Environment Agency

Tyne Catchment Flood Management Plan

Summary Report December 2009

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Introduction

I am pleased to introduce our summary of the Tyne Catchment Flood Management Plan (CFMP). This CFMP gives an overview of the flood risk in the Tyne catchment and sets out our preferred plan for sustainable flood risk management over the next 50 to 100 years.

The Tyne CFMP is one of 77 CFMPs for England and Wales. Through the CFMPs, we have assessed inland flood risk across all of England and Wales for the first time. The CFMP considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding), which is covered by Shoreline Management Plans (SMPs). Our coverage of surface and ground water is however limited due to a lack of available information.

The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if we are to make the right investment decisions for the future and to help prepare ourselves effectively for the impact of climate change. We will use CFMPs to help us target our limited resources where the risks are greatest.

This CFMP identifies flood risk management policies to assist all key decision makers in the catchment. It was produced through a wide consultation and appraisal process; however it is only the first step towards an integrated approach to flood risk management. As we all work together to achieve our objectives, we must monitor and listen to each others progress, discuss what has been achieved and consider where we may need to review parts of the CFMP.

The River Tyne catchment is at risk of flooding from rivers, tidal flooding, surface water and sewers. The risk of flooding from rivers could affect four per cent of the total catchment area. Approximately 4,950 homes and 2,000 commercial properties have a one per cent chance of flooding each year. There is also a risk from high tides, with 900 homes and over 300 commercial properties along the estuary having a 0.5 per cent chance of flooding each year. There are a number of engineered flood defence schemes in the catchment that reduce the risk to some key communities.

We cannot reduce the risk of flooding by ourselves, we will therefore work closely with all our partners to improve the co-ordination of flood risk activities and agree the most effective way to manage flood risk in the future. We have worked with others including Local Authorities, Natural England, Port of Tyne Authority, National Farmers Union and Northumberland Wildlife Trust to develop this Catchment Flood Management Plan.

This is a summary of the main CFMP document, if you need to see the full document an electronic version can be obtained by emailing **enquiries@environment-agency.gov.uk** or alternatively paper copies can be viewed at any of our offices in the North East.

David Dangerfield,
Director – Yorkshire and North East

Contents

The purpose of a CFMP in managing flood risk

CFMPs help us to understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs should be used to inform planning and decision making by key stakeholders such as:

- The Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- Local authorities who can use the plan to inform spatial planning activities and emergency planning;
- IDBs, water companies and other utilities to help plan their activities in the wider context of the catchment;
- Transportation planners;
- Land owners, farmers and land managers that manage and operate land for agriculture, conservation and amenity purposes;
- The public and businesses to enhance their understanding of flood risk and how it will be managed.

CFMPs aim to promote more sustainable approaches to managing flood risk. The policies identified in the CFMP will be delivered through a combination of different approaches. Together with our partners, we will implement these approaches through a range of delivery plans, projects and actions.

The relationship between the CFMP, delivery plans, strategies, projects and actions is shown in figure 1.

Figure 1 The relationship between CFMPs, delivery plans, projects and actions

Note: Some plans may not be led by us – we may identify the need and encourage their development.

Catchment overview

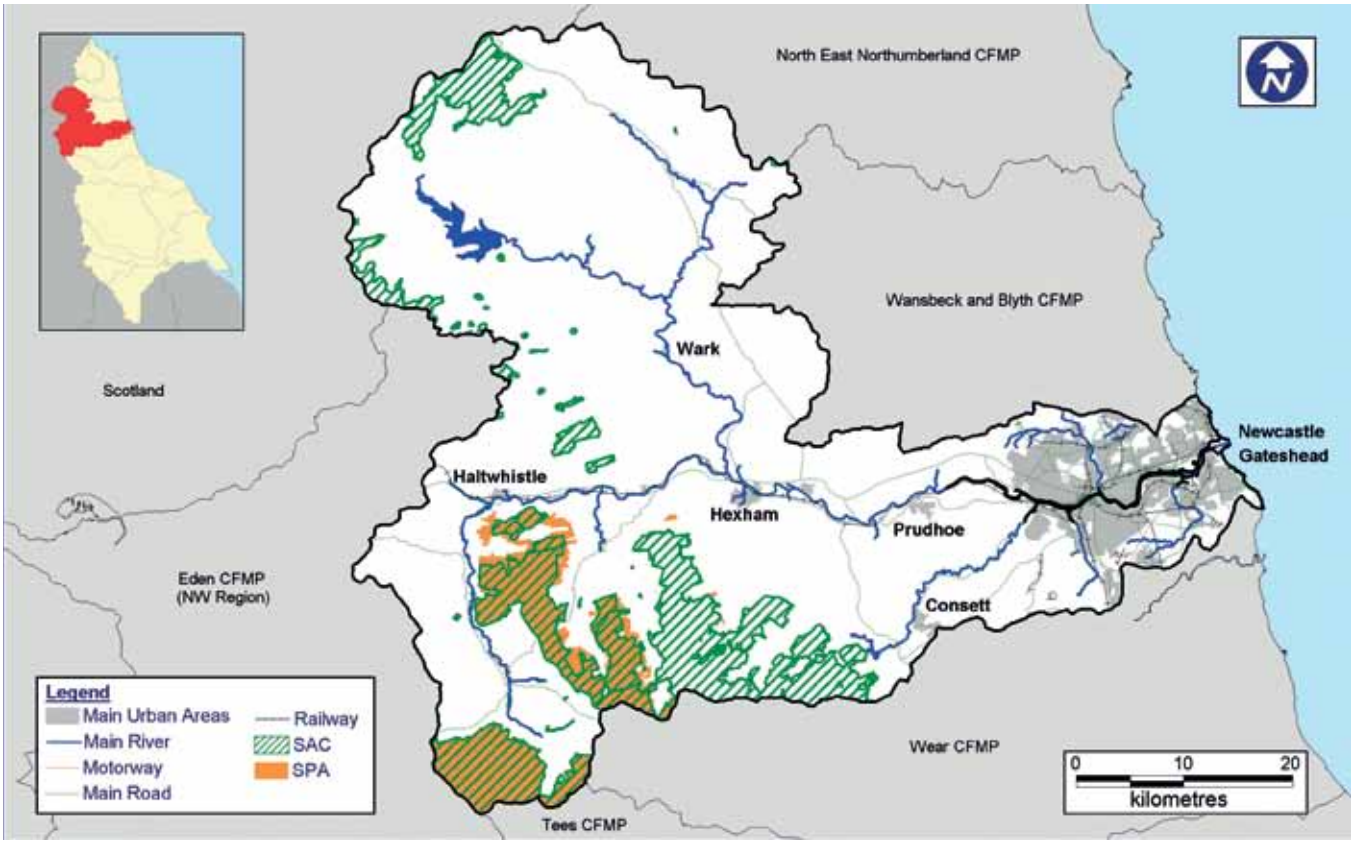
The Tyne catchment lies in the north east of England, covering an area of 2,300 square kilometres. Main rivers in the catchment include the Allen, Derwent, North Tyne, Rede, South Tyne and the Tyne. There are three distinct parts of the Tyne catchment. The headwaters drain remote moorland and flow through narrow, steep valleys. Within the upland area of the North Tyne, Rede and Derwent there are a number of regionally important water supply reservoirs including Kielder and Derwent Reservoirs. These reservoirs can effect flood flows and are also able to maintain river flows in the Tyne, Wear and Tees rivers via water transfer infrastructure. The middle catchment contains fertile agricultural plains with a string of towns along the watercourses. The lowest parts of the catchment are covered by urban development including Newcastle and Gateshead. The River Tyne, which flows into the North Sea, is tidally influenced from Wylam to the coast.

The Tyne catchment has a population of just under one million people. The major urban areas of Newcastle and Gateshead, one of the major economic and development centres within the north east lie within the eastern area of the catchment. The River Tyne is still an important sea port with the Tyne Dock and Ferry Port located in the lower estuary near the river mouth. Despite the rapid growth in industry, much of the area is still high quality agricultural land, which is also important to the local economy.

In the eastern part of the catchment, where the main urban areas are located, there are a number of regionally important transport routes, including the East Coast Mainline from London to Edinburgh, main roads including the A1, A19, A68 and A69, the Tyne Dock and part of Newcastle International Airport.

The Tyne catchment has a wealth of environmental assets and culturally recognised sites. Much of the upland catchment lies within the North Pennine Area of Outstanding Natural Beauty (AONB). In addition there are 87 Sites of Special Scientific Interest (SSSI), as well as all or part of nine Special Areas of Conservation (SAC) and two Special Protection Areas (SPA) within the catchment flood management plan boundary. There is a rich cultural heritage, including 530 Scheduled Ancient Monuments (SAM), part of the Hadrians Wall World Heritage Site, 14 Registered Parks and Gardens and two Registered Historic Battlefields.

Map 1 Location and extent of the Tyne CFMP area



Current and future flood risk

Overview of the current flood risk

The risk caused by flooding can be broken down into two parts; The chance (probability) of a particular flood and the impact (consequence) that the flood would have if it happened. The probability of a flood relates to the likelihood of a flood of that size occurring within a one year period, it is expressed as a percentage. For example, a one per cent flood has a one per cent chance or 0.01 probability of occurring in any one year.

The flood risks quoted in this report are taken from broadscale mathematical modelling, they represent the undefended one per cent flood figures, they do not take into consideration the presence of defences in order to demonstrate the total risk of flooding within the catchment.

The Tyne catchment has a long history of flooding. The greatest recorded flood occurred in 1771, and caused considerable loss of life and destroyed all bridges in the Tyne valley apart from that at Corbridge. In more recent years, flooding has occurred throughout the catchment in the 1950's and more recently in 1995, 2005, when over 100 properties were flooded throughout the catchment and 2008 from the river systems. Flooding in urban Tyneside areas have occurred in 2005 and 2008 form drainage systems.

The main sources of flooding are:

- River flooding from the River Tyne and its tributaries, particularly in the areas of Hexham, Haydon Bridge, Haltwhistle and Newcastle areas;
- Tidal flooding from the River Tyne in Newcastle and Gateshead areas and;
- Surface water flooding in the urban areas.

What is the risk?

There is currently a low risk of flooding to the rural parts of the Tyne CFMP area, but there is higher risk in the urban areas. There is a risk of flooding from rivers in Haydon Bridge, Hexham and Corbridge. There is a risk of tidal flooding in the Lower Tyne. In total, there are approximately 4,930 residential properties and 2,000 commercial properties at risk from a one per cent probability flood.

Flooding could potentially have a negative impact on six of the SACs effecting 2.6 kilometres squared of those sites and 1.5 kilometres squared of SPA across two sites. There are also 51 SSSI partly at risk of flooding and 262 Scheduled Ancient Monuments which lie within the one per cent flood outline, however, the impact of flooding on these has not been fully studied within the CFMP as the tools available are not detailed enough to assess individual locations and sites.

Table 1 Locations of towns and villages with 25 or more properties at risk in a one per cent annual probability river flood

Number of properties at risk	Locations
› 1,000	Gateshead, Newcastle
500 to 1000	None
100 to 500	Hexham
50 to 100	Haydon Bridge, Haltwhistle
25 to 50	Corbridge, Bellingham

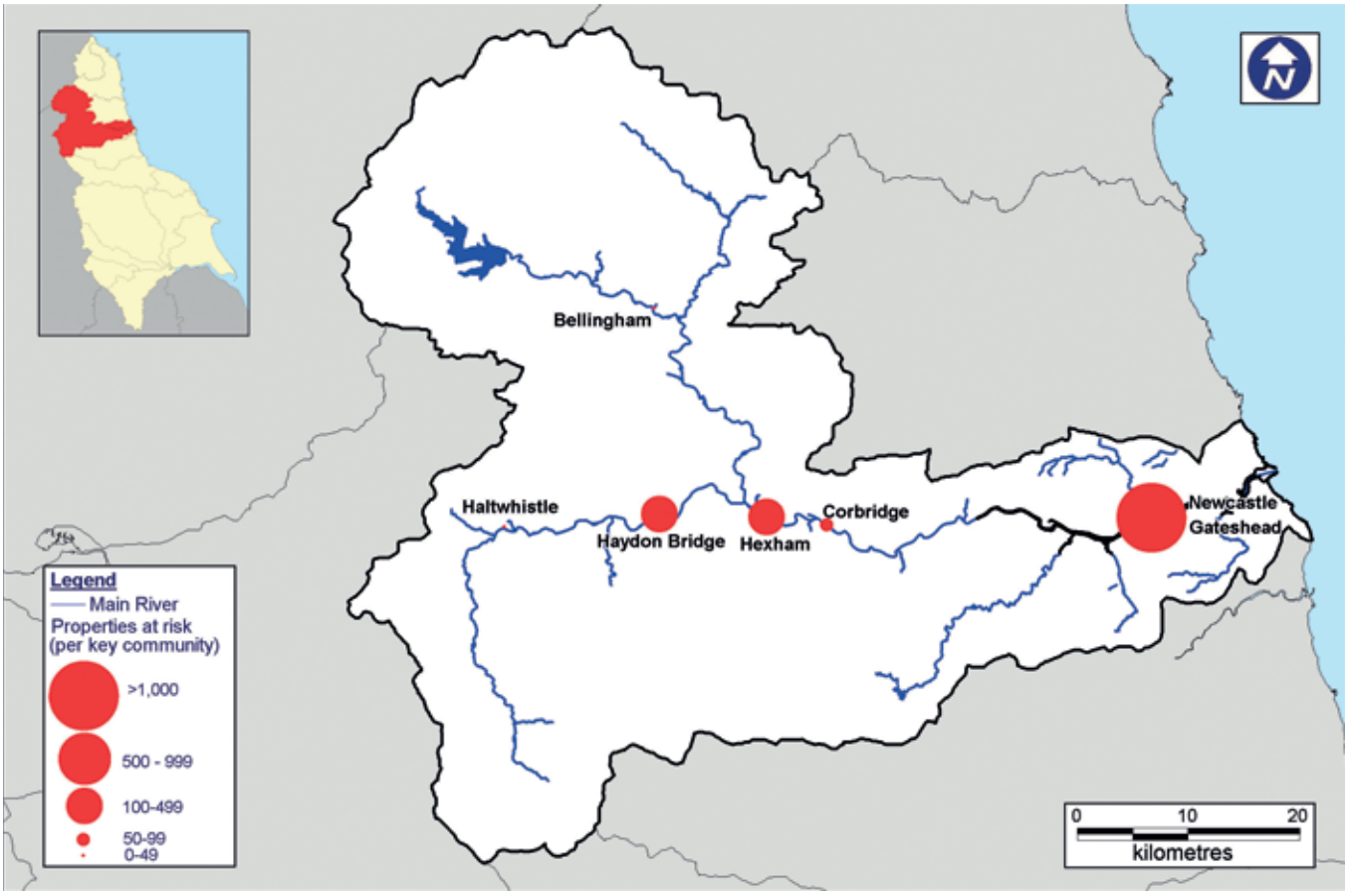
Table 2 Critical infrastructure at risk:

117 electricity and gas assets
8 wastewater treatment works
6 health care facilities
2 emergency services buildings

Where is the risk?

The majority of the population within the Tyne Catchment is located in the east of the catchment, the risk is therefore concentrated in the areas of Newcastle and Gateshead and their suburbs. Further upstream key locations at risk include the areas around Hexham, Haydon Bridge and Haltwhistle.

Map 2 Properties at risk of flooding in the Tyne catchment



How we currently manage the risk in the catchment

Our flood risk management activity is prioritised on a risk basis. Our main activities include:

- **Maintenance of existing defences and structures** prioritised on a risk basis to ensure the effectiveness of our assets. Within the Tyne catchment there are over 51 kilometres of floodbanks and walls consisting of over 150 separate structures. We carry out routine maintenance including inspection, grass cutting and vermin control and upgrades on these structures to ensure that they continue to provide vital protection to key communities such as Hexham, Corbridge and Haydon Bridge. The maintenance also includes regular clearance of river channels to maintain flood capacity. Without these defences risk would be much higher in the catchment.
- **Flood risk mapping** to gain a more detailed understanding of flood risk in localised areas. This includes modelling and detailed mapping to understand flood risk and sharing data with others to assist in gaining a better understanding of flood risk in all areas. The team coordinates data collection following major floods to ensure that we gather information on flooded properties and sources of flooding. The team assist in production of the Environment Agency Flood Maps and in assessing the quality of modelling by third parties.
- **Capital schemes** including the design and project management to create new flood defences and replace existing outdated ones. Recent work in the Tyne catchment has included the development of the Hexham Flood Alleviation Scheme which has installed new bypass culverts and upstream storage reservoirs on the Cockshaw Burn to provide a 0.5 per cent standard of protection for Hexham.

- **Flood forecasting and warning.** Includes monitoring the weather and tidal conditions to predict river and coastal flooding and to warn professional partners including emergency responders and members of the public of predicted river and coastal flooding. Currently we provide a flood warning service to over 1,700 properties within the Tyne catchment via over 35 separate warning areas. These warnings are based on a network of raingauges and river level stations across the whole catchment.
- **Development control** to prevent inappropriate development in flood risk areas. Working with Local Authorities to develop Strategic Flood Risk Assessments and Surface Water Management Plans. Provide advice and regulate the work of others to ensure that the work does not increase flood risk.
- **Strategic planning** to plan sustainable long term investment on a risk basis. This includes the development of strategic documents such as Catchment Flood Management Plans.

The impact of climate change and future flood risk

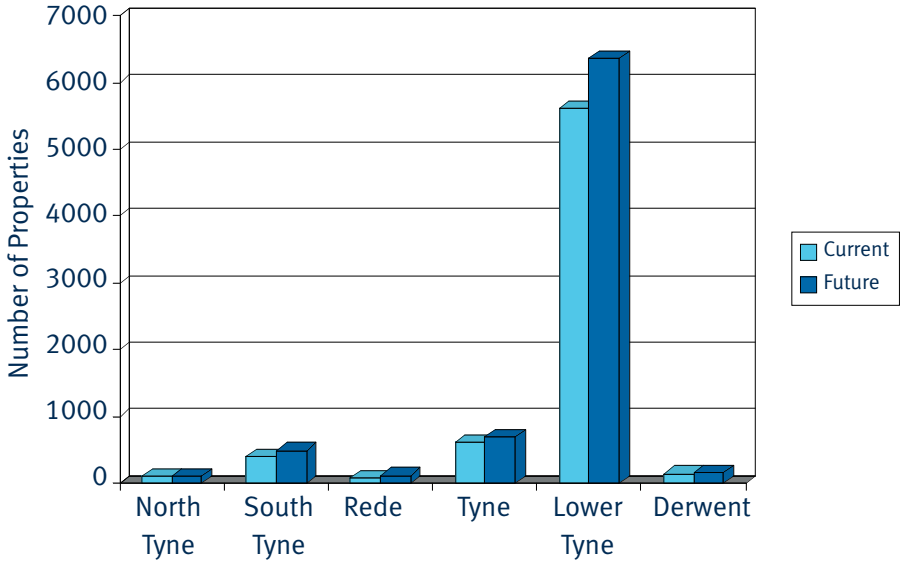
The effect of flooding in the future is influenced by a range of issues such as climate change, changes in land use (e.g. development), and changes in how land is managed. We considered various scenarios such as increasing afforestation, improved agricultural drainage and increased land use. The scale of changes that would affect the flooding probabilities were too large to be feasible in the timescale of the CFMP.

Climate change was therefore considered to be the most significant future scenario likely to effect flooding. We have therefore only considered the impact of climate change in assessing future flood risk in the catchment. The following future scenario was used in the Tyne CFMP future flooding analysis.

- 20 per cent increase in peak flow in all watercourses. This will increase the probability of large-scale flood events by increasing the frequency of river banks overtopping;
- Between 2.5mm and 13mm per year increase in sea levels;
- Increased rainfall intensity, especially convection storms, increasing the risk of surface water and urban watercourse flooding.

The impact of these changes in the catchment are significant in the urban areas. In total it is estimated that there will be almost 8,000 properties at risk in the catchment in the future. Figure 2 shows the difference between current and future flooding in a one per cent annual probability flood. The larger increases in flooding are located in the lower reaches where that majority of population is located and where the combination of increased river flows and higher sea levels are most pronounced. The rural areas are less sensitive to increased flows due to lower population density.

Figure 2 Current and future flood risk to property through the Tyne catchment



Future direction for flood risk management

Approaches in each sub-area

Flood risk is not the same in all of the catchment. We have divided the Tyne catchment into seven sub-areas which have similar physical characteristics, sources of flooding and level of risk. We have identified the most appropriate approach to managing flood risk for each of the sub-areas and allocated one of six generic flood risk management policies, shown in Table 3.

To select the most appropriate policy, the plan has considered how social, economic and environmental objectives are affected by flood risk management activities under each policy option.

In the following sections we outline the approach in each sub-area by highlighting:

- Key issues in each sub-area;
- Our policy and vision for future management;
- The key messages for each sub-area;
- The key actions to carry out the policy.

Map 3 Catchment policy decisions

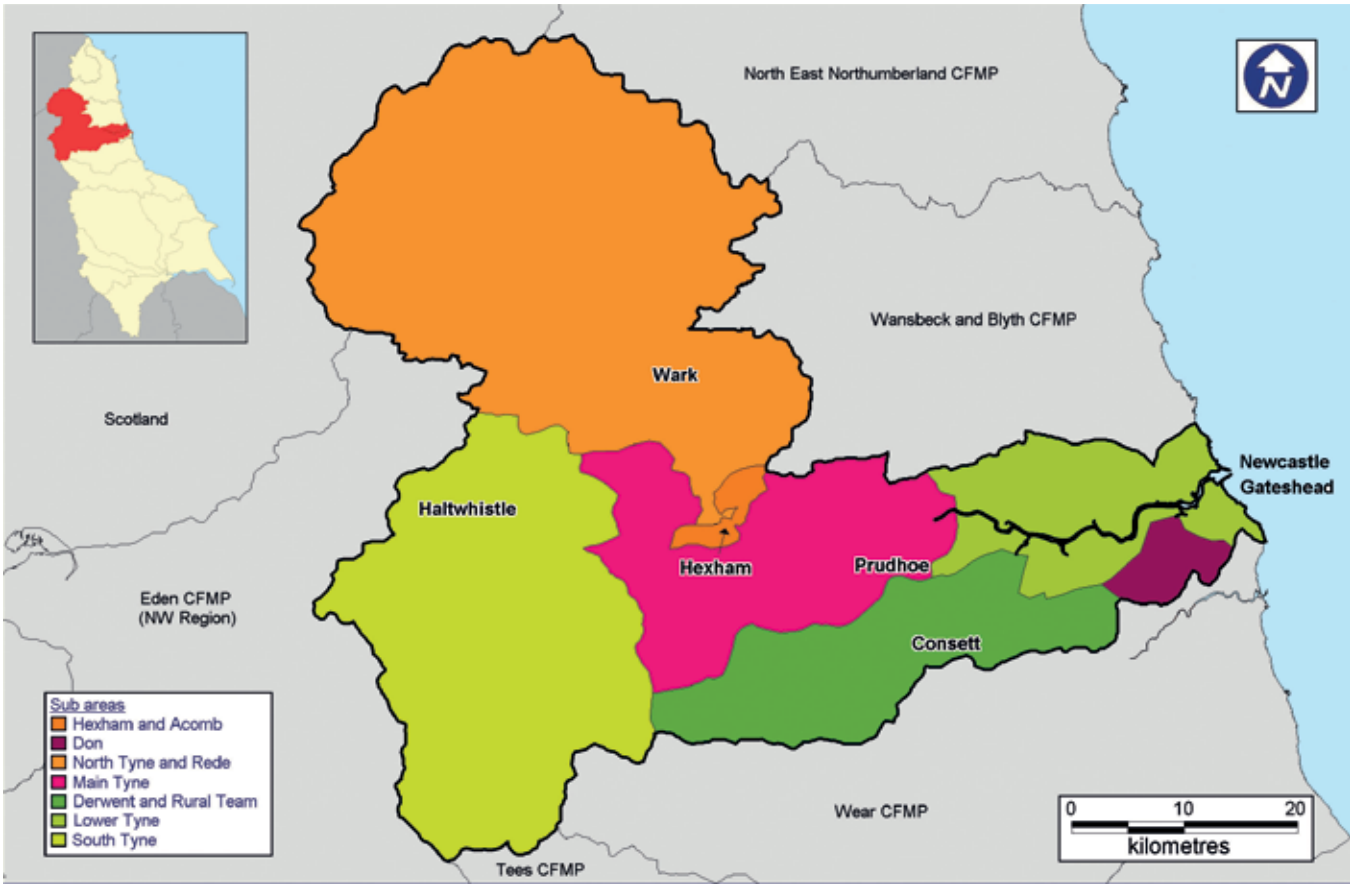


Table 3 Policy options

➜ Policy 1

Areas of little or no flood risk where we will continue to monitor and advise

This policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible.

➜ Policy 2

Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions

This policy will tend to be applied where the overall level of risk to people and property is low to moderate. It may no longer be value for money to focus on continuing current levels of maintenance of existing defences if we can use resources to reduce risk where there are more people at higher risk. We would therefore review the flood risk management actions being taken so that they are proportionate to the level of risk.

➜ Policy 3

Areas of low to moderate flood risk where we are generally managing existing flood risk effectively

This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

➜ Policy 4

Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change

This policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future. In this case we would need to do more in the future to contain what would otherwise be increasing risk. Taking further action to reduce risk will require further appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

➜ Policy 5

Areas of moderate to high flood risk where we can generally take further action to reduce flood risk

This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

➜ Policy 6

Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits

This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off. The policy has been applied to an area (where the potential to apply the policy exists), but would only be implemented in specific locations within the area, after more detailed appraisal and consultation.

Hexham and Acomb

Our key partners are:

- Northumberland County Council
- Northumbrian Water Ltd
- Land owners
- Natural England

The issues in this sub-area

The risk of flooding comes from the River Tyne, the Cockshaw Burn in Hexham and Red Burn in Acomb. There are 280 properties currently at risk and this is predicted to increase to 306 in the future. Water levels on smaller watercourses rise and fall quickly, partly due to rapid drainage from urban areas. Culvert capacity and trapped debris have previously been issues, but recently improvements have been made.

The vision and policy

Policy Option 3 is the approach. The main risk areas benefit from flood defences and risk is not predicted to increase significantly in the future. Recent defences protect Hexham from the River Tyne and Cockshaw Burn. The level of economic damages from flooding justifies the present levels of defence. We will continue our current actions including maintaining the existing defences, channel maintenance and providing flood warnings.

The key messages

- The risk of flooding is located in the urban areas of Hexham and Acomb, and is a combination of flashy local floods on urban watercourses and flows from the River Tyne. The risk of flooding is not likely to increase significantly in the future.
- Urban streams like Cockshaw Burn and Red Burn contain a number of obstructions to water flow, such as culverts and debris screens, which have caused local flooding in the past. Improvements to channel capacity and maintenance have already been made to help reduce the risk of flooding.

Actions to implement the policy

- Develop a plan to effectively manage flood defences and channels. This will improve their condition and reduce the potential for blockages.
- Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Provide advice to make sure there is no increase in the risk of flooding from either rivers or surface water as a result of future development. We will do this by working with local authorities and other partners, for example to produce Surface Water Management plans.
- Work in partnership with landowners and other partners to promote rural land management to help manage the risk of flooding and deliver environmental benefits particularly in the Acomb area. This may be through catchment sensitive farming practices and environmental stewardship schemes.

Sub-area 2

North Tyne and Rede

Our key partners are:

- Northumberland County Council
- Northumbrian Water Ltd
- Land owners
- Natural England

The issues in this sub-area

This is a rural area of mainly upland moors. There are many environmental designations and reservoirs throughout and the area is sparsely populated. Flooding happens when the rivers North Tyne and Rede overtop their banks, and affects the villages of Butteryhaugh, Bellingham, Otterburn, Falstone and Wark. Important issues are the isolated location and wide geographical distributions of some properties. There are currently 192 properties at risk and this is predicted to rise to 223 in the future.

The vision and approach

Policy option 2 is the chosen policy. There is potential to reduce flood risk management actions across much of this area, while continuing actions within the key risk areas minimising the increased risk in populated areas. Maintenance to channels and structures in these populated areas is essential to help protect them from flooding. In the rural areas, floodplains are currently active, slowing flood waters and naturally reducing the risk of flooding to the key communities. We will reduce maintenance outside the populated areas but will continue to provide flood warnings.

The key messages

- The risk of flooding is scattered throughout the area along the Rivers North Tyne and Rede. The small settlements in this area mean there are no significant hotspots that are at risk of flooding.
- Kielder Water is a temporary store of floodwaters near the source of the River Tyne, and helps to reduce or slow peak flood flows on the North Tyne.
- Current spending on river maintenance is high in proportion to economic risk, and there is a case to reduce the work we carry out across this area.

Actions to implement the approach

- Develop a plan to effectively reduce management of flood defences and channels in areas where this is suitable. This will bring the amount spent on maintenance in line with the level of flood risk. Where there are small communities at risk, continue existing actions.
- Look at feasibility of improving flood warning lead times. Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Work in partnership with landowners and other partners to promote rural land management to help manage the risk of flooding and deliver environmental benefits. This may be through catchment sensitive farming practices and environmental stewardship schemes.

Main Tyne

Our key partners are:

- Northumberland County Council
- Northumbrian Water Ltd
- Land owners
- Natural England

The issues in this sub-area

There are a series of towns located in the floodplain, surrounded by largely agricultural land. There is high risk of flooding in the urban areas due to their location in the floodplain, poor drainage and culvert restrictions. There are 522 properties at risk which could rise to 800 in the future assuming no defences. However current flood defences provide protection to the majority of the at risk areas. We currently manage flood risk using raised defences and channel maintenance.

The vision and approach

Policy option 3 is the approach for this sub-area. The main areas at risk of flooding currently benefit from 15 kilometres of raised defences which protect many urban areas. The level of economic damages from flooding justifies the present levels of defence, and ongoing actions such as channel maintenance. The number of properties at risk is not likely to increase significantly in the future as the defences will continue to offer protection, therefore it is reasonable to continue with existing actions of inspection and maintenance.

The key messages

- The areas of Haydon Bridge, Warden, Corbridge, Wylam, Ovingham, Stocksfield and Riding Mill are at risk of flooding. This is because of high flows in the Rivers Tyne and North Tyne, and also smaller local streams.
- Peak flows on the main rivers rise over a few hours, but floods on Devils Water and West Dipton Burn can rise more quickly.
- Existing raised defences prevent water flooding except during very large floods.

Actions to implement the approach

- Develop a plan to effectively manage flood defences and channels. This will ensure their condition and function is maintained.
- Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Provide advice to make sure there is no increase in risk of flooding from either rivers or surface water as a result of future development. We will do this by working with local authorities and other partners, for example to produce Surface Water Management Plans.
- Work in partnership with landowners and other partners to promote rural land management to help manage the risk of flooding and deliver environmental benefits. This may be through catchment sensitive farming practices and environmental stewardship schemes.

Don

Our key partners are:

South Tyneside MBC

City of Sunderland Council

Northumbrian Water Ltd

The issues in this sub-area

The Don sub-area is urban. The risk of flooding is highest in Usworth Hall and Hebburn. Currently there are 100 properties at risk this could rise to 102 in the future. Restricted culvert capacity increases the risk of flooding, and surface water runoff during short but heavy storms is thought to be a key source of floodwater.

The vision and approach

Policy Option 3 has been chosen for this sub-area. The main areas at risk of flooding benefit from defences which protect property from the River Tyne and River Don. The level of economic damages from flooding justifies the present levels of defence and future increase is limited. It is therefore appropriate to continue with existing flood management actions in the sub-area.

The key messages

- The risk of flooding is located in the urban areas of Usworth Hall and Hebburn, and is a combination of flashy local floods on small urban watercourses and flows from the Rivers Tyne and Don. The risk of flooding is not likely to increase significantly in the future.
- Urban streams contain a number of obstructions to flow, such as culverts and debris screens, which have caused local flooding in the past. Improvements to channel capacity and maintenance have already been made to help reduce flood risk.

Actions to implement the policy

- Develop a plan to effectively manage flood defences and channels. This will improve their condition and reduce the potential for blockages.
- Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Provide advice to make sure there is no increase in the risk of flooding from either rivers or surface water as a result of future development. We will do this by working with local authorities and other partners, for example to produce Surface Water Management Plans.

Sub-area 5

Derwent and Rural Team

Our key partners are:

- Northumberland County Council
- Durham County Council
- Northumbrian Water Ltd
- Land owners
- Natural England

The issues in this sub-area

The risk of flooding comes from the River Derwent, River Team and small tributaries. Currently there are 180 properties at risk of flooding and this could rise to 189 in the future assuming no defences. Derwent Reservoir provides some reduction of flood peaks, but high flows can pass downstream and are increased by tributary inflows, causing risk at Shotley Bridge, Blackhall Mill and elsewhere.Some tributaries are small and partly urban, making them rise rapidly during heavy rainfall.

The vision and approach

The approach is **Policy Option 2**. The main areas at risk are protected by raised defences and we will continue to maintain these and associated channels. We will also continue to provide a flood warning service. However, there is potential to reduce flood risk management actions across other parts of this area which will encourage naturalisation of the river channels.

The key messages

- The risk of flooding is located throughout the catchment. Flood risk arises from high flows in the River Derwent and the River Team and smaller local streams. Flood risk is not likely to increase significantly in the future.
- Appropriate actions need to be taken to address alternative ways of managing the risk of flooding between rural and urban areas, so that resources are concentrated in the areas with most risk.

Actions to implement the approach

- Develop a plan to reduce management of flood defences and channels in areas where this is suitable, to bring maintenance spending in line with flood risk. Where there are communities at risk, continue existing actions to manage flood risk.
- Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Work in partnership with landowners and other partners to promote rural land management to help manage the risk of flooding and deliver environmental benefits. This may be through catchment sensitive farming practices and environmental stewardship schemes.

Lower Tyne

Our key partners are:

Local Authorities

Northumbrian Water Ltd

The issues in this sub-area

This is the most urban part of the catchment, including Newcastle-upon-Tyne, Gateshead and North and South Shields. Flooding comes from the Rivers Tyne and Ouseburn and tributaries. There is also the risk of tidal flooding from the Tyne Estuary, including tide-locked drains. Surface water flooding has also been reported. From our broadscale modelling there are currently 5,081 properties at risk which could rise to 6,014 in the future assuming no defences.

The vision and approach

A **Policy Option 4** approach is justified in the sub-areas as there is a predicted increase in risk in the future. While there are no specific flood defences the channel is modified in urban areas and has a large capacity, therefore flooding of the extent suggested by computer models is unlikely to occur. We will do more to ensure that the risk of flooding does not increase in the future. This policy choice is relevant to the likely future urban development and redevelopment in the area.

The key messages

- The risk of flooding is potentially high in this area, due to the urban nature of the land and its high regional economic importance. The combination of risk from river and tidal flooding is important to understanding and managing risk.
- There is little natural floodplain, due to the urban environment and the modified channel; no formal flood defence assets are present.
- Flood risk could increase in the future and therefore there is a need to carry out more detailed studies to identify suitable flood risk management actions.

Actions to implement the approach

- Undertake a study to examine flood risk in more detail, including flood extents, river and tidal interactions, future changes and identify options to address future risk.
- Provide advice to make sure there is no increase in risk of flooding from either rivers or surface water as a result of future development. We will do this by working with local authorities and other partners, for example to produce Surface Water Management Plans.
- Develop a system asset management plan to identify assets and ensure future maintenance is effective. Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.

South Tyne

Our key partners are:

- Northumberland County Council
- Eden District Council
- Northumbrian Water Ltd
- Land owners
- Natural England

The issues in this sub-area

River gradients are steep in the headwaters of the Rivers South Tyne, East and West Allen, flowing off the North Pennine Moors. Wet soils and steep valleys cause flood waters to rise quickly and floodplain is limited. The small towns most at risk of flooding are Alston, Haltwhistle and Greenhead. Currently there are 178 properties at risk which could rise to 207 in the future assuming no defences.

The vision and approach

Under **Policy Option 3**, we will continue with existing levels of action in this sub-area. There are raised flood defences in the catchment protecting key villages and caravan parks. The level of risk now and in the future justifies the present standard of protection and existing actions such as channel maintenance.

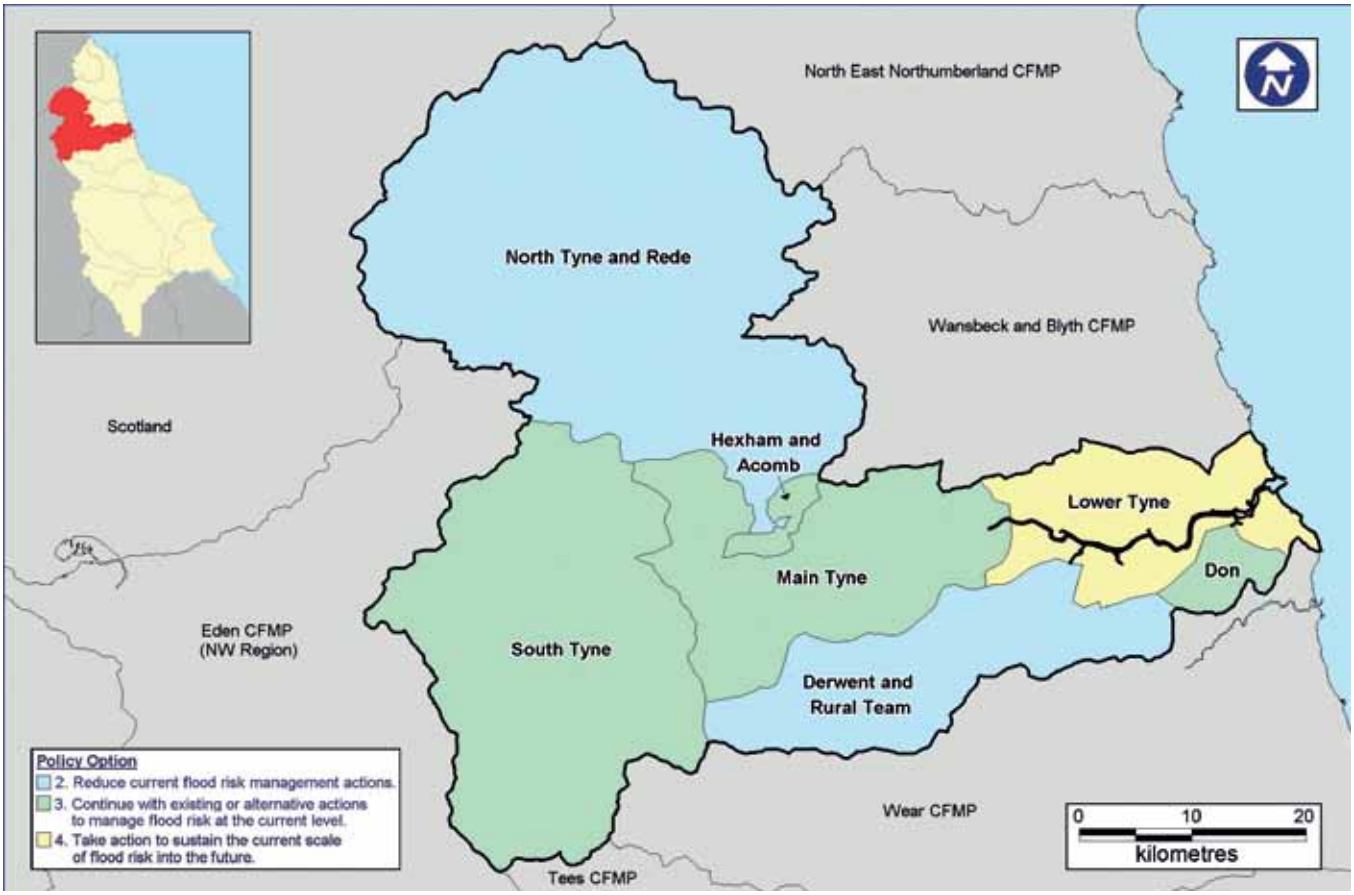
The key messages

- Although this is a rural area there are small communities at risk from rapidly rising floods.
- We will continue with our current levels of action to manage risk within the sub-area.

Actions to implement the approach

- Develop a plan to effectively manage flood defences and channels in areas where this is suitable. Where there are small communities at risk, continue existing actions.
- Look at feasibility of improving the flood warning service. Promote the flood warning service to increase uptake of the service by local residents and businesses and to increase awareness of flooding preparedness.
- Work in partnership with landowners and other partners to promote rural land management to help manage the risk of flooding and deliver environmental benefits. This may be through catchment sensitive farming practices and environmental stewardship schemes.

Map of CFMP policies



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*** Approximate call costs: 8p plus 6p per minute (standard landline). Please note charges will vary across telephone providers.**

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