



Poole and Christchurch Bays Shoreline Management Plan Review Sub-cell 5f

Section 4. Policy Development Zone 2

Bournemouth Borough Council

2011

Report V4

9T2052

A COMPANY OF



ROYAL HASKONING

HASKONING UK LTD.
COASTAL & RIVERS

Stratus House
Emperor Way
Exeter, Devon EX1 3QS
United Kingdom
+44 (0)1392 447999 Telephone
Fax
info@exeter.royalhaskoning.com E-mail
www.royalhaskoning.com Internet

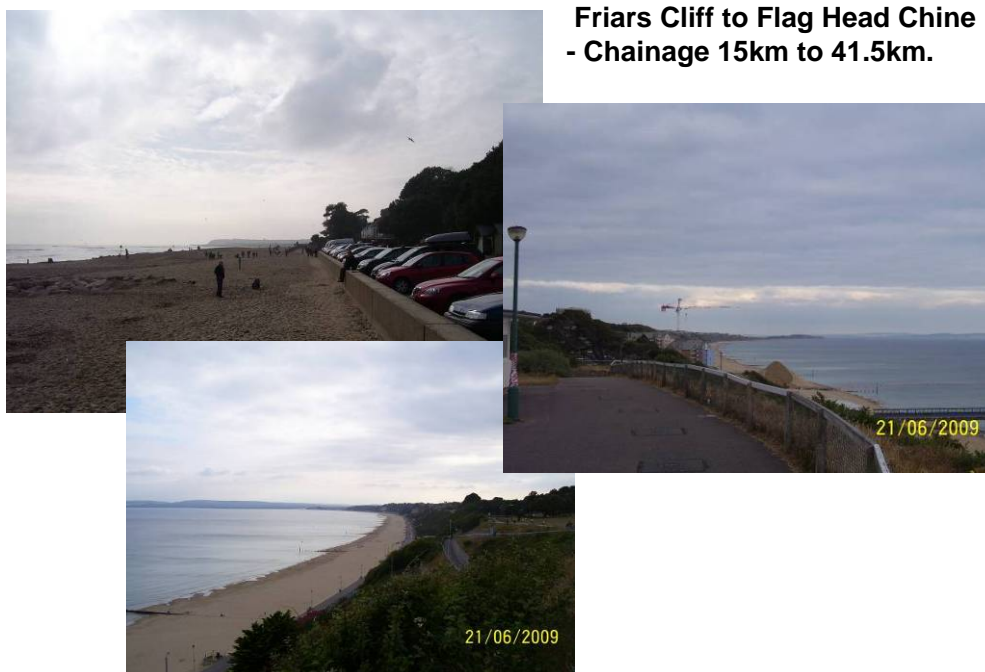
Document title Poole and Christchurch Bays Shoreline
Management Plan Review Sub-cell 5f
Section 4. Policy Development Zone 2
Document short title PDZ 2
Status Report V4
Date 2011
Project name Poole and Christchurch Bays SMP2
Project number 9T2052
Client Bournemouth Borough Council
Reference 9T2052/R/301164/Exet

Drafted by JGL Guthrie
Checked by J Ridgewell, N Carpenter
Date/initials check
Approved by TL Eggiman, H Hall 
Date/initials approval

CONTENTS

		Page
4.3	PDZ 2 Christchurch Harbour and Central Poole Bay	1
4.3.1	Overview	4
4.3.2	Baseline Management Scenarios	16
4.3.3	Discussion and Detailed Policy Development	31

4.3 PDZ 2 Christchurch Harbour and Central Poole Bay



SMP 1 Management Units

UNIT	LOCATION	CHAINAGE	POLICY
CBY2	Chewton Bunny to Mundeford Sandbank	12.9 – 17.2km	Selectively Hold the Line, short and long term. undefended sections possibly retreat long term.
CHB5	Mundeford Quay	17.2 – 17.8km	Hold the Line, short term and long term
CHB4	Mundeford Town	17.8 – 19km.	Hold the Line, short term and long term
CHB3	Stanpit and Grimbury Marshes	19 – 21km	Do Nothing with long term retreat
Christchurch, not previously included		21 – 23km	
CHB2	Southside	23 – 25.7km	Do Nothing
CHB1	Harbour-side of Mundeford Spit	25.7 – 26.3km	Hold the Line.
CBY1	b) Mundeford Spit.	26.3 – 27km	Hold the Line
	a) Hengistbury East	27 – 28 km	Retreat
PBY3	Warren Hill	28 – 29 km	Allow the backshore to retreat selectively holding the beach width.
PBY2	Point House Café to Warren Hill	29 – 30.4 km	Selectively Hold the Line
PBY1	Sandbanks to Point House Cafe	30.4 – 43.9	Hold the Line

Note: SMP1 policy was set over a 50 year period. Short term refers to immediate approach to management of defences with long term policy being set for the 50 years.

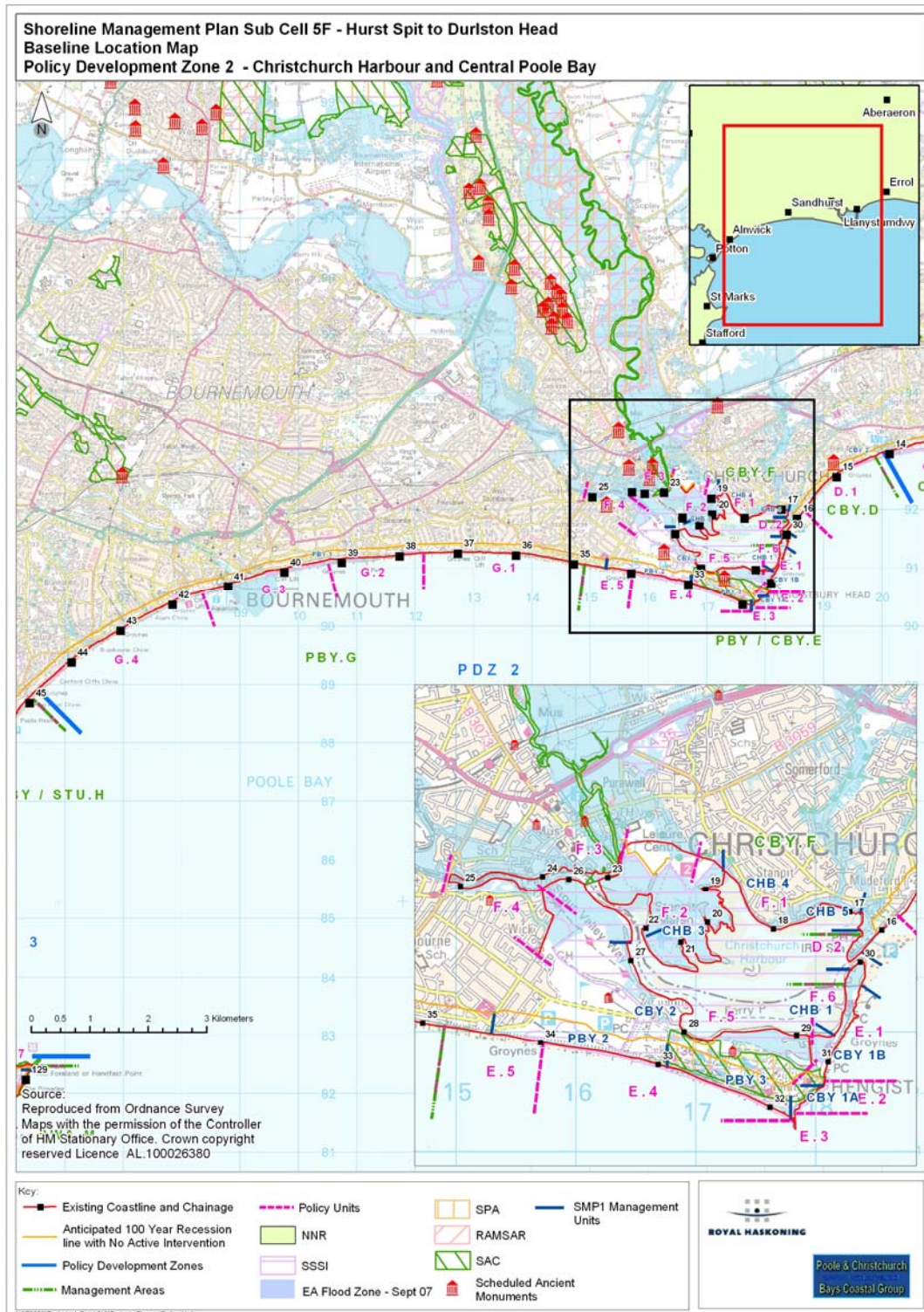


Figure 4.3.1

4.3.1 OVERVIEW

PRINCIPAL FEATURES (further details are provided in Appendix D)

Built Environment:

There are two major conurbation areas: the Bournemouth area; including Southbourne, Boscombe and Westbourne and the centre of Bournemouth itself, and extending through to the area of Canford Cliffs within the Borough of Poole, and the Christchurch area; including Christchurch, Stanpit, Mudeford and Friars Cliff. The two main sea front areas, separated by Hengistbury Head have very different characters but are both seen as being an integral aspect of the built environment with promenades, large numbers of beach huts or sea front chalets as well as commercial and tourism related properties. Although the main trunk roads lie back from the coast, the main A35 runs across the flood plain directly linked to the tidal area of Christchurch Harbour. There are local roads within the Christchurch conurbation lying closer to the shoreline and potentially at risk from flooding. The coastal road linking through the Bournemouth conurbation runs along the crest of the steep coastal cliff. There is an important fishing fleet based within Christchurch Harbour, the RNL station and a ferry service between Mudeford Quay and the Mudeford Sandbanks. There are three funicular railways or Cliff Lifts over the Bournemouth frontage providing access to the promenade and the two piers. Apart from the roads, there is little critical infrastructure within the direct coastal erosion zone, although there are electricity substations, schools and hospitals set a short distance back. There are substations, schools and the main sewage works to Christchurch located in the tidal flood risk zones of the Stour and Avon at the back of Christchurch Harbour.

Heritage and Amenity:

Hengistbury Head and its associated area is an important archaeological area (scheduled monument (SM)), with examples of iron age settlement. This area has various earth works and barrows, including the Double Dykes. There are important SM's within Christchurch, including the Bridge, Monastery and the old town walls.

Amenity, both for local recreation and tourism, underpinning the regional economy, is a very important aspect of the area. There are important recreational moorings and a marina within Christchurch Harbour. Over the whole frontage there are car parks and access points to the coast. A major car park has been developed in the area between Southbourne and Hengistbury Head. The promenades are an essential feature of the coast together with amenity beaches. Access along the sea front is now continuous between Mudeford Quay through to Friars Cliff and along the whole Poole and Bournemouth frontages. In each area there are management plans, zoning use and providing pedestrian, cyclist and disabled access.

The landscape provides an important aspect of the recreational and tourism values, with important longshore views, as well as seascape views to the Isle of Purbeck and the Isle of Wight. Christchurch Harbour provides an essentially different and less developed landscape.

There is a golf course and leisure centre at Christchurch with a golf driving range at Wick.

Nature Conservation:

Christchurch Harbour is an SSSI, with further designation of the River Avon system and the Purewell Meadows. Hengistbury Head is designated SPA and SAC (*Dorset Heathlands and Dorset Heath*), with the River Avon and Avon Valley, extending from Christchurch up river, being SPA, SAC and Ramsar. There are discrete sections of cliff designated SSSI for its geological exposures along the Poole Bay frontage. These include areas at Southbourne, adjacent to Boscombe Pier, along much of the central section of Bournemouth and through to Canford Cliff Chine. There are areas both along the Poole Bay frontage and at Mudeford Spit and Quay designated SNCI for cliff top grasslands and for the dunes and shingle beaches.

Within Christchurch Harbour there is a Field Studies Centre, important for research and monitoring of habitats as well as providing nature conservation educational services. There is also a bird observation and ringing centre to the rear of Hengistbury Head. Christchurch Harbour and the associated area of Hengistbury Head provide a very important nature conservation area generally, contrasting but complementing the more developed open coast sea front.

KEY VALUES

Notwithstanding the major conurbations situated on the coast and within Christchurch Harbour, an essential feature of the area is the varied natural and dynamic value of the coast and harbour area. The open coast represents that quintessence of the British seaside, with the expectation of open access, sea, sand, history and landscape; supported by facilities for recreation, activity and enjoyment.

The different areas of the coast provide emphasis to the varying aspects of this. The Mundeford Quay area aims to provide a generally less intrusive use of the coastal strip benefiting from quiet areas of beach and managed coastal slopes with well defined areas of greater beach use activity and local water sport. Mundeford Spit offers an area of traditional beach use supported by the large number of beach huts.

While varying in character, area by area, the Poole Bay seafront is strongly developed as a high quality seaside attraction, enticing more visitors than any other coastal area of the UK. The vision is that “The seafront will become an environmental showcase for the town, promoting environmental values to our visitors”. (Bournemouth Seafront Strategy 2007 – 2011.) The values of the area are, therefore, as much about the overall setting of the coast and its landscape as it is about maintaining open access and facilities on the sea front. This varied context is provided in the value of the semi-natural cliffs and open space at the cliff crest and in the more natural unobtrusive development of Christchurch Harbour. In many ways Hengistbury Head typifies this interaction as an iconic part of the landscape, valued for both its natural and historic environment. It plays an important role in being the closest and most accessible natural ‘green space’ area for much of the eastern part of the Bournemouth area.

Christchurch and Mundeford add important heritage value to the area and the evidence of man’s early settlement in the area of Hengistbury Head is carried forward in the later historic development of these areas at the mouth of the Avon and Stour.

These local values of the coastal area contribute fundamentally to the regional value of the two conurbations, in maintaining a vibrant sustainable sense of community and economic well-being. While maintaining this economic well-being of the developed coast is seen as a primary driver, this is inextricably linked to maintaining the natural conservation values, the historical perspective and environment, high quality landscape and varied use of the area.

These values are brought together as an interrelated set of management objectives developed from the above, but more specifically from the individual objectives identified in Appendix D and E.

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

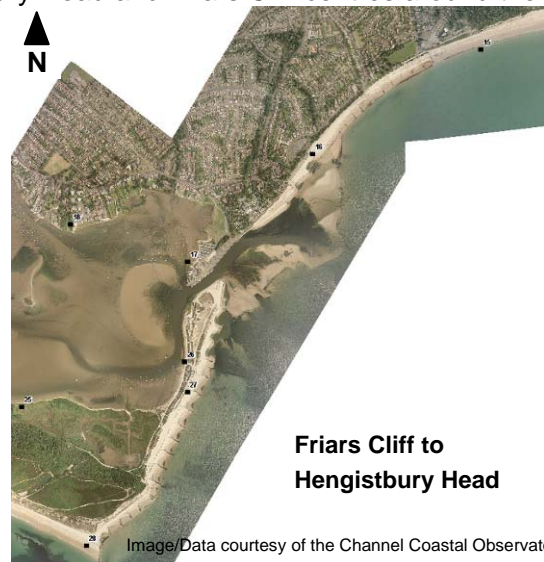
- Protect economic viability of Bournemouth, Poole and Christchurch;
- Maintain important heritage values with Christchurch;

- Support management of heritage interests around Hengistbury Head;
- Reduce flood risk to Christchurch and Mudeford.
- Retain and improve the width and amenity value of the intertidal (beaches) area in Poole Bay;
- Maintain essential sea front facilities.
- Maintain the opportunity for commercial, recreational and sports use of the water, in particular the use of shore-based facilities such as Mudeford Quay;
- Manage risk to properties due to erosion and flooding where sustainable;
- Maintain open space and recreational use of such space;
- Minimise net loss of species/habitat (identify compensatory habitat if any net loss occurs);
- Maintain opportunity for natural development of the mosaic of habitats, particularly within Christchurch Harbour;
- Maintain geological exposure of cliff line;
- Maintain the outstanding landscape and the views and appreciation of the varied coastal environment;
- Support adaptability of coastal communities;
- Reduce reliance on defences.

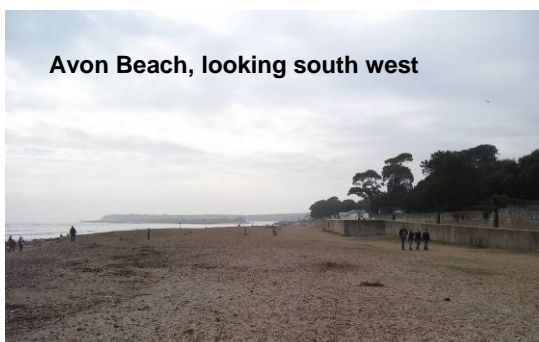
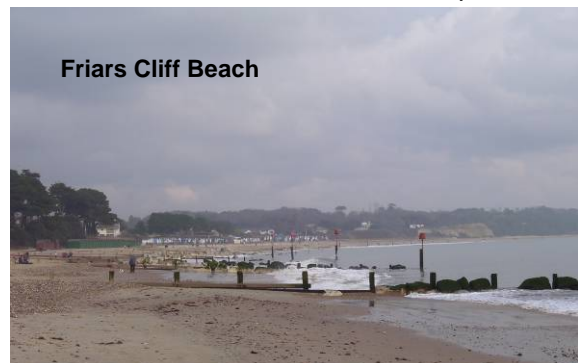
DESCRIPTION

The Policy Development Zone which extends from the western end of Friars Cliffs through to Flag Head Chine at Poole (and including Christchurch Harbour), covers a distance of some 26km.

The open coast section between Hengistbury Head and Friars Cliff centres around the entrance to Christchurch Harbour. To the south, attached to the high ground of the Head, is Mudeford Spit. The spit sets back slightly from the eastern cliff line and is defended by rock groynes and revetment. The Spit is populated by private beach huts and has some limited public facilities. This heavily defended spit closes off the entrance to the harbour, with the narrow channel (the Run) fixed between the end of the spit and the hard defences to Mudeford Quay. The end of the spit overlaps the end of Mudeford Quay and there is an extensive ebb tide delta extending from the end of the spit nearly 1 kilometre further north in front of the open coast.



This northern section of the frontage is defended by sections of sea wall and groynes through to the undefended section of cliff at Steamer Point. The foreshore comprises sand with some areas of shingle. The cliff at Steamer Point is some 20m in height and this reduces in level quite rapidly, such that along much of the frontage the level of the back cliff is of the order of 4m to 5m ODN. This backshore level drops further to Mudeford Quay, with the quay area being around 3m ODN. This frontage is divided into four principal zones within the Christchurch Beaches and Hinterland Management Plan, these being:



- Mudeford Quay, with its car park, boat facilities, RNLI station and ferry terminal to Mudeford Spit;
- Gundimore, defended by a sea wall and linking Mudeford Quay to Avon Beach;
- Avon Beach, the main beach use area backed by its promenade, car parks and commercial facilities, and backed also by the Avon Run Road;
- Friars Cliff beach, protected by

groynes and seawall and backed by open public space, the Maritime and Coastguard Training centre and ending at the undefended section of Friars Cliff.

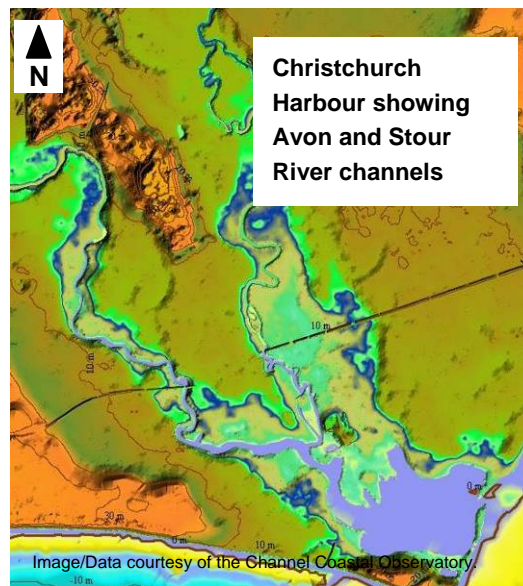
Behind the shoreline is a large area of residential properties, making up the newer part of Mudeford. The town extends down to its older core set back from the shore within the



lee of Mudeford Quay. Here, the frontage comprises low retaining walls backed by generally open grass areas to properties behind. There is a wide expanse of muddy foreshore in front of the wall. The old town and the main road run around the small bay created by the river Mude and the Bure Brooke in the lee of the Quay. Newer development has taken place on the low headland to the west of this small bay. This area is more

densely developed forward of the main core of the town and there are landing stages and slipways servicing the significant boat use of this lower area of Christchurch Harbour.

Further within the Harbour, on its northern side, are large areas of mud flat and saltmarsh, marking the change in character of the estuary, from open intertidal flood plain to that of a more riverine environment. The saltmarsh, though now eroding in areas, is understood to be a past sink for sediment delivered from the two main rivers. The main River Avon channel is held to the western side of the estuary, with the wider valley closed off on its eastern side by higher ground linked to the island forming the centre of Christchurch. There is also a small area of high ground slightly further forward of this at Crouch Hill, within the area of the marsh.



Behind the marshes is reclaimed land in front of Stanpit and the main centre of Christchurch. These areas are defended, typically by embankments and walls set back from the estuary edge. Although Stanpit is largely built upon the rising higher ground to the east of the river valley, with little development to the estuary side of the road, much of the core of Christchurch, to either side of Bridge Street, lies within the larger valley floor of the Avon.

Upstream of the town, the old river valley has not generally been developed. The A35 road and railway line run across the valley on embankments.

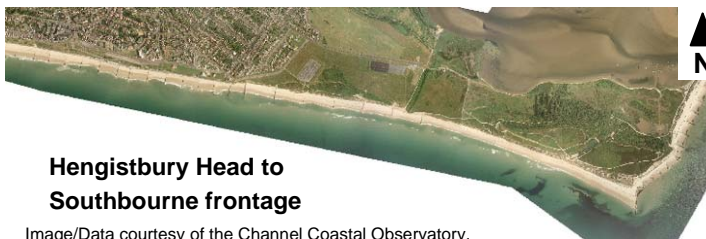
To the western side of the Avon, Christchurch has developed around and out from the ridge upon which sits the Priory and remains of the Castle. Much of the surrounding development is within the potential flood plain of the Avon and the Stour.



Christchurch and Wick

To the southern side of the Stour, the land rises relatively steeply to the rear of Southbourne. The village of Wick extends down to the edge of the estuary with some new development within the old village behind Wick Farm. To the east side of Wick is a golf driving range and golf course, with the range developed over the tidal flood plain but the golf course set further up the slope. Along the southern side of the estuary the land is

undeveloped, sloping down to a saltmarsh area giving out to the mud and sand flats of the wider intertidal harbour area. The Field Study Centre is just to the west of the narrowest neck of land between the Harbour and the open coast. The Iron Age earthworks of Double Dykes are located some 500m to the west of the narrowest part of the neck, cutting across the isthmus from the coast to Christchurch Harbour behind the rising land of Hengistbury Head. The lowest-lying topography of the isthmus coincides with the position of the Double Dykes. The neck of land is littered with evidence of early settlement, with several tumuli over the low lying land and upon the rising land of the headland.



Hengistbury Head to Southbourne frontage

Image/Data courtesy of the Channel Coastal Observatory.



The mature saltmarsh area widens again in the lee of the headland and the shelter of Mudeford Spit.

Along the open coast to the south and west of the Spit,

Hengistbury Head rises steeply with eroding cliffs protected by rock groynes. At the Head is the Long Groyne, holding a wider area of beach and dune against the south face of the headland. There is a shallow bay developed between the headland and the first main section of promenade and coast defence at Southbourne. To the west of the Double Dyke area commences a series of timber groynes which extend through the BBC section of the Poole Bay frontage. The Double Dykes section itself is defended by a gabion wall and three rock groynes.



Double Dykes, looking east toward Warren Hill

The main Poole Bay frontage at the larger scale describes a continuous sweeping arc from Southbourne through to the cliffs at Canford; however it shows considerable variation from this overall alignment at the local scale. This reflects principally the staged construction of the coastal defence.



Southbourne

At the western end of Southbourne, the lower land is held forward by groynes and the promenade. This forms a shallow bay to the higher cliffs at Boscombe Overcliff Drive. The rising cliffs of Southbourne have been graded back with properties close to the crest of the cliff.

Further west, the cliff is more natural, with heavy vegetation on the cliff face and over a good width to the road and properties behind.

This cliff line and groyned sand foreshore curves through to the valley and pier at Boscombe. The pier has recently been refurbished and the area to the rear of the pier largely redeveloped. A surfing reef is under construction in this vicinity, complementing the redevelopment of the area.



To either side of Boscombe Pier there are particular exposures of the coastal slope designated as SSSI. The promenade runs along this entire section of coast, protecting the toe of the cliffs.

The coastal road to the west of Boscombe runs close to the crest of the slope with property directly behind. The promenade continues through some 2.5km to the centre of Bournemouth, with the Bournemouth Pier at the entrance to the Bourne valley. The Bournemouth

International Centre (BIC) is located immediately behind the Pier, together with significant core development of the town.

The pier area tends to locally hold the foreshore area forward, forming a further shallow bay along West Cliff and through to the cliffs at the end of this zone.

The Poole Bay frontage is cut by several valleys, (or chines); some of which are developed as wooded parks and public open space. Areas of both the chines and the coastal slope and crest are locally designated as SSSI.



Along West Cliff and through to Flag Head Chine at the end of the zone, properties tend to be set back from the cliff line, with gardens extending to the cliff crest. In other areas, local roads approach the cliff but, with the notable exception of the Avenue at Branksome Chine, the main through roads lie well back from the coast.

PHYSICAL PROCESSES (further details are provided in Appendix C)

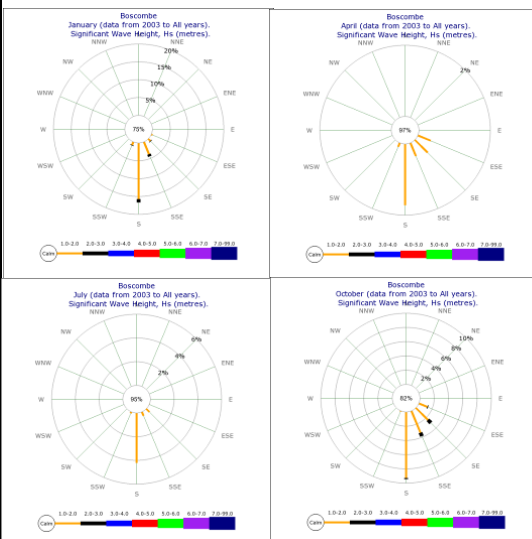
TIDE AND WATER LEVELS (m.ODN)

Location	LAT	MLWS	MLWN	MHWN	MHWS	HAT	Neap range	Spring range	Correction CD/ODN
Christchurch Entrance		-0.31	-0.21	0.49	0.89		0.7	1.2	-0.91
Bournemouth		-0.9	-0.3	0.2	0.6		0.5	1.5	-1.4

Extremes(m.ODN)

Location:	1:1	1:10	1:25	1:50	1:100	1:200	1:500	1:1000
Christchurch Priory Quay	1.39	1.65	1.75	1.83	1.91	1.99	2.09	2.17
Hengistbury Head	1.39	1.65	1.75	1.83	1.91	1.99	2.09	2.17
Bournemouth	1.38	1.63	1.73	1.81	1.88	1.96	2.06	2.14
Sandbanks	1.39	1.63	1.73	1.80	1.88	1.95	2.05	2.12

WAVE CLIMATE



Image/Data courtesy of the Channel Coastal Observatory "

The dominant wave direction is from the south to south-west, which corresponds with the direction of longest fetch and longer period swell waves originating in the Atlantic Ocean. However this section of coast can be subject to significant shorter period wind waves from the east and south-east. The dominant SW wave direction has driven the geomorphological alignment of the Poole Bay frontage, although wave energy from the south east results in variation of sediment drift.

The largest waves (and therefore greatest amount of wave energy) are received by Christchurch Bay and the easterly part of Poole Bay (Bournemouth eastwards). Nearshore, Poole Bay receives less energy from swell waves than Christchurch Bay due to the greater protection provided by Handfast Point. However, the steeper nearshore slope allows significant wave energy into the foreshore area.

The south west offshore waves are diffracted around the Durlston and Handfast Point headlands such that at the shoreline waves approach more from a southerly direction. The wave roses for Boscombe show this very strong direction bias.

TIDAL FLOW

Currents across the main section of the frontage are relatively low: peak flows less than 0.5 m/sec. Tidal and wave induced currents have been assessed as being a significant factor in biasing west to east sediment transport across Solent Beach and past Hengistbury Head and it is reported that there is a strong southerly current developed off the Head over the ebb tide. Flows through the entrance to Christchurch Harbour, through the Run, are very strong both on flood and ebb.

PROCESSES

Control Features:

The log spiral shape of Poole Bay is controlled by the headland at Handfast Point. The zone overall is then controlled by the presence of Hengistbury Head, acting as a downdrift control to the coast to the west and an updrift headland to the coast to the east. Mudeford Quay provides an anchor for the entrance to Christchurch harbour with flows from the estuary acting to influence development of the Christchurch seafront through the development of the ebb tide delta. Within Christchurch Harbour the areas of high ground upon which Christchurch is built controls the position of the Avon, allowing development of the marshes in front of Stanpit. The high ground ridge at Wick acts to divert the Stour in an easterly direction creating the opportunity for marsh development to the southern side of the estuary. Local to the Poole Bay frontage, the defended ridge coming down from Southbourne acts as a minor headland, tending to create a secondary bay over the frontage between Southbourne and Hengistbury Head (Double Dykes). Along the Poole Bay frontage there is local variation created by defences.

Existing Defences:

Individual defences are identified in Appendix D. The general description of defences is provided above. This is summarised below.

Mudeford Quay is a heavily defended and modified natural landform, with vertical sea walls and quay structures. To the north of Mudeford Quay, sea walls continue beneath the low cliffs, through to Friars Cliff, fronted by timber and rock groynes along the beach. Within lower Christchurch Harbour, along the northern shore, are low front face walls. Local ad-hoc flood defences are provided to properties behind. The main area of Christchurch is defended by embankments and defences generally set back from the waterfront, although there are tidal defences along the rivers. The area of Wick is partially defended. There are no formal defences along the southern side of Christchurch Harbour. Mudeford Spit is heavily defended with rock groynes and rock revetment and the groynes extend in front of the eastern flank of Hengistbury Head.

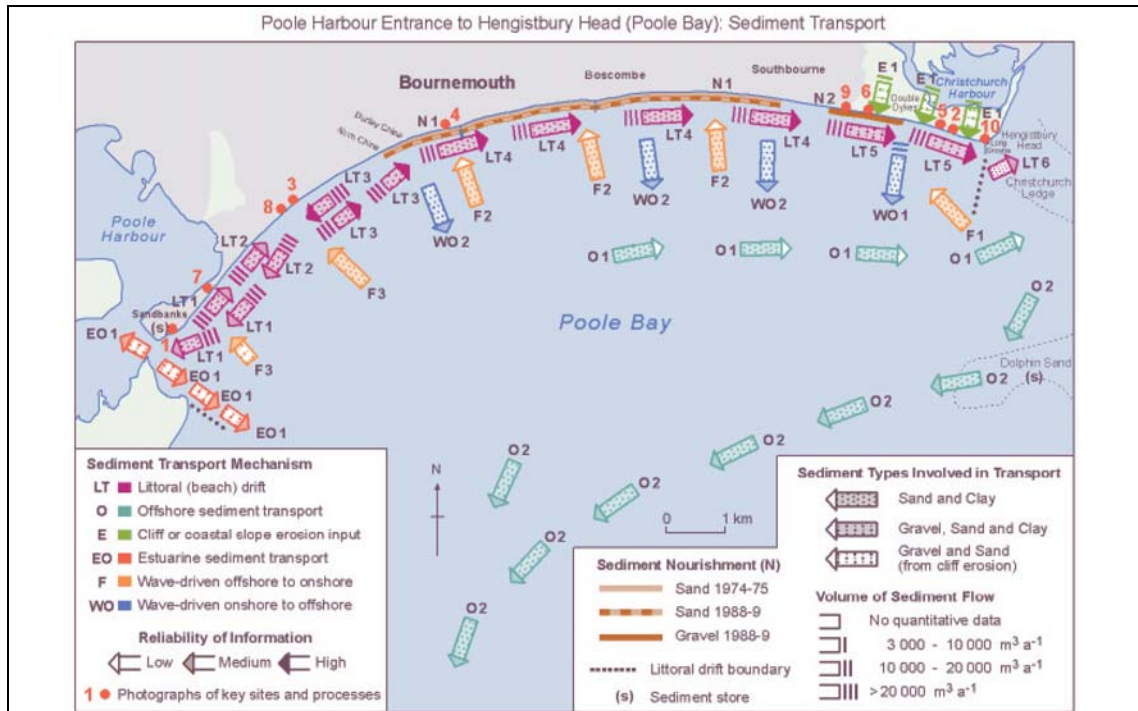
The position of Hengistbury Head is currently held by the Long Groyne. There are a series of groynes along the Solent Beach (3 rock groynes in the area of Double Dykes) and groynes are in place over much of the frontage to the west, as far as Alum Chine. Upgrading of the older timber groynes to rock structures has been recently completed for the Poole Beach section. The main defence however along the Poole Bay frontage is the beach, which is regularly recharged. Behind the beach is a sea wall and promenade, which provides secondary defence to the entire Poole and Bournemouth frontage as far east as Southbourne.

Over the Christchurch frontage defences have been assessed as having a residual life of some 20 to 30 years, although this is very dependent of beach recharge in the area. The defences along Mudeford Spit appear in reasonable condition but again rely on recharge to maintain their integrity. The Poole Bay defences are sustained through regular beach recharge and there is a programme for upgrading groynes from timber to rock. The gabion wall in front of Double Dykes is in poor condition in places and because of its nature is only likely to have a residual life of some 5 years. The Long Groyne is in poor condition.

Within Christchurch Harbour the lower estuary defences are exposed to low energy conditions and with low level maintenance are likely to remain as a competent boundary defence for 20 to 50 years. The local flood defences behind the front line are not formally maintained and in places provide only limited flood defence. The main embankments and defences around Christchurch are infrequently exposed and are reported to be in good condition.

Processes:

The general processes are summarised in the following diagram.



MMIV © SCOPAC Sediment Transport Study

Figure 4.3.2

The main features of this are:

- The net drift along the Poole Bay frontage is from west to east. This however, is very variable and there can be periods of drift reversal from east to west. Under specific storm conditions very high drift rates (in the order of $100,000\text{m}^3$ can be developed). Observation of drift alignment in relation to groynes highlights this variation, showing some areas to be more stable than others;
- There is minimal interchange between the shoreline and the nearshore area, apart from at the eastern end;
- There are both inputs and outputs of sediment at the western end of the zone. This is also a variable supply and loss of sediment from the Canford Cliffs area;
- There is sediment transfer around Hengistbury Head, although with the Long Groyne in place this tends to be through the nearshore area of the Christchurch Ledge;
- Sediment supply to the eastern beaches therefore tends to be through interaction with the nearshore area, associated with the ebb tide delta of the Harbour;
- There is little or no natural sediment supply from the cliffs along Poole Bay due to the defences;
- The low, soft frontage around Double Dykes does provide some sediment to the foreshore, as do the Hengistbury Head cliffs to the east of Double Dykes;
- Historically the cliff face to the east of Hengistbury Head provided sediment to Mudeford Spit, but contemporary trends show no erosion occurring since the installation of groynes in 1986;
- Although nominally ebb dominant, there is a supply of coastal sediment to within Christchurch Harbour;
- Fine sediment supply is provided by fluvial flow from the rivers to Christchurch Harbour.

On the open coast there is a general deficit of sediment and this is compensated for by recharge. With sea level rise, the trend will be for increased drift and loss of sediment. Sediment movement along the shoreline towards Hengistbury Head is reported as being strongly influenced by flows at the coastline

biasing sediment movement towards the east. However, the area of beach and dune immediately to the west of Long Groyne has remained quite stable, showing less drift variation as a result of changes in wave direction and reinforcing the significance of the Long Groyne in controlling sediment to the west more generally.

There is erosion reported to areas of saltmarsh within Christchurch Harbour (Appendix C). There have been no detailed studies to map the extent or location of such erosion.

Unconstrained Scenario:

Although unrealistic, because of the residual impact of defences, this scenario considers how the coast would respond, if all defences were removed. It is useful in examining the pressure along the frontage.

The fundamental change at the shoreline would be the erosion (and eventual loss beyond the period of the SMP2) of the influence of Hengistbury Head. This unconstrained erosion would tend to reduce the width of the isthmus between Southbourne and Hengistbury Head, leading eventually to a breach in this area through to Christchurch Harbour. The Southbourne headland would continue to erode back and associated with this would be a general erosion of the frontage along Poole Bay.

To the east of Hengistbury Head, there may be an increase in sediment supply to Mudeford Spit. However, this Spit would tend to roll back, increasing pressure on the Run. This in turn would result in increased erosion of Mudeford Quay. It seems probable that the overlap between the quay and the spit would become unsustainable. The differential erosion of the Spit, in relation to the erosion of the eastern side of Hengistbury Head, would make it likely that a breach would occur along the Spit. The eastern end of the Spit may well then meld itself to Mudeford Quay, with a new entrance developing closer to Hengistbury Head. A new channel and ebb delta configuration would be established, with the Mudeford Quay Spit rolling back into the Harbour.

The coast to the north of Mudeford Quay would continue to erode back in line with the process described above.

As the influence of Hengistbury Head was lost, the entrance to Christchurch Harbour would become a large delta system with variation in channels and banks. There would be a general infilling of the harbour area system.

To the west of the now lost Hengistbury Head, the Poole Bay frontage would erode back significantly, allowing the Bay to assume a more classic log spiral form, with erosion affecting the frontages of Southbourne, Boscombe, Bournemouth and Poole. In line with the log spiral plan form, the extent of erosion back into the hinterland would increase from east to west, with the West Cliff and Poole frontages likely to undergo the greatest recession.

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. The base rates provided below are taken as an average based on historical records. The rates are a composite value based on erosion of the toe and recession of the crest of the cliff and reflect the erosion rates following failure of defences.

(Sea Level Rise assumed rates: 0.06m to year 2025; 0.34m to year 2055; 1m to year 2105. Baseline date 1990)

Location	Base Rate	Notes	100yr. Erosion / Recession (m)
Highcliffe	1.1m/yr	Erosion resisted by defences and slopes stabilised	120m
Avon Beach	1.4m/yr	Erosion resisted by defences	120m
Hengistbury Head East	1.6m/yr	Erosion partially constrained by defences	160m
Hengistbury Head	1.8m/yr	Erosion partially constrained by defences	180m
Bournemouth Cliffs	1.7m/yr	Erosion resisted by defences and slopes stabilised	150m
Canford Cliffs	1.8m/yr	Erosion resisted by defences and slopes stabilised	180m

4.3.2 BASELINE MANAGEMENT SCENARIOS

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			MODIFIED POLICY		
MU	LOCATION	POLICY	REF	LOCATION	POLICY
CBY 2	Mudford Quay to Highcliffe	Selectively HTL	S1	Mudford Quay to Friars Cliff	Hold The Line. Replace timber Groynes with rock, beach management.
CHB5	Mudford Quay	HTL	S2	Mudford Quay	Manage Flood Risk. Maintain flood warning, support local resilience/adaptation. Reassess in line with sea level rise.
CHB4	Mudford Town	HTL	S2	Mudford Town	Manage Flood Risk. Maintain flood warning, support local resilience/adaptation. Reassess in line with sea level rise.
CHB3	Stanpit and Grimbury	Do Nothing with Retreat in long term	S3	Purewell	Maintain and raise frontline flood defence.
	Christchurch	Not included in SMP1	S3	Central Christchurch (area 3.4)	Extend frontline defence and raise.
			S3	Mill Race (area 3.3)	Construct frontline defences (low priority score).
			S3	Priory Quay (area 3.2)	Maintain and raise defence (excluding further work to Priory Marina).
			S3	Stour Frontage of Christchurch (area 3.1)	Construct and raise riverside defences.
CHB2	Southside	Do Nothing	S3	Wick	Raise and extend defences.
			S3	Hengistbury to Wick	No Active Intervention.
CHB1	Harbour-side of Mudford Spit	HTL	S3	Harbour-side of Mudford Spit	Hold The Line. Beach recharge to raise level (low priority score).
CBY1	b) Mudford Spit.	HTL	S1	Mudford Spit	Hold The Line.. Beach recharge.
CBY1	a) Hengistbury East	Retreat	S1	Hengistbury	Managed retreat.
PBY3	Warren Hill	Retreat Cliff , HTL to beach width	S4	Not concluded/ based on existing practice *	Current policy for maintaining Long Groyne.
PBY2	Point House Café to Warren Hill	Selectively HTL	S4	Not concluded/ based on existing practice *	Current policy to maintain defence to Double Dykes.
PBY1	Sandbanks to Point House Cafe	HTL	S4	Not concluded/ based on existing practice *	Current policy to maintain recharge with groynes.

References:

- S1 *Christchurch Bay Strategy Study(DRAFT) - April 2007*
S2 *Mudford and Stanpit Feasibility Report (EA November 2008)*
S3 *Christchurch Bay Strategy Study. Christchurch Harbour Benefit Cost Assessment (June 2008)*
S4 *Poole Bay and Harbour Strategy – 2004 (* the policy for these frontages was not conclude in strategy. Current practice is HTL)*

The key objectives determined from the Catchment Flood Management Plan (2008) for the area is set out below.

- Prevent an increase in the number of people affected by river and tidally influenced flooding;
- Prevent an increase in the economic damages to residential, commercial properties and infrastructure caused by river and tidal flooding;
- Prevent an increase in the economic damages to agricultural land caused by river and tidally influenced flooding in the rural areas;
- Where appropriate to ensure the floodplains are utilised for recreational and green space;
- Where appropriate to ensure rivers and floodplains are utilised for the benefit of nature conservation and restore them to their naturally functioning state, particularly in the urban areas;
- To sustain and improve the condition of internationally and nationally designated sites within areas prone to flooding;
- To increase biodiversity, BAP habitats and amenity values of the river-floodplain environment; and
- Protect significant historic environment assets and their settings from flood related deterioration.

BASELINE SCENARIOS FOR THE ZONE

No Active Intervention (Scenario 1, NAI):

Under this scenario, no works would be undertaken to maintain existing defences along the frontage. Because of the residual impact of structures, evolution of the unconstrained scenario would be modified, although in the longer term the development of the coast would be similar.

Under this scenario, there are two underlying influences at work, the change in structure or geomorphology of the coast and the increased risk of flooding. The first impacts on the whole zone, the second is of more significance in terms of the areas around Christchurch Harbour.

Geomorphological Change

Over the time scale of the SMP2, the following sequence would tend to occur. Over the first epoch, groynes would tend to fail through lack of maintenance. This would be associated with, and accelerate the loss of beaches generally over the frontage. Potentially most significant in the longer term would be the failure of the Long Groyne. While this would result in some increase of sediment feed to the east, this would also be at the expense of significant erosion of the Solent Beach area. Erosion of this frontage would only be temporarily held by the defences in front of Double Dykes. As this frontage erodes back there would be increased pressure on the local headland of Southbourne. Loss of this headland, coupled with the more general loss of the foreshore and beach over much of the rest of the Poole Bay frontage, would expose the old sea wall and promenade behind. This wall would fail within the second epoch and erosion would occur to the cliffs behind.

East of Hengistbury Head, the additional sediment would provide a degree of additional protection,

but as exposure to wave action occurred with the loss of the Long Groyne, so sediment drift along the frontage would increase. This sediment would not be retained as defences in this area started to fail and Mudeford Spit would become increasingly vulnerable to breach. The defences to the north of Mudeford Quay would benefit more significantly from the failure of the Long Groyne and loss of control along the spit. However, as the groynes in this area failed during the second epoch so sediment would be carried still further east. Over the second epoch defences generally over Avon Beach to Friars Cliff would fail and erosion would occur along this frontage.

It has been assessed that even under this No active Intervention scenario, the isthmus between Hengistbury Head and Southbourne would remain as a barrier over the period of the SMP. There would be increased probability of a breach occurring but it seems unlikely that this would form a permanent new channel to Christchurch Harbour. More probably a new entrance would form along the length of Mudeford Spit. This would result in a different configuration of the estuary channels and may result in increased saltmarsh development behind the isthmus. The existing saltmarsh behind Mudeford Spit would tend to be eroded. In the longer term, erosion of Hengistbury Head would result in continued erosion of the coast to either side of the headland. Under existing predicted erosion rates, the full width of Hengistbury Head (some 400m) would be lost within some 200 years. This does not take account of sea level rise which would increase erosion rates. On this basis, there would be a full breach at the isthmus within about 150 years, based solely on erosion rates. This might be expected to occur earlier taking account of increased overwash and the potential impact of sea level rise.

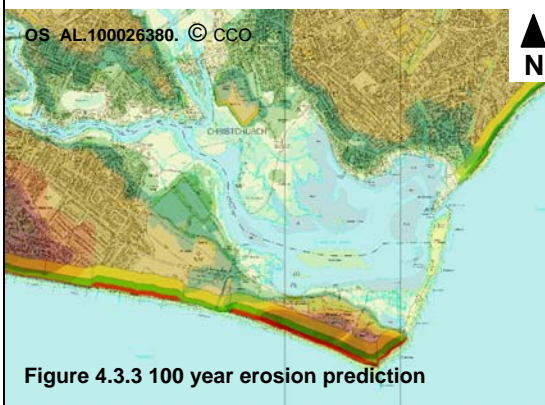


Figure 4.3.3 100 year erosion prediction

It would be the breach of Mudeford Spit, potentially during the second epoch, which would result in increased wave energy within Christchurch Harbour. It seems unlikely, however, that there would be significant increase in wave height over the period of the SMP 2 due to a breach at the isthmus. In the longer term (100 to 150 years) both the reduction in size of Hengistbury head and a breach at the isthmus would contribute to this. The predicted 100 year erosion position under this scenario is shown in the adjacent diagram. This does not make any

prediction as to erosion of Mudeford Spit, this being closely linked to the rate of erosion of Hengistbury Head.

The initial breach at Mudeford Spit would result in increased wave action generally over the Mudeford town frontage, substantially increasing flood risk in this area. The old spit of Mudeford Quay would develop to a degree and this would make navigation of the harbour entrance difficult.

Flood Risk

With sea level rise there would be increased risk of flooding around the shore of Christchurch Harbour. Although it seems unlikely that defences would be under any greater pressure for erosion, without raising defences or raising the existing natural river banks, many areas would suffer from flooding. At Mudeford Quay, the operational area of the quay, (irrespective of the pressure for erosion) may become untenable, with substantially greater overtopping. The main areas of flooding would be within Christchurch. Over the longer term (150 years), there would be significant increase in wave exposure to many of the frontages due to the geomorphological changes discussed above.

Overall Impacts

The potential economic damages arising from projected erosion and flooding are identified in Table 1 at the end of this sub-section.

The impact of this scenario would be substantial and significant. There would be loss of assets all the way along the seafront. Both in

the areas of Bournemouth and Christchurch, there would be little opportunity to maintain the important tourist attraction of the seafront. Not only would facilities be lost but there would also be loss of the beach. It would not be until the third epoch that major damage would occur along the Christchurch frontage in terms of hard assets, although there would be loss much earlier of the important area of beach huts situated on Mudeford Spit. Along the Bournemouth and Poole seafront there would be some £60 million loss of hard assets during the first two epochs with some £5 million lost along the Poole frontage in epoch one. During the third epoch damages would increase by some £550 million as the cliffs erode back. This large increase in damages is highlighted in the comparison between the draft strategy (50 year horizon) and the subsequent project appraisal (100 year horizon).

Flooding to Christchurch and associated areas would be in the order of £100 million over the next 50 years. The potential flood risk would increase significantly with sea level rise, potentially affecting both the centre of Christchurch and areas along the Stour. Landfill sites are also identified within the potential flood risk area in front of Christchurch and Stanpit.

At Mudeford, properties most at risk tend to have some local private defence. Most properties

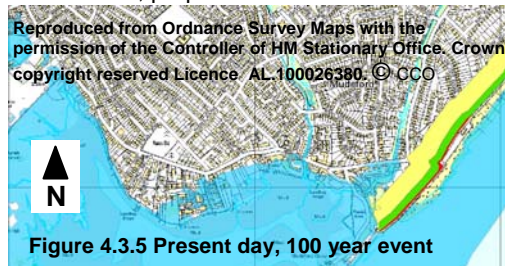


Figure 4.3.5 Present day, 100 year event

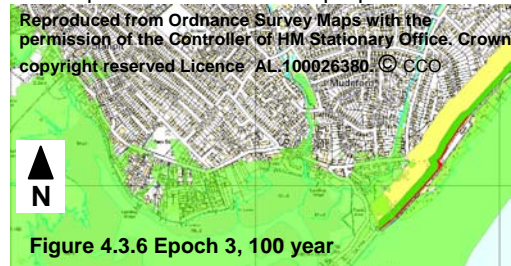


Figure 4.3.6 Epoch 3, 100 year

presently at risk within this area would only suffer inundation on very extreme events. With sea level rise, this situation could change such that a larger number of properties are at direct risk on a more frequent basis. Even so, within the Mudeford area, flood risk tends to be limited to properties seaward of the main road.

Two plots are shown: for the estimated 100 year event (present day) and the estimated 100 year event in 2075, having added an average sea level rise mid-way through epoch 3.

(Note: plots are indicative and further detail of flood risk should be obtained from Environment Agency flood risk mapping.)

On the open coast under this scenario, the ability of the cliffs over the zone to erode would be restored, maintaining new exposures of the cliff face. While this would improve the geological interest of the area, the general and continuing loss of properties and infrastructure along, particularly, the

Poole Bay frontage, would have a negative impact on the landscape associated with the area. There would also be substantial loss of heritage value in terms of important features within Christchurch and the older archaeological interests associated with Hengistbury Head.

There would be some scope for natural development of existing habitat and the mosaic of habitat within Christchurch Harbour. In some areas, however, such habitat may be squeezed against the more steeply rising land around the edge of the Harbour area.

There is likely to be greater saline influence within the upper valley of the Avon, certainly leading to change of habitat at the southern extent of this designated area. In the longer term (100 years to 200 years) the natural habitat development within Christchurch Harbour would radically change. The actual impact, both within the Harbour area and within the Avon valley, would critically depend on the flood or ebb dominance of the estuary processes and upon, therefore, the capacity of the estuary and new estuary areas to accumulate sediment. This would determine whether mud flat and saltmarsh would develop or whether there would be increasing erosion of critical habitat with sea level rise. The scope for replacement of freshwater and brackish habitat within the area would be limited. It could not, therefore, be concluded that there would be no net loss to the ecological system.

Overall, the essential balance and diversity of interests of the zone would suffer, failing to support the interactive value between human, natural and historic interests. This has been identified as an essential quality of the area. This is reflected in the assessment against objectives set out in Table 2 at the end of this subsection.

With Present Management (Scenario 2):

The present management scenario is based on that set by SMP1 and updated through the development of the recent draft strategies (Ref. S1, S3 and S4). Although in draft, these strategies are taken as reflecting the intent of Present Management within this baseline scenario, together with on-going day to day management of the frontages.

Along the open coast the With Present Management (WPM) aims to Hold the Line over all sections, with the exception of Hengistbury Head East. Here the policy would be to allow realignment of the frontage with continued controlled erosion of the cliff. The general practice elsewhere would be to recharge beaches and maintain groynes and control structures. There is the potential for replacement of timber groynes with rock groynes. This is recommended by the draft strategy for the eastern end of the zone, extending the use of rock groynes, replacing timber groynes to the east. Replacement with timber and rock groynes is also being considered along the frontage to the west of Bournemouth.

In the area of Solent Beach, between Southbourne and Hengistbury Head the intent would be to continue defence of Double Dykes and to further groyne the beach frontage. This is all in line with SMP1 policy of selectively hold the line.

Within Christchurch Harbour, the draft strategy recommended maintaining and generally increasing flood defence to assets in the areas of Mundeford, Stanpit, Christchurch and Wick. The principal areas of increased defence under the draft strategy would be at Mundeford, Wick and the Stour frontage of Christchurch. In the case of Wick, this potentially extends defence beyond that envisaged by SMP1. The identification of the landfill site at Stanpit has resulted in recommendations within the draft strategy for maintaining the advanced line of defence, as opposed to the SMP1 policy for potential long term retreat.

Subsequent, more detailed study of the Mudeford Town frontage has shown that the high level strategic assessment of flood risk to properties overestimates the risk. The recommendation from this more detailed study (Mudeford and Stanpit Pre-Feasibility 2008) for this area, is to support maintenance of private flood defences and possible resilience measures to locally reduce flood impact on property.

As with scenario 1 (No Active Intervention), discussed above, the assessment of With Present Management considers first the impact of this scenario on the coastal form and the potential pressures introduced into the coastal system. The discussion then considers the impact of flood defence within the Harbour area and the impacts this might induce.

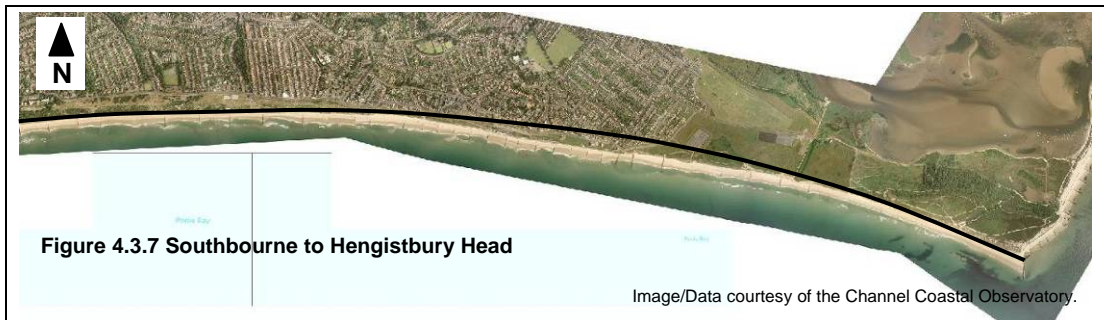
Geomorphological Change

The intent is to hold the overall position of Hengistbury Head, with the replacement of the Long Groyne. This will to some extent continue to restrict sediment from moving to the east (although to a degree this is mitigated by the continued policy for recharge). However, maintaining the influence of the Head fixes the general shape of the coast to the east and management of this frontage is considered on this basis. Over the short term, holding the alignment of Mudeford Spit maintains the position of the Christchurch Harbour entrance, supported behind by maintaining Mudeford Quay. This in turn supports the development of the ebb tidal delta which in turn provides sediment and protection to the Avon Beach through to Friars Cliff. The management policy for continued recharge to the area, together with imposing slightly greater control using rock groynes, compensates for the potential reduction of sediment. The impact of this on the coast to the east was considered in policy to the management of the coast to the east based on the proposed form of management set out in PDZ1.

Despite sea level rise, maintaining a beach in the area between Mudeford Quay and Friars Cliff is considered appropriate to sustaining the values of the frontage. The existing pressures along the Mudeford Quay frontage will increase in line with sea level rise and there is likely to be increased frequency of sea wall overtopping. However, continued defence of the Quay and associated front defences is seen as an essential feature of this WPM Scenario.

The main pressure over this eastern section of the coast would be along Mudeford Spit and in particular the interface between the spit and the eastern face of Hengistbury Head. With the present management aim to fix the position of the spit along its whole length, as the cliff line to the south retreats (even under managed realignment), the root of the spit will become increasingly vulnerable. The spit might eventually be held forward of its natural alignment and the interface between spit and cliff will need to be reinforced, creating an artificial promontory. This would tend to isolate the spit, making maintenance of a beach in this area more difficult. Following through the consequence of this scenario, the approach could in effect convert the spit into a breakwater across the mouth of Christchurch Harbour.

To the west of Hengistbury Head, holding the position of the headland will support the intent, further to the west, to maintain defence along the Bournemouth and Poole frontages. Sediment transport studies ((S4, Halcrow 2004 Technical Annex 5) show this area to be very closely aligned to net wave direction but with the potential for significant gross movement depending on the angle of wave approach. The technical annex reports that if wave driven sediment is the sole factor considered, the net movement in the area between Southbourne and Hengistbury Head is from east to west (in comparison to the west to east transfer generally accepted over the main part of Poole Bay). The report indicates that the continued loss of sediment from the Solent Beach area (between Southbourne and Hengistbury Head) is as a result of wave and tide induced currents, forcing net loss of sediment to the east.



This may be further considered in terms of the local variation in coastal orientation at this sensitive location. From the image above it may be seen in general terms that the past erosion of Hengistbury Head, coupled with the influence of protection at Southbourne, has allowed the formation of a slight headland at Southbourne. The line shown on the image projects a smoothed curve based on the extension of the shape of Poole Bay through to the alignment of the relatively stable growth of dune at the toe of Hengistbury Head, retained by the Long Groyne. It is stressed that the line above is not a definitive erosion line but is intended, rather, to highlight the slight unconformity formed at Southbourne with past erosion of Hengistbury Head. This slight unconformity in the coast may be seen also in the photograph along with the protuberance created in the centre of Solent Beach by the defence of the southern end of Double Dykes. It may be seen that Solent Beach is already forming a separate bay.

Critical in assessing this With Present Management scenario is defining the intent of holding the line over this whole section. For this purpose, this is taken as management necessary to limit erosion of the Hengistbury headland, maintain the full integrity of Double Dykes and the car park to the west and retain the integrity of the defence and promenade at Southbourne; and furthermore to provide the necessary control in terms of erosion and coastal alignment of the coast to the west.



In taking this intent, maintaining the position of the promenade at Southbourne is essential. Its current advanced position and the consequential narrower beach make this location relatively vulnerable. To maintain a sustainable width of beach some additional control at this location is likely to be required (the draft strategy (S4, Halcrow 2004) identifies generally that beach recharge without the support of groynes is unlikely to be sustainable). This would tend to reinforce, or make more pronounced, the development of the headland at Southbourne. As such this will tend to emphasise the separation between the shoreline to the west and that to the east. With the further constraint of the movement of sediment between these two sections of the coast there is likely to be increased pressure for the Solent Beach bay to set back further than at present, placing greater pressure on the gabion wall and the southern end of Double Dykes. In line with present management of the coast, in general this would be addressed through beach recharge and imposing further control of potential erosion through the use of rock groynes. The Long Groyne would be reinforced to retain sediment at the eastern end. As shown by past experience, there would be a need to undertake regular recharge to maintain an advanced position of the beach over the frontage. With sea level rise this effort would need to increase over the period of the SMP2.

Over the western section of the Poole Bay frontage, the draft strategy (*S4, Halcrow 2004*) recommends a continued approach of beach recharge and investment in maintaining the groynes. This again will require increased effort either in establishing greater control over the beach recharge or through increasingly frequent recharge of the beaches.

With Present Management of the open coast imposes conditions for management of the flood risk within Christchurch Harbour. This is considered below.

Flood Risk

Based on the draft strategy and the more detailed study of Mudeford, the intent would be to maintain existing standards of defence over the whole area, accepting some degree of higher risk associated with local private defence at Mudeford.

This in general would require defences to be maintained and raised in line with sea level rise. In terms of Christchurch, the aim would be to build upon the existing defence line, which tends to be set back from the exposed estuary shoreline. The draft strategy (*S3, Christchurch Bay Strategy Study 2007*) identifies that many of the existing defences only come into play on more extreme events. However, the draft strategy identifies the intent for new defences at:

- Stanpit in defending against potential contamination due to the landfill site;
- Along the northern edge of the Stour defending the extensive areas of properties in this location;
- Around Wick. It is uncertain as to the exact position of defences and this potentially changes the approach put forward in SMP1 that this area would be allowed to develop naturally.

Neither the SMP1 nor the draft strategy comment on the potential flood risk further north along the Avon valley, although quite extensive areas of grazing marsh are at present within the coastal flood plain and, with sea level rise, these areas may extend to affect transport routes and property to the north of the town. The extent of coastal flood plain only marginally impacts on the Avon Valley SPA, however management of flooding in this area could impact on the SAC designation of the river course and upon the SSSI at Purewell.

At Mudeford Quay and Mudeford Town, extending the implications of present management, the intent would be to support existing private defence of property but to consider some form of set back defence in the longer term, in line with increasing risk due to sea level rise.

Overall Impacts

In terms of sustaining economic viability and communities along the Poole Bay frontage and at Christchurch, Mudeford and Wick, this scenario meets the objectives. It also maintains the heritage value within Christchurch and largely that in the area of Hengistbury Head. There would be some continuing risk as the eastern side of the headland erodes.

The potential economic damages arising from this scenario are identified in Table 1 at the end of this sub-section.

Overall the tourism and recreational facilities of the open coast would be maintained, although there may be greater disruption to this in the long term with increasing need for beach management and more frequent need for recharge. At Mudeford Spit, the increasing need for defence would tend to reduce beach width reducing the attractiveness of the area. Similarly, increasing engineering effort to maintain an advanced beach line along Solent Beach may be considered to reduce the semi-naturalness of this frontage, detracting from the contrasting but complimentary green space offered by

this section of the coast. It is in these two areas in particular that increased control and effective hardening of the shoreline may impact on landscape values associated with Hengistbury Head.

Over the open coast, there would be continuing reduction of exposure of the geology, detracting from this important value. This would not be significantly different from present and it is recognised that within the Bournemouth Seafront Strategy mitigation of impact on this is being put in place.

Within Christchurch Harbour, the main potential concerns are in relation to the impact of increased extent of defences and the potential constraint this imposes on the ability of the mosaic of habitat within the Harbour to adjust to sea level rise. A significant uncertainty in this regard is the capacity for the estuary fringes to accrete with sea level rise without additional width within which to adapt. The principal opportunities for such adaptation are in the areas of Stanpit marshes, constrained by the anticipated need to defend former landfill areas and in the detail of how defence might be provided to the village of Wick. The opportunity to allow adaptation along the Stour frontage to Christchurch is constrained by the development of this area.

Considered as a whole, there is a trend within this scenario for further encroachment of engineering management on the coast and estuary areas which detract from the overall diversity of the area. This relates specifically to the areas of interface between the natural and human zones of activity, in areas such as Solent Beach through to Mudeford Spit and in areas of Christchurch Harbour. This is reflected in the assessment against objectives set out in Table 2 at the end of this subsection.

Table 1. Economic Assessment

The following table provides a brief summary of damages determined by the SMP2 analysis for the whole PDZ. Further details are provided in Appendix H. 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. The damages for each epoch are current values. These are discounted to give present values in the final column. It is important for the reader to note that the loss figures quoted only refer to domestic dwellings and no account has been taken of commercial, industrial or infrastructure property values.

ASSESSMENT OF EROSION DAMAGES

Epoch		0 -20 year		20 – 50 years		50 – 100 years		Present Value Damages (£x1000)
No Active Intervention	SMP1 MU	Number of properties	Value x £1000	Number of properties	Value x £1000	Number of properties	Value x £1000	
Location								
Mudford Quay	CBY2b	3	706	9	2,118	80	18,828	3,305
Mudford Spit	CBY1	0	0	0	0	0	0	0
Hengistbury Head	PBY3	0	0	0	0	0	0	0
Double Dykes	PBY2	0	0	9	1,732	29	5,583	1,224
Bournemouth (BBC)	PB1a	2	385	203	39,081	2483	478,032	66,253
Canford Cliffs (PBC)	PB1b(i)	24	5,915	150	36,969	201	49,538	22,717
Total for PDZ1								93,499
With Present Management	SMP1 MU	No.	x £1000	No.	x £1000	No.	x £1000	Present Value Damages (£x1000)
Location								
Mudford Quay	CBY2b	0	0	0	0	0	0	0
Mudford Spit	CBY1	0	0	0	0	0	0	0
Hengistbury Head	PBY3	0	0	0	0	0	0	0
Double Dykes	PBY2	0	0	0	0	0	0	0
Bournemouth (BBC)	PB1a	0	0	0	0	0	0	0
Canford Cliffs (PBC)	PB1b(i)	0	0	0	0	0	0	0
Total for PDZ1								0
Notes								
Present Value NAI damages are assessed by the Christchurch Bay Coastal strategy as being of the order of £40 million for the length between Mudford Quay and Highcliffe. This includes car parks and recreational value.								
Market value NAI damages are assessed by the Christchurch Bay Coastal strategy as being of the order of £32 million Mudford Spit (£16 million PV based on loss in year 20).								

Analysis of damages in technical Annex 8 of the Poole Bay Strategy Study (2004) gave a NAI present value of £156 million for PBY1. This included loss of recreational value but was only valued over a 50 year period. Subsequent analysis undertaken for the approved project appraisal of the latest beach recharge demonstrated the significant additional damages arising from erosion beyond the 50 year period. The higher values from the appraisal have drawn upon more accurate assessment of property than has been possible in the high level assessment provided by the SMP.

ASSESSMENT OF POTENTIAL FLOOD RISK

		Flood risk total tidal and fluvial 2008		Flood risk total tidal and fluvial 2102		
No Active Intervention	SMP1	Number of properties	Value x £1000	Number of properties	Value x £1000	Averaged PVD (£x1000)
Location	MU					
Mudford Quay	CBY 2	9	£2k to £10k AAD	9	£2k to £10k AAD	184
Mudford Quay inner	CHB5	35	£2k to £10k AAD	124	£2k to £10k AAD	1,200
Mudford	CHB4	47	£2k to £10k AAD	343	£2k to £10k AAD	2,745
Stanpit	CHB3	1	Write off £253K	1	Write off £253K	179
Christchurch (not included within SMP1)		Assessment taken from strategy				88,490
Wick	CHB2	0	0	2	Write off £506K	112
Mudford spit rear	CHB1	1	£2k to £10k AAD	1	£2k to £10k AAD	20
Mudford Sandbanks	CBY1	2	£2k to £10k AAD	2	£2k to £10k AAD	41
With Present Management						
No Active Intervention	SMP1	Number of properties	Value x £1000	Number of properties	Value x £1000	Averaged PVD (£x1000)
Location	MU					
Mudford Quay	CBY 2	0	0	0	0	0
Mudford Quay inner	CHB5	0	0	0	0	0
Mudford	CHB4	0	0	0	0	0
Stanpit	CHB3	0	0	0	0	0
Christchurch (not included within SMP1)						
Wick	CHB2	0	0	0	0	0
Mudford spit rear	CHB1	0	0	0	0	0
Mudford Sandbanks	CBY1	0	0	0	0	0

OTHER INFORMATION:			
Mudford and Stanpit Viability (2008) report assesses Do Nothing Damages of £1.1M over the next 50 years for CHB5 & 4.			
Christchurch Bay Strategy (technical Annex 4, 2008) determines the following potential damages and costs:			
Area	Do Nothing damages (£ x 1000)	With proposed management (£ x 1000)	Notes
CHB 5	4,210	0	Subsequently assessed that flood risk is primarily below threshold of properties
CHB 4	7,610	0	Subsequently assessed that flood risk is primarily below threshold of properties
CHB 3	88,490	0	Includes areas of Christchurch not previous assessed in SMP1. Maintain and raise defences (£7,390k).
CHB2	1,429	0	Extend existing defences (£986k) to protect property in Wick,
CHB 1	707	0	Continued management (£779k), beach huts at risk.

Table 2. 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.

OBJECTIVE	NAI				WPM			
	Neutral	Fails	Partial	Positive	Neutral	Fails	Partial	Positive
Protect economic viability of Bournemouth, Poole and Christchurch,								
Maintain important heritage values within Christchurch,								
Support management of heritage interests around Hengistbury Head.								
Reduce flood risk within Christchurch area and Harbour and at Mudeford.								
Retain and improve the width and amenity value of the intertidal (beaches) area in Poole Bay,								
Maintain essential sea front facilities. Maintain the opportunity for commercial, recreational and sports use of the water, in particular the use of shore-based facilities such as Mudeford Quay,								
Manage risk to properties due to erosion and flooding where sustainable,								
Maintain open space and recreational use of such space,								
Minimise net loss of species/habitat (identify compensatory habitat if any net loss occurs),								
Maintain opportunity for natural development of the mosaic of habitats, particularly with Christchurch Harbour,								
Maintain geological exposure of designated cliff line,								
Maintain the outstanding landscape and the views and appreciation of the varied coastal environment,								
Support adaptability of coastal communities,								
Reduce reliance on defences.								

4.3.3 DISCUSSION AND DETAILED POLICY DEVELOPMENT

The discussion provided within the two baseline scenarios highlights the significant economic risk, both at a regional and national level, that continued management of flooding and erosion aims to address. This is quite clearly a major driver for policy development.

However, it also highlights the important interaction and dependency, in meeting these social objectives, of balancing this with sustaining and enhancing the natural environmental values. The importance of this not only relates to the essential inherent value of the natural environment, as recognised through the various environmental designations, but also in achieving the aims for an integrated and diverse setting within which social objectives are delivered; as set within the various local management strategies for the coast.

The overall conclusions that may be drawn are that a policy scenario of NAI (Scenario 1) fails to address the substantial threat to the economic, social and heritage value of the area. While the No Active Intervention scenario could deliver some significant ecological benefits, this scenario fails to deliver a balanced sustainability of values. The identified economic benefits of the With Present Management scenario (Scenario 2) demonstrates the viability of maintaining defences to large areas of the coastline and estuary - but in specific detail potentially fails to take account of the need to sustain nature conservation and landscape values. It is very much, therefore, the detail of delivery of the existing With Present Management approach that needs to be considered rather than a major change from current practice.

As discussed earlier, the key area for control of the zone is the whole frontage around Hengistbury Head, extending from Mudeford Spit through to Southbourne. Management of this area is discussed initially.

Hengistbury Head Frontage.

Despite the significant potential economic damages associated with the loss of Mudeford Spit, the main driver for management of this area is seen as being the areas influenced by management of the frontage, rather than management of the frontage itself. These associated issues are summarised in the following table.

Assessment of Management Influence of Hengistbury Head

Associated Area	Consequential Issues based of withdrawing management along Hengistbury Head Frontage – Mudeford Spit to Southbourne. (Physical impact shown in <i>Blue</i> . Management consequences shown in <i>Red</i>)
Avon Beach	<ul style="list-style-type: none"> Loss of protection from ebb delta, increased drift (epoch2) Increased pressure on Mudeford Quay (epoch 2) Significant additional cost in maintaining amenity beach, transferring control to Mudeford Quay to maintain sustainable management of the area. (epoch 2)
Mudeford Quay and Town	<ul style="list-style-type: none"> Increased wave action at Quay and along low wall to town. (epoch 2) Increased frequency of flooding (epoch 2) Increased erosion pressure (epoch 2) Combined flooding and erosion risk without additional protection provided at Mudeford Quay.(epoch 2) Potentially making maintenance of existing defences and reliance on private defences unsustainable. (epoch 2)
Christchurch	<ul style="list-style-type: none"> Increasing wave action (from epoch 2)

Harbour	<ul style="list-style-type: none"> • Realignment of channels and intertidal areas (from epoch 2) • Potential loss of existing habitat due to wave action. (epoch 3) • Potential opportunity for new habitat associated with wider open estuary, sand banks and saltmarsh. (beyond period of SMP2) • Significant loss of existing boat use and navigation. (epoch 2)
Christchurch and Wick	<ul style="list-style-type: none"> • Potential reduction in extreme water levels. (epoch 2) • Potential minor reduction in cost of defence. (epoch 2) • Loss of boat use and amenity value of the area. (epoch 2)
Poole Bay	<ul style="list-style-type: none"> • Potential increased drift rates. (epoch 2) • Increased pressure on Southbourne. (epoch 1) • Increased frequency or control of beach recharge, resulting in increased cost. (epoch 2) • Significant cost incurred in transfer of defence to Southbourne (epoch 1)
Direct Impacts	<ul style="list-style-type: none"> • Continued erosion of Hengistbury Head. (epoch 1) • Increased pressure and breach of Mudeford Spit. (epoch 1) • Increased pressure for erosion of Solent Beach. (epoch 1) • Management of Mudeford Spit unsustainable, significant amenity and economic loss. (epoch 2) • Loss of SAC and SPA (epoch 2) • Loss of Heritage Value (epoch 2) • Loss of amenity area and car parks (beginning in epoch 1)

From this there is clearly strong justification for continued management of the frontage, from Mudeford Quay to Southbourne. Certain elements of this derive from aspects such as the continued use of Christchurch Harbour for boat use and might, therefore, be considered outside the direct scope of flood and coastal erosion risk management funding; such activities are recognised as being important to delivering the overall values of the area. The economic justification for management is principally made, therefore, with respect to the additional costs associated with sustainable management of areas remote, geographically, from the Hengistbury Head. These additional costs generally occur within the second epoch and beyond. However, it is a direct consequence of management decisions being made now; it is not a situation where there might be benefit in allowing the Hengistbury Head frontage to erode further over the first epoch. Rather, the frontage is already seen as being in a critical alignment, where further unconstrained erosion would make taking advantage of the underlying control of coastal behaviour less effective.

The key location for management is at Hengistbury Head and the approach to management effects management of the specific frontages to east and west.

To the east, the intent of management is to maintain a functioning spit across the entrance to Christchurch Harbour, providing directly the opportunity to maintain the important amenity value while also retaining the position of the Run and the ebb tide delta and sediment transfer to the northern shoreline. There is also the aim to maintain the potential for erosion of the geologically important cliff.

Present management has been driven by the existing location of assets with little scope to allow the whole frontage to adapt. The southern cliff line is held forward by defences, potentially creating a discontinuity in the shoreline in the future. Under present management, allowing erosion of the cliff but holding the line of the spit, this situation could gradually change, such that the cliff line would retreat further back than the line of

the spit, exacerbating the situation. This area of discontinuity has been highlighted as a section vulnerable to breach. In future management, this needs to be addressed without significantly imposing a managed promontory isolating the spit from the southern headland.



Over the first epoch the intent would be to maintain defence over the length of the spit, gradually allowing erosion of the cliff reducing the discontinuity in the shoreline. Within the second and third epoch the intent would be to allow and facilitate a slow readjustment of the whole frontage. This would need to be managed in steps reflecting any acceleration in sea level rise. This will continue to require recharge to the front face of the spit and maintaining defences to the front face. In the longer term there may also be a need for nourishment to the back of the spit allowing continued width against breach and maintaining the important amenity use of the area.

Maintaining the position of the Long Groyne would be important in this adaptive management. Detailed consideration would need to be given to the orientation and shape of the groyne to prevent outflanking and to provide a more appropriate transition through to managed realignment of the cliff.

At the northern end of the spit, while there would be some potential scope for adjusting the front face, the general position of the spit head would, however, be maintained to manage the flow through the Run, maintaining navigation without imposing significantly greater pressure on the sea wall to the face of Mudeford Quay.

Adopting this adaptive approach will require re-examining the way in which defences along the spit are managed. The aim would be to take an approach where the defence line can be adjusted over time in line with changing pressure, taking account of the monitoring and information on sea level rise. This would need to be approached in a progressive manner with the intent, possibly to adjust existing defences over a 20 to 50 year management review cycle. The initial response would be adjustment of existing defence at the interface between the cliff and the spit. As the coast then adjusts, the new position would be re-assessed and further adaptation allowed as a result. An overall management plan would need to be developed, looking at possible responses to

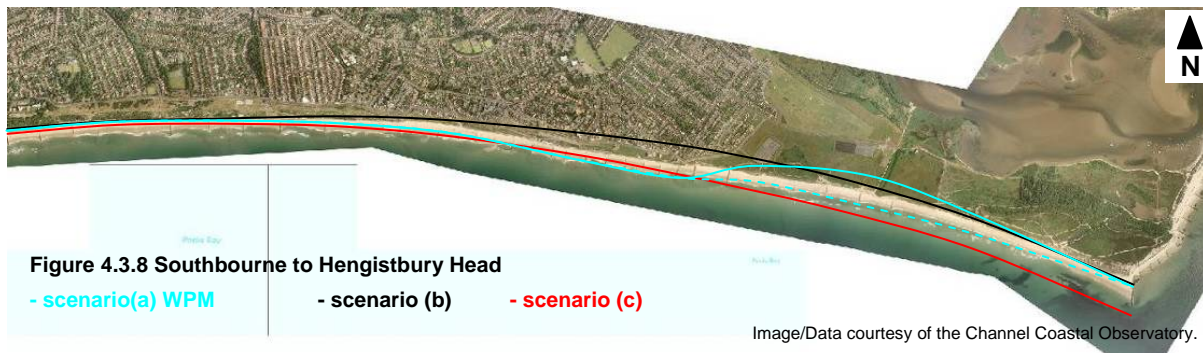


different scenarios. This plan would need to be developed with the involvement of the local community groups, Natural England and the planning authority.

To the west of the headland, the intent of management is to maintain as far as possible the continuity of the shoreline through to the main frontage of Poole Bay. The frontage was considered in some detail in describing the With Present Management scenario. Certain issues were identified, highlighting the difficult decisions needing to be taken:

- Hengistbury Head has already eroded back to such an extent that the emerging Southbourne headland is beginning to act as a significant feature in management of the main Poole Bay frontage.
- This process has resulted in a degree of separation between the main Poole Bay frontage and Solent Beach.
- Present Management, reinforcing the headland at Southbourne and bringing forward the beach line of Solent Beach through recharge and groynes, would tend to reinforce this separation.

The following figure illustrates, in principle the coastal alignment under the With Present Management approach (scenario (a), showing the typical natural alignment of Solent Beach shoreline and the intended line of the beach held forward by recharge and groynes). The figure also illustrates two alternative scenarios (retreat the line at Southbourne – scenario (b), and increase the effective length of the Long Groyne – scenario (c)). These alternatives aim, through realignment, to re-establish the overall continuity of the sediment movement over the coast. In effect these three scenarios bracket the possible approaches to management. These are developed below.



<p>Scenario (a)</p> <p>Description: maintain the Long Groyne, reinforce the headland at Southbourne and hold forward Solent Beach through recharge and Groynes.</p> <p>Rationale: The intent works within the existing constraints defined by holding the existing line at Southbourne, resisting further erosion of the Solent Beach frontage, protecting Double Dykes from further erosion, and maintaining the integrity and position of the Long Groyne. This rationale attempts to restore the continuity between Solent Beach and the main Poole Bay frontage through holding forward the alignment of Solent Beach.</p> <p>Implications: Although the Hengistbury Head headland still provides a beneficial influence on the overall coastal shape, the main effort in this respect is in holding the line at Southbourne. The influence of Hengistbury Head and the Long Groyne are in effect reduced to a role of supporting a beach, and protection, to the east of Southbourne. The Southbourne headland would act to maintain the alignment of the coast to the west. Realigning the beach, forward, over the Solent Beach frontage brings it forward of the local control of the Long Groyne, tending to increase the potential for drift towards the east and increasing the severe response to different wave conditions. As such, a fairly robust control would be required, not just to limit loss of beach recharge, but to actually control the whole shape of the beach and frontage. Typically this would be in the form of substantial rock groynes. In transferring the main effort for management to Southbourne and the groynes along</p>
--

Solent Beach, there would be less justification for works at Hengistbury Head.

With increased pressure from sea level rise, it is probable that the headland at Southbourne would need to be reinforced, potentially with larger control structures. The long term implications of this approach would be to separate management of the two frontages, with the main justification for managing Solent Beach being the management of the new headland. The probable extreme position, given the difficulty of holding forward Solent Beach without reliance on the control imposed by Hengistbury Head, would be that of eventually allowing the retreat of Solent Beach forming a distinct bay through to Hengistbury Head.

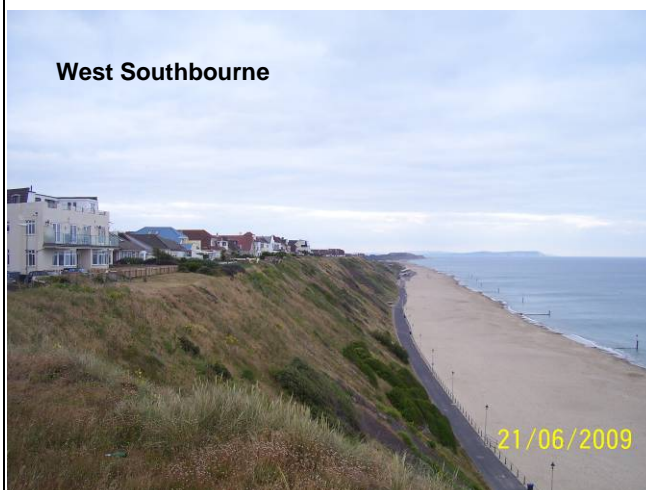
Impacts: The approach would support defence along the main Poole Bay frontage continuing to provide a sustainable context within which this frontage might be managed. Property and the road at Southbourne would be protected. The car park, Double Dykes and the scrubland dune of Solent Beach would be protected over the first and second epochs but, with increasing pressure on the frontage and the need to increase protection at Southbourne it might be expected that eventually Solent Beach would be allowed to set back to a new natural alignment. Generally, with the establishment of a new headland at Southbourne and the intent only to protect Hengistbury Head in its current form, the heritage and nature conservation interest associated with the area would be maintained.

Although as with any of the scenarios being considered, there would be some increased reliance on defence, under this approach, such defence effort would be very apparent, with significant structures required to maintain the Southbourne headland and to control recharge along Solent Beach. This may be considered to be intrusive on the semi-natural environment of the frontage, reducing the landscape and amenity value of the area.

Scenario (b)

Description: maintain the Long Groyne and allow erosion to occur over the Southbourne Frontage.

Rationale: The intent would be to allow the coast to the west to erode back to re-establish a natural



West Southbourne

alignment, with Hengistbury Head being the principle control point. The rationale would be to restore unconstrained movement of sediment along the frontage avoiding, in part, some of the inconsistency in sediment drift presently experienced.

Implications: The importance of Hengistbury Head would increase with respect to long term management of the Poole Bay frontage. The main effort in terms of control would be focussed on management of the Long Groyne, although as at present there

would still be a need for regular sediment recharge and groynes to control drift. The main benefit in taking this approach would be in potentially reducing the severe variation in drift in the area, establishing, overall a more stable alignment and potentially reducing the frequency of recharge in the local area. In the longer term there would be increased pressure on the frontage but this could be addressed in a more consistent manner over the whole length of Poole Bay. The extent of the retreat would typically be some 150m in the area of Southbourne. This might require readjusting the line of the promenade extending west some 1.5km back along the Southbourne frontage. This would result in retreat of the line of the stabilised cliff beneath the Southbourne Coast Road.

Impacts: This scenario is recognised to be an extreme position in terms of realignment of this section of the coast and is based on the typical natural alignment controlled solely by Hengistbury Head. The impact on Southbourne would be significant. There would be loss of in excess of 100 properties, together with the main coastal road. Erosion would affect part, but not all, of the main car park and would result in further loss of Double Dykes. There would not be significantly greater erosion of the main Hengistbury Head cliff and following an initial set back of Solent Beach, the semi-natural dune line would be re-established. As such there would be little substantive loss of the SAC or SPA and the landscape value and open green space would be improved as a result of less defence being required over Solent Beach.

There would be increased reliance on defence at Long Groyne but this would allow less effort in managing the adjacent frontage. With sea level rise there would still be increasing need for recharge or more effort required in retaining sediment along the frontage.

Scenario (c)

Description: extend the Long Groyne and recharge over the whole frontage.

Rationale: The intent would be to increase the influence of the Long Groyne extending its effective length by some 200m to 300m. This would in effect pull the alignment of the coast forward sufficiently to compensate for past retreat that has allowed emergence of the Southbourne Headland. The aim would be to create a new alignment that re-establishes continuity of sediment movement, re-linking processes across the frontages of Poole Bay and Solent Beach. The overall aim would be to retain a protective beach in front of Southbourne and Solent Beach, to ensure no loss or further erosion in the area

Implications: Re-establishing this link would allow a more consistent approach to recharge management of the whole frontage, establishing a more stable overall alignment and potentially avoiding more severe and sudden loss of sediment. The corollary of this would be the need for significant volume of beach recharge to allow such realignment. This would still need to be topped up on a regular basis, in that there would still be some loss to the east. Pressure on the coast is still likely to increase with sea level rise and there would be increasing effort required in managing the situation.

Impacts: This scenario is recognised to be the opposite extreme to scenario (b), proposing a major forward realignment of the eastern end of Poole Bay.



The approach would create significant additional width along Solent Beach and following the initial recharge would create conditions for possible dune development. There would be no loss of assets at Southbourne and no further erosion along the existing line of Solent Beach. There would be a substantial increase of open space. There would be little erosion of the cliff at Hengistbury Head. Although inevitably there would be some initial loss of sediment beyond the new Long Groyne, over time

this approach is likely to reduce feed to Mudeford Spit. This could be mitigated through design of the new structure and this would have to be considered in conjunction with developing the management approach to the northern section of the coast. The approach would have a significant impact on the

landscape tending to reduce the impact of Hengistbury Head.

There would be increased reliance on defence at Long Groyne but this would allow less effort in managing the adjacent frontages. With sea level rise there would still be increasing need for further recharge but the approach establishes a more sustainable frontage for the future. There would be significant additional cost in developing this scenario and much of the benefit of this would be in recreating extensive areas of open space. As such it is unlikely that funding would come solely from flood and erosion risk management.

Scenarios (b) and (c) are recognised as being extreme cases, requiring either major loss of established assets or major investment in coastal realignment, respectively. As such it is unlikely that either approach would be acceptable or viable. Even so they do assist in understanding the potential implications, highlighting the interaction between management of Hengistbury Head and focussing management at Southbourne. In contrast scenario (a) demonstrates the potential problems of taking a purely reactive approach; driven by the intent to address existing local issues and with a consequential shift in management to separating the behaviour of Poole Bay and that of Solent Beach. Unless one of the more extreme approaches were adopted, however, at least in part, it seems inevitable that in the long term (epoch 3 and beyond) greater reliance would be placed on Southbourne as the main control feature of the coast. These options would need to be developed with all appropriate stakeholders.

Potentially, the appropriate management approach lies within these extremes. There is scope for some realignment of the overall frontage through both retreat at Southbourne and increasing the effectiveness of the control point at Hengistbury Head. In the case of the former, the opportunity for retreat needs to be maintained, defining the lower lying area and open ground in front of Southbourne Coast Road in planning terms as a coastal change management area, allowing longer term adaption. This would provide the necessary scope to re-design the defence approach in this area based on the most sustainable position, rather than being constrained by the existing alignment of the promenade and the position of property. Even relatively small scale realignment may provide the opportunity for managing the difficult interface between the two sections of beach in a more sustainable manner. In the case of the latter, developing an approach to replacement of the Long Groyne, potentially extending the influence of this structure, together with some realignment of Solent Beach would allow more effective management of the area.

The role of the SMP in this area is, therefore, more one of providing a broader scale, longer term appreciation of options and general approach to management. It would not be appropriate for it to define an actual shoreline position. The Long Groyne is reported to be in poor condition and, therefore, resolving a more detailed plan for the area is quite critical. In terms of policy it is recommended that although potential realignment at Southbourne may not be critical over the first epoch or potentially the second epoch and, therefore, an initial policy of Hold the Line may be concluded, there may be a need for realignment in the longer term future. In terms of Hengistbury Head, under any of the scenarios, Hold the Line is considered important to sustainable management of the adjacent frontages; but with the option, needing detailed consideration, to extend the effectiveness of the groyne effect.

Between Southbourne and Hengistbury Head, sustainable management should not be dictated by the existing extent of Double Dykes. While it may prove to be appropriate, through extension of the Long Groyne, beach management and management at

Southbourne, to reduce the pressure of erosion on this feature, this would not be the primary consideration in management of Solent Beach. Accordingly the policy in this area should be managed realignment.

Given the condition of the Long Groyne and the need to resolve uncertainty as to management at Southbourne, it would be recommended that a detailed strategy for the area is undertaken as soon as possible. It would be further recommended that such a study takes account quite specifically of management of the Mudeford Spit frontage so that any benefits in redesign of the Long Groyne takes account of issues arising from this northern frontage. It is recognised that justification for management of this overall frontage draws on benefits arising from management of adjacent sections of the coast; i.e. Poole Bay, Avon Beach and within Christchurch Harbour. As a precursor to study of the area, these benefits, (including potential benefits not necessarily directly associated with flood and erosion risk management appraisal) need to be evaluated, based on information from finalised strategies for these areas.

In summary, therefore, the whole area from the northern extent of Mudeford Spit through to Southbourne is considered an important feature in minimising impact on adjacent areas. It is considered important for sustainable flood and erosion management and development of interests of broader coastal management. The intent of the shoreline management plan is, therefore, to sustain the overall influence of this section of the coast, ensuring that over the period of the SMP2 neither the Solent Beach isthmus nor Mudeford Spit breach. Specifically, the aim is to maintain the position of the Long Groyne, with the potential for this structure to be extended and reshaped to allow better management of adjacent sections of the coast. To the east of the headland, the aim is to maintain the integrity of the spit, sustain amenity value of the area, maintain the position of the Run but also facilitate continued exposure of the cliff face. The intent is initially to restore the alignment of the overall section of the coast. The spit would be allowed to roll back in response to increased pressure due to sea level rise, matching erosion of the cliff. This will require development of a management plan allowing continued use of the area, supported by defence and recharge. The intention would be to maintain the position of the Spit Head, maintaining the navigation channel. To the west of the headland, the intent would be to maintain the integrity of the isthmus and defence to the principle assets at Southbourne. At the same time, the aim is to maintain as far as possible, the continuity of shoreline processes between the main section of Poole Bay and those of Solent Beach. To achieve this, consideration needs to be given to potential retreat along the line of the emerging Southbourne headland while examining options for extending the influence of the structure at the toe of Hengistbury Head. Between these two locations, the aim would be to establish a more sustainable position for maintaining a robust semi-natural defence to the isthmus. This would not preclude increasing the beach width in front of Double Dykes, but neither would the defence position of the frontage be determined by defence of this feature's existing extent. The overall aim in this area is to maintain the open space, amenity and nature conservation value of the area by minimising reliance on hard defence to control the frontage.

Based on the recommended policy for this central section of the zone, the adjacent frontages may be considered in detail.

Mudford Quay to Friars Cliff

The No Active Intervention scenario would result in significant loss in terms of built assets as well as important regional amenity value. This would be unacceptable.

The policy approach set for Mudford Spit establishes a position where increased pressure is avoided along the frontage to the north; maintaining the Run and the associated ebb delta provides opportunity for some natural sediment supply as well as providing some protection from wave attack. Therefore, overall present management of the frontage is considered sustainable.



**Figure 4.3.9
Avon Beach**

Image/Data courtesy of the Channel Coastal Observatory.

Associated with the intent to maintain the channel at its present location is the need to maintain defences from Mudford Quay through to Avon Beach. This section of the frontage acts as an important navigation control. There would be no scope for realignment; however, equally there is little increased pressure from scour as a result of the policy intent to hold the northern end of Mudford Spit. There might be increased overtopping at the Quay due to sea level rise. This might not significantly affect operation on the Quay but could be addressed by increasing the wall height. This would need to be considered at a local scale.



Avon Beach

The overall approach is very much in line with the With Present Management scenario. The frontage is maintained by beach recharge, compensating for a general trend for loss of beach towards the east. This is supported by construction of rock groynes and maintenance of earlier timber groynes further to the east. With increased sea level rise, the current approach recommended in the draft strategy to replace older groynes appears appropriate. At present these structures

do not significantly impact on the amenity value of the area. Unlike areas further east, the groynes and beach do not act as toe support to the coastal slope and the main function of the groynes is merely to provide additional constraint against sediment transport. The beach then provides protection against erosion of the back shore.

The overall intent of management to this area is, therefore, to maintain the alignment of Mudford Quay to maintain the use of this area and to continue to act as a navigation training wall to support continued water use of Christchurch Harbour. The ebb tide delta provides protection to Avon Beach and the aim of management in this area is in taking advantage of this in sustaining a wide amenity beach as protection to extensive areas of housing to the rear. There is little defence advantage in realignment further east along the frontage and maintaining the beach in this area fulfils the aims of the Christchurch Beaches and Hinterland Management Plan. Even with sea level rise this aim is considered sustainable. This policy is in line with policy developed in PDZ1 for Highcliffe but detailed examination would need to be given at a local scale as how best

to manage the transition between the maintained beach and the natural development proposed for Friars Cliff.

Christchurch Harbour

As identified in the assessment of the two baseline scenarios, the key possible conflict is the potential extension of defences in front of Stanpit and at Wick, reducing the ability for natural development of estuary habitat in line with sea level rise. Overall, however, nothing identified in either baseline scenario indicates any major physical interaction between management approaches to different sections of the frontage. Over much of the upper estuary area there is a strong economic argument for continued defence of the main town of Christchurch as identified in the With Present Management scenario.

With a general acceptance of the With Present Management approach, each local area is discussed below.

The policy set out above for Mundeford Quay and Spit, retains the overall shape of the entrance and maintains protection against increased wave action, which would otherwise impact significantly of the Mundeford Town frontage.

At present, policy for the town is one of holding the basic line of defence as defined by the low estuary-side wall. This provides only limited protection against flooding and is regularly over topped. This overtopping only affects a limited number of properties and flooding would only significantly impact on the main old core of Mundeford on exceptional events. Flood protection is provided by local private defences (i.e. garden walls) and this has been assessed as appropriate to the scale of the problem. This may need to be re-assessed in line with sea level rise.

The intent of the Plan is therefore to maintain a general policy of Hold the Line to the frontage, supporting continued maintenance of the low sea wall. This would not involve raising this line of defence and, with sea level rise, areas such as the open area behind the Quay, the car park and boat park behind the Quay and the headland to the north would be subject to increased flooding. Consideration could be given in the area immediately behind the Quay, particularly in the area of open ground, to removal of the low wall, allowing some limited scope for natural habitat development. This would, to a degree, depend upon the capacity for the estuary in this area to accumulate sediment in line with sea level rise. This would need to be monitored. The aim would be to avoid squeeze of habitat against the wall. The intent elsewhere in this area would be to continue to support local private defence, only actively considering more formal set back defence of the main core of the town if the long term need arises with sea level rise. Planning should recognise that the lower lying properties, particularly at the headland, would be at increased risk of flooding. This general approach would apply around the frontage including the road in front of Stanpit.

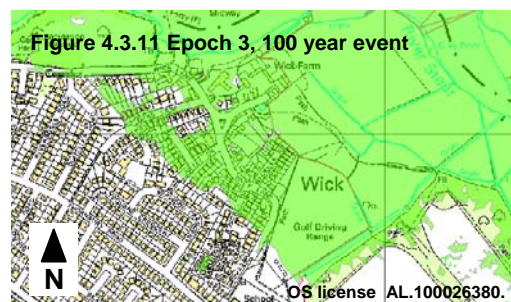
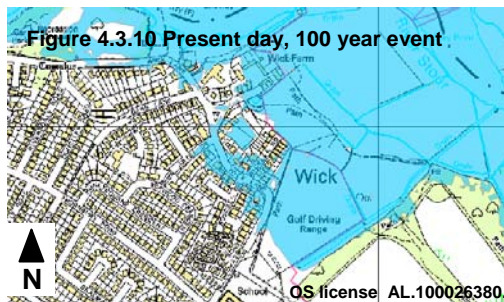
A distinction is made above between policy for the main developed area of Stanpit, landward of the coast road, and Christchurch town centre and the former SMP management unit running around the edge of Stanpit Marshes, in front of the road and the town. The SMP policy was for retreat over the marshes with the intent to maintain defence along the back of the area. This area of marsh, including much of the recreation ground would be at increasing flood risk with sea level rise. The area of the

recreation ground offers potential scope for redevelopment of natural habitat in compensation for loss more generally within the area of the SSSI. The draft strategy, however, identifies the presence of a land fill site as a constraint against such adaptation. Subject to further monitoring of the behaviour of possible accretion or erosion patterns within the Harbour in line with sea level rise, this constraint would need to be reassessed. Potentially, over the long term, should it be identified that the integrity of the SSSI is being damaged due to this constraint and the inability of the estuary to adapt naturally, further consideration should be given to the landfill area to determine whether there is scope to allow natural diffusion of possible pollutants or to the possibility of excavation of material to allow further retreat of defences along the estuary edge. The policy and intent of the plan within the SMP is for managed realignment subject to such further investigation.

There is little scope for managed realignment within the town centre or along the north edge of the Stour valley to the west. The policy over the whole frontage would be to Hold the Line, in line with the draft strategy recommendations. Some local areas potentially fall below the priority scope for funding under flood defence. Even so, the SMP assessment supports the strategy position that these areas are of fundamental importance to the heritage value of the town and to maintain the overall integrity of the community. As such no distinction is made in these areas and the SMP would continue to support of policy for Hold the Line.

Consideration might need to be given to joint funding in such areas, looking to gain additional funding in line with the recommendations of Defra's strategy Making Space for Water.

At Wick, new development in and around the old village centre has resulted in increased flood risk. At present this is not severe, but may substantially increase with sea level rise. This increase in risk is shown in the following figure.



While there seems no benefit in abandoning defence of the community, the manner in which defence might be provided needs to recognise the need to allow space for adaption of the nature conservation interest in the area. Therefore, while the SMP policy for the village would be to Hold the Line of defence, this should be strictly limited to the footprint of the developed area. In particular the marsh land in front of Wick Farm and the area of the golf range should remain undefended, allowing scope for saltmarsh and transitional habitat development.

The section of estuary to the south and east of Wick should be allowed to develop naturally with no active intervention.

The area behind Mudeford Spit should similarly be allowed to develop naturally. However, with managed realignment of the spit to maintain its integrity and width, there

would be a loss of intertidal area. Issues relating to this would need to be considered alongside the detailed long term management plan for the spit.

In considering each local area, recommendations have been made to allow as far as possible future natural development of Christchurch Harbour, retaining the integrity of the mosaic of habitat. However, depending on the future behaviour of the estuary, specifically with respect to its capacity to accrete sediment in line with sea level rise, it is anticipated that there may be loss of saltmarsh area. Although considered outside the direct area of the SMP, the upstream Avon valley does offer potential for conversion to natural estuary conditions. This would principally be outside the area of the Natura 2000 site further upstream, although bordering on this designated area. The Purewell Marsh SSSI lies to the rear of the principal road system which might sensibly be taken as the limit of realignment with low level defences maintained on the estuary side of the various roads. This would also act to protect a range of properties from flooding. Subject to monitoring of estuary behaviour, this upstream area possibly offers compensation for management within the main area of the Harbour.

Main Poole Bay Frontage

The final section of coast within this zone is the main frontage between Poole and Bournemouth extending through to Southbourne. The large scale of damages arising from the No Active Intervention scenario along this section would be unacceptable, having significant national and regional consequences. The key features of management in this area are associated with maintaining the economically important use of the foreshore and backshore width. This would provide protection from erosion to the properties along the cliff behind. Current practice, over the last 30 years, has achieved this through regular beach recharge, with loss of recharge material being reduced by groynes. The original groynes were 70m in length and constructed in timber. Experience gained through this process had confirmed that over filling the beach encouraged higher initial losses, with loss reducing as the effect of the groynes emerged. This process has been the subject of modelling studies (Draft Strategy - Technical Annex 2, 2004) and the results of this used in the Benefit/ Cost analysis (Technical Annex 8). The conclusion of this work was that optimum management would be achieved through replacement of the timber groynes with longer rock groynes and recharge on a typical ten year cycle. In addition, the Poole Harbour Commissioners channel dredging programme produces a subsequent local source of sediment with which to supplement the recharge cycle, improving the overall cost effectiveness of the approach.

This modelling was undertaken over a 50 year period considering existing water level and wave conditions. The results of the economic analysis were updated considering a 100 year period and demonstrated a benefit cost ratio in excess of 20. This reinforces the very strong broader socio-economic argument for continuing this approach to defence, when considered appropriately over the longer period of the SMP2.

With anticipated sea level rise, there is likely to be increased pressure on maintaining the present practice of recharge. Typically, the response to increased water levels and potential increased wave energy would be to increase both the levels of recharge and the length and height of control structures. A further related risk as a result of sea level rise is highlighted in the Bournemouth Seafront Strategy:

“The long term prospect of rising sea levels already determines the Environment Agency’s policy of only advising new coastal building developments with a ground floor level of 4.6 metres above the ordnance datum line. Typically, this translates to around 2 metres above the current Bournemouth promenade level.”

Although this policy advice is updated as better information becomes available through climate change research, this does suggest that in the future there may be a need to re-examine how the use and defence of the frontage is sustained, both in terms of engineering and possibly funding. The attitude of the Council has been to carefully examine, through development of such documents as the Seafront Strategy how best use can be made of its shoreline while maintaining existing overall values. Typical of this is the adaptive redevelopment, or redesign at Boscombe, incorporating aspects such as a surfing reef. This whole area is an example of how alternative funding approaches may be brought in, in an integrated manner, to sustain use of the seafront.

If this general approach were adopted for the frontage, the logical extension of this might be to actually advance the line of defence; the distinction being made that rather than merely increasing the width of the defence zone, positive use is made of control structures in addition to purely their defence function.

Under this scenario, the aim would be to actually reclaim over the foreshore, in effect, constraining sediment movement and retaining local beach areas. This could provide the opportunity to attract inward investment for coastal use development.

Such an approach would radically alter processes along Poole Bay. It is made possible by the central location of the frontage in relation to the overall alignment of the bay. Any works taken to advance the line would have a reducing impact on the adjacent shoreline with distance from the works. Potential impacts that would need to be considered are:

- Some minor influence on the Poole Harbour frontage, potentially influencing sediment supply.
- Reduction of sediment supply to Solent Beach area. This supply at present is again provided by current practice of beach recharge.

Clearly such impacts would need to be considered in detail as part of developing a framework for taking forward an advance the line policy. However, these issues are not considered to be a significant constraint.

In summary, the recommendations from the SMP2 for this frontage would be for Hold the Line over the three epochs. The intent for management is to maintain protection by recharge and sediment movement control, thereby sustaining the essential recreational and amenity benefits along with defence of important infrastructure and properties along the crest of the cliff. The SMP, however, recognises the possible difficulties in terms of the potential increased effort required to maintain the existing practice of regular recharge and maintenance of the groynes in the long term. As such a potential policy, possibly over the third epoch could be to advance the line. This approach would intend to constrain sediment drift so as to retain areas of beach along a redesigned frontage, developing a fully integrated approach to management of the coastal zone. This possible policy would need to be taken forward in partnership within a strong framework for development of the whole frontage. Furthermore, this framework would need to

define acceptable influence or mitigation with respect to maintaining underlying coastal processes and management of the adjacent areas of coast.

PDZ2

Management Area Statements

CBY D - Friars Cliff to Mundeford Quay. (CH. 15 KM TO CH 17 KM.)
Covering previous SMP1 management units CBY2

CBY E and PBY E - Mundeford Spit to Southbourne (CH. 26 KM TO CH 31 KM.)
Covering previous SMP1 management units CBY1, PBY3, 2 and part of PBY1

CBY F - Christchurch Harbour (CH. 17 KM TO CH 26 KM.)
Covering previous SMP1 management units CHB 5 through to CHB 1

PBY G - Southbourne to Flag Head Chine (CH. 31 KM TO CH 41.5 KM.)
Covering previous SMP1 management unit PBY1


Location reference:	Friars Cliff to Mudeford Quay
Management Area reference:	CBY.D
Policy Development Zone:	PDZ2



* 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 SMP, 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 "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 Preferred Policy this distinction is made in showing two different lines:

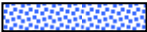
-  With Present Management.
-  Preferred Policy.

-  In some areas, the 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:

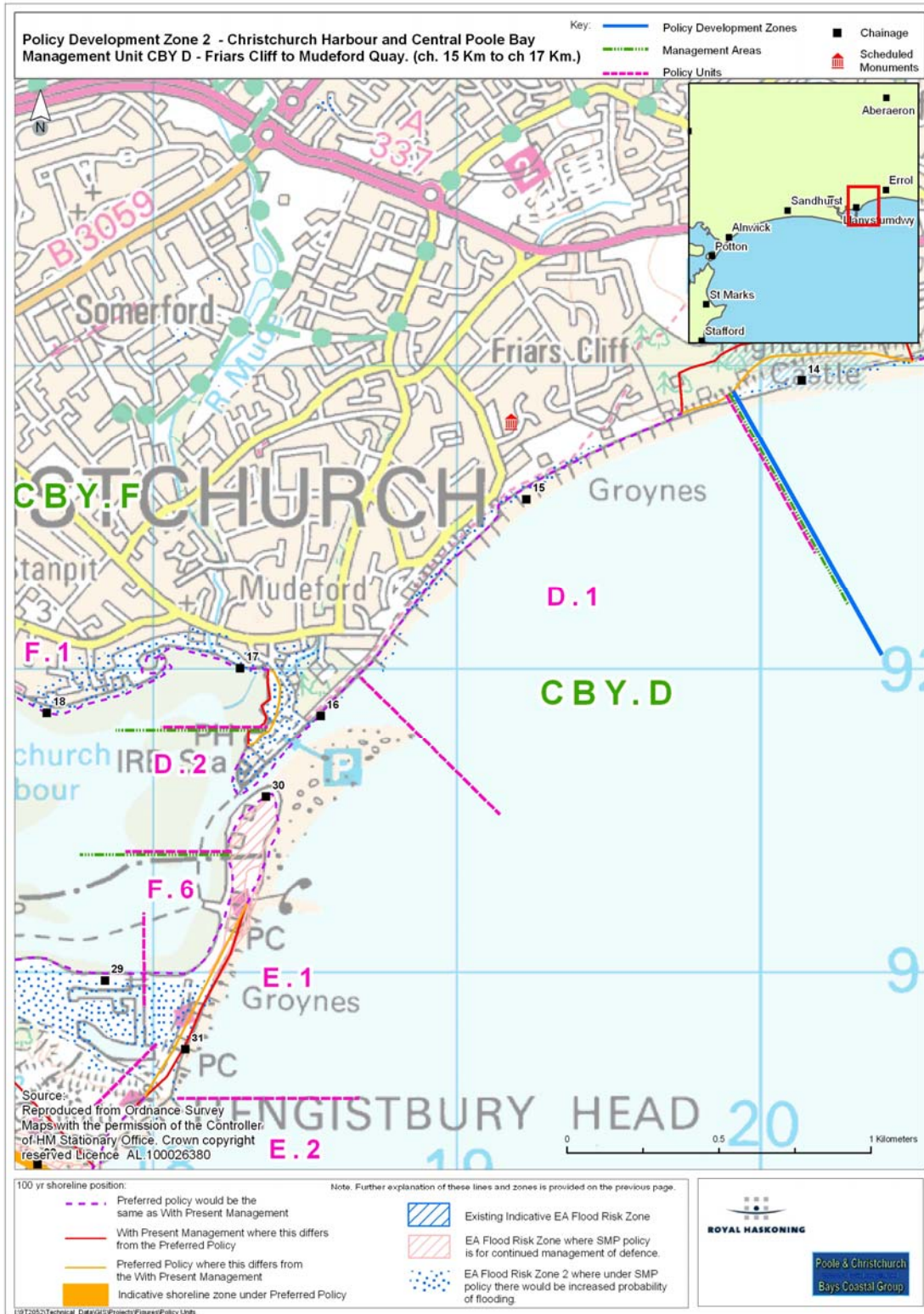
Flood Risk Zones

 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 SMP document show where SMP policy might influence the management of flood risk.

 Indicate areas where the intent of the SMP 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 SMP document.



SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The overall intent of management to this area is to maintain the alignment of Mudeford Quay, to maintain the use of this area and to continue to act as a navigation training wall to support continued water use of Christchurch Harbour. The ebb tide delta provides protection to Avon Beach and the aim of management in this area is in taking advantage of this in sustaining a wide amenity beach as protection to extensive areas of housing to the rear. Maintaining the beach in this area fulfils the aims of the Christchurch Beaches and Hinterland Management Plan. This policy is in line with policy developed in PDZ1 for Highcliffe but detailed examination would need to be given at a local scale as how best to manage the transition between the maintained beach and the natural development proposed for Friars Cliff.

The intention in this Management Area is to implement an approach which will provide a basis for long-term sustainability. Although the NAI damages are exceeded by the plan implementation costs in the first 2 epochs, the longer view is that long term positive benefit / costs ratios are supported by early investment in the frontage and commitment in going forward with the preferred plan. Management of this frontage is also inherently linked to the longer-term viability of Christchurch Harbour (and therefore Christchurch town) and therefore it is felt the intrinsic benefits go beyond simply those indicated by the broad-scale economic assessment. The apparent risk that public funding may be difficult to obtain for this frontage is acknowledged. However it is felt that a more detailed assessment of the benefits would provide a more robust argument of the affordability of continuing to manage this frontage with intent to maintain the position of the Mudeford Run and the wide recreational beach, for both the direct benefits obtained and the wider benefits to Christchurch Harbour. In particular this would provide a more comprehensive assessment of how the Government's Outcome Measures would be delivered through such an approach.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain existing defences. Consider replacement of timber groyne to rock. Continue regular cycle of beach recharge.
Medium term	Maintain existing defences. Continue regular cycle of beach recharge.
Long term	Maintain existing defences. Potential increase of defence level along Mudeford Quay. Continue regular cycle of beach recharge

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
CBY.D.1	Avon Beach	HTL	HTL	HTL	Maintain integrity of beach through controls structures and recharge.
CBY.D.2	Mudeford Quay	HTL	HTL	HTL	
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	501	752	2052	3305
	Preferred Plan Damages £k PV	0	0	0	0

	Benefits £k PV	501	752	2052	3305
	Costs of Implementing plan £k PV	685	200	221	1106


Location reference:	Mudford Spit to Southbourne
Management Area reference:	CBY/PBY.E
Policy Development Zone:	PDZ2



* 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 SMP, 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:



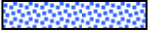
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of "With Present Management" and under the "Preferred Policy" being put forward through the Shoreline Management Plan.

-  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 Preferred Policy this distinction is made in showing two different lines:

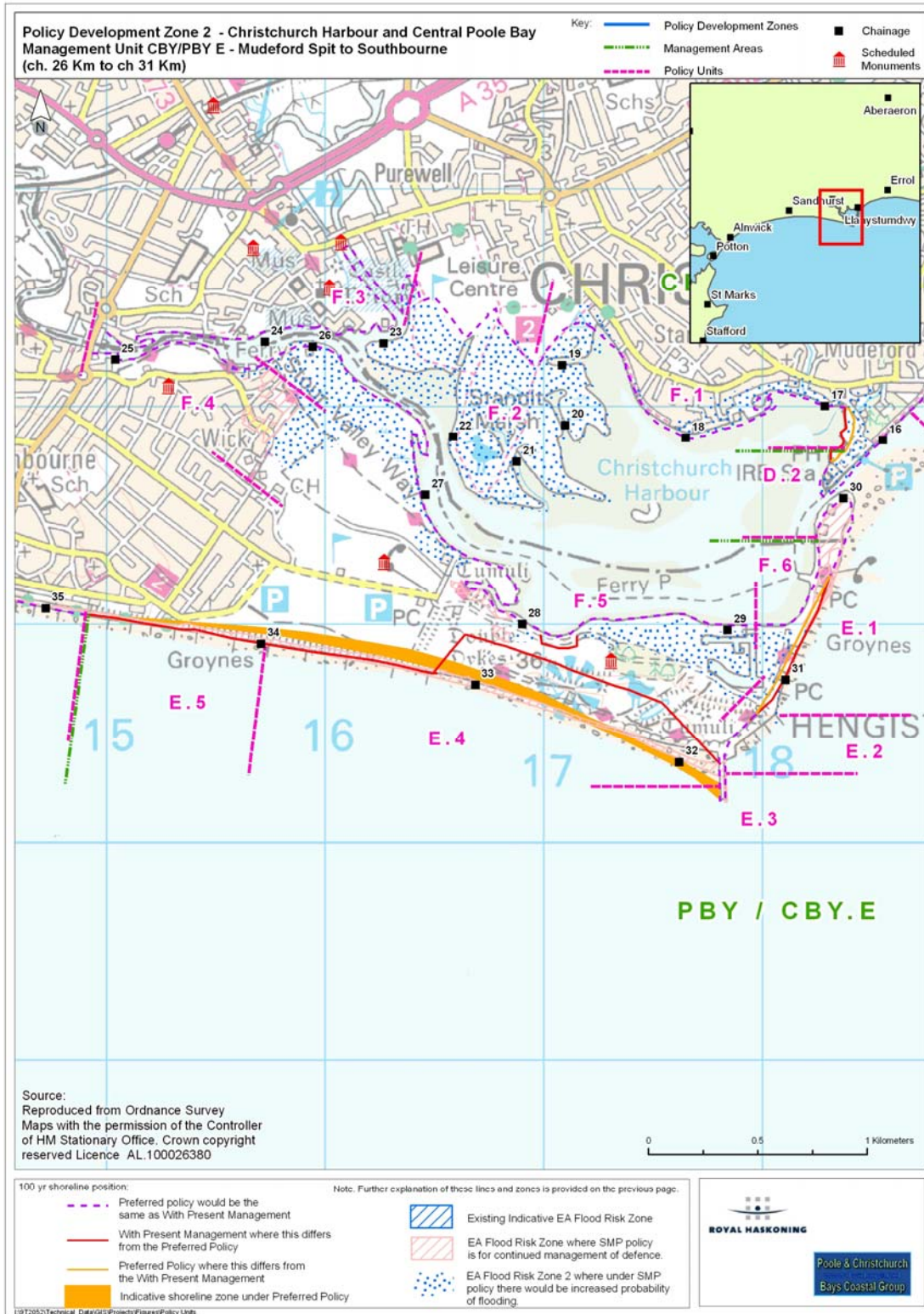
-  With Present Management.
-  Preferred Policy.

-  In some areas, the 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 SMP document show where SMP policy might influence the management of flood risk.
-  Indicate areas where the intent of the SMP 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 SMP document.



SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The whole area from the northern extent of Mudeford Spit through to Southbourne is considered an important feature in minimising impact on adjacent areas of the coast. It is considered important for sustainable flood and erosion management and development of interests of broader coastal management over the whole zone. The intent of the shoreline management plan is, therefore, to sustain the overall influence of this section of the coast, ensuring that over the period of the SMP2 neither the Solent Beach isthmus nor Mudeford Spit breach. Specifically, the aim is to maintain the position of the Long Groyne, with the potential for this structure to be extended and reshaped to allow better management of adjacent sections of the coast. To the east of the headland, the aim is to maintain the integrity of the spit, sustain amenity value of the area, maintain the position of the Run but also facilitate continued exposure of the cliff face. The intent is initially to restore the alignment of the overall section of the coast. The spit would be allowed to roll back in response to increased pressure due to sea level rise, matching erosion of the cliff. This will require development of a management plan allowing continued use of the area, supported by defence and recharge. The intention would be to maintain the position of the Spit head, maintaining the navigation channel. To the west of the headland, the intent would be to maintain the integrity of the isthmus and defence to the principle assets at Southbourne. At the same time the aim is to maintain as far as possible the continuity of shoreline processes between the main section of Poole Bay and those of Solent Beach. To achieve this, consideration needs to be given to potential realignment along the line of the emerging Southbourne headland while examining options for extending the influence of the structure at the toe of Hengistbury Head, this would be undertaken in the strategy development. The aim at Southbourne would still be to maintain defence to the majority of property and interests. Between these two locations the aim would be to establish a more sustainable position for maintaining a robust semi-natural defence to the isthmus. This would not preclude increasing the beach width in front of Double Dyke, but neither would the defence position of the frontage be determined by defence of this feature's existing extent. The overall aim in this area is to maintain the open space, amenity and nature conservation value of the area by minimising reliance on hard defence to control of the frontage.

It is acknowledged that the low benefit/cost ratio presented in the economics table below indicates a low-level of affordability for the preferred plan along this part of the frontage. However in this location, possibly more than anywhere else along the SMP frontage, the much wider benefits of the intent of management are simply not reflected by identification of the value of the local assets protected. Maintaining the Long Groyne and managing the width of Solent Beach is an inherent part of the strategy to retain Hengistbury Head. This in turn provides essential control of the erosion risk for the whole of Poole Bay to the west and part of Christchurch Bay to the east. It is therefore intrinsically linked to achieving the high level SMP2 objectives throughout the Poole and Christchurch Bays. It is therefore felt that although apparent affordability is very limited, the envisaged investment along this frontage actually represents very wide benefits for relatively limited long-term investment.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Develop upon existing local management plan of Mudeford spit and establish agreement for relocation of assets. Review shape and extent of Long Groyne in conjunction with strategy for Solent Beach. Allow further erosion of the eastern cliff face. Maintain defence to the spit with recharge. Develop strategy for Solent Beach and confirm management at the Long Groyne and Southbourne.
Medium term	Implement realignment of Mudeford Spit. Maintain replacement of the Long Groyne and implement strategy for Solent Beach, with potential realignment at Southbourne.
Long term	Implement realignment of Mudeford Spit. Maintain replacement of the Long Groyne and implement strategy for Solent Beach.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
CBY/ PBY.E.1	Mudeford Sandbank, Harbour Side	HTL	MR	MR	Allow gradual rollback in line with sea level rise.
CBY/ PBY.E.2	East of Hengistbury Head	MR	MR	MR	Managed realignment of cliff line.
CBY/ PBY.E.3	Hengistbury Head Long Groyne	HTL	HTL	HTL	Maintain position and influence of the Head on sediment transport.
CBY/ PBY.E.4	Solent Beach	MR	MR	MR	Maintain beach levels as principal defence linked to intent to HTL at Hengistbury Head and potentially extend the influence of Long Groyne. Intent to provide a robust defence of isthmus
CBY/ PBY.E.5	Southbourne	HTL	HTL	MR	Manage to allow transition between main Bournemouth Frontage and Solent Beach
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	5	636	624	1265
	Preferred Plan Damages £k PV	0	0	0	0
	Benefits £k PV	5	636	624	1265
	Costs of Implementing plan £k PV	842	142	97	1081


Location reference:	Christchurch Harbour
Management Area reference:	CHB.F
Policy Development Zone:	PDZ1

* 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 SMP, 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 "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 Preferred Policy this distinction is made in showing two different lines:

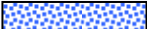
-  With Present Management.
-  Preferred Policy.

-  In some areas, the 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:

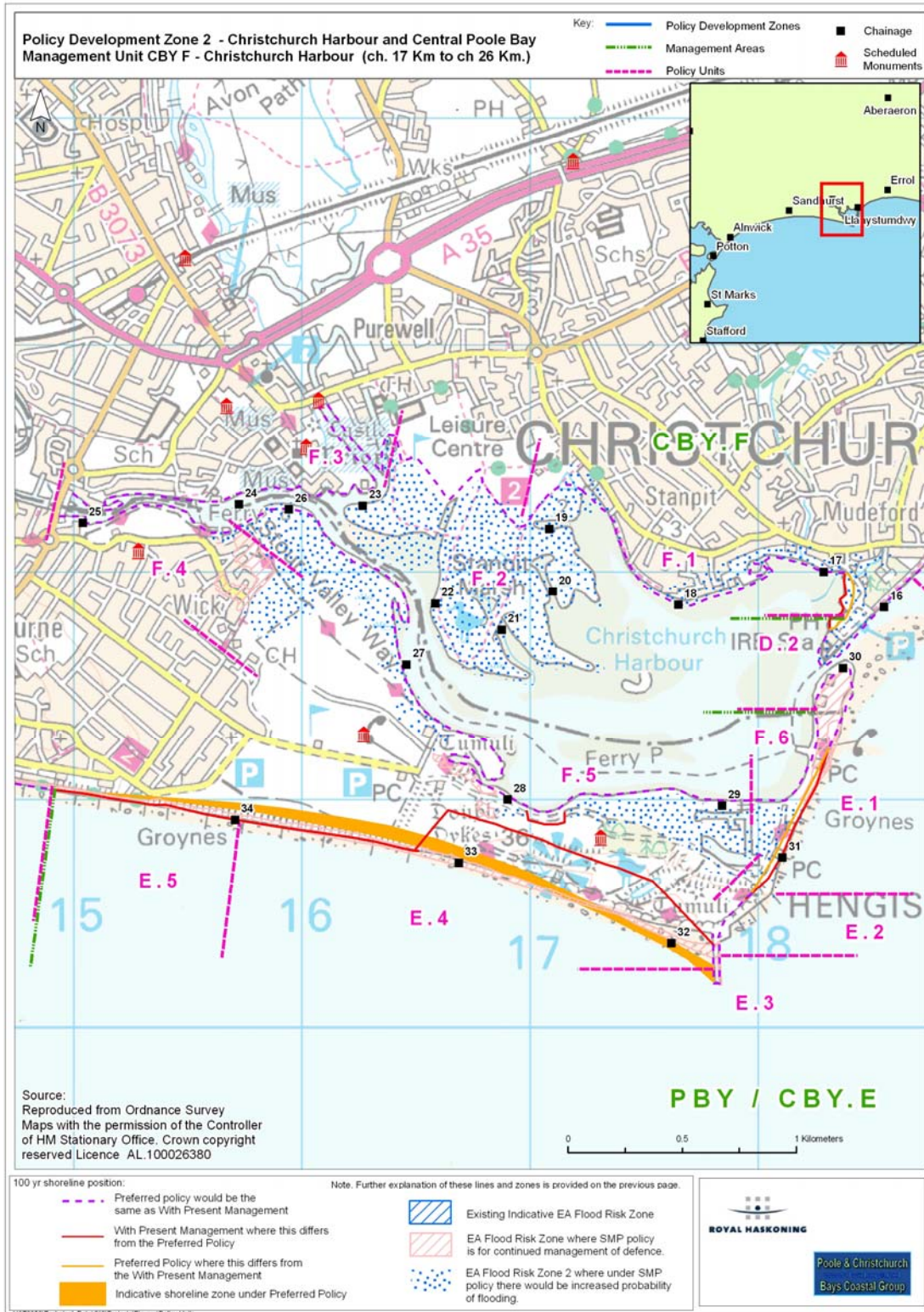
Flood Risk Zones

 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 SMP document show where SMP policy might influence the management of flood risk.

 Indicate areas where the intent of the SMP 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 SMP document.



SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The intent of the Plan is to maintain a general policy of Hold the Line to the important areas of development around the Harbour but also to ensure opportunity for natural adaption of the mosaic of habitats.

In the Mundeford and Stanpit area defining policy has to consider quite complex issues of future flood risk due to sea level rise. The recent studies have shown immediate coastal flood risk is limited to five properties. However, future flood risk would substantially increase this number. Therefore, present investment in flood risk management would not be beneficial, but in the future may be likely and justifiable.

Along the Mundeford front the intent would be to support continued maintenance of the low sea wall. The car park and boat park behind the Quay and the headland to the north would be subject to increased flooding. Consideration could be given in the area of open ground, immediately behind the Quay, allowing some limited scope for natural habitat development along side setback defence. This would be subject to further investigations of the landfill. The aim would be to avoid squeeze of habitat against the wall. The intent elsewhere in this area would be to continue to support local private defences (i.e. garden walls), only actively considering more formal set back defences of the main core for the village if the long term need arises with sea level rise. Planning should recognise that the lower lying properties particularly at the headland would be at increased risk of flooding. This general approach would apply around the frontage including the road in front of Stanpit. Even though there is a changing emphasis in the specific way in which risk is managed, the policy for this area during the first epoch is to Hold the Line, realign the shoreline defence during the second epoch and hold this new line through to the third epoch.

The intent for Christchurch is to maintain and improve flood defence to maintain the integrity of the town. Subject to long term monitoring, should it be identified that the integrity of the SSSI is being damaged due to the inability of the estuary to adapt naturally, further consideration should be given to retreating the line behind the Stanpit Marshes. At Wick, the aim of the plan is to restrict defence strictly to the area of development. Natural development of estuary habitat should be encouraged over the existing marsh and rising land. To the south side of the estuary natural development of the estuary would be allowed.

Despite actions recommended above it is recognised that the balance of habitat may not be achieved with Christchurch Harbour. Subject to monitoring of estuary behaviour, the upstream area north of Christchurch possibly offers compensation for management within the main area of the Harbour.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain and raise defences as set out in the draft strategy taking account of the caveats in relation to habitat creation.
Medium term	Maintain defences and allow adaption of habitat.
Long term	Maintain defences and allow adaption of habitat with potential conversion of the lower Avon valley to saline conditions.

SUMMARY OF SPECIFIC POLICIES

Policy Unit	Policy Plan			
	2025	2055	2105	Comment

CHB.F.1	Mudford	HTL	MR	HTL	Manage flood risk initially through local protection and flood warning. Potential need for a combination of set back defences to compliment existing foreshore structure. Decisions in this area will be influenced by further investigation of the landfill site.
CHB.F.2	Stanpit Marshes	HTL	MR	MR	Maintain opportunity for roll back of marshes with Sea level rise subject to investigation of landfill.
CHB.F.3	Christchurch	HTL	HTL	HTL	Maintain and improve flood defence.
CHB.F.4	Wick	HTL	HTL	HTL	Local improvement to defences in line with sea level rise.
CHB.F.5	Southside of Christchurch Harbour	NAI	NAI	NAI	
CHB.F.6	Rear of Mudford Sandbank	MR	MR	MR	Allow ,managed roll back of Spit as for CBY1.1
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	387	1331	2525	4243
	Preferred Plan Damages £k PV	0	0	0	0
	Benefits £k PV	387	1331	2525	4243
	Costs of Implementing plan £k PV	1595	389	394	2378





Location reference:	Southbourne to Flag Head Chine
Management Area reference:	PBYG
Policy Development Zone:	PDZ2

* 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:

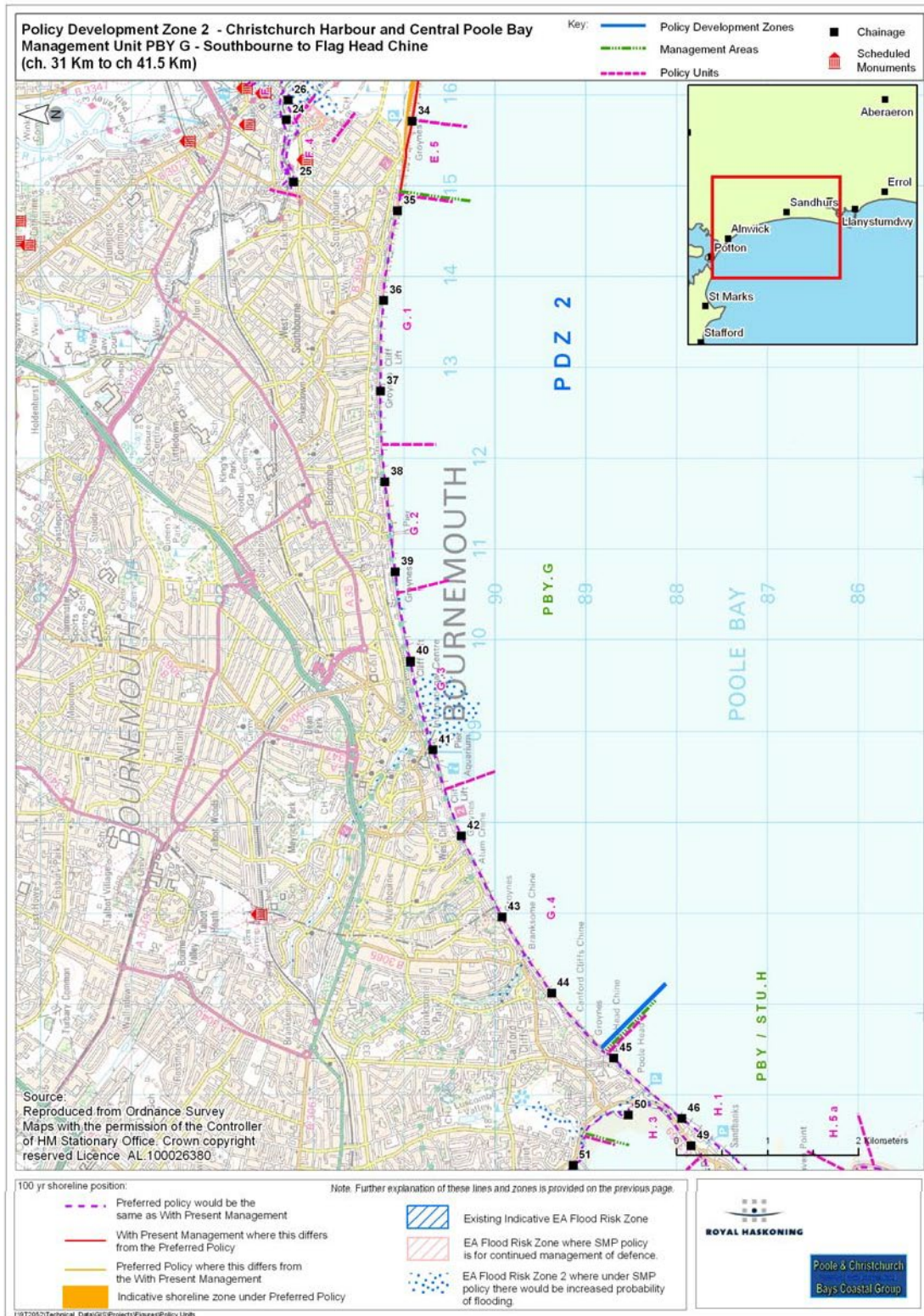
The following maps aim to summarise the anticipated position of the shoreline in 100 years under the two scenarios of “With Present Management” and under the “Preferred Policy” being put forward through the Shoreline Management Plan.

-  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 Preferred Policy this distinction is made in showing two different lines:
 -  With Present Management.
 -  Preferred Policy.
-  In some areas, the 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 SMP document show where SMP policy might influence the management of flood risk.
-  Indicate areas where the intent of the SMP 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 SMP document.



SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

PLAN:

The intent for this frontage is to Hold the Line of the existing seawall/promenade over the three epochs to prevent coastal erosion of the base of the cliffs that rise landwards of this line, despite the potential issues of flood and coast protection funding. The intent for management is to maintain protection by recharge and sediment movement control which prevents exposure and risk of collapse of the aging seawall/promenade, and also sustains the significant recreational and amenity benefits along with defence of important infrastructure and properties along the crest of the cliff.

The SMP, however, recognises the possible difficulties in terms of maintaining funding, securing sufficient volume of desired sediment grading, and the potential increased effort required to maintain the existing practice of regular recharge and maintenance of the groynes. If this existing practice becomes unsustainable, then achieving the policy intent to hold the line of the seawall/promenade will need to consider alternative management approaches such as moving to a coarser sediment grading or constructing more larger/higher hard defences; options that would be less desirable from a recreational and amenity perspective but would prevent coastal erosion.

Given this potential for the existing approach to become unsustainable (which is most likely during the third epoch but could possibly occur sooner), a potential policy to be considered could be to advance the line. This approach would intend to constrain sediment drift so as to retain areas of beach between areas of reclamation. This possible policy would need to be taken forward in partnership within a strong integrated framework for development of the whole frontage and with consideration of the potential impacts on the wider environment. Furthermore, this framework would need to define acceptable influence or mitigation with respect to maintaining underlying coastal processes and management of the adjacent areas of coast.

It is important to recognise that the policy and management intent described above does not address the residual risk of localised cliff falls and landslips caused by rainfall / groundwater factors, and so some cliff top areas will still remain vulnerable to cliff crest recession. Measures to address this residual risk are not able to access flood and coast protection funding and so need to be funded by other means. As such, the Local Authority should develop a separate (but complimentary to this SMP) cliff management plan to manage this residual risk.

PREFERRED POLICY TO IMPLEMENT PLAN:	
From present day	Maintain the programme of beach recharge and management of control structures. Reassess this practice and consider development of a framework to attract joint funding.
Medium term	Maintain the programme of beach recharge and management of control structures. Reassess sustainability of this practice and subject to this consider options for changing management approach to achieve hold the line.
Long term	Maintain the programme of beach recharge and management of control structures. Reassess sustainability of this practice and subject to this consider options for changing management approach to achieve hold the line, or changing policy (and management approach) to Advance the line.

SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
PBY.G.1	Southbourne	HTL	HTL	HTL/A	Maintain foreshore through control and recharge/ consider potential need for increased control of coastline.
PBY.G.2	Boscombe	HTL	HTL	HTL/A	Maintain foreshore through control and recharge/ consider potential need for increased control of coastline.
PBY.G.3	Bournemouth Central	HTL	HTL	HTL/A	Maintain foreshore through control and recharge/ consider potential need for increased control of coastline.
PBY.G.4	West Cliff and Poole	HTL	HTL	HTL/A	Maintain foreshore through control and recharge/ consider potential need for increased control of coastline.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

CHANGES FROM PRESENT MANAGEMENT

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
Property	Potential NAI Damages/ Cost £k PV	4467	26998	57505	88970
	Preferred Plan Damages £k PV	0	0	0	0
	Benefits £k PV	4467	26998	57505	88970
	Costs of Implementing plan £k PV	28146	14331	15542	58019