
4 Management Unit plans and option selection

4.1 Management Unit plans

Management Unit plans have been set out as brief individual documents for each of the Units indicated in Figure 2. Each plan sets out relevant information as text and a supporting map, outlines the impacts of the coastal defence options for each Unit, recommends the preferred option, suggests possible operations to achieve the option and sets out a preliminary economic assessment. Although the Plans are intended to contain sufficient information to stand alone, they only present a summary of the information contained in Volume I (Stage 1).

Timescales for the SMP are classified as follows:

- short term - up to 20 years
- medium term - 20 to 50 years
- long term - more than 50 years

As most coastal structures are designed and justified economically to have an approximate 50 year life expectancy, their management options are only relevant to this term. However, as long term economic, technical and environmental sustainability is important, then the implications of the options after the 50 year period must also be considered.

The *information* within each Unit plan includes:

- Unit boundaries and length, rounded to the nearest 50m to allow future management flexibility
- Coastal processes
 - summary of historic and existing shoreline situation
 - solid and drift geology, including beach sediment type
 - wave climate, including dominant directions and predicted significant wave heights with a range of occurrence probabilities (i.e. annual probability equivalent to one event in ten years)
 - tidal regime, including current directions and maximum speeds, direction of residual flow, and predicted maximum water levels with a range of occurrence probabilities
 - sediment transport paths and qualitative sediment budget
 - possible future changes based on existing wave climate trends and accepted rates of sea level rise
- Summary of existing defences
- Natural environment, including designated areas and implications for management
- Land use
- Human environment, including recreation, landscape interests and cultural heritage
- Planning policies for future developments and the relevant policy documents.

The *strategic coastal defence options* for the open coast Units, as defined by the MAFF guidance, are then considered using an impact matrix table. The options are:

- Do nothing - allow natural processes to act with no intervention (the consequences of this option are used to assess the benefits arising from the other options)
- Hold the line - maintain or improve the existing shoreline or line of built defences
- Retreat the line - managed landward realignment of the shoreline or line of built defences to a pre-determined and more sustainable position

- Advance the line - reclamation of land by shifting the shoreline or line of built defences seawards.

This simplified set of management options are used as a basis for the open coast SMP but are considered to be inadequate for practical purposes. A more extensive and detailed set of options are discussed in Section 4.2.6 and are used to expand the preferred options for each Management Unit.

The results of a *do-nothing policy* are then expanded and used as the basis for economic assessment for each Management Unit.

The *preferred coastal defence option* is stated, based on the impact matrix assessment and the potential losses of the do-nothing scenario. An indicative standard of defence is suggested. Section 4.2 below expands on the selection process for the preferred strategic coastal defence options and on some of the more controversial aspects of the SMP process.

Management operations to achieve the preferred strategic option are suggested for each Unit. The suggested operations are only intended as a guide, as there may be other methods of achieving the preferred option. Those outlined are considered to be technically achievable, sustainable and to be compatible with the natural and human environment. No specific mention is made of the need for ongoing monitoring of beaches, structures and significant habitats as this is assumed to be included within normal management procedures and is also included in the general recommendations for monitoring and further studies (Section 5.4).

A *preliminary economic assessment* is then presented following the simplified approach set out in Section 4.3. Where the preferred option does not achieve a benefit-cost ratio significantly greater than unity then further investigations of recreational or environmental factors are recommended to examine the situation in greater detail.

4.2 Strategic issues and constraints on options

4.2.1 Background

Selection of the preferred strategic coastal defence option is by no means a simple process. The guiding principles of economic, engineering and environmental sustainability encompassed within the impact matrices for each Unit are interlinked with legal obligations, social and political pressures, identification of management responsibility, the availability and sources of funds, definitions of the existing line of defence and assumptions regarding standards of defence. Uncertainty over the present and future situation regarding these management issues, combined with the engineering uncertainties of incomplete understanding of coastal processes, poor definition of defence failure risk, varying estimates of future water levels and inability to predict storm frequencies, directions or intensities, means that selection of preferred options must rely heavily on the Consultation process and the judgement of the shoreline managers. Stage 1 of the SMP brought together background information to facilitate the selection process. The remainder of this section outlines some additional factors that have been considered in arriving at the preferred coastal defence strategies for the East Solent

4.2.2 Sustainability

The aim of a SMP, as set out by the MAFF guidelines, is *to provide the basis for sustainable coastal defence policies within a sediment cell and to set objectives for the future management of the shoreline*. The guidelines go on to define sustainable schemes as those *which take account of the inter-relationships with other defences, developments and processes within a catchment or coastal cell or sub-cell, and which avoid as far as possible, tying future generations into inflexible and expensive options for defence*. This definition of sustainability is open to differing interpretation depending on the perceptions of different interest groups. These different perceptions are at the root of many of the conflicts over the preferred strategic defence options.

Within the East Solent SMP a number of general principles have been applied to assist in the interpretation of sustainability:

- the SMP is assumed to apply over a period of 50 years, although uncertainty over future coastal processes may result in the need for revision within a shorter period
- the SMP is based on present day economic, social and political values, but recognizes that these values will continue to evolve as they have in recent decades with respect to issues such as the natural environment, farmland, military facilities, public access to open areas, golf courses, transport routes and the value of shorefront residential property

- existing residential areas will be retained and protected to an appropriate standard of defence, except along some immediate backshore areas where long term planning initiatives to reduce existing development are supported as they decrease the future risks of overtopping or erosion damage
- existing commercial or private holiday property within areas at risk will not necessarily be retained
- agricultural or recreational land will not necessarily be retained
- if a preferred strategic defence option cannot be agreed at present, then any temporary works required to retain the existing situation should be designed and implemented in a manner that is not prejudicial to future options
- it is assumed that existing planning policies restricting development in Coastal Zones will be retained and that there will be no further development in areas identified as at risk..

Issues not covered by these general principles are considered on a site specific basis with consideration being given to matters raised during the consultation period and to the discussions below.

4.2.3 Responsibility for shoreline management

Obligation and responsibility for management of the shoreline requires explanation. MAFF has overall responsibility for coastal defence policy in England and Wales. Local Authorities with a maritime frontage, as defined under Schedule 4 of the Coast Protection Act (1949), are responsible for supervising the application of the Act along the entire shoreline within their administrative boundary. The Environment Agency has a statutory obligation to exercise supervision over all matters related to flood defence under the Water Resources Act (1991), and has permissive powers in respect of the shoreline where the hinterland is liable to tidal flooding. These responsibilities and powers to act do **not** imply a duty to prevent erosion or flooding.

Owners of property along the shoreline, including government bodies (e.g. Ministry of Defence, Department of Transport), local authorities and private landowners are responsible for their own frontage, but must act within the applicable statutory planning and other legislation. In some circumstances a Local Authority or the Environment Agency will undertake shoreline management operations along privately owned frontages, particularly where the risk from flooding or erosion extend beyond the frontager's property. In general Local Authorities and the Environment Agency will only act where:

- there is clear economic justification
- an appropriate engineering solution is achievable
- environmental legislation is not contravened.

Construction of defences by a Local Authority or the Environment Agency does not imply a continuing responsibility for prevention of erosion or flooding, only for ensuring public safety in relation to the structures themselves (e.g. supporting or removing unstable structures, marking navigational hazards

4.2.4 Statutory obligations

The primary aim of the Government's Flood and Coastal Defence Policy is "*the protection of life and hence of urban areas*" but this aim does not infer any legal obligation on the part of the Government, Local Authorities or the Environment Agency and does not entitle frontagers to any compensation for loss of property, income or other assets. There is, however, an obligation to comply with the European Union Habitats Directive with respect to the maintenance of those aspects of the natural environment set out by Natura 2000 (see Volumes I and III).

Compliance with the Directive is a significant issue within Langstone, Chichester and Pagham Harbours, but is also important along the open coast around the harbour entrances, along the south coast of Hayling Island, at Gilkicker Point and to the east of the River Hamble mouth. These areas are within existing or proposed SPA or SAC under EC Directives. In brief the Directive requires that shoreline management operations within a

European designated site that are considered to cause significant environmental damage may not be undertaken unless there is an overriding public interest. If there is considered to be an overriding public interest and works are undertaken, then compensatory measures must be applied through habitat creation schemes to maintain the total extent and quality of the designated habitat at a regional level.

Unfortunately the practical interpretation and implications of the Habitats Directive are by no means clear at present. Responsibility for supervision of the application of the Directive is with English Nature. It is likely that definitions of “significant damage” and “overriding public interest”, the practicalities of providing satisfactory compensatory measures and establishing the source of funding to cover the costs of compliance will take several years and may involve the establishment of legal precedents.

In addition to the obligations to comply with environmental legislation, there are also obligations to the maintenance of navigation rights and the protection of Scheduled Ancient Monuments. Within the East Solent navigation issues are most notable within the entrance channels to the harbours. Structures impeding navigation may well be considered unacceptable and would, at the least, require appropriate notification and marking. A number of Scheduled Ancient Monuments are located within the shoreline risk areas, but in most cases their protection is linked to the protection of other property assets and is therefore not noted as a separate issue. The most notable exceptions are the situations at Old Portsmouth and Haslar where management operations must give specific consideration to a number of historic structures along the shoreline.

4.2.5 Funding of shoreline management operations

In recent years the majority of major coastal defence schemes have been funded to a large extent by MAFF. Increasing requirements for accountability of public expenditure has led to the publication of guidelines for economic assessment of proposed schemes. As MAFF funding is provided centrally then the economic benefits given primary consideration are those applicable to the nation rather than those that may have a local relevance.

As the SMP procedures were also set up by MAFF then the economic assessment procedures, as discussed in Section 4.3, also give primary consideration to nationally important assets. It should be noted that MAFF may not consider the full costs of complying with the Habitats Directive to be supportable by grant aid. Further guidance will be available as precedents are set (Section 4.2.4).

The practical implications of this approach to funding are important to shoreline managers. Fixed property assets such as houses or other buildings are valued in a widely accepted way, but businesses, jobs, quality of life, the natural environment, cultural heritage, mobile assets (e.g. caravans), etc. are not necessarily given a value that would be considered satisfactory to a resident, business owner or local interest group. Demands for improved defence standards based on local perceptions of benefits may attract local support, but unless a sound economic argument based on MAFF procedures can be presented then sufficient funding is unlikely to be made available from MAFF.

This restriction does not prevent private frontagers, commercial interests, local authorities or other land owners (Ministry of Defence, Department of Transport) from undertaking shoreline management operations in the absence of MAFF funding. In these situations the economic basis for the preferred coastal defence strategy in the SMP may be inappropriate and could be reviewed. However, the engineering and environmental basis for the preferred SMP strategy would still be valid and would need careful consideration. Locally funded schemes would still be subject to Planning restrictions, review by MAFF and compliance with statutory procedures with respect to the environment.

Further guidelines on the prioritization of schemes are in preparation by MAFF. Publication of these guidelines will assist operating authorities in determining the potential for grant aid of schemes and may encourage investigation of alternative funding arrangements.

4.2.6 Strategic coastal defence options

The strategic defence options set out by the MAFF guidance for SMP purposes are:

- Do-nothing
- Hold the line
- Retreat the line
- Advance the line.

Although the SMP for the open coast of the East Solent conforms to this simplified standard where possible it should be noted that in practical terms these options are inadequate, as they:

- do not consider defence standards
- do not define the meaning of the term “line”
- imply that “do-nothing” is a management option rather than a theoretical scenario for use in economic analysis
- use the emotive term “retreat” that is widely misunderstood by Consultees
- imply that “advance the line” is a normal coast defence option
- do not consider the options of risk management or tiered defence.

An earlier MAFF document (MAFF, 1993c) presented a more extensive set of options, which has been modified to the following:

- ***Do-nothing*** - this is a hypothetical option to be evaluated as a baseline against which the benefits of other options can be assessed.
- ***Non-intervention*** - monitor shoreline and maintain public safety. This is the basic minimum shoreline management option, involving no attempt to maintain or improve standards of flood or erosion defence, but possibly involving works such as removing unstable and redundant coastal structures. Where appropriate, public rights of way may need to be realigned to prevent loss by flooding or erosion. This option equates to *retreat the line* under MAFF guidance, except in the situation (not found in the East Solent) of a hard rock shoreline with no erosion or flooding.
- ***Risk management*** - develop warning systems, plan evacuation procedures to safeguard lives and plan for emergency service communication and transportation, in conjunction with the non-intervention option or with other options. Risk management may also involve publication of flood risk information to allow owners of property or other assets the opportunity to make provisions for protection (e.g. sand bagging, construction of minor flood embankments, etc.). This option equates to *retreat the line* under MAFF guidance.
- ***Maintain standard along existing defence alignment*** - carry out works to maintain defences at their design standard along the existing defence alignment, including works to maintain standards in response to future changes in sea conditions. This option may include works to maintain existing natural defences, such as saltmarshes, and equates to *hold the line* under MAFF guidance.
- ***Upgrade standard along existing defence alignment*** - carry out works to improve standards of defence, maintaining the approximate alignment of the existing defence (e.g. beach recharge that moves high water line to seaward). This option may include works to maintain or enhance natural defences, such as saltmarshes, and equates to *hold the line* under MAFF guidance.
- ***Maintain or upgrade standard by constructing new defences to seaward*** - provision of protected water (e.g. harbour) or reclaimed land by moving defences seaward. This option is not normally considered as coast defence, since the motivation is normally property development, provision of infrastructure or provision of land fill sites. An exception would be construction of a barrage across the mouth of an inlet or estuary to reduce potential flood risks or wave attack along the shoreline. This option equates to *advance the line* under MAFF guidance.
- ***Maintain or upgrade standard by constructing new defences to landward*** - planned loss of existing land to recreate new intertidal habitat or reduce long term defence costs by shifting to a less exposed alignment or shortening the defended shoreline. This option equates to *retreat the line* under MAFF guidance.
- ***Upgrade standard by creating a tiered defence*** - creation of backshore zones with different risk levels by construction of a secondary defence line while maintaining the existing defence alignment, possibly at a reduced standard (e.g. recreation or environmentally sensitive areas protected by existing defences with a 1:5 year risk of flooding, while a secondary flood wall provides a 1:200 year defence standard to residential property further inland). This option may include works to maintain or enhance natural defences, such as saltmarshes, and equates to *retreat the line* under MAFF guidance.
- ***Combinations of options within a Management Unit*** (applicable to the open coast only) - provision of several strategies within a single Unit in response to spatially varying shoreline situations (e.g. differences in geology, land use, topography, wave exposure, etc. along the frontage that are not sufficient to justify division into further Management Units).

Changing of options over time - planning for a change of strategy in response to temporally varying shoreline situations (e.g. planned change of land use allowing retreat or reduced standard, anticipated increase in wave climate due to expected nearshore erosion making existing defence inadequate, etc.).

This much more extensive and detailed set of strategic options allows for greater management flexibility and has been used to elaborate on the basic SMP options for the East Solent open coast and is the basis for management within the harbours. All of these options, except *do nothing* assume ongoing monitoring of coastal processes, the environment and the effectiveness of the management operations to allow future review.

4.2.7 Standards of defence

MAFF have published guidelines for indicative standards of defence for a range of land use types (MAFF, 1993a, Annexe K). Table 3 presents these standards, which are the basis of recommendations set out for each Unit in Appendix 1. The intention of the MAFF guidelines is not to indicate an entitlement to protection at a certain level, but only to indicate design targets for shoreline managers. The return period indicates the annual probability that a coast defence will encounter conditions more severe than those for which it was designed.

This concept of standard of defence is most easily applied to predicted wave overtopping rates under extreme conditions. Other forms of risk, such as flooding due to breaching, backshore erosion due to sea wall collapse or property loss due to cliff instability, are all much too complex and site specific to assess within an SMP. The problems of risk assessment are the subject of extensive research from which guidance and predictive methods will emerge over the next few years.

It should be noted that the table of standards does not consider environmental, cultural or recreational assets. Allowance has been made for these assets for Management Units where they are considered to be important. Further consideration will be needed at the scheme strategy and project appraisal stages.

Table 3 Indicative standards of protection (based on MAFF 1993a)

Current land use	Return period in years
High density urban	200
Medium density urban, may include some agricultural land	150
Low density or rural communities including high grade farmland	50
Medium grade farmland with isolated properties	20
Predominantly unimproved grazing, few properties at risk	5

4.3 Economic assessment

The SMP economic assessment is not intended to replace a full Project Appraisal for specific schemes, and a simplified approach has been used based on an assumed 50 year economic design life for management operations.

Use has been made of the work completed for the previous Pagham Harbour to River Hamble study (HR Wallingford 1995a&b). This has been extended as necessary using basic present day values of probable damages for a range of asset types as set out in Table 4. These values have been applied to:

- land predicted to be lost to erosion within 50 years
- buildings or infrastructure predicted to be lost to erosion or within 10m of the eroding shoreline within 50 years
- land, buildings or infrastructure permanently lost due to flooding or overtopping damage as a result of events with a return period of less than the relevant MAFF indicative standard for the Unit.

The values are based on recent Project Appraisals completed along the south coast and on the 1991 Geodata Institute (Southampton University) study on the economic consequences of sea level rise. The costs of single flood events not resulting in permanent loss of value are not included as these require a level of probabilistic analysis that is outside the scope of an SMP. No phasing of losses or present value discounts have been applied. All losses and all scheme costs are assumed to be applied in year one.

The table does not include the less tangible damage values associated with the natural or human environment, such as loss of natural habitats, damage to historic sites or changes to the landscape, nor do they include the potential values of damage to recreational use of the shoreline or the indirect costs associated with flooding and erosion damage (loss of income, short term disruption of services, clear-up of debris, etc.). These intangible considerations are noted but not costed. In cases where the potential benefits of management options are not clearly established by land and property losses, then further study is recommended to determine the values that can be attributed to these less tangible benefits and whether there is justification for intervention when these values are considered. This is particularly applicable in areas affected by the Habitats Directive as costs for compensatory measures for damaged habitats must be included in a cost-benefit assessment, although they may not be eligible for MAFF grant aid (Section 4.2.5).

Table 4 Present day asset values of damages

Asset type	Value
High density urban	£2,000,000/ha
Low density urban	£600,000/ha
High value private or public recreational land (gardens, public parks, golf courses, etc.)	£100,000/ha
Low value recreational land and higher grade farmland	£6000/ha
Lower grade farmland	£3000/ha
Main roads	£700,000/km
Minor roads	£300,000/km

The costs of works to hold the line are estimated using a similarly simplistic approach. Typical costs based on recent experience are set out in Table 5. These have been applied to the suggested management operations for each Unit. No phasing or present value discounts have been applied except for the long term maintenance items, which are costed over 50 years.

Table 5 Indicative costs for management operations

Operation	Cost
Construction of groynes	£1.5M/km
Refurbishment of groynes	£0.5M/km
Construction of seawalls/revetments - exposed frontage	£4M/km
- sheltered frontage	£2M/km
Refurbishment of seawalls/revetments - exposed frontage	£1M/km
- sheltered frontage	£0.4M/km
Construction of flood embankments - sheltered frontage	£0.5M/Km
Recharge	£1.5M/km
Annual recycling/regrading	£0.75M/km over 50 years
Annual maintenance of existing structures	£0.3M/km over 50 years

4.4 Summary of preferred strategic options

This Section presents a summary of the preferred strategic coastal defence options for the Management Units. Summary descriptions of the Units are set out in Table 2 and locations are shown in Figure 2. The Management Unit Plans are set out in Appendix 1.

Unit 1 (South Downs SMP Unit 2) **Hold the line** within pre-determined limits by ongoing beach management. Future changes to the sediment budget may necessitate a realignment of the existing spits to a more stable position. Management operations must seek to minimize damage to the geomorphological and environmental assets along the spits and within Pagham Harbour.

Management operations should be addressed within a strategic defence programme for Selsey Peninsula (Units 1-5 and Pagham Harbour).

Unit 2 (South Downs SMP Unit 1) **Hold the line** by improving hard defences and implementing a programme of beach recharge, allowing for drift to adjacent Units 1 and 3. Support Chichester District Council planning initiatives to establish a set back zone landward of the existing defences. Management operations must seek to minimize impacts on cultural heritage and geological assets within the intertidal and nearshore zones. Management operations should be addressed within a strategic defence programme for Selsey Peninsula (Units 1-5, Pagham Harbour and West Wittering).

Unit 3 **Hold the line in the short term** by continued beach management while urgent studies are undertaken to establish the most appropriate method of achieving sustainable management. A tiered defence involving construction of a set back flood embankment with a 1:50 year standard of services combined with a reduced beach management programme is considered to be the most promising approach in view of predicted increases in nearshore wave energy, an uncertain sediment budget, environment/geological impacts and likely economic constraints. Management operations must include the eroding cliffs west of Selsey, must give consideration to land drainage and must seek to minimize damage to geological, environmental and cultural heritage assets both landward and seaward of the existing ridge.

Management operations should be addressed within a strategic defence programme for Selsey Peninsula (Units 1-5, Pagham Harbour and West Wittering).

Unit 4 **Hold the line** by improving existing hard defences and implementing a programme of beach recharge, allowing for drift to adjacent Units 3 and 5. Support Chichester District Council planning initiatives to establish a setback zone landward of the existing defences.

Management operations should be addressed within a strategic defence programme for Selsey Peninsula (Units 1-5, Pagham Harbour and West Wittering).

Unit 5 **Hold the line** by improving hard defences and implementing a programme of beach recharge up to the Hinge of East Head. Continued habitat management of East Head. Management activities must seek to minimize damage to the geomorphological and environmental assets.

Potential flooding along the Chichester Harbour shoreline between East Head and West Wittering should be addressed in conjunction with this Unit, and the Unit should be part of a strategic defence programme for Selsey Peninsula (Units 1-5, Pagham Harbour and West Wittering).

Unit 6 **Hold the line** by a programme of beach recharge and ongoing beach management, combined with minor extensions and improvements to hard defences from Eastoke Point to Sandy Point. Potential flooding from the north side of Eastoke and impacts on Unit 7 should be addressed as part of a strategic defence programme. Works on other parts of the Hayling Island shoreline within Chichester and Langstone Harbours are independent of works at Unit 6 and should be addressed separately. Management operations at Eastoke must seek to minimize damage to environmental assets and allow continued sediment transport to Sandy Point.

Unit 7 A mixture of management options are required:

- **do-nothing** for the central area around Gunner Point to allow continued natural development
- **hold the line** at Langstone Ferry by improving the existing defences as required to maintain the built assets
- **retreat** of Hayling Golf Club assets away from the short length of shoreline between Langstone Ferry and the Hayling Ferry Sailing Club to allow a more sustainable beach situation to develop while also allowing continued public access along the upper foreshore
 - **retreat** of recreation assets (parking area, huts, etc.) along the shoreline west of Inn on the Beach to reduce the need for long term maintenance of existing timber defences; future planning for the relocation of the Inn on the Beach to allow development of a sustainable and continuous shoreline across the present boundary of Units 6 and 7.

Management operations must seek to minimize damage to the geomorphological and environmental assets around Gunner Point and within the Langstone entrance channel and must minimize disruption to navigation.

Unit 8 **Hold the line** by improving the hard defences combined with ongoing beach management around Fort Cumberland and along Eastney Spit. Improve remaining defences as required in the future in response to shoreline developments. Management operations must seek to minimize damage to historic structures or disruption to navigation.

Unit 9 **Hold the line** by upgrading hard defences combined with ongoing beach management. Management operations along the Old Portsmouth frontage must seek to minimize damage to historic structures or disruption to navigation and should consider associated problems of ground water levels and flooding of Old Portsmouth from within Portsmouth Harbour as part of a strategic defence

programme. A minor advance of the defences around the fortifications may be required to achieve sustainable defences without damaging historic structures.

Unit 10 **Hold the line** by improving the seawall, improving and extending the groyne system and implementing a programme of beach recharge. Management operations should seek to minimize any disruption to navigation or damage to historic structures

Unit 11 A mixture of management options are required:

- **do-nothing** along the open beach, and restrict development of recreation assets along the immediate backshore to prevent the need for future works.
- **hold the line** at the River Alver outfall by ongoing beach management operations to remove shingle from around outfall
- **retreat the line**, in the future, if required, by realigning the coast road at Alverstoke away from the shoreline and thereby reducing the need for improvements or extensions to the existing seawall.

Unit 12 **Hold the line** by maintaining hard defences combined with beach management. Management operations must seek to minimize impacts on recreational use of the foreshore and damage to intertidal habitats. Restrict development of property or other assets in areas at risk from flooding or erosion.

Unit 13 A mixture of management options are required:

- **hold the line** in the short term by maintaining existing defences around Hill Head Harbour and along the road to Meon Shore; review this policy in the medium term to determine sustainability
- **do-nothing** along the Brownwich cliffs and along the shingle bank; restrict development of property or other assets

Unit 14 **Hold the line** by upgrading and extending hard defences and by implementing a beach recharge programme. Restrict further development of property or other assets. Review policy when National Grid tunnel and headworks reach their design life or become redundant. Management operations must seek to minimize damage to cultural heritage and environmental assets.

Pagham Harbour (This Unit is considered in detail in Volume IV of the SMP.) **Hold the line** by improving defences around the perimeter of the harbour and by undertaking salt-marsh enhancement works. Management operations must seek to minimize damage to environmental assets and must give consideration to the implications of sharing a flood risk area with Units 1 and 3.

There is a potential managed retreat site along the south shore of the harbour where compensatory habitat could be developed as a mitigatory measure for damage incurred within SPA/proposed SAC sites around the Solent.