

Poole Bay & Harbour Coastal Group
POOLE BAY & HARBOUR
STRATEGY STUDY
Assessment of Flood
and Coast Defence Options
STUDLAND BAY

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
0	1	Draft to : David Jenkins, National Trust Mike Goater, PDC	10 Sept 03	LSBanyard
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1 Introduction

1.1 *What is a Coastal Strategy?*

This document is part of the Poole Bay & Harbour Strategy, which defines methods by which coastal defence of the Hengistbury Head to Durlston Head (including Poole Harbour) should be managed in the next 50 years. The strategy builds on the work of the Poole and Christchurch Bays Shoreline Management Plan (SMP) Halcrow (1999)

1.2 *How does this Coastal Strategy relate to the Shoreline Management Plan?*

The existing SMP defines the shoreline alignment *policy* (whether the existing alignment should be held, realigned or moved forward; or whether there should be only limited intervention or no action at all.)

The current study is not an SMP, but it develops the SMP policies by appraising ways of implementing them. The range of strategic options will vary according to the section of coastline under consideration.

The relationship between the SMP, Coastal Strategy and Scheme Development is shown in **Figure 1.1**.

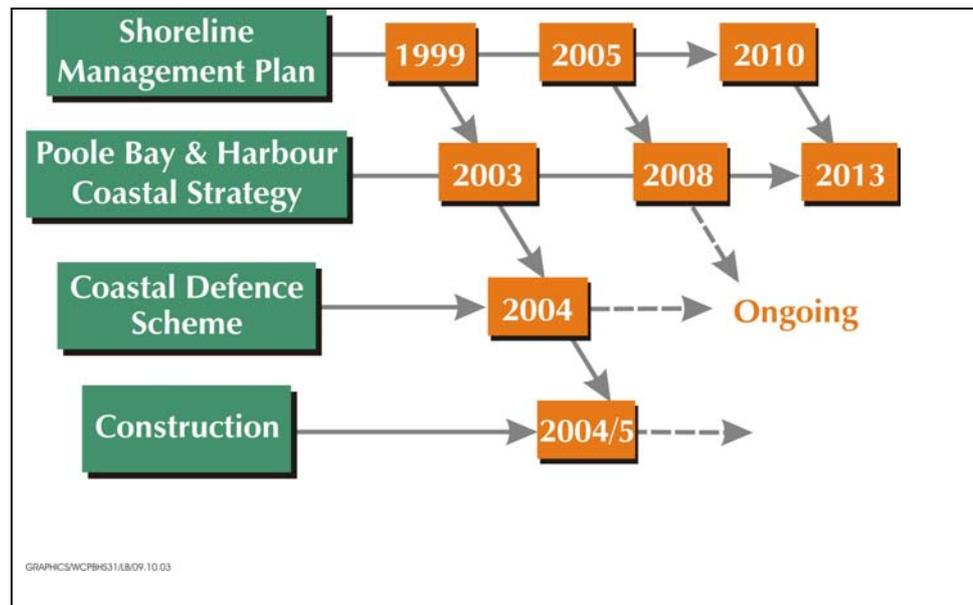


Figure 1.1 Relationship between Strategy Study and SMP

The shoreline of Studland Bay has been divided into a number of management units, as shown in **Figure 1.2**:

- STU1 - Handfast Point to The Warren
- STU2a - The Warren to Redend Point
- STU2b - Redend Point to Knoll Beach
- STU3 - Knoll Beach to Pilot Point
- STU4 - Shell Bay

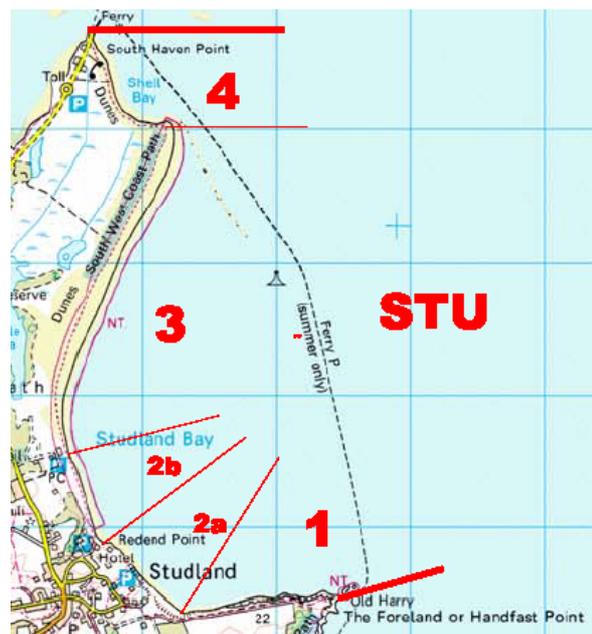


Figure 1.2 Studland Bay Management Units

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In developing the Strategy for Studland Bay, a wide range of studies have been undertaken. The following provides a brief summary of those parts of the study that are of relevance to the STU frontage.

- ***Technical Annex 1 – Coastal Conditions*** – the coastal conditions affecting the shoreline have been assessed through modelling and calculations of wave conditions, extreme water levels, tidal cycles and joint probability between waves and water levels.
- ***Technical Annex 2 – Beach Modelling*** – limited modelling of the cross shore movement of the beach under storm wave action was carried out for Studland Bay. The primary constraint on further investigations is the availability of a reliable, long-term set of historic beach level data.
- ***Technical Annex 3 – Shoreline Evolution*** – the location of the shoreline in 1951 and 2001 has been compared using georectified aerial photographs. This method provides a more accurate comparison than the use of Ordnance Survey Mapping or conventional aerial photographs. The georectified photographs are “stretched” electronically to fit the 2001 Ordnance Survey Landline (electronic mapping) and the uncertainties in the method can be calculated directly.
- ***Technical Annex 5 – Coastal Processes*** – the sources of supply, movement and output of sediment within Studland Bay were identified using the computer modelling described in Technical Annex 2 and in HR Wallingford 2003 (tidal and wave modelling carried out for this Strategy Study). Where possible, the volumes of sediment movement were evaluated (with the measurement in cubic metres per year - m³/year). This information is essential to the assessment of why a particular shoreline may be eroding or accreting and in judging what the affect of any intervention on the coast may have.
- ***Technical Annex 7 – Implications of Climate Change*** – the potential effects of the following factors associated with climate change have been evaluated and the potential implications for each management unit of the shoreline have been assessed:
 - (i) changes in sea level, incorporating global (eustatic) sea level rise and land-level (isostatic) change
 - (ii) changes in storm surge, due to changes in extremes of barometric pressure and wind stress caused by changing weather patterns
 - (iii) changes in wind climate affecting the height, periods and directions of wave conditions

(iv) changes in rainfall intensities, durations, and event frequencies, particularly affecting cliff slippage and run-off flooding

- ***Technical Annex 10 – Strategic Environmental Assessment (SEA)*** –

This document contains the background data on which the Strategic Environmental Assessment is based (known as the baseline), which describes how the environmental objectives of the Strategy have been selected. Each of the options in the Strategy are then compared against these objectives to assess their environmental implications.

2 Strategic Overview

2.1

Coastal Zone Management

The existing policies for Studland Bay set out in (i) the Shoreline Management Plan, produced by Halcrow in 1999 and (ii) in the Studland Management Plan, produced by National Trust in 2001 are to allow managed retreat of the shoreline. The strategic options that allow this to occur are, therefore, limited and concern mainly the timing of the removal of defences.

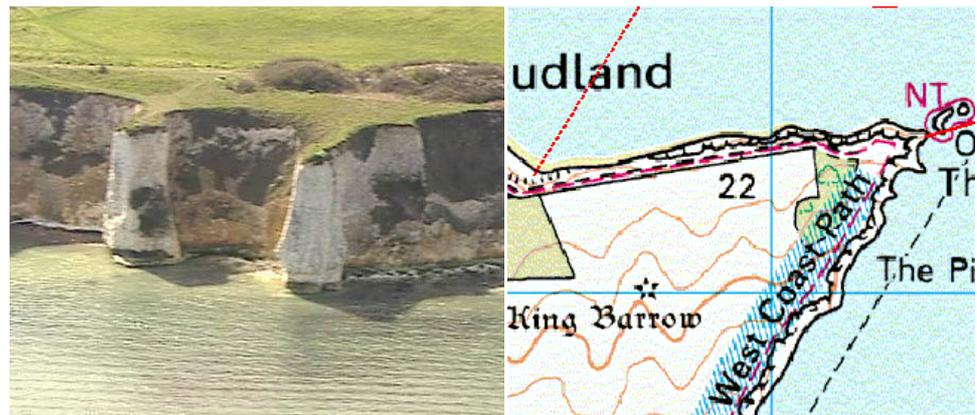
The implementation of the strategy that is presented in this document relies on the management of other land use considerations such as:

- transportation and parking,
- building accommodation on the site by National Trust and its tenants, ie beach huts, cafes, toilet facilities
- tourism & visitor numbers

Whilst the management of these aspects of Studland Bay is outside the scope of the existing work, it is understood that National Trust intends to review the overall land-use of the site in the light of the findings of shoreline change presented in this study.

3 Studland Bay

3.1 *Handfast Point to The Warren - STU1*



3.1.1 *Existing Shoreline & Defences*

The shoreline comprises chalk cliff formations which form the headland.

3.1.2 *Flood and Coast Defence Problem*

There are no properties or utility services on the cliffs which are foreseen to be at risk in the next 50 years. The headland is important in providing protection from wave attack and in stabilising the shoreline alignments of Studland Bay, Poole Bay and therefore, much of Poole Harbour as well. The degree of shoreline recession is likely to be small in the coming 50 years, although it may be punctuated with isolated cliff collapses. As a result, it is not expected, however, that there will be a detrimental impact on flood or coast defences in other management units.

Increased cliff falls in the future may be expected due to increased rainfall, particularly in winter, and increased wave attack at the base of the cliff. The change in the shoreline recession due to climate change (including sea level rise) cannot be estimated. However, even if it were to result in a doubling of the rate of erosion, it remains unlikely that a detrimental impact in other management units would occur.

3.1.3 *Current SMP Policy (adopted 1999)*
Do Nothing in the Short Term and Do Nothing in the Long Term

3.1.4 *Strategic Options*
Since the existing SMP policy is Do Nothing, there is only one strategic option, given in **Table 3.1**.

Strategic Option	Description
No Active Intervention	No action taken apart from fulfilling health and safety requirements

Table 3.1

3.1.5 *Strategic Environmental Assessment*
The specific objectives for this area have been established as part of the Strategic Environmental Assessment (see Technical Annex 10, Table 5.2). These have been summarised in Table 3.2, together with the implications of adopting the No Active Intervention option.

No Active Intervention would meet the objectives of avoiding interference with the earth science, nature conservation and landscape. It is uncertain whether this option would benefit the recreational resources within this process unit. There is a possibility that the coastal footpath may be eroded and some local measures would be appropriate to facilitate the re-routing and re-creation of the footpath lost within this coastal section.

3.1.6 *Economic Appraisal*
No economic appraisal was required.

3.1.7 *Preferred Strategy*

It is recommended that the SMP policy be amended to No Active Intervention, in line with the 2001 SMP Guidance.

The preferred strategy to achieve this policy is to: take no action apart from fulfilling health and safety requirements.

3.1.8

Risks and Implications

There will be erosion of Jurassic Coast World Heritage Site, Isle of Portland to Studland Cliffs cSAC and Purbeck Ridge (East) SSSI with the option No Active Intervention. As a natural process, this is considered an appropriate management approach to these sites. Indeed, measures to reduce erosion could be detrimental to the landscape value and to the on-going natural processes.

The existing coastal footpath would need to be set back, and it is recommended that each time this is done, the area of land between the footpath and the new cliff edge could be used for creating cliff top grassland, to provide an area of habitat and landscape feature. This would require agreements with landowners, as there is no legal basis at present for re-routing a footpath lost to erosion.

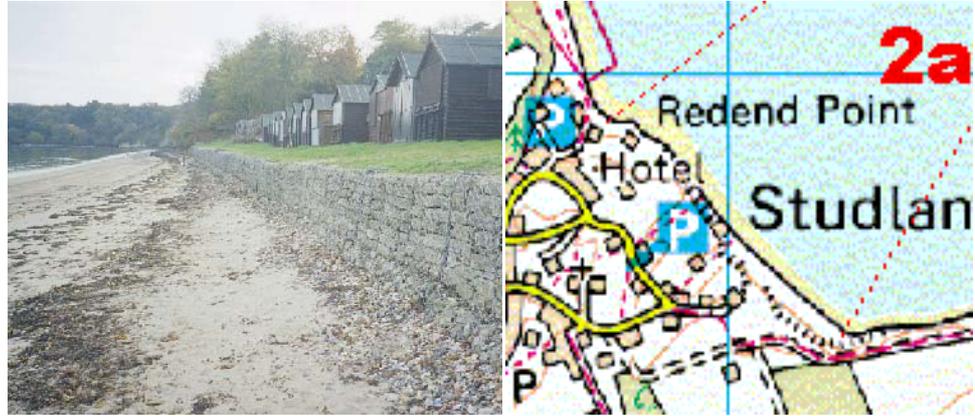
	DESCRIPTION
	No Active Intervention
STU0.1 Avoid constructing any new coastal defences that would be detrimental to the landscape value of Dorset AONB or Purbeck Heritage Coast	Y
STU0.2 Maintain/enhance recreational resources in the coastal zone, where environmentally sustainable, practical, economic and financially viable, whilst ensuring that they are inherently adaptable and reversible.	?
<p><i>STU1.1 Avoid constructing any new coastal defences that would be detrimental to the earth science or nature conservation value of:</i></p> <ul style="list-style-type: none"> <i>• Isle of Portland to Studland Cliffs cSAC</i> <i>Studland Cliffs SSSI</i> 	Y

Table 3.2 - Handfast Point to The Warren Strategic Environmental Assessment

<p><i>Notes:</i></p> <p>1) Options have been assessed against the objectives with the following outcomes:</p> <p> Y = this option meets the objective</p> <p> N = this option does not meet the objective</p> <p> ? = uncertain whether this option meets the objective or not</p> <p>2) Objectives in bold italics arise from legal obligations, including the Habitats Regulations and Water Resources Act</p> <p>3) Other objectives do not represent legal obligations</p> <p>4) Objectives that are <u>underlined</u> identify where there is potential conflict with another objectives</p>

3.2

The Warren to Redend Point – STU 2a



3.2.1

Existing Shoreline & Defences

The shoreline between The Warren (to the south) and Redend Point (to the north) comprises a sand and shingle beach backed by gabion basket defences that protect beach huts. The beach is sheltered by the chalk cliffs to the south, which reduce the influence of longshore transport. The sand beach receives a very small feed of sediment from offshore (having a potential due to wave action of the order of $100\text{m}^3/\text{year}$) and from the adjacent chalk cliffs, but longshore transport predominantly from south to north is also very small (also potentially up to $100\text{m}^3/\text{year}$). Sediment transport will therefore tend to be dominated by cross-shore movement, with beach draw-down under storm wave action and onshore feed during calmer periods.

The gabion baskets were constructed by the National Trust in 1983/4 and remain in reasonable condition. Prior to their construction there were no defences here. The comparison of the change of the cliff line between 1951 and 2001 by georectified aerial photographs (Technical Annex 3) shows that during this period there has been little change of the cliff position. It is apparent, therefore, that over the 50 years (including the 30 years when there were no defences) that the retreat of the shoreline was very small, with the average erosion between The Warren and Redend Point being 1.4m over the 50 year period (or $0.03\text{m}/\text{year}$). Even if all of this erosion was assumed to have taken place before construction of the gabions, the rate of erosion would have been $0.04\text{m}/\text{year}$ over the 32 years between 1951 and 1983.

3.2.2

Flood and Coast Defence Problem

The gabion baskets were constructed in 1983/4 and remain in reasonable condition. The beach level is not monitored, but from observation and through discussion with the National Trust staff at Studland, it is not believed that they are being undermined.

The effects of climate change as described in Technical Annex 7 could result in the effects of storms being more severe. The increase in mean sea level (17 cms recorded at Portsmouth 1962-2002) and the changes in offshore wave climates, could result in greater draw-down (cross-shore movement) of the beach under storm conditions. The gabion defences may suffer greater wave overtopping.

It is not expected, however, that longshore drift will increase, since the sediment transport here is primarily in one direction (see Section 4.2 of Technical Annex 7) and in any case, longshore transport is predominantly controlled by the chalk headland of Handfast Point.

Increased rainfall (especially as projected in winter) could result in increased cliff instability and this should be monitored through analysis of future geo-rectified aerial photographs.

3.2.3

Current SMP Policy (adopted 1999)

Do Nothing in the Short Term (involving observe and monitor) and Retreat the Line in the Long Term (subject to monitored erosion rates and economic viability of such a policy to the National Trust).

3.2.4

Strategic Options

The options in **Table 3.3** have been developed as ways of achieving the SMP Policy

Strategic Option	Description
No Active Intervention	No action taken apart from fulfilling H&S requirements
Limited Intervention - With Beach & Cliff Monitoring	This option comprises: <ul style="list-style-type: none"> • beach monitoring through measurement of beach profiles • beach and cliff monitoring through analysis of geo-rectified aerial photographs • minimum maintenance of the existing defences • removal of defences if and when they collapse • moving beach huts to another location after collapse
Managed Realignment	This option comprises: <ul style="list-style-type: none"> • beach monitoring through measurement of beach profiles • beach and cliff monitoring through analysis of geo-rectified aerial photographs • minimum maintenance of the existing defences • removal of defences at an agreed time before they collapse • moving beach huts to another location at that time

Table 3.3

3.2.5

Strategic Environmental Assessment

The specific objectives for this area have been established as part of the Strategic Environmental Assessment (see Technical Annex 10, Table 5.2). These have been summarised in **Table 3.4**.

There are no options that definitely satisfy all environmental objectives. Any option to protect property from coastal erosion will entail an adverse effect on the landscape, earth science and nature conservation value. Possible solutions that may achieve both objectives are to monitor the retreat of the shoreline to proactively identify the need for further intervention.

Recreational resources would be maintained in the short term with limited intervention, although with the possibility of intervention in the long-term it is not

known whether this option would benefit the recreational resources within this process unit.

3.2.6

Preferred Strategy

On the basis of the work carried out for this study, comprising the analysis of geo-rectified aerial photographs, modelling of the potential for longshore transport and discussions with National Trust staff at Studland, the existing defences are not at immediate risk of collapse through on-going beach evolution. The most likely cause of collapse would be either a substantial cliff slippage or an extreme easterly storm. Prediction of when such events will occur is not possible. The gabion baskets could potentially remain in place without collapse for a further decade.

The effect of the defences remaining in place over this time on the adjacent frontages will be small and is not sufficient justification in itself to promote proactive removal of the defences. The reduction in the supply of sediment from the cliffs behind which would otherwise erode is small, taking into account the low rate of erosion that appears to have occurred between 1951 and the construction of the defences in 1983. The defences do not interfere with longshore transport, which in any case is very small, being of the order of 100m³/yr compared to the typical rates of between 1,000m³/yr and 10,000m³/yr further north within the process unit.

The Managed Realignment option would depend on achieving consensus amongst the owners of the beach huts as to where to relocate their property, which will be difficult to achieve. The stability of the cliffs and the potential for landslip needs to be addressed just as much as the seaward impacts. This would require geotechnical analysis, including a ground investigation to determine the soil conditions and location of existing slip planes, if any.

It is recommended that the SMP policy be amended to Limited Intervention, in line with the 2001 SMP Guidance.

The recommended way of achieving the SMP policy is therefore by Limited Intervention with Beach and Cliff Monitoring:

- ***beach monitoring through measurement of beach profiles***
- ***beach and cliff monitoring through analysis of geo-rectified aerial photographs***
- ***minor repairs of the existing defences, such as local repairs to the gabion wires***

- *removal of defences if and when they collapse*
- *moving beach huts to another location after collapse (of gabions or of cliffs)*
- *ensuring that further ‘embedding’ of the huts and infrastructure by incremental improvements is prevented*

3.2.7

Development of Preferred Strategy

(a) Opportunities

Ongoing monitoring of the shoreline is being carried out as part of the Defra funded South Coast Regional Monitoring programme. This will include annual beach surveys and aerial photography. The programme should take the opportunity to address the monitoring requirement of the preferred strategy.

(b) Risks

The preferred strategy is essentially reactive, being reliant on monitoring. There will always remain a risk of a single catastrophic storm event that will affect the coast protection interests within this management unit. There is a need to ensure that any response (by NT, by agencies, by other parties) post-event takes opportunity of long term objectives and does not react by re-instating status quo.

The stability of the cliffs without the gabion baskets needs to be established prior to removal/collapse of these structures. A geotechnical analysis of cliff stability is recommended to address this issue.

	DESCRIPTION			
	No Active Intervention	Limited Intervention - Without Beach Monitoring	Limited Intervention - With Beach Monitoring	Managed Realignment
STU0.1 Avoid constructing any new coastal defences that would be detrimental to the landscape value of Dorset AONB or Purbeck Heritage Coast	Y	Y	Y	Y
STU0.2 Maintain/enhance recreational resources in the coastal zone, where environmental sustainable, practical, economic and financially viable.	N	?	?	?
<p><i>STU2.1 Avoid constructing any new coastal defences that would be detrimental to the earth science or nature conservation value of:</i></p> <ul style="list-style-type: none"> • <i>Dorset Heaths (Purbeck and Wareham) and Studland Dunes cSAC</i> • <i>Isle of Portland to Studland Cliffs cSAC</i> • <i>Studland Cliffs SSSI</i> 	Y	Y	Y	Y
STU2.2 Avoid constructing any coastal defences that would be detrimental to the setting of Studland Conservation Area	Y	Y	Y	Y
STU2.3 <u>Protect properties of architectural merit within Studland Conservation Area and other properties in Studland from coastal erosion, where technically feasible, environmentally sustainable and economic</u>	Y	Y	Y	Y

Table 3.4 - The Warren to Studland Sandspit (South) Strategic Environmental Assessment

Notes:

1) Options have been assessed against the objectives with the following outcomes:

Y = this option meets the objective

N = this option does not meet the objective

? = uncertain whether this option meets the objective or not

2) Objectives in bold italics arise from legal obligations, including the Habitats Regulations and Water Resources Act

3) Other objectives do not represent legal obligations

4) Objectives that are underlined identify where there is potential conflict with another objectives

3.3

Redend Point to Knoll Beach – STU 2b



3.3.1

Existing Shoreline & Defences

The shoreline comprises a sand beach backed by dunes, with gabion baskets protecting beach huts. The gabions are in poor condition, having been undermined by wave action.

Along this frontage, the longshore transport potential due to wave action increases considerably from approximately 200m³/year at Redend Point to 5,000m³/year at the National Trust Visitors Centre. This means that this beach will be subject to erosion, since the feed of sediment from South Beach and from offshore is small (a potential for perhaps 100m³/year).

Over the past 50 years the beach has eroded by an average (along the whole frontage) of 27m, being approximately 0.5m/yr. The erosion has been most severe at Knoll Beach, which has been set back by approximately 50m adjacent to the car park immediately to the south of the National Trust Visitors Centre.

The beach is also subject to cross-shore transport, with beach draw-down under storm wave action and onshore feed during calmer periods. The ability of the beach to recover from storm wave action is affected by the gabion baskets and the clearance of the dunes for car parking and beach huts. Dune systems act as a reservoir for beach sediment, in that they will receive sand from the beach during calm periods when sand will be blown off the dry upper beach by onshore winds. During storm wave action, the dunes will be eroded and sediment will be drawn back down onto the beach. Clearance of the dunes for car parking and buildings

will impair the beach-dune system's ability to respond to storms and will tend to exacerbate erosion.

3.3.2

Flood and Coast Defence Problem

The following 5 No. National Trust properties are at risk of damage from erosion and flooding:

- Middle Beach Café
- Middle Beach Shop
- Middle Beach Toilet Block
- Knoll Beach Shop
- Knoll Beach Toilet Block

In addition, there are 206 beach huts that are also at risk.

The properties at Middle Beach are immediately at risk due to undermining of the defences. At Knoll Beach, the shoreline will need to erode by a further 30m before the properties are undermined. At the historic rate of erosion this could take some decades, but it is expected that damage will occur before this due to the risk of flooding from wave overtopping of the beach and due to factors influenced by climate change (including sea level rise).

The effects of climate change as described in Technical Annex 7 could result in the effects of storms being more severe. The increase in mean sea level and the changes in offshore wave climates, could result in greater draw-down (cross-shore movement) of the beach under storm conditions.

It is not expected, however, that longshore drift will increase since the sediment transport here is primarily in one direction (see Section 4.2 of Technical Annex 7)

Increased rainfall (especially as projected in winter) could result in increased instability of the cliff on which the properties at Middle Beach are located, but this is unlikely to be a dominant factor, given the immediate undermining by wave action.

3.3.3

Current SMP Policy (adopted 1999)

Do Nothing in the Short Term (involving observe and monitor) and Retreat the Line in the Long Term (subject to monitored erosion rates and economic viability of such a policy to the National Trust).

3.3.4

Strategic Options

The options in **Table 3.5** have been developed as ways of achieving the SMP Policy

Strategic Option	Description
No Active Intervention	No action taken apart from fulfilling health & safety requirements: <ul style="list-style-type: none"> • existing gabions left in place and exposed wire removed
Limited Intervention	This option comprises: <ul style="list-style-type: none"> • beach monitoring • removal of gabion defences that have already collapsed • removal of remaining gabion defences when they collapse • relocating 206No beach huts when the defences collapse • relocating cafes, shops, lavatories and car parks when their locations are no longer tenable
Managed Realignment (set back of properties and dune rehabilitation)	This option comprises: <ul style="list-style-type: none"> • beach monitoring • removal of gabion defences • removal/relocation of 206 no. beach huts • removal/relocation of 5No NT buildings & car parks • rehabilitation of beach & dunes south of Knoll Beach by altering the car park layout/location

Table 3.5

The Limited Intervention and Management Realignment (set-back of properties) options would allow for ongoing erosion by retreating back from the shoreline. These options would allow the natural process of erosion to continue. The space available within this management unit for recreational facilities would continue to be reduced. In 50 years, much of the south end of the frontage would be expected to comprise a narrow strip of beach in front of the rising ground to the west, which would become cliffed.

3.3.5

Strategic Environmental Assessment

The specific objectives for this area have been established as part of the Strategic Environmental Assessment (see Technical Annex 10, Table 5.2). These have been summarised in **Table 3.6**.

None of the options are considered to be detrimental to the landscape value of the AONB and Purbeck Heritage Coast or detrimental to the setting of the Studland Conservation Area. All options other than No Active Intervention would however, result in a short-term disturbance (at most 2-3 months) due to the various works required.

3.3.6

Economic Appraisal

The National Trust's future plans need to include a benefit cost analysis of providing the same level of services as presently, and the potential benefits of downscaling infrastructure of café, shop, car park, etc. The relocation of these services out of the zone of risk is essential and these costs need to be assessed.

3.3.7

Preferred Strategy

It is recommended that the SMP policy be amended to a phased approach – with Limited Intervention as the immediate approach, and Managed Realignment as the longer term approach, taking advantage of time bought in the meanwhile to further negotiate options with all interested parties

The recommended way of achieving the SMP policy is therefore by:

- ***beach monitoring***
- ***removal of gabion defences that have already collapsed***
- ***negotiation of best method for, and timing of, removal of remaining gabion defences & relocation of 206 no. beach hut***
- ***negotiation of programme for relocation of NT cafes, shops, lavatories and car parks before there becomes a risk to life or property***
- ***rehabilitation of beach & dunes south of Knoll Beach, by altering the car park layout/location and access arrangements***

(a) Opportunities

Ongoing monitoring of the shoreline is being carried out as part of the Defra funded South Coast Regional Monitoring programme. This will include annual beach surveys and aerial photography. The programme take the opportunity to address the monitoring requirement of the preferred strategy.

(b) Risks

The preferred strategy is essentially reactive, being reliant on monitoring. There will always remain a risk of a single catastrophic storm event that will affect the coast protection interests within this management unit. There is a need to ensure that any response (by NT, by agencies, by other parties) post-event takes opportunity of long term objectives and does not react by re-instating status quo.

	DESCRIPTION		
	No Active Intervention	Limited Intervention	Managed Realignment (set back of properties & dune & beach restoration)
STU0.1 Avoid constructing any new coastal defences that would be detrimental to the landscape value of Dorset AONB or Purbeck Heritage Coast	Y	Y	Y
STU0.2 Maintain/enhance recreational resources in the coastal zone, where environmental sustainable, practical, economic and financially viable.	N	Y	Y
<p><i>STU2.1 Avoid constructing any new coastal defences that would be detrimental to the earth science or nature conservation value of:</i></p> <ul style="list-style-type: none"> • <i>Dorset Heaths (Purbeck and Wareham) and Studland Dunes cSAC</i> • <i>Isle of Portland to Studland Cliffs cSAC</i> • <i>Studland Cliffs SSSI</i> 	Y	Y	?

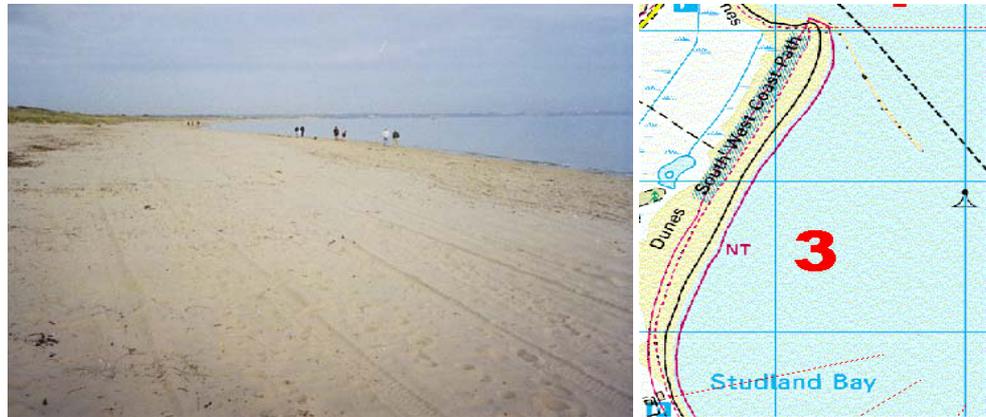
STU2.2 Avoid constructing any coastal defences that would be detrimental to the setting of Studland Conservation Area	Y	Y	Y	Y	Y
STU2.3 Protect <u>properties of architectural merit within Studland Conservation Area and other properties in Studland from coastal erosion, where technically feasible, environmentally sustainable and economic</u>	N	N	Y	N	Y

Table 3.6 - The Warren to Studland Sandspit (North) Strategic Environmental Assessment

<p><i>Notes:</i></p> <p>1) Options have been assessed against the objectives with the following outcomes: Y = this option meets the objective N = this option does not meet the objective ? = uncertain whether this option meets the objective or not</p> <p>2) Objectives in bold italics arise from legal obligations, including the Habitats Regulations and Water Resources Act</p> <p>3) Other objectives do not represent legal obligations</p> <p>4) Objectives that are <u>underlined</u> identify where there is potential conflict with another objectives</p>

3.4

Knoll Beach to Pilot Point - STU3



3.4.1

Existing Shoreline & Defences

The shoreline comprises a sandy beach, backed by dunes. At the north end, the Training Bank that maintains navigation to Poole Harbour comes ashore at Pilot Point.

The shoreline is generally accreting and has grown seaward by between 20-40m (± 10 m) in the past 50 years, an accretion rate of some 0.4-0.8m/year. This is due to a feed of sand of approximately 120,000m³ (or 2,400m³/year), of which 80,000m³ has come from Middle Beach to the south and 40,000m³ has been driven onshore by wave and tidal action, particularly under storm conditions.

3.4.2

Flood and Coast Defence Problem

There are no properties at risk along the sandspit. The spit as a whole provides protection to Poole Harbour and the numerous properties, assets and habitats within.

3.4.3

Current SMP Policy (adopted 1999)

Selectively Hold the Line (involving observe and monitor and selective intervention at the junction of STU3 and STU4 should there be a need) in the Short Term and Selectively Hold the Line (allowing intervention subject to need i.e. breach into STU4).

3.4.4

Strategic Options

The options in **Table 3.7** have been developed as ways of achieving the SMP Policy

Strategic Option	Description
No Active Intervention	No action taken apart from fulfilling health and safety requirements
Limited Intervention	This option comprises: <ul style="list-style-type: none"> • beach monitoring • no action unless the shoreline erodes by more than 250m • no action unless the shore connection of Training Bank or the protection of the chain ferry slipway is compromised, in which case measures to be agreed at that time

Table 3.7

3.4.5

Strategic Environmental Assessment

The specific objectives for this area have been established as part of the Strategic Environmental Assessment (see Technical Annex 10, Table 5.2). These have been summarised in Table 2.4.1.

Since the shoreline is accreting, a process which is likely to continue, No Active Intervention would meet all the objectives of avoiding interference with the nature conservation and landscape value. It would not allow for maintenance of the Swash Channel Training Bank should this ever be required. Equally, if the shoreline were to erode, this would still be in line with the nature conservation and landscape objectives.

Limited Intervention would meet all the objectives of avoiding interference with the landscape, nature conservation and landscape value. Should there be a requirement for maintenance of the shore connection of the Training Bank the question of the effect on the conservation and landscape interests set out in **Table 3.8** would need to be addressed.

3.4.6

Economic Appraisal

No economic appraisal was required.

3.4.7

Preferred Strategy

It is recommended that the SMP policy be amended to Limited Intervention in line with the 2001 SMP Guidance.

The recommended way of achieving the SMP policy is therefore by:

- ***beach monitoring***
- ***no action unless the shoreline erodes by more than 250m***
- ***no action unless the shore connection of Training Bank or the protection of the chain ferry slipway is compromised, in which case measures to be agreed at that time***

3.4.8

Development of Preferred Strategy

(a) Opportunities

Ongoing monitoring of the shoreline is being carried out as part of the Defra funded South Coast Regional Monitoring programme. This will include annual beach surveys and aerial photography. The programme take the opportunity to address the monitoring requirement of the preferred strategy.

(b) Risks

The preferred strategy is essentially reactive, being reliant on monitoring. There will always remain a risk of a single catastrophic storm event that will affect the coast protection interests within this management unit. There is a need to ensure that any response (by NT, by agencies, by other parties) post-event takes opportunity of long term objectives and does not react by re-instating status quo.

	DESCRIPTION	
	No Active Intervention	Limited Intervention
STU0.1 Avoid constructing any new coastal defences that would be detrimental to the landscape value of Dorset AONB or Purbeck Heritage Coast	Y	Y
STU0.2 Maintain/enhance recreational resources in the coastal zone, where environmental sustainable, practical, economic and financially viable.	Y	Y
<p><i>STU3.1 Avoid constructing any new coastal defences that would be detrimental to the accretion, earth science, nature conservation value of:</i></p> <ul style="list-style-type: none"> • <i>Dorset Heaths (Purbeck and Wareham) and Studland Dunes cSAC</i> • <i>Dorset Heathlands Ramsar Site</i> • <i>Dorset Heathlands SPA</i> • <i>Studland and Godlingston Heaths SSSI</i> • <i>Poole Harbour SSSI</i> 	Y	Y
STU3.2 Maintain Swash Channel training wall for navigational access to Poole Harbour	N	Y
<i>STU3.3 Maintain or restore natural processes to maintain in favourable condition the habitats of Dorset Heaths (Purbeck and Wareham) and Studland Dunes cSAC</i>	Y	Y

Table 3.8- Studland Sandspit Strategic Environmental Assessment

Notes:

1) Options have been assessed against the objectives with the following outcomes:

Y = this option meets the objective

N = this option does not meet the objective

? = uncertain whether this option meets the objective or not

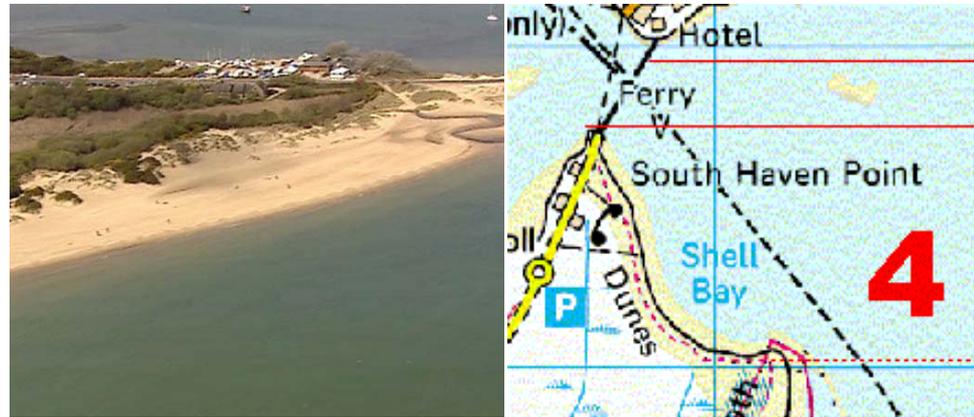
2) Objectives in bold italics arise from legal obligations, including the Habitats Regulations and Water Resources Act

3) Other objectives do not represent legal obligations

4) Objectives that are underlined identify where there is potential conflict with another objectives

3.5

Shell Bay - STU4



3.5.1

Existing Shoreline & Defences

The shoreline comprises a sandy beach, backed by dunes. At the south-east end, the Training Bank that maintains navigation to Poole Harbour comes ashore at Pilot Point. At the north-west end the slipway for the Sandbanks-Studland Bramble Bush Chain Ferry has localised wave protection.

The comparison of aerial photographs between 1951 and 2001 shows an average accretion within the bay of some 20m. However, the movement of sand at this frontage, which is so dominated by the tidal currents of the harbour entrance is expected to be highly variable. There is no erosion shown immediately to the east of the slipway.

3.5.2

Flood and Coast Defence Problem

There are no properties at risk along the shoreline, with the exception of the toll buildings for the chain ferry. The spit as a whole provides protection to Poole Harbour and the numerous properties, assets and habitats within. The continued existence of the sandspit is therefore vital.

3.5.3

Current SMP Policy (adopted 1999)

Selectively Hold the Line (involving observe and monitor particularly at the boundary with STU3) in the Short Term and Selectively Hold the Line (allowing intervention subject to specific need e.g. breach into STU3).

3.5.4

Strategic Options

The options in **Table 3.9** have been developed as ways of achieving the SMP Policy

Strategic Option	Description
No Active Intervention	No action taken apart from fulfilling H&S requirements
Limited Intervention	This option comprises: <ul style="list-style-type: none"> • beach monitoring • no action unless the shoreline erodes by more than 250m • no action unless the shore connection of Training Bank or the protection of the chain ferry slipway is compromised, in which case measures to be agreed at that time

Table 3.9

3.5.5

Strategic Environmental Assessment

The specific objectives for this area have been established as part of the Strategic Environmental Assessment (see Technical Annex 10, Table 5.2). These have been summarised in **Table 3.10**.

While accretion continues within this management unit, all of the environmental objectives can be met. However, if the shoreline were to erode due to a change in the sediment transport regime, there might be a potential conflict between maintaining the Swash Channel training wall and maintaining the earth science, nature conservation and landscape in the long term. It is likely that appropriately designed works can be implemented in a manner consistent with all objectives for this unit. A possible solution, should the Training Bank be breached, would be the maintenance of an open beach with some extension of the existing structures. In addition, beach activities might be reduced which would include the possible loss of a section of coastal footpath. Some measures would be appropriate to facilitate the re-creation of the lost footpath within this coastal section.

3.5.6

Economic Appraisal

No economic appraisal was required.

3.5.7

Preferred Strategy

It is recommended that the SMP policy be amended to Limited Intervention in line with the 2001 SMP Guidance.

The recommended way of achieving the SMP policy is therefore by Limited Intervention, comprising

- ***beach monitoring***
- ***no action unless the shoreline erodes by more than 250m***
- ***no action unless the shore connection of Training Bank or the protection of the chain ferry slipway is compromised, in which case measures to be agreed at that time***

3.5.8

Development of Preferred Strategy

No further development of the preferred strategy is required.

(a) Opportunities

Ongoing monitoring of the shoreline is being carried out as part of the Defra funded South Coast Regional Monitoring programme. This will include annual beach surveys and aerial photography. The programme take the opportunity to address the monitoring requirement of the preferred strategy.

(b) Risks

The preferred strategy is essentially reactive, being reliant on monitoring. There will always remain a risk of a single catastrophic storm event that will affect the coast protection interests within this management unit. There is a need to ensure that any response (by NT, by agencies, by other parties) post-event takes opportunity of long term objectives and does not react by re-instating status quo.

	DESCRIPTION	
	No Active Intervention	Limited Intervention
STU0.1 Avoid constructing any new coastal defences that would be detrimental to the landscape value of Dorset AONB or Purbeck Heritage Coast	Y	Y
STU0.2 Maintain/enhance recreational resources in the coastal zone, where environmental sustainable, practical, economic and financially viable.	Y	Y
<p><i>STU4.1 Avoid constructing any new coastal defences that would be detrimental to the earth science or nature conservation value of:</i></p> <ul style="list-style-type: none"> • <i>Dorset Heaths and Studland Dunes cSAC</i> • <i>Dorset Heathlands Ramsar Site</i> • <i>Dorset Heathlands SPA</i> • <i>Studland and Godlingston Heaths SSSI</i> 	Y	Y
STU4.2 Maintain Swash Channel training wall for navigational access to Poole Harbour	N	Y

Table 3.10- Shell Bay Strategic Environmental Assessment

Notes:

1) Options have been assessed against the objectives with the following outcomes:

Y = this option meets the objective

N = this option does not meet the objective

? = uncertain whether this option meets the objective or not

2) Objectives in bold italics arise from legal obligations, including the Habitats Regulations and Water Resources Act

3) Other objectives do not represent legal obligations

4) Objectives that are underlined identify where there is potential conflict with another objectives