Title:	Impact Assessment (IA)
Commencement of Section 30 and Schedule 1 of the Flood and Water Management Act 2010 (Designation of third party flood management assets)	**IA No:** DEFRA1160
Lead department or agency: Defra	**Date:** 29/06/2011
Other departments or agencies: Environment Agency	**Stage:** Final
	Source of intervention: Domestic
	Type of measure: Secondary legislation
	Contact for enquiries:)

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary? About two thirds (62,400) of the physical assets that are relied upon for flood and coastal erosion risk management are neither owned nor operated by public risk management authorities. They are known as third party assets (or features). At present, the only legal protection from damage to assets comes from byelaws, but these extend to few - if any - third party assets. If any of these assets has been damaged or removed, or replaced with a material that cannot withstand the forces of floodwater, then people and property will be put at risk. Where assets are functioning as part of a larger system of assets that work together to protect an area, damage to one could have a serious impact on the effectiveness of the whole system, and expose a larger area to flooding, or to more extreme flooding than expected. Government intervention is necessary where the market fails to recognise the consequences of risk and rational personal decisions are taken that avoid exposing self and others to easily avoidable risk as well as where the public good is not easily subscribed to individuals. The provisions form part of a package of measures in the Flood and Water Management Act 2010 that responds positively to Sir Michael Pitt's review recommendations after the 2007 floods.

What are the policy objectives and the intended effects?
The main policy objective is to prevent uncontrolled damage or removal of flood and coastal erosion risk management assets. Underlining this, are objectives of:

- Minimising flood / coastal erosion risk
- Preventing damage or removal of assets and therefore economic damages from flooding / erosion
- Informing people of the importance of assets for risk management so that owners make rational decisions and avoid exposure to risk

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)
Option 1. Do not commence Section 30 and Schedule 1 of the Flood and Water Management Act 2010, and instead rely on risk management authorities to continue to communicate the importance of assets to third party owners. This is the reference case. Option 1 is reactive to the problem – steps can only be taken once damage has taken place.
Option 2. Commence Section 30 and Schedule 1 and necessary minimum regulation under paragraphs15 & 16 of Schedule 1 to establish an appeals process, in addition to encouraging better communication. This would allow risk management authorities to designate third party assets that are relied upon for flood and coastal erosion risk management and to take action when things go wrong. Designation is designed to prevent costs and damages from the outset, and provide the necessary information to enable owners to make rational decisions and prevent risk to themselves and others.
Option 3. As Option 2, and in addition to make extra regulations under paragraph16 to prescribe detailed provisions about appeals as well as the forms, notices, applications and procedures that would need to be followed at all times.
Option 1 represents no overall change as it continues the status quo. Option 2 is the **preferred option**, because it eliminates a share of the ongoing cost in the status quo that would continue under Option 1, and significantly reduces the annual economic damages that would otherwise accrue because of damage to assets.
Option 3 has been discounted because there is no evidence that risk management authorities and appeals bodies have failed to provide a consistent and robust standard of service that requires detailed prescriptive regulations about forms, etc and therefore a case has not been made requiring use of the power (the Act stipulates that the additional regulations *may* be made; they are not mandatory).

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 2016	
What is the basis for this review? PIR. **If applicable, set sunset clause date:**	
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes (for Environment Agency)

SELECT SIGNATORY Sign-off For final proposal stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) the benefits justify the costs.

Signed by the responsible Minister: ..... Date: .....

Summary: Analysis and Evidence

Policy Option 1

Description:

Do not commence Section 30/Schedule 1 of the Flood and Water Management Act (reference case)

Price Base Year 2011	PV Base Year 2011	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: 0	High: 0	Best Estimate: 0

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0	0	0	0
High	0		0	0
Best Estimate	0		0	0

Description and scale of key monetised costs by 'main affected groups'

This is the 'do nothing' option. There are no **new** costs or benefits arising.

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

There are no other key non-monetised costs. However, it is important to understand the ongoing costs and losses within the status quo: There are ongoing costs within the status quo including those arising from flood damage because of removal, damage or alteration of third party assets (£28.6m per annum), and the costs of intervening to remedy damage in some cases (£1.0m per annum). The £1 million intervention costs include costs to risk management authorities (£0.6m per annum) and costs to owners of compliance (£0.4m per annum). The cost to each business sector is around £0.08 million per annum, if evenly spread across each sector.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0		0	0
High	0		0	0
Best Estimate	0		0	0

Description and scale of key monetised benefits by 'main affected groups'

None

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

Under both Option 1 (the do nothing option) and 2 (do something different option), where an asset has been damaged, it is repaired, and the benefit of the asset is retained. The long term benefit from the assets is therefore not calculated since it is the same under both options. There is no question in the foreseeable future of risk management authorities ceasing to intervene to restore damaged features (under Option 1 this is through communication, enforcement where available, and exercising works powers; under Option 2 this is using designations). The question being considered is 'which form of intervention (i.e. the status quo under Option 1, or the new approach under Option 2) is most effective?' Option 2 is relative to Option 1. The benefits for Option 2 are therefore above and beyond those that could be achieved under Option 1 as the status quo.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

It is assumed that:

- There are 96,000 assets, of which 62,400 are third party assets, spread across 3,000 risk management systems.
- An asset on average offers £0.02 m of benefit a year, which is negated if the asset is damaged.
- A system offers an average of £0.62 m of benefit a year; 15% is lost if a third party asset in the system is damaged.
- Each year, 4% of third party assets are subject to a change, with 2.6% requiring intervention by a risk management authority because of damage that has been done.

Direct impact on business (Equivalent Annual) £m):			In scope of OIOO?	Measure qualifies as
Costs: 0	Benefits: 0	Net: 0	No	NA

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			Present Day (Reference Case)		
Which organisation(s) will enforce the policy?			Environment Agency		
What is the annual change in enforcement cost (£m)?			No change as it is the reference case (an estimated £0.6 million per annum)		
Does enforcement comply with Hampton principles?			Yes		
Does implementation go beyond minimum EU requirements?			N/A		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** nil	**Non-traded:** nil	
Does the proposal have an impact on competition?			No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:** n/a	**Benefits:** n/a	
Distribution of annual cost (%) by organisation size (excl. Transition) (Constant Price)	**Micro** £0	**< 20** £0	**Small** £0	**Medium** £0	**Large** £0
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[1] Statutory Equality Duties Impact Test guidance	No	32
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	32
Small firms Small Firms Impact Test guidance	No	32
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	32
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	32
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	32
Human rights Human Rights Impact Test guidance	No	32
Justice system Justice Impact Test guidance	No	32
Rural proofing Rural Proofing Impact Test guidance	No	32
Sustainable development Sustainable Development Impact Test guidance	No	32

Summary: Analysis and Evidence

Policy Option 2

Description:

Commence Section 30 and Schedule 1 of the Flood and Water Management Act (minimum regulation)

Price Base Year 2011	PV Base Year 2011	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: 19.5	**High:** 1,051.1	**Best Estimate: 393.6**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	2.9	1-3	0.34	**8.4**
High	11.7		0.67	**22.1**
Best Estimate	6.7		0.47	**14.0**

Description and scale of key monetised costs by 'main affected groups' Costs of intervening making designations and administering consents (£0.47m per annum). Costs of intervention include costs to risk management authorities (£0.29m per annum) and costs to owners of complying (£0.14m per annum). Cost of appeals to appeals body (<£0.1m per annum). Phasing evenly over first three years (i.e. one third of cost in first year, two thirds in second year, and full cost in remaining years – discounted over 25 years). This gives a PV for total average annual cost over 25 years of £7.6 million, plus £6.4 million transition costs (discounted over three years), totalling £14.0 million.

Other key non-monetised costs by 'main affected groups' Despite the long standing availability of flood maps showing areas at risk, it is possible that owners experience some anxiety due to being more informed about the risk they face. However, this should be considered alongside the fact that the risk is real and the cost of actual flooding can be significant, as well as the non-monetised benefits.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0	1.36	**27.9**
High	0		67.46	**1,073.2**
Best Estimate	0		24.83	**407.6**

Description and scale of key monetised benefits by 'main affected groups' Benefits are relative to Option 1, and are measured in terms of reduced annual damages because fewer third party assets are damaged for less time and no longer incurring the cost of continuing the status quo. Benefits accrue to owners of assets (up to ~£273m PV net benefit best estimate) and the wider public (up to ~£121m PV net benefit).

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

The impact on value of property of Option 2 is expected to be positive or neutral, since the continued operation of a flood defence will lead to greater assurance of lower economic damages in the event of flood-conditions. Due to the ability to apply for consent for a change or removal, owners will still be able to have a change in utility provided that the effect on flood risk is suitably managed.

There should be a benefit to owners due to the increased certainty that any damage to assets can be identified and acted upon, and certainty to anyone purchasing property (or continuing to reside) that risk management systems will continue to operate and that there is less risk of undetected damage.

It is possible that services such as insurance would continue to be available and relatively affordable since the underlying flood / erosion risk is likely to be known with or without an asset, and the presence of a designated feature will help provide assurances about the risk being actively managed with lower annual estimated damages.

There may be positive health / wellbeing impacts from the security of an identified and functioning asset.

There may be benefits to owners in having certainty about acceptability of decisions about their assets.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

It is assumed that:

- There are 96,000 assets, of which 62,400 are third party assets, spread across 3,000 risk management systems. About 25% would require designation to provide sufficient coverage to deliver benefits.
- An asset on average offers £0.02 m of benefit a year, which is negated if the asset is damaged. Designations minimises the number of assets damaged.
- A system offers an average of £0.62 m of benefit a year; 15% is lost if a third party asset in the system is damaged. Designations minimises damage and loss to systems.

Each year, 4% of third party assets are subject to a change, with 2.6% requiring intervention by a risk management authority because of damage that has been done. 4% would be subject to consenting process managing out the need to intervene reactively in 2.6% of cases.

Direct impact on business (Equivalent Annual) £m:				In scope of OIOO?	Measure qualifies as
Costs:	0.05	**Benefits:** 7.42	**Net:** 0	Yes	IN

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			04/2012		
Which organisation(s) will enforce the policy?			Environment Agency, Local Authorities, Internal Drainage Boards		
What is the annual change in enforcement cost (£m)?			£ - 0.3m		
Does enforcement comply with Hampton principles?			Yes		
Does implementation go beyond minimum EU requirements?			N/A		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** n/a	**Non-traded:** n/a	
Does the proposal have an impact on competition?			No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:** 0	**Benefits:** 0	
Distribution of annual cost (%) by organisation size (excl. Transition) (Constant Price)	**Micro** 0.01[1]	**< 20** 0.01[1]	**Small** 0.01[1]	**Medium** 0.01[1]	**Large** 0.01[1]
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	Impact	Page ref within IA
Statutory equality duties[2] Statutory Equality Duties Impact Test guidance	No	32
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	32
Small firms Small Firms Impact Test guidance	No	32
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	32
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	32
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	32
Human rights Human Rights Impact Test guidance	No	32
Justice system Justice Impact Test guidance	No	32
Rural proofing Rural Proofing Impact Test guidance	No	32
Sustainable development Sustainable Development Impact Test guidance	No	32

[1] Total for business is £0.03 million per annum, equating to not more than £0.01 million by each category of organisation if evenly spread.

[2] Public bodies including Whitehall departments are required to consider the impact of their policies and measures on race, disability and gender. It is intended to extend this consideration requirement under the Equality Act 2010 to cover age, sexual orientation, religion or belief and gender reassignment from April 2011 (to Great Britain only). The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Summary: Analysis and Evidence

Policy Option 3

Description:

Commence Section 30 and Schedule 1 of the Flood and Water Management Act (additional regulation)

Price Base Year 2011	PV Base Year 2011	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: 19.5	**High:** 1,052.1	**Best Estimate: 393.6**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	2.9	1-3	0.30	**8.4**
High	11.7		0.67	**22.1**
Best Estimate	6.7		0.47	**14.0**

Description and scale of key monetised costs by 'main affected groups'

As Option 2.

It is not anticipated that additional legislation would create a measurable cost to owners, risk management authorities or appeals bodies.

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

Detailed regulations on the details of forms, notices, etc are not expected to create additional cost to Option 2.

The Act already prescribes the details that must be included in forms and notices. Additional detail in regulations would likely take the form of prescribing materials such as model forms / templates and detailed processes.

No additional cost is envisaged because risk management authorities will serve exactly the same information, although there is some flexibility such as around format used. Appeals bodies are long established, and guidance and operational procedures can take the place of regulations, with the advantage of being more readily updated based on feedback. Regulations are not needed to devise model forms / templates.

The costs to central government may be lower by not regulating in such detail, and the costs to appeals bodies, risk management authorities and owners should be much the same. In the context of better regulation, it is not necessary to make regulations at this time, because no evidence exists of a failure from a risk management authority or appeals body to run the process fairly and properly.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0	1.36	**27.9**
High	0		67.46	**1,073.2**
Best Estimate	0		24.83	**407.6**

Description and scale of key monetised benefits by 'main affected groups'

As Option 2.

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

None.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

As Option 2.

Direct impact on business (Equivalent Annual) £m):			In scope of OIOO?	Measure qualifies as
Costs: 0.05	**Benefits:** 7.42	**Net:** 0	Yes	IN

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			04/2012		
Which organisation(s) will enforce the policy?			Environment Agency, Local Authorities, Internal Drainage Boards		
What is the annual change in enforcement cost (£m)?			£ - 0.3m		
Does enforcement comply with Hampton principles?			Yes		
Does implementation go beyond minimum EU requirements?			N/A		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** n/a	**Non-traded:** n/a	
Does the proposal have an impact on competition?			No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:** 0	**Benefits:** 0	
Distribution of annual cost (%) by organisation size (excl. Transition) (Constant Price)	**Micro** 0.01[1]	**< 20** 0.01[1]	**Small** 0.01[1]	**Medium** 0.01[1]	**Large** 0.01[1]
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[2] Statutory Equality Duties Impact Test guidance	No	32
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	32
Small firms Small Firms Impact Test guidance	No	32
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	32
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	32
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	32
Human rights Human Rights Impact Test guidance	No	32
Justice system Justice Impact Test guidance	No	32
Rural proofing Rural Proofing Impact Test guidance	No	32
Sustainable development Sustainable Development Impact Test guidance	No	32

[1] Total for business is £0.03 million per annum, equating to not more than £0.01 million by each category of organisation if evenly spread.

[2] Public bodies including Whitehall departments are required to consider the impact of their policies and measures on race, disability and gender. It is intended to extend this consideration requirement under the Equality Act 2010 to cover age, sexual orientation, religion or belief and gender reassignment from April 2011 (to Great Britain only). The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessments of earlier stages (e.g. Consultation, Final, Enactment) and those of the matching IN or OUTs measures.

No.	Legislation or publication
1	http://www.defra.gov.uk/environment/flooding/legislation/publications-documents/
2	
3	
4	

Evidence Base

Ensure that the information in this section provides clear evidence of the information provided in the summary pages of this form (recommended maximum of 30 pages). Complete the **Annual profile of monetised costs and benefits** (transition and recurring) below over the life of the preferred policy (use the spreadsheet attached if the period is longer than 10 years).

The spreadsheet also contains an emission changes table that you will need to fill in if your measure has an impact on greenhouse gas emissions.

Annual profile of monetised costs and benefits* - (£m) constant prices

	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9
Transition costs	2.2	2.2	2.2	0	0	0	0	0	0	0
Annual recurring cost	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total annual costs	2.4	2.5	2.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Transition benefits	0	0	0	0	0	0	0	0	0	0
Annual recurring benefits[1]	8.1	16.3	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8
Total annual benefits	8.1	16.3	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8

* For non-monetised benefits please see summary pages and main evidence base section

Microsoft Office Excel Worksheet

[1] Comprises £23.4m reduction in losses, and £1m of costs under Option1 not incurred under Option 2

Evidence Base (for summary sheets)

Abstract

1. There are about 96,000 features providing flood or coastal erosion risk management and on which risk management authorities, and public and businesses in the floodplain, rely.

2. One third of these (around 33,600) are owned and operated by the Environment Agency, very often built by the Agency. Byelaws are in place that collectively cover the whole of England and Wales and prohibit interference, damage or removal of the features by third parties to most if not all of these features.

3. About two thirds of the features (62,400) are neither owned or operated by the Environment Agency, and are known as third party assets. Not all of them may have been constructed as a flood defence (for example, artificial things like boundary walls or natural things like embankments may be relied upon because of the consequential or natural risk management properties). The existing byelaws do not extend to these and that means that there is virtually nothing in law to protect the features from damage or removal despite their importance in managing flood and coastal risk.

4. The policy intervention is regulatory, and aims to extend the existing standards of protection for features that exist in byelaws for features owned and/or managed by the Environment Agency to third party assets, and to allow local authorities and internal drainage boards to extend the standard of protection for features to features that affect local flood risk.

5. The lead option is to make regulations under section 30 and Schedule 1 of the Flood and Water Management Act 2010 to allow designation of features, which makes it a requirement to seek consent from the appropriate risk management authority before altering, replacing or removing a designated feature (i.e. one that is relied upon for flood defence but is not owned and operated by a risk management authority), to establish an appeals process and encourage better communication.

6. The alternative is not to introduce new regulations, and instead to rely on risk management authorities continuing their existing practice to communicate the importance of assets to third party owners and step in to rebuild assets under permissive powers, where this is felt necessary for the wider good.

7. It is estimated that the lead option for commencement of the Flood and Water Management Act provisions relating to third-party assets could realise a present value net benefit of nearly £400 million (over 25 years, using the standard discount rate). Benefits accrue to householders, businesses and the public sector.

Introduction to the problem

8. The Flood and Water Management Act 2010 introduces a clear leadership role over local flood risk for Lead Local Flood Authorities set in the context of local and national strategies. Part of the rationale behind the Act is accepting the human cause and mitigation of flooding –including for the first time all forms of flooding including surface water flooding- which can be linked to development as much as natural processes.

9. Schedule 1 of the Act is specifically about addressing an issue about the status of many of the flood and coastal defences and flood risk management systems that are in existence, and that may be vulnerable to unnecessary damage.

10. Flood and coastal defences and risk management systems are made up of individual “assets”. These assets can include a wide range of things from boundary walls, culverts and embankments, to ditches and Sustainable Drainage Systems (or “SuDS”). Assets are most effective when they work alongside others as part of risk management systems.

11. The terms 'asset' and 'feature' are used interchangeably in this document. Third party assets / features refer to things that satisfy the definition at Paragraph 4 of Schedule 1 of the Flood and Water Management Act 2010: structures or natural or man-made features of the environment that through their existence or location affect flood risk or coastal erosion risk but that are not owned by risk management authorities.

12. The Environment Agency estimates there are about 3,000 systems in England and Wales made up of about 96,000 individual assets (also known as “features”, to recognise the many forms that they can take). Each asset is relied upon to provide a risk management function. For example, a boundary wall or an embankment may be relied upon to physically hold back flood water if a river bursts, or a ditch may be relied upon to direct flood water that flows in a period of heavy rain away from property that would otherwise suffer physical damage as a result of being inundated by surface water. SuDS may be relied upon to prevent the overloading of the storm drain system at a time of heavy rain.

13. If any of these assets has been damaged or removed, or replaced with a material or structure that cannot withstand the forces of floodwater, then people and property will be put at risk. It is conceivable that people would expect the defences to have functioned properly, and therefore in the event of a flood might have taken less action to remove their person and belongings from the path of floodwaters. Where assets are functioning as part of a larger system of assets, then damage to one could have a serious impact on the effectiveness of the whole system, and expose a larger area to flooding, or to more extreme flooding than expected.

14. One third of the features (around 33,600[7]) are owned and operated by the Environment Agency, very often built by the Agency. Byelaws are in place that collectively cover the whole of England and Wales and prohibit interference, damage or removal of the features by third parties to most if not all of these features.

15. The problem is that some 65%[8] of the assets relied upon for flood and coastal risk management are not owned or maintained by risk management authorities. The existing byelaws do not extend to these features, despite the fact that they are relied upon for flood and coastal erosion risk management. Whilst risk management authorities can intervene where damage has been done to something that is relied upon for risk management (albeit at a cost) there are few preventative measures that risk management authorities can undertake from their existing suite of powers. This means that at any one time, up to 62,400[9] assets are at potential risk of damage or removal, and each time one is damaged, there will be a delay and cost before a repair or other remedial action can be completed.

16. Damage or removal of an asset could be wilful or negligent, or could be carried out without full knowledge of the consequences. For example, a boundary wall could act as a flood barrier but the owner might want a change in utility such that a chain link fence is put in its place (perhaps because it offers a greater sense of security since as far as the owner is concerned the asset’s primary function including at the time of construction is/was to act as a wall and not a flood barrier). There is nothing to formally compel the person responsible for the wall to consider the consequences for flood risk, at least not until after the event and by which stage almost certainly incurring cost. Whilst risk management authorities are able to provide advice and information without the need for legislation, it is not prudent to allow someone to ignore that advice if it is to the detriment of others.

17. Risk management authorities are able to detect damage to third party assets during routine activity such as inspections or maintenance / repair of other features. The Environment Agency estimates that is takes between three and six months to identify

[7] Source: Environment Agency, National Flood and Coastal Defence Database

[8] Source: Environment Agency, National Flood and Coastal Defence Database

[9] Source: National Flood and Defence Database

damaged features. During that time the feature will not have been offering the standard of defence or risk management that would be expected.

18. Once the Environment Agency identifies a damaged asset / feature, under current arrangements it can pursue a number of options. It can choose to do nothing and accept that the asset and system will be less effective, although this would mean re-exposing people to some or all of the risk they would have expected to be mitigated. It can try to compel the owner to make a repair. Risk management authorities have evidence of achieving this, although it incurs costs and adds to the length of time that defences are less- or ineffective. In practice this may be difficult if the owner doesn't want to effect a repair, is not in a position to undertake the necessary works (perhaps because of competence or cost), does not accept that they should have any responsibility for protecting themselves and others in their area from risk, or fails to recognise the use of the asset as a risk management asset (bearing in mind that the asset may have been built for another purpose or the feature may be a natural one). The risk management authority can carry out its own repair or replacement; it can do this under existing permissive powers, although this would come at a cost, potentially diverting resources away from planned risk management activity in other locations. At present, risk management authorities do not have the ability to prevent individuals from removing or otherwise damaging assets in the first place, and have limited powers to recover costs of remedial action where negligent or wilful damage is in evidence.

19. On average, the length of time that it takes to repair / remedy a damaged third party asset from the time the damage has been detected is estimated at nearly four and a half months[10]. It generally takes less time if straightforward communication is enough to compel remedial action on the owner's part, but it can take longer – up to a year or more - if a prosecution or works need to be taken forward by the Environment Agency.

20. That means that –on average- more than seven months passes between damage being done to a third party asset and repair or remedial action taking place. During that time the expected standards of protection will have been adversely affected and cost will need to be borne by the risk management authority as well as the owner in putting things right.

21. Whilst a feature will have an effect on flood risk in its own right, many features operate as part of larger systems where a series of assets combine to create a larger defence. If any of the constituent assets is damaged it could increase the potential consequences of a flood event for anyone dependent upon that system.

22. It is possible that over a long period of time (likely to be decades) the number of assets owned by third parties could decrease. The Environment Agency –by far the largest investor in risk management- has a policy of in future only incorporating third party assets as a last resort. In future, where third party assets are incorporated in a risk management system, the Agency intends to put in place suitable maintenance agreements. Even where an agreement is in place, the policy proposal could operate in parallel, especially as it has value in deterring inappropriate treatment of risk management assets.

23. Where assets are currently controlled by third parties and will be for the foreseeable future, the Environment Agency is pursuing non-legislative means of encouraging better maintenance. However, risk management authorities are not able to prevent damage or removal outright under existing powers.

Rationale for Government intervention to overcome the problem

24. Ideally the market would recognise the consequences of risk, and actors would make rational decisions about exposing self and property to risk, and undertake action to

[10] Source: Based on internal management information from the Environment Agency. Detail is set out at Annex 3, Table 1.3.

mitigate against risk so that even if the likelihood of being exposed to flooding or coastal erosion is high, steps are taken to mitigate against the consequences (where benefits exceed costs).

25. The reality is that market failure has resulted in people being exposed to the consequences of flooding and coastal erosion and not enough being done to mitigate against the risk.

26. This market failure is often because flood management is a “public good” within floodplain areas. The benefit of flood management systems cannot easily be subscribed to specific individuals, and is ultimately collective. This situation creates weak incentives for action, unless effective collective responsibility can be engendered – which is why we have Risk Management Authorities as public bodies.

27. Despite the existence of Risk Management Authorities, third party assets are currently not adequately part of this collective system, and the lack of representation to asset owners on behalf of beneficiaries means owners are not always aware of wider benefit, and nor do they have incentives to maintain benefit, to the extent it accrues to others (i.e. there are also “externalities”).

28. Government intervention is necessary to ensure that when people make decisions about their assets, they are informed decisions, and will not place other people at risk. Information failures are recognised as an issue in flood and coastal erosion risk management. In the context of third party assets, information tends to be provided reactively, i.e. after damage has already taken place and costs are ramping up, rather than before the event. One of the clear advantages to designation is the first step being to inform owners.

Policy objectives for intervention

29. The main policy objective is to prevent uncontrolled damage or removal of flood and coastal erosion risk management assets.

30. Underlining this, are objectives of:
    - Minimising flood / coastal erosion risk
    - Preventing damage or removal of assets
    - Informing people of the importance of assets for risk management

31. To achieve the objectives, Schedule 1 of the Flood and Water Management Act 2010 includes additional permissive powers to risk management authorities and introduces a system of designating assets.

The legislation

32. Risk management authorities include the Environment Agency, local authorities and internal drainage boards. They have permissive powers to manage flood and coastal erosion risk under the Flood and Water Management Act 2010 and earlier legislation (some of which has been amended by the Act), and are guided by the national strategy and local strategies (also under the Act).

33. A feature is defined in the Act as, "a structure, or a natural or man-made feature of the environment". The definition is intentionally broad because of the wide variety of features that can affect flood risk.

34. The Act provides for the “designation” of third-party assets and sets out conditions that must be satisfied in order for a feature to be designated. The conditions are important

because they directly correspond to the policy objectives. It is immaterial what the feature is; the relevant consideration is its affect on flood and or coastal erosion risk.

35. The conditions are that:
    - The authority thinks the existence or location of the structure or feature affects a flood risk or a coastal erosion risk; and
    - The designating authority has flood or coastal erosion risk management risk functions in respect of the risk which is affected; and
    - The structure or feature is not designated by another authority (for the purposes of Schedule 1); and
    - The owner of the structure or feature is not a designating authority.

36. The "owner" is the owner of the land on or in which the structure or feature is situated, or if different, the person responsible for managing or controlling the structure or feature.

37. A designation is a legally binding notice served by the authority to the owner of the feature. A designation is a local land charge. This means that the conditions in the notice will apply even if the land is sold on. A designated feature is therefore a feature which is the subject of a designation notice. The designation requires the owner to obtain consent before altering, removing or replacing the feature.

38. The owner is within his or her rights to ask for consent to alter, remove or replace a designated feature. The authority should not refuse consent without good reason (in risk management terms).

39. Under the legislation, a risk management authority could:
    - Consider making a designation, in which case it must serve the owner a provisional designation notice
    - Make a provisional designation permanent, by issuing a designation notice
    - Consider an application from the owner to alter, replace or remove a designated feature, or to cancel a designation

40. An owner could:
    - Make representations in respect of a provisional designation notice
    - Appeal against a designation.
    - Apply for consent to alter, remove or replace a feature that has been designated
    - Appeal against the regulators decision on an application to alter, remove or replace a designation. This includes any conditions that may have been included in the granting of consent or against a refusal of consent.

41. This impact assessment is about the commencement of Schedule 1 of the Flood and Water Management Act 2010 and the regulations – that under Schedule 1 must be laid alongside the commencement - that set out an individual's right to an appeal.

42. The primary legislation is designed to prevent inappropriate alteration, removal or replacement of features that would otherwise reduce or negate the flood risk management properties of the features. The legislation is not designed to require or impose maintenance requirements on third parties.

43. Risk management authorities (i.e. the Environment Agency, primarily) in some circumstances will carry out maintenance – normally where a feature is part of a larger system of defences otherwise owned and maintained by it. Where this is the case, existing agreements and byelaws should negate the need to designate the features concerned. In other situations, where the risk management authority does not own or maintain the features and the byelaws don't apply, the Environment Agency intends to

introduce designations to prevent inappropriate damage (in terms of effectiveness of risk management).

44. The legislative powers are permissive and as such risk management authorities will not be required to make a designation where it is not justified. Risk management authorities are expected to follow a risk-based approach, and use the powers in the best public interest.

45. Fail safes are provided in the Act, both in terms of the "conditions" explained above (contained at paragraph 4 of Schedule 1) and the right of appeal. Although the powers are permissive, where there is no effect on risk, then a designation cannot be made at all.

46. More information on the primary legislation is included at **Annex 2**.

47. The intention would be that risk management authorities only intervene in the management of an asset where there is a clear need, in risk management terms, and where it is in line with the five principles of good regulation. The intervention should only be to safeguard against wilful interference with an asset or ill informed decision making by individuals that otherwise could place people and property at risk.

48. The Act is intentionally silent about the routine maintenance of structures and features. The problem under consideration is the vulnerability to damage or removal of things that are relied on for flood and coastal erosion risk management. The policy intervention does not intend, nor does it allow, risk management authorities to interfere in the routine maintenance of third parties' property. In some cases risk management authorities – particularly the Environment Agency - will already undertake routine maintenance of features despite ownership by third parties. In many cases, risk management authorities will neither own nor maintain a feature. Costs of maintenance are not included in the impact assessment because the policy intervention is not designed to have a direct impact. It would however reduce the estimated £0.21 million annual costs of undertaking works where damage is severe and all other options have been unsuccessful.

49. Under the legislation, a risk management authority will be able to designate something it does not own or maintain but that is relied upon for risk management. However, in practice, it is anticipated that where maintenance is already undertaken by a risk management authority, then it is less likely that a designation is necessary because owners will have recognised, understood and agreed with the importance of the structure or feature in terms of risk management, the feature is clearly being looked after, and existing byelaws are in force.

50. In other words, there will be cases where the risk management authority may not need to do anything different or additional to existing good practice. Where the risk management authority plays a less active role, and especially where it does not carry out or intend to carry out maintenance itself (not least of all because of finite resources requiring maintenance to be targeted where it is needed the most), then a designation might be prudent and necessary, particularly where the likelihood of flooding is greatest and particularly where the consequences of damage to the risk management properties of a feature are the greatest.

51. Under the Flood and Water Management Act 2010, Schedule 1, individuals – i.e. the owners of third party assets – would have a comprehensive right of appeal in respect of relevant decisions made by designating authorities.

52. In summary, the intervention will principally take the form of:
    - Communication / Provision of Information / Liaison with owners[11];
    - Serving of Notices[12]; and

[11] Not a formal requirement of the Flood and Water Management Act 2010, but expected as routine good practice

- Local Land Charges[13].

Acceptability of intervention

53. Undertaken in 2010 by Icaro Consulting, Ipsos Mori and Waterwise on behalf of Defra, a piece of research on householders' attitudes towards water retrofit measures included discussion of policy on designation of features[14].

54. A sample of homeowners were asked to indicate whether they found a series of policy options, including designation, acceptable or unacceptable, and whether they considered the policy interventions would be effective or ineffective. Participants were provided information about the policy in advance but, to avoid leading participants, were not told which interventions were already Government policies.

55. The researchers found that householders considered the designation of features in principle to be effective and potentially acceptable as an intervention. Acceptability was found to be conditional on the way in which the policy is administered. This is paramount to inspiring the intended behaviour change, and the ability to take as light touch an approach as possible.

56. Homeowners generally accepted that designating something that is new or is in place and designated at the time of purchase is acceptable. This is something that the householder would need to be informed about at the time of purchase and in the light of which will be able to inform purchasing decisions.

57. Householders indicated that less acceptable is the notion of applying a designation to a longstanding structure that has not been identified as a flood defence. Householders would be more likely to question the intent and motives of risk management authorities that designated things that had no connection to flood risk management, and to challenge the loss of freedom over their property.

58. Whilst it cannot be assumed that the findings are universally applicable as the work is based on a relatively small sample size and participants did not have the benefit of being fully informed about the final policy, the research has provided an invaluable insight into public opinion on designating assets from one of the main stakeholders: the homeowner.

59. It is apparent that designating assets is acceptable provided good communications are maintained. Individuals will expect designations only to apply where there is established flood / coastal erosion risk. It reinforces the importance of the right of appeal and the expectation that risk management authorities have entered into dialogue with owners ahead of initiating a designation, and the importance of provisional designations preceding permanent designation, which will allow the owner every opportunity to make representations to the risk management authority.

60. The research suggests that once a designation is in place, provided communication about the designation accompanies the actual designation, then the purchaser of property is likely to accept and appreciate the importance of the asset and its role in managing risk.

61. One of the research findings - not solely applicable to designations - was that householders expect the right to make personal choices. It was considered acceptable that choices do not include anything that will harm the environment or others. In that spirit, it is anticipated that acceptability of the policy will be enhanced by allowing owners to decide to alter, replace or remove a designated feature, but to set through designation the

[12] Under paragraphs 6, 7 8, 9 ,10, 11 12, 13 of Schedule 1 of the Flood and Water Management Act 2010

[13] Under paragraph 5 of Schedule 1 of the Flood and Water Management Act 2010

[14] "Water Retrofitting Policies Outlook" (FD2649)

framework that ensures that consent is only given where it will not increase risk to self or others. In this context, it appears that regulation will be broadly welcome, provided that it is justified in risk management terms, maintains as much personal choice as possible, and does not lead to excessive "policing" of people in their homes.

Options for implementation

62. A system of designations cannot operate without commencing s.30 and Schedule 1 because a designation as a local land charge and enforcement action would not be possible without corresponding legal powers.

63. The Act (paragraph 15 of Schedule 1) requires the Minister to make regulations providing a right of appeal against designation notices, decisions on applications for a change to a designated feature including refusal to cancel a designation, and enforcement notices. *Schedule 1 cannot, therefore, be implemented without regulations that set out appeals.*

64. Paragraph 16 enables the Minister to make regulations on notices and applications. This is optional, and the implementation of Schedule 1 does not depend on such regulations.

65. Three options for implementation exist therefore:

- **Option 1.** *Do not commence Section 30 and Schedule 1, but continue to rely on risk management authorities to better communicate the importance of assets to third party owners. This is the reference case which would apply without new regulations.*
- **Option 2.** *Commence Section 30 and Schedule 1 and the necessary minimum regulation under paragraphs15 and 16 of Schedule 1 to establish an appeals process, in addition to encouraging better communication.*
- **Option 3.** *As Option 2, and in addition to make additional regulations under paragraph 16 to prescribe detailed provisions about appeals as well as the forms, notices, applications and procedures that would need to be followed at all times.*
- *It is not an option to commence Section 30 and Schedule 1 without making regulations under paragraph15 of Schedule 1 (and the minimum of regulation relating to an appeal process for Notices under paragraph 16), because by virtue of commencing Schedule 1, the Minister will be obliged to make such regulations under paragraphs 15/16.*
- *The Environment Agency does not plan to end existing byelaws that provide a course of action if damage is done to assets built and maintained by the Agency. The byelaws do not extend to the majority of third party assets. The original powers to make the byelaws have been repealed which is why new powers are introduced by the Act. Furthermore, the use of notices and local land charges should better inform people about the importance of individual third party assets and make it clear upfront to each owner the potential legal consequences of contravening a designation.*

66. **Option 1** is not thought to be an effective approach because it would be highly unlikely to deliver the policy objectives. Damage to third party assets will normally be resolved, but the approach is reactive (i.e. action can only be taken after the damage has been inflicted and economic damages from flooding are at risk of accruing to the asset and the parent system) and is therefore expected to be less cost effective than Option 2 or 3.

67. **Option 2** enables Schedule 1 of the Flood and Water Management Act 2010 to commence, setting out an individual's clear right to appeal relevant decisions made by risk management authorities. It exercises restraint in not regulating on every possible aspect of a risk management authority's and appeals body's operation under Schedule 1, instead relying on guidance and expert opinion and experience. It also keeps adequate flexibility

to modify detailed approaches if necessary without detracting from the comprehensive right to an appeal. Option 2 is designed to recognise the underlying problem and to allow risk management authorities to prevent damage from occurring to individual assets and therefore annual economic damages too. The alternative, under the status quo and Opton 1 is to react to problems once they arise.

68. **Option 3** is the same as Option 2, with the addition of detailed prescriptive legislation made under paragraph 16 of Schedule 1 (going beyond the minimum necessary to provide for an appeals process for Notices which this paragraph also enables). Although provided for in primary legislation, it is currently considered unnecessary when guidance and templates can be used in place of extensive regulation about the detail of notices and forms. It is also overly prescriptive and rigid for current conditions, removing flexibility around detailed arrangements – but remains an option for the future. Appeals bodies are well established and used to handing environmental appeals, subject to appropriate guidance. A lack of flexibility could ultimately reduce the choice and fairness available to individuals that want to exercise their right to an appeal.

69. No evidence has come to light to suggest that full prescription in regulations is necessary (there is no evidence to suggest that risk management authorities and established appeals bodies cannot run a fair and proper designations system that includes sufficient transparency and consistency of approach); if it did become necessary at a later date, then the option remains open to Government to add to or amend the regulations. Measures in the Act will also moderate behaviour of risk management authorities, such as through national and local strategies.

70. It is conceivable that costs could increase with a greater regulatory burden entailed by Option 3, because more legal advice may be sought by third parties in understanding how the law affects them, and in interpreting legal provisions.

71. Perhaps the key difference is that through close working with risk management authorities and a lead appeals body, the same forms, templates and procedures can be established without recourse to secondary legislation, with the added benefit of increased flexibility and speed of adjustment to feedback. The products involved (such as forms and templates) and end-user experience should be very similar or the same as under Option 2.

72. **Option 3 is discounted as being unnecessary in the current climate to achieve the policy objectives.** Options 1 and 2 are taken forward to be considered in benefit cost analysis (see below) *whilst further work on Option 3 has not been presented as it does not represent "better regulation" and the economic impact is expected to be much the same as Option 2*.

73. Under Option 1 and Option 2 an owner could seek a change in utility for the third party asset. Under Option 1, the owner may – or may not – have liaised with the risk management authority, and would make a change. Under Option 1, if that change - or other damage that has been inflicted – has a detrimental effect on the risk management properties of the asset, then the risk management authority can seek repair or restoration on a voluntary basis, or in limited circumstances might be able to take a prosecution under the limited existing byelaws. Alternatively the risk management authority would step in and build a replacement, quite possibly on the same person's land; that said, this is a relatively rare step, but one that occurs about seven times a year, at an estimated cost of £200,000[15] with a gap in protection for up to three years, which adds further cost in terms of expected annual economic damages from flooding. Either way, the impact on the value of property and access to services such as insurance is expected to be negative, at least in the short term. Under Option 2, a change can be sought through the consenting

[15] Estimate based on the best available Environment Agency management information on types of intervention

process. The risk management authority can only refuse a change based on flood or coastal erosion risk, and would be expected to work with the owner to find a mutually suitable solution. Overall therefore the impact on value of property is expected to be neutral at worst, since the continued operation of a flood defence will lead to greater assurance of lower economic damages in the event of flood-conditions and help sustain property values and potentially help with access and affordability of insurance, despite the presence of risk in the locality. Due to the ability to apply for consent for a change or removal, owners will still be able to have a change in utility provided that the effect on flood risk is suitably managed.

Background to appeals regulations

74. The Minister is obliged under Schedule 1 to provide by regulations the right to an appeal. It is an important right to provide a safeguard for individuals.

75. Pre-legislative scrutiny of the Flood and Water Management Bill set out the importance Parliament places on transparent appeals mechanisms and a preference for a clear approach through primary legislation. Parliament accepted that further detail about appeals could be set out in regulations during the passage of the Act.

76. The appeals regulations will make it clear that risk management authorities will be accountable for their decisions, and will be open to legitimate challenge from individuals about their actions. In making regulations, Defra intends to be proportionate and targeted, by covering the key principles and rules to the appeals process, without being overly prescriptive and taking choice away from appellants.

Benefit cost analysis

Option 1 (Reference case – no new regulation; do nothing different)

77. Option 1 is the “do nothing different” option. It entails a continuation of the status quo. As such, **there are no new costs or benefits** that need to be measured in this impact assessment.

78. However, it is important to understand what is actually happening *within* the present-day policy intervention (which is referred to as the “status quo”) in order to calculate the relative benefit of a new policy intervention under Option 2.

79. At present, about 65% of features are owned by third parties. Whilst a risk management authority may take action to reinstate a damaged feature, there are few powers to prevent the damage in the first place. Damage to any of these assets can affect the operation of risk management systems. Every time a feature is damaged, the expected benefit from the asset will be lost for the length of time that damage is sustained.

80. If the feature is part of a larger system, then a portion of the overall benefit of the parent system will also be lost; this is likely to amount to more than the damage to the asset if considered in isolation, although it may not represent complete inoperability of the whole system.

81. Risk management authorities will face a cost where compelled to arrange for - or carry out - a repair or replacement of the damaged feature. Owners will also incur costs where they undertake their own repairs.

82. The underlying ongoing cost faced by risk management authorities and owners under the status quo are set out in detail in the tables at **Annex 3** and summarised below. This reference case estimates for the current system the losses (of benefit that should have been provided by the damaged features) and the costs (to risk management authorities of

arranging for or undertaking remedial works and to owners for complying with requests or enforcement). Table 1 summarises the value of third party assets. There are 62,400 third party assets that on average each provide £ 0.02 million of annual benefit.

Table 1 – Headline figures from the status quo

Estimate	Description	Further Information	Source
£1,869 m	Total annual benefit of all risk management systems.	Based on the avoidance of economic annual damages from flooding and coastal erosion	Environment Agency's National Assessment of Flood Needs and Costs, and National Assessment of Flood Risk adjusted to 2010 prices
62,400	Total number of third party assets / features.	These are natural or manmade assets, features or structures that affect flood or coastal erosion risk (and which may form part of larger systems of assets that work together to provide risk management to a larger area). In total, there are 96,000 assets / features of which 62,400 are third party assets / features. There are about 3,000 systems in existence, which comprise individual assets working together	Environment Agency's National Flood and Defence Database
£0.02 m	Annual benefit of a third party asset / feature (on average).	Based on equal distribution of benefit across all assets and of third-party assets across systems, each third party asset provides an average of £0.02 million in equivalent avoided economic damages each year. [This is equivalent to £623,000 per system, comprising 20 Third Party Assets per system]. This is how much benefit is lost for each asset that is damaged for a period of one year[16].	Data above

83. Table 2 summarises the scale of the problem experienced each year because of damage – be it accidental or deliberate – to third party assets. More than 1,600 third party assets are subject to change each year with nearly 500 cases that require action on the part of risk management authorities (up to now, that has been the Environment Agency) to mitigate against a loss of risk management. On average, it takes 7.4 months between the damage taking place and completion of repair / remediation.

Table 2 – Scale of problem under the status quo

Estimate	Description of Estimate	Further Information
2,496 (4%)	Third party assets altered each year, on average.	About 4% of third party assets are altered each year. Not all alterations are damaging, but some are. [62,400 * 4% = 2,496]
499 (0.8%)	Third party assets where an alteration / damage requires remediation / repair.	About 20% of the third party features that have been altered require remediation / repair for flood or coastal erosion risk management purposes. That means that in 80% of cases, the alteration has not negated the features' risk management properties, or only a minor repair or remedial action was required and arranged at negligible expense. However, in the remaining 20% of cases it has, and intervention becomes necessary. That means that of all third party assets, about 0.8% (or 499) require intervention in order to sustain the existing levels of flood or coastal erosion risk management[17]. [Step 1: 62,400 * 4% = 2,496]

[16] This may represent a conservative estimate if taken in isolation because the loss of an asset in a system might negate the effectiveness of the whole system. However, although assets / features work together in systems, the loss of an asset may not negate all benefit to the system, nor is it necessarily true that damage to individual features will be uniformly distributed across all systems. In order to test the policy, it is assumed that only 15% of the benefit of systems is negated. It is assumed that damage to features is spread evenly across all systems; in reality the damage could be concentrated on fewer systems. **Table 4** includes the assumption that 15% of the total benefit of the system in which the asset rests is lost if the asset is lost.

[17] That is to say: Of the 96,000 risk management features, 62,400 are third party assets. Of those third party assets, around 4% are altered each year. 20% of the 4% amended require remediation / repair to sustain the existing standard of protection / risk management.

		[Step 2: 2,496 * 20% = 499] [*or* 62,400 * 0.8% = 499]
7.4 months	Average time it takes to repair asset / feature	This is an average (see table 3). Most cases can be resolved through communication with the owner, but in some cases formal notices, prosecution or use of works powers may be necessary, each of which will take longer

Source: Environment Agency estimates based on management information

84. Environment Agency experience is that discussion with the owner and basic advice is sufficient to encourage a repair in the majority of cases. It would typically take three months to discover that a repair is needed, and a further three months before the repair is made. However, it can take longer, with a prosecution or exercise of works powers taking a year or longer, as summarised in Table 3.

Table 3 - Time of interventions

Type of Intervention	**Time taken (months)**	**% of cases that require this intervention**
Communication	3	100
Formal letter	4	12
Notice	6	3
Prosecution	9	<1
Works	12	<0.5
Average (weighted by cases)	4.4 (7.4[18])	n/a

Source: Environment Agency estimates based on management information

85. Table 4 sets out an estimate of aggregate loss of benefit whilst damage from deficient third party assets is sustained. On an annual basis, it is estimated that an average of £6.2 million of benefit that the damaged third party assets should have provided is lost because of the damage sustained during the average 7.4 month period before a repair takes place. An additional £22.4 million of benefit is lost to the systems in which features are part (that is based on the assumption that 15% of the benefit of the system is no longer being realised). This gives a total loss of £28.6 million for each year if nothing changes.

Table 4 – Loss of benefit under the status quo

Estimate	**Description of Estimate**	**Further Information**
£6.2 million	Loss of benefit as a result of damage to third party assets	Each feature should provide £0.02m in benefit each year. If 499 are damaged and are out of action for 7.4 months, then annual loss of benefit is £6.2m (£0.02m x 499 features x (7.4/12) years = £6.2m)
£22.4 million	Additional loss of benefit to risk management systems.	Risk management systems will be less effective if third party assets within those systems are not operating as expected. It is assumed that 15% of the benefit of systems is lost for each feature. On average, a system provides £0.62m of benefit a year. (15% of £0.62m = £0.093m) (£0.093m x 499 features = £46.6m) (£46.4m x 7.4 months = £28.6m) (£28.6m - £6.2m = £22.4m)
£28.6 million	Total loss of benefit	The total includes both numbers above i.e. individual assets and 15% of the overall benefit expected from parent systems

Source: Environment Agency estimates based on management information

86. Under the status quo, risk management authorities face a cost for arranging for damage to be mitigated as outlined in tables 4A and 5. This is £397 per feature on average, with an annual total cost of £0.6 million. It is assumed that owners also face a cost for complying with requests and enforcement, totalling £0.4 million a year (see table 5).

[18] Including three months to detect the problem

Table 4A - Cost of different interventions under the status quo

Type of intervention	Cost (in £)	% of cases that require this type of intervention
Communication	135	100
Formal letter	280	12
Notice	1,500	3
Prosecution	5,500	<1
Works	30,000[l]	<0.5
Average (weighted by cases)	397	n/a

[l] The Environment Agency expects works to cost between £30,000 and £50,000 due to the need to replace third party assets with dedicated flood risk management features. The cost is incurred in a minority of cases, estimated at less than half a percent.
Source: Environment Agency estimates based on management information

Table 5 – Cost of arranging for damage to be mitigated under the status quo

Estimate	Description of Estimate	Further Information
£397	Cost to risk management authority for each intervention, on average	The Environment Agency contacts each owner that has made an alteration to their feature. Internal management information from the Environment Agency indicates that there are more than 1,600 cases thought to involve third party assets each year that require some form of intervention from communication to formal letters. In 499 cases a greater level of intervention is required to put right damage that has been done to something that is relied on for risk management. See also table 4.
£1.0 million	Annual cost of interventions	Costs to the Environment Agency run to around £0.6 million a year (£397 x 1,600). In addition, an estimated £0.4 million costs are incurred by owners responding to intervention. Actual costs to owners are not known, but it is estimated that costs are broadly similar to those incurred by the Environment Agency except for works costs, which are only 10% (this is a conservative estimate)[19]. More data is included in Tables 1.1 and 1.3 in Annex 3.

Source: Environment Agency estimates based on management information

87. Combining the totals from table 4 (loss) and table 5 (cost) shows that £29.6 million a year of cost continues to be faced by risk management authorities and owners. Option 1 is the "do nothing different" option, which means **there are no new costs arising from retaining the present day intervention under Option 1**.

Option 2 (Commencement with minimum regulation)

88. In this section, the *headline* costs, benefits and calculations are set out. A more detailed breakdown of figures and assumptions is included at **Annex 4** which includes supplementary narrative.

89. Option 2 is compared with Option 1 (the reference case; "do nothing") for the purposes of the benefit-cost analysis.

One-Off Costs

90. The process of designating features will present 'one off' costs to risk management authorities (the Environment Agency, local authorities and Internal Drainage Boards), owners of features and the appeals body (which will be funded by central government). Thereafter annual costs will be associated with applications to alter, remove or replace features. It is anticipated that the majority of designations will be made in the first three years. It is possible it would take place over a longer timeframe.

[19] This is because costs of replacement or repair should be lower for owners than for a risk management authority because owners will repair or replace like-for-like whereas the Environment Agency may need to put a new/bespoke flood defence in place.

91. The designation of features will present costs to risk management authorities for making designations and handling enquiries. There will be a cost to owners for making enquiries, representations and appeals. There will be a cost to the appeals body for handling appeals. No fees, charges, payments or similar penalties will be imposed on owners. A designation does not in itself impose a maintenance regime, although it could require restoration of a damaged feature under the enforcement powers provided at paragraph 11 of Schedule1 of the Flood and Water Management Act 2010. The cost to the owner of maintenance is therefore not affected directly by the policy intervention. It is possible that greater understanding of the utility of a designated feature for the purpose of risk management might encourage better maintenance; if this were the case, then benefits should also be sustained if not increased because the feature will continue to provide risk management, potentially for longer or to a greater or more reliable standard.

92. Not all features need to be designated as, in practice, a risk based approach will be taken that would target for designation those features that are considered to be most vulnerable to damage or have the highest consequences in the event of a failure. The Environment Agency's evidence in the reference case indicates that there may be up to 1,600 features a year that require some form of intervention, but that only around 500 need significant intervention in any given year. This indicates that not more than 25% of all assets (15,600; 25% of the 62,400 third party assets) would need to be designated for the policy to be effective given that a good standard of intelligence and experience has been built up by risk management authorities over a number of years.

93. Table 6 sets out the total one off costs that would be borne by risk management authorities, owners and the appeals body.

Table 6 - Summary of one off costs

Value	Unit	Description of cost / estimate
4.9	£ m	Cost to risk management authorities
1.4	£ m	Cost to owners
0.4	£ m	Cost to appeals body
6.7	**£ m**	**Total costs (over three years)**
2.2	**£ m**	**Annualised cost over 3 years**

94. The key assumptions and calculations leading to the numbers in table 6 are set out in table 7 (further sensitivities are included at Annex 4).

Table 7 - Key assumptions and calculation of one off costs

[References: A# = Assumption; S# = Subtotal; T# = Total; Y# = Annualised Total]

Ref	Value	Unit	Description of cost / variable	Bearer of cost
A1	15,600	#	Number of features designated (number of cases)	N/A
A2	3	Year	Phasing-in period	
A3	139	£	Making a provisional designation, per case	Risk management authorities
A4	42	£	Handling enquires on a provisional designation, per case	
A5	70	£	Making a (final) designation, per case	
A6	21	£	Handling enquiries on a (final) designation, per case	
A7	42	£	Providing evidence for an appeal, per case	
T1	**4.9**	**£ m**	**Total cost (A3 to A7 multiplied by A1)**	
Y1	**1.6**	**£ m**	**Annualised cost over 3 years (T1 divided by A2)**	
A8	42	£	Making enquiries and representations about a provisional designation, per case	Owners of third party assets / features
A9	21	£	Making enquiries about a (final) designation, per case	
S3	**1.0**	**£ m**	**Total cost of making enquiries and representations**	

			(i.e. A8 and A9 multiplied by A1)	
A10	650	£	Making an appeal (based on typical costs of environmental appeals. It is assumed that the cost to owners is similar to that borne by the appeals body)	
A11	624	#	Number of appeals (based on the Environment Agency's experience with similar policies (around 4% appeal rate)	
S4	**0.4**	**£ m**	**Cost of making appeals (A10 multiplied by A11)**	
T2	**1.4**	**£ m**	**Cost of making enquiries, representations and appeals (S3 plus S4)**	
Y2	**0.5**	**£ m**	**Annualised total cost (T2 divided by A2)**	
A12	650	£	Handling an appeal	Appeals body
T3	**0.4**	**£ m**	**Total cost of appeals (A12 multiplied by A11)**	
Y3	**0.1**	**£ m**	**Annualised cost of appeals (T3 divided by A2)**	
T4	**6.7**	**£ m**	**Total one off costs (sum of T1, T2 and T3)**	**All**
Y4	**2.2**	**£ m**	**Annualised one off costs (T4 divided by A2)**	

95. It is assumed that about 15,600 features would be designated in total (A1). The total number of features in existence is based on the National Flood and Coastal Defence Database which records about 96,000 structures and features of which around 65% (or 62,400) are owned by third parties and relied on for flood and coastal risk management in medium or high consequence systems.

96. Risk management authorities are expected to take a risk based approach in exercising their flood and coastal erosion risk management functions and permissive powers. In many cases there may be no reason for a risk management authority to hold particular concern about the integrity of a feature, and it is assumed that designations will be focused on cases where a failure of the feature or system would have medium or high consequence.

97. It is possible that more features are identified than are currently recorded. For example, if local authorities record additional features on registers kept under s.21 of the Act and the new focus on surface water and groundwater. It is possible therefore that the final number of designations could be higher than the best estimate. The powers are permissive, which means that the final decision on use of the powers is for individual risk management authorities based on strategic and local need.

98. For the impact assessment, it is estimated that around 25% of features would need to be designated, or 15,600.

99. A three year phasing-in period is assumed, and this is based on the Government's assessment of new burdens relating to the Act (item A2 in Table 7). The phasing of funding support to local authorities is based on a three year period during which the one-off costs are accrued. As the powers are permissive, authorities are free to choose to implement over a shorter or longer period on the basis of local need or business planning. Assuming three years however, the annual number of designations would average 5,200 (15,600 divided by 3).

100. It is possible for some residual cost to continue in the medium to long term as a result of new features being identified over time, for example as a result of updating local authority registers. The Environment Agency is unlikely to build new defences that rely on privately owned features; in the instances where it does then it would look to entering arrangements with owners about upkeep and if a designation is necessary and incurs a cost that would become part of the project costs and be separately evaluated in each case.

101. It is assumed that a Full Time Equivalent member of staff (FTE) costs £278 a day, based on independent data on salaries (set out at **Annex 4**). The Agency expects that half a

day would be required per provisional designation. That is equivalent to £139 per designation. Less is required to confirm a final designation (A3 and A5 in Table 7 above).

102. The Agency's experience in permitting suggests that up to an additional 30% of the time taken for initial designation may be needed per case to handle representations and enquiries that individuals would be within their rights to make. That is equivalent to £42 per designation (See A4 and A6 in Table 7).

103. A designation does not actually oblige an owner to take any interventionist steps themselves. This means that a designation may represent zero cost to owners. Costs would be incurred from making enquiries and appeals, if the owner chooses to do so. It is reasonable to assume that owners would exercise their right to understand the policy, a designation and to consider taking an appeal, so these costs are reflected in this impact assessment (See A8 and A9 in Table 7).

104. The cost of making enquiries and representations by individuals is assumed to be on a par with staffing costs for risk management authorities for handling enquiries and representations. The system is designed to be straightforward, and not to require significant technical proficiency or access to funding before the public can engage risk management authorities. The rationale for intervention by risk management authorities is required to be made clear in every case through the notices that must be served before a designation can be confirmed, and authorities will be expected to have made a sensible effort to talk to owners in advance of making a provisional designation.

105. The Agency does not intend to rely on third party assets in the future (having already identified and utilised the features in existence). If there is a need to make use of a third party assets, particularly in making prudent use of available resources, it is increasingly likely that people will already have had explained to them the importance of the features, especially as in many cases a third party asset would be part of a larger defence that will have had extensive public engagement before, during and after the construction phase as well as during routine inspection and maintenance activity that is not dependent on the designations policy.

106. Where an owner decides to make an appeal, it is assumed that costs to the owner are roughly similar to the costs faced by the appeals body in determining the case. The total number of appeals is assumed to be in line with the proportion of cases that are appealed in existing processes the Agency oversees (which is around 4%). It is possible that an appreciation of risk will minimise the number of appeals, but it is also possible that the fact that a designation affects personal property could increase appeals; these two effects are assumed to broadly cancel each other out. The cost to the appeals body is based on estimates of the cost of environmental appeals currently handled by the Planning Inspectorate (A12).

107. Zero cost is attached to identifying features and notifying owners since this would already occur by virtue of the operation of local authority registers, the National Flood and Coastal Defence Database and planning of risk management schemes.

Annual Costs

108. Annual costs would be incurred once the new system is up and running. The main variables include the costs of handling applications for an alteration, replacement or removal of a designated feature and any appeals that are made by owners. The total annual costs will depend on how many applications and appeals take place. A summary of the annual costs is included in Table 8, with a more detailed breakdown in Table 9 and **Annex 4**.

Table 8 - Summary of annual costs

Value	Unit	Description of cost / variable
0.29	£ m	Cost to risk management authorities
0.14	£ m	Cost to owners
0.04	£ m	Cost to appeals body
0.47	**£ m**	**Total annual costs**

Table 9 - Key assumptions and calculation of annual costs

[References: A# = Assumption; S# = Subtotal; T# = Total]

Ref	Value	Unit	Description of cost / variable	Bearer of cost
A13	15,600	#	Number of designated features, in total	N/A
A14	4	%	Percent of designated features that are subject to a consent application, each year	
A15	590[20]	#	Number of applications from owners for consent to an alteration, removal or replacement of a feature, per year	
A16	650	£	Cost of an appeal, per case	
A17	10	%	Decisions on applications that are appealed, per year	
A18	314	£	Cost of processing an application from an owner to alter, replace or remove a feature, per case	Risk management authorities
S5	**0.2**	**£ m**	**Processing applications (A15 multiplied by A18)**	
A19	60	#	Cases of enforcement, a year[21]	
S6	**0.09**	**£ m**	**Cost of enforcement, a year[22]**	
T5	**0.29**	**£ m**	**Total annual cost (S5 plus S6)**	
A20	157	£	Making an application for a consent to alter, remove or replace a feature (assumed to be 50% of the cost to risk management authorities at A16)	Owners of third party assets / features
A21	59	#	Number of appeals (A15 multiplied by A17)	
S7	**0.1**	**£ m**	**Cost of applications (A15 multiplied by A20)**	
S8	**0.04**	**£ m**	**Cost of appeals (A16 multiplied by A21)**	
T6	**0.14**	**£ m**	**Total annual cost (S7 plus S8)**	
S9	**0.04**	**£ m**	**Cost of appeals (A16 multiplied by A21)**	Appeals body
T7	**0.04**	**£ m**	**Total annual cost (S9)**	
T8	**0.47**	**£ m**	**Total annual costs (sum of T5, T6 and T7)**	**All**

109. The cost of processing a consent (See A18 above) is based on the cost to the Environment Agency of existing interventions, which suggest that a formal letter costs £280 and handling of enquiries of around £35 (£314 is used in the assessment as set out at Annex 4). With 590 applications a year (based on the Agency's experience of the number of applications under similar procedures), the total annual cost of consents to risk management authorities is expected to be around £0.2 million.

[20] If 4% of the 15,600 designated features are changed each year, that equates to 624 instances. In the central case it is assumed that the designations policy is 95% effective in preventing unconsented changes (i.e. damage). That means that there would be ~590 applications for consent each year, with the remaining cases facing enforcement; in addition to any cases of enforcement that continue to take place under existing byelaws outside the designations policy.

[21] Where designations are made, it is assumed that they will be 94.5% effective in preventing unconsented alterations. 5.5% would therefore require enforcement, equivalent to about 34 cases a year (that's 4.5% (of the 4% subject to annual change) of the 15,600 features designated). It is assumed that the proportion and cost of enforcement notices and prosecutions is the same as in the reference case, which presents a cost of £0.05 million a year under Option 2 (98.4% of cost is formal letters and notices at £1,500 each and 1.6% prosecutions at £5,500 each). Byelaws will continue to be used where the risk management authority owns or maintains the features and a designation has not been made. It is assumed that the policy is about 90% effective in reducing the number of cases taken under the former enforcement powers (because not every single asset will be designated, included some that will be owned by the Agency and fall outside the scope of designations policy), which is equivalent to around 26 cases of enforcement a year using byelaws and a cost of £0.04 million a year). In total there would be ~60 cases a year, costing £0.09 million. This compares to in excess of 250 cases of formal action in Option 1. The ambition is to support with good, clear communication and a robust system of applications and appeals in order to minimise the actual amount of enforcement that is necessary (and which would mean the cost of making and administering applications would increase slightly as enforcement costs come down).

[22] See table 2.13 and 2.14 of Annex 4

110. The assessment assumes that operating authorities will continue to seek a resolution in 100% of cases where damage still occurs. Where a designation is made the new enforcement powers will be used; however if there is damage to a feature that was not designated, existing practice will continue. Designations are designed to be preventative. By designating features (using a risk based approach) and putting in place a local land charge, it should encourage owners to do less damage to features from the outset and to look after them too. Where there is damage done, then enforcement may need to be pursued. This should be less frequently than at present because people will be better informed of the presence and importance of features and the risk of enforcement being taken against them if they do not act within the requirements of a designation. People will also know that they will be liable for covering costs involved. This should bring costs to risk management authorities down over time, and will significantly reduce the length of time that features are damaged and therefore increase the overall avoidance of economic damages when compared to the reference case (Option 1)[23].

111. Under the reference case (i.e. under current arrangements) the Agency can often resolve issues through discussion and written communication with owners. Although in many cases the damage has not been inflicted maliciously, the relatively light touch intervention is often enough to compel an owner to put right any damage that has been done to an asset, albeit that it takes time before the feature is repaired and fully functional again. It is a reactive policy.

112. Consents for designated features are expected to be relatively straightforward compared to existing consents that are processed. It is possible that a consent may cover more than one feature at a time, which could also reduce costs overall. The Agency has indicated that based on similar processes around 4% of designated features are likely to be the subject of an application from the owner for consent to alter, remove or replace a designated feature (see item A14, above). For this impact assessment, it has been assumed that 10% of cases are appealed. Although this is higher than experienced in other consent schemes the EA operates, it is assumed that the fact that consents relate to property leads to a relatively high percent of cases that are appealed (see A17 and A21). It is expected that the cost to the owners of seeking consent should be about half those of the risk management authority in processing it (A20 vs A18).

113. The cost of an owner's time (A20) is assumed to be equal to that of the risk management authority. Wider costs such as architect's fees or other planning issues are not included as the owner would be subject to this irrespective of a designation of a feature.

114. Consistent with other appeals mechanisms under the Flood and Water Management Act 2010, it is assumed based on estimates by the Planning Inspectorate that costs can vary from ~£500 to ~£1,500 depending on the type of appeal that is appropriate. In most cases appeals should be relatively straightforward. It is assumed that 80% of appeals are basic, 10% are more involved written appeals, and 10% are major cases. Costs are summarised at table 10.

Table 10 - Cost of appeals (Source: Planning Inspectorate)

Type of appeal	Duration (days)	Cost (£)	Assumed proportion (%)
Basic	0.5	500	80
Written (minor)	1.0	1,000	10
Written (major)	1.5	1,500	10

115. The average cost per appeal (i.e. equivalent to 90% at basic appeal cost, 10% at minor, 10% major) is therefore estimated at £650 (See A16 above).

[23] The costs to the owner of enforcement have been estimated in the assessment. It is assumed that costs to owners are £0.4 million a year under Option 1. If designations succeed in reducing the amount of enforcement by 90 to 95% then the equivalent cost to owners could be reduced to as low as £0.02 million to £0.04 million a year under Option 2.

116. There is no accurate way of knowing costs of appeals to individuals and business ahead of commencement. It is assumed that given the relatively straightforward nature of appeals, the cost of preparing an appeal will not exceed the equivalent costs borne by the Planning Inspectorate. Individuals will not be charged for appeals. The Planning Inspectorate's Costs are being met by central government, and funding has been secured in the Spending Review settlement that assumes that the Planning Inspectorate handles appeals using funding from central government (no fees or charges will be imposed on applicants).

117. Costs to risk management authorities should be negligible because the process of designating features obliges the risk management authority to have satisfactorily assessed risk and have set out the specifics of the designation within the provisional designation notice and designation notices, as well as in determining any applications for an alteration, removal, replacement or cancellation of a designation. If the decision on an appeal favours the owner then the risk management authority would need to respond, although costs should be no higher than the original cost of designating and issuing a notice.

118. Overall, total annual costs are expected to be between around £0.47 million.

119. The National Flood Risk Assessment 2008 indicates that almost one third of properties at moderate or significant risk are non-residential. This figure will include business as well as other public and government buildings. It is assumed[24] that 22% of property falls into the business category, within a range of between 20 and 24% (to test sensitivity to small changes, given the importance of business costs in the current regulatory agenda). This suggests that one off costs to business will be between £0.3 million and £0.4 million, with annual costs of £0.03 million to £0.04 million. Where the micro business moratorium applies, this cost will in practice be lower.

120. It is worth noting that the same businesses may rely on the risk management properties of the feature for their premises to remain viable and the third party assets are likely to bring benefits such as fewer economic damages from flooding, better insurance terms and higher property values. Furthermore, business at large will share some of the benefits of the wider third-party assets approach, in terms of reduced flood damage. Based on the Environment Agency's Long Term Investment Strategy (Environment Agency, 2009), it is estimated that around a third of the benefits of the policy could accrue to business, of one form or another. This means that the costs above would be more than offset by benefit to business (see section below on benefits).

Cost Profiles

121. Costs overall will be phased-in over the first three years. Annual costs will only be incurred once designations are in place. This means that the costs can be expected to steadily rise in the first few years, and then flatten out once designations are in place and (for the most part) the only costs are those associated with consents and related appeals.

122. Cost profiles have been set out in tables 11 and 12, based on the figures from tables 6 and 8. The profiles are illustrated in graphs 1.

123. The profiles represent an estimate of the cost in each financial year following commencement. Each year of the profile includes both the one off and the ongoing annual cost that may be incurred. Table 11 sets out the profile that has been applied in table 12 and is consistent with Government's assessment of new burdens for the Flood and Water Management Act 2010.

[24] The precise number of businesses on the floodplain that could be subject to designation is not known but it is assumed three quarters of properties in the "other" category listed under Appendix H of the 2008 Assessment are businesses, with the remainder comprising mostly of public buildings. The authors anticipate that this is a 'high end' estimate.

124. One off costs are incurred in equal amounts over the course of the phasing-in period (i.e. 3 years) and annual costs cumulate as more features are designated each year. In reality, the annual costs may accrue less quickly if owners are less inclined to put in an application for an alteration, removal or replacement in the short term following a designation. It is also possible that one off costs are spread across a greater or lesser number of years at the discretion of each risk management authority.

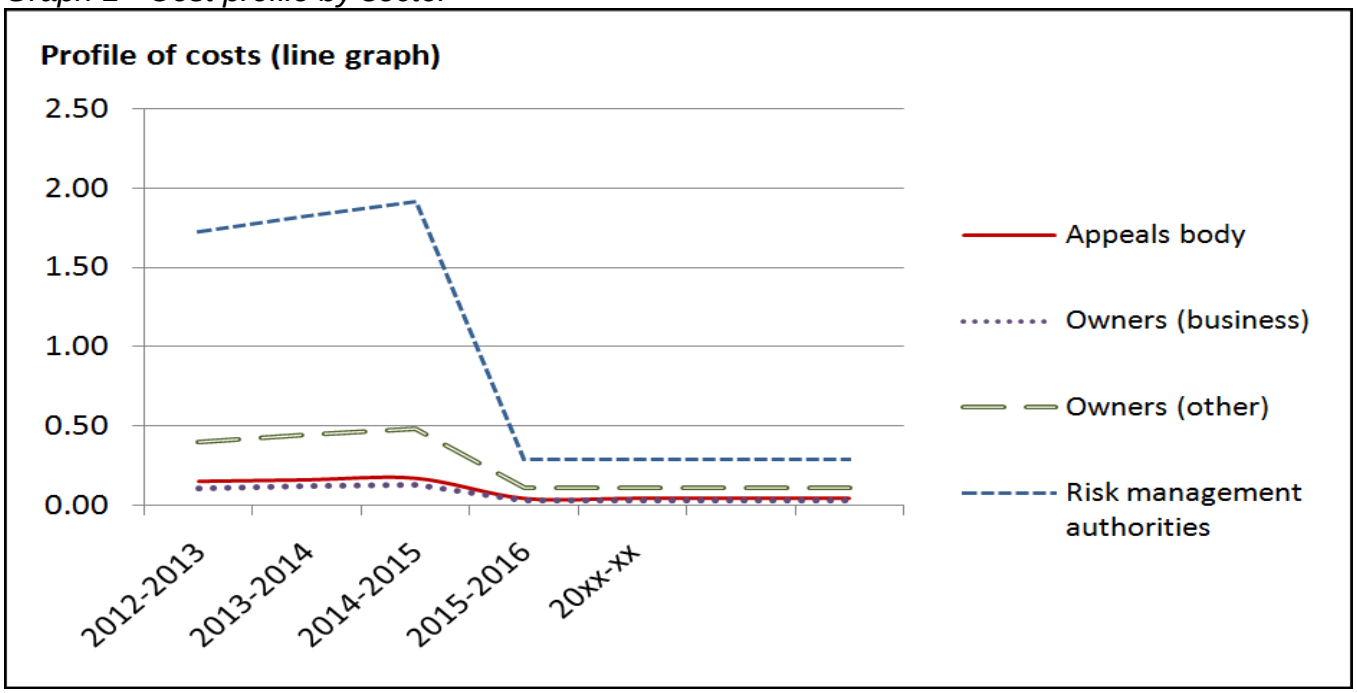
Table 11 - Overall cost profile

Financial Year	**Annualised one off costs incurred pa** (%)	**Annual costs incurred pa** (%)
2012-2013	33.3	33.3
2013-2014	33.3	66.7
2014-2015	33.3	100.0
Thereafter	0.0	100.0

Table 12 - Cost profile by sector[25]

Financial Year	**Cost to authorities** (£m)	**Cost to owners (not business)** (£m)	**Cost to business owners** (£m)	**Cost to appeals body** (£m)	**Total cost** (£m)
2012-2013	1.73	0.40	0.11	0.15	2.29
2013-2014	1.86	0.44	0.12	0.16	2.53
2014-2015	1.92	0.48	0.13	0.17	2.70
Thereafter	0.29	0.11	0.03	0.04	0.47

Graph 1 - Cost profile by sector



Benefits

125. The benefits of designating features are expected to come from:
- Less flood damage because less interference is made with risk management systems and any change that is made is done with the approval of the risk management authority;
- Less cost expended in remedying damage to features.

126. Whilst the costs and benefits of **Option 1** are zero – because there is not a change in intervention under Option 1 – there are nonetheless cost incurred under the present-day

[25] Shares accruing to each sector are based on estimates informed by the National Flood Risk Assessment 2008

policy intervention, which are set out in the preceding section. The benefits for **Option 2** assume therefore that none of the costs within the reference case are incurred. That means that £1 million a year cost is effectively a benefit (of which £0.6 million of previously occurring cost is no longer faced by risk management authorities, and £0.4 million by owners of third party assets). There are of course costs under Option 2, but these are captured under the section on costs. Without acknowledging the saving / change brought about by the Option 2, effectively costs would be double counted.

127. It is assumed that where a feature has been designated, the risk management authority would not consent any change that reduces the standard of defence (or where the benefit of the defence is clearly greater than the cost to the beneficiary). It is possible that risk management authorities would consent to a removal or cancellation if there is no longer a need for a defence to be in place. This has been accounted for by including sensitivity tests on the expected lifetime of an asset. Risk management authorities should only refuse consent where there is a clear justification in terms of flood/coastal erosion risk.

128. Table 13 summarises the headline costs and losses within the status quo, and the relative costs (or change brought about) under Options 1 and 2. These costs are "steady state", after transition, and undiscounted.

129. An overall reduction in costs in Option 2 compared to the status quo provides quantifiable benefit for Option 2. The (annual) cost of intervention for risk management authorities is lower in Option 2 than the status quo (a reduction from £0.6 million to £0.3 million) because the presence of a local land charge and use of associated notices will mean that people damage or remove fewer features than is currently the case. This means that the cost of administering designations should be slightly less expensive overall than not having designations and pursuing enforcement solely under existing byelaws or paying to repair and replace features. Annual costs to owners are similarly reduced, from an estimated £0.4 million (conservative estimate) to £0.14 million, despite the potential new costs of appeals (which should be lower overall under Option 2 than the additional remediation costs that are incurred under the status quo). New costs are incurred by the appeals body, but these are relatively small at around £0.04 million a year. Total costs are £0.52 a year, under Option 2, which is roughly half the £1.0 million annual cost under the status quo. The costs of the status quo are incurred under Option 1, but as the "do nothing option" the *change* is zero.

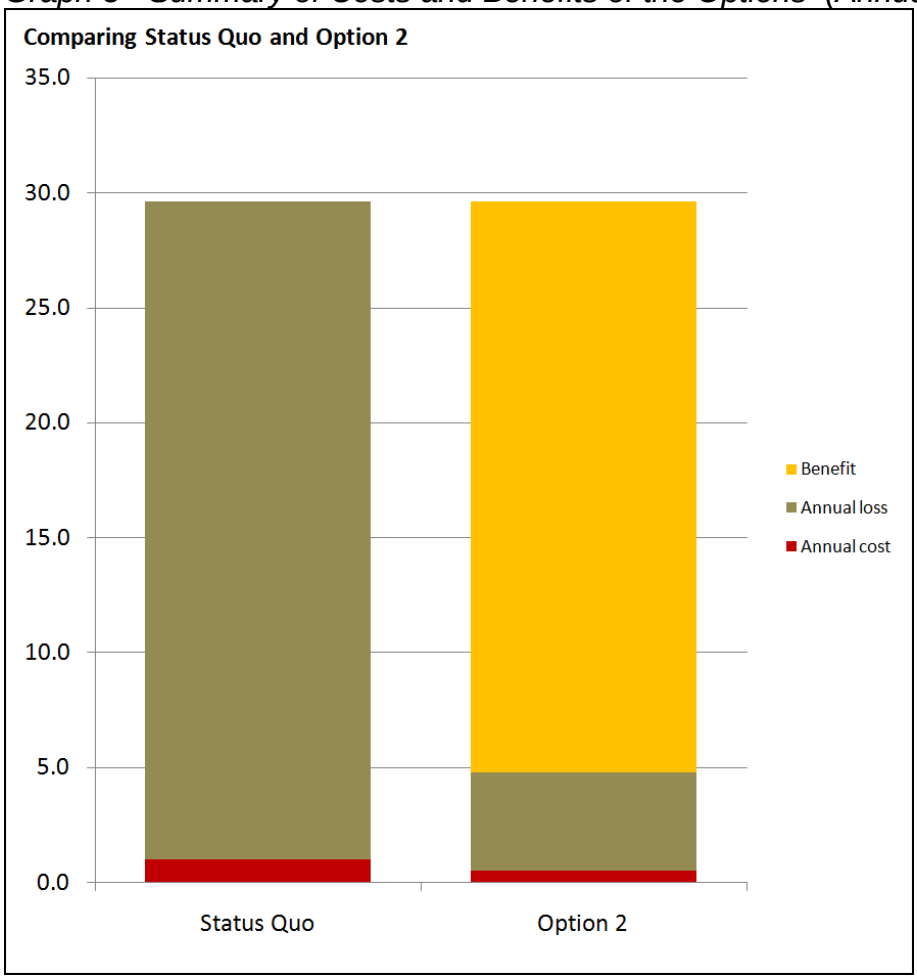
Table 13 - Overall change in annual costs under Options 1 and 2 (typical year, £m)

Loss / cost	Status Quo	Change under Option 1	Change under Option 2
Loss of benefit because of damage to features	28.6	0	-24.3
Cost of intervention to remedy damage[26]	1.0	0	- 0.5
Total Cost / Loss / Change	29.6	0	-24.8
Overall Relative Benefit of the Options		***0***	***24.8***

130. Graph 3 illustrates the difference between Options 1 and 2 and summarises the share of cost and benefit across the key sectors (based on proportions of accrual of benefit to different sectors, as estimated in the Environment Agency's Long Term Investment Strategy - see Annex 4). **NB: In the diagram, the underlying economics of the status quo are illustrated, to show where the relative benefit of Option 2 is found**. Option 1 as the "do nothing different" option results in zero *change* in costs and benefits compared to the status quo.

[26] £1.0 million comprises £0.6 million cost to risk management authorities and £0.4 million (conservative estimate) cost to owners

Graph 3 - Summary of Costs and Benefits of the Options (Annual, typical year, £m)



Present Value costs and benefits

131. Present Value (PV) benefits and costs have been calculated for **Option 2** over a 25 year period (relative to Option 1). They indicate an overall net present value of £393.6 million (benefit cost ratio of 29:1) based on a present value cost of £14.0 million and present value benefit of £407.5 million. This indicates that designations policy and taking a new and more comprehensive[27] regulatory approach does not need to lead to increased costs overall and should help significantly reduce loss of benefit and replacement / repair costs.

Table 14 - Present Values and Benefit Cost Ratio for Option 2

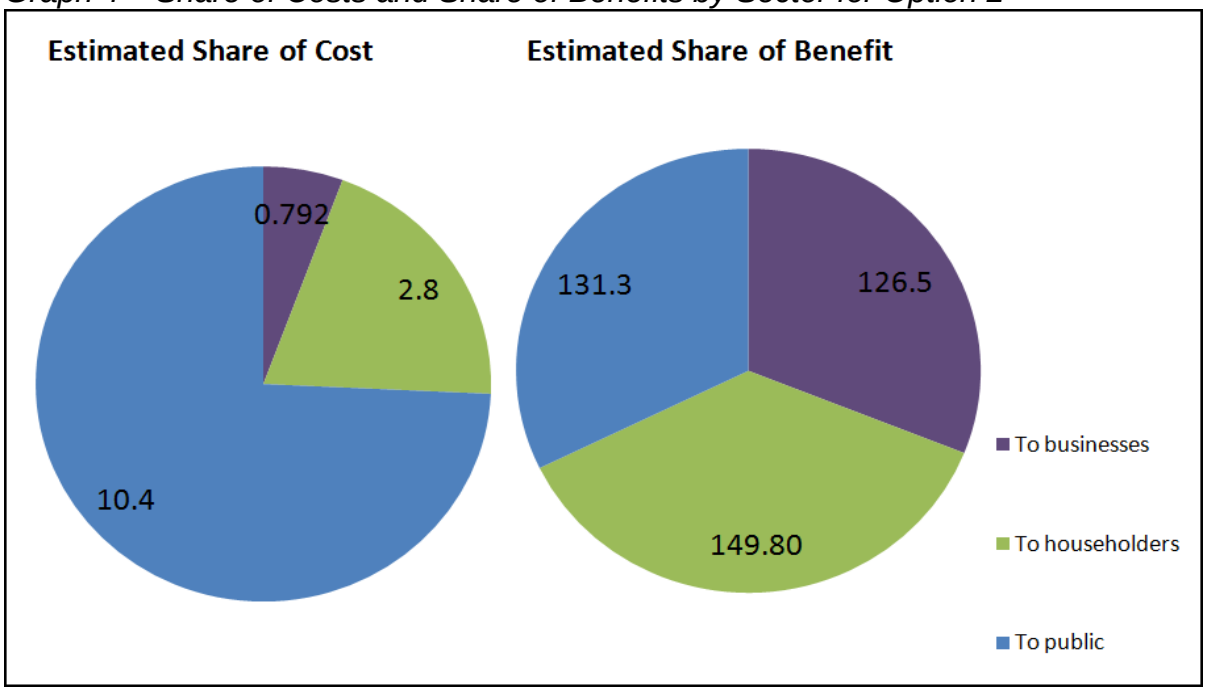
Value	Unit	Description of cost / variable
25	*Years*	*Time period*
17.4815146	*#*	*Discount factor (cumulative for 25 years)*
6.7	*£ m*	*Total transition cost*
3	*Years*	*Transition period (spread across three financial years)*
2.2	*£ m*	*Average Annual transition cost*
24.8	*£ m*	*Average Annual Benefit*
0.5	*£ m*	*Average Annual Cost (not transition)*
407.6	**£ m**	**PV Benefit (Which counts the reduced losses as well as none of the costs incurred under Option 1; new costs appear under PV Cost, below)**
14.0	**£ m**	**PV Cost (This is the average annual cost, which has been multiplied by the discount factor, and adjusted to reflect the phasing-in of the approach during the transition period. Added to this are the transition costs which have been discounted over the transition period.)**
393.6	**£ m**	**PV Net Benefit (PV Benefit minus PV Cost)**
29 : 1	**BCR**	**Benefit to Cost Ratio (PV Benefit divided by PV Cost)**

[27] Than existing byelaws

Table 15 - Present Values and Benefit Cost Ratios by Sector[28]

Value	Unit	Description of cost / variable	
126.5	£ m	PV Benefit	Businesses' Share
0.8	£ m	PV Cost	
125.7	£ m	PV Net Benefit	
160 : 1	BCR	Equivalent Benefit to Cost Ratio	
149.8	£ m	PV Benefit	Householders' Share
2.8	£ m	PV Cost	
147.0	£ m	PV Net Benefit	
53 : 1	BCR	Equivalent Benefit to Cost Ratio	
131.3	£ m	PV Benefit	Wider Public Benefit Share (cost is cost to public sector)
10.4	£ m	PV Cost	
120.9	£ m	PV Net Benefit	
13 : 1	BCR	Equivalent Benefit to Cost Ratio	

Graph 4 – Share of Costs and Share of Benefits by Sector for Option 2



132. The assessment has highlighted the potential scale of the problem and the impact that even a relatively small amount of damage to risk management systems can have in the long term if allowed to continue unabated, and the relatively low cost of intervening. Householders and businesses are expected to bear the majority of the benefit which should be far in excess of cost, as set out at Table 15 and illustrated in Graph 4.

Sensitivity Testing

133. The case set out above represents the central case. The central case represents Government's best estimate of the economic impact of the options under consideration. This section present sensitivity analysis for the low and high case included in the 'Summary: Analysis and Evidence' pages at the front of this impact assessment, and demonstrates the effect if the assumptions are underplayed or exaggerated in Tests 1 and 2. **Test 3 combines Test 1 and 2 and is used for the front sheets**.

[28] Proportions of accrual of benefit to different sectors are based on estimates calculated for the Environment Agency's Long Term Investment Strategy; each sector's share of costs are based on estimates informed by the National Flood Risk Assessment 2008.

134. The amount of change in cost is influenced by the assumptions about the average cost of repairing a feature, and the costs of administering designations, and the change in benefit is dependent upon the length of time it takes to discover damaged features and repair them, the effect a damaged feature has on the parent system.

135. Please note that in the diagrams that follow, Option 1 has been presented as the status quo, with the absolute costs included for comparison. As Option 1 is the "do nothing different" option, there *change* in costs between the status quo and Option 1 is zero.

Test 1: Assumptions on "the problem"

136. Test 1 demonstrates the effect of varying the assumptions about the underlying problem. The low and high sensitivity scenarios assume that key assumptions are one-third less and one-third more (respectively) than in the central case.

137. Table 16 sets out the assumptions that have been adjusted in the sensitivity testing. In all other respects, each scenario is identical. Table 17 sets out the output of the modelling for the status quo and 2 and each of the sensitivity scenarios.

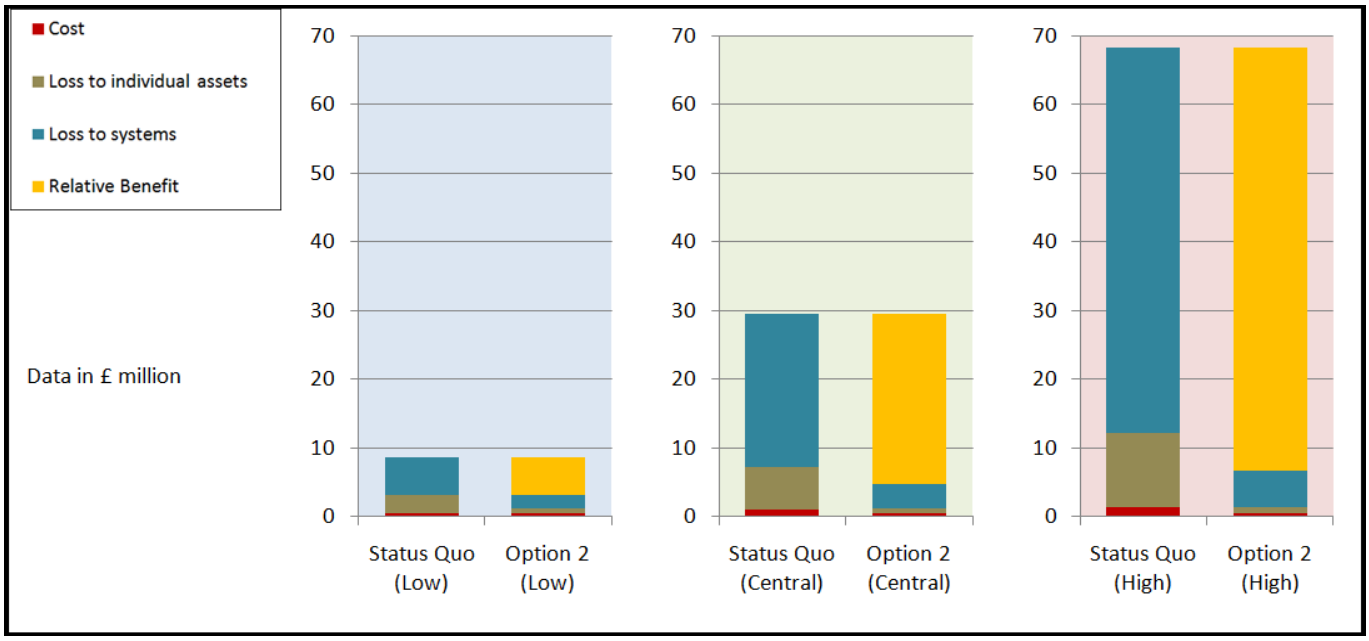
Table 16 – Assumptions subject to variation in the high medium and low sensitivity scenarios (Test 1) (figures in £m)

Scenario	**Low**	**Central**	**High**
Scaling factor	66	100	133
Assets damaged per year (as %)	2.6	4.0	5.3
Time to make repair (in months)	4.9	7.4	9.8
Average cost of repair (in £)	262	397	528
Reduction in effectiveness of parent system (in %)	9.9	15	20

Table 17 – Results of sensitivity scenarios (Test 1) (figures in £m)

Scenario	**Low**		**Central**		**High**	
	Status Quo	Option 2	Status Quo	Option 2	Status Quo	Option 2
Loss to individual assets	2.6	0.7	6.2	0.8	10.8	0.9
Loss to systems	5.5	2	22.4	3.5	56.2	5.4
Cost	0.6	0.5	1.0	0.5	1.4	0.5
Total Loss and Cost	**8.7**	**3.2**	**29.6**	**4.8**	**68.4**	**6.8**
Change in cost from Option 1 to 2		-0.1		-0.5		-0.9
Change in loss from Option 1 to 2		-5.4		-24.3		-60.7
Total reduction (£m)		**-5.5**		**-24.8**		**-61.6**
Total reduction (as %)		**-63.2**		**-83.8**		**-90.1**

Graph 5 – Illustration of effect of sensitivity scenarios (Test 1)



138. As graph 5 illustrates, in each scenario, the overall cost/loss arising from damage to assets is expected to be less under Option 2 than under the status quo / Option 1. In the central case, the annual cost/loss of £29.6 million would fall by nearly 84% to £4.8 million, representing an annual benefit of £24.8 million. In the low case scenario the cost/loss is much lower to start with, at £8.7 million a year in Option 1, which would fall by about 63% to £3.2 million, representing an annual benefit of £5.5 million. In the high case scenario the cost/loss is much higher, at £68.4 million under Option 1, which would fall by about 90% under Option 2 to £6.8 million, representing an annual benefit of £61.6 million.

139. Tables 18 and 19 set out the results of PV calculations for each of the sensitivity cases, and include a breakdown by sector.

Table 18 – PV calculations for sensitivity scenarios (Option 2 vs the status quo)

Scenario	Low	Central	High
Discount period	25	25	25
Discount factor (cumulative for period)	17.0583676	17.0583676	17.0583676
Total transition cost	6.7	6.7	6.7
Transition period (spread across three financial years)	3	3	3
Average Annual transition cost	2.2	2.2	2.2
Average Annual Benefit	5.55	24.83	61.62
Average Annual Cost (not transition)	0.45	0.47	0.48
PV Benefit	97.0	407.6	999.3
PV Cost	13.6	14.0	14.1
PV Net Benefit	83.4	393.6	985.2

Table 19 – PV calculations by sector (Option 2 vs Option 1)

	Scenario	Low	Central	High
Business	PV Benefit	28.5	126.5	314.4
	PV Cost	0.8	0.8	0.8
	PV Net Benefit	27.7	125.7	313.6
Householders	PV Benefit	34.8	149.8	368.9
	PV Cost	2.8	2.8	2.8
	PV Net Benefit	32.0	147.0	366.1
Wider Public Benefit	PV Benefit	33.7	131.3	316.0
	PV Cost	10.0	10.4	10.5
	PV Net Benefit	23.7	120.9	305.5

Test 2: Assumptions on costs of intervention

140. Test 2 demonstrates the effect of varying the assumptions about the costs of intervention. The low and high sensitivity scenarios assume that key assumptions are one-third less and one-third more (respectively) than in the central case.

141. Table 20 sets out the assumptions that have been adjusted in the sensitivity testing. In all other respects, each scenario is identical. Test 2 does **not** include the adjustments made in Test 1. Table 21 sets out the output of the modelling for Option 1 and 2 and each of the sensitivity scenarios.

Table 20 – Assumptions subject to variation in Test 2

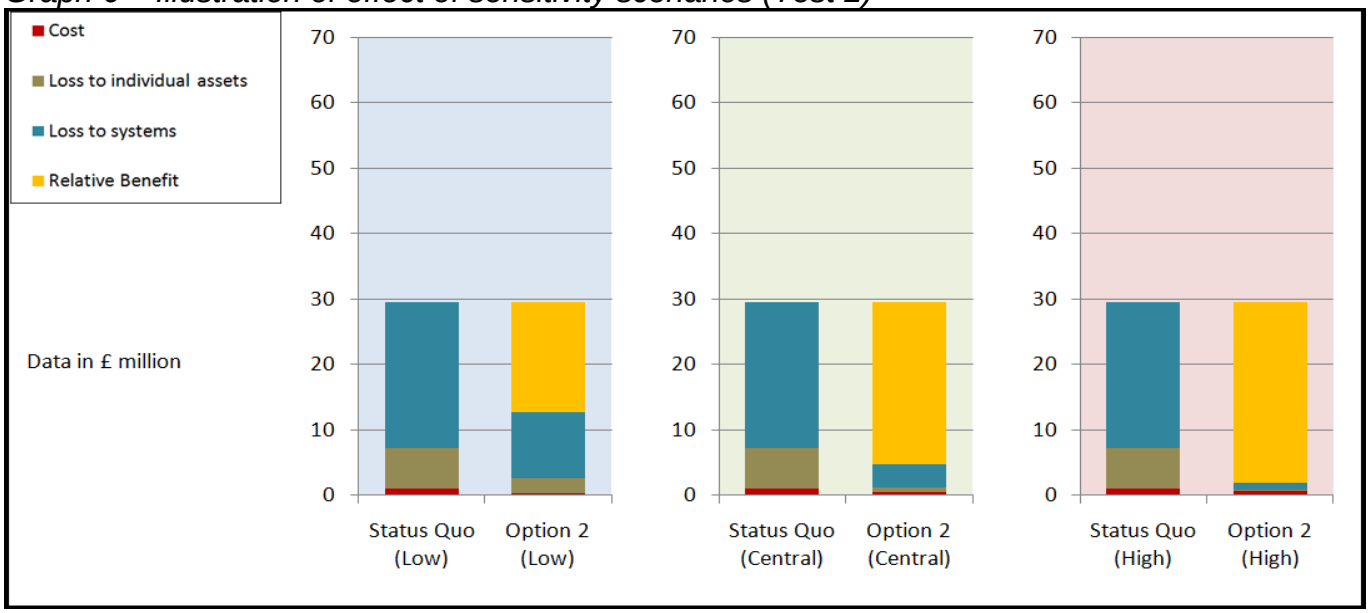
Scenario	Low	Central	High
Scaling factor	66	100	133
Percent of assets designated	16.5	25.0	33.3
Costs of making a designation*	221.1	335.0	445.6
Cost of consents*	207.2	314.0	417.6
Decisions on designations that lead to an appeal (in %)	2.6	4.0	5.3
Decisions on consents that lead to an appeal (in %)	6.6	10.0	13.3
Reduction in damage/removal of third party assets (%) **	85.1	94.5	98.0

** Figure shown is the combined cost to risk management authorities and to owners*
*** Scaling factor of 10% used; limit of 98%*

Table 21 – Results of the sensitivity scenarios (Test 2)

Scenario	Low		Central		High	
	Status Quo	Option 2	Status Quo	Option 2	Status Quo	Option 2
Loss to individual assets	6.2	2.2	6.2	0.8	6.2	0.2
Loss to systems	22.4	10.1	22.4	3.5	22.4	1.1
Cost	1	0.4	1.0	0.5	1	0.7
Total Loss and Cost	**29.6**	**12.7**	**29.6**	**4.8**	**29.6**	**2.0**
Change in cost from Option 1 to 2		-0.6		-0.5		-0.3
Change in loss from Option 1 to 2		-16.3		-24.3		-27.3
Total reduction (£m)		**-16.9**		**-24.8**		**-27.6**
Total reduction (as %)		**-57.1**		**-83.8**		**-93.2**

Graph 6 – Illustration of effect of sensitivity scenarios (Test 2)



142. Under Test 2, Option 1/Status Quo does not vary because it is the reference case, and the changes brought about by the test are seen solely in the results for Option 2.

143. As graph 6 illustrates, in each scenario, the overall cost/loss arising from damage to assets is expected to be less under Option 2 than Option 1. In the central case, the annual cost/loss of £29.6 million under Option 1 would fall by ~84% to £4.8 million under Option 2, representing an annual benefit of £24.8 million. In the low case scenario the cost/loss is the same under Option 1 and £16.9 million (57.1%) less under Option 2. In the high case scenario the cost/loss is also the same under Option 1 and £27.6 million (93.2%) less under Option 2.

144. Tables 22 and 23 set out the results of PV calculations for each of the sensitivity cases, and include a breakdown by sector.

Table 22 – PV calculations for sensitivity scenarios (Option 2 vs Option 1)

Scenario	Low	Central	High
Discount period	25	25	25
Discount factor (cumulative for period)	17.0583676	17.0583676	17.0583676
Total transition cost	2.9	6.7	11.7
Transition period (spread across three financial years)	3	3	3
Average Annual transition cost	1.0	2.2	3.9
Average Annual Benefit	16.92	24.83	27.63
Average Annual Cost (not transition)	0.38	0.47	0.67
PV Benefit	279	407.6	455.8
PV Cost	9.0	14.0	22.1
PV Net Benefit	270	393.6	433.7

Table 23 – PV calculations by sector (Option 2 vs Option 1)

	Scenario	Low	Central	High
Business	PV Benefit	85.3	126.5	141.9
	PV Cost	0.2	0.8	1.5
	PV Net Benefit	85.1	125.7	140.4
Householders	PV Benefit	102.2	149.8	167.6
	PV Cost	0.7	2.8	5.2
	PV Net Benefit	101.5	147.0	162.4
Wider Public Benefit	PV Benefit	91.4	131.3	146.2
	PV Cost	8.0	10.4	15.4
	PV Net Benefit	83.4	120.9	130.8

Test 3: Assumptions on underlying problem and costs of intervention

145. Test 3 demonstrates the effect of combining Test 1 and 2, thereby varying the assumptions about the *underlying problem* (Test 1) and *costs of intervention* (from Test 2). It adjusts both the sets of assumptions listed in Table 16 and Table 20 (above). In all other respects, each scenario is identical. Table 24 and graph 7 sets out the output of the modelling for Option 1 and 2 and each of the sensitivity scenarios. Tables 25 and 26 set out the results of PV calculations.

Table 24 – Results of the sensitivity scenarios (Test 3)

Scenario	Low		Central		High	
	Status Quo	Option 2	Status Quo	Option 2	Status Quo	Option 2
Loss to individual assets	2.6	1.7	6.2	0.8	10.8	0.2
Loss to systems	5.5	5.3	22.4	3.5	56.2	1.5
Cost	0.6	0.3	1.0	0.5	1.4	0.7
Total Loss and Cost	**8.7**	**7.3**	**29.6**	**4.8**	**68.4**	**2.4**
Change in cost from Option 1 to 2		-0.3		-0.5		-0.7
Change in loss from Option 1 to 2		-1.1		-24.3		-65.3
Total reduction (£m)		**-1.4**		**-24.8**		**-66.0**
Total reduction (as %)		**-16.1**		**-83.8**		**-96.5**

Graph 7 – Illustration of effect of sensitivity scenarios (Test 3)

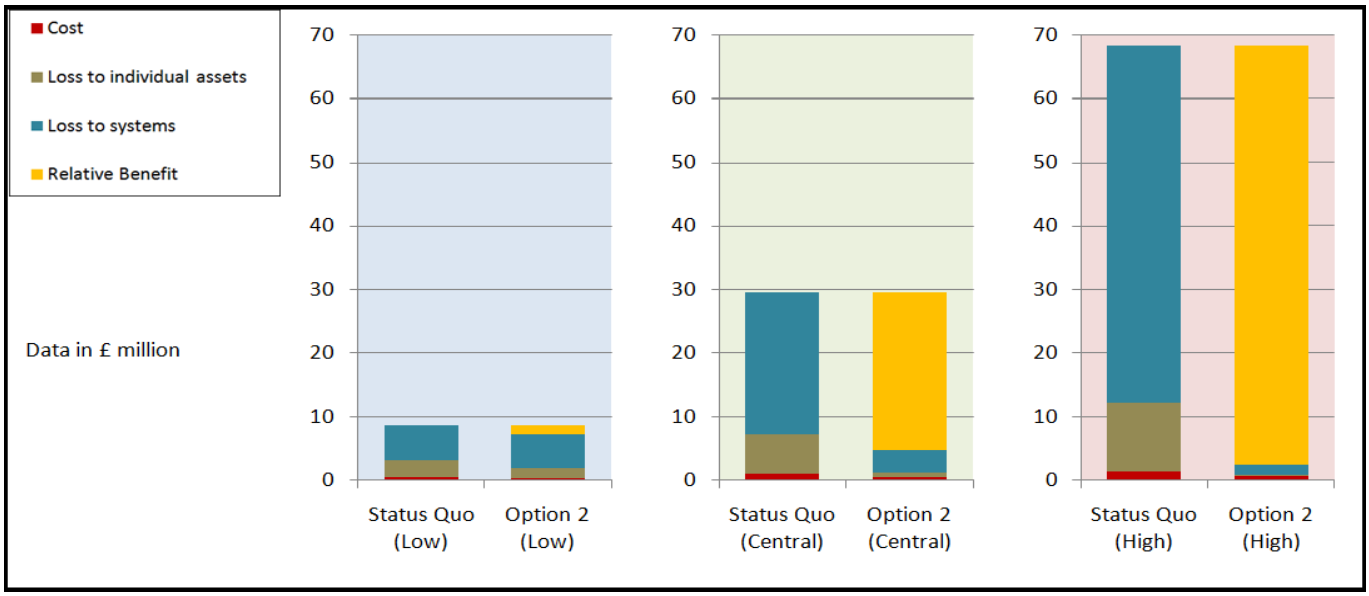


Table 22 – PV calculations for sensitivity scenarios (Option 2 vs Option 1)

Scenario	Low	Central	High
Discount period	25	25	25
Discount factor (cumulative for period)	17.0583676	17.0583676	17.0583676
Total transition cost	2.9	6.7	11.7
Transition period (spread across three financial years)	3	3	3
Average Annual transition cost	1.0	2.2	3.9
Average Annual Benefit	1.36	24.83	66.03
Average Annual Cost (not transition)	0.34	0.47	0.67
PV Benefit	27.9	407.6	1,073.2
PV Cost	8.4	14.0	22.1
PV Net Benefit	19.5	393.6	1,051.1

Table 23 – PV calculations by sector (Option 2 vs Option 1)

	Scenario	Low	Central	High
Business	PV Benefit	6.4	126.5	338.0
	PV Cost	0.2	0.8	1.5
	PV Net Benefit	6.2	125.7	336.5
Householders	PV Benefit	9.2	149.8	396.2
	PV Cost	0.7	2.8	5.2
	PV Net Benefit	8.5	147.0	391.0
Wider Public Benefit	PV Benefit	12.3	131.3	338.9
	PV Cost	7.3	10.4	15.4
	PV Net Benefit	5.0	120.9	323.5

146. The results of Test 3 demonstrate the significant variation that is brought about by varying the key assumptions, especially if a full set of conservative estimates are used for the status quo. In the central case, the cost/loss of £29.6 million under the status quo would fall by nearly 84% to £4.8 million under Option 2, providing a PV Net Benefit of £393.6 million over 25 years. In the low case, the lower cost/loss of £8.7 million would fall by 16% to £7.3 million, providing £19.5 million PV Net Benefit over 25 years. In the high case, the

higher cost of £68.4 million would fall by 96.5% to £2.4 million, providing £1,051.1 million PV Net Benefit.

147. The potential variation is large between the low case estimates and the high case estimates. In all cases the costs are outweighed by the benefits. Defra and the Environment Agency are confident that the central case includes the best possible estimates about the extent of the underlying problem, although uncertainty naturally increases for costs and benefits in the future. As a result it is unlikely that the benefits would be as low as in the low case or as high as the high case and the effect of introducing the policy is expected to be close to the central case; although it is possible that the actual benefits might be slightly more or less.

Summary of sensitivity tests

148. Tables 24 and 25 set out the calculated costs and benefits in terms of transition costs and benefits, average annual costs and benefits and net benefit. The costs are affected by the assumptions made about the extent of the problem that the intervention is designed to overcome.

149. Under the status quo, risk management authorities intervene to ensure that third party assets are restored when they are damaged. There is a cost to this. In addition, there is a period of time during which the benefit that should be derived from the assets is lost, because the assets are damaged and await repair. In the central case, this totals £504.9 million (PV over 25 years). Without the intervention, loss would be much higher. The benefits are not calculated, since it is the cost that is necessary to retain the benefits that should have been derived from the third party assets from the outset.

150. Option 2, as the lead Option, is designed as a replacement to Option 1. The calculation of benefit is the benefit that is achievable in comparison to Option 1. Under Option 2, instead of intervening on a reactive basis, designations are designed to prevent damage being incurred from the outset. If an asset is nonetheless damaged then a reactive approach is available and cost is incurred from enforcement, whilst benefit will be lost until the damage is put right.

151. Despite the best efforts of risk management authorities, under the status quo, £487.9 million of benefit is lost (PV, 25 years). Under Option 2, and the mid sensitivity, this is reduced to £97.4 million (PV, 25 years, adjusted for phasing-in during the first three years), because designations prevent much of the damage being incurred from the outset. That means that when compared to Option 1, Option 2 offers £390.5 million of benefit in terms of *avoided damages*.

152. Annual costs under the status quo are £1.0 million (£0.6 million to risk management authorities, and £0.4 million to owners). The PV cost is £17.1 million PV (25 years).

153. Option 2 has annual costs of £0.47 million a year (current prices), which will be phased in over the first three years. This is equivalent to £7.55 million PV over 25 years (including adjustment for phasing). There are transition costs, of £6.7 million (or £6.47 million PV over three years). Total PV costs are £13.95 million under Option 2. When compared to Option 1, Option 2 offers £3.1 million of benefit in terms of *avoided cost*.

154. The PV benefit is calculated as the reduction in damages and the removal of all costs. This is because all costs would end, and be replaced by new costs for the new approach, which are calculated as PV costs for Option 2. The total PV benefit under Option 2 is £407.6 million PV over 25 years. As the PV costs under Option 2 are £14.0 million over 25 years, the PV benefit of Option 2 is £393.6 million over 25 years.

155. Both Options achieve the same eventual outcome. Where an asset has been damaged, it is repaired, and the benefit of the asset is retained. This long term benefit is not calculated, since it is the same under both options and there is no question in the foreseeable future of risk management authorities not intervening to restore damaged features (there is therefore, no plausible do nothing option), only a question of which form of intervention (the status quo or designations) is most effective.

156. In practice, risk management authorities may be partly reliant on the status quo (i.e. Option 1) during the phasing-in of Option 2, in localities where Option 2 is yet to take effect. It is anticipated that risk management authorities apply the new powers first where they are needed the most. However, if the pre-existing intervention is used in inverse proportion to the phasing-in of new powers, that would suggest a PV cost of £1.0 million for intervention and £28.3 million of lost benefit before assets are restored under the old powers, totalling £29.3 million. That would result in a reduction in the calculated net PV benefit from £393.6 million to £364.3 million, over 25 years. The effect on this additional sensitivity test is set out at table 25.

Table 24 – Summary of calculations for sensitivity tests

Scenario		Low		Central / Best Estimate		High	
		Status Quo	Option 2	Status Quo	Option 2	Status Quo	Option 2
Costs	Total Transition (Cash)	n/a	2.9	n/a	6.7	n/a	11.7
	Average Annual (Cash)	8.7	0.34	29.6	0.47	68.4	0.67
	Total Cost (PV)	148.4	8.4	504.9	14.0	1,166.8	22.1
Benefits	Total Transition (Cash)	n/a	0.00	n/a	0.00	n/a	0.00
	Average Annual (Cash)	n/a	1.36	n/a	24.83	n/a	66.03
	Total Benefit (PV)	n/a	27.9	n/a	407.6	n/a	1,073.2
Net Benefit (PV)		n/a	19.5	n/a	393.6	n/a	1,051.1

PV = Present Value (discounted over 25 years)

Table 25 – Adjustment to Option 2 to account for partial reliance on pre-existing powers during phasing-in of the new powers

Scenario	Low	Central	High
PV annual cost of intervention using pre-existing intervention during transition period	0.6	1.0	1.4
PV annual loss using pre-existing intervention during transition period	8.0	28.3	66.2
PV total using pre-existing intervention during transition period	8.6	29.3	67.6
Revised PV net benefit of Option 2	10.9	364.3	983.5

157. The sensitivity testing suggests a range between £19.5 million and £1,051.1 million PV net benefit of Option 2 over the status quo. This could potentially fall to between £10.9 million and £983.5 million if old powers are partially relied on during the transition period.

158. The best estimate is a **PV net benefit of £393.6 million of Option 2 over Option 1**, which could potentially fall to £364.3 million if old powers are partially relied on during the transition period. In all cases, the costs are outweighed by benefits.

Impact Tests

159. A summary of the impact tests is produced below.

Statutory Equality Duties – the proposals should not have an impact.

Competition - the proposals do not change any competition elements for businesses.

Small firms - If small firms were not exempted, then the cost will only generally occur where assets are designated or they propose works that might require consenting. There is no extra regulatory burden on individual firms. The cost to each business category is expected to be up to £0.08 million under Option 1, reducing to £0.01 under Option 2.

Greenhouse gas – no implications beyond current position. Large projects by consent applicant will be subject to individual assessment as required under current prevailing legislation.

Wider environment – as greenhouse gas assessment.

Health – this proposal aims to reduce adverse health impact from flooding, or be neutral when looking at other issues such as ecological work.

Human Rights – there is, or will be, an appropriate right of appeal built in to provisions on designating features. Where registers or databases are considered, these will be compliant with human rights and data protection.

Justice – there may be a small impact on legal aid where those responsible for assets dispute the designation or are prosecuted for removing or altering the asset. However it is envisaged that most disputes will be resolved by negotiation with legal action as a last resort and few with responsibilities for third party assets are likely to qualify for legal aid.

Rural proofing – legislative changes apply equally to urban and rural areas.

Sustainable development – proposals are aimed to help facilitate statutory duty of EA and aims of other organisations to contribute to sustainable development.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added where the Specific Impact Tests yield information relevant to an overall understanding of policy options.

Annex 1: Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. If the policy is subject to a sunset clause, the review should be carried out sufficiently early that any renewal or amendment to legislation can be enacted before the expiry date. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

Basis of the review: A review of the effectiveness and utility of the new regulations will be carried out by 2016.
Review objective: A review of the regulations will establish whether the policy outcomes are being delivered.
Review approach and rationale: Primarily, the Environment Agency will monitor its use of the powers and the ongoing need to take enforcement action and/or carry out repairs itself
Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured] Number of interventions and costs outlined in Option 1, the reference case
Success criteria: Less enforcement action – and associated cost - by risk management authorities, in particular the Environment Agency
Monitoring information arrangements: Primarily via the management information collected by the Environment Agency, supplemented by available data on issues such as asset condition and use of powers
Reasons for not planning a review: n/a

Annex 2: Features of Legislation

This annex sets out the main features of the legislative provisions in the Flood and Water Management Act 2010

The main features of the *designation* process are as follows:

- Operating authorities may designate a feature on flood risk grounds:
    - A broad definition is applied to a feature; one can include a structure or a natural or man-made feature of the environment.
    - An operating authority can only designate a feature where it thinks that feature affects a flood or coastal erosion risk.
    - An operating authority can only designate in respect of its own risk management functions (i.e. the Environment Agency could designate in respect of a flood risk from a main river and the coast, and local authorities and Internal Drainage Boards in relation to ordinary watercourses and coastal protection).
    - An operating authority cannot designate a feature if it has been designated by another operating authority, or if it is owned by another operating authority (since that authority will already have risk management responsibilities).
- If an operating authority identifies a feature that it intends to designate, the owner must be informed in writing using the appropriate notice:
    - An owner is the person that owns the land on which a feature is present, or if different then the person responsible for managing or controlling the feature.
    - An operating authority must give an owner a provisional designation notice which sets out the period of notice, the feature to be designated, the reason for wanting to designate the feature and how the owner can make representations to the operating authority in respect of designation of their feature.
    - An operating authority may then formally designate a feature, but must consider any representations made. The designation notice must set out the feature designated, the reasons for the designation and information about the owner's right to appeal against the designation and the period within which an appeal can be brought.
- An operating authority may cancel a designation, and an owner may apply to an operating authority to seek a cancellation.

- As has been the case until now, the owner of a designated feature would be within their rights, and expected, to maintain the designated feature as previously to a reasonable and appropriate standard, but it will not be a formal duty under the Bill.

- The designation would prohibit alteration, removal or replacement of a feature without the consent of the designating operating authority.

- Consent of the operating authority could not unreasonably be withheld (i.e. if there is no effect on flood risk).

- Enforcement action may be taken by the designating/responsible authority if an owner alters, removes or replaces a feature without the appropriate consent. Failure to comply with an enforcement notice would be an offence.

- The designation would be a local land charge, meaning that the designation would not expire if property ownership changes hands.

- Arrangements for the local land charge would be the responsibility of the operating authority at no expense to the owner of the feature.

- A right of appeal will operate if an application for consent is turned down in respect of any proposed works to alter, remove or replace a feature.

The main features of the *enforcement* process are as follows:

- If someone alters, removes or replaces a designated feature without the consent of the operating authority administering the designation, the authority may issue an enforcement notice.

- An enforcement notice would be issued to the person who contravened the designation, or the landowner.

- An enforcement notice must specify the remedial action expected of the owner and the time period in which it is to be carried out.

- Failure to comply with an enforcement notice would constitute a criminal offence. The Bill stipulates that a fine can be imposed on summary conviction, up to level five on the standard scale.

- In default of an enforcement notice, the responsible authority may enter the land on which the feature is situated and take any steps specified in the enforcement notice. The authority would be entitled to recover costs as a civil debt.

- In the event of an emergency, if a person has breached a designation notice and there is an immediate and material risk of flooding, the authority may enter the land and take remedial action without recourse to an enforcement notice. Reasonable expenses may be recovered as a civil debt. This is without prejudice to exiting powers of operating authorities.

- An offence will be committed by any person that intentionally obstructs a person entitled to enter land under default or emergency powers, and will be subject to up to 2 years imprisonment, a fine or both.

The main features of the *appeals* process are as follows:

- Owners of features will have a wide right to make representations and appeal an operating authority's decisions at all stages of designation:
    - A person in receipt of a provisional designation notice will be entitled to make representations to the operating authority. The authority must consider any representations before taking a decision on confirming the designation.
    - A person in receipt of a designation notice will have a right to appeal the designation, within a certain period of time.
    - A person in receipt of a designation notice may request that it is cancelled, and has a right of appeal if the request is denied.
    - A person in receipt of an enforcement notice may appeal against the notice.
- Owners of features will have the right to seek consent to alter, remove or replace their features, and have the right to appeal the decision of the operating authority.
- The Bill includes a clause requiring Ministers to lay secondary legislation in respect of the right of appeal against designations and refusal of consent to alter, remove, replace or cancel a designated feature.

Annex 3: The Reference Case (Option 1)

Introduction

96,000 flood risk management assets / features help to protect people and property from the damage inflicted by flooding and coastal erosion. These features can be grouped into about 3,000 systems that work together to provide risk management to geographical areas. Around 35% of features are owned and/or operated by risk management authorities. However, about 65% of features are owned by third parties. Damage to any of these can affect the operation of risk management systems. Every time a feature is damaged, the expected benefit from the asset (and at least part of the system) will be lost for the length of time that damage is sustained. Risk management authorities will face a cost where compelled to arrange for - or carry out - a repair or replacement of the damaged feature.

The **reference case** is summarised in the tables that follow in this annex. The tables set out estimates for the current system of the losses (of benefit that should have been provided by assets that have been damaged) and the costs (to risk management authorities of arranging for or undertaking remedial works).

Notes on the Tables

The table below sets out individual aspects of the reference case that have been quantified. Each row quantifies an aspect or variable. For each row, the columns set out:

Reference ("Ref")	A unique alphanumeric for each aspect to allow cross-references
Value	An amount that is quantified
Unit	The unit in which the quantified amount is measured. For example, A value of "1" with a unit of "£" means "£1"
Description	An explanation of the aspect of the reference case that has been quantified, including formulae where (applicable)
Notes	Supplementary information about the aspect / variable
Sources	A brief indication of the source data (where applicable)

Table 1.1 - *Calculation of costs and losses under the status quo – which is used for calculating the difference between Option 1 (do nothing different) and Option 2 (introduce designations)*

Aspect	Ref	Value	Unit	Description	Notes	Sources:
Monetised benefit of risk management	A1	3155	£ m	Equivalent annual cost of flooding as though there were no risk management systems in place/operation.	Estimate of annual economic damages that would be experienced without any flood & coastal erosion risk management taking place (adjusted to 2010 prices)	From National Assessment of Flood Needs and Costs, and National Assessment of Flood Risk adjusted to 2010 prices. [CPI: http://www.statistics.gov.uk/StatBase/tsdataset.asp?vlnk=7174&More=N&All=Y] [See table 1.2]
	A2	1285	£ m	Equivalent annual cost of flooding that occurs despite risk management systems in place/operation.	Risk management authorities already intervene to minimise risk. Current intervention cannot avoid all flooding and erosion from occurring. This is the estimate of annual economic damages that are experienced with flood and coastal risk management taking place (adjusted to 2010 prices)	
	A3	1869	£ m	Equivalent annual benefit of risk management systems in terms of avoided economic damages.	Estimate of the overall benefit of flood and coastal erosion risk management. Economic annual damages represent the standard approach to valuing the effect and benefit of risk management.	
Monetised benefit per feature and per system	B1	3000	#	Total number of risk management systems in place.	Assets / features work together to provide risk management to an area. There are about 3000 systems in operation. The assets may be owned / managed by risk management authorities or third parties such as landowners.	From National Flood and Defence Database and the sources above.
	B2	96000	#	Total number of features / assets.	Each system is made up of individual assets / features that provide individual benefit to a locality as well as working together in systems to provide benefit to an area.	
	B3	62400	#	Number of third party features / assets.	About 65% of assets / features are owned by third parties. This equates to about 62400 individual third party assets.	
	B4	0.62	£ m	Average estimated annual benefit of a system. [Basis: A3 divided by B1]	This is the average benefit provided by each system's operation. It is expressed in terms of economic annual damages that would otherwise have been expected to have resulted from flooding.	
	B5	0.02	£ m	Average estimated annual benefit of an asset. [Basis: A3 divided by B2]	This is the average benefit provided by each individual asset / feature. This is consistent with the Environment Agency's estimate of the benefit of individual assets.	

Existing rate of intervention by risk management authorities in respect of third party assets / features	C1	4	%	Percent of the third party assets that are altered each year and that may cause concern to risk management authorities because of the increased flood risk that has resulted from the alteration.	Where a feature is owned by a third party, it can be subject to alteration or removal without consulting / consent from the relevant risk management authority.	Environment Agency
	C2	65	%	Proportion of the alterations (above) that require some form of intervention (e.g. oral or written communication) from a risk management authority before remedial action is taken and the risk is once again mitigated.	A proportion of the assets / features that area altered or removed causes risk management authorities to intervene and make good the damage to the risk management system.	
	C3	20	%	Percent of alterations that require more intensive intervention to remedy damage (e.g. formal letters, notices, prosecutions and works in addition to less formal oral and written communication).		
	C4	2.6	%	Overall percentage of third party assets requiring some intervention. [Basis: C1 and C2]		
	C5	1622.0	#	Equivalent number of third party assets (annual). [Basis: B3 and C4]		
	C6	0.8	%	Overall percentage of third party assets / features requiring active intervention due to an alteration. [Basis: C1 and C3]		
	C7	499	#	Equivalent number of features / assets requiring active intervention due to an alteration (annual). [Basis B3 and C6]		
Potential loss of benefits as a result of damage to	D1	10	£ *m*	Potential annual "loss" of benefit from assets (assumed no intervention) [Basis: B3, B5 and C6]	Each asset / feature should provide economic benefit. Risk management systems are made up of individual features. A loss of one of the assets could affect the integrity and benefit of the whole system.	Estimates

third party assets / features	D2	310	*£ m*	Potential annual "loss" of benefit to systems (*including* the monetised loss of benefit of individual assets from D1) [Basis: B4, C7 and D1]		
	D3	7.4	*Months*	Average time to effect repair [Basis: G3 in table 1.4]	Loss of benefit is finite. Normally, routine inspections will detect and often put right any damage. Typically the Environment Agency expects this to happen within 6 months. The evidence from the table to the right suggests that on average it takes 7.4 months, including the time that lapses between the damage taking place and repair / replacement being completed. The more involved the level of intervention, the longer and more costly it is.	
	D4	6.2	*£ m*	Expected annual "loss" of benefit due to damage to individual assets / features. [Basis: D1 and D3]		
	D5	191	*£ m*	*Potential* annual "loss" of benefit from systems (*including* the monetised benefit of individual assets at D1) [Basis: D2 and D3]		
	D6	15	*%*	Actual expected loss of benefit to systems (as % of potential)	Although assets / features work together in systems, the loss of an asset may not negate all benefit to the system, nor is it necessarily true that damage to individual features will be uniformly distributed across all systems. In order to test the policy, it is assumed that only 15% of the benefit of systems is negated.	
	D7	22.4	*£ m*	Expected actual loss of benefit to systems (*not including* the loss already attributed to individual third party assets / features at D4). [Basis: D5 and D6]		
	D8	28.6	*£ m*	Total annual loss of benefit. [Basis: D4 and D7]	Loss of benefit to individual features that have been damaged plus the loss to systems each year. The policy is designed to avoid the cost.	
Potential cost of replacing damaged third party assets / features	E1	397	*£*	Cost to risk management authority arranging for damage to be repaired, on average. [Basis: Table 1.3]	Each feature that requires replacement by the risk management authority will represent a cost, which the policy is designed to avoid. The Environment Agency typically expects a feature to cost £30,000 to £50,000 to replace. However, actual replacement by the risk management authority is relatively rare, when other measures can be taken to encourage the owner to make good damage that has been done.	Environment Agency and sources above
	E2	0.6	*£ m*	Total annual cost of intervention to risk management authorities. [Basis: Table 1.3]		

	E3	0.4	*£ m*	Estimate of cost to owners of complying with intervention (e.g. responding positively to communication and enforcement under existing byelaws)	Owners will face costs under Option 1 - the reference case - for complying with enforcement under existing byelaws that extend to some third party assets as well as responding positively to communications and formal letters. It is not possible to fully quantify the cost, but it is assumed for the purpose of impact assessment that the cost to owners is the same as the cost to risk management authorities, **excluding** 90% of the cost of works which are likely to be higher for risk management authorities that are constructing risk management features than to owners of repairing or replacing like-for-like (this is considered a conservative estimate).	Estimate
Summary of Option 1	**F1**	28.6	*£ m*	Annual loss of benefit. [Basis: D8]	Damage to assets / features results in a loss of benefit because the flood risk will not be managed as intended, and a cost will be incurred by risk management authorities in making good any damage.	
	F2	1.0	*£ m*	Annual cost of intervention. [Basis: E2]		
	F3	**29.6**	***£ m***	**Total annual loss and cost.** [Basis: F1 and F2]		

Table 1.2 - *Source data used in Table 1.1 from National Assessment of Flood Needs and Costs*

Ref	Value	Unit	Description / Source
G1	2700	*£ m*	Damages without risk management incl. structures and features
G2	1100	*£ m*	Damages incurred despite existence of structures and features
G3	1600	*£ m*	Overall benefits from risk management structures and features
G4	114.5	*CPI*	2010
G5	98	*CPI*	Equivalent year of NADNAC data
G6	116.8	*2010 prices*	Multiplier

Table 1.3 - *Enforcement rates and costs under the status quo*

Based on management information from the Environment Agency

		All assets – 2,385 require action a year				Third Party Assets – 1,622 per year			All assets	
Description	**Form of action**	**No. of actions (all assets)**	**Cost per action**	**Cost sub-total**	**% share assets requiring action**	**No. of actions for third party assets**	**Cost per action**	**Cost sub-total**	**Months per stage**	**Time to resolve (cumulative)**
Unit	*Type*	*#*	*£*	*£ m*	*%*	*#*	*£*	*£ m*	*Months*	*Months*
Value	Communication	2,385	135	0.32	100	1,622	135	0.219	3	3
	Formal letter	296	280	0.08	12.4	202	280	0.057	4	7
	Notice	67	1,500	0.10	2.8	46	1,500	0.069	6	13
	Prosecution	4	5,500	0.02	0.2	4	5,500	0.022	9	22
	Works	9	30,000	0.27	0.4	7	30,000	0.21	12	34
Calculations	**Total of all actions**	**2,761**	**289**	**0.80**	**n/a**	**1,881**	**307**	**0.6**	**On average**	**4.4**
	Average cost per feature*	**334**				**397**				

* Based on 2,395 assets needing action, of which 1,622 are third party assets. Some require more than one 'action', as indicated in the '% share of assets requiring action' column which is why the 'average cost per feature' is higher than the 'average cost per action'. On average, there are 1.16 'actions' per asset.

Table 1.4 - *Data on timing of repairs*

Description	Ref	Value	Unit	Notes
Time until damaged asset / feature is discovered by risk management authority	H1	3	Months	*Based on Environment Agency estimate of 3 to 6 months between routine inspections and works that would establish that an asset / feature has been damaged*
Average time per feature to undertake remedial action	H2	4.4	Months	Based on calculation at Table 1.3
Total lapse of time before a damaged asset / feature is repaired or replaced	H3	7.4	Months	Sum of H1 and H2

Annex 4: Option 2

SECTION 2.1 - COSTS

• ASSUMPTIONS AND EVIDENCE

The main assumptions about the policy intervention insofar as they affect the benefit cost analysis calculation have been set out in table 2.1 below including the costs of administering the new policy, the extent that the policy applies to the real-world problem and the phasing-in of the intervention.

Table 2.1

Value	Unit	Description	Source
278	£ per day	Staff costs, taken as a midpoint between estimated cost of a technician and a chartered engineer	Supplementary table (see below)
0.5	Days	Staff time to make a designation (provisional)	EA estimate
0.25	Days	Staff time to confirm a designation (final)	EA estimate
30	%	Equivalent staff time for handling enquiries	EA estimate
62400	#	Number of 'third party' assets / features	National Flood and Coastal Defence Database
3	Years	Phasing-in period	Defra
2012	Date	First year of implementation	Defra
4	%	Decisions to designate an asset that lead to an appeal	EA estimate
100	%	Equivalent cost to owners of making an appeal (compared to appeals body's costs)	Estimate

TABLE NOTES: The main variables quantified (above) are in terms of staff time to administer the policy, the number of third party assets and the anticipated demand for appeals, which is largely informed by the Environment Agency's experience of managing similar processes. Other key variables (below) include the cost of staff (from which time costs can be derived) and the cost of administering appeals.

Staff costs:

Table 2.2

Qualification	*Chartered Engineer* [(i)]	*Technician* [(ii)]	*EA staff* [(iii)]
Salary	*49000*	*34000*	*-*
NI	*5390*	*3740*	*-*
Pension	*6860*	*4760*	*-*
Overheads	*9800*	*6900*	*-*
Total per FTE	*71050*	*51300*	*50000*
Assumed working days per year	*220*	*220*	*220*
£ per day	*323*	*233*	*227*

Equivalent staff cost
278

TABLE NOTES: [(i)] and [(ii)] based on draft "Framework for costs and efficiency savings to local authorities from the new roles and responsibilities arising from the Flood and Water Management Bill 2009" prepared by the Local Government Centre, Warwick Business Schools and Atkins Limited; [(iii)] based on EA estimate.

Appeals costs:

Table 2.3			
Type of appeal[(iv)]	*Duration (Days)*	*Cost (£)*	*Assumed proportion (%)*
Basic	*0.5*	*500*	*80*
Written (minor)	*1*	*1000*	*10*
Written (major)	*1.5*	*1500*	*10*

Equivalent cost of appeal
650

[(iv)] based on Planning Inspectorate estimates. The cost of administering an appeal is largely dependent upon the relative complexity of the case and the type of appeal that is available. The table assumes that most appeals will be relatively basic, and centre on whether there is a risk present that is affected by the feature in question. A proportion are likely to be more complicated, and may include more detailed written opinion.

● ONE OFF COSTS

Note on **one off costs** - One off costs are expressed as a total one off cost and an annualised cost (or annual equivalent cost for each year of implementation; an annualised cost assumes an equal amount of cost is incurred in each year). This is consistent with the measures commencing at the start of a financial year. If measures commence during the course of the financial year then the cost profile would reflect that, although the total costs would not be affected. [See table 2.18]

Costs are expected to fall on risk management authorities (table 2.5), owners of assets / features (table 2.6 to 2.8) and the appeals body (table 2.9). Total one off costs are estimated at table 2.10.

Table 2.4		
Value	**Unit**	**Description**
25	%	Percent of third party assets / features that are designated
90	%	Min sensitivity, where applied
100	%	Mid sensitivity, where applied
110	%	Max sensitivity, where applied

TABLE NOTES: Not all features need to be designated as a risk based approach will be taken that would target for designation those features that are considered to be most vulnerable to damage or have the highest consequences in the event of a failure. The Environment Agency's evidence in the counterfactual indicates that there may be up to 1,600 features a year that require some form of intervention but that only around 500 need significant intervention in any given year. This indicates that not more than 25% of all assets would need to be designated for the policy to be effective given that a good standard of intelligence and experience has been built up by risk management authorities over a number of years.

○ To risk management authorities

Costs will fall on risk management authorities in making provisional and final designations, handling enquiries and representations and providing evidence for appeals. The total costs are dependent on how many features are designated and how many representations and appeals are made. The assumptions are set out in the table.

Table 2.5		
Value	**Unit**	**Description of cost / variable**
139	£	Making a provisional designation
42	£	Handling enquires on a provisional designation
70	£	Making a (final) designation
21	£	Handling enquiries on a (final) designation
15600	#	Number of features designated
42	£	Providing evidence for an appeal
4.9	**£ m**	**Total cost**
1.6	**£ m**	**Annualised cost over 3 years**

○ **To owners**

Some costs will fall on owners in understanding and making representations about provisional designations and final designations (table 2.6), and in making appeals (if the owner decides to object to the grounds on which a designation is made - table 2.7). The total is indicated in table 2.8.

- Cost of handling designations:

Table 2.6		
Value	**Unit**	**Description of cost / variable**
42	£	Making enquiries about a provisional designation. This is assumed to be about the same as the cost faced by the risk management authority.
21	£	Making enquiries about a (final) designation. This is assumed to be about the same as the cost to the risk management authority.
15600	#	Number of features
1.0	**£ m**	**Sub-total [A]**

- Cost of making appeals (including sensitivity test):

Table 2.7				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
635	650	665	£	Making an appeal (based on typical costs of environmental appeals. It is assumed that the cost to owners is broadly the same as the cost to the appeals body)
561.6	624	686.4	#	Number of appeals (based on the Environment Agency's experience with similar policies)
0.4	**0.4**	**0.5**	**£ m**	**Sub-total [B]**

- Total cost to owners:

Table 2.8				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
1.4	**1.4**	**1.5**	**£ m**	**Total cost [A** (designations from table 2.6) **+ B** (appeals from table 2.7)**]**

Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
0.5	**0.5**	**0.5**	**£ m**	**Annualised cost over 3 years**

○ **To appeals body**

Some costs will fall to the appeals body, based on the values at table 2.3.

Table 2.9				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
561.6	624	686.4	#	Number of appeals
0.4	**0.4**	**0.4**	**£ m**	**Total Cost**

0.1	**0.1**	**0.1**	**£ m**	**Annualised cost over 3 years**

○ **Total one off costs**

Total one off costs is the sum of the subtotals from table 2.5 to 2.9.

Table 2.10				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
4.9	4.9	4.9	£ m	Cost to risk management authorities
1.4	1.4	1.5	£ m	Cost to owners
0.4	0.4	0.4	£ m	Cost to appeals body
6.7	**6.7**	**6.8**	**£ m**	**Total costs**
2.2	**2.2**	**2.3**	**£ m**	**Annualised cost over 3 years**

● **ANNUAL COSTS**

○ **Assumptions**

Annual costs are incurred once the new system is up and running. The main variables include the costs of handling applications for an alteration, replacement or removal of a designated feature and any appeals that are made by owners. The total annual costs will depend on how many applications and appeals take place. The assumptions for benefit cost analysis are included in table 2.11.

Table 2.11		
Value	**Unit**	**Description of cost / variable**
314	£	Cost of processing an application
4	%	Percent of designations that are subject to a consent application
50	%	Equivalent cost to owner of making an application
10	%	Decisions on applications that lead to an appeal
100	%	Equivalent cost to owners of making an appeal (compared to appeals body's costs)

○ **To risk management authorities**

- Costs of consenting process:

Table 2.12				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
283	314	345	£	Processing consent applications
531	590	649	#	Number of consent applications
0.2	**0.2**	**0.2**	**£ m**	**Total annual**

TABLE NOTES: Consents will be from owners to the designating authority asking for permission to alter, replace or remove a designated feature.

- Costs of enforcement process:

Table 2.13		
Value	**Unit**	**Description of cost / variable**
94.5	%	Effectiveness of designations in preventing unconsented alterations. The Agency's policy is to follow through with enforcement in all cases in the public interest.
100	%	Enforcement rate using new powers where unconsented alteration has been made.
34	#	Equivalent number of cases.
90	%	Reduction in need to use byelaws (byelaws would need to be used where the Agency owns or maintains a feature that has not been designated)
100	%	Enforcement rate where byelaws remain the primary enforcement route
26	#	Equivalent number of cases enforced using byelaws
0.09	£	Total cost of enforcement (breakdown of cost of old vs new powers included in table 2.14)

Table 2.14		
Value	**Unit**	**Description**
0.05	£ m	Cost of enforcement using new powers
0.04	£ m	Cost of enforcement using old powers

TABLE NOTES: The assessment assumes that operating authorities will continue to seek a resolution in 100% of cases. Where a designation is made then the new enforcement powers will be used, however if there is damage to a feature that was not designated, then the old enforcement powers will continue to be used, where available. Designation will be risk based, meaning that in most cases enforcement is avoidable, and where enforcement is necessary then the new powers that go with the designation can be used.

Under the counterfactual (i.e. at the present time) the Agency can often resolve issues through discussion and written communication with owners. Although in many cases the damage has not been inflicted maliciously, the relatively light touch intervention is often enough to compel an owner to put right any damage that has been done to an asset, albeit that it takes time before the feature is repaired and fully functional again. It is a reactive policy.

Designations are designed to be preventative. By designating features (using a risk based approach) and putting in place a local land charge, it should encourage owners to do less damage to features and encourage people to look after them too. Where there is damage done, then enforcement may need to be pursued. This should be less frequently than at present because people will be better informed of the presence and importance of features and the risk of enforcement being taken against them if they don't act within the requirements of a designation. People will also know that they will be liable for covering costs involved. This should bring costs to risk management authorities down over time, and will significantly reduce the length of time that features are damaged and therefore increase the overall avoidance of economic damages when compared to the counterfactual.

The calculation assumes that the designation process takes the place of the bulk of the basic communications previously taking place, and that where a formal letter, notice or prosecution may have been previously required, the new powers are used to issue a notice and prosecute if necessary. Where a designation has not been made and enforcement is taken using the existing byelaws, then the costs are equivalent to Option 1.

- **To owners of assets / features**

Table 2.15				
Value			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
141.3	157	172.7	£	Making an application for consent
530.7	589.7	648.6	#	Number of consent applications
0.1	0.1	0.1	£ m	Cost of consents
585	650	715	£	Making an appeal
48	59	71	#	Number of appeals
0.03	0.04	0.05	£ m	Cost of appeals
0.13	**0.14**	**0.15**	**£ m**	**Total annual**

TABLE NOTES: Costs to owners will relate to applications for consents and appeals, and total amounts depend on the number of applications and appeals made. The figures are informed by similar processes the Environment Agency already administers.

○ **To appeals body**

Table 2.16				
Value[i]			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
90%	100%	110%		
48	59	71	#	Number of appeals cases
0.03	**0.04**	**0.05**	**£ m**	**Total annual**

[i] Values for minimum, mid, and maximum range determined by preceding tables

○ **Total annual costs**

Total annual costs is the sum of the sub totals in table 2.12 to 2.16.

Table 2.17				
Value[i]			**Unit**	**Description of cost / variable**
(Min)	(Mid)	(Max)		
0.29	0.29	0.29	£ m	Risk management authorities
0.13	0.14	0.15	£ m	Owners
0.03	0.04	0.05	£ m	Appeals body
0.45	**0.47**	**0.49**	**£ m**	**Total annual**

● **COST PROFILES**

Cost profiles have been set out in table 2.18 to 2.22 and 2.25. The tables use the data on costs from the preceding tables.

The profiles represent an estimate of the cost in each financial year following commencement. Each year of the profile includes both the one off and the ongoing annual cost that may be incurred. Table 2.18 assumes that the one off costs are incurred in equal amounts over the course of the phasing-in period (i.e. 3 years) and the building up of annual costs as more features are designated each year. In reality, the annual costs may accrue less quickly if owners are less inclined to put in an application for an alteration, removal or replacement in the short term following a designation; it is not possible to accurately predict. It is also possible that one off costs are spread across a greater or lesser number of years if that is what the risk management authority decides it would prefer.

○ **Overall profile for annualised one off and annual costs**

Table 2.18						
Year	**Annualised one off costs incurred pa (%)**	**Annual costs incurred pa (%)**	**Unit**	*% of one off cost incurred each year*	Equivalent financial year
2012-2013	33.3	33.3	%	*33.3333333*	1
2013-2014	33.3	66.7	%	*33.3333333*	2
2014-2015	33.3	100.0	%	*33.3333333*	3
2015-2016	0.0	100.0	%	*0*	4
20xx-xx	0.0	100.0	%	*0*	Ongoing

○ **For risk management authorities**

Table 2.19				
Year	**Range**			**Unit**
	(Min)	(Mid)	(Max)	
2012-2013	1.73	1.73	1.73	£ m
2013-2014	1.83	1.83	1.83	£ m
2014-2015	1.92	1.92	1.92	£ m
2015-2016	0.29	0.29	0.29	£ m
20xx-xx	0.29	0.29	0.29	£ m

○ **For owners of assets / features**

Table 2.20

Year	Range			Unit
	(Min)	(Mid)	(Max)	
2012-2013	0.51	0.51	0.55	£ m
2013-2014	0.55	0.56	0.60	£ m
2014-2015	0.60	0.61	0.65	£ m
2015-2016	0.13	0.14	0.15	£ m
20xx-xx	0.13	0.14	0.15	£ m

○ **For appeals body**

Table 2.21

Year	Range			Unit
	(Min)	(Mid)	(Max)	
2012-2013	0.10	0.15	0.15	£ m
2013-2014	0.15	0.16	0.17	£ m
2014-2015	0.16	0.17	0.18	£ m
2015-2016	0.03	0.04	0.05	£ m
20xx-xx	0.03	0.04	0.05	£ m

○ **Total cost profile**

Table 2.22

Year	Range			Unit
	(Min)	(Mid)	(Max)	
2012-2013	2.34	2.39	2.43	£ m
2013-2014	2.53	2.55	2.6	£ m
2014-2015	2.68	2.7	2.75	£ m
2015-2016	0.45	0.47	0.49	£ m
20xx-xx	0.45	0.47	0.49	£ m

TABLE NOTE: Based on amounts in Table 2.19 and 2.21

● **POTENTIAL COST TO BUSINESS**

The share of the costs that accrue to business in table 2.23 to 2.25 are based on data from the National Flood Risk Assessment 2008 (see table 2.26); a sensitivity range has been included.

○ **One off**

Table 2.23

Ranges	(Min)	(Mid)	(Max)	Unit
	20	22	24	%
(Min)	0.3	0.3	0.3	£ m
(Mid)	0.3	0.3	0.3	£ m
(Max)	0.3	0.3	0.4	£ m

○ **Annual**

Table 2.24

Ranges	(Min)	(Mid)	(Max)	Unit
	20	22	24	%
(Min)	0.03	0.03	0.03	£ m
(Mid)	0.03	0.03	0.03	£ m
(Max)	0.03	0.03	0.04	£ m

○ **Cost profile (based on Mid ranges)**

Table 2.25

Year	Range (Mid) : 22%	Unit
2012-2013	0.11	£ m
2013-2014	0.12	£ m
2014-2015	0.13	£ m
2015-2016	0.03	£ m
20xx-xx	0.03	£ m

Table 2.26

Value		Unit	Description
Residential	**Other**		
372578	205323	#	Properties at significant risk
655497	222682	#	Properties at moderate risk
1028075	428005	#	Total
70.6	29.4	%	
-	22.05	% (estimate)	Share for business

Source: Nafra 2008: Appendix H

SECTION 2.2 - BENEFITS

● **Total costs and "losses" under counterfactual / option 1**

Table 2.27

Value	Unit	Description of cost / variable
499	#	Equivalent number of features / assets requiring active intervention due to an alteration (annual).
6.2	£ m	Expected annual "loss" of benefit due to damage to individual assets / features.
22.4	£ m	Expected actual loss of benefit to systems (not including the loss already attributed to individual third party assets / features at D4).
0.6	£ m	Total annual cost of intervention to risk management authorities.
0.4	£ m	Estimated total annual cost of compliance for owners.
29.6	**£ m**	**Total annual cost and loss**

● **Total costs and "losses" under new policy (mid sensitivity)**

Table 2.28

Value	Unit	Description of cost / variable
4.3	£ m	Annual "loss" of benefit due to damage to assets / features
0.5	£ m	Expected annual cost of intervention under the new policy
4.8	**£ m**	**Total annual cost and "loss" under new system**

Table 2.29

Value	Unit	Description
0.4	£ m	"Loss" to individual assets until enforcement concluded using new powers under Schedule 1
0.4	£ m	"Loss" to individual assets until enforcement concluded using existing byelaws where a designation is not applicable
1.8	£ m	"Loss" to systems until enforcement concluded using new powers
1.7	£ m	"Loss" to systems until enforcement concluded using existing byelaws
2.2	£ m	Total "loss" using new powers
2.1	£ m	Total "loss" using existing byelaws
4.3	£ m	Total "loss" (both)

- **Total benefit of new policy (mid sensitivity)**

Table 2.30

Value	Unit	Description of cost / variable
24.3	£ m	Reduction in annual "loss" from designations policy [Benefit]
0.5	£ m	Reduction in annual cost under new policy [Benefit] *
24.8	**£ m**	**Total annual benefit**

Table 2.31

	Unit	Status quo	Option 2
Annual loss	£ m	28.6	4.3
Annual cost	£ m	1.0	0.5
Benefit	£ m	n/a	24.8

Table 2.32

	Unit	To businesses	To householders	To public
Cost	£ m	0.792	2.8	10.4
Benefit	£ m	126.5	149.90	131.5

● **Overall:**

Table 2.33		
Value	**Unit**	**Description of cost / variable**
25	*Years*	*Time period*
17.0583676	*#*	*Discount factor*
6.7	*£ m*	*Total transition cost*
3	*Years*	*Transition period (spread across four financial years)*
2.2	*£ m*	*Average Annual transition cost*
24.8	*£ m*	*Average Annual Benefit (not adjusted for phasing)*
0.47	*£ m*	*Average Annual Cost (not transition) (not adjusted for phasing)*
407.6	**£ m**	**PV Benefit**
14.0	**£ m**	**PV Cost**
393.7	**£ m**	**PV Net Benefit (PV Benefit minus PV Cost)**
29 : 1	**BCR**	**Benefit to Cost Ratio (PV Benefit divided by PV Cost)**

● **To individual sectors:**

Table 2.34			
Value	**Unit**	**Description of cost / variable**	
126.5	£ m	PV Benefit	Businesses' Share
0.8	£ m	PV Cost	
125.7	£ m	PV Net Benefit	
160 : 1	BCR	Benefit to Cost Ratio	
149.8	£ m	PV Benefit	Householders' Share
2.8	£ m	PV Cost	
147.0	£ m	PV Net Benefit	
53 : 1	BCR	Benefit to Cost Ratio	
131.3	£ m	PV Benefit	Wider Public Benefit Share (cost is cost to public sector)
10.4	£ m	PV Cost	
120.9	£ m	PV Net Benefit	
13 : 1	BCR	Benefit to Cost Ratio	

TABLE NOTE: Cost to each sector is based on the same proportions identifies by the Long Term Investment Strategy (see table 2.35)

Table 2.35		
Value	**Unit**	**Description**
16	%	Share of benefit accruing to business insurance
11	%	Share of benefit accruing to commerce
5	%	Share of benefit accruing to agriculture
32	**%**	**Share of benefit to business**
27	%	Share of benefit accruing to domestic insurance
10	%	Share of benefit accruing to householders
37	**%**	**Share of benefit to householders**
31	**%**	**Wider public benefit**

Source: Environment Agency: Long Term Investment Strategy (p8)