

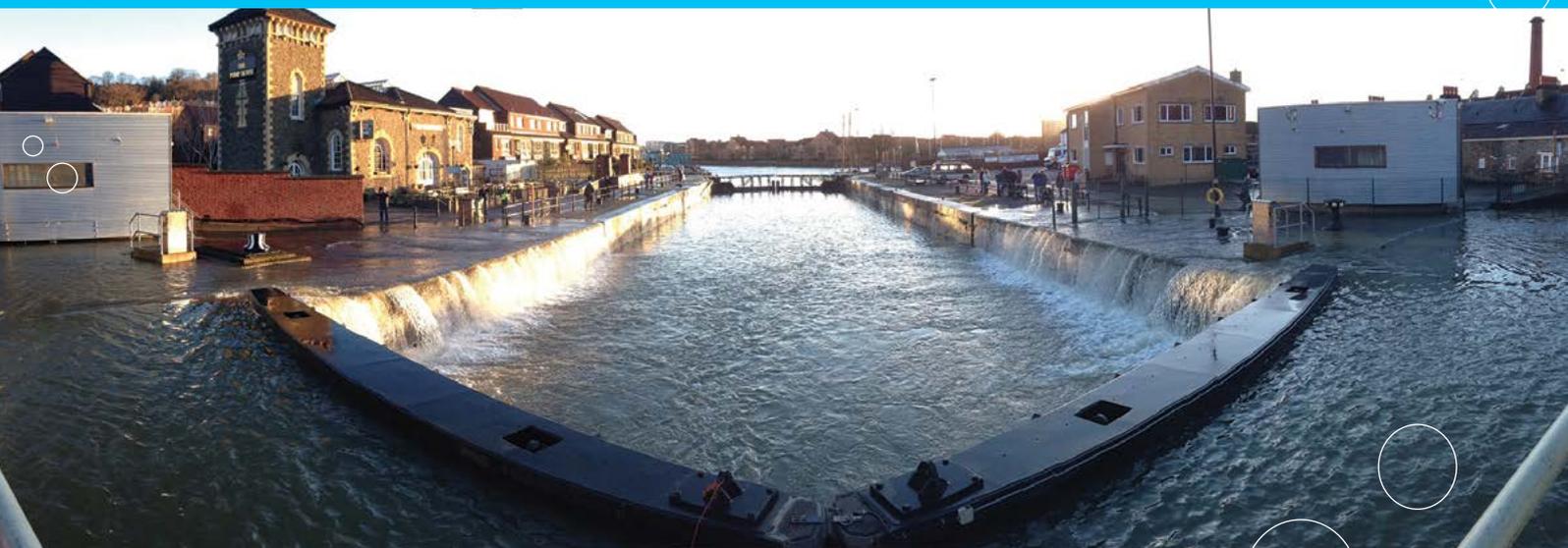
# **Bristol**

## **Local Flood Risk**

### **Management Strategy**

#### **Summary**

**February 2018**



# Introduction

The widespread flooding experienced across the UK in recent years as well as the 1968 event in Bristol demonstrates the devastating effects that flooding has on people and their homes and communities. Over the last few years, Bristol has been relatively fortunate compared to other areas of the UK. However, we have experienced a number of flood events such as the tidal flooding in 2014 and 1981 as well as the heavy rainfall events in 1979 and 1995. As the Lead Local Flood Authority for the Bristol area, an important duty for Bristol City Council is to produce and maintain a Local Flood Risk Management Strategy. The Strategy sets out our vision for managing flood risk in Bristol together with other organisations that have a role in flood risk management.

## Strategy overview

This is the first update of the LFRMS. We have made significant progress with our duties as summarised by flood risk information available via: <http://maps.bristol.gov.uk/bfrm/>. This document presents a summary of the main objectives, measures and actions that are proposed to manage and try to reduce flood risks to the people and places of Bristol. The full version of the draft strategy is available from Bristol City Council by visiting <https://www.bristol.gov.uk/policies-plans-strategies/flood-risk-strategy> or by calling 0117 922 3206. We are required by law to call the report a 'strategy'. However, our approach to the Local Flood Risk Management Strategy is to maximise delivery by ensuring it is an action plan, with specific objectives and targets that can be met to improve flood risk management in Bristol.

## Principles guiding the development of the strategy

We are keen to ensure that the strategy has a clear focus on delivering actions. Therefore it is built around an action plan of activities to be completed by us as the LLFA. However, there is a legal requirement to name the report a strategy.

### A number of key guiding principles have influenced the production of this strategy:



Flooding can never be prevented altogether – the strategy is based on assessing the risk and targeting areas at greatest risk – examining both the likelihood and consequences of a flood occurring.



It takes what's termed a 'catchment based approach' which means that actions will be agreed whilst ensuring they do not adversely affect other areas.



Working closely with communities to understand local issues and working with other authorities is essential for the success of the strategy.



Finding ways to fund activities with the support of those who directly benefit from them will be crucial to deliver necessary activities.



Sustainable management of flood risks should be sought taking account of the impact of climate change.



Multiple benefits can also be achieved, for example sustainable drainage systems can also reduce pollution of watercourses – agreed actions should maximise these opportunities.

**If you would like this information in another language, Braille, audio tape, large print, easy English, BSL video or CD rom or plain text please contact: 0117 922 3206 or email [flood.data@bristol.gov.uk](mailto:flood.data@bristol.gov.uk)**

## Who is involved in managing flood risk?

While Bristol is the Lead Local Flood Authority (LLFA) for the Bristol area, there are several other authorities (known as Risk Management Authorities) that have a role in managing the risk of flooding from different sources, so working together is an essential part of this strategy.

The responsibility areas of each partner are shown in the illustration below.



## Funding to manage flood risk

To implement this strategy successfully, it is important to understand and plan how to fund its delivery. There are many potential funding opportunities for all of our flood risk management activities. Our general approach to funding is as follows:

- As the Lead Local Flood Authority, we receive national funding from DCLG (through a Revenue Support Grant) to deliver our statutory duties of the Flood and Water Management Act. We use this funding for staffing resources and professional services that are needed to ensure our responsibilities and duties of the Act are met.
- Bristol City Council capital and revenue funds are used to undertake maintenance and make essential capital infrastructure improvements. These funds are primarily used to undertake duties under the 1991 Land Drainage Act and are allocated locally.
- Flood Defence Grant in Aid is administered by Defra and we bid for these funds to improve the standard of protection to existing residential properties. In 2011, Defra introduced a new approach to allocating these funds, known as partnership funding. The key change was to replace 100% funding of fewer schemes to a situation where more schemes are partially funded with the shortfall in cost made up of third party contributions to individual schemes.
- The Local Levy is a levy that is on all LLFA's that is administered by the Wessex Regional Flood and Coastal Committee that is similar to Flood Defence Grant in Aid but used to fund local projects that benefit the communities of the Wessex region.
- The Community Infrastructure Levy is allocated locally and we will bid for a share of these funds to deliver flood risk mitigation schemes as and when appropriate.
- Other funding sources such as European Union funding - in the short term, we have been successful in bidding for EU grant funding to help us implement our ambitions. We continue to seek out alternative funding sources.
- Private beneficiary funding will become a more and more important part of our funding strategy as processes for securing such funds develop. The more those beneficiaries contribute towards flood risk management activities, the less restricted we are by standards and approvals and the more activity we can undertake.

## Types of flooding

The flood risk in Bristol comes from a number of sources, which are given below in order of priority:

**1. Surface water** – rainwater that cannot enter the ground or sewers, but flows across the surface. This presents the most significant risk across Bristol, with approximately 30,000 properties being at risk of flooding, with areas of higher risk in Henbury, Southmead, Ashton and Hengrove

**2. Sewer** – flooding from underground drainage pipes and sewers, including foul sewage pipes. In an urban setting, this risk is heavily linked with surface water flooding and hence shares similar areas of higher risk with surface water flooding

**3. Tidal** – flooding from the sea. For Bristol, this is the Severn Estuary and River Avon. We estimate that approximately 1,000 properties are at risk from this type of flooding, which rises to 4,000 properties in the future, with the impacts of climate change

**4. Fluvial** – flooding from rivers, for example the Rivers Avon, Frome, Malago, Trym, Brislington Brook. A number of flood mitigation structures have been built in Bristol (for example the Malago Interceptors and Northern Stormwater Interceptor) to reduce this risk significantly

**5. Groundwater** – flooding from water held underground that rises to the ground surface. This is not believed to be a significant risk across Bristol, but there is some risk in lower lying areas such as Ashton and Avonmouth. Some localised flooding can occur from springs in areas such as Horfield, Redland, Brentry and Withywood

From previous research and studies the following list shows the areas currently at highest risk from different types of flooding. These form a priority list for larger schemes and projects. While risks are continually re-assessed, a particular focus of further work will be to understand the risk of groundwater flooding, which has historically been considered a low risk.

All are expected to increase with future climate change projections indicating increases in amounts of rainfall, river flows and sea level .

**Table 2** Priority list of areas requiring flood mitigation schemes

Flood Source	Priority Number	Area/Location	Types of Properties at risk
Tidal	1	City Centre	Commercial, residential, infrastructure
Surface water/ Ordinary Watercourses	2	Dundry Hills	Mostly residential, some schools and commercial areas
Tidal, fluvial	3	Avonmouth	Commercial, residential, infrastructure
Surface water, tidal, river, groundwater	4	Ashton	Residential, commercial and industrial
Surface water	5	Southmead	Mostly residential, some commercial
Tidal	6	St Philips Marsh	Commercial and industrial
Surface water	7	Bamfield Road	Mostly residential, some infrastructure

# Strategy outline

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In line with the Environment Agency's National Strategy, objectives have been considered from a flood risk perspective for Bristol City Council's governance area. The following pages detail:

- The National objective set by the Environment Agency
- The Local objective (how we are going to meet the national objective)
- The Measures we aim to take to meet the local objective
- The more specific Actions we propose to deliver these measures



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## Objective 1

### National objective:

- **Understand the Risk**

### Local objective:

- **Gain a greater understanding of the flood risks posed to Bristol and its people and places**

### Measures

Much research has already been carried out but further work is needed and these measures will help prioritise areas most at risk.

- A.** Identify and prioritise local flood risks, taking climate change projections into account
- B.** Work in partnership with the risk management authorities to identify and prioritise other sources of flood risk
- C.** Learn from real-life flooding by recording and investigating events
- D.** Gather, manage and share high quality data to help understand the risk of flooding
- E.** Create and maintain the Flood Risk Asset Register to identify key flood risk assets and who is responsible for their maintenance

## Local Objective 1 - Actions

### Actions completed

Undertake Avonmouth/Sevenside flood defence study

Update and procure *Flood Risk* and Drainage Advice and Design consultancy Framework

Formulate methodology to identify *significant flood risk assets* for the *Flood Risk Asset Register*

Install *trash screen* monitors and rain gauges

Develop the flood events records database

Publish appropriate datasets such as the *Flood Risk Asset Register* on the Council's web site

### Actions outstanding

Complete integrated Ashton *flood risk* study in partnership with EA and WW

Action No.	Action Name	Short term 2016 - 2018	Medium term 2018 - 2022	Long term 2022 onward
1.1	Complete SWMP update including Ashton <i>surface water flood risk</i> study			
1.2	Complete River Avon Tidal Flood Risk Management Strategy			
1.3	Complete Full Business Case for the Avonmouth/Sevenside Ecology Mitigation and Flood Defence scheme			
1.4	Undertake citywide <i>groundwater</i> risk assessment			
1.5	Undertake vulnerability mapping exercise using study results and enhance infrastructure resilience			
1.6	Undertake comprehensive local flood-risk asset surveys			
1.7	Update and procure the asset survey contract, ensuring national standards are met			
1.8	Utilise Confirm asset management system and transference of applicable information. Including asset inspections, issuing of maintenance work, records of visits from contractors and developing forecast spend profiles.			
1.9	Improve the recording system of <i>flood risk</i> management activities undertaken. To demonstrate clearly to other <i>RMA</i> s and the public the progress made in completion of Strategy actions and the status work carried out.			
1.10	Continue to provide <i>flood risk</i> data to BCC Civil Protection Unit to inform emergency management procedures.			
1.11	Contribute towards the completion of the Horizon 2020 RESilience to cope with Climate Change in Urban arEas (RESCCUE) project with European partners			

# Objective 2

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## National objective:

### ■ Manage the Likelihood

## Local objective:

### ■ Actively manage flood risk infrastructure to reduce the likelihood of flooding causing harm to people and damage to society, the economy and the environment

Bristol is one of the UK's ten Flood Risk Areas so the measures suggested here seek to further reduce the risk of flooding.

- A.** Improve our flood risk management maintenance procedures
- B.** Use our understanding of flood risk in Bristol to ensure limited resources are targeted at areas of highest risk
- C.** Seek partnership working opportunities so that those that benefit from flood risk assets contribute towards their planning and management
- D.** Encourage use of green areas and waterways to reduce the risk of flooding and contribute towards wider benefits

○ The central area of Bristol is at risk of flooding from the tide, with approximately 1,000 properties at risk currently

Bristol is at significant risk from surface water flooding - approximately 30,000 properties have been identified as at risk

## Local Objective 2 - Actions

### Actions completed

Update and procure *watercourse* maintenance contract

Identify and prioritise *watercourse* structural improvement requirements

Deliver Dundry flood alleviation scheme

Progress Sustainable Southmead water sensitive design feasibility work including Stanton Road and Trowbridge Road high risk areas

Develop process for risk based approach to highway gully maintenance and leaf clearance

### Actions outstanding

Formalise process for consulting on *RMA* led schemes to maximise inclusion of *SuDS* and green space

Action	Action Name	Short term 2016 - 2018	Medium term 2018 - 2022	Long term 2022 onward
2.1	Continue maintenance of <i>ordinary watercourses</i> and associated structures			
2.2	Implement minor land drainage works as appropriate			
2.3	Deliver Sandburrows Road flood alleviation scheme			
2.4	Deliver Bamfield flood alleviation scheme			
2.5	Deliver Henbury flood alleviation schemes			
2.6	Deliver Scotland Lane flood alleviation scheme			
2.7	Deliver Willway Street <i>culvert</i> tide flap replacement			
2.8	Formalise process for consulting on <i>RMA</i> led schemes to maximise inclusion of <i>SuDS</i> and green space			
2.9	Identify and prioritise Floating Harbour <i>flood risk</i> asset improvement requirements			
2.10	Utilise strategic board groups to identify opportunities for partnership working and funding contributions			
2.11	Follow established process for consenting works to <i>ordinary watercourses</i>			
2.12	Complete green spaces study to assess the importance of existing green spaces on <i>flood risk</i> management in the city			

# Objective 3

## National objective:

### ■ Help People Manage Their Own Risk

## Local objectives:

### ■ Increase public awareness and encourage communities to take action to manage the risks that they face

### ■ Understand communities flooding concerns and priorities, and gather knowledge based on their perception of flooding

These measures will help people understand the risks to their local area and find ways to reduce the risk of flooding themselves, as well as enabling the authorities to better understand the concerns and needs of each community.

- A.** Work with existing groups, networks and agencies to engage with communities at risk of flooding
- B.** Involve local people in flood risk management activities taking place in their community
- C.** Help communities understand the benefit of flood plans to improve community resilience and preparedness for flooding

- D.** Use a range of communication techniques to effectively reach a diverse audience

Climate change presents a significant challenge to Bristol, from an increase in occurrence of heavy rainstorms to increased sea levels. Approximately 4,000 properties are predicted to be at risk from tidal flooding in the year 2110

## Local Objective 3 - Actions

### Actions completed

Produce and publish improved *LLFA* section on BCC website

Produce and develop a community engagement activity to manage highway gullies and debris clearance

Action	Action Name	Short term 2016 - 2018	Medium term 2018 - 2022	Long term 2022 onward
3.1	Introduce proposed flood alleviation schemes to neighbourhood forums			
3.2	Identify existing groups, networks and agencies that we can use to engage with communities			
3.3	Produce programme of community engagement activities including flood plan development			
3.4	Ensure final version and future updates of local strategy are freely available to the public in a variety of formats			
3.5	Produce and develop a community engagement activity to manage highway gullies and debris clearance			

# Objective 4

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## National objective:

### ■ Prevent Inappropriate Development

## Local objective:

### ■ Promote sustainable development that seeks to reduce flood risk and includes a consideration of climate change

These measures seek to ensure new developments are assessed for flood risk and actively contribute to reducing the risk of flooding.

- A.** Inform planning policy to ensure flood risk to new and existing developments is effectively identified and future land use is appropriately considered
- B.** Ensure sustainable drainage solutions are included in all new developments
- C.** Ensure new developments are better protected and able to withstand flooding where appropriate
- D.** Work with new developments to reduce flood risk and incorporate Water Sensitive Urban Designs to provide multiple benefits
- E.** Co-ordinate responses to planning applications in partnership with risk management authorities to ensure new developments have an appropriate and consistent regard to flood risk
- F.** Work in partnership to identify opportunities for contributions to flood mitigation schemes

Climate change presents a significant challenge to Bristol, from an increase in occurrence of heavy rainstorms to increased sea levels. Approximately 4,000 properties are predicted to be at risk from tidal flooding in the year 2110

## Local Objective 4 - Actions

### Actions completed

Formalise process for reviewing planning applications following Development Management standards

Formalise process for consultation with RMAs, City Docks and other relevant teams and authorities to seek consistency of approach and advice provided

### Actions outstanding

Update the SFRA (see Appendix D) with results from recent studies

### Actions removed

Establish the SAB (*SuDS* Approval Body) subject to enabling Government Legislation

Implement an interim SAB approach including production of Local *SuDS* guidance, requirements and associated Planning Guidance Note. Implement drainage adoption on an optional basis with additional requirements, exclusions and charges to be determined

When established, SAB to evaluate drainage applications. Adopt, charge for and maintain those *SuDS* which SAB has duty to adopt.

Action	Action Name	Short term 2016 - 2018	Medium term 2018 - 2022	Long term 2022 onward
4.1	Follow established process on consultation of planning applications from a <i>flood risk</i> perspective.			
4.2	Implement drainage adoption on an optional basis with additional requirements, exclusions and charges to be determined.			
4.3	Inform <i>JSP</i> and <i>Local Plans</i> preparation to ensure <i>flood risk</i> is appropriately considered.			
4.4	Update the SFRA (see Appendix D) with results from recent studies.			
4.5	Ensure Flood Team involvement with, and inform distribution of <i>CIL</i> and other funding sources.			
4.6	Identify contributions to flood mitigation schemes through development management process			
4.7	Produce best practice guide to establish water sensitive urban design in Bristol			
4.8	Develop risk based enforcement procedures for auditing approved applications			
4.9	Submit comments in line with the agreed procedures and risk based approach on all Major planning applications with regards to <i>surface water</i> management and drainage. To fulfil the role of the <i>LLFA</i> as a statutory consultee.			

# Objective 5

## National objective:

### ■ Improve flood prediction, warning and post flood recovery

## Local objective:

### ■ Improve preparedness for flood events and post flood recovery

Flooding within Bristol can never be prevented entirely. These measures seek to ensure that there is an effective response to flooding when it occurs.

- A.** Monitor and analyse warnings issued by the Environment Agency and Met Office to co-ordinate and prepare our response to extreme weather events.
- B.** Use our local knowledge and technical expertise to inform decisions made in advance of a potential flood incident.
- C.** Work with partners to support those who have been affected by flooding.
- D.** Review Lead Local Flood Authority response to flood events and identify opportunities to improve community flood resilience.

## Local Objective 5 - Actions

Action	Action Name	Short term 2016 - 2018	Medium term 2018 - 2022	Long term 2022 onward
5.1	Continue to provide advice regarding warnings issued by the Flood Forecasting Centre to the wider authority and other stakeholders.			
5.2	Undertake functions from Section 19 of the FWMA, and endeavour to investigate smaller flood incidents where appropriate.			
5.3	Identify and Undertake training to improve flood knowledge and preparedness of the LLFA team.			
5.4	Liaise and work in conjunction with colleagues in BCC who have a role to fulfil as the LLFA. To promote and co-ordinate flood response and preparedness across key teams within the authority			
5.5	Develop and promote the use of flood data to inform emergency traffic management procedures .			
5.6	Attend Environment Agency community flood plan meeting(s) to improve knowledge and help improve community flood resilience			