

Upper Mersey Catchment Flood Management Plan

Summary Report December 2009



managing
flood risk

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December 2009

Introduction



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

The Upper Mersey 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, groundwater, 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 groundwater 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 Upper Mersey catchment is made up of the Rivers Mersey, Tame, Goyt, Bollin and Sinderland Brook. The catchment has a mix of predominantly rural uplands with the lower catchment highly urbanised. It is

home to approximately 1.2million people with South Manchester, Stockport and Macclesfield being the main urban areas. There is a history of flooding with Didsbury, Sale and Altrincham at greatest risk. Over 2,600 residential and commercial properties are at a 1% annual probability of flooding from rivers within the Upper Mersey catchment. This is expected to rise to 2,900 properties in the future due to the effects of climate change.

We cannot reduce flood risk on our own, 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 management flood risk in the future. To develop this plan and ensure social, economic and environmental issues were taken into account we worked with, and consulted many organisations. These include: Defra, Local Authorities, Greater Manchester District Council Officers Group, United Utilities, and the Manchester Ship Canal Company.

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 North West Region.

A handwritten signature in black ink, appearing to read 'Tony Dean'.

Tony Dean
Regional Director

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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:

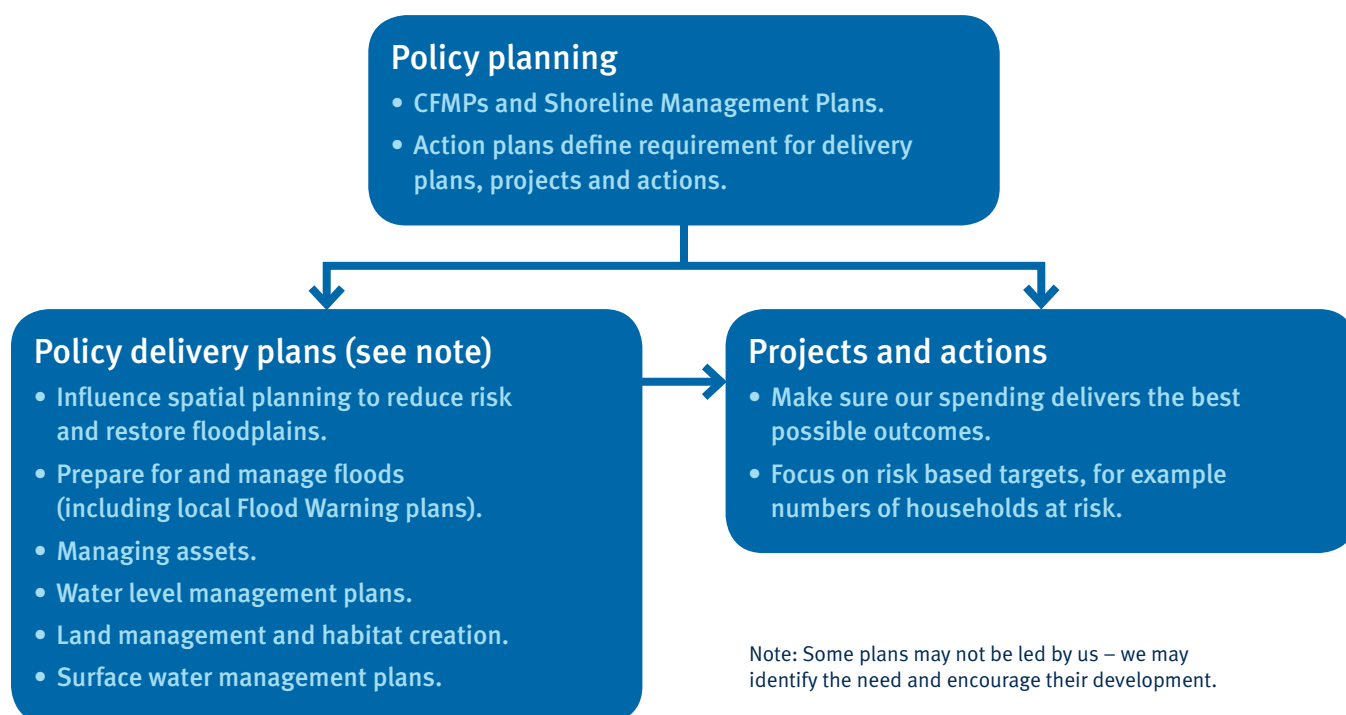
- The Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions.
- Regional planning bodies and local authorities who can use the plan to inform spatial planning activities and emergency planning.

- Internal Drainage Board, water companies and other utilities to help plan their activities in the wider context of the catchment.
- Transportation planners.
- Landowners, farmers and land managers who 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



Catchment overview

It is useful to draw out some general characteristics that are most important in our management of flood risk. The Upper Mersey catchment is made up of the Rivers Mersey, Tame, Goyt, Bollin and Sinderland Brook. The catchment covers approximately 1,052km² and has a mix of predominantly rural uplands with the lower catchment highly urbanised. The catchment extends from the Pennines at its eastern boundary to the confluence of the Bollin and the Manchester Ship Canal in the west. The northern boundary principally comprises the periphery of the Greater Manchester conurbation whilst the Cheshire Plains are located along the southern boundary. The catchment is home to approximately 1.2million people with South Manchester, Stockport and Macclesfield being the main urban areas, 27% of the catchment is classified as urban. The

catchment has a history of flooding with Didsbury, Sale and Altrincham at greatest risk.

The watercourses within the Upper Mersey CFMP catchment have been extensively modified. In urban areas, many watercourses have been culverted or channelised through development. Some upstream reaches retain a more natural character. Reservoirs in the Tame, Goyt and Etherow sub-catchments have an influence on flows within the catchment, particularly in the upper reaches. The Manchester Ship Canal receives waters from both the Upper Mersey and River Irwell catchments and provides an important drainage and flood alleviation function.

In the Mersey catchment there are operational washlands which provide a valuable flood risk management function and these assets will continue to form

an essential part of flood risk management in the future.

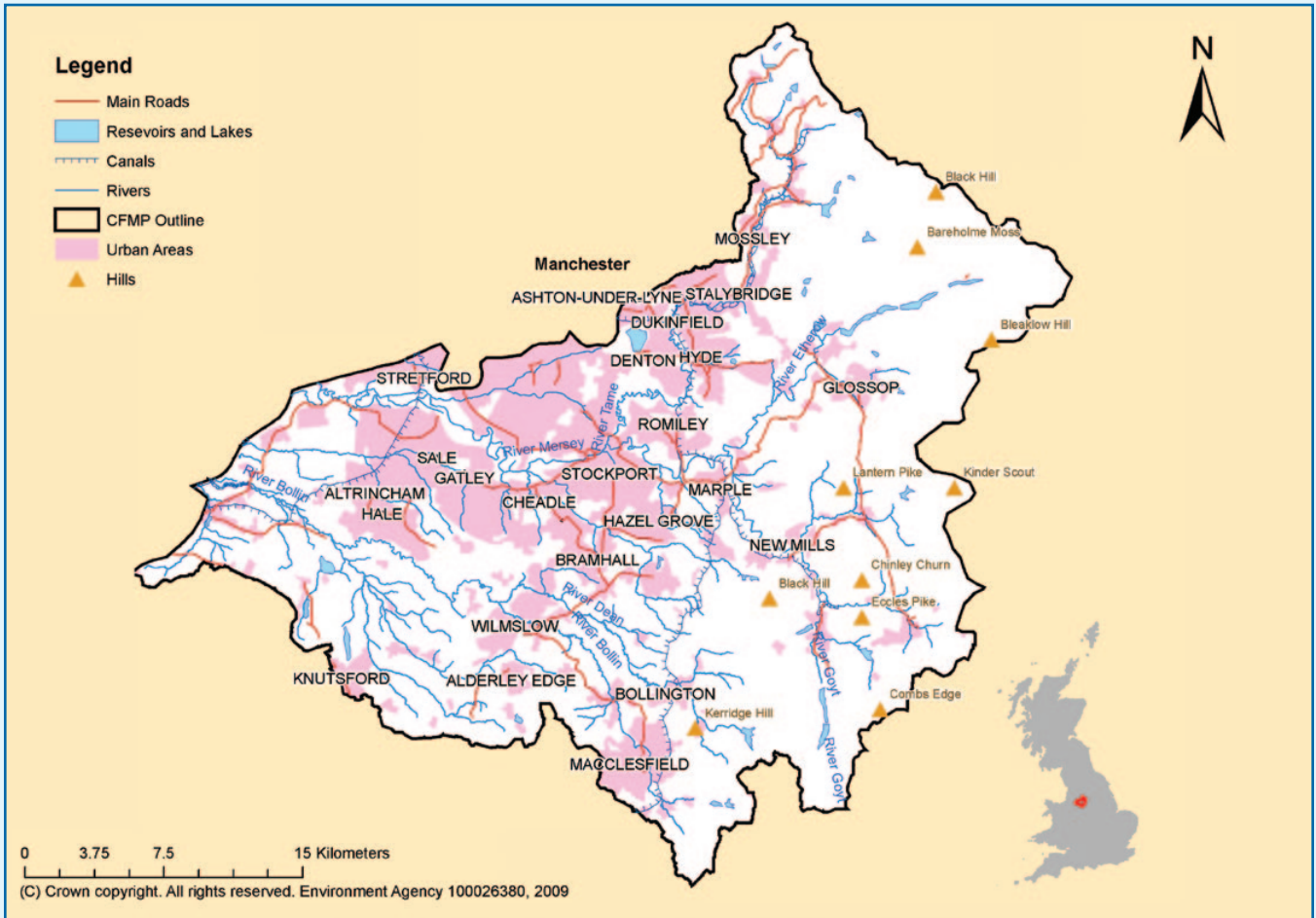
The Manchester, Stockport, Tameside and Trafford districts contain a total combined population of 830,000. This is approximately 70% of the total population in the Upper Mersey CFMP area. Our approach to management in these locations is focussed around sustainable re-development, flood warning, resilience and "Making Space for Water" either locally or upstream.

The CFMP area is important for nature conservation. Four areas of special scientific interest are within the floodplain. For example, the Peak District National Park has many watercourses and is a dynamic system and provides opportunities to store water and/or manage run-off to reduce flood risk downstream as well as improving natural habitat locally.



↑ Sinderland Brook, Sale

Map 1 Upper Mersey CFMP – main features



↑ Baguley Brook, Wythenshawe

Current and future flood risk

Overview of the current flood risk

Flood risk has two components: the chance (probability) of a particular flood and the impact (or 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 1% flood has a 1% chance or probability of occurring in any one year, and a 0.5% flood has a 0.5% chance or probability of occurring in any one year. The flood risks quoted in this report are those that take account of flood defences already in place.

The Upper Mersey has historically been subject to sudden periods of flooding. A number of notable flood events have occurred in the catchment between 1965 and 2002. The most significant, that had a widespread effect on the Upper Mersey catchment, occurred in 1965 when the River Mersey breached its banks and widespread damage was caused as well as loss of livestock. Other major events occurred in August 1998 and October 1998 when 130 properties were affected by flooding. Most recently 190 properties were flooded in Glossop after very heavy rainfall followed a drought.

The main sources of flooding in the Upper Mersey catchment are:

- River flooding can occur in the upper and lower parts of the catchment. In the upper catchment, the Tame, flows through a steep and heavily urbanised area. Uppermill, Mossley, Stalybridge and Dukinfield are at flood risk in a 2% event. The Goyt and Etherow flow through more rural areas. The response times of these two rivers are fast, often less than 2 hours and as a result can put Glossop, Wooley Bridge and Hollingworth on the River Etherow at risk of flooding. The Goyt puts New Mills, Hayfield, Thornsett and Birch Vale at flood risk. The Goyt and the Tame join at Stockport to form the River Mersey which then flows through heavily engineered channels, embankments and washlands into the Manchester Ship canal. The River Bollin also flows into the Ship Canal and there is a history of flooding in Bollington (from the River Dean), Prestbury and Macclesfield. The lower reaches of the River Bollin put Heatley at flood risk.
- Surface water flooding is known to occur in urban areas of this catchment. It is as a result of short intense storms, when the capacity of the urban drainage system is exceeded and water is forced to flow across the ground. There is little information available on surface water flooding and further work is being undertaken to assess its true extent.
- Sewer flooding is known to have affected houses internally in Heaton Moor, Stretford and Altrincham. United Utilities have an ongoing programme of work to maintain and improve public sewers.
- Groundwater flooding can occur if the water table exceeds ground level. Parts of the catchment lie over permeable rocks that form aquifers. There have not been any reports of groundwater flooding in this catchment. Potentially there are areas with increased risk of flooding if there should be an overall rise in the water table.
- Canal or reservoir flooding is not thought to be a significant risk in the catchment. There are however five canals, one of which breached in 1973 causing some damage to property. The Manchester Ship Canal has occasionally flooded near to the river confluences but this is mainly in rural areas. There are many reservoirs in the upper catchment but the inspection programmes undertaken make a breach unlikely, although the consequences of such an event would be significant.

What is at risk?

The main sources of risk are fluvial flooding from the rivers, surface water and sewer flooding from the drainage system. Using broad-scale hydraulic models for the Mersey, Bollin, Sinderland Brook and their tributaries we estimate 2,600 residential and commercial properties in the catchment have a 1% chance of flooding in any one year from rivers. Where models were not available flood zone maps were used to calculate the number of properties at risk. There are four sites of special scientific interest (SSSIs) that are within the 1% fluvial flood extent, but only small areas of land would be affected. Also at risk in a 1% event are four ancient monuments and four registered parks and gardens.

Where is the risk?

The catchment has a history of flooding with parts of Didsbury, Sale and Altrincham at greatest risk. The distribution of flood risk to property across the catchment is illustrated on the map overleaf.

We recognise the potential risk from surface water and sewer flooding. Further studies, following on from the CFMP, will be undertaken with our partners to quantify the potential risk.

Table 1. Locations of Towns and Villages with 25 or more properties at risk in a 1% annual probability river flood

Number of properties at risk	Locations
Over 500	Didsbury
151 to 500	Uppermill, Stockport, Sale
51 to 150	Mossley, Ashton-upon-Mersey
25 to 50	Bollington, Handforth

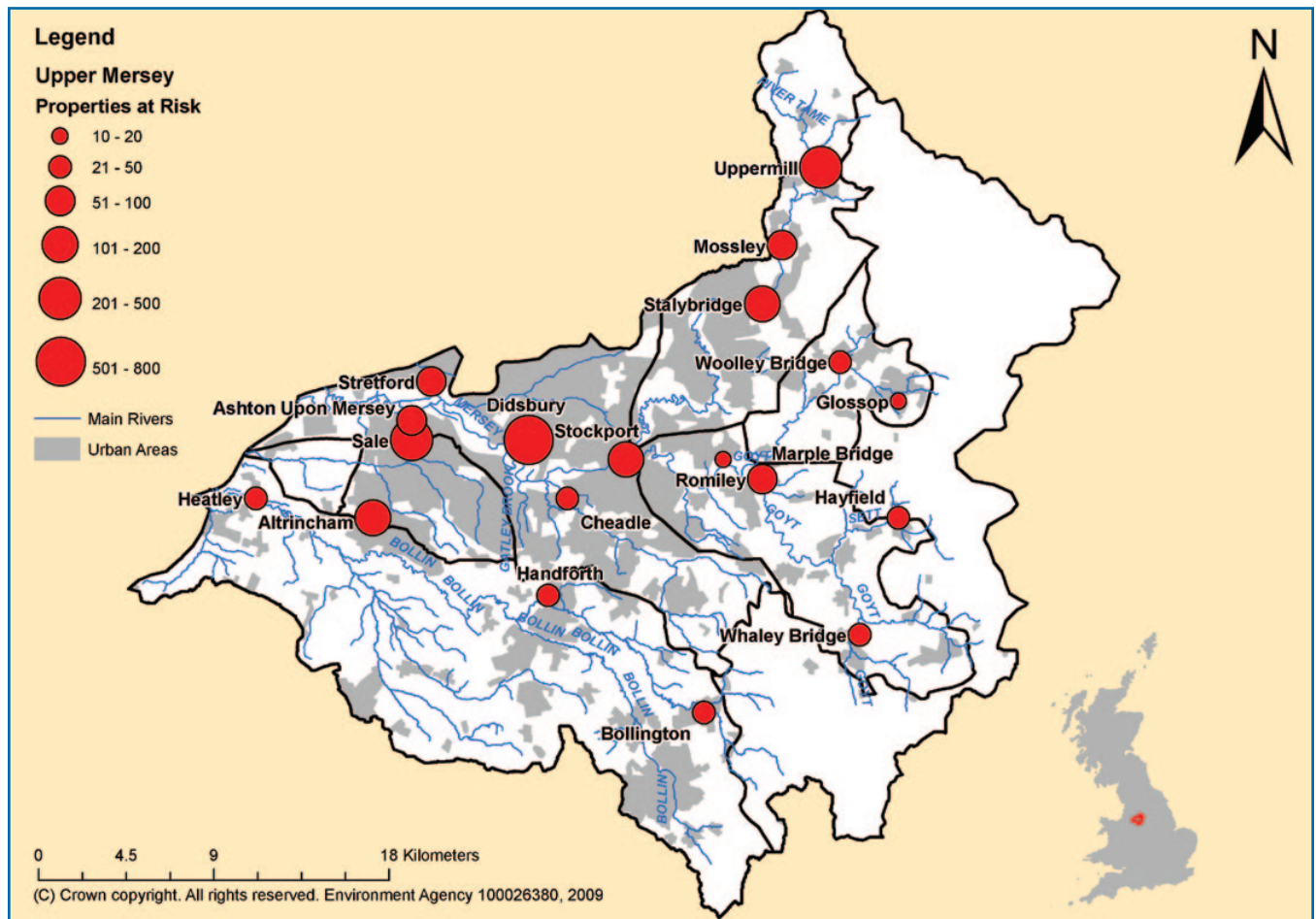
Table 2. Critical infrastructure at risk:

4 electricity sub stations, 9 sewage and water treatment plants, 6 health centres, 2 IPPC sites, 4 leisure facilities, 2 Schools, 4 waste management sites, 1 police station, 1 emergency response centre, 1 care home, 1 caravan and camp site



↑ Mersey at Flixton

Map 2 Risk to property across catchment for the 1% annual probability fluvial event



How we currently manage the risk in the catchment

The Upper Mersey catchment has benefited, from engineering schemes put in place over the last 30 years or more. This includes:

- Twenty million pounds has been invested in the last ten years on the development of flood alleviation schemes in Glossop, Wooley Bridge, Bollington, Fallowfield, Northenden and Didsbury. There are over 67 km of raised flood defences in this catchment.
- Three flood storage areas at Sale, Timperley and Didsbury. The result of attenuation and temporary

storage is a reduction in peak flow of 35% during a 1% annual event at the confluence of the Manchester Ship Canal.

In addition to these engineering schemes, other flood risk management activities are carried out in the catchment. These include activities, that help to reduce the probability of flooding, and those that address the consequences of flooding.

Activities that reduce the probability of flooding include:

- Maintaining and improving existing flood defences, structures

and watercourses; the Upper Mersey catchment has over 67km of raised defences.

- Enforcement and maintenance where riparian owners and others carry out work detrimental to flood risk or neglect their duties.
- Identifying and promoting new flood alleviation schemes where appropriate, such as studies on the Upper Tame and at Chorlton/Fallowfield.
- Working with local authorities to influence the location, layout and design of new and redeveloped property and ensuring that only

The impact of climate change and future flood risk

appropriate development is allowed on the floodplain through the application of Planning Policy Statement 25 (PPS25).

Activities that reduce the consequences of flooding include:

- Flood risk mapping, understanding where flooding is likely to occur.
- Providing flood incident management.
- Operation of floodline and warning services to areas of Didsbury, Northenden, Flixton, Wooley Bridge, Glossop, Macclesfield and Bollington.
- Promoting awareness of flooding so that organisations, communities and individuals are aware of the risk and are prepared in case they need to take action in time of flood.
- Promoting resilience and resistance measures for those properties at risk of flooding.

In the future, flooding will be influenced by climate change, changes in land use (for example urban development) and rural land management. In the Upper Mersey catchment, with current land drainage practices, sensitivity testing revealed that climate change has the greatest impact on flood risk, with land management change, and urbanisation having a lesser but significant effect. Whilst we do not know exactly what will happen in the future the key trends are:

- More frequent and intense storms causing more widespread flooding from drainage systems and some rivers.
- Wetter winters increasing the likelihood of large-scale flooding.

The future scenarios used in the Upper Mersey CFMP were:

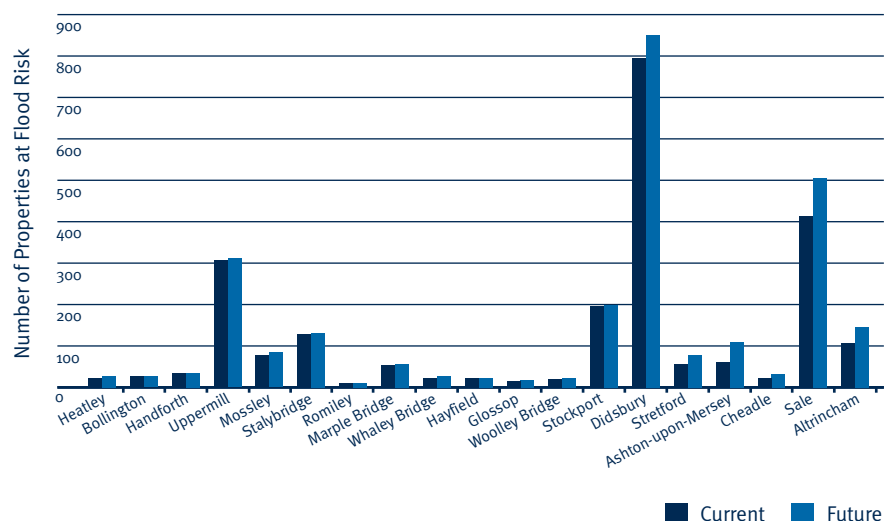
- A 20% increase in peak flow in all watercourses. The predicted increase in flow can affect the frequency, timing, scale of flooding and the flood levels.

- Increased urbanisation (5-12%) and change in rural land use reducing time to peak by 2 hours and run-off by 15%.

We estimate that by 2100 the number of properties at risk from fluvial flooding in the CFMP area will increase by around 11% (nearly 300 properties). The greatest impact is predicted in the main urban areas of Ashton-on-Mersey, Cheadle and Stretford. In Ashton-on-Mersey, if no action is taken to account for climate change, the number of properties at risk in a 1% Annual Exceedance Probability (AEP) fluvial flood event could increase from 62 to 110, up to 77% higher than currently. The peak river levels in a 1% AEP fluvial flood event will be higher. The onset of flooding would also occur earlier, possibly impacting on the ability to provide adequate flood warning.

The graph below shows the difference between current and future flood risks from a 1% event at key locations across the catchment.

Figure 2 Current and future (2100) flood risk to property from a 1% annual probability river flood, taking into account current flood defences.



Future direction for flood risk management

Approaches in each sub-area

We have divided the Upper Mersey CFMP area into eight distinct sub-areas that have similar physical characteristics, sources of flooding and levels of risk. These sub-areas will allow us and the key stakeholders to promote flood risk management approaches, policies and actions that are most appropriate in that area to deliver the various Government and regional strategies, in particular the Making Space for Water strategy. In the face of increasing risk, it often is not sustainable to keep building

and raising defences. We have to look catchment wide at how we direct effort and resources to ensure sustainable solutions. We have assessed what will be the most sustainable approach to managing flood risk in each sub area. This is presented in the following sections and they outline:

- The key issues in that area.
- The vision and preferred policy.
- The proposed actions to implement the policy.

This document does set out our policies for managing flood risk, recognising the constraints that do exist. Our future direction for managing flood risk is expressed by applying one of our six standard policy options to that sub area. 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. The six policy options are explained on page 11.

Map 3 Sub-areas

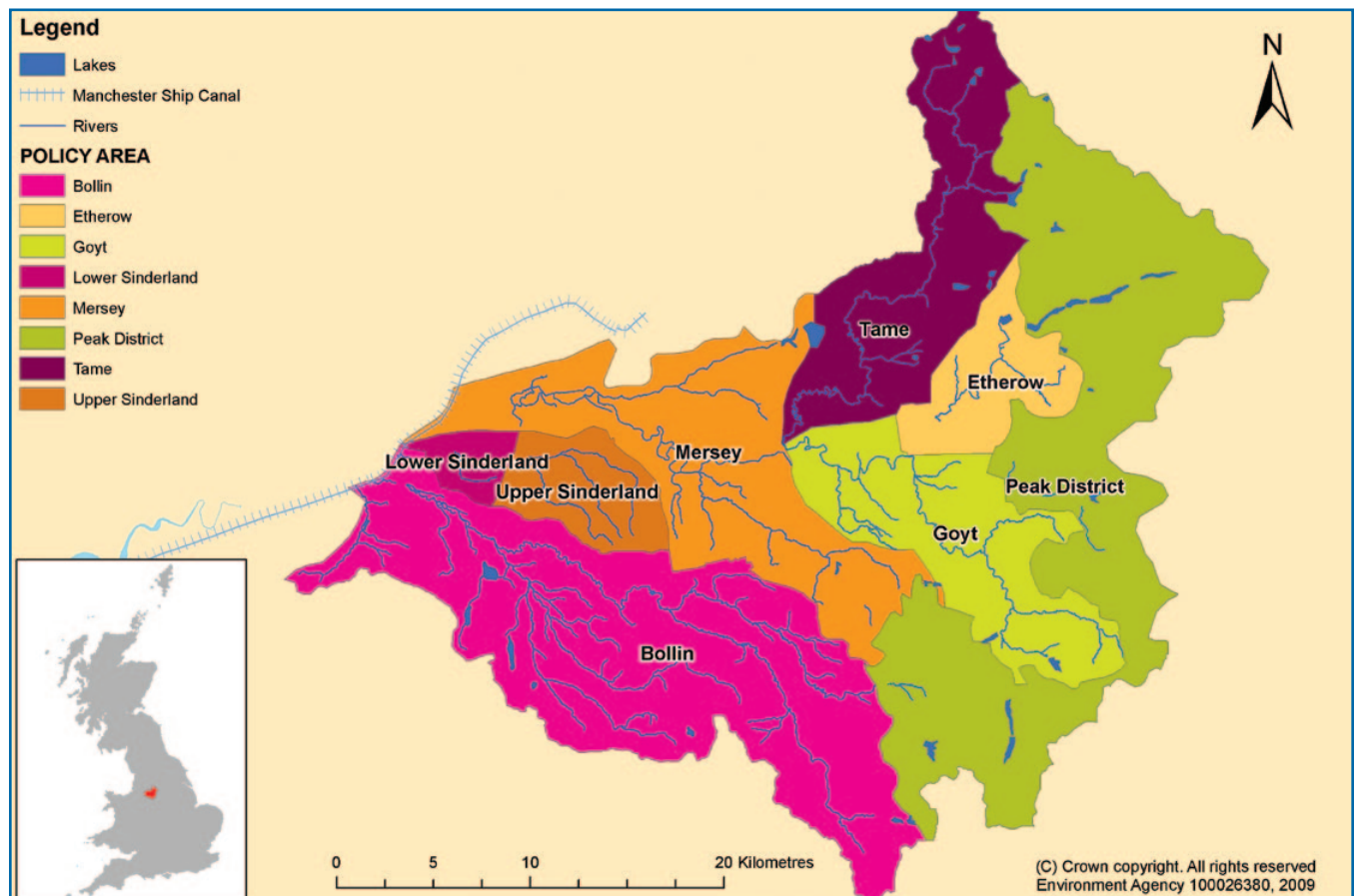


Table 3 Policy options

→ 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.

Peak District

Our key partners are:

Oldham Metropolitan Borough Council

High Peak Borough Council

Cheshire East Council

Peak District National Park Authority

Natural England

United Utilities

Landowners

Environmental groups

The issues in this sub-area

The flood risk in this sub-area is very low due to the rural nature of the area with scattered/isolated properties. We estimate only 1 property is at risk in a 1% annual probability event (APE) and the effects of climate change is not expected to change this. The Peak District National Park has high environmental value due to its Sites of Special Scientific Interest (SSSI), Special Area of Conservation (SAC)/ Special Protection Area (SPA) designations and Biodiversity Action Plan (BAP) habitat comprising blanket bog and upland heather.

The vision and preferred policy

Policy option 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.

Our preferred policy sets a framework which permits flooding to increase at some locations within the sub-area to provide flood risk management benefits locally and across the wider catchment. It also provides for action to manage flood risk both now and in the future. This includes investigating the use

of redundant reservoirs to reduce run-off in extreme storms. We are also supporting the Moors for the Future project to block existing moorland grips with the aim of reducing run-off.

The key messages

- The preferred policy complements the existing actions of the Peak District National Park and associated parties in blocking up of moorland grips and drainage systems.
- The wetland status of environmental sites within the area can be enhanced and using the natural attenuation of the land will have benefits to flood risk management further downstream.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Explore means of achieving land management change to reduce run-off from the upper catchment, especially through blocking of moorland grips.
- Assess further the potential for making further flood storage or expanding existing flood storage to reduce flood risk downstream and increase biodiversity and water sports recreation.



↑ Peak District National Park - view of Torside Clough

Bollin

Our key partners are:

Trafford Metropolitan Borough Council

Manchester City Council

Stockport Metropolitan Borough Council

Cheshire East Council

Natural England

United Utilities

The issues in this sub-area

This area is characterised by the conurbations of Bollington, Prestbury, Alderley Edge, Macclesfield and Wilmslow. The majority of the watercourses are natural channels with short lengths of raised embankments. Flood risk is considered to be moderate, with over 140 properties at risk now from the 1% event rising to over 160 in the future due to climate change. Generally the sub-area has a standard or protection up to the 2% annual probability fluvial event. Key flood risk locations within the area, for example, are Bollington and Macclesfield. A small number of electricity sub-stations and sewage/water treatment plants are also potentially at flood risk. In future, it is likely that resources will be focussed on these areas.

The vision and preferred policy

Policy option 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.

Our vision is to sustain the current level of protection into the future, while also accepting that specific locations need improvement. For properties at risk, flood resistance and resilience opportunities should be encouraged. Wider opportunities at a catchment scale such as beneficial land management change and upstream flood storage will also play a part in ensuring no increase in the level of flood risk in this downstream sub-area. This will result in a safe environment in which people can live and work.

The key messages

- We need to better understand localised flooding including non-main rivers and sewer systems.
- Existing defences will need to be maintained in the long term at Bollington, Macclesfield, Prestbury and Heatley.
- Future flood risk management expenditure will be targeted to certain key risk areas.
- We will consider a range of flood risk management measures,

including improved flood warning and flood resilience to sustain the level of risk and enable sustainable development.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Identify the maintenance/capital works associated with flood risk management assets that will be required over the future 100 year horizon. This will identify areas where maintenance and resources can be redirected, to provide greatest flood risk benefit from expenditure in the sub-area.
- Improve awareness of new Flood Warning Areas in Macclesfield and Prestbury. Implement planned new Flood Warning Areas including Bollington, Handforth and Wilmslow.
- Investigate the impact of catchment changes on the current level of risk in Bollington, Macclesfield and Prestbury and identify options for maintaining the level of risk into the future.
- Improve understanding of surface water/sewer flooding by working with our partners.

Tame

Our key partners are:

Oldham Metropolitan Borough Council

Tameside Metropolitan Borough Council

Stockport Metropolitan Borough Council

Developers

The issues in this sub-area

This sub-area is heavily urbanised, with steep narrow valleys and potentially high damages, in particular at Uppermill, Mossley and Stalybridge. There is increased flood risk from potential culvert blockages and channel degradation. The current and future flood risk is considered to be high, with over 600 properties at flood risk for the 1% event now, rising to over 650 properties in the future. A small number of electricity sub-stations and sewage/water treatment plants are also potentially at flood risk.

The vision and preferred policy

Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.

Flood risk is high enough to warrant further investigation. Urban regeneration is needed but this is constrained by flood risk issues. Strategic redevelopment and relocation outside the floodplain could reduce the number of people and properties at flood risk. A suite of measures will be required both locally (such as innovative development layouts, resilience, SUDS and flood warning) and further upstream (such as providing upstream flood storage and land management change).

The key messages

- Change the character of the urban footprint through re-development so that the consequences of flooding are reduced by better layout, for example, introduction of green infrastructure along the rivers, resilient to flooding, with the potential for some flood alleviation downstream.
- Seek to achieve land management change in upland areas to retain water and reduce flood risk in the key urban areas.
- A large flood alleviation scheme is unlikely to be sufficiently viable to

attract funding but smaller, location specific works may be possible.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Identify the maintenance/capital works associated with flood risk management assets that will be required over the future 100 year horizon.
- Implement planned new Flood Warning Areas including Uppermill, Mossley and Stalybridge.
- Undertake a feasibility study to consider the justification and appropriate management measures for reducing flood risk in Mossley, Stalybridge, Uppermill and Diggle.
- Put in place policies within the Local Development Framework which seek to remove critical infrastructure from Flood Zones 3 (1% event) and 2 (0.1% event) over time. A policy which seeks to relocate this infrastructure at the end of its operational life would improve the area's ability to respond to and deal with flood incidents in the future.

Mersey

Our key partners are:

Trafford Metropolitan Borough Council

Manchester City Council

Stockport Metropolitan Borough Council

Cheshire East Council

United Utilities

Landowners

The issues in this sub-area

The River Mersey between Stockport and its confluence with the Manchester Ship Canal is heavily engineered, with flood storage areas and extensive flood defence embankments. There are very high numbers of people and property at flood risk. Over 2000 people and 1000 properties are at risk from the 1% event. In the future by 2100 we estimate approximately 1,270 properties will be at risk in a 1% APE due to climate change. Critical infrastructure at flood risk from the 1% event includes, several electricity sub stations, sewage/ water treatment plants and health centres/care homes. The current and future flood risk is considered to be very high and warrants further investigations.

The vision and preferred policy

Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.

Increased investment in flood risk management is likely to provide significant benefits in terms of reduced flood damages. Many of the urban watercourses in South Manchester are substantially culverted. We are proposing to undertake detailed investigations to

improve our knowledge of the risk of flooding should these culverts block. This will form part of the South Manchester Strategy.

The key messages

- It is likely that reduction in flood risk will be provided by the implementation of flood alleviation schemes on the Mersey where economically and environmentally feasible.
- It is recognised that there are intense development pressures in this sub-area and therefore opportunities for strategic redevelopment and relocation are limited.
- The use of sustainable drainage systems (SUDS) and improvements to the urban sewerage and drainage network can have a local impact in reducing flood risk from these sources.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Carry out a Flood Risk Strategy for Chorlton Platt Gore to consider a range of options for reducing flood risk in Chorlton and Fallowfield.
- Carry out a study to investigate the condition and associated flood risk of the culverted sections of Chorlton Platt Gore and Cringle Brook. This should include the impact of silt, blockages and any mitigation measures which could be put in place.
- Implement a programme of Asset Maintenance and Repair in line with the Mersey Maintenance Strategy. This should include looking at options for environmentally sensitive management of the existing defences.
- Implement planned new Flood Warning Areas including Stockport and Ashton-on-Mersey.
- Increase awareness of existing Flood Warning Areas in Northenden, Didsbury and Flixton.
- Investigate the potential for reducing flood risk in the Mersey catchment by use of strategic storage areas upstream.



↑ Mersey at Northenden

Upper Sinderland

Our key partners are:

Trafford Metropolitan Borough Council

United Utilities

Manchester City Council

The issues in this sub-area

This sub-area is located to the south side of Manchester and is heavily urbanised. A large proportion of the watercourse has been modified and there are significant lengths of culvert and other structures present. Flood risk to people and property and its associated economic impacts are considered to be high. Around 1100 people and 500 properties are currently at flood risk for a 1% AEP event. It is anticipated that over 1500 people and 650 properties will be at flood risk in the future.

The vision and preferred policy

Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.

Our preferred policy for this sub-area sets a framework which maintains the current level of flood risk and takes account of future climate change, urbanisation and land use management. We aim to reduce flood risk through the design and layout of new developments. We are also preparing the South Manchester Strategy which will review current flood risk and investigate possible flood risk reduction measures.

The key messages

- Future flood risk management works need to incorporate measures to provide green infrastructure along the watercourses, where practicable, which will enhance the urban environment and potentially provide some level of flood risk reduction.
- We will consider a range of flood risk management measures to sustain the level of risk and enable sustainable development. Measures such as flood resilience, flood proofing, flood warning and promoting self-help will also be investigated to reduce the consequences of flooding.
- The use of SUDS and improvements to the urban sewerage and drainage network should have a local impact in reducing flood risk from these sources.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Carry out a Flood Risk Strategy for Baguley, Fairywell, Timperley and Sinderland Brooks to consider a range of options for reducing flood risk in Wythenshawe, Sale and Altrincham.
- Identify the maintenance/capital works associated with flood risk management assets that will be required over the future 100 year horizon.
- Increase awareness of existing Flood Warning Areas in Sale.



↑ Fairywell Brook at Kentmere Road

Goyt

Our key partners are:

Stockport Metropolitan Borough Council

Cheshire East Council

High Peak Borough Council

Developers

The issues in this sub-area

This sub-area is semi-rural, with steep valleys and settlements centred around old mill towns. Particular flood risk areas include Romiley, Marple Bridge, Whaley Bridge and Hayfield. There is potential flood risk from culvert blockages and degradation of natural channels. There is flood risk to over 230 people and 160 properties for the 1% APE. In future, the number of people and properties at risk are likely to increase to approximately 180.

The vision and preferred policy

Policy option 3: Areas of low to moderate flood risk where we are generally managing existing flood risk effectively.

Our preferred policy sets a framework which maintains flood risk at the current level, accepting that flood risk is likely to increase over time. We will look to direct flood risk management to areas of highest risk. Where possible, old mill culverts will be opened up when sites are redeveloped to reduce the risk of blockage and flooding.

The key messages

- The provision of flood warning areas and awareness campaigns will provide a cost-effective method of reducing the impacts of flooding to people and properties.
- The scale of flood risk is not sufficient to warrant undertaking significant flood risk management measures.
- In urban areas, many of the buildings are located against the river bank and the rivers culverted. Where possible, we will seek to open up the river corridor as opportunities arise through re-development and the development control process.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Identify the maintenance/capital works associated with flood risk management assets that will be required over the future 100 year horizon.
- Implement planned new Flood Warning Areas including Whaley Bridge and Lower Bredbury.
- Put in place policies within the Local Development Framework which seek to remove critical infrastructure from Flood Zones 3 and 2 over time.



↑ Goyt, New Mills

Etherow

Our key partners are:

Tameside Metropolitan Borough Council

High Peak Borough Council

Stockport Borough Council

Natural England

The issues in this sub-area

This sub-area is generally rural, except for the notable urban developments in the upper reaches of the catchment at Woolley Bridge and Glossop, built up around old mill towns. Build up of gravel is an issue on stretches of this river, and can cause blockages and potentially exacerbate flooding (Glossop 2002). The level of flood risk is moderate, with over 80 people and 50 properties at risk from a 1% APE. Our studies suggest that flood risk in this area is not expected to increase significantly over time. Fifty one properties are at risk in a 1% APE by 2100 due to climate change.

The vision and preferred policy

Policy option 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.

Our vision is to sustain the current level of protection into the future, while also accepting that specific locations need improvement. For properties at risk, flood resistance and resilience opportunities should be encouraged. Wider opportunities at a catchment scale such as beneficial land management change and upstream flood storage will also play a part in sustaining the level

of flood risk in this downstream sub-area. This will result in a safe environment in which people can live and work.

The key messages

- It is acknowledged that sections of the river channel are prone to blockage and the 2002 flood event caused flooding to almost 200 properties in Glossop as a result of these blockages. Gravel management is an issue to be investigated in this sub-area.
- The provision of flood warning areas and awareness campaigns will provide a cost-effective method of reducing the impacts of flooding to people and properties. Continuing the existing flood warning system will help people and businesses to protect themselves, or take other action, in the event of a predicted flood.
- In terms of flood risk, it is considered to be more efficient to concentrate resources and expenditure on the key flood risk areas and to reduce expenditure in the lower risk areas within this unit.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Identify the maintenance/capital works associated with flood risk management assets that will be required over the future 100 year horizon.
- Carry out a catchment Gravel Management Plan to identify how gravel levels in the channel can be managed.
- Increase awareness of new and existing Flood Warning Areas in Glossop and Woolley Bridge.
- Assess the potential for creating further storage or expanding existing storage to reduce flood risk downstream, and improve wetland habitats and biodiversity.
- Investigate the impact of catchment changes on the current level of flood risk in Glossop and Woolley Bridge and identify options for sustaining the current level of risk into the future.



↑ Etherow

Lower Sinderland

Our key partners are:

Trafford Metropolitan Borough Council

National Farmers Union

Natural England

The issues in this sub-area

This sub-area is principally rural and comprises high quality (Grade 2) agricultural land. Partington is the only significant settlement. Watercourses have been heavily modified as a result of agricultural land management practice. The area contains a significant environmental feature, Brookheys Covert SSSI which includes biodiversity action plan habitat. Flood risk in the area is considered to be very low both now and in the future. Two properties are currently at risk in a 1% APE this may rise to 4 by 2100 due to climate change.

The vision and preferred policy

Policy option 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 sub-area is largely rural, with scattered areas at risk of flooding. Our vision is to ensure as much of the natural floodplain as possible is restored in order to provide storage, thereby reducing flooding to downstream areas and providing environmental and amenity benefits.

The key messages

- Flood risk in the area is considered to be very low.
- Maintaining (and in some places enhancing) the capacity of the natural floodplain to retain water, reduces the impacts of the more frequently experienced floods downstream and has benefits for the natural environment.

Proposed actions to implement the preferred policy

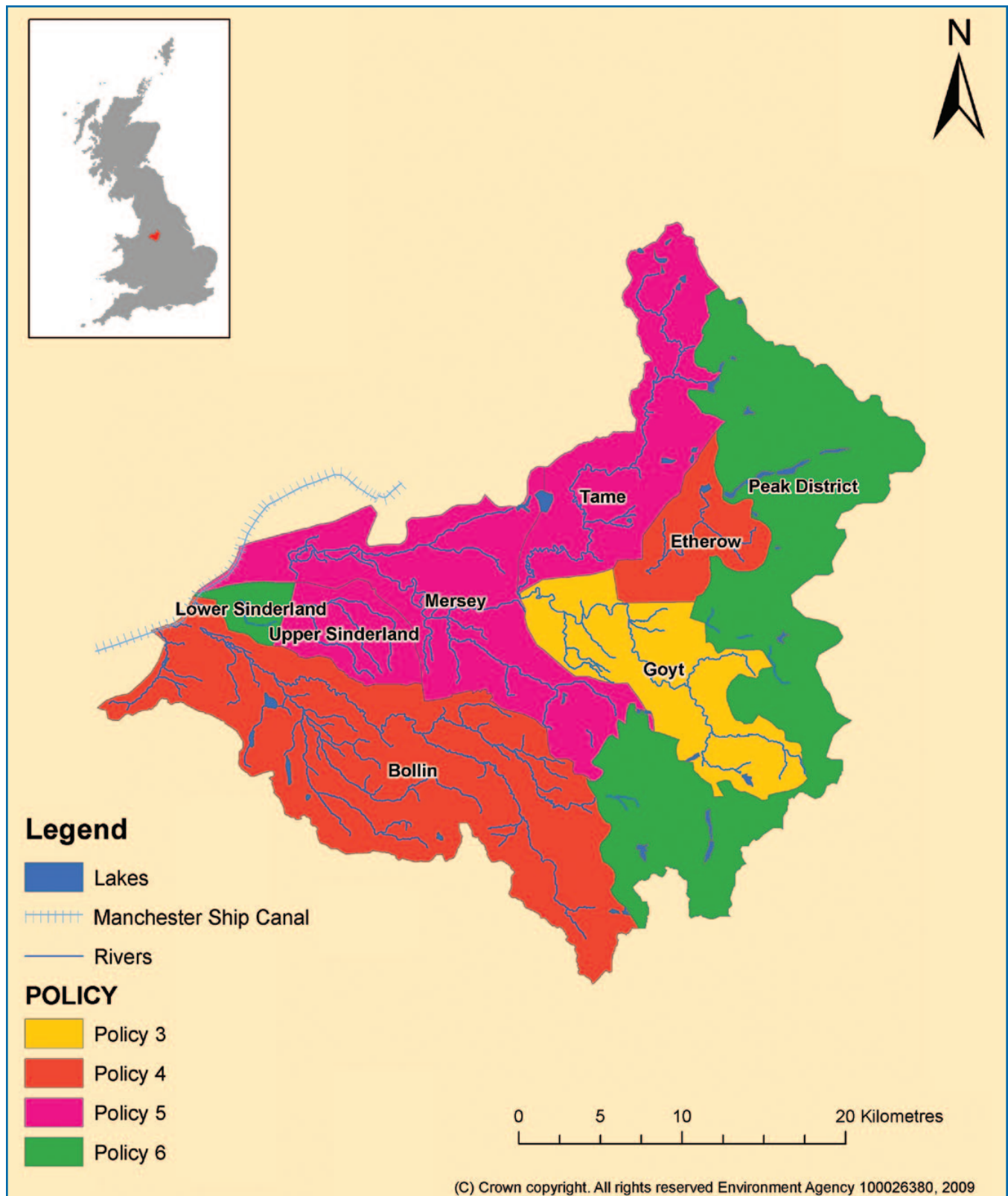
The essential actions to achieve our policy aim are listed below:

- Explore means of achieving land management change to reduce run-off from the upper catchment.
- Encourage the use of appropriately designed SUDS to control run-off at source.



↑ Sinderland Brook nr Partington

Map of CFMP policies



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