H Policy appraisal methodology

CONTENTS

H.1 Introduction H-2

H.2 Define Policy Scenarios (Task 3.1) H-2

H.3 Policy Scenario Assessment (Task 3.2) H-4

H.4 Preferred Scenario Identification (Task 3.3) H-5

Annex H1: Appraisal summary tables (ASTs)

Annex H2: Techniques for policy scenario comparison

H.1 Introduction

This Appendix provides information in support of Policy Development (Stage 3). It provides guidance on some of the techniques that may be employed in the process of Policy Option appraisal to deliver a consistent approach to Shoreline Management Plan development, elaborating on the approach presented in Volume 2.

H.1.1 Principles for delivery of Policy Appraisal

To support the overall philosophy it is also important to consider some high level mechanisms that help support delivery of sustainability for a whole SMP area in an auditable and transparent way.

The assessment of risk and uncertainty is central to decision making at all stages of flood and coastal defence project appraisal from large scale planning (SMPs) through strategy development to scheme appraisal. The aim of SMPs is to identify policies to reduce risks to the natural and built environment from tidal flooding and coastal erosion.

The role of risk assessment is described in PAG1 as: *'…contributing to informed analysis and decision-making at all stages of project appraisal. It not only assesses the likelihood of design conditions being exceeded but also the likelihood of defence failure and the degree of harm resulting to people, property and other assets behind the defences. It provides a framework within which risk can be documented and communicated to relevant stakeholders. Risk assessment reduces the chance of 'surprise' and enables consequences to be managed and planned for in advance'*.

Risk management then builds recognition of risk and uncertainty into the decision making process and takes the form of:

- mitigation (e.g. incorporation of procedures or design features to limit the consequences if risks occur);
- control (e.g. actions taken to avoid risks occurring); and
- acceptance (e.g. provision of an appropriate allowance in scheme costs in case the risk arises).

It is also important that there is a 'common thread' of risk assessment running from the high level to the more detailed level and that all risks are identified at an early stage when the policies for coastal management are being set otherwise it may not be possible to implement them through future strategic and scheme considerations.

H.2 Define Policy Scenarios (Task 3.1)

Task 3.1 involves the definition of Policy Scenarios to be taken forward for detailed appraisal.

As with most elements of the appraisal process, the initial assessment of options to define scenarios will be a subjective and iterative process, which will benefit from inputs from client

and stakeholder representatives.

The following tables identify examples of summary assessments of the generic options.

THE SUTTONS TO JURY'S GAP			
Summary description: Low lying frontage backed by road and properties, at Jury's Gap. Backed by vast Dungeness flood risk area.			
Position of 'the line': Existing linear defences.			
Policy	**Years 0 – 20 (2025)**	**Years 20 – 50 (2055)**	**Years 50 – 100 (2105)**
Hold the Line	To be appraised. Will protect the economic assets of the frontage and backing flood risk area.		
Advance the Line	No benefits, and potential environmental impacts, would result from seaward movement of defences.		
Managed Realignment	Not appropriate given properties/road and environmental assets behind shoreline.	To be appraised for potential long-term technical and environmental benefits. Various realignment positions to be considered.	
No Active Intervention	Limited potential process benefits and uncontrolled inundation of vast flood risk area.		

LYDD RANGES			
Summary description: Largely undeveloped area, used by the MoD as a firing range. The area is of nature conservation importance.			
Position of 'the line': Landward edge of beach ridge.			
Policy	**Years 0 – 20 (2025)**	**Years 20 – 50 (2055)**	**Years 50 – 100 (2105)**
Hold the Line	To be appraised. Will protect the economic assets of the frontage and backing flood risk area.		
Advance the Line	No benefits, and potential environmental impacts, would result from seaward movement of defences.		
Managed Realignment	To be appraised for potential long-term technical and environmental benefits. Various realignment positions to be considered.		
No Active Intervention	Limited potential process benefits and potential uncontrolled inundation of vast flood risk area.		

These appraisals for individual frontages must pay regard to alongshore linkages, and any 'Policy Driver' influences established. Based upon the process linkages, these possible policies can then be combined to form scenarios for testing, as shown in the examples below.

Scenario 1 – Cliff End to Rye Harbour (Hold)			
Location	**0-20**	**20-50**	**50-100**
Cliff End to Winchelsea beach	Seawall, groynes and beach recycling/recharge continued	Seawall, groynes, beach recycling/recharge continued	Seawall, groynes, beach recycling/recharge continued
Winchelsea to Rye Harbour	No defences (existing secondary defence)	No defences (existing secondary defence)	No defences (existing secondary defence)
Rye Harbour	Rye harbour terminal groyne and east pier training wall maintained	Rye harbour terminal groyne and east pier training wall maintained	Rye harbour terminal groyne and east pier training wall maintained.

Scenario 2 – Cliff End to Rye Harbour (Managed Realignment)			
Location	**0-20**	**20-50**	**50-100**
Cliff End to Winchelsea beach	Seawall, timber groynes and beach recycling/recharge continued	Foreshore defences allowed to fail, beach management ceases. Secondary defences constructed (to limit flood propagation)	Secondary defences maintained
Winchelsea to Rye Harbour	No defences (existing secondary defence)	No defences (existing secondary defence)	No defences (existing secondary defence)
Rye Harbour	Rye harbour terminal groyne and east pier training wall maintained	Rye harbour terminal groyne and east pier training wall. Shingle recycling to Broomhill Sands.	Failure of terminal groyne and east pier training wall. Shingle recycling to Broomhill Sands.

H.3 Policy Scenario Assessment (Task 3.2)

This process has two stages: the assessment of shoreline interactions and response; and, assessment of achievement of objectives.

The former of these is described in Volume 2 Task 3.2(a) and Appendix D. This outputs the likely form and estimated position of the coastline for each scenario. The position of the coastline can be used to define the risks to features (see Task 2.5 and Appendix G). These risks, together with the understanding of anticipated form of the shoreline, can then be used to appraise whether the scenario achieves the objectives set for the frontage (Task 3.2b). This will be a subjective process and the decision for each objective should be fully recorded. This recording can simply be incorporated into the issues table, or possibly through alternatives such as an Appraisal Summary Table (AST), see Annex H1.

H.4 Preferred Scenario Identification (Task 3.3)

Following the appraisals under Task 3.2, it will be necessary to review the results of objective achievement at the local and policy scenario scale to identify the preferred scenario. In some instances this may be a very straightforward process. This is likely to be the case where either: the identification of potential policy options (Task 3.1b) has eliminated all alternative options for a frontage; or, where the scenario assessments (Task 3.2) clearly indicate that one scenario has a far greater achievement of objectives.

However, in most instances it is likely that some form of comparison of the outputs from the assessment of scenarios will need to be undertaken. This requires the comparison of different types of impacts associated with a range of options and will therefore inevitably involve a degree of qualitative review and expert judgement, in identifying the preferred scenario.

Where a qualitative comparison of the scenarios does not adequately support the selection of a preferred policy it may be appropriate to adopt techniques for a more structured comparison of the scenarios. Such methods might build on the classification/rank of objectives (Volume 2 Task 2.6, Appendix G.4), simple enumeration of the number of objectives achieved by each scenario or alternative approaches such as Multi-Criteria Analysis. Further details of these approaches are presented in Annex H2.

Regardless of the method adopted for the selection of the preferred policy scenario, it is important that the assessments are clearly recorded and referenced to the objectives defined for the frontage, in order to ensure transparency of the decision making. The reporting structure presented in Appendix I, provides opportunity for the assessment to be clarified locally in the individual ‘Policy Unit Statements’ (to be included as Chapter 4 of the main document) and as a policy scenario in the ‘Plan for balanced sustainability’ (to be included as Chapter 3 of the main document).

In some locations it may be considered appropriate to further detail the review of objective achievement, in support of the Policy Unit Statements. Where this is the case it may be appropriate to develop the issue table further, or consider alternative reporting formats such as an Appraisal Summary Table (Annex H1).

Annex H1: Appraisal summary tables (ASTs)

This Annex details an approach than can be taken to the recording and comparison of objective achievement for policy scenarios. Appraisal Summary Tables (AST) are tabular summaries of the main economic, environmental and social impacts of a proposed option and can include qualitative descriptors, quantitative data and economic valuations. The aim of the ASTs is to ensure transparency, i.e. to provide a structure in which all the reasons for choosing the preferred option are set out in a clear and intelligible manner. In this way, the decision making process transforms from a 'black box' to a more auditable process.

The main concept behind the AST approach is to provide a summary of the main economic, environmental and social impacts of an option. The key components of an AST include cells for recording the following types of information:

- a description of the option being assessed and the area affected by it;
- a discussion of any option specific assumptions;
- a qualitative description of the effects of the option for a prescribed set of impact categories and sub-categories;
- a quantitative description in physical or natural units of the effects of the option under each category;
- the results of monetary valuation exercises, as appropriate; and
- any assumptions specific to the impact assessments or comments on uncertainty, robustness and validity.

The list of impact categories and sub-categories should be comprehensive, but stay within the remit of flood management and coastal defence and, most importantly, should be manageable to practitioners and stakeholders and proportional to the level of detailed required. A possible structure for an AST is shown in Table H1-1.

The advantages of using of an AST-based methodology are that:

- it allows information on impacts to be recorded in a consistent manner, being it qualitative, quantitative and/or monetary (as well as the assumptions behind them), and, hence, ensures transparency;
- it helps identifying which impacts are more important to the end decision and demonstrates how this was reached;
- it provides the means for others to audit the assessment accompanying the decision making process; and
- it allows for consistency across the different levels of decision making since the same AST structure can be used throughout the appraisal of the Plan or Policy, the Strategy and the Project or Scheme.

Table H1-1 Appraisal Summary Table

Description of Option				
Description of Area Affected by Option				
Impact Category	**Impact likely? (Y/N)**	**Qualitative Description of Impacts**	**Quantitative Assessment of Impacts (no. units/monetary)**	**Assumptions/Comments**
Economic Impacts				
Assets				
Land use				
Transport				
Business development				
Environmental Impacts				
Physical habitats				
Water quality				
Water quantity				
Natural processes				
Historical Environment				
Landscape and visual amenity				
Social Impacts				
Recreation				
Health and safety				
Availability and accessibility of services				
Equity				
Sense of community				
Cross-Cutting Impacts				
Policy Integration				

Note: It may be possible to arrange ASTs side by side so that alternative options can be readily compared.

Annex H2: Techniques for policy scenario comparison

This Annex identifies a number of approaches that may be considered for use in identifying a preferred policy scenario (Task 3.3). This is not a comprehensive review of techniques, but reviews some of the approaches likely to benefit SMP developers where policy selection involves the balancing of a wide range of objectives. The techniques identified are:

- ranking;
- percentage compliance; and
- Multi-Criteria Analysis

RANKING

The objective appraisal process (Task 2.6) can be used to assign a rank to each objective. Whilst these ranks are theme specific (e.g. a rank 3 housing objective is not necessarily of equal importance as a rank 3 nature conservation objective), it is possible to use this ranking in the policy appraisal process as it identifies the 'important' objectives for a section of coast. This can assist in decision-making, particularly where different options meet different objectives, as it is likely to be the options achieving the higher ranked objectives that will be more acceptable.

By using the objective rank:

- It is possible to consider firstly the higher ranked objectives, then medium, then lower, with the intent to meet the more important objectives and accommodate the others objectives where possible.
- It is possible to use the rank of each objective as a weight to use with scoring methods (see below), but it should be recognised that such an approach may not result in achieving all the higher ranked objectives, as it would simply be total score for a frontage (rather than individual objectives) that would be considered.
- It is possible to use ranking to check the outcome of a scoring approach, so that the Policy Scenario identified is appraised to see if it meets the high ranking objectives. If any high objectives are not met then consideration will need to be given on how it may be met, the impact that a different Policy may have (e.g. by altering a Policy you may be excluding a different high rank objective), and the consequences of not meeting it.

Table H2-1 shows how each option A to D performs in terms of meeting objectives 1 to 6 in either quantitative (where available) or qualitative terms. In Table H2-2, objectives are ranked in decreasing order of importance and the options are ranked according to how they address each objective. An initial qualitative review would appear to show that option A offers the 'best' solution.

Table H2-1. Option Appraisal Matrix

Objective/Issue	Policy Option			
	A	**B**	**C**	**D**
e.g. Habitat loss	10ha	70ha	65ha	100ha
e.g. Economics	3.0	2.5	4.6	1.0
e.g. Climate Change Impacts	no	uncertain	uncertain	limited
e.g. Community	improved	damaging	damaging	no change
e.g. Recreation	low	low	high	medium
e.g. Tourism	£1.4m	£1.6m	£0.8m	£2.0m

Table H2-2. Option Ranking Appraisal Matrix

Importance of Objective	Achievement of Objectives			
	Highest			**Lowest**
Very high e.g. Habitat loss	A	C	B	D
High e.g. Economics	C	A	B	D
High e.g. Climate Change Impacts	A	D	C B	
Medium e.g. Community	A	D	B C	
Low e.g. Recreation	C D	A	B	
Negligible e.g. Tourism	D	B	A	C

The analysis should enable a tabulated summary to be produced. Presentation of this information should follow a format similar to the Table H2-3 below.

Table H2-3. Guidance format for presentation of tabulated summary

Frontage x/ Candidate Policy Unit				
Objective	**Option**			
	A	**B**	**C**	**D**
Objective 1	10ha	70ha	65ha	100ha
Objective 2	3000	2500	2400	5000
Objective 3	√	×	√	×
Objective 1 – related to habitat gained Objective 2 – related to property at risk from erosion Objective 3 – related to working with natural processes				

PERCENTAGE COMPLIANCE

Compliance methods are a clear way to show the differences between Policy Options and their acceptability. There is a benefit in using categorised objectives to demonstrate the degree of balance between them that a particular Policy may provide. It is unlikely that any Policy Option will score 100% across all groups of objectives and this reflects the degree of compromise for the Option. This is easily understandable by stakeholders and allows clear graphical presentation of the information. It also enables identification of less clear decisions that can be discussed and resolved through the SMP Coastal Group and Stakeholders. While a simple yes/no format to display which policy meets which objectives is sufficient as a summary, a statement of how the policy meets the objective is required to maintain the transparency, ownership and audit trail in the policy decision process (see Task 3.2b, and Table H2-4 below).

Table H2-4 Example objective achievement

LOCATION: CLIFF END TO WINCHELSEA BEACH			0-20		20-50		50-100	
			NAI	HOLD	NAI	HOLD	NAI	REALIGN
Feature	**Objective**	**Rank**	*Defences fail, recycling stops*	*Maintain existing defences*	*No defences*	*Maintain existing defences*	*No defences*	*Secondary defence*
Coastal Landscape	Maintain landscape quality within High Weald AONB area	1L	Y	N	Y	N	Y	Y
Properties in Cliff End and Winchelsea settlements	Prevent damage to /loss of residential properties in Winchelsea and Cliff End due to flooding or erosion	3H	N	Y	N	Y	N	N
Infrastructure	Maintain services to properties in Cliff End and Winchelsea	4I	N	Y	N	Y	N	N
Infrastructure	Maintain local communication links between communities	4I	N	Y	N	Y	N	N

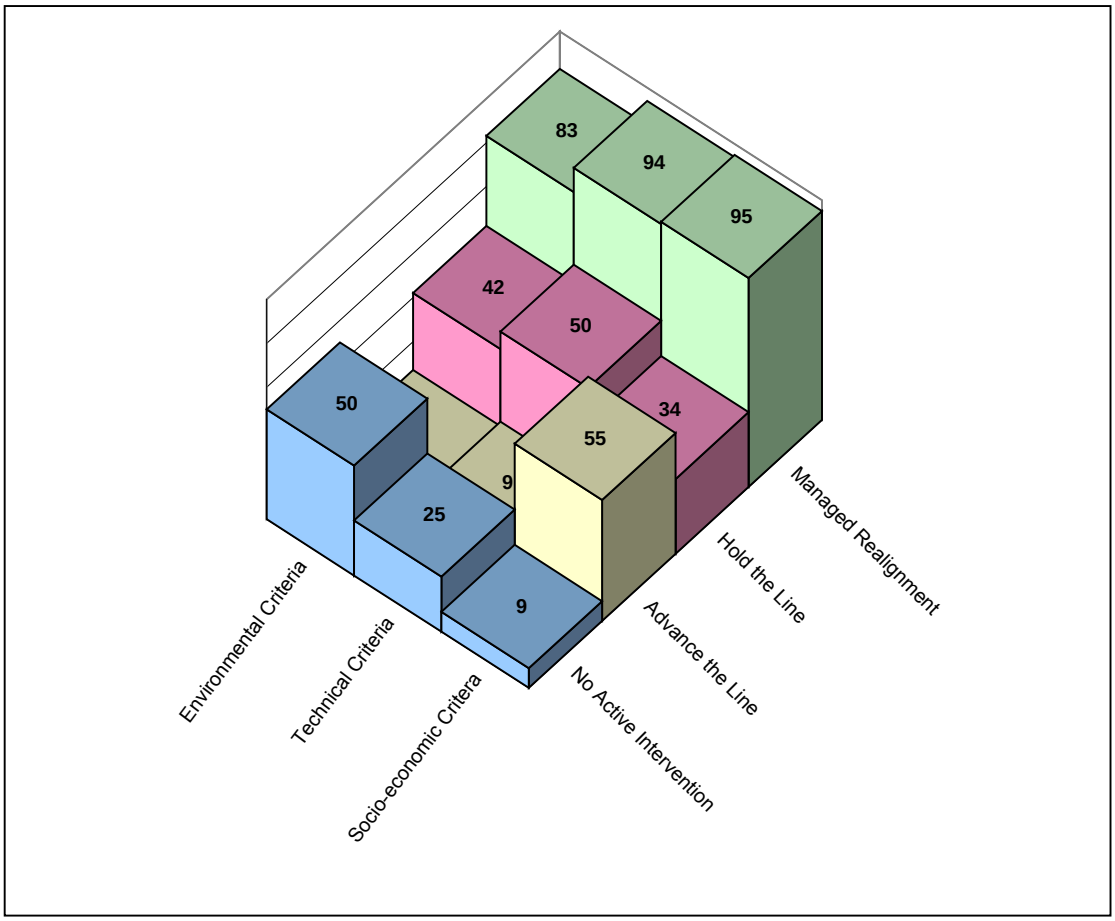
The Percentage Compliance approach does not assume any priority in the objectives; instead it assumes that all objectives that have been set for the SMP are all equally relevant to achieving a balanced SMP (i.e. the ranking is ignored). The determination of whether the Policy does or does not meet the objective is based upon the information and data gathered under the SMP and application of any appropriate analysis. Partially met objectives may draw into question the way an objective is phrased and may require it to be re-phrased or sub-divided, creating objectives that are more specific and measurable in terms of matching to a particular policy.

By subdividing the objectives into key categories, a representation of how each policy/scenario performs against them and the balance of the preferred policy scenario over the SMP coastline can quickly show how sustainable the policy scenario is. This can be simply presented as the percentage of objectives (under categorised headings) met by each policy for a particular policy unit/ feature (e.g. based upon Table H2-4, 'NAI' achieves 25% of objectives in years 0-20 and 'Hold' achieves 75%).

This scoring method can be applied to all objectives. It provides a simple method for

displaying how different categories of objective have been met through the process. Figure H2-1 shows an example of how the scoring can help to visualise the most appropriate Policy Option to apply. In this example, the percentage compliance of the benefit objectives under the three primary theme headings, for each of the four generic options, has been graphed. This can be used to give a clear indication of the extent of objective achievement by each policy.

Figure H2-1. Example of Percentage compliance



MULTI-CRITERIA ANALYSIS

Multi-Criteria Analysis (MCA) covers a range of appraisal techniques that have the potential to capture a wide range of impacts that may not be readily valued in monetary terms, and an MCA approach is being developed for use in flood and coastal defence appraisals.

MCA aims to establish preferences between options by reference to an explicit set of specified objectives. The MCA approach is systematic and makes use of Appraisal Summary Tables (ASTs), which are used for screening at different decision levels and provide the framework for scoring and weighting.

In mathematical terms, a range of different approaches can be used in the scoring of impacts. Numerical ranges can be developed for different impacts and scores assigned

against these. Alternatively, qualitative descriptors and associated scores can be used in cases where there are no natural units of measure.

In general, a balance must be struck between level of detail and the need for simplicity. This means that the measure upon which scoring is based should be sufficiently detailed to enable a robust appraisal but simple enough to allow easy application. In addition, the complexity of the scoring system should be in line with the level of accuracy surrounding the data that will be used as the basis for assigning the scores.

The aim of weighting the impacts is for the score to be able to reflect the relative (proportional) importance of changes in one impact as compared to another. By developing a weighting system, it is possible to aggregate the scores into an overall index or measure of performance for a given option and thus, together with cost benefit analysis for those impacts that can be measured in money terms, assist in the identification of the preferred option.

Full guidance on the application of an MCA approach for the appraisal of flood and coastal erosion risk management is provided in the 2004 Defra/EA R&D report (FD2013) 'Developing a Multi Criteria Analysis methodology for application to Flood and Coastal Management Appraisals'. This can be obtained from the Defra website http://www.defra.gov.uk/environ/fcd/research/