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# **Flood and Water Management Bill**

## **Impact Assessment - new definition of Flood and Coastal Erosion Risk Management and strategic overview**

**Last updated: 25 September 2009**

## Summary: Intervention & Options

<b>Department /Agency:</b> Defra	<b>Title:</b> Impact Assessment of new definition of FCERM and overview	
<b>Stage:</b> Final	<b>Version:</b> 2.03	<b>Date:</b> 25 September 2009
<b>Related Publications:</b> Local Flood Risk Management Impact Assessment, Floods Directive Impact Assessment		

### Available to view or download at:

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

Flood and erosion risk is increasing due to climate change and development in areas at risk. Business as usual will not be enough to effectively counter these increasing risks. Government policy already promotes use of wider portfolios of measures to sustainably manage the probability and consequences of flooding and erosion in an integrated fashion. However, existing legislation is limited to empowering authorities to drain land, build defences and provide flood warning without providing any local/national overview of the way that these risks are managed and integrated with related policies.

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

- 1/ to promote the use of a wider range of measures to manage both the probability and the consequences of flooding and erosion.
- 2/ to bring legislation in line with existing Government policy reflected in Making space for water which seeks to promote integrated flood and erosion risk management together and with wider environmental and social objectives.
- 3/ to provide for a strategic overview of flood management and coastal erosion risk management for all sources of flooding in England and Wales.

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

Option 0. No change from existing situation.

Option 1. Retain concepts in existing law of flood defence and coast protection but extend flood defence to include the management of flooding from all sources (except sewers).

Option 2. Update legislation in line with the Government's strategy for flood and erosion risk management (Making space for water). This is the preferred option as it allows a broader portfolio of measures to be used, and formalises the strategic overview of flood and coastal erosion risk by the Environment Agency, providing for more consistent and integrated management.

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?** It is intended to review the impact of the new arrangements across the wider bill policy areas within 5 to 10 years of introduction.

### **Ministerial Sign-off** For final proposal/implementation stage Impact Assessments:

***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.***

Signed by the responsible Minister:

.....Date:

## Summary: Analysis & Evidence

Policy Option: 2

Description: Update definitions and powers in line with Government strategy

<b>COSTS</b>	<b>ANNUAL COSTS</b>		Description and scale of <b>key monetised costs</b> by 'main affected groups' Given the permissive nature of FCERM legislation, the change of definition and integrated approach are not expected to cause any increase in overall costs. Funding has already been provided to the EA for their overview activities during the current spending review period.	
	<b>One-off</b> (Transition)	<b>Yrs</b>		
	£ n/a			
	<b>Average Annual Cost</b> (excluding one-off)			
	£ n/a		<b>Total Cost (PV)</b>	£ n/a
Other <b>key non-monetised costs</b> by 'main affected groups' Broader definitions and powers may lead to an increase in appraisal costs, but guidance should ensure that these are proportionate and any costs offset by better decisions. Benefits are likely to be spread more widely in areas at risk, which may affect some of those who would have gained from conventional approaches.				

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>		Description and scale of <b>key monetised benefits</b> by 'main affected groups' The rigorous procedure that we have in place for the cost benefit analysis and prioritisation of publicly funded projects should ensure the most beneficial projects are funded. The EA overview, sustainability duty and better understanding of wider approaches should result in more benefits from the same funding.	
	<b>One-off</b>	<b>Yrs</b>		
	£ n/a			
	<b>Average Annual Benefit</b> (excluding one-off)			
	£ n/a		<b>Total Benefit (PV)</b>	£ n/a
Other <b>key non-monetised benefits</b> by 'main affected groups' The broadening of possible flood risk measures is likely to mean that it is feasible to manage risks for a wider range of situations, thus playing an important part in enabling a fairer and more socially just policy and legislative framework for FCERM.				

**Key Assumptions/Sensitivities/Risks** The risk that some new approaches may be less cost effective than current practices is countered by the rigorous prioritisation, cost benefit analysis and appraisal of government funded projects that is already in place.

Price Base Year	Time Period Years	<b>Net Benefit Range (NPV)</b> £ n/a	<b>NET BENEFIT (NPV Best estimate)</b> £ n/a	
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What is the geographic coverage of the policy/option?			England & Wales		
On what date will the policy be implemented?			2011		
Which organisation(s) will enforce the policy?			Defra / WAG / EA		
What is the total annual cost of enforcement for these organisations?			£ n/a		
Does enforcement comply with Hampton principles?			Yes		
Will implementation go beyond minimum EU requirements?			Yes		
What is the value of the proposed offsetting measure per year?			£ n/a		
What is the value of changes in greenhouse gas emissions?			£ n/a		
Will the proposal have a significant impact on competition?			No		
Annual cost (£-£) per organisation (excluding one-off)		Micro	Small	Medium	Large
Are any of these organisations exempt?		No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)				(Increase - Decrease)
Increase of	£ n/a	Decrease of	£ n/a	<b>Net Impact</b>
				£ n/a

Key:

Annual costs and benefits: Constant Prices

(Net) Present Value

## Evidence Base (for summary sh

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

### 1 Introduction

Current climate change predictions suggest that England will experience wetter winters and generally drier summers but with more frequent intense rainfall events. Furthermore, sea level rise will accelerate, leading to an overall increase in flood and erosion risk. An independent study on future flood risk<sup>1</sup> and the Government's own policy analysis<sup>2</sup> have both concluded that a reliance solely on current methods (i.e. flood defence and coast protection), is likely to become increasingly expensive and unable to deliver the intended objectives. As a result, they recommend the use of an extended portfolio of approaches such as land management and resilience measures that can reduce either the probability of flooding occurring or the harmful consequences of flooding that cannot be avoided.

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 in these activities relating to protection, prevention and preparation. It requires that these flood management plans "*take into account relevant aspects such as costs and benefits, flood extent and flood conveyance routes and areas which have the potential to retain flood water, such as natural floodplains, the environmental objectives of Article 4 of Directive 2000/60/EC [the Water Framework Directive], soil and water management, spatial planning, land use, nature conservation, navigation and port infrastructure*". It says that management plans "*may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event*" thus supporting this broader approach. Member states are required to implement the directive by the end of 2009.

#### 1.1 A broader approach to flood management

Existing legislation limits the Government's ability to meet the requirements of the EU directive and its own policy intentions (as described in the Government's strategy for flood and erosion risk management: *Making space for water*). Operating authorities with responsibility for implementing policy on flooding and coastal erosion risk management (the Environment Agency, local authorities and internal drainage boards) are currently restricted in what they are empowered to do by narrow definitions in existing legislation and powers that relate only to drainage, flood defence, coast protection and warning. A broader approach to risk management for example requires powers to remove flood defences in order to allow some areas of land to be flooded thus improving the standard of protecting for others.

Limited moves towards the portfolio approach have come in spite of current legislation but have been seriously 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 consulted on a wide range of options that included flood plain management and resilience measures. Although such activities may be possible, the focus on building and maintaining defence

<sup>1</sup> Evans E, Ashley R, Hall J, Penning-Rowsell E, Sayers P, Thorne C and Watkinson A (2004). *Foresight. Future Flooding. Scientific Summary: Volume II Managing future risks*. Office of Science and Technology, London.

<sup>2</sup> *Making Space for Water*. Defra, 2005.

structures in line with the existing legislative definition of defence makes the planning for, and delivery of, alternative and complementary measures very difficult.

The existing legal definition of flood defence does not support investment in measures that increase preparedness and resilience. This is a key to the management of the consequences of flooding and emphasised in the EU Directive as *preparation*. For example, a recent Government scheme to promote the use of household-level flood risk mitigation measures needed to focus 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), which may have been a more effective means of managing risk in some cases.

### 1.2 Integration of coastal erosion and coastal flood defences

The definitions and powers in current legislation do not encourage an integrated approach to flood and coastal erosion management. Separate legal and institutional frameworks are provided for the management of the two issues, giving Environment Agency (EA) responsibility for the former and District Councils the latter. By bringing these areas of risk management together and ensuring that both are dealt with in national and local strategies, a more efficient, integrated and cost-effective approach is foreseen.

### 1.3 Embedding a sustainability duty and approach into flood and coastal erosion management

A further issue in terms of ensuring an integrated approach to flood and erosion management and the achievement of multiples objectives, where possible, is that current definitions and powers do not support authorities' delivery of wider environmental benefits. This means that opportunities to, for example, to contribute to objective for the natural environment are missed or stifled. An extension of the EA's duty to contribute to the achievement of sustainable development to local authorities and Internal Drainage Boards (IDBs) when using their flood and erosion management functions, together with a clear requirement for local and national strategies to detail the contribution that each authority will make and wider powers, will resolve this issue. The already EA has a duty to contribute to the achievement of sustainable development through its flood risk management functions<sup>3</sup> and all Flood and Coastal Erosion Risk Management (FCERM) authorities have narrower duties<sup>4</sup> to exercise their powers so as further the conservation and enhancement of natural beauty and the conservation of flora, fauna and geological or physiographical features of special interest. However, local authorities and IDBs do not have the same overall sustainable development duty that the Agency has and none of the authorities currently have adequate powers to manage flooding and erosion purely for beneficial effects.

### 1.4 Requiring the Environment Agency to have a strategic overview function in respect of all flood risks

In terms of our broad approach to flood management, although the EA has played a central role it has not had clear responsibility to consider how to address all flood risks in England. Its focus has been on main rivers and the sea. Moreover, though it has put together many policy documents, carried out extensive mapping and risk assessments and developed a high level strategy, it has not had a clear responsibility to put together a strategy with clear measurable objectives which all authorities contribute to achieving. Similarly it has not had a responsibility to put together guidance which other authorities are obliged to have regard to. The Pitt Review concluded that the absence of such an overview role was detrimental to flood management.

## **2 Options under consideration**

Option 0 – This involves no change from the existing situation and is provided as a baseline against which other options are compared. It would result in a lack of consistency between the

<sup>3</sup> We do not propose any additional duty on the Agency in this respects.

<sup>4</sup> For example, under s.61 of the LDA

Floods Directive and the permissive powers through which flood risk is managed which would be likely to hinder the implementation of flood risk management. The Floods Directive is being implemented through regulations under section 2(2) of the European Communities Act.

Option 1 – involves doing the bare minimum to bring the definition and powers in line delivery of the measures required by the EU Floods Directive. Such a change would extend the definition of flood defence to include the management of harmful effects of flooding from all sources, except sewers, thus including surface water, reservoirs and groundwater, all of which are important in the UK context. It is important to note, however, that coastal erosion is not integrated into this definition and it does not contain a clear sustainable development duty. Nor is the concept of risk management embedded in this option because the Directive is only concerned with the stages of risk assessment, mapping and planning and rather than being prescriptive about how those risks are managed.

Option 2 – goes further, updating legislation in line with policy developments by:

- (a) making it clear that flood risk management is about managing all aspects of flood risk. That is to say, clarifying that flood risk management is about managing both the probability and the potential consequences of flooding. This is compatible with what is required by the Directive but gives greater clarity as to the goal of reducing risk.
- (b) integrating the management of coastal erosion with flood risk
- (c) incorporating a duty on all operating authorities (EA already has such a duty) to exercise powers in a way which contribute to the achievement of sustainable development thus ensuring that environmental, social and economic objectives are all taken into account. This includes providing powers to manage flooding, erosion and water levels to obtain social and environmental benefits as well as reduce harmful effects.

Some of the activities to manage flood and erosion risk that would be allowed by this definition are already used informally in a limited number of places. However, there is evidence that lack of a legislative framework for these measures and the enduring focus of organisational cultures on the more 'traditional' structural approaches of flood defence is a barrier to their widespread adoption<sup>5</sup>. The benefit of option 2 is not only that it expands the range of options available to FCERM authorities but that they would remove uncertainty about whether currently underused techniques are permitted and would therefore support their uptake in appropriate situations.

- (d) giving the EA a strategic overview role which requires it to put together a strategy, drawing from risk assessment carried out itself and by others, which sets clear objectives and means of achieving those objectives. The other part of this role is providing guidance and working with others to seek to ensure these objectives are met.

### 3 Costs and Benefits

The approach taken in this impact assessment relies on *describing* the impacts of the options rather than seeking to attribute uncertain monetary costs and benefits to the change of definition at a high level. This is because the principle constraint on what is included in the programme of investment is flood and erosion risk management is rigorous appraisal of the costs and benefits of options at a project level and this will not change. This will ensure that the benefits of option 2 are at least as great as option 1 and the baseline for this assessment. To some extent relevant authorities are already moving towards a risk management approach supported by government policy. However, they are hampered by the ambiguity as to their roles. The precise impact of this change is difficult to assess.

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<sup>5</sup> Penning-Rowsell, Parker, Harries and Werritty. *CRUE Research Report No I-1: Systematisation, evaluation and context conditions of structural and non-structural measures for flood risk reduction*. Era-Net Crue: London. 2008.

### 3.1 Option 0 – No change from existing situation

Costs and benefits would remain as they are now – this option provides the baseline against which others have been assessed.

### 3.2 Option 1 – Retain existing concepts in existing law of flood defence and coast protection but extend flood defence to include the management of flooding from all sources (except sewers).

This would involve the Environment Agency having powers relating to *flood defences* in relation to coasts and main rivers, district councils retaining responsibility for *coastal erosion*, with IDBs or District Councils having responsibility for *drainage* and the network of ordinary watercourses. There would be no clear duty on all authorities to take into account sustainable development objectives or to integrate flood risk management with coastal erosion risk management.

Compliance with the EU Floods Directive will mean that surface water and reservoirs would need to be included within domestic systems of risk management. We have not sought to set out the benefits of this approach in this IA as they are covered in the Floods Directive and Local Flood Risk Management IAs.

The current focus in law is on flood defences and drainage, rather than risk management. However, as mentioned above, the relevant authorities are already beginning to move towards a risk management approach. When choosing which FCERM projects to fund, operating agencies focus on three main factors: meeting any legal requirements cost effectively, gaining the best overall value for money<sup>6</sup> and contributing to key policy goal and Government targets. 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 they contribute to key targets that might not otherwise be attained, new projects generally only receive funding if benefits exceed costs by a significant margin.

### 3.3 Option 2 – Embed the up to date concepts of flood and erosion risk management, as described in the Government's strategy for flood and erosion risk management, *Making space for water*, into legislation and providing related powers to allow a broader portfolio of measures to be taken.

The 3 main elements to this option are:

- (1) A risk management approach, which allows authorities to take measures to manage both the probability of flooding as well as the potential consequences. This would support the shift in policy and practice which has occurred in the past 15 years and promote a move towards a broader portfolio of measures.
- (2) Giving the Environment Agency powers in respect of coastal erosion and providing for the it to take a lead role in overall management of flood and coastal erosion risk by requiring it to develop, maintain and implement a national strategy including preparation of guidance for other authorities.
- (3) Giving all authorities clear duty to contribute to the achievement of sustainable development authorities and providing powers for authorities to manage flood and erosion for the beneficial effects of those processes as well as to reduce the harmful impacts.

### 3.4 Risk Management

The move to a risk management approach has implications for specific projects and investment decisions which would subject to the normal appraisal process where the costs and benefits will

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<sup>6</sup> Taking account of both the quantifiable costs and benefits and any significant impacts which cannot be described in monetary terms.

be fully considered on a case by case basis. It is expected that the ability of non-structural measures to compete for funding on the basis of benefit-cost analysis is likely to increase as the negative impacts of artificial defence structures are better understood and recognized. It is also probable that some of the newer non-structural approaches will become cheaper and more cost effective as these measures become more widely used.

One of the clearest examples of a limitation placed on policy implementation by the current definition of flood management relates to the promotion of household-level risk mitigation measures. When the Government's scheme was launched in December 2008, the narrow approach enshrined in law led to a decision to exclude resilience measures because current legislation did not permit the funding of such works. However, such measures may be more efficient or provide wider benefits such as helping vulnerable people that would not otherwise benefit from public investment (which is typically focussed on structural measures).

The updating of the definition will increase the flexibility of the Government to promote new risk management techniques in response to future need. An independent, government funded study in to future flood risk<sup>7</sup> concluded that a combination climate change and socio-economic growth in areas of risk would lead to increased threat from flood risk under a broad range of possible scenarios.

By explicitly recognising approaches, such as flood storage, that increase managed flooding in some areas to decrease the risk elsewhere, the change in definition would also support opportunities for recreation or habitats enhancement that, if properly managed, would mitigate flood risk. Many of these wetland and coastal habitats are valuable in their own right, as well as providing important ecosystem services, and their conservation and enhancement is a high priority.

Option 2 would expand the range of erosion risk management options for managing coastal erosion risk beyond coast protection, which is all that is permitted under current legislation. Coastal erosion, like flooding, is a process that can be managed. However, the natural erosive forces of the sea cannot be entirely prevented and in some cases the cost of arresting erosion will be greater than the benefits. The Government's policy is to maintain defences where it is sustainable and affordable to do. However, it also acknowledges this will not always be possible and encourages adaptation and other means of reducing risk where protection is not affordable or sustainable (see for example the recent consultation on coastal change policy). In some cases, the best management option is to allow the coast to erode naturally to a more sustainable position. In others, allowing erosion of one place on coast might help protect another and, as argued with respect to flooding, the amenity, environmental or economic benefits of allowing erosion can outweigh the costs. The definition adopted in Option 2 would permit this, and other, means for managing flooding and coastal erosion.

### 3.5 Integration of coastal erosion into flood management

Coastal erosion risk and coastal flood risk are closely interrelated. There is therefore a strong rationale for considering the two issues together when decisions are taken about the management of flooding and erosion. For example, sediment released by erosion processes can be essential to the maintenance of natural flood defences such as beaches, mud flats and salt marshes. Slowing or preventing erosion in one area can increase flood or erosion risk in another area. At the same time, cliffs 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. While, the legislation and institutional responsibilities are currently different, Government policy promotes an integrated approach to the management of flood and coastal

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<sup>7</sup> Evans E, Ashley R, Hall J, Penning-Rowsell E, Sayers P, Thorne C and Watkinson A (2004). *Foresight. Future Flooding. Scientific Summary: Volume II Managing future risks*. Office of Science and Technology, London.

erosion risk. Option 2 brings legislation into line with policy by establishing a common legal and management framework. The integration of coastal erosion and flood risk management is expected to reduce the administrative cost by allowing joint schemes to be taken forward by a single lead authority and the development of common knowledge and skills bases.

### 3.6 Sustainability duties and Environmental Works Powers

Flood and coastal erosion risk management has a profound impact on biological and geological diversity and hence also on amenity value. It follows that 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 wetlands and coastal landscapes. Indeed, many nationally important wildlife sites are currently in an unfavourable condition due to inappropriate drainage or flood management and some of the Government's key targets and objectives for the natural environment can only be met 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 change in definition, together with the powers to manage flooding and erosion for the beneficial effects and a comprehensive duty to contribute to the achievement of sustainable development, are required to achieve this.

Broader sustainability duties and environmental works powers would encourage an integrated approach to management of flood risk and coastal erosion risk ensuring social, economic and environmental policy goals are considered together. The benefits of a clear sustainable development duty on all operating authorities would mean that other environmental, biodiversity and social benefits need to be considered and are likely to be realized including reducing climate change impact.

It is not possible to give a certain value for the environmental costs and benefits of the schemes that would be brought forward as a result of these changes because each case would need to be considered and treated on its merits in competition with alternative investment options. However, indicative examples of the costs and benefits of creating habitats that could result of these changes illustrate the kinds of values that may be possible. Using an valuation methodology promoted by Defra's ecosystem approach, based on the value of the goods and services provided by habitats on human welfare<sup>8</sup>, values for the types of coastal and wetland habitats that might typically be created through flood and erosion management range from £200-6350 per hectare per year, with typical mid-range indicative values of £800-2750 ha/yr<sup>9</sup>. These values include carbon storage, pollution control functions, contribution to fisheries and recreational benefits. Typical whole life costs of creating such wetland habitats range from £15,000-124,000 per hectare over 100 years<sup>10</sup>. These benefits may include or be additional to any functional benefit that the habitat provides in terms of reducing flood risk, such as reducing flood peaks in river or dissipating wave energy at the coast, which may be the primary objective of the project. One recent investigation into the economics of coastal habitat recreation concluded that "*There are sites at which managed realignment is likely to be the most economic option for flood defence, even without taking habitat values into account. Equally, there are some cases in which [it] can be justified purely in terms of the habitat created, without the need to invoke flood protection benefits.*"<sup>11</sup>

It is expected that the provision of environmental works powers, will enable flood and erosion risk management authorities to realise such benefits. These benefits are more likely to be gained cost-effectively by giving powers to the same authorities who have the powers to manage flooding and erosion to reduce the harmful effects because they have the necessary technical

<sup>8</sup> Defra 2007, An introductory guide to valuing ecosystem services.

<sup>9</sup> Eftac 2007, Flood and Coastal Erosion Risk Management: Economic Valuation of Environmental Effects. The Environment Agency.

<sup>10</sup> Defra 2006, National Assessment of the Cost of meeting environment requirements. R&D Technical Report FD2017/TR

<sup>11</sup> Tinch, R and Ledoux, L; 2006 Economics of Managed Realignment in the UK. Final Report to Coastal Futures Project,

expertise and administrative competencies. They are thus best placed to make sure that no conflicts arise between different objectives and that any synergies are realized.

### 3.7 Strategic Overview Role

It is considered that having this clarity of objectives based on rigorous risk assessments will ensure that we have a risk based approach to flood management where resources are directed to the areas that require works. In addition, clarity of objectives and guidance which ensures that knowledge of best practise is spread around the country should also ensure more cost-effective flood management. Reviewing the strategy and seeking to ensure that it is followed will add to these benefits. The Environment Agency already undertakes much of this activity on an informal basis and a large amount of this work is about pulling together information and guidance that has already been produced as well as the guidance and the risk assessments required by the Floods Directive. Funding for these activities during the current spending review period was provided to the Environment Agency as part of the allocations following the publication of the Government response to the Pitt review.

## **4 Specific impact tests**

Impact assessments require consideration of a number of potential impacts on businesses, people and the environment. Our proposed introduction of new definitions and overview enhances existing flood risk management policy and is expected to allow for better use of resources. The impacts on the specific test criteria required are summarised below:

Competition – the introduction of an overview and new definitions will not have any significant impact on competition. Decisions on investment in flood and coastal erosion risk management infrastructure may be affected, but procurement procedures will not be constrained by these changes.

Small firms – most flood and coastal erosion risk management activities are likely to continue to be undertaken by large organisations, the Environment Agency and lead local authorities and will not have particular impacts on small firms. However, the increasing diversity of approaches likely to be adopted to manage flood and coastal erosion risk is should increase opportunities for small firms with particular expertise to become involved in these activities.

Legal aid – the policy measures do not introduce any new criminal sanctions, civil penalties or appeals so no impact is expected on Legal aid.

Sustainable development – the introduction of an overview for all forms of flooding and a duty on local authorities and IDBs to contribute to sustainable development should provide significant positive benefits as described in section 3.6.

Carbon assessment – the proposals will not have a significant impact on emissions of greenhouse gasses, but are likely to contribute to an overall reduction through increasing effectiveness of flood risk management and resulting reduction in flood damage.

Other environment – The wider range of intervention options is likely to provide benefits for the natural and wider environment as identified in section 3.4.

Health impact – no significant impacts expected, although more effective flood risk management is likely to have beneficial impacts on health and particularly stress for communities in areas at risk.

Race, disability, gender equality and human rights – no impact is anticipated from the introduction of an overview or new definition for flood and coastal erosion risk management.

Rural proofing – the wider range of intervention options provided through the adoption of a new definition are likely to facilitate greater support to rural communities as identified in section 3.4.

## 5 Conclusion

Option 1 is the minimum bare necessary change that is necessary to meet the requirements of the Flood Directive. However, it would not be sufficient to support the implementation on current Government policy as articulated through *Making space for water* and *Future Water*. This option is likely to lead to continuing calls for further legislative reform in order to facilitate more innovative approaches to flood and erosion risk management.

Option 2 is strongly preferred because it enshrines the concept of risk management in the law. It brings broader sustainability goals into the implementation of flood and coastal erosion risk management and ensures that flood management authorities are able to use their powers to achieve wider environmental objectives where necessary. It also strengthens the EA's central role creating a formal strategic and overview role which should take us one level beyond the Floods Directive in ensuring a strategic approach to flood and coastal erosion risk management across the country which, as well as ensuring wider uptake of best practise should enable better integration of delivery and reduced administrative burdens.

It is not possible to reliably quantify the benefits that would flow from this approach but in our view overall the benefits would increase while the costs would not change significantly. The rigorous approach which is in place for the cost benefit analysis of government investment in flood and erosion risk management will guard against the selection of options which have lower benefits. It is important to highlight that the types of benefits may change, for example while the overall economic value of the programme should remain the same or increase, it is possible that putting greater emphasis on the valuation of less easily valued benefits could mean that proportionally more social and environmental benefits are delivered. There is also likely to a greater spread of benefits amongst the community at risk of flooding and erosion. However, this may inevitably, at the margins, be at a cost to some people that may have benefited from continuing with conventional approaches to flood defences and coast protection.

## Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

**Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.**

<b>Type of testing undertaken</b>	<b><i>Results in Evidence Base?</i></b>	<b><i>Results annexed?</i></b>
Competition Assessment	Yes	No
Small Firms Impact Test	Yes	No
Legal Aid	Yes	No
Sustainable Development	Yes	No
Carbon Assessment	Yes	No
Other Environment	Yes	No
Health Impact Assessment	Yes	No
Race Equality	Yes	No
Disability Equality	Yes	No
Gender Equality	Yes	No
Human Rights	Yes	No
Rural Proofing	Yes	No

## Annexes

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