



# Slapton Coastal Zone Management Main Study

Volume 4: Executive Summary

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For Slapton Line Partnership



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## **Preface**

The Slapton Coastal Zone Management Study has been commissioned by the Slapton Line Partnership.

The Slapton Line Partnership is made up of the following organisations:

English Nature  
Devon County Council  
South Hams District Council  
Whitley Wildlife Conservation Trust  
Slapton Ley Field Centre  
Environment Agency  
Defra

The Partnership has been formed to decide how best to deal with potential future erosion of Slapton Line and its effect on the road, the environment, and the community.

The objective of this Study is to compile a single reference document that will form the basis for all future decision-making that affects the shingle ridge.

Scott Wilson has undertaken the Study in collaboration with the University of Plymouth, Roger Tym and Partners and Dr Mark Lee.

The University of Plymouth provided material for the chapters on coastal processes and modelling, Roger Tym and Partners focused on the socio-economic aspects of the study and Dr Mark Lee provided specialist geomorphology information.

This report should be read in conjunction with Volumes 1, 2 and 3. Volumes 1 and 2 present the findings of Phase1 of the study and Volume 3 presents Phase 2 of the study.

Contents

1	Executive Summary.....	1-1
2	Annex A: Recommended Management Policy .....	2-1

# 1 Executive Summary

- 1.1 This report summarises the scope and findings of the Slapton Coastal Zone Management Study. This report has been prepared by Scott Wilson for the Slapton Line Partnership.

## Aim

- 1.2 The aim of the Study is to provide a comprehensive evaluation of the issues relating to coastal processes at Slapton Sands for the purposes of determining an appropriate shoreline management response to the recent erosion and from this, to establish a robust long-term coastal zone management strategy for the area.

## Background

- 1.3 In previous years storms have caused significant damage to the shingle ridge, forcing closure of the A379. In the winter of 2000/2001 a series of storms caused the loss of up to 5m of shingle beachhead over a length of 1000m. The erosion undermined a 200m section of the A379 that runs along the shingle ridge. This resulted in closure of the road.
- 1.4 The A379 offers an important transport link between local communities, as well as providing a secondary emergency route into Dartmouth. The principal emergency route is via the A381 and A3122. Narrow lanes offer the only other alternative route, suitable for small vehicles only.
- 1.5 Following the damage to the A379, the worst affected section was realigned. The realignment extended over a length of about 300 metres and moved the road approximately 20 metres landwards.

## Study Scope

- 1.6 A detailed study was made of the coastal processes affecting the shingle barrier, including:
- An assessment of the wave climate, wind data and water levels
  - Modelling of sediment transport along the beach and in the cross-shore direction
  - Modelling of breach probability
  - Topographic and bathymetric survey and sidescan sonar survey of the seabed
  - Assessment of historical changes in beach position and rates of erosion
- 1.7 A series of other investigations and studies was also completed, including a traffic survey, an environmental baseline assessment and beach profile monitoring.

## Coastal Processes Findings

- 1.8 The overall assessment of the January 2001 event was that it was caused by a combination of beach line recession (due to longshore transport rates in the preceding autumn) and the occurrence of a severe storm, which further cut back the beach profile. Because the storm coincided with a period when the beach was at a historically narrow state, its effect on infrastructure (road, car park) was greater than previous events.
- 1.9 Long-term barrier retreat rates were estimated at 0.3m/year at the present day, increasing over time due to sea level rise. A series of maps was produced showing areas at risk along the shingle bank within different time frames. Various authors have suggested that the shingle bank is likely to break down irreversibly and breach within the next 30 to 50 years. This was found to be highly unlikely. Neither of the storm events that have occurred in the last 10 years has had a major impact on the shingle barrier height or width, nor has come close to causing a breach of the barrier. The current probability for a breach was considered to be much less than 1 in 100 years. Although the risk of a complete breach of the barrier is low, the risk of damage to the road is much higher.
- 1.10 It was found that over time sea level rise and increased storminess will increase the rate of erosion and the risk of a major recession event, but the risk of a breach of the shingle bank will remain low over the next 20 or 50 years. It was found that possibly after 50 years, and probably beyond 100 years, a No Intervention scenario will result in breakdown of the shingle barrier, with breaching and forming of intermittent tidal inlets.
- 1.11 It was found that retreat of the shingle barrier will eventually result in lowered beaches in front of Torcross, and leave the northern part of Torcross exposed to wave attack. Protection of Torcross will require an extension of the sea wall to link up with the retreated barrier location.

## Management Options

- 1.12 A wide range of options were considered for managing the risk to the shingle barrier and to the road:
- Do nothing (also described as 'No Active Intervention') – allowing erosion to continue, with eventual loss of the road and breaching of the barrier
  - Coastal defence measures to counter erosion of the barrier and the loss of the road. Coastal defence measures considered included beach nourishment, where the width of the beach is increased by importing shingle dredged offshore, recycling and redistribution of shingle along the beach from areas of accumulation to eroding areas, rock revetments and sheet piled retaining walls.

- Managed realignment of the coast road. Sub-options for this included constructing a new road inland, upgrading the existing inland route or moving the road landwards on the shingle barrier, thereby increasing the buffer distance between the road and the sea.

## Funding

- 1.13 Defra consider that because, with the exception of Torcross, there is little or no risk to people or property, the issue of safeguarding the road is one for the highway authority, Devon County Council. Therefore funding will not be available from Defra. A number of other possible funding sources were considered (e.g. Regional Development funds), but it was concluded that it is unlikely that significant funding will be made available to protect the road. Funding may be available to help the community to adapt to the loss of the road once this happens.
- 1.14 The requirement for funding for works to protect, maintain or realign the road will fall principally on the County Council as highways authority. The principle of keeping the road in place would be consistent with the objectives of the Provisional Devon Local Transport Plan 2006-2011, published by Devon County Council, particularly in regard to Objective 3: Making Roads Safer and Objective 5: Improving Recreation, Leisure and Tourism.

## Option Assessment

- 1.15 An outline environmental assessment was made of the impact of the options. The evaluation method used for environmental impact was an abbreviated version of the Transport Appraisal Guidance (TAG) methodology using four environmental criteria (ecology, geomorphology, landscape, heritage and archaeology) and two socio-economic criteria (social & community issues and business impacts).
- 1.16 The key impacts of the No Active Intervention option were identified as being in the socio-economic and traffic areas:
- Intermittent closure of the A379 will cause disruption to access and accessibility of services. Examples of these disruptions include bus services, travel to work times, emergency service access. In the long term, permanent closure of the road will increase drive times to schools, workplace, doctors etc.
  - Use of minor roads will cause difficulties for larger vehicles – buses, vans, and lorries.
  - Road closure will disrupt local businesses.
- 1.17 Although the loss of the coast road may generate some benefits to the local community, the No Intervention option was found to generate significant net adverse impacts in the socio-economic and transport contexts.

- 1.18 An approach to assessing the options was developed which combined the economic, technical, environmental and socio-economic aspects. A scoring system was developed which determined a score for each option. The higher the score, the more acceptable the solution. As a result of this options were compared, some immediately rejected and eventually a preferred option identified.
- 1.19 Based on this approach Managed Realignment of the coast road on the shingle barrier was identified as the preferred option. In summary, Road Realignment was the highest-scoring option because of its relatively low cost, it is technically feasible, it has less adverse environmental impact than many other options and because it would sustain the status quo in terms of transport links.
- 1.20 The Study concluded that the Managed Realignment option would allow the road to be maintained for at least another 30 years. Implicit in this conclusion is the assumption that eventually the effects of sea level rise will make maintenance of the road link economically and environmentally unviable and the road will then be abandoned.
- 1.21 A consultation and exhibition event was mounted. Several hundred people attended the exhibition and of the 75 or so questionnaire responses received, 90% were in favour of intervention to maintain the road and 80% of these were in favour of a 'soft' approach to intervention – realignment of the road, beach nourishment or shingle recycling. There was a strong consensus of support from members of the public for the proposed policy of managed realignment of the A379 on the shingle barrier. There was also support from members of the Slapton Line Partnership in the formal consultation letters received.
- 1.22 A questionnaire was issued to over 450 businesses in the region to allow evaluation of the impact of road closure on the business community. There was a strong consensus that closure of the road had a negative impact on business and that works to keep the road in being were beneficial.
- 1.23 Following these consultation activities, further work was undertaken which confirmed Road Realignment on the shingle barrier as the preferred option. The best management approach was found to consist of a proactive approach to road realignment in areas where there was already a clear and imminent risk to the road, and where proactive measures could be undertaken with relatively minor works, and a reactive approach to road realignment elsewhere. Proactive works in two areas would be over a relatively short length of road, with corresponding low expenditure, and would immediately secure the integrity of the A379 road from the turn off to Slapton village as far as Strete Gate.

## Summary of Recommendations

- 1.24 It is recommended to the Slapton line Partnership that the A379 should be maintained by a combination of the following measures:



- Proactive realignment of the road to the north of the junction of the A379 and the road to Slapton village. The realignment should be undertaken as soon as funding and permissions are in place, which could start to be sought during 2006.
  - Reactive realignment of the road at other locations. The realignment should be undertaken when damage to the road is believed to be imminent or has already occurred. The aim should be to reinstate the road as soon as is practicable. Realignment will involve landward movement of the road on the shingle ridge. Preliminary work on permissions and funding should be undertaken in advance, to expedite the re-opening of the road.
  - Localised movement of shingle to provide temporary protection to short lengths of the road or to allow reinstatement of short lengths of the road following damage.
- 1.25 It is recommended that this approach should be followed until such time as retention of the road becomes unsustainable. At this point the road will be closed and no replacement will be constructed.
- 1.26 In all a total length of road of about 500m should be realigned proactively. Using the costs of the 2001 realignment, the cost of this work has been estimated at £300,000. In addition there will need to be environmental and planning consents and consents from landowners. Once completed these works will provide a reasonable level of protection of the A379 over the majority of its length along Slapton Sands. The cost of the reactive works cannot be estimated reliably, but for budgetary purposes a mean expenditure of £50,000 per annum should be allowed for to keep the road in being.
- 1.27 A management policy based on this approach has been prepared and recommended to the Slapton Line Partnership. This is attached as Annex A.

## Conclusions

- 1.28 At some point in the future, the effects of climate change and sea level rise will make managed realignment of the road unsustainable. The A379 will then be permanently closed. This is unlikely to happen for 30-50 years if the recommended management policy is implemented. It should be borne in mind, however, that a particularly severe storm or series of storms could occur in any year, and cause historically unprecedented damage.

## 2 Annex A: Recommended Management Policy

### Recommended Objectives

- 2.1 To protect local communities against flooding and coastal erosion.
- 2.2 To maintain the character and value of the landscape, ecology, geomorphology, geology, archaeology and historical setting of the area.
- 2.3 To support local social and economic activities through the provision of community services and public infrastructure.
- 2.4 To maintain the coastline in a way that is environmentally sustainable, allowing the beach and shingle ridge to evolve with natural processes and minimal intervention.
- 2.5 To maintain a road transport link along the Slapton Line to the benefit of the local and regional community until such time as this becomes unsustainable.
- 2.6 To develop a programme for adaptation which will provide the infrastructure necessary to maintain the economic well being of the community when the road link is eventually lost.
- 2.7 To continue to provide an educational resource, and to provide a sound basis for decision-making, by continued and improved collection of data on coastal processes and the natural environment.
- 2.8 To involve the local community in decision-making and to maintain systems for communication between the community and the various agencies and organisations.
- 2.9 To keep in place an organisational framework for management and executive decision-making.
- 2.10 To publicise the Management Policy and to ensure that it's key principles are incorporated into other statutory and non-statutory plans.

### Recommended Policies

- 2.11 The A379 should be maintained by a combination of the following measures:
  - Proactive realignment of the road to the north of the junction of the A379 and the road to Slapton village. This realignment should be undertaken at two separate locations encompassing a total length of about 500m. The realignment should be undertaken as soon as funding and permissions are in place, which could start to be sought during early 2006.
  - Reactive realignment of the road at any other location. The realignment should be undertaken when damage to the road is believed to be imminent or has already occurred.

The aim should be to reinstate the road as soon as is practicable. Realignment will involve landward movement of the road on the shingle ridge. In realigning the road, the viability of cost-saving measures such as provision of a carriageway to a lesser standard should be considered. Preliminary work on permissions and funding should be undertaken in advance, to expedite the re-opening of the road.

- Localised movement of shingle to provide temporary protection to short lengths of the road or to allow reinstatement of short lengths of the road following damage. The volume of shingle moved should be limited to the same order of magnitude as undertaken previously for the creation of the shingle bastions.
- 2.12 A programme of regular surveys should be implemented to monitor the beach. Surveys should be undertaken following every major storm event, at least twice yearly, and in such a way that beach movements can reliably be calculated.
- 2.13 Data on the incidence of road closure, extent and cost of road damage and costs of road realignment should be maintained and kept up to date. The ecology of the shingle barrier and Ley should be monitored and kept up to date.
- 2.14 The Slapton Line Partnership, Slapton Line Technical Group and Slapton Line Advisory Forum should remain in being to provide systems for ongoing management and consultation.
- 2.15 A forward planning workshop should be held to initiate planning of measures, both short-and long-term, to help the community prepare for loss of the road at some point in the future. Following the holding of the workshop, a body should be set up to continue this work through the activities of councils, agencies and local community. An Adaptation Plan should be developed and implemented.
- 2.16 Local residents, businesses and service providers should be informed of the objectives and policies in place and encouraged to undertake their own adaptive measures in anticipation of the eventual closure of the road in the long term.
- 2.17 The key principles of the Management Policy should be incorporated into other local plans such as the Local Development Framework, the Devon Local Transport Plan and the Shoreline Management Plan.
- 2.18 The Slapton Line Partnership should from time to time, but not less frequently than every 5 years, undertake a review of the management policy, taking into account the results of monitoring and data on storm occurrences, trends in damage, damage costs etc to refine and amend the policy.
- 2.19 In the event of a road-damage event occurring the Contingency Plan should be put into operation until such time as the road is re-opened. The members of the Slapton Line Partnership should aim to re-open the road in such circumstances as quickly as possible.

- 2.20 When it becomes apparent that maintaining the road link is no longer sustainable (either in part or in whole), then the road should be closed and the measures developed in the Adaptation Plan for road abandonment should be put into being. The judgement on sustainability should be made using an accepted investment evaluation method, and should take into account projected long-term economic and environmental costs and benefits.
- 2.21 The existing defences at the Car Park should not be maintained or improved and should be removed if they present a hazard to the public. New defences should not be built and the edge of the car park should be allowed to erode. Some minor works may be undertaken to improve the visual aspect of this area.
- 2.22 In the event that the Monument is in danger of damage than it should be relocated landwards to a safer location.
- 2.23 The existing defences to the road at Torcross should remain, but not be enhanced.