

Document 3 - An Introduction to Coastal Defence

Definitions

Coast Protection.

- The protection of the land from erosion and encroachment by the sea.
- Erosion is a problem on cliffed sections of the coastline and the Coast Protection Act (1949) gives Local Authorities permissive powers to undertake coast protection works on their frontage.

Sea Defence.

- Defence against sea and tidal flooding.
- Flooding is only of concern in low lying coastal areas and, under the Water Resources Act (1991), the Environment Agency has permissive powers to provide sea defences.

Both Local Authorities and the Environment Agency have permissive powers to provide defences. This means there is **no duty** on them to provide defences.

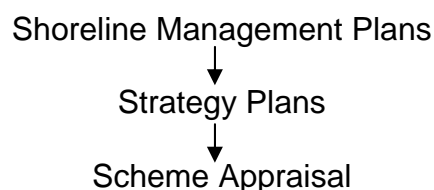
Government Policy

The term 'coastal defence' includes both coast protection and sea defence. The Department of Environment, Food and Rural Affairs (Defra) has overall policy responsibility for both coastal defence and inland flood defence in England (prior to June 2001 this responsibility lay with the Ministry of Agriculture, Fisheries and Food (MAFF)).

The Government's policy aims

“to reduce risks to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of technically, environmentally and economically sound and sustainable defence measures.”

To ensure a strategic approach is taken towards new defence schemes, Defra have developed the hierarchy of coastal defence plans, shown here, to provide a framework in which Local Authorities and the Environment Agency must operate.



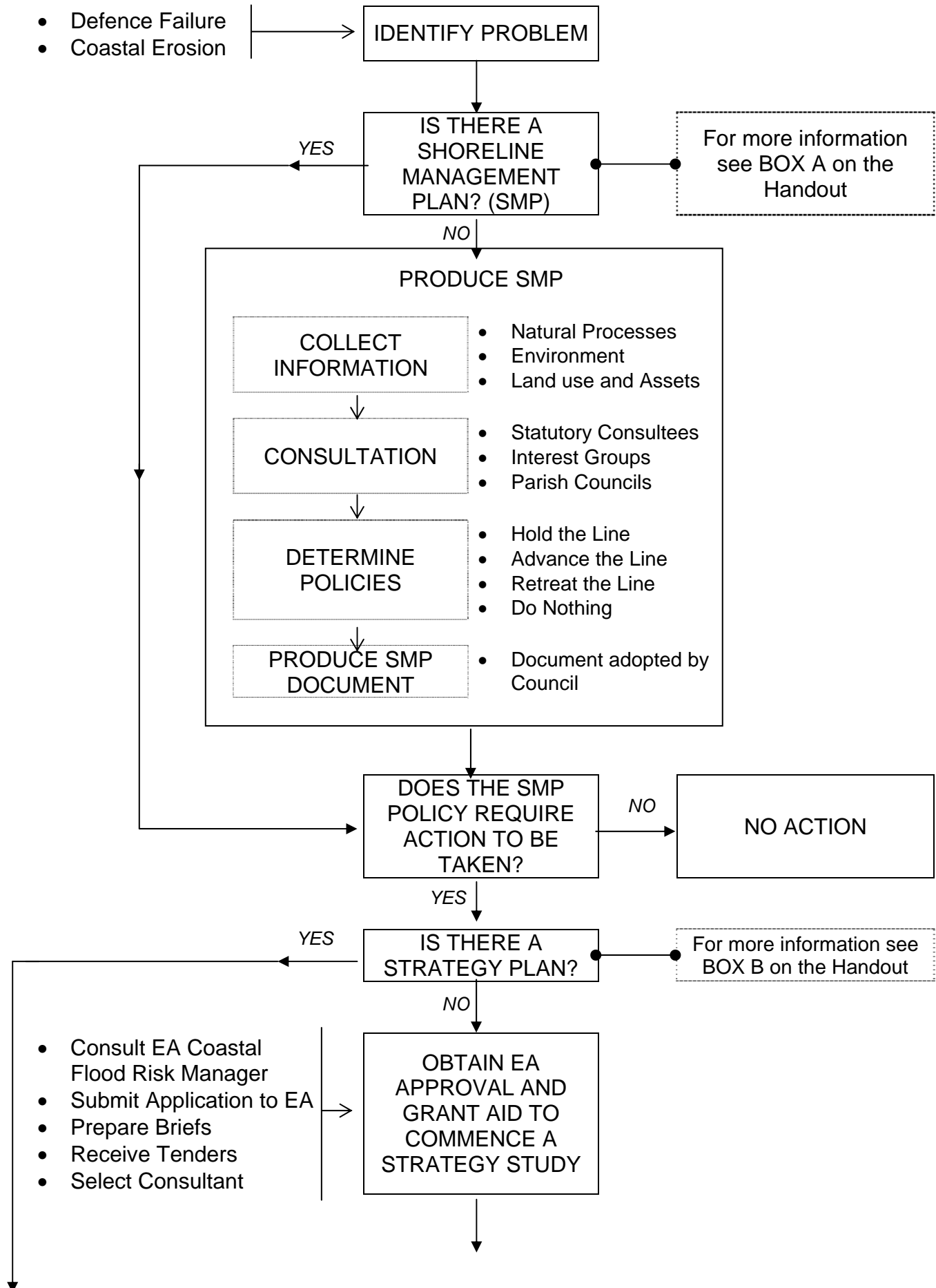
More information on these plans is provided below in a flow chart that illustrates the development of a coast protection scheme.

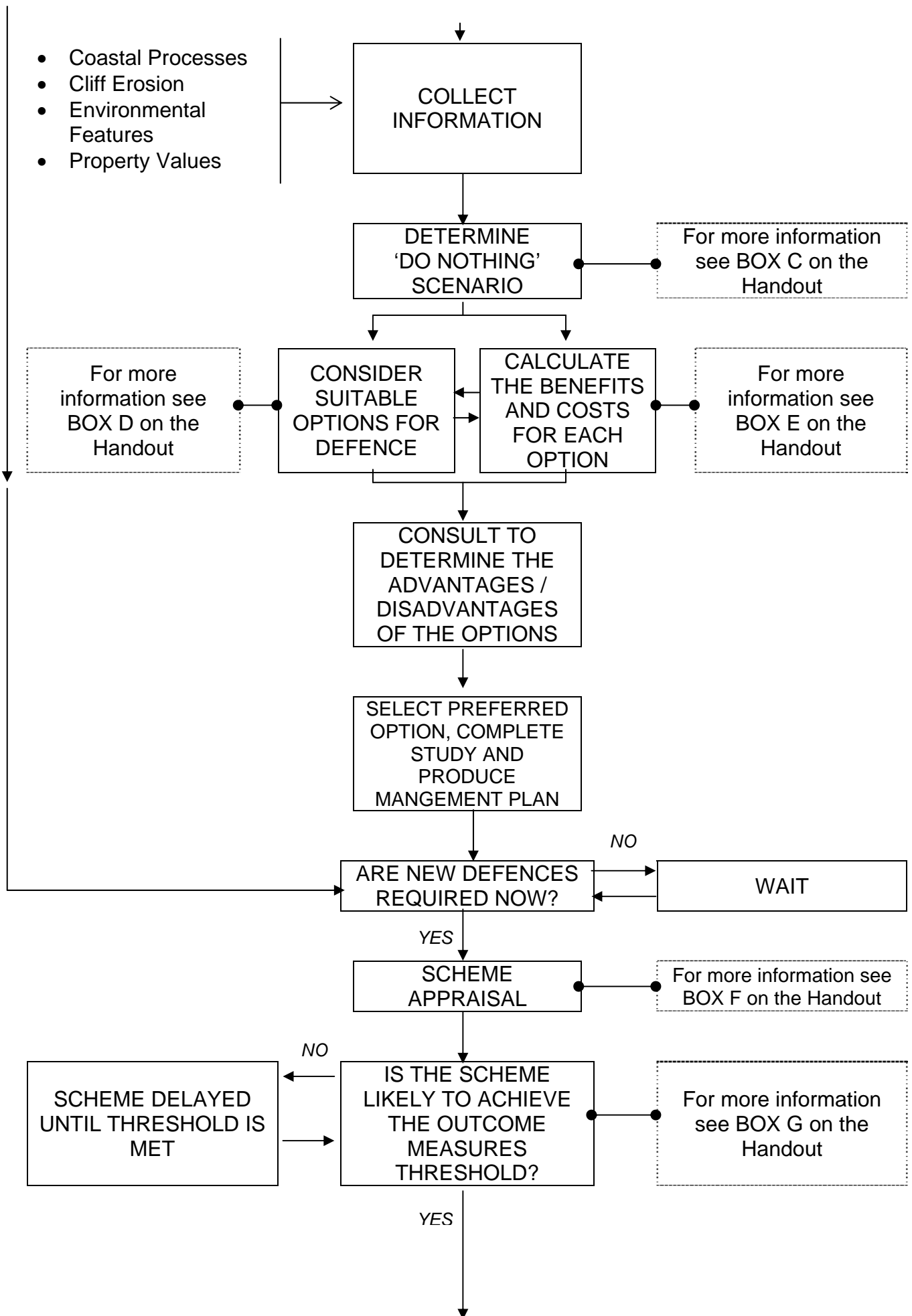
Government Approval and Funding

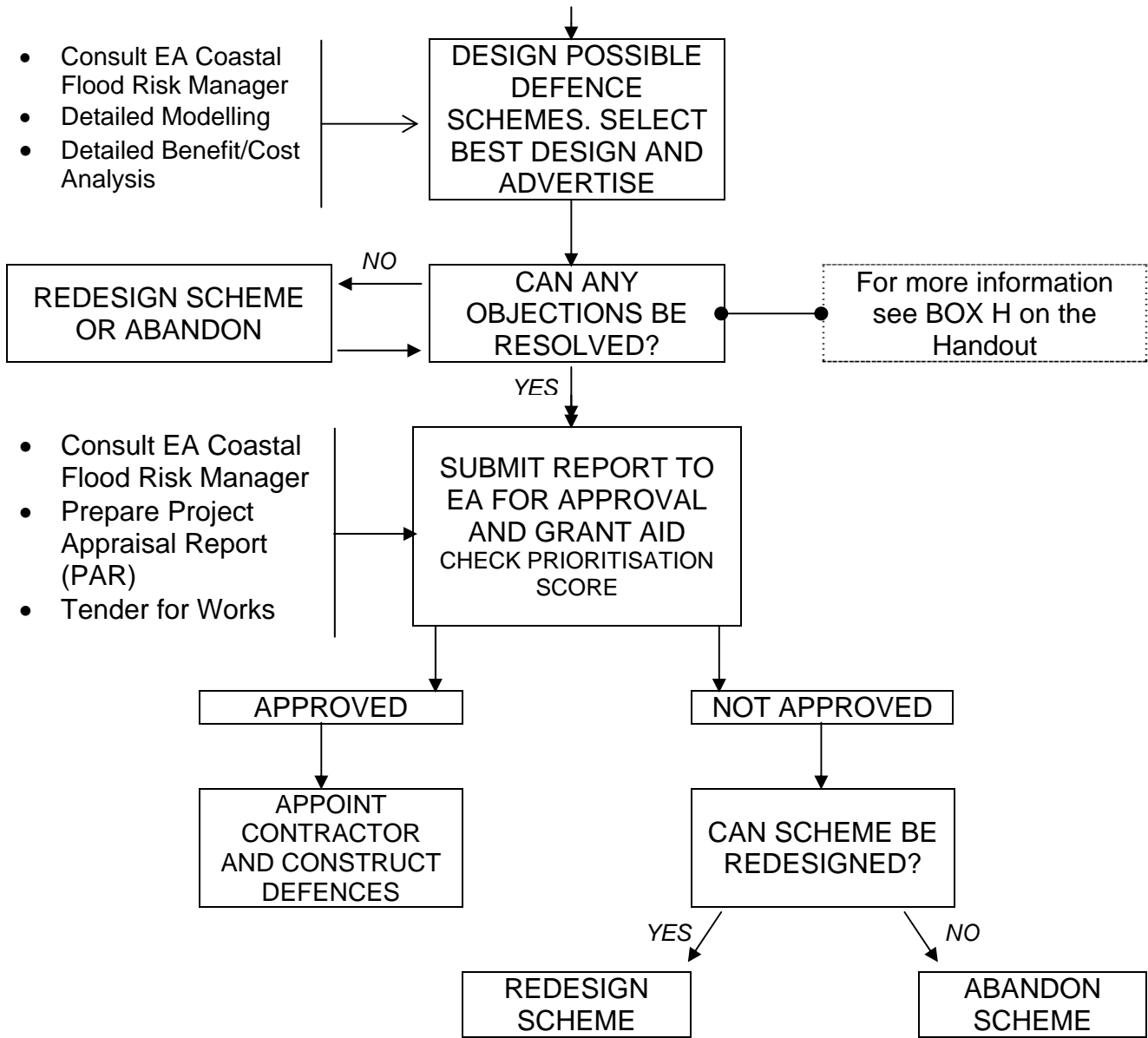
- Coastal defence work, other than maintenance, requires EA approval before construction.
- The EA provides financial support for defences in the form of Grant Aid, providing their criteria are met. Local Authorities and the Environment Agency cannot afford to build new defences without Grant Aid.
- Maintenance work is also funded by Government through the Revenue Support Grant.

All the Council's coast defence work is paid for by Central Government. **It does not affect Council Tax.**

DEVELOPMENT OF A COAST PROTECTION SCHEME







BOX A

Shoreline Management Plans

A Shoreline Management Plan (SMP) determines appropriate policies for the management of the coastline.

Information is collected and consultation undertaken to allow the selection of one of the four possible policies. These are:

- Hold the existing line

“By intervention, hold the existing defence where it is”

- Advance the existing line

“By intervention, to move the existing defence seaward”

- Retreat the existing line (also called Managed Retreat and Managed Realignment)

“By intervention, to move the existing defence landward”

- Do Nothing (also called No Active Intervention)

“Carry out no coastal defence activity except for safety measures”

The SMP document is intended to be reviewed every 5 to 10 years.

BOX B

Strategy Plans

A Strategy Plan considers how to implement the policies set out in the Shoreline Management Plan. It recommends a preferred type of defence option and provides a Management Plan indicating when and what action is likely to be needed over the next 50 to 100 years.

The strategy study investigates natural processes and the residual life of any defences in order to determine how the coast is likely to behave in the future. This enables the ‘Do Nothing’ Scenario to be developed (see BOX C). The study considers possible options for defence (for example: no action, a sea wall, a beach recharge etc.), bearing in mind the benefits available (see BOXES D and E).

On completion of consultation and after all the options have been considered, the study will recommend a course of action and produce a Management Plan. If defences are required then design and EA approval are covered in the Scheme Appraisal stage (see BOX F).

BOX C

The 'Do Nothing' Scenario

The 'Do Nothing' Scenario assumes that no action (no new construction or maintenance work) will be taken at the location. It is used to identify what assets are likely to be lost through erosion and these losses become the benefits in any scheme that prevents or delays their loss.

The 'Do Nothing' Scenario represents the maximum benefit available if all properties are protected. Where a scheme delays (but does not prevent) the loss of a property, only a percentage of its value may be used as a benefit. Therefore, options that only delay property loss will generate a reduced total value of benefits.

See also Box E

BOX D

Defra's Basic Criteria for Defence Schemes

Defra require all coastal defence schemes to meet the following basic criteria:

- Technical Soundness

The scheme must be appropriate to the task, be based on an understanding of natural processes and, as far as possible, work with those processes

- Environmental Acceptability

The scheme must not have adverse environmental impacts. Natural England are consulted to ensure the scheme is acceptable.

- Economic Viability

The scheme must undergo a Benefit/Cost Analysis to demonstrate it is a worthwhile use of public money (see BOX E).

- Sustainability

Schemes should be sustainable. That is they should take account of the interrelationships with other defences, developments and processes within a coastal cell and they should avoid, as far as possible, tying future generations into inflexible and expensive options for defence.

In addition to these criteria, since 1997 all schemes looking to attract Grant Aid must pass some form of prioritisation score threshold. From 2008 these have been known as Outcome Measures.

BOX E

Benefit / Cost Analysis

Benefit/Cost Analysis is an economic tool, used to demonstrate that public money is being spent appropriately. Any defence scheme wishing to secure EA approval and Grant Aid must demonstrate that the financial benefits from the scheme clearly outweigh the costs of constructing the defence scheme.

Benefits are identified through the “Do Nothing” Scenario (see BOX C) and will often be the financial value of properties or infrastructure that is lost. The predicted timing of any loss is important because an economic tool called Discounting is used to ensure all losses can be compared at present day values. It has the following effect:

- If a property is lost immediately (in the first year following a failure) then it contributes all its value to the benefit total.
- If a property is predicted to be lost in 10 years then it only contributes 50% of its value to the benefit total.
- If a property is predicted to be lost in 20 years then it only contributes 30% of its value to the benefit total.

Therefore, properties that are not threatened by erosion in the near future (typically those situated some distance inland) contribute very little to the benefits of a scheme.

Where a scheme delays (but does not prevent) the loss of a property, only a percentage of its value may be used as a benefit.

Defra set a basic criterion that the benefits from a scheme must at least equal the costs of the scheme if it is to be approved. In other words, the ratio of benefits to costs must be 1 to 1 or better.

BOX F

Scheme Appraisal

Scheme Appraisal builds on the SMP (see BOX A) and Strategy Plan (see BOX B) to design the most appropriate defence for a given location and purpose. It is at this stage that the EA decide whether or not they will approve a scheme.

Scheme Appraisal is the time for detailed design work and may involve modelling of both the defence and natural processes to determine the effects it will have.

BOX G

The Prioritisation Scoring Scheme

The Prioritisation Scoring Scheme was introduced in 1997 to help distribute a finite Grant Aid budget between all the competing demands.

Under the scheme, all applications for Grant Aid are scored out of 10 on 3 components: Priority, Urgency and Economics. The total score is compared with a Threshold Score published by Defra. If an application equals or exceeds the threshold it can be considered for Grant Aid.

The Priority component reflects the Government's priorities for coastal defence. Happisburgh scores 8 points here as an Urban coastal defence scheme (Urban because 50% of the benefits come from property or infrastructure).

The Urgency component reflects how quickly works are required and is based on the residual life of the defences. Happisburgh scores 8 points because the defences are expected to fail within 2 years (although if one assumes the defences have already failed then this rises to 10 points).

The Economic component is based purely on the benefit/cost ratio achieved by the scheme (see BOX E). The higher the ratio, the more points the scheme scores. Assuming it is possible to achieve the minimum ratio of 1 to 1.5 then Happisburgh will score 2 points.

Potentially, the total score at Happisburgh is 18 points (if the minimum benefit/cost ratio is achieved) and this rises to 20 points once the defences fail.

The Threshold Score for this year (2001-2002) is 20 points, the first time it has been this low. Previously the Threshold score has been either 22 or 23 points

Box H

Objections to Proposed Defence Schemes

In accordance with the Coast Protection Act (1941), new coast protection schemes must be advertised. At this stage, any objections to the scheme can be made. No scheme can be progressed until any objections to the scheme have been resolved.