

Summary: Intervention & Options

Department /Agency: Defra	Title: Impact Assessment of transposing and implementing the EC Floods Directive in England and Wales	
Stage: Post-consultation	Version: 2.0	Date: 1 September 2009
Related Publications: The Pitt Review: Lessons learned from the Summer 2007 floods; Floods and Water Bill consultation - Floods Directive impact assessment.		

Available to view or download at:

<http://www>.

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

The European Commission Floods Directive aims to reduce the risk of flooding by ensuring that flood risk from all sources is assessed and managed in a consistent way. This approach is consistent with established government policy which is to extend flood risk management from coastal and main river flooding to include local flood risk and combined risks (i.e. floods from more than one source). Government intervention is needed to provide the necessary powers to coordinate flood risk management from all sources, the Directive adding a more challenging timeframe to this process. Transposition also reduces the risk of infraction penalties.

What are the policy objectives and the intended effects?

Implementing the Floods Directive is intended to draw together and enhance existing and developing flood risk appraisals and maps in order to inform management plans that address flood risk from all sources. The flood risk management plans will enable decisions as to where to implement flood risk management measures and reduce flood risk.

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

The options of doing nothing more and comprehensive implementation of the Floods Directive were compared and presented for the consultation on the Flood and Water Management Bill. However, although existing flood risk management goes some way towards meeting the Floods Directive requirements it falls short in terms of a co-ordinated assessment of flood risk from all sources. It would therefore carry a high risk of infraction penalties and the preferred option here is a comprehensive implementation of the Directive, drawing on existing maps and plans so as to reduce costs where appropriate.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects? A full review is expected after the EC has provided feedback following the first cycle of appraisals, maps and plans, in 2016. Interim reviews are likely to be carried out after each product is completed.

Ministerial Sign-off For SELECT STAGE Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Date:

Summary: Analysis & Evidence

Policy Option:	Description: -
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COSTS	ANNUAL COSTS	Description and scale of key monetised costs by 'main affected groups' Most costs will arise from the co-ordination and production of appraisals, maps and plans. The Environment Agency and upper tier local authorities will incur costs in enhancing their flood risk documents to meet Directive requirements; costs not directly attributed to the Directive are accounted for in the local flood risk management IA.	
	One-off (Transition) Yrs		
	£ 6.26-6.66m		
	Average Annual Cost (excluding one-off)		
	£ 0	Total Cost (PV)	£ 6.26-6.66m
Other key non-monetised costs by 'main affected groups'			

BENEFITS	ANNUAL BENEFITS	Description and scale of key monetised benefits by 'main affected groups' Annual costs of enhancements to the evidence base and definition of strategic objectives for all flooding sources are expected to amount to a very small proportion of the current government funding (about 0.25%) and should enable more effective flood risk management and thus achieve a reduction in flood damages that exceeds the costs.	
	One-off Yrs		
	£ 0		
	Average Annual Benefit (excluding one-off)		
	£ 0	Total Benefit (PV)	£ 0
Other key non-monetised benefits by 'main affected groups' Public understanding and engagement should improve as a result of consultation on, and publication of, the maps and plans required by the Directive.			

Key Assumptions/Sensitivities/Risks After the first cycle, the cost of flood appraisal, maps and plans are assumed to decrease by two-thirds. The EA may not need to produce preliminary flood risk assessments for main river and coast as they already hold equivalent information.

Price Base Year	Time Period Years	Net Benefit Range (NPV) £ 0	NET BENEFIT (NPV Best estimate) £ 0
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What is the geographic coverage of the policy/option?	England and Wales
On what date will the policy be implemented?	26 November 2009
Which organisation(s) will enforce the policy?	Environment Agency
What is the total annual cost of enforcement for these organisations?	£ n/a
Does enforcement comply with Hampton principles?	Yes
Will implementation go beyond minimum EU requirements?	No
What is the value of the proposed offsetting measure per year?	£
What is the value of changes in greenhouse gas emissions?	£
Will the proposal have a significant impact on competition?	No
Annual cost (£-£) per organisation (excluding one-off)	Micro Small Medium Large
Are any of these organisations exempt?	No No N/A N/A

Impact on Admin Burdens Baseline (2005 Prices)		(Increase - Decrease)
Increase of £	Decrease of £	Net Impact £

Key: Annual costs and benefits: Constant Prices (Net) Present Value

Evidence Base (for summary sheets)

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

What is the problem under consideration?

Following a series of major floods across Europe between 1998 and 2004, the European Commission proposed a directive that would aim to reduce the probability and consequences of similar flooding in the future. It devised a process of flood risk appraisal and mapping for all sources of flooding (although flooding from sewerage systems may be excluded) as a basis for developing flood risk management plans. These plans should set out objectives and measures for reducing flood risk.

In England and Wales the challenge is to improve our existing evidence base to better determine where and when we should target flood risk management measures. We need to enhance existing flood risk appraisals, maps and plans and ensure that they consider all sources and combinations of flooding.

The independent report by Sir Michael Pitt, Learning Lessons from the 2007 Floods (“the Pitt Review”) provides an important backdrop to this impact assessment. It found that the legislative framework for flood risk management was fundamentally important in managing risk now and in the future, but that the current legislation was fragmented and presented significant gaps. For example, flood management legislation today is contained in the Land Drainage Act 1991; the Water Resources Act 1991; the Environment Act 1995; and the Water Act 2003, with aspects of the Town and Country Planning Act 1990, Building Act 1984, Highways Act 1980 and the Civil Contingencies Act also relevant.

A number of gaps were identified, such as who is responsible for different sources of flooding (fluvial, coastal, surface and groundwater), with particular reference made to surface water and ground water which needed to be defined. Under the current regime there is limited scope for approaches to flood risk management such as increased resilience and adaptation and lastly there is little flexibility to allow legislation to keep up with scientific, technical and policy developments.

In acknowledging that current legislation is insufficient for today’s challenges, Sir Michael Pitt identified that implementation of the EC Flood Directive would address some of the issues and gaps in the current legislative framework but stressed the importance of having a single unifying act on flood risk management and he put forward 92 recommendations in total covering a wide spectrum of flood risk management issues from flood forecasting to the response and maintenance of essential services.

In view of the work under way to implement the Pitt Review recommendations, some of which is being done in advance of the new legislation, and developing proposals for the draft Flood and Water Management Bill, our policy objectives are to:

- understand the extent to which current flood management practice and arrangements go towards meeting the obligations of the Directive;
- decide how we can make best use of available resources to meet any additional Flood Directive requirements.

Requirements and timetable for the Floods Directive

The Floods Directive requires Member States:

- a. To draw together a Preliminary Flood Risk Assessment (PFRA) by 22 December 2011 based on available or readily derivable information.
- b. On the basis of the PFRA, to identify areas of potentially significant flood risk ('significant risk'). Member States may decide the flood risk threshold above which a significant risk applies, which in effect means a flood risk of sufficient magnitude to require further assessment and possible intervention.
- c. For those areas of significant risk, to prepare Flood Hazard Maps, showing the probability and nature of future floods and Flood Risk Maps showing potential consequences of floods by 22 December 2013.
- d. For these mapped areas, to produce Flood Risk Management Plans (FRMPs) by 22 December 2015 that set out objectives and measures aimed at reducing the consequences of and/or likelihood of flooding.

These deliverables must cover a consistent area of land, or unit of management, (set either at the river basin district level or river catchment level, or equivalent areas for coastal flooding).

The PFRAs and FRMPs must include an assessment of the impact of flooding on cultural heritage, the environment, economic activity and human health and outline measures, in the FRMPs, to address these impacts. In determining the threshold for significant risk we will need to determine the relative importance of flood impact on cultural heritage, environment and economic activity, and combinations of these negative consequences, compared with the effect on human health.

The appraisal, mapping and planning sequence continues thereafter on a 6-year cycle, although the second cycle PFRA is not due until 2018. However, we propose to bring this forward one year to allow two years for the subsequent mapping, in common with other Directive deliverables.

Why is Government intervention necessary?

Government intervention is necessary to address a market failure whereby investment decisions fail to adequately address the resulting increase in flood risk. For example, where the progressive development of an area results in a cumulative increase in surface water flood risk, individual investors may be under no obligation to mitigate for their actions.

Government policy, reinforced by the Pitt Review, is to reduce the risk of flooding and its impact in the light of climate change. Through implementing the Directive we will seek to enhance our evidence base, working closely with land use planning authorities, and set objectives and measures in flood risk management plans that reduce flood risk and promote sustainable development. These objectives and measures should in turn ensure that land use planning decisions require developers to manage any increase in flood risk presented by their proposals.

Through implementing the Floods Directive we need both to enhance existing flood risk appraisals and maps where they fall short of Directive requirements and to ensure that future plans and decisions secure a co-ordinated, strategic approach to reducing flood risk from all sources. The current direction of travel for flood management policy is to extend existing practice, which focuses on river and coastal flooding, to incorporate local flood risks including surface water and combined flooding, i.e. flooding arising from more than one source. The Directive timescales mean that we will need to progress this work more quickly.

Sectors and groups affected

As outlined in the draft Flood and Water Management Bill (the Bill), the Environment Agency will be responsible for main river, reservoirs and coast. County or unitary authorities will be responsible for local flood risk in respect of ordinary water courses, ground and surface water. This is in line with the recommendations made in the Pitt Review.

Since the burden of producing the preliminary risk assessments, maps and management plans for the purposes of the Directive will fall to the Environment Agency (the EA) for main river, coast and reservoirs and a Lead Local Flood Authority (which will be either a County or unitary Authority) we do not expect any burdens, including administrative ones, to fall on any particular business sector or on the public.

Policy options considered

The options taken to consultation as part of the draft Flood and Water Management Bill were:

(1) to do nothing more, or;

(2) a proportionate transposition.

Responses from the consultation indicated a clear preference for option 2, however both options are described below.

Option 1 (rejected) – do nothing more

This option sets out current practice and arrangements for flood risk management, assesses the extent to which they meet the Floods Directive requirements and explores the costs, risks and benefits of continuing with the status quo.

Existing and developing flood risk management practice

In relation to **local flood risk and reservoirs**, the Pitt Review put forward a number of recommendations, listed below as they specify action that is in line with the Flood Directive requirements. They are:

- Recommendation 14: Local authorities should lead on the management of local flood risk, with the support of the relevant organisations
- Recommendation 16: Local authorities should collate and map the main flood risk management and drainage assets (over and underground), including a record of their ownership and condition
- Recommendation 18: Local Surface Water Management Plans, as set out under PPS25 and coordinated by local authorities, should provide the basis for managing all local flood risk

In relation to the three recommendations above, local authorities already prepare preliminary flood risk assessments in the form of Strategic Flood Risk Assessments (SFRAs) under Planning Policy Statement 25 on development and flood risk. SFRAs underpin the spatial planning system and guide the location of future development to avoid and minimise flood risk.

Level one SFRAs are carried out in areas where neither flood risk nor development pressure is a major issue and are essentially a desk based study whereas level two SFRAs provide further detail on flood risk from all sources. In addition, certain areas, depending on the risk of flooding posed, are being funded to prepare flood risk management plans in the form of Surface Water Management Plans, which will map areas to identify flooding hotspots and outline measures to reduce and manage local flood risks.

- Recommendation 57: The Government should provide Local Resilience Forums with the inundation maps for both large and small reservoirs to enable them to assess risks and plan for contingency, warning and evacuation and the outline maps be made available to the public online as part of wider flood risk information.

Work is well underway to map the inundation paths and consequences of reservoir dam failure, to share this information with emergency planners. This will also help reservoir undertakers (owners or operators) to prepare reservoir flood plans to reduce the probability of flooding.

In response to the Pitt Review Defra has developed the draft Flood and Water Management Bill, which seeks to simplify the framework for managing the risk of flood and coastal erosion and addresses many of Sir Michael's recommendations including those listed above. However, as indicated above, action is being taken in advance of this legislation and this is outlined in our first six-monthly progress report on the implementation of the Pitt report (<http://defraweb/environ/fcd/floods07/pitt-progress090625.pdf>)

In relation to flood risk from **main rivers and coast**, flood risk assessments are already carried out in the form of the national flood risk assessment (NAFRA¹) and Flood Map, which provides information on flooding from rivers and the sea for England and Wales. The Flood Map² also has information on flood defences and the areas benefiting from those flood defences. Flood risk maps and management plans already exist for main river and sea flooding. These take the form of Catchment Flood Management Plans (CFMPs) and Shoreline Management Plans (SMPs).

The cost of producing these various products and the extent to which they meet Flood Directive requirements are detailed in the table below.

Table 1: Assessment of coverage and costs of current flood risk management activity

Item and (owner)	Description	Costs	Extent to which they meet Floods Directive requirements
National Flood Risk Assessment – NAFRA (EA)	NaFRA is a national assessment of flood risk from rivers and the sea across the whole of England and Wales. It estimates the likelihood of flooding and the expected cost of the damage that flooding could cause to property and other structures in the floodplain.	£1m average annual costs	Likely to meet some of the requirements for PFRAs and Flood Risk and Hazard Maps – although only on a national and overarching scale. No assessment of impacts to human health, cultural heritage, the environment and economic activity detailed.
Surface and Groundwater Flood Risk Information Project (EA)	This project will develop suitable tools, techniques and methods for risk assessment of areas susceptible to surface water flooding. Includes collection of historical data in form of maps showing susceptible areas, and a final science phase which will look at the future context for incorporating surface water flood risk into planning.	£1m one-off costs	Likely to meet some of the requirements for PFRAs. Unclear on extent to which impacts to human health, cultural heritage, the environment and economic activity detailed.
Floods Map (EA)	The Flood Map is a multi-	£12.4m annual costs	Likely to meet some of

¹ <http://www.environment-agency.gov.uk/research/library/publications/108660.aspx>

² <http://www.environment-agency.gov.uk/homeandleisure/floods/31656.aspx>

	layered map which provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.		the requirements for PFRAs and Flood Hazard Maps. Likely to need more on impacts to human health, cultural heritage, the environment and economic activity detailed.
Catchment Flood Management Plans - CFMPs(EA)	<p>CFMPs build on the National Flood Risk Assessment by understanding all flood risk in a Catchment, and how flood risk may change in the future as a result of climate change or different land use. Each CFMP includes the following:</p> <ul style="list-style-type: none"> • Catchment overview – a thorough overview of the hydrology, land use and other characteristics of the catchment. • Current flood risks and management – a broad account of the existing flood risks and the protective regime already in place to manage them. • Future flood risk – an assessment of how the risks may evolve, for example through climate change. • Policy appraisal – an examination of what actions are possible to meet the objectives in each specific area within the catchment. 	£16m - £20m (one-off costs for 77 CFMPs)	Likely to meet the requirements for Flood Risk Management Plans. Unclear extent to which impacts to and measures for human health, cultural heritage, environment and economic activity detailed.
Shoreline Management Plans - SMPs(EA and LAs in partnership)	<p>SMPs set out a framework for dealing with coastal flooding and erosion risks. Fully account for impacts on people and the developed, historic and natural environment. They take climate change impacts into account in planning long-term policies and set in motion actions over the 100 year horizon to achieve a sustainable shoreline</p> <p>In setting a longer term view on the coast, SMPs use the latest available information on physical coastal changes, and social,</p>	£5.5m (one-off costs to produce 22 plans and associated reports.)	Likely to meet the requirements for Flood Risk Management Plans. Unclear extent to which impacts to and measures for human health, cultural heritage, environment and economic activity detailed.

	economic and environmental data. It sets out proposed management options to deal with suggested flood and coastal erosion risk management policies for 20, 50 and 100 years into the future.		
Strategic Flood Risk Assessments – SFRAs (LAs)	Level I SFRAs underpin the spatial planning system and guide the location of future development to avoid and minimise flood risk Level II SFRAs go into greater detail and should assess risk from all sources of flooding.	Between £5,000 and £40,000 per local authority, so between £860,000 and £6.88m in total for all 172 upper tier/unitary authorities in England and Wales (The variation is due to the number of local planning authorities involved, their geographic area, the complexity of the flooding and the degree of additional modelling required.)	Likely to meet most of the requirements for PFRAs and Flood Hazard Maps. However, SFRAs vary in quality and detail depending on geography and circumstances. Therefore many may not all meet requirements set out in Floods Directive.
Surface Water Management Plans (SWMPs) (LAs)	SWMPs allow key local partners with responsibility for surface water and drainage in their area work together to understand the causes of surface water flooding and agree the most cost effective way of managing surface water flood risk.	Reasonable median costs are in the range £75k to £150k to which we should add £15k for the average input required from Environment Agency ³ staff. It is a fair assumption to assume a similar resource input from water companies. Total costs are therefore in the range £105k to £180k.. The national cost of SWMP is therefore in the range £10.2m to £33.5 m. ⁴	Likely to meet most of the requirements for Flood Risk Management Plans. Unclear extent to which the 6 plans currently being developed as part of the pilot will cover impacts to human health, cultural heritage, environment and economic activity.
Reservoir Mapping (EA)	All reservoirs over 10,000m ³ to be mapped by end of 2010. Flood hazard maps are currently being produced for large raised reservoirs (over 25,000m ³)	£1,500.00/reservoir = £ 7m	Likely to meet most of the requirements for PFRAs and Flood Hazard Maps. Impact of past and future flooding on economic activity, cultural heritage and the environment needs to be included for reservoirs over 10,000m ³ All reservoirs will need to be included in PFRAs

³ Estimate from first edition SWMP based on 0.33 FTE (at grade 5) per SWMP.

⁴ Halcrow Group Limited, Impact Assessment of Local Flood Risk Management, Supplementary Evidence Base, August 2009

Total one off costs		£40.56m-73.88m	
Total average annual costs		£13.4m	

Risks

The current approach to flood risk management presents a number of risks because not all the assessments, maps and plans detailed above meet the full requirements of the Floods Directive. These are detailed below:

- a) Under the status quo, with the EA responsible for Main River and coastal flooding and county and unitary authorities beginning to take responsibility for local flood risk from ground water, surface water and ordinary watercourses, there are no means by which all these risks are taken and assessed together to identify their combined impacts. For example, the risk from main river and surface water assessed separately may lead to a conclusion that risks posed are not significant, but if they are assessed together may lead to a conclusion that in combination they are potentially significant. Under the status quo therefore, there is a risk that we are not properly identifying and assessing flood risk from all sources. This risk would be minimised if we combined risk assessments, maps and plans at a unit of management area as required by the Flood Directive (This is required by Article 3.2 (b) of the Directive). Adopting a unit of management would mean, therefore, that we can take all risk assessment done by the EA and LAs together for one unit of management and assess the information together and then determine future mapping and management planning needs.
- b) there is a lack of consistent preliminary screening of flood risk from local flooding sources (ordinary watercourses, surface water and groundwater) by local authorities. Although Strategic Flood Risk Assessments make a broad assessment to inform spatial planning considerations, these assessments vary depending on geographic size and local circumstances and do not consistently consider all sources of flooding (e.g. fluvial, tidal, surface water and/or groundwater);
- c) in addition, these preliminary flood risk assessments and the various management plans, do not consider in detail the impact of flooding on human health, economic activity, cultural heritage and the environment, as required under the Directive (Article 4.2 (b) and (d) and Article 7.2).
- d) in addition, the Floods Directive requires Flood Hazard Maps, to show the probability of the flooding event, and Flood Risk Maps to show the impact of a future flooding event. The assessment above shows that currently there is some work being done to demonstrate Flood Hazard Mapping but not consistently across the board and very little is being done to produce Flood Risk Maps for national flood risk and local flood risk.

Aside from the limitations in current risk management practice, not transposing or fully complying with EU legislation will result in infraction proceedings being initiated against the UK. Under article 17 of the Floods Directive, Member States shall 'bring into force the laws, regulations and administrative provisions necessary to comply with this directive before 26 November 2009'. Under Article 226 of the EC Treaty, the European Commission (the Commission) is able to start infraction proceedings against countries who fail to transpose Directives in time, which can ultimately end up with fines as much as E20, 000 a day being imposed.

Currently the Commission operates a two stage process, which means that so long as Member States make sure that they have transposed by the time that the European Court of

Justice (ECJ) issues its first judgment, there is no possibility of a fine being imposed. However, when the Lisbon Treaty comes into force, which could well happen this autumn, the ECJ could impose a fine the first time that the case goes to them. Therefore even if a Member State has transposed by the time the case got to court, they could still be fined for failure to meet the deadline.

The risks relating to late transposition have also increased as the Commission is now giving priority to non-transposition cases. This means that if we fail to transpose on time, we can expect them to begin this process immediately and be fined a lot earlier. Recent ECJ decisions also show an increasing willingness to impose substantial fines.

Although the risk of infraction is not, in itself, the rationale for government intervention, it should be noted that apart from the financial implications, a fine would have important reputational consequences for the UK, especially as the UK has never been fined by the ECJ for non-transposition.

Benefits

There is a relatively strong evidence base from the work being done to assess and manage flood risk from main rivers and coast. While the situation on local flood risk management is developing, with local authorities just beginning to take charge of local flood risk, this will lead to a greater appreciation of flood risks posed and more effective flood risk management.

Conclusion

There is a case to be made for not transposing the Floods Directive and it rests mainly on the fact that work is being carried out that delivers some of what is required under the Directive.

However, the case for not transposing is weak. This is because under the status quo:

- a. there is a strong risk of infraction proceedings being bought against the UK if we do not transpose the Directive into domestic law, which could cost us E20,000 a day, not to mention the reputational damage; and
- b. there are still gaps in flood risk assessments and flood risk mapping, especially in terms of local flood risk management, where our practices and capabilities are still developing;
- c. the assessment of the impact of floods on human health, the environment, cultural heritage and economic activity is limited; this is a key requirement of the Floods Directive; and
- d. we do not assess the whole picture in terms flood risk from all sources together so that we might understand the **combined** impact flood risks from different sources might have. Therefore, currently our mapping and management plans only cater for a particular source of flood risk without assessing the impact of the combined risk from all sources of flooding.

Option 1 is therefore not the preferred option.

Option 2 (preferred) - proportionate transposition

Under this option we consider the cost of producing the deliverables needed to fully comply with the Directive and the administrative arrangements for implementation. This includes determining an appropriate unit of management, how a scrutiny/quality assurance mechanism will work and whether we should include flooding from sewerage systems within our implementation. The costs of the current activities undertaken to assess, map and plan for flood risk are included as a baseline comparison.

In assessing the costs of producing the deliverables necessary to comply with the Directive and the benefits to be derived from producing them, this option is preferred.

Although this option requires us to meet the Floods Directive requirements in full, we have the advantage of an advanced starting position. Flood risk management in England and Wales already addresses Main River and coastal flooding and, in the light of the summer 2007 flooding and the Pitt Review, is now focusing on surface water, groundwater and reservoirs. In many respects transposing and implementing the Directive simply means continuing this evolution of maps and plans, and then co-ordinating the outputs to meet the requirements of the Directive.

Legal approach to transposition

Given the proposed changes to flood risk management roles and responsibilities set out in the draft Flood and Water Management Bill, and the central role that the Floods Directive will play in future flood risk mapping and planning, we originally planned for transposition to be done through the final Bill. However, in view of the significant risk of not meeting the transposition deadline through these means we are now pursuing transposition via Regulations made under the section 2(2) of the European Communities Act 1972.

Responsibility for preparing Directive assessments, maps and plans

We anticipate that the burden of producing the deliverables for the Directive will fall to the EA and Local Authorities. This is in line with the consultation paper for the draft Bill, which set the context for the proposed division of responsibilities between 'national' and 'local' flood risk. It also follows the recommendations made in the Pitt Review. Given that the policy on roles and responsibilities is subject to a further, separate impact assessment, the proposed roles are set out below without any alternative options.

The roles and responsibilities under the Directive are therefore as follows:

- a. The Environment Agency would be responsible for preliminary assessments, mapping and planning in relation to flood risk from the sea, main rivers and reservoirs.
- b. Lead Local authorities (county or unitary) would be responsible for preliminary assessments, mapping and planning local flood risk (i.e. from surface water, ground water and ordinary watercourses) and for engaging with other relevant bodies to inform this work. Where there is more than one lead local authority, one area lead authority will be appointed to co-ordinate outputs with other authorities in its patch.
- c. In line with the EA's strategic overview role they would support local authorities in undertaking their roles (for example by providing guidance on undertaking assessments, mapping and planning).
- d. We also anticipate that the EA will undertake a co-ordinating role at the agreed unit of management level to produce the Directive's deliverables to the agreed scale.

Our proposed arrangements for implementing the Floods Directive are described in **Annex A**.

Carrying out the requirements under the Floods Directive

Assumptions

Under article 13 of the Floods Directive member states may be exempt from producing Preliminary Flood Risk Assessments if they have already undertaken to produce Flood Hazard and Risk Maps and prepare Flood Risk Management Plans. The Environment Agency assumes that it will be exempt from the requirement to produce preliminary flood risk assessments for flooding from main rivers and coast because it already produces maps and

management plans for all areas by way of its Catchment Flood Management Plans and Shoreline Management Plans.

In relation to local flood risk, while we can assess the cost implications of undertaking preliminary flood risk assessments because they must be done for all areas, we must make an assumption on the basis for which Flood Hazard Maps, Flood Risk Maps and for Flood Risk Management Plans must be prepared. This is because we cannot predict the number of areas which will be identified as at significant potential flood risk, for which these deliverables must be produced. The cost of producing these depends on two things (1) the information contained in the preliminary flood risk assessment and (2) whether this information supports a conclusion that 'potential significant' flood risk is present, for which 'potential significant' flood risk must be defined for the purposes of the Directive.

The current activity on producing Surface Water Management Plans is on the basis of finding whether there is a 'significant risk' from flooding. This is a formula approach based on a number of factors, but for which a threshold is set on the number of properties put at risk and was not formulated for all forms of flooding. For the purposes of this impact assessment we will assume that the definition of potential significant risk will not vary too greatly from that adopted for the purposes of Surface Water Management Plans. We can therefore conclude that around 10 to 30, with an average of 20 (if London boroughs are all done together) areas will need flood hazard and risk maps and a production of a flood risk management plan.

Preliminary Flood Risk Assessments (PFRAs)

In order to inform the Preliminary Flood Risk Assessment (PFRA) it will be necessary to draw together relevant information from existing flood maps and plans, this is supported in the Directive, which says that the information should be available or readily derivable.

Table 2 – costs of producing Preliminary Flood Risk Assessments (PFRAs)

Current activity or flood source and (owner)	Description of extra work necessary to comply with the Directive	Costs associated with extra work needed
National Flood Risk (EA)		
Main River	Impacts to human health, cultural heritage, the environment and economic activity may need to be included	No extra costs envisaged
Sea	Impacts to human health, cultural heritage, the environment and economic activity may need to be included	No extra costs envisaged
Reservoirs All reservoirs over 10,000m ³ to be mapped by end of 2010. Flood hazard maps are currently being produced for large raised reservoirs (over 25,000m ³) at a cost of £1.5k per reservoir.	The impact of past and future flooding on economic activity, cultural heritage and the environment needs to be included for reservoirs over 10,000m ³ All significant risk small reservoirs will need to be mapped, estimated to cost £3.5 million.	No extra costs as reservoir mapping is a commitment from the Pit Review.
Local Flood Risk (Lead Local Authorities)		

Level one SFRAs are prepared by local authorities to inform spatial planning decisions, should provide the information on which the PFRA may be based	SFRAs will need to include impacts of past and future flooding on economic activity, cultural heritage and the environment.	SFRAs are desk based studies and no additional cost is envisaged for meeting the additional requirements of the Floods Directive.
Co-ordination at unit of management level	Work already undertaken to prepare Catchment Flood Management Plans should consider all sources of flooding. Additional costs: guidance £50K, receptor database £250, methodology and additional analysis £150 = £450K	The cost of drawing together flood risk data for each River Catchment Unit is uncertain, but estimated to be of the order of £30,000, giving £2.31 million in total for all 77 Catchments in England and Wales. Plus guidance / specification costs of about £50,000 These costs might rise if additional work is required, e.g. on the Agency's National Receptor Database, (£250,000), a literature review (£50,000) on historical events and GIS evaluation of future impact (£100,000), so a more realistic cost range is between £2.36m-2.76m. Costs will be higher if data sets and modelling cannot be co-ordinated with other Flood Risk Mapping activities.
Total costs in first cycle		£5.86m-6.26
Reviews of PFRAs		We estimate that the total cost should fall to about one-third of the original costs in the subsequent review periods.

Flood Risk Maps and Flood Hazard Maps

The number of Flood Risk Maps and Hazard Maps which need to be produced will depend wholly on determining the threshold for significant risk.

Table 3 – cost of producing Flood Risk Maps and Flood Hazard Maps

Current activity or flood source and (owner)	Description of extra or new work necessary to comply with the Directive	Costs associated with extra work needed
National Flood Risk (EA)		
Main River and Sea		
The EA's flood mapping strategy promotes the	In order to meet Floods Directive mapping requirements the	For the <u>Environment Agency</u> the cost of additional

<p>probabilistic approach, which includes probabilistic velocity</p>	<p>Environment Agency will need to expand its main river and coastal flooding maps to include indicators such as depth, velocity and consequence. Another additional cost recognised is developing the science to support the Directive's mapping requirements.</p> <p>Production of mapping specification for LAs</p>	<p>scientific development is assumed to be addressed through continuing research and development activities since much of this work is already anticipated to extend existing mapping and assessment.</p> <p>The cost is about £100,000, a one-off cost in 2010-2011.</p> <p>So additional costs of £0.1 million during this period</p>
	<p>To fulfil Directive requirements the EA will need to make all maps and plans available on a single national map portal</p>	<p>Estimated at £300,000 for integration (mostly in 2013-2014) and a possible £150,000 to £300,000 per year thereafter depending on IT data sharing issues. This would mean a maximum cost to the Agency over four years of £1.5 million.</p>
<p>Reservoirs (EA) Flood Hazard Maps are currently being produced for large raised reservoirs (over 25,000m³)</p>	<p>This mapping only considers the risk to life, and does not take into account the other impacts that fall within the directive (Economic, Cultural, Environment and Infrastructure). Additional work will be required to assess economic, cultural, and environmental and infrastructure impacts from the existing mapping.</p> <p>This is in addition to the need to produce flood hazard maps for smaller reservoirs as discussed previously in the 'Preliminary Flood Risk Assessments' section</p>	<p>The cost of the additional assessment is unknown, but is likely to be low in comparison to the cost of producing the flood hazard maps for smaller reservoirs, which are estimated to cost £3.5m</p>
<p>Local Flood Risk (Lead Local Authorities)</p>		
<p>Local authorities will need to produce maps to a specification set by the Environment Agency for areas of local significant risk. To this end level two strategic flood risk assessments will help inform the requirements of flood risk and flood hazard maps</p>	<p>Further work may be needed to identify consequences of future flooding and risk.</p>	<p>Cost will vary depending on the number and extent of significant risk areas selected, but an estimate of £105-180,000 per modelling study per area is suggested. This should include additional factors which need to be covered for the Directive's requirements and existing funding is already allocated for Surface Water Management Plans</p>

		(SWMPs) – see the SWMP impact assessment for further details – so no additional cost is envisaged for Directive compliance.
Total Costs of the first cycle		£5.1million
Reviews of Flood Hazard and Flood Risk Maps		For subsequent cycles the costs to the EA are likely to decrease considerably as the initial development will have been completed, estimations are that costs will fall by a third

Flood Risk Management Plans (FRMPs)

The final stage in the Floods Directive mapping and planning cycle is the preparation of Flood Risk Management Plans (FRMPs) and will only be produced for those areas which present a potential and significant flood risk. These must include appropriate objectives and measures to manage flood risk, focusing on reducing the adverse consequences and/or likelihood of flooding. The Directive provides for a single FRMP or co-ordinated set of plans.

Table 4 – Cost of producing Flood Risk Management Plans (FRMPs)

Current activity or flood source and (owner)	Description of extra or new work necessary to comply with the Directive	Costs associated with extra work needed
Main River and Coast (EA)		
Catchment Flood Management Plans	Extend scope, including more on prioritisation and proposed progress monitoring post implementation	No extra cost
Shoreline Management Plans	Expand scope of SMPs	No extra cost
Reservoirs	Not known but will be included in impact assessment of risk based legislation (Floods and Water Bill)	Not known
Local Flood Risk Management (LAs)		
Surface Water Management Plans	Most elements under Directive will be met under current guidance offered on SWMPs	No extra cost
Subsequent reviews		No extra cost

Quality Assurance/Scrutiny mechanism

There are a number of options for scrutiny of the deliverables under the Directive for consistency and compliance. The costs are likely to be associated with providing a

secretariat function, as well as paying for the time of each of the expert representatives. Given that a similar quality assurance or scrutiny function is likely to be required for other reasons as part of the new arrangements for managing flood risk, the additional costs for the Directive are minimal.

Other impacts

Impact assessments require consideration of a number of potential impacts on businesses, people and the environment. Our proposed implementation of the Floods Directive enhances existing flood risk measurement and management policy making better use of resources. It is unlikely to impact on any of the criteria listed below

Competition – transposing and implementing the Floods Directive will have no impact on competition. The objectives and measures set in the Flood Risk Management Plan will inform decisions on investment in flood management infrastructure, but this will be subject to existing procurement procedures.

Small firms – the additional work demanded by the Directive will be carried out by large public organisations, the Environment Agency and lead local authorities. No impact on small firms is expected.

Legal aid – the policy measure introduces no new criminal sanctions or civil penalties.

Sustainable development – the Floods Directive complements current flood risk management policy which supports sustainable development.

Health impact – none anticipated.

Race, disability, gender equality and human rights – no impact is anticipated from transposition and implementation of the Floods Directive.

Rural proofing – existing flood risk management policy will apply.

Benefits

The benefits of implementing the Directive can broadly be divided into three:

- A potential reduction in flood damages as a result of improvements in existing flood risk appraisal, a combination of different sources of flood risk, and better communications to the public;
- Avoiding the risk of infraction in terms of penalties and reputational damage
- Implementation of the Floods Directive acknowledged by the Pitt Review as addressing some of the deficiencies in the existing legal framework

It has not been possible to quantify these benefits; however they are described in more detail below.

Reducing potential flood damages

The Flood Directive's three step approach to flood assessment, mapping and planning should enable investment in flood risk management to better target areas of greatest need, thereby reducing potential flood damages. It is an approach that is already adopted in England and Wales with regard to flooding from main rivers and the sea. The need for this to be extended to cover local flood risk (including from surface water, groundwater and ordinary watercourses) has been accepted by the Government in its response to the Pitt Review.

The PFRA screening process will support best use of public funds by applying nationally consistent 'significant risk' criteria across all sources of flooding. Flood risk mapping will be significantly enhanced by including surface water flood risk in high risk areas. And flood risk management plans will secure a reduction in potential flood damages as the objectives and measures agreed therein will draw from a comprehensive integration of all evidence of flood risk, flood mapping and planning. By expanding flood risk mapping and planning to include issues such as health effects and the impact on cultural heritage, the Directive will help to enable flood risk management measures to be informed by a comprehensive assessment of risk.

The most significant benefits will arise from improvements in the evidence base, in particular expanding SFRAs, and using this additional information to better target investment identified in the SWMP. The marginal benefits of reduced flood damages secured by these enhancements is expected to be cost neutral or exceed the additional cost.

Avoiding the risk of infraction and reputational damage

The work that is already done in England and Wales with regard to assessing and mapping flood risk, and providing plans for its management, already goes a long way towards achieving compliance with the Directive. However, it falls short of achieving full compliance in relation to flood risk from surface water, groundwater and ordinary watercourses. Also, flood hazard mapping is not fully developed and nor is there the level of public participation that is required by the Directive.

If we decided not to do any further work to meet the requirements of the Directive, not only would we fail to achieve the benefits of this extended approach to flood risk management, we would also lay ourselves open to infraction and reputational damage.

If we failed to transpose and implement the Floods Directive to the satisfaction of the European Commission then Article 228 proceedings may be initiated. This means a risk of being taken to the European Court of Justice who can impose a lump sum fine and/or penalty payment (periodic payments until the breach is rectified) on the UK. Such fines can be considerable; for example, Greece was recently fined €20,000 a day for breaching EU waste requirements.

Moreover, public interest in flooding has been heightened by flooding in recent years, most notably the flooding in 2007 much of which resulted from surface water. Though action is already under way to address this, there could be significant reputational damage to the Government if it failed to act on the requirements of the Directive which address this issue.

Conclusion

- (1) Transposing the Floods Directive into law in England and Wales will consolidate existing and developing flood risk management practice and ensure that it tackles all sources of flooding consistently.
- (2) The preliminary flood risk assessment will assist in identifying local flood risks, building on strategic flood risk assessments in which local authorities already engage. In particular the PFRA will extend existing assessments to include all local flood risks and will require joint working between local authorities and the Environment Agency on combined flood risk from both 'national' and local sources.
- (3) Flood hazard and flood risk mapping will mirror the preliminary assessment stage in that it will build on existing level 2 strategic flood risk assessments, but in this case local authorities will need to produce more detailed maps. This work was already identified

and funded as preparatory work leading to surface water management plans, which contrary to their title, will cover all flood risks.

- (4) Finally the core output from transposition of the Directive, the flood risk management plan, will be an amalgam of existing plans (catchment flood management plans and shoreline management plans); surface water management plans (currently under development and funded separately) and reservoir flood plans.
- (5) So in summary the only *additional* work required to fulfil the Directive beyond the current policy direction of travel is mapping local flood risk (i.e. enhancing SFRAs where required), and for the EA, co-ordinating the components for PFRAs, FHMs, FRMs and FRMPs.

Specific Impact Tests: Checklist

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

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

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

Annex A: Decisions on arrangements for Floods Directive implementation

There are a number of points which we must decide to enable proper implementation of the Directive. These are described below.

Sewer flooding

In transposing the Floods Directive, Member States may opt to exclude flooding from sewerage systems. Sewers do not themselves create significant flooding except when overwhelmed by high rainfall or river levels. Such events will be covered by the steps taken to manage other flood risks.

Although sewer flooding is unpleasant and a health hazard it is unpredictable and affects very few people. Water companies are required to investigate such instances and, under the terms of the Price Reviews, invest to reduce this risk.

Therefore, following informal consultation with Ofwat and Water UK, we propose that flooding caused entirely by a failure in the sewerage system as opposed to excess loading (e.g. from heavy rain) should be excluded.

This is the position set out in the Flood Management (Scotland) Bill and similar provisions are expected in Northern Ireland.

Given the strong policy preference for tackling sewer flooding through other means, no assessment of the cost of including such flooding has been made.

Unit of management

The Floods Directive requires member states to choose a unit of management area for which preliminary risk assessments, maps and flood management plans will be prepared. This is a fundamental decision for the operation of the Directive and will affect the degree to which the Environment Agency and Local Authorities must co-ordinate to deliver the assessments, maps and plans required by the Directive.

The Directive states that member states may either assign river basin districts, as identified under the Water Framework Directive, or identify certain coastal areas or individual river basins and assign them to a different unit of management.

Our main options are therefore to use River Basin districts, of which there are 11 in England and Wales, or river catchments, which number 77 in England and Wales.

See Map from the link below for River Basin Districts

<http://defraweb/environment/water/flooding/images/map-a.gif>

and map from this link for catchment level units

<http://defraweb/environment/water/flooding/images/map-b.gif>

The Directive does not allow for local authority or other political boundaries to be used for this purpose. Hence this option is not considered.

The advantages of adopting the river basin district scale of assessment for the Directive are:

- a. potential for ensuring consistency across wide range of catchments and local authorities;
- b. fewer documents produced i.e. only 11, rather than 77, preliminary flood risk assessments produced. Thus, potentially less paperwork for the Environment Agency in its reporting function and a more streamlined approach taken.

The disadvantages of adopting a river basin district unit of management are associated with dealing with a much larger area, thus:

- a. it is more administratively difficult to combine risk and identify the high risk areas, also there is a risk that adopting a larger unit of management may render more local flood risks in the overall assessment insignificant
- b. likely to be a significantly greater burden, in terms of time and effort, on the lead local authority to co-ordinate with other authorities in the district to prepare flood risk assessments. We are not able to quantify this burden, but for preliminary flood risk assessments it will be quite a significant burden, because these must be done for all areas. For areas of potential significant risk, we expect the burden to be much smaller because there are likely to be fewer areas which will receive this higher risk classification.

Setting a unit of management at catchment scale is closer to our existing level of managing flood risk as the EA currently puts together Catchment Flood Management Plans. The advantages are listed below

- a. A more manageable level for combining flood risk. Thus there is a better chance of a more thorough assessment of all local flood risks being factored into the catchment level decision making.
- b. Likely to be a much smaller burden on the lead local authority, although we cannot quantify the cost of the time and effort taken, we expect it to be much smaller than if done at river basin level.

One of the disadvantages of using catchment level units to manage outputs under the Directive is that there is potential for overlapping of boundaries, for example, it is possible that one local authority may have its boundaries within 2 or 3 river catchments.

There are pros and cons in respect of either option. On balance our view is that the catchment level is the preferred option in that:

- a. It is the more manageable level for complex assessments in relation to combined flood risk and therefore will result in less administrative burdens for the co-ordinating lead local authority. This should far outweigh any advantages from having to produce fewer reports for the European Commission;
- b. It also fits in better with existing systems and thus there is less by way of administrative change.

Quality assurance

If we are to adopt a catchment level unit of management we would have 77 preliminary flood risk assessments, and if all these catchments are deemed to include a potential significant flood risk, 77 flood hazard maps, 77 flood risk maps, and 77 management plans to ensure they are

consistent and compliant with the Directive. In order to ensure this is the case we propose to establish a scrutiny or quality assurance mechanism of local authority and EA tasks. It is important therefore to have a body which is relatively autonomous of these bodies. Our options are to either convene a brand new national panel, appointing necessary experts, or use an existing network of Regional Flood Defence Committees (RFDCs) to undertake this function.

RFDCs are composed of local authority appointed members (with a bare majority), EA appointees and Defra appointees, and are currently responsible for raising local levies to pay for flood management as well as flood management priorities in their region. They operate on a wider basis than river catchments – closer to a River Basin District. The advantages of using these committees to perform a quality assurance role are that:

- a. They cover a sufficient part of the country to be able to rule on consistency and compare approaches;
- b. They are existing bodies and structures, which are seeking a scrutiny role; and
- c. They represent a variety of different interests, although they can be adapted to include representation from cultural and economic bodies.

However, as these committees are essentially a part of the Environment Agency, they may be regarded as insufficiently autonomous to perform this scrutiny role. In addition, the EA may be reluctant to allow a part of its organisation to get involved in scrutinising local authority work. Another drawback is that RFDCS would be dependent on the EA for full time staff in order to carry out this function.

An alternative is that we establish a brand new independent body set up at a national or regional level to ensure consistency. Membership could include not only, LA, EA and Defra appointees but also statutory relevant authorities, such as National Trust, English Heritage, CBI, British Waterways, economic experts etc. The advantages are that the body would be independent of the EA and potentially broader membership (although current RFDCs can be adapted in this way). The disadvantage would be that we would have the burden of setting up, funding, briefing and training a completely new body.

In conclusion, RFDC scrutiny has a number of benefits and this appears to be the best option. It avoids the costs and duplication of setting up new quality review panels which would have a similar composition. To ensure relative autonomy from the EA, we will need to consider whether they could operate with a clear sense of their independent scrutiny role.