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Environment  
Agency

# managing flood risk

## Calder Catchment Flood Management Plan

Consultation summary document, April 2007

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 ENVIRONMENT AGENCY <b>Information Services Unit</b>	

# foreword

I am pleased to introduce the draft **Calder Catchment Flood Management Plan consultation summary**.

Past flood events remind us of the hardship and devastation that flooding can cause, especially in the built environment where they impact upon our homes and livelihoods.

This plan will allow us to use a scientific approach to **better understand flood risk now and in the future**. It will describe how the river catchment behaves and what the most sustainable flood risk management policies may be over the next 50 to 100 years. We can then use this knowledge to plan the most acceptable measures to manage flood risk for the long term, taking into account potential climate change and other pressures that may be placed upon the natural water system.

Once we have consulted on this document, we will use the plan to steer our future investment, policies and overall flood risk management activities for the catchment. We hope that our public and private partners will find it useful in adopting the principles of flood risk management in their decision making, especially where it can guide the planning of land use and avoid inappropriate development.

We welcome your comments on this draft plan. You have until 16 July 2007 to return your comments using the feedback form enclosed or by emailing [ridingscfmps@environment-agency.gov.uk](mailto:ridingscfmps@environment-agency.gov.uk). More details can be found on page 27.

Peter Holmes  
Ridings Area Flood Risk Manager

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# what is a Catchment Flood Management Plan?

A Catchment Flood Management Plan (CFMP) is a way of managing the long-term risk of flooding within a particular area.

Catchment Flood Management Plans (CFMPs) are a key planning tool that are being used to encourage organisations to work together to reduce flood risk. These plans take a strategic and active approach to flooding.

It is about deciding what action to take and where by assessing flood risks and by predicting how these risks will develop over the next 50 to 100 years. CFMPs will help us to plan for the likely impacts of climate change and further development in a river catchment.

CFMPs help to answer the following questions about flood risk within an area:

- how significant an issue is flooding within the catchment?
- what are the likely problems for flood risk management in the future?
- can we continue with our existing approach to flood risk management?
- what changes do we need to make in the catchment?

- what are the most sustainable options and policies for managing flood risk?

CFMPs offer a new way of thinking about flooding and flood risk, encouraging people and organisations to work together to manage the catchment more effectively.

The Calder CFMP will identify the significant factors that influence flood risk and investigate how they may change with time.

The final plan will outline flood risk management policies that provide a balance between cost effectiveness, social needs, demands upon land for urban development and the environment.

The CFMPs policies will establish whether we should take action to allow flood risk to:

- increase in suitable areas;
- be reduced;
- remain at the current level.

The CFMP will not propose specific measures to manage flood risk but will identify where we should undertake further work.

It is essential that all key organisations and decision-makers in the Calder catchment work together to plan and take joint action to reduce any unacceptable flood risk and at the same time, create opportunities to improve the environment, where possible.

We are working with a number of organisations to produce this CFMP. These organisations include, local authorities, English Heritage, National Farmers Union, RSPB, Natural England and Yorkshire Water.

# what is the draft CFMP?

The purpose of this draft CFMP is to present information to allow an informed debate about the preferred flood risk management policies within the catchment. It includes an explanation of the proposed policies, the process of policy selection we went through and the Action Plan.

The CFMP includes:

- a summary of past and current flood risk;
- possible future changes in the Calder area;
- the preferred policies for managing flood risk within the catchment.

Table one shows the timetable for developing and delivering the Calder CFMP. It also highlights the stage we are currently at.

When	Milestone	Output
May 2003 – September 2004	Inception stage	<ul style="list-style-type: none"> <li>• Initial data collection and understanding of the catchment</li> <li>• Engage interested parties</li> <li>• Produce Inception report</li> </ul>
March 2005 – June 2005	Scoping stage	<ul style="list-style-type: none"> <li>• Assessment of catchment issues</li> <li>• Identify draft opportunities and constraints</li> <li>• Identify draft appraisal objectives and scenarios</li> <li>• Produce Scoping report</li> </ul>
April 2005 – June 2005	Scoping stage consultation	<ul style="list-style-type: none"> <li>• Consultation responses</li> <li>• Establish direction of CFMP</li> </ul>
October 2005 – February 2007	Draft CFMP stage	<ul style="list-style-type: none"> <li>• Finalise future scenarios</li> <li>• Develop opportunities and constraints</li> <li>• Appraise policies</li> <li>• Produce draft plan</li> </ul>
April 2007 – July 2007	Public comment on Draft plan	<ul style="list-style-type: none"> <li>• Comments received</li> </ul>
July 2007	Final plan	<ul style="list-style-type: none"> <li>• Analyse feedback recommendations</li> <li>• Agree sustainable responses</li> <li>• Produce final plan</li> <li>• Submit to Defra for approval</li> </ul>

Table one: Calder CFMP timetable

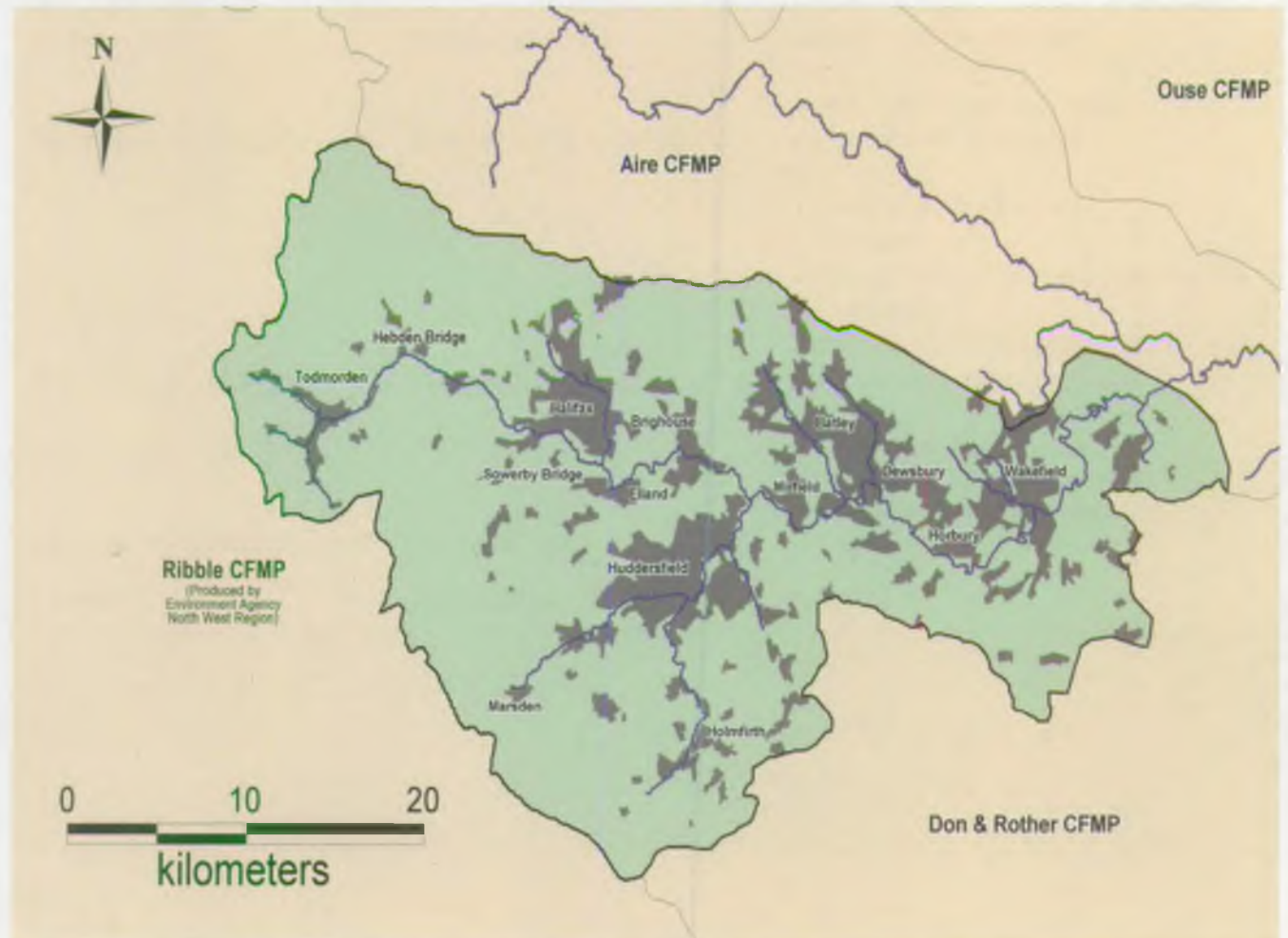
# the Calder catchment

The River Calder rises on the Pennine Moors west of Todmorden. It is predominantly an urban river, flowing through the towns of Halifax, Brighouse, Huddersfield, Dewsbury and Wakefield before it joins the Aire at Castleford. The Calder is the largest tributary of the River Aire, which is covered by a separate CFMP. Further afield the waters of the Calder end up in the Humber Estuary, an internationally important wildlife site.

The main Calder valley flows from west to east and is joined by the Rivers Colne and Holme, which extend the overall catchment to the south. Other significant tributaries are the River Spen, Walsden Water, Hebble Brook, Fenay Beck, Batley Beck and Balne Beck. The Calder catchment drains 957 square kilometres of West Yorkshire; its boundary matches closely with those of the local authority districts of Calderdale, Kirklees and Wakefield.

The Calder catchment is 86 kilometres long and home to some 800,000 people. An important feature of the catchment is that there are riverside towns along the whole of its course, starting with Todmorden near the Greater Manchester border. The western part of the catchment consists of high moors and rough grassland, which drop down steeply to the often narrow valley bottoms. This means that there are homes and businesses at risk of flooding along the entire length of the Calder and its tributaries. There is a long history of flooding particularly in the upper Calder valley.

In the upper catchment the hills above Todmorden the Pennines rise to over 470 metres (1,500 feet). Large expanses of the high moors are covered by wildlife protection designations.

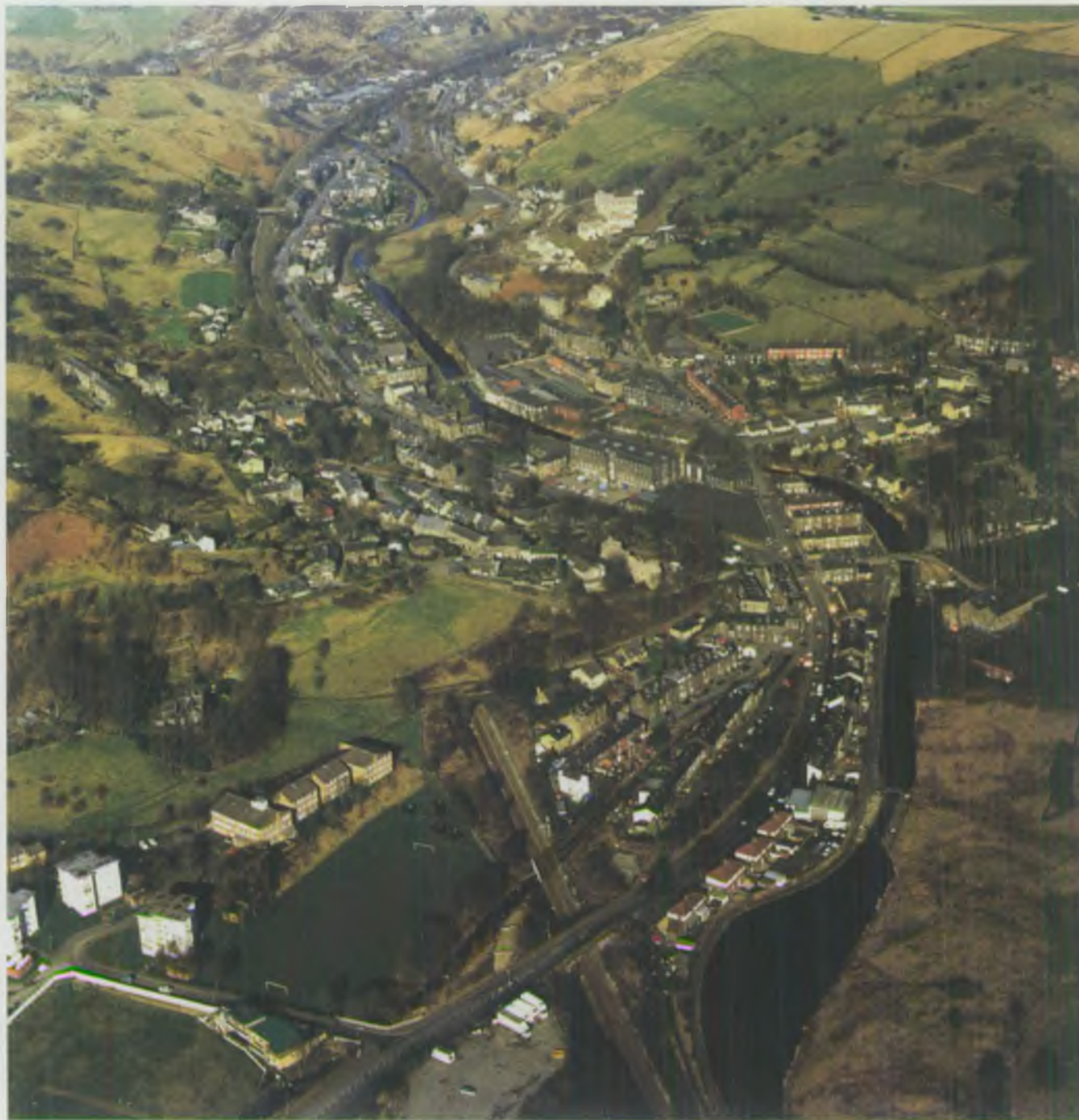


Map one: The Calder catchment

The landscape here is strewn with reservoirs built to supply drinking water, power the mills or serve the Trans Pennine canals. Roads and rivers, canals and railways all jostle for space in the narrow valley floor. There is little woodland to soften the landscape and the broad sky is punctured by soaring monuments like Stoodley Pike or communications masts like Holme Moss. This bleak wild landscape attracts many walkers, perhaps undertaking the 434 kilometre (270 miles) Pennine Way or on a weekend ramble from the industrial towns of the Calder valley.

The towns of the mid-Calder valley grew up around textile mills. These mills were located next to rivers and streams, which were a source of water, a place to get rid of waste and a way of transporting finished goods. Engineering and chemical industries developed along the Calder to serve the needs of the textile trade for machinery, dyes and detergents. As the woollen trade declined it left a legacy of dead polluted rivers. Today the rivers have been restored and support good populations of fish.

Below Dewsbury the valley opens out and the hills become gentler and no longer dominate the landscape. Roads and railways are not restricted to the valley bottoms and towns and villages largely lie on higher ground away from the floodplain. Coal not wool was the traditional industry here but this too is largely a thing of the past. Wakefield the old county town of West Yorkshire, lies astride the Calder linked by the fourteenth century Chantry Bridge. Around the city, flood storage schemes have been developed to keep the waters of the Calder out of the city but also bring benefits for recreation and wildlife.



Walsden in the upper Calder valley

## current flood risks

People, property and the environment are at risk from flooding. The Calder catchment has 230 kilometres of designated main river. Over 28,000 people are at risk from flooding

Unlike some other river systems, flood risk is spread fairly evenly throughout the whole catchment. There are properties at risk from almost the very source of the Calder, around Walsden and Todmorden. The typical landscape of the catchment is of very sparsely populated uplands consisting of high moorland or rough grazing. Steep valley sides drop to a narrow valley bottom. There is little level ground in the catchment suitable for building and so historically towns and villages have grown up along the valley bottoms of the rivers Calder, Colne and Holme. Towns along the valley expanded rapidly after the industrial revolution, with growth concentrated around the textile mills and engineering factories.

Much of the property that is at risk from flooding is affected in even relatively minor flood events. The number of properties at risk from an extreme flood is not much greater than for a more frequent flood

event. There are very few undeveloped washlands in the catchment. Where washlands do exist, they are found in the final few miles of the Calder below Wakefield. Their location means that they can't be used to protect upstream towns from flooding.

It is not surprising then that there is a long history of flooding throughout the Calder catchment, although the upper Calder has been the most prone to flooding. Particularly damaging floods occurred there in June 2000. Recent flood defence schemes have been built at either end of the catchment in Todmorden and Wakefield. Much of the catchment is covered by our flood warning service, but due to the nature of the catchment, rivers can rise very quickly and so it can be difficult to give people an adequate warning of flooding. This is particularly true of localised cloud-burst which can result in several millimetres of rain falling in a very short period of time.

Due to the built up nature of much of the valley bottoms, agriculture here is less affected by flooding than in other catchments. However transport routes are at risk from flooding in many places. Throughout the catchment roads, railways and canals criss-cross each other as they compete for space along the valley floor. When flooding does occur, there is often no practical alternative transport route.

Environmentally wildlife sites along the Calder are not at significant risk from flooding. Unspoilt nature sites are on the higher ground away from the heavily urbanised valley bottoms.

The CFMP also looks at the risk from other sources of flooding such as surface water, ground water and sewers.

## opportunities and constraints

The main aim of the CFMP is to develop policies to manage long-term flood risk that also brings wider benefits and contribute towards sustainable development.

When we are developing the plan it is important that we identify all the issues that will help or may hinder us implementing it. We have considered issues concerning people, property, infrastructure, land use, land management and the environment

and used them to develop our policies and actions. These include the need to protect people, vulnerable social groups and property, and to reduce disruption to essential infrastructure. At the same time, we need to conserve, protect and

encourage wildlife and also, as well as promote land use and land management practices, which help to reduce/delay run-off.



# future changes

To develop a sustainable long-term plan for flood risk management we need to consider how climate change, land use management and urban development might change in the future.

We assessed the impact of a number of forces or 'drivers' to see how they would affect flood risk. These included climate change and the use and management of land in the catchment.

We have used a broad scale model to measure the effect of different scenarios on flood extent, depth and velocity. This identified that climate change has the most significant effect on runoff.

## Climate change

Current scientific opinion suggests that we can expect a warmer and more variable climate as a result of global warming. This will lead to an increase in the frequency and intensity of heavy rainfall, causing more flooding. We have applied a 20 per cent increase to peak flows throughout the CFMP area to represent the effects of climate change.

## Urban development

An important feature of the Calder catchment is that there are riverside towns and villages along the whole length of the rivers of the catchment. Urban development exists alongside the upland tributaries of the Calder in places such as Walsden, Todmorden, Marsden and Holmfirth. In the middle of the catchment there are large industrial towns which have grown up around the river such as Brighouse, Huddersfield and Dewsbury. Only between Wakefield and the meeting with the River Aire are there sparsely populated washlands with little property.

Particularly in the upper catchment because of the steep valley sides, there are few level sites suitable for development. Where flat ground does exist it is often in the floodplain. In the future much new development is likely to take place on 'brownfield' sites previously occupied by industry. With the recent improvement in water quality, property alongside the rivers and canals are now attractive places to live. Old waterfront mills are now frequently being converted in to residential flats.

## Environmental Designation

Another key characteristic of the catchment is the fact that large tracts of the Pennine uplands are covered by one of a variety of environmental designations to protect the moorland habitat and the species that live there such as the merlin and golden plover. This formal protection would prevent widespread land management changes such as tree-planting or building reservoirs, which might be useful in reducing flood risk. There is little woodland in the catchment and those woods that do exist are often on steep valley sides that are unusable for agriculture or development.

## Future flood risk management

How can we manage flood risk along the Calder in the future? Options include:

- manage existing reservoirs to retain floodwater
- build new washlands to store floodwater with benefits for wildlife and recreation
- open up restricting culverts and bridges to increase the size of the river channel
- build new raised defences
- improve flood warning

# policies and actions

With an understanding of the main issues in the catchment, we have been able to identify a combination of policies, which will help us manage flood risk in a sustainable way.

We chose policies using the following approach:

**Step 1** - establishing an understanding of flood mechanisms operating within the Calder CFMP area and their consequences for risk.

**Step 2** - identifying objectives (policy appraisal objectives/criteria) for the selection of policies to address outstanding flood risk issues that occur either now or in the future, including objectives that are not specific to flood risk management.

**Step 3** - dividing the CFMP area into sub-areas, termed policy units.

**Step 4** - choosing a preferred policy from a set of generic policies for each policy unit. We also considered the possible effect from interaction of policies between policy units.

**Step 5** - identifying uncertainties about flood risk and its analysis and any knowledge gaps that may affect our conclusions.

**Step 6** - interpreting policy options in terms of actions needed to deliver the CFMP.

**Step 7** - identifying a way of monitoring how implementation of the CFMP is progressing.

## Policy units

We have divided the Calder CFMP into three policy units on the basis of similarities such as land use, geography and geology. We did not consider policies in isolation from each other but thought about how they would interact. Looking at the Calder catchment as a whole is an important part of preparing a CFMP. We presented the three policy

units to the Steering Group for approval. They are:

- The Pennine Uplands
- The Industrial Calder Towns
- The Lower Calder Plain

## Policy options

We want to identify the most sustainable way of managing flood risk in the Calder catchment by setting long-term policies. The policy options are:

**Policy 1:** no active intervention (including no flood warning and maintenance) continue to monitor and advise.

**Policy 2:** reduce existing flood risk management actions (accepting that flood risk will increase with time).

**Policy 3:** continue with existing or alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline).

**Policy 4:** take further action to sustain the current scale of flood risk into the future (responding to the potential increases in flood risk from urban development, land use change, and climate change).

**Policy 5:** take further action to reduce flood risk.

**Policy 6:** take action to increase the frequency of flooding to deliver benefits locally or elsewhere (which may constitute an overall flood risk reduction).

## Policy appraisal

The six policy options reflect different approaches to managing flood risk that involve eliminating (avoiding), accepting, reducing, transferring or sharing flood risk. Our choice of policy was objective led and guided by the extent to which current and future flood risks could be managed and whether the scale of existing flood risk management activities is significant.

Map two and the following pages summarise the preferred policies for each unit. There is also a draft Action Plan. The Action Plan is a way to ensure that the necessary work that we have identified in preparing the CFMP is carried out.

Actions include studies, plans and other projects that need to take place to implement certain policies or to address uncertainties. The Action Plan is organised by policy unit, describes each action and gives a priority/time-span for implementation.

These are draft actions and we would like your comments and feedback on these, as well as the choice of policy. For more detail see chapter six of the full report found on the CD in the back of this document.

## Vision

The primary objective of our flood risk management activities will be to reduce the risk to life from flooding.

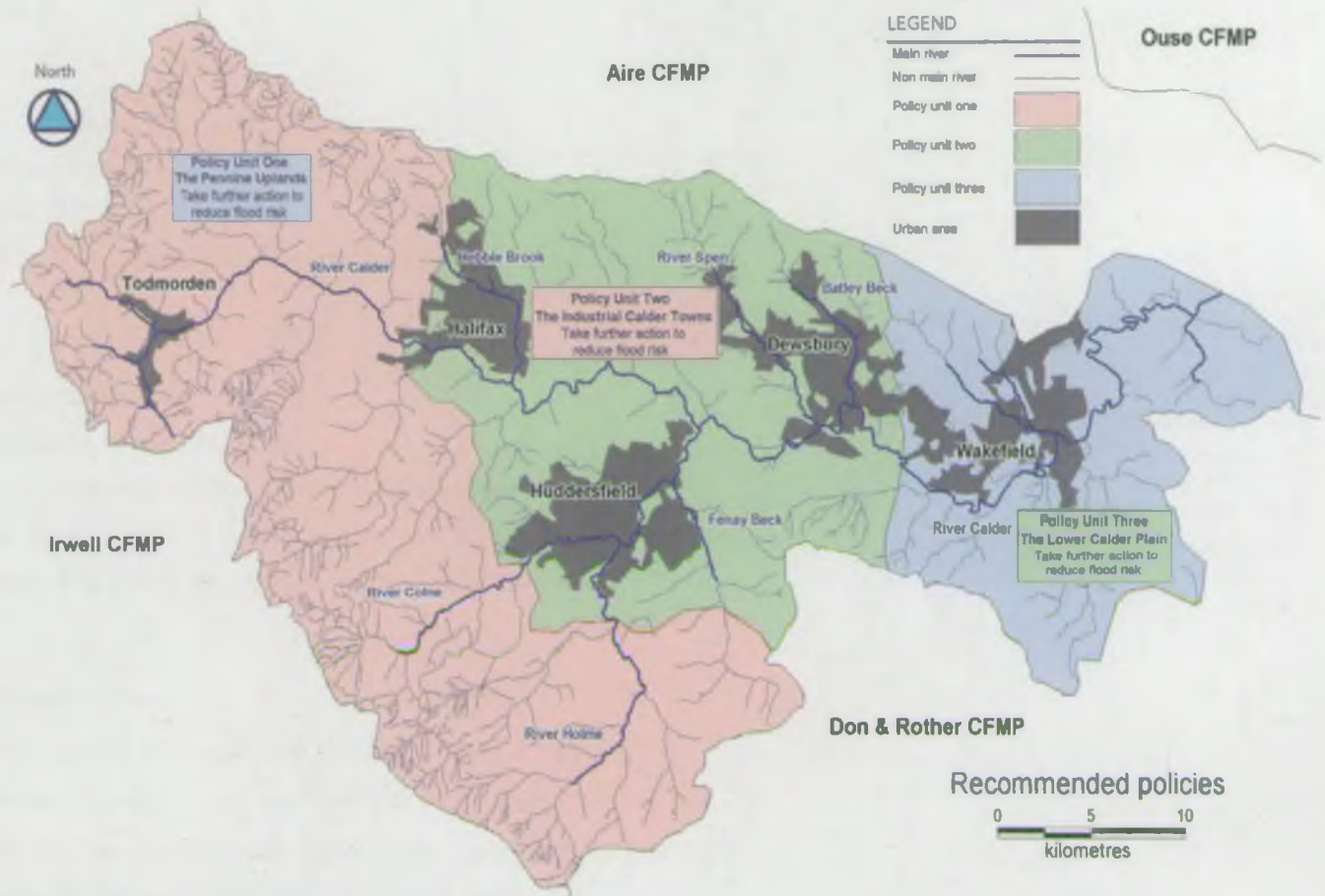
We will raise awareness of flooding and promote our Flood Map and warning service. Everyone will have their own plan for how to respond in a flood. Flood forecasting and warning systems will be improved.

Successful redevelopment will take place without increasing flood risk. Planning controls will play a key role in managing flood risk and we will work closely with local authorities on new development. The principles of Planning Policy Statement 25 will be adopted.

Flood risk management schemes will be fully integrated in to local authority development frameworks.

Flood defence activities will be carried out on sustainable principles and enhance the quality of life. Funding will be available for both maintenance work and building new schemes. All sources of flooding will be better understood.

Flood risk management works will protect biodiversity and create new habitats. They will also benefit recreation for example through providing better access and facilities for fishing. Studies will be carried out to better understand flood risk in the catchment and the benefits of land use changes in managing flood risk.



Map two: policy units and draft preferred policies.

# Pennine Uplands policy unit

## Policy appraisal summary

<p><b>Policy 1</b> No active intervention including no flood warning and no maintenance</p>	<ul style="list-style-type: none"><li>• Increased flooding of three Scheduled Ancient Monuments.</li><li>• High impact on people who currently depend on flood warning service.</li><li>• High impact on communities due to more frequent flooding.</li><li>• High cost of damage to property, doubling of current damages.</li><li>• Reduced maintenance costs.</li></ul>
<p><b>Policy 2</b> Reduce existing flood risk management actions</p>	<ul style="list-style-type: none"><li>• Increased flooding of three Scheduled Ancient Monuments.</li><li>• High impact on people who currently depend on flood warning service.</li><li>• High impact on communities due to more frequent flooding.</li><li>• High cost of damage to property.</li><li>• Reduced maintenance costs.</li></ul>
<p><b>Policy 3</b> Continue with existing or alternative actions to manage flood risk at the current level</p>	<ul style="list-style-type: none"><li>• Increased flooding of three Scheduled Ancient Monuments.</li><li>• Moderate impact on people.</li><li>• Damages as at present but to rise in the future.</li><li>• No environmental gains with this option.</li></ul>
<p><b>Policy 4</b> Take further action to sustain the current scale of flood risk into the future</p>	<ul style="list-style-type: none"><li>• Increased defences may affect Conservation Areas. A more artificial river channel.</li><li>• Impact of flooding on people and property as at present.</li><li>• Costs of flood management as at present.</li><li>• Slowing moorland drainage and tree planting may have environmental advantages.</li><li>• Existing protection for people and property.</li></ul>

### Policy 5

Take further action to reduce flood risk - now and/or in the future

- Increased defences may affect Conservation Areas. A more artificial river channel.
- No adverse effect on people or property.
- Increased flood risk management costs.
- Slowing moorland drainage and tree planting may have environmental advantages.
- Impact of flooding reduced.
- Cost of flood damages reduced.

### Policy 6

Take action to increase the frequency of flooding to deliver benefits locally or elsewhere

- Increased defences may affect Conservation Areas.
- Increased impact on people and property.
- Some wildlife may benefit from increased flooding.
- Decreased flood risk management costs.

Actions for preferred policy option 5	Priority/time-span	Responsibility	Indicators/outcomes
Funding for remaining phases of Todmorden scheme	High / 2012	Environment Agency	Funding obtained Works completed
Review gravel management strategies	Moderate / 2017	Environment Agency	Sustainable strategies
Investigate use of reservoirs for storage	Moderate / 2012	British Waterways Yorkshire Water Environment Agency	Completion of study. New operating agreements
Assess flood risk from mill dams	Moderate / 2017	Local authorities Environment Agency	Risk assessed
Study effect of moorland drainage	Low / 2017	Defra Natural England Environment Agency	Improved understanding Identify trial locations
Study effect of tree planting	Low / 2017	Defra Natural England Environment Agency	Improved understanding Identify trial locations

# Industrial Calder Towns policy unit

## Policy appraisal summary

**Policy 1**  
No active intervention  
including no flood warning and  
no maintenance

- Possible increased flooding of Conservation Area and five hazardous chemical sites.
- High impact on people who currently depend on flood warning service and defences.
- Costly impact on property and infrastructure. Some property becomes unviable.
- No maintenance work might benefit some wildlife.
- Decreased flood risk management costs.

**Policy 2**  
Reduce existing flood risk  
management actions

- Increased flooding of Conservation Area and five hazardous chemical sites.
- High impact on people as flooding occurs more often.
- Costly impact on property and infrastructure.
- Reduced maintenance work might benefit some wildlife.
- Decreased flood risk management costs.

**Policy 3**  
Continue with existing or  
alternative actions to manage  
flood risk at the current level

- Increased flooding of Conservation Area and five hazardous chemical sites.
- Moderate impact on people.
- Damages as at present but to rise in the future.
- No environmental gains with this policy.

**Policy 4**  
Take further action to sustain  
the current scale of flood risk  
into the future

- Increased maintenance may affect riverside habitats and a Conservation Area.
- Impact on people as at present.
- Damages as at present but to rise in the future.
- Slowing moorland drainage and tree planting may have environmental advantages.

### Policy 5

Take further action to reduce flood risk - now and/or in the future

- Increased flood defences may affect a Conservation Area. A more artificial river channel.
- Increased flood risk management costs.
- Slowing moorland drainage and tree planting may have environmental advantages.
- Reduced impact of flooding, reduced risk to life.
- Reduced impact of flooding, reduced risk to property.

### Policy 6

Take action to increase the frequency of flooding to deliver benefits locally or elsewhere

- Increased flooding of Conservation Area and five hazardous chemical sites.
- Increased impact on people, relocation may be needed.
- High and increasing costs of flooding.
- Reduced maintenance costs.
- High impact of flooding.
- Decreased maintenance costs.

Actions for preferred policy option 5	Priority/time-span	Responsibility	Indicators/outcomes
Investigate 're-phasing' of Rivers Colne and Holme	Low / 2017	Environment Agency	Feasibility and means understood
Review gravel management strategies	Moderate / 2017	Environment Agency	Sustainable strategies
Assess flood risk from mill dams	Moderate / 2017	Local authorities Environment Agency	Risk assessed
Study effect of tree planting	Low / 2017	Defra Natural England Environment Agency	Improve understanding Identify trial locations
Flooding of 'hazardous' sites	High / 2012	Health & Safety Executive Environment Agency	No increase in incidents

# Lower Calder Valley policy unit

## Policy appraisal summary

### Policy 1

No active intervention including no flood warning and no maintenance

- Possible flooding of three Scheduled Ancient Monuments.
- High impact on people who rely on flood warning service and defences.
- Expensive impact on property. Some property becomes unviable.
- No maintenance work might benefit some wildlife.
- Reduced flood risk management costs.

### Policy 2

Reduce existing flood risk management actions

- Extra flooding of three Scheduled Ancient Monuments.
- High impact on people who rely on flood warning service and defences.
- Costly impact on property and infrastructure.
- Reduced maintenance work might benefit some wildlife.
- Reduced flood risk management costs.

### Policy 3

Continue with existing or alternative actions to manage flood risk at the current level

- Extra flooding of three Scheduled Ancient Monuments.
- Moderate impact on people.
- Damages as at present but to rise in the future.
- No environmental gains with this option.

### Policy 4

Take further action to sustain the current scale of flood risk into the future

- Increased maintenance may affect some wildlife and a Conservation Area.
- Impact on people and property as at present.
- Increased flood risk management costs.
- Slowing moorland drainage and tree planting may have environmental advantages.



### Policy 5

Take further action to reduce flood risk - now and/or in the future

- Increased maintenance may affect some wildlife and a Conservation Area.
- Increased flood risk management costs.
- Decreased flood damages.
- Reduced impact of flooding, reduced risk to life.
- Reduced impact of flooding, reduced risk to property.

### Policy 6

Take action to increase the frequency of flooding to deliver benefits locally or elsewhere

- Increased flooding of three Scheduled Ancient Monuments and a Conservation Area.
- Increased impact on people, relocation may be needed.
- High and increasing costs of flooding.
- Some wildlife may benefit from increased flooding.
- Reduced flood risk management costs.

<b>Actions for preferred policy option 5</b>	<b>Priority/time-span</b>	<b>Responsibility</b>	<b>Indicators/outcomes</b>
Funding for Ings Beck scheme, Wakefield	High / 2012	Environment Agency	Funding obtained Works completed
Carry out review of operation of washlands	Moderate / 2012	Environment Agency	Better understanding of operation
Flooding of 'hazardous' sites	High / 2012	Health & Safety Executive Environment Agency	No increase in incidents

## all policy units

Actions	Priority/time-span	Responsibility	Indicators/outcomes
Increase take up of warning service	High / 2012	Environment Agency	Increased coverage
Continue to raise awareness of flood risk	Moderate / 2022	Local authorities Environment Agency	Improved public understanding
Develop and review flood warning plans	High / 2012	Local authorities Environment Agency	Adequate plans
Improve flood forecasting and warning	High / 2022	Environment Agency	Increased accuracy and warning times
Promote self-help schemes for isolated properties	High / 2022	Local authorities Parish councils Insurance industry Environment Agency	Adoption of self help practices
Integrate this CFMP with the Lower Aire Flood Risk Management Strategy and other CFMPs and strategies	Moderate / 2017	Environment Agency	Integrated plans
Investigate benefits of a new Calder Strategy	Moderate / 2012	Environment Agency	Business case produced
Undertake pre-feasibility studies in to new defences on at risk tributaries	High / 2012	Environment Agency	Completion of studies
Programme of flood risk mapping	High / 2012	Environment Agency	Completion of studies Improved understanding
Communicate flood risk through use of Flood Map	High / 2012	Environment Agency	Raised awareness of flood risk
Prepare Performance Specifications for flood defence assets	High / 2012	Environment Agency	Performance specifications prepared
Flood risk management schemes for 'low risk' locations	Low / 2017	Environment Agency	Flood risk reduced
Promote interaction of Local Development Frameworks and flood risk management measures	High / 2012	Local authorities Environment Agency	Integrated plans

## all policy units

Actions	Priority/time-span	Responsibility	Indicators/outcomes
Investigate causes of surface water flooding	High / 2022	Local authorities Environment Agency	Programme of improvements
Undertake feasibility studies in to new defences including 'low spots'	High / 2012	Environment Agency	Completion of studies
Continue maintenance work on watercourses	High / 2017	Local authorities Internal Drainage Boards Landowners Yorkshire Water Environment Agency	No increase in flood risk
Identify land at risk from all sources of flooding	Moderate / 2022	Environment Agency	Extent of land identified
Implement Planning Policy Guidance 25	High / 2022	Local authorities Environment Agency	Development in accordance with Guidance
Safeguard land in the floodplain needed for flood management	High / 2022	Local authorities Environment Agency	Land is protected
Promote Sustainable Urban Drainage Schemes (SUDS)	High / 2022	Local authorities Regeneration agencies Yorkshire Water Environment Agency	Installation of SUDS
New development in the floodplain is resilient to flooding	High / 2022	Local authorities Regeneration agencies Environment Agency	No increase in flood risk in new development
Relocation of inappropriate development	High / 2022	Local authorities Environment Agency	Unsustainable development is relocated
Preparation of Regional Flood Risk Appraisal	High / 2022	Local authorities Environment Agency	Number of unprotected people in the floodplain
Preparation and review of Strategic Flood Risk Assessment (SFRA)	High 2012	Local authorities	Completion and revision of SFRA

## all policy units

Actions	Priority/time-span	Responsibility	Indicators/outcomes
Encourage non residential use of ground floors	High / 2022	Local authorities Environment Agency	Reduced damages from flooding
Investigate potential to remove bridges and culverts	Moderate / 2022	British Waterways English Heritage Local Authorities Landowners Environment Agency	Increased flow capacity
Promote use of suitable planning controls and building regulations	High / 2022	Developers Local authorities Environment Agency	No increase in flood risk
Obtain developer contributions to flood defences	Moderate / 2022	Developers Local authorities Environment Agency	Developer contributions to costs of new defences obtained
Work with local authorities to influence location of new development	High / 2022	Developers Local authorities Environment Agency	Prevention of unsuitable development
During redevelopment tackle drain or sewer problems	High / 2022	Developers Local authorities Environment Agency	Fewer incidents of flooding from drains and sewers
Seek opportunities for river restoration projects	Low / 2022	Environment Agency	Schemes identified and implemented
Creation of new washland and wetland habitats	Moderate / 2022	Natural England RSPB Environment Agency	Inclusion of works in Regional Habitats creation programme
Seek opportunities for improving biodiversity along riverbanks	Moderate / 2022	Natural England Local authorities Regeneration agencies Environment Agency	Improved biodiversity along river corridor

## all policy units

Actions	Priority/time-span	Responsibility	Indicators/outcomes
Encourage agri-environment schemes that will have flood risk management benefits	Moderate / 2022	Natural England Environment Agency	Uptake of agri-environment schemes
Investigate possible diffuse pollution risk from realigning defences	Low / 2017	Environment Agency	Knowledge based assessment of risk
Identify opportunities for removal of weirs or construction of fish passes	Moderate / 2022	Environment Agency	Proposals for fish passes
Use flood risk management works to support local strategic partnerships	Moderate / 2022	Environment Agency	Contribution to local strategic partnerships
Quantify quality of life benefits from flood risk management activities	Moderate / ongoing	Environment Agency	Opportunities for quality of life benefits understood
Include recreation facilities in new flood defences	Moderate / 2022	Local authorities Interest groups Environment Agency	Increased recreation facilities
Maintain and improve access to riverside	Moderate / 2022	Local authorities Environment Agency	No reduction in level of access
Educate and enforce over incidents of encroachment on to flood banks	Moderate / 2017	Landowners National Farmers Union Environment Agency	Reduced damage to defences
Seek opportunities to protect and enhance heritage sites	Moderate / 2022	British Waterways Developers English Heritage Local authorities Environment Agency	Number of sites enhanced
Ensure flood risk management works enhance local character	High / 2022	British Waterways Developers English Heritage Local authorities Environment Agency	New flood risk management works are complimentary to local environment

## next steps

We will review all feedback and comments we receive. Once we are confident that we have taken account of all available information, we will set the policies and publish the Calder CFMP.

We will value highly all the responses we receive. All your feedback and comments will be carefully considered and used to shape the final version of this plan. When this has been done the policies will be set and the final version of the Calder CFMP published.

We will carry out further work to decide how we apply the CFMP policies. We will update the CFMP to include the latest information on the catchment, such as flood outlines, environmental baseline data, property databases, improved flood estimates and knowledge of the affects of climate change. We will also need to consider new planning and modelling tools, the effects of recent significant flood events, catchment development and greater understanding of climate change or changes in national policy guidance.

The CFMP will remain a 'living document' that evolves as we learn more about flood risk through new information gained from the actions described in the original CFMP.



River Calder at Chanty Bridge, Wakefield

## further information

The enclosed CD includes the full report and appendices.

If you would like to comment on the draft Calder CFMP please complete the feedback form and send it to the address below.

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