### Summary: Intervention & Options

<table>
<thead>
<tr>
<th>Department /Agency:</th>
<th>Defra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong></td>
<td>Impact Assessment of changes to the terms describing the functions of flood risk management</td>
</tr>
<tr>
<td><strong>Stage:</strong></td>
<td>Draft bill</td>
</tr>
<tr>
<td><strong>Version:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Date:</strong></td>
<td>11th March 2009</td>
</tr>
</tbody>
</table>


**Available to view or download at:**

**Contact for enquiries:** Paul Murby  
**Telephone:** 0207 238 6239

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**What is the problem under consideration? Why is government intervention necessary?**

If predictions about the consequences of climate change are correct, England will experience increasingly wetter winters and drier summers, rainfall events and storms generally will be more intense and sea levels will rise. The use of traditional methods alone to deal with this risk is becoming increasingly unaffordable, both in terms of financial cost and damage to the environment, so a portfolio of other approaches is needed. At present, the language used in legislation is orientated towards constructing and maintaining flood defence and coastal structures over other approaches. Although this has not entirely prevented the development of a wider portfolio of measures, it has limited the flexibility of the Government’s policy response. The need to tailor policies to fit with legislation not entirely suited to them has also increased the costs of policy design and implementation and hampered effectiveness.

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**What are the policy objectives and the intended effects?**

The aims are:

1/ to bring legislation in line with existing Government policy, so that the implementation of that policy can become more efficient and effective
2/ to create flexible legislation that will allow governments to respond to changing risk.

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**Table 1**

**What policy options have been considered? Please justify any preferred option.**

Option 1. Write the draft Floods and Water Bill in such a way as to comply with the EU Floods Directive, encompassing all floods except those from sewers and defining flood risk management as including any activity that reduces the probability of floods or their potential for damage.

Option 2. Expand the definition beyond that required by the EU Floods Directive, including activities for the management of coastal erosion risk and giving a flexible definition of flood risk management including, where this is expected to bring a net benefit, activities that increase the probability of flooding or erosion.

We strongly favour Option 2 because:

a. It brings together flood risk management and coastal erosion risk management, encouraging operating authorities to consider the inter-dependencies between these activities.

b. By listing examples of activities that can be considered under flood and coastal erosion risk management (FCERM), it reduces ambiguity about what is permitted, gives greater impetus to the take-up of new FCERM activities and promotes the use of the broad spectrum of measures recommended by the Foresight report and specified in the *Making Space for Water* strategy.

c. It allows operating authorities to manage flooding and erosion, including raising water levels and reinstating flooding and erosion processes, to gain benefits for the cultural or natural environment, the local economy and local amenities.
When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects? Not applicable

<table>
<thead>
<tr>
<th>Ministerial Sign-off</th>
<th>For Final Stage Impact Assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.</td>
</tr>
<tr>
<td>Signed by the responsible Minister:</td>
<td>Minister for the Environment</td>
</tr>
</tbody>
</table>
| Date: | }
## Summary: Analysis & Evidence

**Policy Option:**
1

**Description:** Write the draft Floods and Water Bill in such a way as to comply with the EU Floods Directive

### COSTS

<table>
<thead>
<tr>
<th>Description and scale of key monetised costs by 'main affected groups'</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is unlikely that Option 1 will lead to any significant short-term change in the pattern of FCERM measures used. Hence, the quantifiable costs will be negligible.</td>
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</table>

<table>
<thead>
<tr>
<th>ANNUAL COSTS</th>
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</thead>
<tbody>
<tr>
<td><strong>One-off (Transition) Yrs</strong></td>
</tr>
<tr>
<td>£ 0</td>
</tr>
<tr>
<td><strong>Average Annual Cost</strong></td>
</tr>
<tr>
<td>£ 0</td>
</tr>
<tr>
<td><strong>Total Cost (PV)</strong></td>
</tr>
<tr>
<td>£ 0</td>
</tr>
</tbody>
</table>

**Other key non-monetised costs by 'main affected groups'**

### BENEFITS

<table>
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<tr>
<td>£ 0</td>
</tr>
<tr>
<td><strong>Total Benefit (PV)</strong></td>
</tr>
<tr>
<td>£ 0</td>
</tr>
</tbody>
</table>

**Other key non-monetised benefits by 'main affected groups'**

The Govt. will be more able to achieve its aim of using a wider portfolio of FCERM measures (see *Making Space for Water*).

It will be easier for operating authorities to take measures to help at risk communities for whom large-scale protection/defence is not appropriate.

It will reinforce the Government’s message regarding the importance of managing the risk from flooding from all sources and not just tidal and river flooding.

It will emphasise the importance of preparing for floods and will emphasise the fact that not all flooding can be prevented.

### Key Assumptions/Sensitivities/Risks

The FCERM measures that are made more possible by this definition generally have a relatively low benefit-cost ratios and are therefore unlikely to compete for funding under the existing formula.

In order for some of the above benefits to be realised, either ring-fenced funding would need to be provided, additional funding streams created or current targets reviewed.

Risk: this option might encourage operating authorities to adopt projects that have lower benefit-cost ratios but that help them meet Defra’s targets, leading to a relative reduction in NPV of the programme.

### Price Base Year

<table>
<thead>
<tr>
<th>Price Base Year</th>
<th>Time Period Years</th>
<th>Net Benefit Range (NPV) £</th>
<th>NET BENEFIT (NPV Best estimate) £</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td></td>
<td>n/a</td>
<td>0</td>
</tr>
</tbody>
</table>

**What is the geographic coverage of the policy/option?**

England

**On what date will the policy be implemented?**

N/A

**Which organisation(s) will enforce the policy?**

N/A

**What is the total annual cost of enforcement for these organisations?**

£0

**Does enforcement comply with Hampton principles?**

N/A

**Will implementation go beyond minimum EU requirements?**

No
ANNEX C

<table>
<thead>
<tr>
<th>Will the proposal have a significant impact on competition?</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual cost (£-£) per organisation (excluding one-off)</td>
<td>Micro</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)</td>
<td>Increase of £ 0</td>
</tr>
</tbody>
</table>

Key: Annual costs and benefits: Constant Prices
## Summary: Analysis & Evidence

### Policy Option: 2

**Description:** As Option 1, but also include coastal erosion risk management in the definition, permit measures that increase flooding and list

<table>
<thead>
<tr>
<th><strong>ANNUAL COSTS</strong></th>
<th>Description and scale of key monetised costs by 'main affected groups'</th>
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<tbody>
<tr>
<td><strong>One-off (Transition) Yrs</strong></td>
<td>It is unlikely that Option 2 will lead to a substantial short-term change in the core measures supported by grant in aid for FCERM. Hence, the quantifiable costs will be negligible.</td>
</tr>
<tr>
<td>£ 0</td>
<td></td>
</tr>
<tr>
<td><strong>Average Annual Cost</strong></td>
<td></td>
</tr>
<tr>
<td>£ 0</td>
<td>Total Cost (PV) £ 0</td>
</tr>
</tbody>
</table>

**Other key non-monetised costs** by 'main affected groups'

<table>
<thead>
<tr>
<th><strong>ANNUAL BENEFITS</strong></th>
<th>Description and scale of key monetised benefits by 'main affected groups'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One-off</strong></td>
<td>It is unlikely that Option 2 will lead to a direct short-term change in the core measures supported by grant in aid for FCERM. Hence, the quantifiable monetary benefits will be negligible.</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Average Annual Benefit</strong> (excluding one-off)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Total Benefit (PV) 0</td>
</tr>
</tbody>
</table>

**Other key non-monetised benefits** by 'main affected groups'

**In addition to those listed for Option 1:**

Authorities will take better account of the interactions of coastal erosion and flood risk management, thus facilitating clearer accountability and integration of risk management at the coast and in estuaries.

Authorities will be better able to realise the synergies between managing flood and erosion risk and other policy objectives, such as improving the environment.

### Key Assumptions/Sensitivities/Risks

See under Option 1.

### Price Base Year

<table>
<thead>
<tr>
<th>Net Benefit Range (NPV)</th>
<th>NET BENEFIT (NPV Best estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### What is the geographic coverage of the policy/option?

England

### On what date will the policy be implemented?

N/A

### Which organisation(s) will enforce the policy?

N/A

### What is the total annual cost of enforcement for these organisations?

£ 0

### Does enforcement comply with Hampton principles?

N/A

### Will implementation go beyond minimum EU requirements?

Yes

### Will the proposal have a significant impact on competition?

No

### Annual cost (£-£ per organisation (excluding one-off)

<table>
<thead>
<tr>
<th>Micro</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Are any of these organisations exempt?

N/A

### Impact on Admin Burdens Baseline (2005 Prices)

<table>
<thead>
<tr>
<th>Increase of</th>
<th>Decrease of</th>
<th>Net Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ 0</td>
<td>£ 0</td>
<td>£ 0</td>
</tr>
</tbody>
</table>
## ANNEX C

**Key:** | **Annual costs and benefits: Constant Prices** | **(Net) Present Value**
---|---|---
1. Introduction

If predictions about the consequences of climate change are correct, England will, in future, experience increasingly wetter winters and drier summers, rainfall events and storms generally will be more intense and sea levels will rise. Both an independent study on future flood risk\(^1\) and the Government’s own policy analysis\(^2\) have concluded that a reliance on traditional methods of dealing with the risk of flood and coast erosion will be impractical due to the environmental and financial costs that such reliance would imply. As a result, they recommended the use of an extended portfolio of approaches.

At the same time, the European Union recently issued a directive aimed at improving the quality and consistency of flood risk management across Europe. The directive obliges member states to make plans that cover all types of flooding (with the exception of sewer flooding) and to include activities relating to protection, prevention and preparation. Member states are required to implement the directive by the end of 2009.

Existing legislation, however, limits the Government’s ability to meet the requirements either of the EU directive or of its own policy intentions. As statutory bodies, the operating authorities with responsibility for implementing policy on flooding and coastal erosion (the Environment Agency, local authorities and internal drainage boards) are restricted in their activities by what they are empowered to do in legislation. As a result, the legislative definition of flood and coastal erosion risk management is critical.

The present definition is limited in a number of respects. Firstly, it only applies to flooding from the sea and from watercourses, thus limiting the development of a capacity to manage risks stemming from other sources of flooding such as surface water and groundwater, whose importance was highlighted by the experience of the floods of the summer of 2007. Secondly, it only allows what are sometimes considered the more “traditional” approaches to flood and coastal erosion risk management: “flood defence”\(^3\) (which is defined as “defence against water (including sea water)”) and “coastal protection”\(^4\) (which is defined as, “any work of construction, alteration, improvement, repair, maintenance, demolition or removal for the purpose of the protection of any land”). This restrictive definition has led to an emphasis on physical barriers and restricted agencies’ capacity to consider the interrelation between erosion and flood risk.

Moves towards the portfolio approach have come in spite of current legislation but have been hampered by it. For example, in the development of a long-term tidal flood risk management plan for London and the Thames Estuary, the Environment Agency is consulting on a wide range of options that include many innovative measures not part of the traditional approach to flood risk management. Although such activities are possible within the existing legislative regime, the legal focus on building and maintaining defence structures makes such approaches more difficult to implement.

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3 Section 113 of the Water Resources Act. The definition of this term is based on that used in section 72 of the Land Drainage Act 1991.
4 See section 49 of the Coast Protection Act 1949.
The existing definition discourages measures that increase preparedness and resilience and the current legislation makes it difficult to respond to the emphasis in the EU Directive on preparation. For example, a recent Government scheme to promote the use of household-level flood risk mitigation measures focused on household protection (i.e. the use of barriers to prevent ingress into the home) rather than resilience (e.g. the use of water-resistant fittings and building materials).

This document considers two options for changes in the legal definition of flood risk management. The option of not making any change to the current definition is not considered here, because compliance with the EU Floods Directive is a legal requirement.

1) Option 1 - compliance with the EU Floods Directive

Compliance with the EU Floods Directive would remove some, though not all, of the legislative restrictions inherent in the current definition.

The Directive’s broad definition of a flood (“the temporary covering by water of any land not normally covered by water”) would facilitate the management of flooding from all sources, including surface water, reservoirs and groundwater, all of which are important in the UK context. (The only permitted exception is sewer flooding in which river water, rain-water and tidal water play no contributory part.) It is important to note, however, that coastal erosion risk management is not integrated into this definition of flood risk management and that the focus is on the management of flood risk alone.

Furthermore, the Directive’s requirement that member states introduce flood risk management plans to address “all aspects of flood risk management” (Article 7, 3) indicates that no type of flood risk management activity should be excluded from consideration so long as that activity reduces the damage caused by such floods to the natural environment, cultural heritage, property and economic activity. This may include allowing flooding in some locations in order to reduce the level of risk in other more vulnerable locations.

2) Option 2 – including activities not specified in the EU Floods Directive

Some potentially very helpful aspects of flood and coastal erosion risk management are not, however, adequately covered by the definition used in the EU Directive. Option 2 looks at an extension of the definition to cover these. As well as including all the characteristics of Option 1, it therefore also has the following attributes:

a. It includes the management of the risk of coastal erosion.

b. It includes activities that increase flooding or erosion where this is justified by the social and/or environmental benefits.

c. It lists examples of specific activities that can be included in flood risk management, where Option 1 only mentions general areas of activity.

As a result of the inclusion in the definition of coastal erosion risk management as well as flood risk management, the term flood and coastal erosion risk management (FCERM) in used in the description of this option in place of the term flood risk management (FRM) that is used in the description of Option 1.
It is important to note that many of the activities that are mentioned in the proposed definitions are already used in some places. However, there is evidence that lack of familiarity with some of these measures and the enduring focus of organisational cultures on the more traditional approaches to FCERM is an important barrier to their widespread adoption. The benefit of these options is not only that they expand the range of options available to FCERM authorities but that they would remove uncertainty about whether currently underused techniques are permitted and would therefore encourage their wider use. This analysis, in other words, assumes that the textual force of written legislation helps determine its influence on behaviour and that it is therefore important not only what legislation says, but also how clearly it says it.

2 The benefits and costs of the two options

It is important to note, therefore, that neither of the options would necessarily lead to any change in the actual implementation of FCERM. They would, however, allow and facilitate changes in flood and coastal erosion risk management, encouraging the use of a broader portfolio of measures that include preparation and resilience and address all types of flooding. They would also encourage integrated management of flood risk and coastal erosion risk and the integration of FCERM with other policy goals.

When they are choosing which FCERM projects to fund, operating agencies focus on two main factors: gaining the best value for money and the contribution that projects would make to the targets set out in Defra’s outcome measures. Defra has currently set a target that the Government’s overall programme of investment in FCERM should have a benefit-cost ratio of at least 5:1. As a result, unless there are overriding legal or policy reasons for projects, or unless they contribute to an outcome measure that might not otherwise be attained, new projects generally only receive funding if they have a benefit-cost ratio that is at least 5:1.

This analysis assumes that most of the broader portfolio of measures permitted by the two options would have benefit-cost ratios of less than 5:1. Further work is planned that will establish with greater certainty whether this is the case for those measures that would be most likely to have a significant quantifiable impact if they were widely adopted. Meanwhile, although the use of these measures might be increased in order to attain Defra’s targets such as carry out work that are necessary to get 95% of nationally important wildlife sites into target condition by 2010, it is not possible to estimate the likely scale of such increases in the longer term.

The exceptions to this are activities that are specifically mentioned elsewhere in the Bill and are supported by some element of prescription – e.g. the creation of surface water management plans. The implementation of these measures is considered largely independent of the definition of flood risk management. However, the change of definition is an important step in delivering improved surface water management. Furthermore, the costs and benefits associated with these measures are included in separate impact assessments that are dedicated to these specific parts of the draft bill.

As a result of the above arguments, none of the benefits or costs of the two options are quantified and the analysis in this impact assessment relies entirely on arguments regarding non-quantifiable costs and benefits.

It is worth noting, however, that the ability of some of these activities to qualify for funding on the basis of benefit-cost ratios might improve in the future. Firstly, it seems possible that the

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6 Taking account of both the quantifiable costs and benefits and any significant impacts which cannot be described in monetary terms.
negative impacts of engineered protection and defence projects on the natural environment will increase substantially as the scale of the threat increases and larger and stronger defence and protection become necessary and that the benefit-cost ratios of such activities will therefore worsen. Secondly, it is likely that the costs to future communities of maintaining these measures will begin to have a greater impact on benefit-costs calculations. Finally, it also seems probable that some of the newer options will become cheaper and more effective – the understanding of how to improve household level protection and resilience, for example, is in its infancy and the price of products is kept high by the absence of a mass market.

3. Option 1 – compliance with the EU Floods Directive

Compliance with the EU Floods Directive is required by the agreed date of 25 November 2009. Under Option 1, the definition of flood risk management used in the Floods and Water Bill would reflect the definition used in the Directive. That is to say, it would include all aspects of flood risk management whose aims were to reduce the damage caused by any kind of flooding other than sewer flooding.

3.1 Enabling the implementation of existing policy intentions

The clearest example of a limitation placed on policy implementation by the current definition of FCERM regards the promotion of household-level risk mitigation measures. When this scheme was launched in December 2008, restrictions in the definition of FCERM led to a decision to exclude resilience measures from the measures supported by the scheme.

Option 1 would enable any future extension of this scheme to include resilience measures as well as protection. This would extend the range of flood risk scenarios that could be covered by the scheme.

This would have a number of benefits. It is likely that people living in homes requiring resilience measures currently receive less government support with regard to flood risk reduction than most other categories of at-risk household, so any inclusion of resilience would enhance the equality with which flood risk management funds are allocated. Also of importance is the increased profile that the scheme would give to the concept of household resilience. Resilience is not a familiar idea to most householders, who automatically consider protection to be the most appropriate household-level measure. In situations of frequent flooding, however, resilience can sometimes be a more cost-beneficial approach. Furthermore, by enabling householders to move back into their homes more quickly and reducing the emphasis on vigilance and response to warnings, it can significantly reduce the stress and anxiety associated with flood risk. Including resilience in the Government’s scheme would help disseminate awareness of these advantages.

3.2 Increased flexibility over the implementation of future policies

Option 1 would also increase the flexibility of the Government to pursue as yet undeveloped policies in response to future need. It is not possible to predict what these might be. However, an independent, government funded study of future flood risk concluded that climate change could lead to a rising intensity of storms and flooding and to an increased threat of flooding to London, so it seems likely that England will face challenges in the future that are greater in scale and different in nature to those currently being faced.

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3.3 The acceleration of existing policies

Two measures that are given specific mention elsewhere in the Floods and Water Bill would be given added momentum if, as they would be under Option 1, they were also included in the general definition of flood risk management: the creation of surface water management plans and the implementation of sustainable drainage systems (SUDS).

The draft Floods and Water Bill will include a range of measures to promote better management of surface water. Not only will it require local authorities to draw up Surface Water Management Plans for all areas of high flood risk. Please refer to the Impact Assessment on Local Flood Risk Management for other surface water orientated provisions.

The validity of these activities as part of flood risk management is greatly clarified by the definition in Option 1, which, for the first time, includes surface water management within the definition of flood risk management. Furthermore, all of the activities listed above fall more comfortably within the terms “prevention” and “preparedness” that are used in Option 1 than they do within the concept of “protection” that forms the mainstay of the current definition.

Regardless of which definition of FCERM is used in the draft bill, the creation of these plans will be specified very clearly. As a result, levels of compliance would not be influenced by the definition used in the Floods and Water Bill and Option 1 would have no quantifiable monetary benefits or costs in this domain.

The quantifiable costs and benefits that might result from the changes to the implementation of surface water management and SUDS have been included in the impact assessments that focus on these issues and are not, therefore, included in this analysis.

Option 1 should also enhance operating authorities’ ability to promote changes in land management that reduce flood risk. Landowners’ choices of land management practices influence the speed with which water is conveyed to watercourses. During high intensity rainfall events, this can affect flooding. Management techniques can also cause ‘muddy floods’, in which water drains off agricultural land onto other property, where it causes damage or disrupts public services. Furthermore, topsoil that is washed away can silt up watercourses and thereby increase the risk of fluvial flooding in nearby areas. Although, authorities already sometimes engage in the promotion of behaviour change, such activities would be more clearly allowed under Option 1 due to its emphasis on flood prevention.

It seems unlikely that measures to promote changes in land management would be able to compete for full funding from the FCERM budget on the grounds of benefit-cost ratios alone. However, the many different benefits of reducing run-off could attract funding from sources other than the FCERM budget, which would make such projects more viable. Furthermore, as was argued above with regard to household-level resilience measures, land management interventions are most likely to be attractive where no alternative means of reducing flood risk is effective or affordable. There is therefore a social justice case for empowering authorities to intervene in such cases if the benefits are sufficient and funding can be secured (see 6.1.1 below).

3.4 Allowing activities that increase flooding

By recognising the validity of increasing flooding in some areas to decrease the risk elsewhere, this option encourages the creation, recreation or enhancement of habitats that are valuable in their own right but that also mitigate flood risk. Flood and coastal erosion risk management has a profound impact on biological and geological diversity and hence also on amenity value. Therefore there are key dependencies between the management of flood and erosion risk and
the health and sustainability of certain features of the natural environment – especially in wetlands and coastal landscapes. Many of the country’s most important wildlife sites are currently in an unfavourable condition due to inappropriate drainage or flood management and a number of the Government’s key targets and objectives for the natural environment can only be achieved through flood and erosion management. There is therefore a strong case for managing flooding and erosion in an integrated way to gain desirable social and environmental outcomes at the same time as reducing the risk to people and property.

The net impact of flooding or erosion is not always damaging. In some areas, the benefits of ecosystem changes resulting from floods or erosion can outweigh the damage caused. For example, by creating or restoring salt marshes or grazing marshes, floods can bring benefits for soil formation, nutrient recycling, the breeding of commercially important fish, climate regulation, water regulation and purification, pollination, erosion regulation, recreation and education. Option 2 would allow flood and erosion risk management authorities to play a role in meeting objectives relating to these benefits and to realize any efficiencies and synergies in the delivery of policy objectives.

As a result, this option would improve the capacity of operating authorities (the Environment Agency, local authorities and internal drainage boards) to help the UK meet environmental goals such as targets set by the EU Water Framework Directive for the enhancement of aquatic ecosystems and the achievement of good surface water status and those within the Habitats Directive for the restoration of natural habitats. It would also help the Environment Agency meet the targets, set out in Defra’s Outcome Measures, for creating priority biodiversity habitats and for bringing Sites of Special Scientific Interest in to target condition.

3.5 Enhancing social justice

The achievement of social justice is a fundamental part of the Government’s sustainability strategy, which promotes the creation of a “strong, healthy and just society” and argues that government activities should meet “the diverse needs of all people in existing and future communities”. The present definition of FCERM falls short of these goals because it emphasises flooding from some sources over that from others and because it focuses on protection and defence and thereby pays little regard to the needs of people in situations where protection or defence is not appropriate.

As was emphasised by the flooding in the summer of 2007, surface water flooding and flooding from the failure of a dam present a significant part of the overall risk of flooding in England. By increasing the scope of the definition of FCERM to include these sources of flood risk and others, Option 1 would result in flood risk management resources being distributed more equally amongst people exposed to the various forms of flood risk.

Similarly, this option dilutes the focus on protection and defence that exists in the current definition. This, too, improves the capacity for an improvement in distributive equality. For example, in areas where community-level flood defence is not economically viable and household-level protection is not practical, Option 1 would allow the state to support the introduction of household-level resilience measures. Rather than being concentrated in those areas where defence or protection happens to be practical and economically viable, therefore, a change in definition would allow resources to be spread more evenly. This is in keeping with the

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Government’s policy goals, as described by the minister for flooding, Elliot Morley, in their *Making Space for Water* strategy in 2005:

Whilst recognising the need to focus investment in defences where there is the greatest risk in terms of probability and consequence, we also want to consider what more the Government may be able to do to help all communities and individuals prepare for and live with flooding and coastal erosion risk.

The concept of social justice adopted by the Government in its sustainable development strategy also recognises the rights of communities of the future and these, too, are more easily protected under the two proposed changes to the definition. Although large-scale, engineered protection and defence measures might maximise benefits for existing communities, the need to maintain these measures places a burden on future generations. Furthermore, the existence of such measures tends to encourage more development in protected areas, thus increasing the value of the assets that would be at risk if the measures gave inadequate protection against future increases in the probability of flooding or erosion. By encouraging adaptation rather than defence, and by facilitating the use of alternative probability-reduction measures such as flood storage, Option 1 allows greater consideration to be given to communities of the future.

### 3.6 Ensuring a healthy society

By obliging operating authorities to consider all types of flooding, Option 1 would also lead to the negative health impacts of flooding being reduced for a greater number of at-risk householders. There is a clear association between flooding and ill health. Household floods are thought to cause gastro-intestinal problems, respiratory illness and skin irritations. In addition, the psychological demands on flooded householders are great. Not only do they have to deal with the fear and disruption of the flood event itself, but also with the practical disruption that follows and with emotional consequences, such as anxiety about exposure to water-borne contaminants and viruses and guilt that they inadequately protected their homes. Flooding has therefore been associated with a number of mental health problems, including chronic fatigue syndrome, adjustment dysfunction and post traumatic stress disorder. Broadening the range of options available within FCERM should facilitate an increased reduction in flooding and flood risk and thereby reduce these impacts. This would contribute to a second strand of the Government’s sustainable development agenda, “ensuring a healthy society”.

### 4. Option 2 – A definition that includes activities not specified in the EU Floods Directive

Option 2 fully encompasses the definition used in Option 1 but also:

1. encourages the appropriate use of activities that deliberately increase flooding or erosion where this will bring net benefits for the natural or cultural environment, economic activity and local amenities

2. includes the management of coastal erosion risk alongside that of flood risk

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14 Which is evidenced by flashbacks, sleep disorders, depression and a reluctance to recall the disaster event.

3. list examples of activities that FRM might involve.

The various benefits of this option are explored in the paragraphs that follow.

4.3. Including the management of coastal erosion risk in the definition

Coastal erosion risk and coastal flood risk are closely interrelated and should be considered together when decisions are being taken about risk management. The sediment released by erosion processes can be essential to the formation of natural flood defences such as beaches, mud flats and salt marshes. Slowing or preventing erosion in one area can, therefore, reduce natural flood protection in other areas. At the same time, cliffs themselves sometimes form a natural barrier against coastal flooding, sheltering hinterlands from high tides that might otherwise cause them to flood. In such cases, allowing cliff erosion to continue unchallenged can add to the exposure of inland areas to coastal floods. As a result of these interdependencies, the issues of flood risk and coastal erosion risk have long been considered together in the UK. We argue that this approach should be supported by the inclusion of flood risk and coastal erosion risk in a common legal definition.

The definition proposed by the EU Floods Directive, Option 1, speaks only of flood risk management (FRM) and makes no mention of coastal erosion. Option 2 proposes a definition that encompasses both flood risk management and coastal erosion risk management. Hence, the use in the description of this option of the term flood and coastal erosion risk management (FCERM) in place of the term flood risk management (FRM) that was used in the description of Option 1.

Existing legislation permits the management of coastal erosion risk by protection activities but Option 2 would expand the range of erosion risk management options encouraged by the definition. Coastal erosion, like flooding, is accepted as being a process that can be managed but cannot always be prevented without incurring financial and environmental costs that are disproportionate to the gains. In some cases, the only cost-effective response to the threat of coastal erosion might be to allow the coast to naturally erode to a more sustainable position. In others, allowing erosion of one piece of coastline might be necessary for the protection of another. Elsewhere, as argued in 4.1 with respect to flooding, the amenity, environmental or other benefits of allowing erosion might outweigh the costs. The definition adopted in Option 2 would permit this, and other, means for managing flooding and coastal erosion.

4.4 Including in the definition an illustrative list of FCERM activities

Option 2 also differs from Option 1 by including in the definition of FRM an illustrative list of permitted activities (see Figure 1).

Figure 1 – flood risk management activities listed in the definition in Option 1

(a) planning, erecting, maintaining, altering or removing buildings or other structures,
(b) maintaining or restoring natural processes,
(c) reducing or increasing the level of water in a place (whether or not it results in a change to the water level in another place),
(d) carrying out work in respect of a river or other watercourse (such as taking things out of it or supporting or diverting the banks),
(e) moving things onto, off or around a beach, or carrying out other works in respect of the shoreline,
(f) using statutory or other powers to permit, require, restrict or prevent activities,
(g) making arrangements for financial or other support for action taken by persons in respect of a risk of, or in preparing to manage the consequences of, flooding or coastal erosion,
(h) making arrangements for forecasting and warning,
(i) preparing, gathering and disseminating maps, plans, surveys and other information, and
(j) providing education and giving guidance (including, for example, guidance on changes to land management).

The inclusion of such a list would have little effect on the powers awarded by the bill, but it would provide greater clarity as to the meaning of the provisions. In consequence, any reluctance to adopt new practices will be more easily overcome and the benefits of these practices will be more quickly and more efficiently realised.

4.5 Surface water management

Compared to Option 1, Option 2 provides clearer encouragement for operating authorities to engage in activities supporting the implementation of surface water management plans. It does this by making specific mention of the kinds of activities that would be involved, including, “preparing and disseminating maps” (which would relate to the mapping of surface water flooding risk), “gathering and disseminating other information” (which would relate to the creation of a register of surface water management assets) and “using statutory or other powers to permit, require, restrict or prevent activities” (which would relate to the enforcement of the abolition of the right to connect). In addition, by listing “giving guidance” as a valid flood risk management activity it would, when compared to Option 1, also give the Environment Agency a clearer remit to advise and support local authorities in their new surface water management role, and in their capacity as promoters, advisers and regulators of SUDS.

4.6 Minimising delays to the implementation of future new FCERM policies

A further argument for Option 2 is that it would delay the need for further primary legislation to extend the definition in the light of perceived changes in need. The most recent change to the definition of FCERM was made in the Water Resources Act 1991 and the need for its revision was recognised thirteen years later in the Government’s 2004 strategy consultation, Making Space for Water.

Avoiding the need for further primary legislation would speed the implementation of new policies and would bring forward the benefits associated with them. It would also reassure the public that government was able to respond quickly to changes in weather patterns and would thereby reduce anxiety about climate change and flood risk.

4.7 Allowing activities that increase flooding or erosion for the immediate benefit of the cultural, natural or economic environment

As was argued in section 3, above, flood and coastal erosion risk management can have profound positive impacts on biological and geological diversity, and hence also on the economic and amenity value of areas. Many wetland and coastal environment depend on the processes of flooding or erosion to maintain their quality, interest and value. Option 2 enhances the ability of operating authorities to manage flooding and erosion for the beneficial effects of the processes. Whereas Option 1 only allows activities that increase flooding if they decrease flooding elsewhere, Option 2 does not include this conditionality. Under Option 2, the processes of flooding or erosion could be managed in a particular location with the sole purpose of enhancing the cultural, natural or economic environment there or further afield. This option would, therefore, further enhance authorities capacity to meet key government targets and objectives for the natural environment and to provide economic growth and educational and amenity opportunities.

5 Conclusion
The main argument presented here for the adoption of a changed definition of flood and coastal erosion risk management is the legal requirement that member states of the European Union conform to the EU Floods Directive. This directive is unambiguous and it is clear that the existing definition of flood risk management, with its exclusive focus on flooding from the sea and from rivers, is not adequate to allow implementation in England. For this reason, it is essential that some change be made to the existing legal definition.

The discussion about the nature of this change rested largely on a belief in the power of legislation to influence not only the legality of an activity but also the ease with which the activity can be undertaken and the confidence that operating authorities can have about adopting it. In this respect, it has been argued, Option 2 is preferable to Option 1 because it specifies more clearly what kind of activities comprise flood and coastal erosion risk management. It also makes it clear that flood risk management and coastal erosion risk management should be considered together – an issue not addressed by Option 1.

A further argument for Option 2 is the inclusion of activities that manage flooding or erosion processes for their beneficial effects. The wording of the EU Directive does not encompass these activities. As increased flooding or erosion can sometimes be beneficial and could help achieve environmental goals, this consideration important.

As a result of the reasoning presented in the above paragraphs, it is the conclusion of this analysis that Option 2 should be preferred over Option 1.

It should be recognised, however, that although they might not be as capable of supporting some of the principles of the Government's sustainable development agenda, large-scale engineered measures will continue to be highly cost-beneficial. Unless they contribute to one of Defra’s outcome measures that might not otherwise be achieved, and with the exception of those activities prescribed elsewhere in the Floods and Water Bill, the adoption of other measures might continue to be relatively slow and neither Option 1 nor Option 2 would have any great effect on the principal investment programmes of the operating authorities.