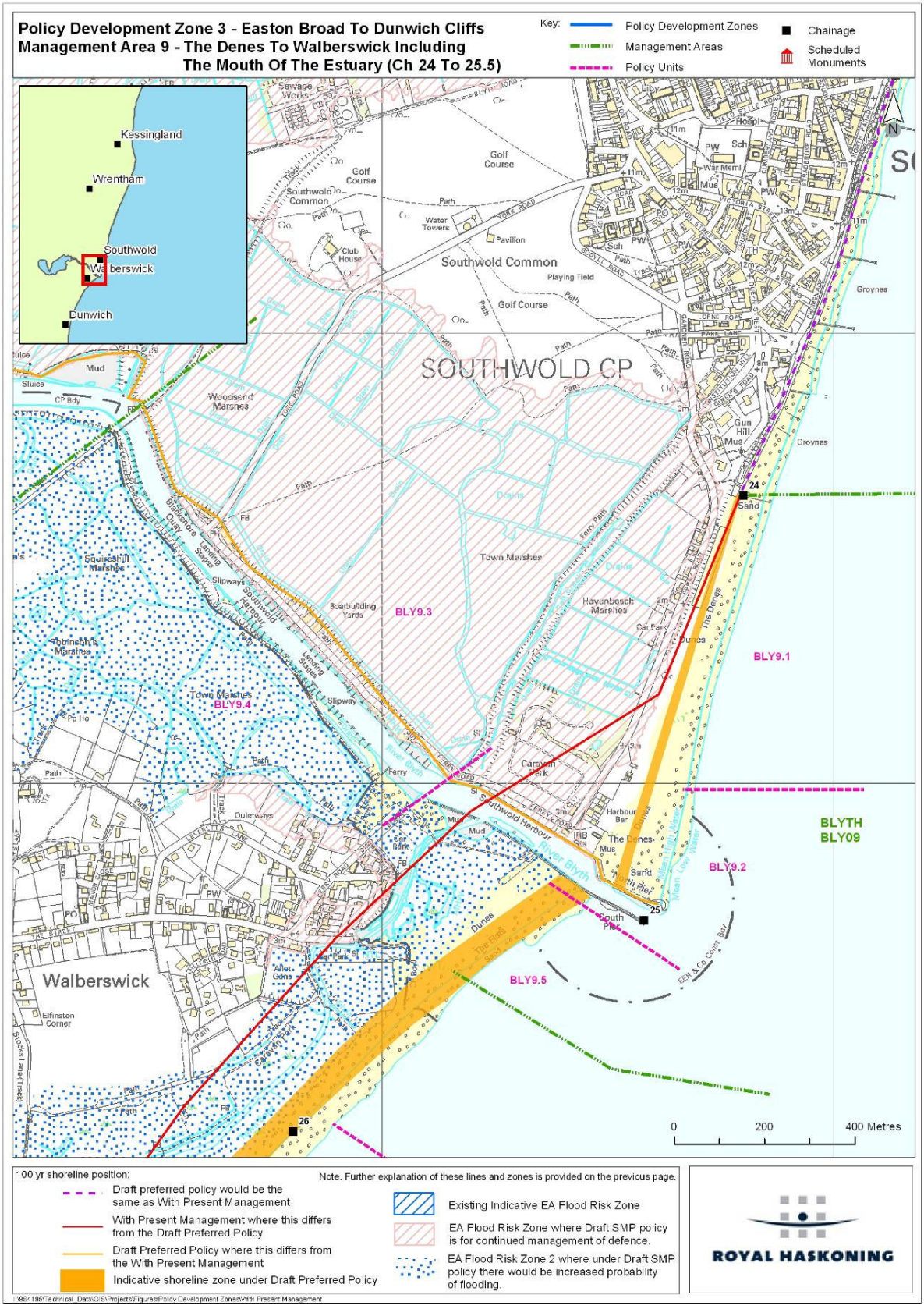
Flood Risk Zones

General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this Draft SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.

Indicate where over the 100 years the policy would allow increased risk of flooding.

The maps should be read in conjunction with the text within the Draft SMP document.


Policy Development Zone 3 - Easton Broad To Dunwich Cliffs
Management Area 9 - The Denes To Walberswick Including
The Mouth Of The Estuary (Ch 24 To 25.5)
Key:
Policy Development Zones
Management Areas
Policy Units
Chainage
Scheduled Monuments
Kessingland
Wrentham
Southwold
Walberswick
Dunwich
SOUTHWOLD CP
Southwold Common
Golf Course
Walberswick
BLY9.1
BLY9.2
BLY9.3
BLY9.4
BLY9.5
BLYTH
BLY09
24
25
26
0
200
400 Metres
100 yr shoreline position:
Draft preferred policy would be the same as With Present Management
With Present Management where this differs from the Draft Preferred Policy
Draft Preferred Policy where this differs from the With Present Management
Indicative shoreline zone under Draft Preferred Policy
Note. Further explanation of these lines and zones is provided on the previous page.
Existing Indicative EA Flood Risk Zone
EA Flood Risk Zone where Draft SMP policy is for continued management of defence.
EA Flood Risk Zone 2 where under Draft SMP policy there would be increased probability of flooding.
ROYAL HASKONING

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN: The principal intent of the plan is to maintain the high economic and socio-economic value of the area associated with the harbour and Walberswick in a sustainable manner. Within this, the harbour would be maintained along with the important dunes and beach south of Southwold. As such, the harbour entrance should be seen as a single unit with the intent of maintaining its function with respect to issues identified above. Although recent studies have indicated consistent accretion of the open mudflats within the estuary in line with existing sea level rise, there remains uncertainty as to long term influence on tidal prism from both sea level rise and future defence management. There may, therefore, be a need to adjust the position of the South Pier and the quay at Walberswick in response to medium to long term change in the estuary to sustain the function of the harbour entrance. Within the range of uncertainty, there remains doubt over the detailed management of Robinson's Marsh. This would need to be resolved at a detailed level. Even so, and irrespective of the detailed policy for Robinson's Marsh, the intent would be to maintain defence to the main area of the Walberswick Village. Should the Robinson's Marsh wall be allowed to fail, the intent would be to consider local defences to the village. The Estuary Strategy has demonstrated significant funding constraints. This plan would be subject to available funding in addition to that provided nationally under flood and coastal erosion risk management. Without such funding the default plan abandoning estuary defences would be adopted. This would not allow sustainable management of key values identified for the coastal area.

In setting policy there are therefore important caveats. It has to be appreciated that there is still uncertainty associated with behaviour of the estuary, in particular in relation to the ability to maintain defence within the middle section of the estuary and in relation to the estuary's response to sea level rise. In addition to the above there are potential impacts on the important natural conservation interests that need to be considered. While the proposed management plan is realistic set against anticipated change this will need to be monitored and reviewed. Notwithstanding the intent of the policy to manage the frontage, therefore:

- The uncertainty associated with the behaviour of this area needs to be taken into account in considering any policies and/or proposals for development in areas at risk of erosion or flooding.
- There will be continued risk of flooding on extreme conditions, in particular to the harbour buildings and work area, the public house and Walberswick Quay. Consideration in the longer term will need to be given here in terms of flood warning and emergency response, particularly in relation to safe access and egress.
- Ongoing monitoring and monitoring recommended by the SMP should reduce uncertainty. There remains the possibility that policy would need to be revised in the light of this monitoring. Any revision of policy would take account of potential damages to nature conservation interests and any indicated difficulty in maintaining defences.
- Local action has already been undertaken in sustaining defences and further local involvement in defence management is being discussed. It is indicated that the national priorities for FRM funds are such that this location does not meet funding requirements. It is therefore likely that future works may have to continue to be funded via alternative sources and not necessarily government funding.

At a more local scale, it has been identified that the Denes suffer from trampling by people and that this potentially reduces their capacity as a defence. Developing a suitable plan for management of this is noted in the SMP action plan.

Subject to the above issues:

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain the North Pier and the entrance to the harbour. Maintain defences along the northern side of the Harbour reach. Maintain Robinson's Marsh defences and Walberswick Dunes. Examine options for management of South Pier and Walberswick Quay in line with requirements to maintain the entrance to the harbour. Maintain the integrity of the Denes whilst allowing the dunes to adjust naturally.
Medium term	Maintain the North Pier and defences along the northern side of the Harbour reach. Allow failure of Robinson's Marsh defences and construct local retired defences. Maintain the integrity of the Denes whilst allowing the dunes to adjust naturally.
Long term	Maintain the North Pier and defences along the northern side of the Harbour reach. Maintain new defences to the south of the harbour mouth. Maintain the integrity of the Denes but allowing the dunes to adjust naturally.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		**Policy Plan**			
		2025	**2055**	**2105**	**Comment**
BLY 9.1	The Denes	HTL	HTL	HTL	Maintaining the integrity of beach and dune defence, allowing the dunes to respond naturally.
BLY 9.2	Harbour Entrance (north and South)	HTL	HTL	HTL	Maintain and improve the harbour structures in line with use and development of the harbour.
BLY 9.3	Harbour Reach north	HTL	HTL	HTL	Improve defence and raise in 50 years in line with harbour use. Policy will have to be reviewed if not technically feasible and/or economically justifiable using private funding.
BLY 9.4	Harbour reach south side	HTL	MR	MR	Redevelop defences in line with harbour use but maintain defence to Walberswick.
BLY 9.5	Walberswick dunes	MR	MR	MR	Retain beach and dunes as a defence.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

There is significant change to current assumed policy, although in line with SMP1. The change is required in maintaining a sustainable approach to shoreline management of Walberswick and the use of the harbour area. There is a need to develop a plan for change within the harbour, but with the aim of holding the basic form of the coast.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	-	-	-	104,377
	Preferred Plan Damages £k PV	-	-	-	28,926
	Benefits £k PV	-	-	-	75,451
	Costs of Implementing plan £k PV	4,375	500	25,823	30,698

Strategic Environmental Assessment summary table for preferred policy MA BLY 09

This is an excerpt from the **Strategic Environmental Assessment** undertaken for the Suffolk SMP – for the full assessment, please refer to **Appendix F** (**Strategic Environmental Assessment: Environmental Report**).

ISSUE	DETERMINATION
ISSUE - Maintenance and Enhancement of Biodiversity on a Dynamic Coastline	
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences – will SMP policy provide a sustainable approach to habitat management?	Designated sites in this Management Area are Minsmere Walberswick Heaths & Marshes SSSI, Minsmere Walberswick Ramsar/SPA and Minsmere Walberswick Heaths and Marshes SAC. The Management Area seeks to provide a sustainable approach to the sites of the Blyth whilst maintaining harbour side activity at the mouth. The Management Area seeks to provide stability to the mouth of the estuary by a HTL. The Management Area therefore will provide a significant benefit for habitat in this area
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses – will there be no net loss of UK BAP habitat within the SMP timeline up to 2100?	The BAP habitat in this area includes: Coastal Floodplain Grazing Marsh, Mudflat, Sand Dunes and Lowland Dry Acid Grassland. The Management Area promotes a natural development of the estuary and coast whilst maintaining a sustainable harbour. There would be a shift from Coastal Floodplain Grazing Marsh to grazing marsh influenced by saline intrusion and saltmarsh. It considered however that the overall provision of BAP habitat will remain constant. Therefore, the Management Area is considered to have a minor positive effect on this issue. Some BAP habitat may be lost but an equivalent amount of alternate habitat will be gained.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. For example, approximately 50 of 100 SSSI units assessed at the Minsmere-Walberswick Heaths and Marshes SSSI are in unfavourable condition, although the majority of these (36) are in an unfavourable recovering condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze – will SMP policy contribute to further SSSIs	The SSSI in this Management Area is designated for mudflat and grazing marsh. . The Management Area provides for a more natural management of this system and it is considered that policy provides for a more natural development of the coast and estuary.

ISSUE	DETERMINATION
falling into unfavourable condition and address the causal factors of existing units which are in unfavourable declining condition (due to coastal management) wherever possible?	Therefore, the Management Area is considered to have a minor positive effect on this issue.
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life	
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements at estuary mouths	
The Suffolk coast is a complex system of dynamic and static shingle, beach frontages, urban areas and estuary mouths. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	
Will SMP policy maintain an overall level of balance across the Suffolk coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	The Management Area provides the natural development of the coast/estuary in this area to the south of Southwold whilst protecting the established harbour and estuary mouth in a coordinated manner. Therefore the Management Area seeks to provide a level of natural balance. Overall, the Management Area will have a major positive effect however due to the development of a natural coastal system.
Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	The Management Area will not lead to increased levels of erosion or flood risk. However ongoing maintenance will be required for defences to the north/rear of Walberswick and to the harbour. The overall effect therefore is neutral.
Will SMP policy commit future generations to spend more on defences to maintain the same level of protection?	There will be continued commitment to maintain use of the harbour and to retain beaches and protection to Southwold.
Does the policy work with or against natural processes?	The overall intent of the Management Area is to promote a natural evolution of the coast/estuary. However, in order to stabilize areas to support communities, some degree of defence is central to this Management Area. The overall effect is therefore minor negative.
ISSUE - Maintenance of water supply in the coastal zone	
Agriculture on the Suffolk coast is dependent on the maintenance of a freshwater supply from	The Management Area will lead to natural development, and will lead to possible

ISSUE	DETERMINATION
groundwater aquifers. The delivery of this supply is threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion – will SMP policy maintain structures to defend water abstraction infrastructure and to avoid any exacerbation of levels of saline intrusion into freshwater aquifers.	threats of this supply. This will need to be examined in more detail. The effect of this Management Area is therefore negative.
ISSUE - Maintenance of the values of the coastal landscape & Area of Outstanding Natural Beauty (AONB)	
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition and form. Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Suffolk coastal landscape? Will SMP policy lead to the introduction of features which are unsympathetic towards the character of the landscape?	The Management Area will provide for the natural development of the coast to the south of Southwold whilst maintaining the harbour side activities on the Blyth. The benefit is therefore expected to be minor positive. The Management Area will not introduce new features into the landscape, although there may be some shift in habitat composition.
ISSUE - Protection of historic and archaeological features on a dynamic coastline	
The Suffolk coast contains a range of historic settlements and harbours typically located on the open coast and mouths of estuaries (for example, Southwold - Walberswick, Aldeburgh, Shingle Street etc). These settlements may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast – will SMP policy maintain the fabric and setting of key historic listed buildings and conservation areas?	The Management Area provides the opportunity to maintain the harbour and its buildings and also for Walberswick which contain a variety of listed buildings and conservation areas. The Management Area therefore actively secures the retention of these features.
The coastal zone in Suffolk contains a range of archaeological and palaeo-environmental features which may be at risk from loss from erosion within the timeline of the SMP – will SMP policy provide sustainable protection of archaeological and palaeo-environmental features (where appropriate) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	The Management Area provides for a gradual/natural approach to realignment which would enable the study and investigation of archaeological features. The Management Area therefore may lead to the loss of features, but time is provided for their study and the benefit is therefore neutral.

ISSUE	DETERMINATION
ISSUE - Protection of coastal communities and culture	
Protection of coastal towns and settlements	
The Core Strategies of Waveney Council and Suffolk Coastal District Council identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. These settlements are likely to face a higher level of risk from coastal flooding and loss due to erosion in response to sea level rise. There is a need therefore to ensure that the settlements below are protected for the duration of the SMP. Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation? Will SMP policy protect the coastal character of communities which have historically been undefended?	The Management Area promotes the natural development of coast/estuary and the protection of the harbour which is essential to the economy of this area. The Management Area therefore seeks to provide sustainable protection in a natural context and has a minor positive benefit. The Management Area provides for the protection of Walberswick in a natural dynamic setting and therefore maintains its coastal character. There is therefore a minor positive benefit.
Coastal communities in Suffolk may be dependent on key features which are located outside of the settlement area (for example the relationship of Southwold Harbour (on the Blyth Estuary) to the economy of Southwold). There is a need therefore to ensure that features which support communities are maintained, or the actual utility is maintained) – will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	The Management Area maintains the pedestrian bridge across the Blyth which is essential to the local economy of Southwold, the harbour and Walberswick. The Management Area also seeks to ensure that harbour side activities on the Blyth are maintained. The benefit is therefore minor positive.
Protection of key coastal infrastructure	
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths (the primary footpath being the Suffolk Coasts and Heaths Footpath). The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Suffolk coastal area. Paths are often located close to the foreshore in areas at risk from coastal erosion (or within potential areas for managed realignment) – will SMP policy maintain or enhance levels of access along or to the Suffolk coast.	The coastal footpath in this area runs along the coast/estuary and over the pedestrian bridge over the Blyth. The Management Area would not compromise this route or access and the benefit is therefore minor positive.

APPROPRIATE ASSESSMENT - PREFERRED PLAN **MA 09**

This is an excerpt from **Appendix I** of the **Appropriate Assessment** undertaken for the Suffolk SMP – for a full description of the potential effects and any avoidance measures, mitigation or compensation required as a result of the policies, please refer to **Appendix J** (**Appropriate Assessment Report**).

Minsmere-Walberswick Heaths and Marshes Ramsar & SPA site features	**Ramsar Criterion 1** The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh plants from brackish to fresh water. **Ramsar Criterion 2** The site supports at least nine nationally scarce plants and at least 26 red data book invertebrates. Site supports a population of the mollusk Vertigo Angustior (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth Estuary river walls. Site supports an important assemblage of rare breeding birds associated with reedbeds and marshland: Great Bittern, Eurasian Teal, Gadwall, Northern Shoveler, Pied Avocet and Bearded Tit. **Article 4.1.** During the breeding season the area regularly supports: Bittern, Nightjar, Marsh Harrier, Avocet, Little Tern Over winter the area regularly supports: Hen Harrier **Article 4.2.** During the breeding season the area regularly supports: Northern Shoveler, Common Teal, Gadwall Over winter the area regularly supports: Greater White-fronted Goose Northern Shoveler Common Teal	
Sub Feature(s) Swamp, marginal and innundation communites Saltmarsh	**Sensitivity** Maintaining freshwater and coastal/intertidal habitats in situ, and in a favourable condition is not possible. There is a need to consider adaptation for habitats that are not sustainable in	**Conservation Objective** To maintain*, in favourable condition, the habitats for the populations of Annex 1 species of European importance+ with particular reference to: • Shingle

Shingle Standing wate Grassland Heathland Grassland, marsh and standing water	the face of a dynamic coastal environment. The site is actively managed to prevent scrub and tree invasion of the heathlands grazing marshes and reedbeds. Much of the land is managed by conservation organisations and positively by private landowners through ESA and Countryside Stewardship schemes. The coastline is going to be pushed back by natural processes. Alternative sites for reed bed creation are being sought to help off set the possible future natural losses.	• Swamp, marginal and inundation communities • Saltmarsh • Standing water • Grassland • Heathland + Avocet, Bittern, Little tern, Marsh harrier, Nightjar, Woodlark, Hen harrier To maintain*, in favourable condition, the habitats for the populations of migratory bird species + of European importance, with particular reference to: • Grassland, marsh and standing water + Gadwall, Teal, Shoveler, European White-fronted goose

Minsmere-Walberswick Heaths and Marshes SAC site features	**Annex 1 Habitats**. Annual vegetation of drift lines; one of only two sites in East of England. European Dry Heaths	
Sub Feature(s) Annual vegetation of drift lines Perennial vegetation of stony banks	**Sensitivity** Coastal habitats need to be dynamic in order to function, and to be able to respond to coastal change and sea level rise. Currently this dynamism is constrained by the freshwater habitats of the hinterland. Recreational use of the coast is potentially a threat because rare shingle vegetation is highly sensitive to trampling damage, and rare birds which nest on shingle (such as Little Tern) are easily scared away.	**Conservation Objective** Subject to natural change, to maintain*, in favourable condition, the: • annual vegetation of drift lines • perennial vegetation of stony banks

	Annual vegetation of drift lines: This habitat is maintained through the action of natural coastal processes upon the shoreline. The requirement for management is limited and is restricted to ensuring that significant human disturbance of the vegetated shore zone does not occur. This aspect of management is addressed through the RSPB visitor management plan.	
Heathland	This habitat is not considered likely to the threatened by actions within the SMP	

BLY 9.1 to 9.5

Potential effect of policy: This management area straddles the mouth of the Blythe Estuary and whilst it does not front an International site, the policy to the south bank (BLY 9.5) has the potential (as a Managed Realignment policy) to constrain the development of the designated shingle beach immediately to the south. The SMP recognises this and specifies the requirement to ensure that the realignment works with natural processes.

Implications for the integrity of the site: Policies BLY 9.1 to 9.4 have no adverse effect on site integrity. Providing that the mitigation specified to support Policy BLY 9.5 is provided, no adverse affect on the integrity of the features to the south can be identified.

Avoidance measure: A requirement to ensure that the management realignment on the south shore of the estuary mouth (BLY 9.5) does not constrain the natural development of the shingle beach to the south. This will be subject to an Appropriate Assessment at scheme level.

4.3.6 BLY 10 - BLYTH INNER ESTUARY

Location reference:	**BLYTH INNER ESTUARY**
Management Area reference:	**BLY 10**
Policy Development Zone:	PDZ 3

* 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.

The following descriptions are provided to assist interpretation of the map shown overleaf.

100 year shoreline position:
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Draft Preferred Policy" being put forward through the Shoreline Management Plan.

- In some areas the preferred policy does not change from that under the existing management approach. In some areas where there are hard defences this can be accurately identified. In other areas there is greater uncertainty. Even so, where the shoreline is likely to be quite clearly defined by a change such as the crest of a cliff the estimated position is shown as a single line.

- Where there is a difference between With Present Management and the Draft Preferred Policy this distinction is made in showing two different lines:

  With Present Management.
  Draft Preferred Policy.

- In some areas, the Draft Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

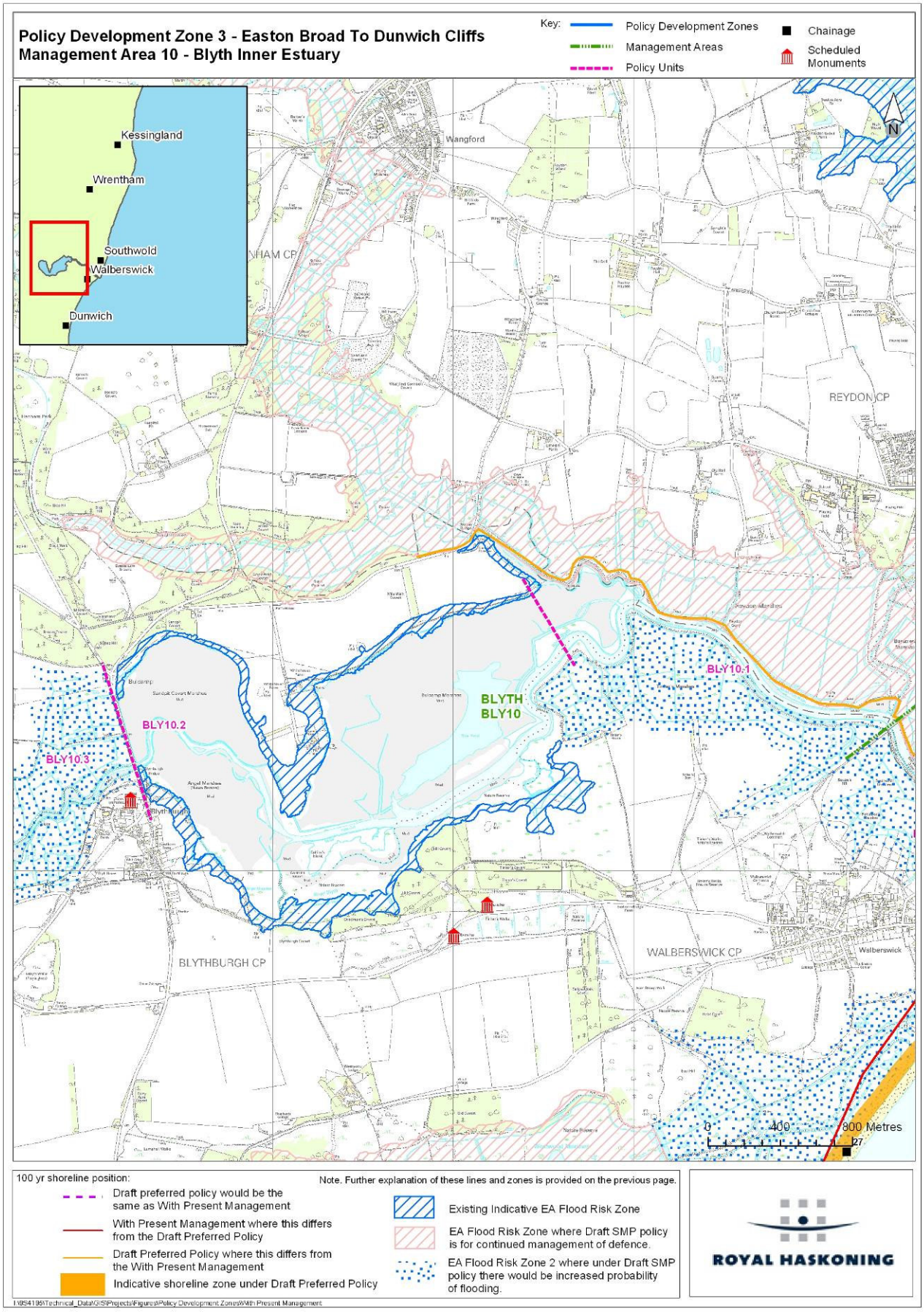
Flood Risk Zones

General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this Draft SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.

Indicate where over the 100 years the policy would allow increased risk of flooding.

The maps should be read in conjunction with the text within the Draft SMP document.


Policy Development Zone 3 - Easton Broad To Dunwich Cliffs
Management Area 10 - Blyth Inner Estuary
Key:
Policy Development Zones
Management Areas
Policy Units
Chainage
Scheduled Monuments
Kessingland
Wrentham
Southwold
Walberswick
Dunwich
Wangford
REYDON CP
BLY10.1
BLYTH
BLY10
BLY10.2
BLY10.3
BLYTHBURGH CP
WALBERSWICK CP
Walberswick
0
400
800 Metres
100 yr shoreline position:
Draft preferred policy would be the same as With Present Management
With Present Management where this differs from the Draft Preferred Policy
Draft Preferred Policy where this differs from the With Present Management
Indicative shoreline zone under Draft Preferred Policy
Note. Further explanation of these lines and zones is provided on the previous page.
Existing Indicative EA Flood Risk Zone
EA Flood Risk Zone where Draft SMP policy is for continued management of defence.
EA Flood Risk Zone 2 where under Draft SMP policy there would be increased probability of flooding.
ROYAL HASKONING
I:\9S4195\Technical_Data\GIS\Projects\Figures\Policy Development Zones\With Present Management

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN: The aim of the policy is to manage the necessary change in the estuary so as to allow sustainable management of the coast. The critical aspect of this is time, in that there is a need to manage the process rather than be dictated by events. The policy with respect to Reydon Marsh is critical to this and, therefore, to decisions as to how to manage reducing possible impacts. Apart from the main issues in relation to the coast, the need to maintain the A12 is identified. This plan would be subject to available funding in addition to that of flood and coastal erosion risk management, derived from the benefits achieved through maintaining the harbour and management of the coast. Without such funding the default plan, abandoning estuary defences, would be adopted. This would not allow sustainable management of key values identified for the coastal area.

In setting policy there are, therefore, important caveats. Notwithstanding the intent of the policy to manage the inner estuary, therefore:

- The uncertainty associated with the behaviour of this area needs to be taken into account in considering any policies and/or proposals for development in areas at risk of erosion or flooding.
- There will be continued risk of flooding on extreme conditions. Consideration in the longer term will need to be given here in terms of flood warning and emergency response.
- Ongoing monitoring and monitoring recommended by the SMP should reduce uncertainty. There remains the possibility that policy would need to be revised in the light of this monitoring. Any revision of policy would take account of potential damages to nature conservation interests and any indicated difficulty in maintaining defences.
- Local action has already been undertaken in sustaining defences and further local involvement in defence management is being discussed. It is indicated that the national priorities for FRM funds are such that this location does not meet funding requirements. It is therefore likely that future works may have to continue to be funded via alternative sources and not necessarily government funding.

Subject to this:

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day:	Maintain Reydon Marsh but withdraw maintenance from Tinkers Marsh. Identify habitat recreation sites and provide compensation in advance of loss.
Medium term	Improve defence to A12.
Long-term	Improve defence to A12.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		**Policy Plan**			
		2025	**2055**	**2105**	**Comment**
BLY 10.1	Lower inner estuary	MR	MR	MR	Maintaining the northern defences, subject to confirmation of funding.
BLY 10.2	A12	HTL	HTL	HTL	Improve defence.
BLY 10.3	Upper estuary	NAI	NAI	NAI	
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

Significant change to economics assumed in current policy to allow adaptation at the coast.

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Costs and damages included within MA09

Strategic Environmental Assessment summary table for preferred policy MA BLY 10

This is an excerpt from the **Strategic Environmental Assessment** undertaken for the Suffolk SMP – for the full assessment, please refer to **Appendix F** (**Strategic Environmental Assessment: Environmental Report**).

ISSUE	DETERMINATION
ISSUE - Maintenance and Enhancement of Biodiversity on a Dynamic Coastline	
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences – will SMP policy provide a sustainable approach to habitat management?	Designated sites in this Management Area are Minsmere Walberswick Heaths & Marshes SSSI, Minsmere Walberswick Ramsar/SPA and Minsmere Walberswick Heaths and Marshes SAC. Policy seeks to allow natural progression of the upper estuary (landward of A12), HTL adjacent to the A12 and providing MR over the unsustainable defences over Tinkers Marshes. Policy therefore seeks to protect key infrastructure while allowing habitat to move landward in response to SLR. Therefore minor positive benefit.
Coastal squeeze and changes to coastal processes has the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives) – will SMP policy have an adverse effect on the integrity of any international sites?	The policies will not affect the SAC. There will be a loss of freshwater habitat on the SPA but this is due to the need to provide a sustainable approach to site management and to create habitat for Intertidal species. Overall no adverse effect is considered and the effect is minor positive.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses – will there be no net loss of UK BAP habitat within the SMP timeline up to 2100?	The BAP habitat in this area includes: Coastal Floodplain Grazing Marsh, Mudflat, Reedbeds and Lowland Dry Acid Grassland. The Management Area promotes a natural development of the estuary whilst maintaining a sustainable defence of the A12. There would be shift from Coastal Floodplain Grazing Marsh to saltmarsh. It is considered, however, that the overall provision of BAP habitat will remain constant. Therefore, the Management Area is considered to have a minor positive effect on this issue. Some BAP habitat may be lost but an equivalent amount of alternate habitat will be gained.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. For example, approximately 50 of 100 SSSI units assessed at the Minsmere-Walberswick Heaths	The SSSI in this Management Area is designated for mudflat, reed bed and grazing marsh. The Management Area provides for a more natural management of this system

ISSUE	DETERMINATION
and Marshes SSSI are in unfavourable condition, although the majority of these (36) are in an unfavourable recovering condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze – will SMP policy contribute to further SSSIs falling into unfavourable condition and address the causal factors of existing units which are in unfavourable declining condition (due to coastal management) wherever possible?	and it is considered that policy provides for a more natural development of the estuary. Policy for MR areas will relive pressure of coastal squeeze, but HTL policy may lead to ongoing declining condition. Overall, the policy will enable habitat movement, rather than prevent it. Therefore, the Management Area is considered to have a minor positive effect on this issue.
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life	
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements at estuary mouths	
The Suffolk coast is a complex system of dynamic and static shingle, beach frontages, urban areas and estuary mouths. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	
Will SMP policy maintain an overall level of balance across the Suffolk coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	The Policy seeks to provide a dynamic estuarine system whilst HTL for the A12. Overall, the Management Area will have a major positive effect however due to the development of a natural coastal system.
Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	The Management Area will not lead to increased levels of erosion or flood risk. The overall effect therefore is neutral
Will SMP policy commit future generations to spend more on defences to maintain the same level of protection?	The Management Area will not lead to any increased requirement for future defence works, and will in fact reduce the level of maintained defences via MR over Tinkers Marshes. Overall, the policy reduces the amount of defence spending in the future.
Does the policy work with or against natural processes?	The overall intent of the Management Area is to promote a natural evolution of the

ISSUE	DETERMINATION
	estuary. The overall effect is therefore minor positive.
ISSUE - Maintenance of water supply in the coastal zone	
Agriculture on the Suffolk coast is dependent on the maintenance of a freshwater supply from groundwater aquifers. The delivery of this supply is threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion – will SMP policy maintain structures to defend water abstraction infrastructure and to avoid any exacerbation of levels of saline intrusion into freshwater aquifers.	The Management Area will lead to the natural development of this area, and will not lead to enhanced threats on aquifers or infrastructure as abstraction points are located on the northern shore and will not be compromised. The effect of this Management Area is therefore neutral.
ISSUE - Maintenance of the values of the coastal landscape & Area of Outstanding Natural Beauty (AONB)	
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition and form. Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Suffolk coastal landscape? Will SMP policy lead to the introduction of features which are unsympathetic towards the character of the landscape?	The Management Area will provide for the natural development of the estuary which is largely agricultural in this area. The benefit is therefore expected to be minor positive due to the provision of a more active, natural coastal landscape. The Management Area will not introduce new features into the landscape, although there may be some shift in habitat composition.
ISSUE - Protection of historic and archaeological features on a dynamic coastline	
The coastal zone in Suffolk contains a range of archaeological and palaeo-environmental features which may be at risk from loss from erosion within the timeline of the SMP – will SMP policy provide sustainable protection of archaeological and palaeo-environmental features (where appropriate) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	The Management Area provides for a gradual/natural approach to realignment which would enable the study and investigation of archaeological features. The Management Area therefore may lead to the loss of features, but time is provided for their study and the benefit is therefore neutral.

ISSUE	DETERMINATION
ISSUE - Protection of coastal communities and culture	
Protection of key coastal infrastructure	
The Suffolk coast is served by a network of roads along the coast (primarily the A12) and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes – will SMP policy maintain road based transport connectivity between settlements on the Suffolk coast?	The HTL policy adjacent to the A12 will ensure its protection. The effect of this Management Area is therefore neutral

APPROPRIATE ASSESSMENT - PREFERRED PLAN **MA 10**

This is an excerpt from **Appendix I** of the **Appropriate Assessment** undertaken for the Suffolk SMP – for a full description of the potential effects and any avoidance measures, mitigation or compensation required as a result of the policies, please refer to **Appendix J** (**Appropriate Assessment Report**).

Minsmere-Walberswick Heaths and Marshes SPA and Ramsar site features	**Ramsar Criterion 1** The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh plants from brackish to fresh water. **Ramsar Criterion 2** The site supports at least nine nationally scarce plants and at least 26 red data book invertebrates. Site supports a population of the mollusk Vertigo Angustior (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth Estuary river walls. Site supports an important assemblage of rare breeding birds associated with reedbeds and marshland: Great Bittern, Eurasian Teal, Gadwall, Northern Shoveler, Pied Avocet and Bearded Tit. **Article 4.1**. During the breeding season the area regularly supports: Bittern, Nightjar, Marsh Harrier, Avocet, Little Tern Over winter the area regularly supports: Hen Harrier **Article 4.2.** During the breeding season the area regularly supports: Northern Shoveler, Common Teal, Gadwall Over winter the area regularly supports: Greater White-fronted Goose Northern Shoveler Common Teal	
Sub Feature(s) Swamp, marginal and inundation communities	**Sensitivity** Maintaining freshwater and coastal/intertidal habitats in situ, and in a favourable condition is not possible and there is a need to consider	**Conservation Objective** To maintain*, in favourable condition, the habitats for the populations of Annex 1 species of European importance with particular reference to:

Shingle Standing waters Grassland Heathland Grassland, marsh and standing water	adaptation for habitats that are not sustainable in the face of a dynamic coastal environment. The site is active	• Shingle • Swamp, marginal and inundation communities • Saltmarsh • Standing water • Grassland • Heathland * Maintenance implies restoration if the feature is not currently in favourable condition.

Minsmere-Walberswick Heaths and Marshes SAC site features	**Annex 1 Habitats.** Annual vegetation of drift lines; one of only two sites in East of England. European Dry Heaths	
Sub Feature(s) Annual vegetation of drift lines Perennial vegetation of stony banks Heathland	**Sensitivity** Coastal habitats need to be dynamic in order to function, and to respond to coastal change and sea level rise. Currently this dynamism is constrained by the freshwater habitats of the hinterland. Annual vegetation of drift lines: This habitat is maintained through the action of natural coastal processes upon the shoreline. The requirement for management is limited and is restricted to ensuring that significant human disturbance of the vegetated shingle This habitat is not considered likely to be threatened by actions within the SMP	**Conservation Objective** Subject to natural change, to maintain*, in favourable condition, the: • annual vegetation of drift lines • perennial vegetation of stony banks * maintenance implies restoration if the feature is not currently in favourable condition.

BLY 10.1 to 10.3

Potential effect of policy: This management area seeks to foster the natural evolution of the Blyth Estuary, whilst having regard to the fact that at present, the freshwater habitat at Tinkers and Delacroix Marshes is under threat due to the existing unsustainable defences. The management area also takes an approach of holding the line on the existing defences in the middle estuary. At the present time, the management of the estuary is subject to the findings of the estuary strategy, the SMP and planning applications for the management of Tinkers Marshes. The assessment therefore needs to have regard to this uncertain management background. Given the fact that Tinker's and Delacroix Marshes are not sustainable in conservation terms, given available information on natural processes and the likely evolution of the estuary, the impacts of coastal squeeze are likely to result in the loss of intertidal habitat. A similar situation is present at Hen reedbed (BLY 10.1).

Policy 10.1 seeks to remove the unsustainable defences within the estuary by a policy of managed realignment. Whilst this will lead to the loss of freshwater habitat (and associated bird species such as bittern), it will also prevent the loss of intertidal habitat through coastal squeeze. This policy is considered to offer a prudent approach to the sustainable management of both the estuary and the habitat contained within. Policy 10.2 (middle reaches of the Blyth) seeks to Hold the Line landward of existing intertidal areas in preserve *in situ* the A12. It is considered that this policy would lead to the loss of intertidal habitat through squeeze, but this may be offset by the creation of intertidal under the previous policy. The remaining factor would be to ensure that levels or intertidal loss through squeeze are balanced by levels of gain through realignment.

Implications for the integrity of the site: Policies 10.1 and 10.2 (consistent with the emerging estuary strategy) are considered to have an adverse effect on site integrity, due to the loss of intertidal and freshwater habitat. There are no implications for the SAC site.

Consideration of alternatives: The alternative management approach would be to defend Tinkers Marshes, but this is not considered sustainable given projections for sea level rise in the estuary and the condition of the existing defences. Equally, the alternative to the hold the line policy in the middle estuary would result in an increase in the tidal prism of the Blyth. This is considered likely to threaten the integrity of the harbourside area which is critical to the maintenance and vibrancy of communities at Southwold and Walberswick. The squeeze of intertidal habitat against the A12 will be mitigated through the habitat created by the MR policy at Tinker's Marsh. As such, there is no need to discuss alternatives further.

Compensation required: The provision of replacement freshwater and intertidal habitat, commensurate with the loss of SPA features, to be provided by the Environment Agency Regional Habitat Creation Programme and agreed in accordance with the assessment of the estuary strategy.

4.3.7 DUN 11 - WALBERSWICK MARSHES AND DUNWICH

Location reference:	**WALBERSWICK MARSHES AND DUNWICH (CH. 25.5 TO 30)**
Management Area reference:	**DUN 11**
Policy Development Zone:	PDZ 3

* 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.

The following descriptions are provided to assist interpretation of the map shown overleaf.

100 year shoreline position:
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Draft Preferred Policy" being put forward through the Shoreline Management Plan.

- In some areas the preferred policy does not change from that under the existing management approach. In some areas where there are hard defences this can be accurately identified. In other areas there is greater uncertainty. Even so, where the shoreline is likely to be quite clearly defined by a change such as the crest of a cliff the estimated position is shown as a single line.

- Where there is a difference between With Present Management and the Draft Preferred Policy this distinction is made in showing two different lines:

  With Present Management.
  Draft Preferred Policy.

- In some areas, the Draft Preferred Policy either promotes a more adaptive approach to management or recognises that the shoreline is better considered as a width rather than a narrow line. This is represented on the map by a broader zone of management:

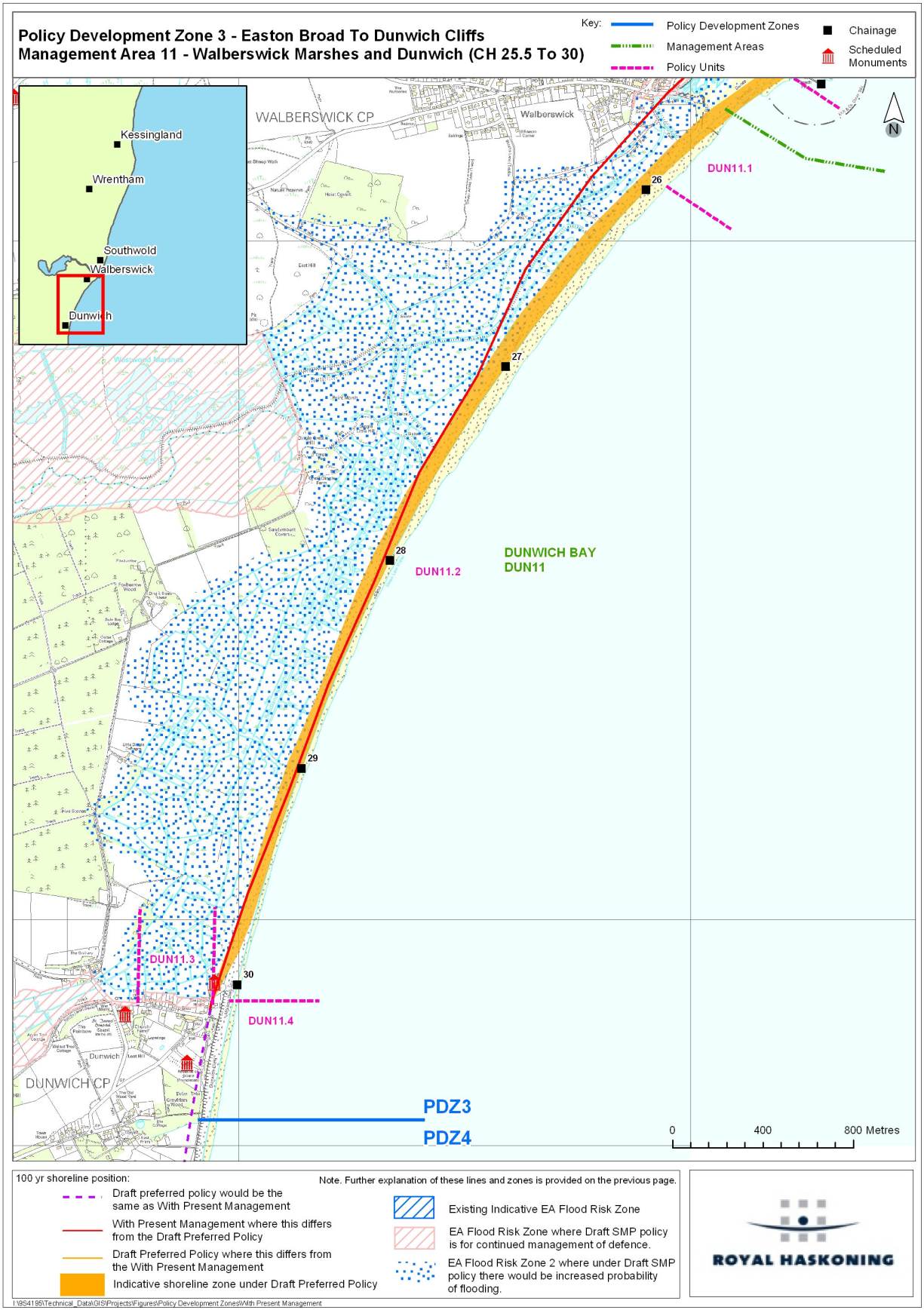
Flood Risk Zones

General Flood Risk Zones. The explanation of these zones is provided on the Environment Agency's web site www.environment-agency.gov.uk. The maps within this Draft SMP document show where SMP policy might influence the management of flood risk.

Indicate areas where the intent of the SMP draft policy is to continue to manage this risk.

Indicate where over the 100 years the policy would allow increased risk of flooding.

The maps should be read in conjunction with the text within the Draft SMP document.


Policy Development Zone 3 - Easton Broad To Dunwich Cliffs
Management Area 11 - Walberswick Marshes and Dunwich (CH 25.5 To 30)
Key:
Policy Development Zones
Management Areas
Policy Units
Chainage
Scheduled Monuments
Kessingland
Wrentham
Southwold
Walberswick
Dunwich
WALBERSWICK CP
Walberswick
DUN11.1
26
27
28
DUN11.2
DUNWICH BAY
DUN11
29
DUN11.3
30
DUN11.4
Dunwich
DUNWICH CP
PDZ3
PDZ4
N
0
400
800 Metres
100 yr shoreline position:
Draft preferred policy would be the same as With Present Management
With Present Management where this differs from the Draft Preferred Policy
Draft Preferred Policy where this differs from the With Present Management
Indicative shoreline zone under Draft Preferred Policy
Note. Further explanation of these lines and zones is provided on the previous page.
Existing Indicative EA Flood Risk Zone
EA Flood Risk Zone where Draft SMP policy is for continued management of defence.
EA Flood Risk Zone 2 where under Draft SMP policy there would be increased probability of flooding.
ROYAL HASKONING
I:\9S4195\Technical_Data\GIS\Projects\Figures\Policy Development Zones\With Present Management

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN: The aim of the plan is to allow natural evolution of the frontage and to ensure no significant impact of the zone to the south. The intent is to allow the natural shingle bank to overtop and to roll inland in response to sea level change. At Dunwich, the plan does not preclude continuation of low level management of the beach within the constraint that it does not develop as a significant coastal headland. The intent of the plan is also to improve flood defences to Walberswick and to the rear of Dunwich, and to allow management and improvement to inland defences behind the front line of the shingle bank. This will provide the best advantage in terms of habitat creation within a more natural defence policy. Further investigation would be required to address and develop an management plan for the potential loss or damage to important archaeological interest in the area. Management of this area in the above manner does require that the harbour entrance is maintained as set out in BLY9. This in turn interacts with policy concluded within the estuary BLY10.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day:	Continue to monitor trial defences at Dunwich. Develop approach to withdrawing management of shingle bank and improvement to defence in land.
Medium term	Improve flood defence standard to both villages.
Long-term	Maintain flood defence to both villages.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		**Policy Plan**			
		2025	**2055**	**2105**	**Comment**
DUN 11.1	Walberswick	HTL	HTL	HTL	Maintain and improve flood defences.
DUN 11.2	Walberswick Marshes	MR	MR	MR	Examine opportunity for managing inland defences.
DUN 11.3	Dunwich Rear Defences	HTL	HTL	HTL	Maintain and improve flood defences.
DUN 11.4	Dunwich Cliff	MR	MR	MR	Low level management is not precluded.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

No significant change to SMP1 Policy

IMPLICATION WITH RESPECT OF BUILT ENVIRONMENT

Economics		**by 2025**	**by 2055**	**by 2105**	**Total £k PV**
Property	Potential NAI Damages/ Cost £k PV				610
	Preferred Plan Damages £k PV				386
	Benefits £k PV				224
	Costs of Implementing plan £k PV		53		53

Strategic Environmental Assessment summary table for preferred policy MA DUN 11

This is an excerpt from the **Strategic Environmental Assessment** undertaken for the Suffolk SMP – for the full assessment, please refer to **Appendix F** (**Strategic Environmental Assessment: Environmental Report**).

ISSUE	DETERMINATION
ISSUE - Maintenance and Enhancement of Biodiversity on a Dynamic Coastline	
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences – will SMP policy provide a sustainable approach to habitat management?	Designated sites in this Management Area are Minsmere Walberswick Heaths & Marshes SSSI, Minsmere Walberswick Ramsar/SPA and Minsmere Walberswick Heaths and Marshes SAC. Policy seeks provide a more natural evolution of the coastline by offering minimal management input to the frontage. Therefore minor positive benefit.
Coastal squeeze and changes to coastal processes has the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives) – will SMP policy have an adverse effect on the integrity of any international sites?	The key policy of this frontage takes an NAI approach to promote the natural evolution of this frontage. The intent being to prevent loss through squeeze of foreshore features and providing sustainable defence for freshwater features behind. The policy is accompanied by a caveat to ensure that management enables the creation of freshwater habitat in advance of its loss. The overall effect is therefore minor positive.
The potential loss of Annex I Priority habitat on the Suffolk coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety – will SMP policy have an adverse effect on the integrity of any Annex 1 Priority Habitat?	As above, the NAI policy is intended to provide a natural development of the coast, where inland management will promote the migration and creation of saline lagoons. The overall effect is therefore minor positive.
New coastal lagoons (EU Annex I habitat) have been created further back from the coast on the Benacre to Easton Bavents SPA. JNCC have recommended that management actions to decrease the rate of erosion should be addressed through the SMP process with rates to enable the sustainable relocation of habitat – has SMP policy provided sustainable management for emerging saline lagoon habitat?	As above, the NAI policy is intended to provide a natural development of the coast, where inland management will promote the migration and creation of saline lagoons. The overall effect is therefore minor positive.

ISSUE	DETERMINATION
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses – will there be no net loss of UK BAP habitat within the SMP timeline up to 2100?	The BAP habitat in this area includes: Coastal Floodplain Grazing Marsh, Lowland Dry Acid Grassland, Coastal Vegetated Shingle, Coastal Cliffs and Slopes and Reed bed. The Management Area promotes a natural development of the coast. There would be a gradual rollback and shift of all BAP features. It is considered however that the overall provision of BAP habitat will remain constant. Therefore, the Management Area is considered to have a minor positive effect on this area. Some BAP habitat may be lost but an equivalent amount of alternate habitat will be gained.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. For example, approximately 50 of 100 SSSI units assessed at the Minsmere-Walberswick Heaths and Marshes SSSI are in unfavourable condition, although the majority of these (36) are in an unfavourable recovering condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze – will SMP policy contribute to further SSSIs falling into unfavourable condition and address the causal factors of existing units which are in unfavourable declining condition (due to coastal management) wherever possible?	The SSSI in this Management Area is designated for mudflat, reed bed, shingle and grazing marsh. The Management Area provides for a more natural management of this coast. Therefore, the Management Area is considered to have a minor positive effect on this issue.
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life	
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements at estuary mouths	
The Suffolk coast is a complex system of dynamic and static shingle, beach frontages, urban areas and estuary mouths. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context. Will SMP policy maintain an overall level of balance across the Suffolk coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management? Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the	The Policy seeks to provide a dynamic coastal system which is underpinned by dynamism and natural coastal evolution. The policy therefore has minor positive effect. The Management Area will not lead to increased levels of erosion or flood risk. The

ISSUE	DETERMINATION
future? Will SMP policy commit future generations to spend more on defences to maintain the same level of protection? Does the policy work with or against natural processes?	overall effect therefore is neutral The Management Area will not lead to any increased requirement for future defence works. The overall intent of the Management Area is to promote a natural evolution of the estuary. The overall effect is therefore minor positive.
ISSUE - Maintenance of water supply in the coastal zone	
Agriculture on the Suffolk coast is dependent on the maintenance of a freshwater supply from groundwater aquifers. The delivery of this supply is threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion – will SMP policy maintain structures to defend water abstraction infrastructure and to avoid any exacerbation of levels of saline intrusion into freshwater aquifers.	The Management Area will lead to the natural development of this area, and will not lead to threats to aquifers or infrastructure. The effect of this Management Area is therefore neutral.
ISSUE - Maintenance of the values of the coastal landscape & Area of Outstanding Natural Beauty (AONB)	
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition and form. Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Suffolk coastal landscape? Will SMP policy lead to the introduction of features which are unsympathetic towards the character of the landscape?	 The Management Area will provide for the natural development of the coast. The benefit is therefore expected to be minor positive due to the provision of a more active, natural coastal landscape. The Management Area will not introduce new features into the landscape, although there may be some shift in habitat composition.
ISSUE - Protection of historic and archaeological features on a dynamic coastline	

ISSUE	DETERMINATION
The Suffolk coast contains a range of historic settlements and harbours typically located on the open coast and mouths of estuaries (for example, Southwold - Walberswick, Aldeburgh, Shingle Street etc). These settlements may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast – will SMP policy maintain the fabric and setting of key historic listed buildings and conservation areas?	The policy would lead to the ultimate loss of a SAM (Hospital of the Holy Trinity) at the southern edge of this area. However due to its location adequate time would be provided for its study. The policy would lead to the loss over time of Dunwich (listed buildings and Conservation Area included) which is considered not to be sustainable in regard to threats from erosion and SLR. Due to the loss of the SAM the overall effect is therefore major negative.
The coastal zone in Suffolk contains a range of archaeological and palaeo-environmental features which may be at risk from loss from erosion within the timeline of the SMP – will SMP policy provide sustainable protection of archaeological and palaeo-environmental features (where appropriate) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	The Management Area provides for a gradual/natural approach to realignment which would enable the study and investigation of archaeological features. The Management Area therefore may lead to the loss of features, but time is provided for their study and the benefit is therefore neutral.
ISSUE - Protection of coastal communities and culture	
Protection of coastal towns and settlements	
The Core Strategies of Waveney Council and Suffolk Coastal District Council identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. These settlements are likely to face a higher level of risk from coastal flooding and loss due to erosion in response to sea level rise. There is a need therefore to ensure that the settlements below are protected for the duration of the SMP. Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation? Will SMP policy protect the coastal character of communities which have historically been undefended?	The Policy prevents Dunwich from Dunwich River, however the long-term protection of Dunwich is not considered sustainable. The overall effect is therefore is neutral. The Policy provides for the retention of the 'living on the edge' character of Dunwich, by not providing unsustainable defence. The effect is therefore minor positive.

APPROPRIATE ASSESSMENT - PREFERRED PLAN **MA 11**

This is an excerpt from **Appendix I** of the **Appropriate Assessment** undertaken for the Suffolk SMP – for a full description of the potential effects and any avoidance measures, mitigation or compensation required as a result of the policies, please refer to **Appendix J** (**Appropriate Assessment Report**).

Minsmere-Walberswick Heaths and Marshes SPA and Ramsar site features	**Ramsar Criterion 1** The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh plants from brackish to fresh water. **Ramsar Criterion 2** The site supports at least nine nationally scarce plants and at least 26 red data book invertebrates. Site supports a population of the mollusk Vertigo Angustior (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth Estuary river walls. Site supports an important assemblage of rare breeding birds associated with reedbeds and marshland: Great Bittern, Eurasian Teal, Gadwall, Northern Shoveler, Pied Avocet and Bearded Tit. **Article 4.1**. During the breeding season the area regularly supports: Bittern, Nightjar, Marsh Harrier, Avocet, Little Tern Over winter the area regularly supports: Hen Harrier **Article 4.2.** During the breeding season the area regularly supports: Northern Shoveler, Common Teal, Gadwall Over winter the area regularly supports: Greater White-fronted Goose Northern Shoveler Common Teal	
Sub Feature(s) Swamp, marginal and inundation communities	**Sensitivity** Maintaining freshwater and coastal/intertidal habitats in situ, and in a favourable condition is	**Conservation Objective** To maintain*, in favourable condition, the habitats for the populations of Annex 1 species of European importance + with particular reference to:

Shingle Standing waters Grassland Heathland Grassland, marsh and standing water	not possible. There is a need to consider adaptation for habitats that are not sustainable in the face of a dynamic coastal environment. The site is actively managed to prevent scrub and tree invasion of the heathlands grazing marshes and reedbeds. Much of the land is managed by conservation organisations and positively by private landowners through ESA and Countryside Stewardship schemes. The coastline is going to be pushed back by natural processes. Alternative sites for reed bed creation are being sought to help off set the possible future natural losses.	• Shingle • Swamp, marginal and inundation communities • Saltmarsh • Standing water • Grassland • Heathland + Avocet, Bittern, Little tern, Marsh harrier, Nightjar, Woodlark, Hen harrier to maintain*, in favourable condition, the habitats for the populations of migratory bird species + of European importance, with particular reference to: • Grassland, marsh and standing water + Gadwall, Teal, Shoveler, European White-fronted goose

Minsmere-Walberswick Heaths and Marshes SAC site features	**Annex 1 Habitats.** Annual vegetation of drift lines; one of only two sites in East of England. European Dry Heaths	
Sub Feature(s) Annual vegetation of drift lines Perennial vegetation of stony banks	**Sensitivity** Coastal habitats need to be dynamic in order to function, and to respond to coastal change and sea level rise. Currently this dynamism is constrained by the freshwater habitats of the hinterland. Annual vegetation of drift lines: This habitat is maintained through the action of natural coastal processes upon the shoreline. The requirement	**Conservation Objective** Subject to natural change, to maintain*, in favourable condition, the: • annual vegetation of drift lines • perennial vegetation of stony banks * maintenance implies restoration if the feature is not currently in favourable condition.

	for management is limited and is restricted to ensuring that significant human disturbance of the vegetated shore zone does not occur. This aspect of management is addressed through the RSPB visitor management plan.	
Heathland	This habitat is not considered likely to be threatened by actions within the SMP	

DUN 11.1 to 11.4

Potential effect of policy: This management area seeks to provide a degree of stability to this area (where it abuts the holding point at Walberswick) but in doing this, enables a no active intervention policy over most of the frontage adjacent to the international sites (thereby encouraging the natural evolution of the coastline and the conditions required for the maintenance of a dynamic shingle ridge). The no active intervention policy (DUN 11.2) does however have the potential to lead to the loss of freshwater features landward of the ridge. This is considered to be a function of maintaining the shingle features and freshwater features subject to natural change. It is expected that the evolution of the ridge would lead to the loss of freshwater reedbed on Oldtown, Point and East Hill Marshes (in Epoch 1) but the provision of rear defences would protect some of the interest features of Westwood Marshes, including the associated reedbed.

However, this reedbed would only remain if protected from wave action, as *Phragmites australis* is typically tolerant of salinities up to that typically regarded as marine. The movement of the shingle ridge would lead to the loss of saline lagoons (although these are not cited features of the SAC), but this is considered acceptable in regard to enabling the natural evolution of the shingle (SAC and SPA habitat) areas and is considered loss through natural change.

Implications for the integrity of the site: Due to the loss of freshwater habitat which supports Bittern, Marsh Harrier and Avocet in Epoch 1 and 2, this management area would have an adverse effect on integrity of the site. Compensation is provided for this loss through the RHCP. In the SAC the policies promote a more natural evolution and development of the shingle ridge and are therefore are not considered to have an adverse effect on the shingle based features.

Consideration of alternatives: The alternative management option in this area would be to hold the line along the existing frontage of the shingle ridge through active management of the ridge along its entirety. Such measures would be detrimental to the integrity of the SAC and SPA shingle features which are dependent on the provision of a balance of static and dynamic shingle habitat being able to respond to a dynamic coastline which is subject to climate change and sea level rise effects. The long term sustainability of managing the ridge, in response to sea level rise is also questionable. The key driver for this approach is to work with natural processes and arrive at a management solution that will allow the conservation *in situ* of habitats and species which can respond to dynamic coastal conditions and to replace habitats which will become increasingly difficult to manage on a dynamic coast which is subject to climate change and sea level rise effects.

Compensation required: The provision of replacement freshwater and intertidal habitat, commensurate with the loss of SPA features, to be provided by the Environment Agency Regional Habitat Creation Programme and agreed in accordance with the assessment of the estuary strategy.