



# LOCAL FLOOD RISK MANAGEMENT STRATEGY

Warwickshire County Council



# Preface

On 25th June 2008, on the first anniversary of the floods of summer 2007, Sir Michael Pitt published his review into what was the biggest peacetime emergency since the Second World War which cost the country around £3.2 billion. At the time of the report going to press twelve months later, many thousands of families were still out of their homes. The Environment Agency estimated that two thirds of the flooding was due to surface water. This is not water coming out of rivers, but rain water that could not find its way into the rivers before causing chaos to homes, businesses and critical infrastructure.

The Pitt Review was commissioned by the Government, and was the most far-reaching review to date regarding flooding in the UK. Over a thousand written submissions were reviewed prior to the 500 page report being published. The report concluded with 92 recommendations which Sir Michael Pitt acknowledged to be challenging, and strong leadership would be required to make them a reality. The recommendations included a new role for local authorities to co-ordinate the management of surface water flooding.

Nearly two years after the Pitt Review, the Flood and Water Management Act was passed which attempted to bring into legislation many of its recommendations. In particular, the Act sought:

- to clarify responsibility for different forms of flooding,
- to bring about a new Lead Local Flood Authority role for upper tier county councils and unitary authorities with oversight by the Environment Agency, and
- to strengthen controls on spatial planning through new Sustainable Drainage Approval Bodies.

The wide-ranging new role of Lead Local Flood Authority has come at a time of some of the biggest cutbacks ever experienced by local authorities. It is a demanding role, requiring partnership working across a wide range of organisations and specialist areas, strategic planning at a county-wide level, as well as investigating specific flooding incidents as far as possible across the county. In practice, it is not possible to respond to or investigate every flooding incident. Active community involvement is critical in order to manage flooding effectively at a local level. In Warwickshire we are very fortunate to have many flood groups, communities and parish and town councils who are positively engaged in helping manage their flood risk and to take action if and when the worst happens. We also are fortunate that our professional partners, including the Environment Agency, Severn Trent Water and our Districts and Boroughs, make a positive and significant contribution.

Within Warwickshire significant areas are subject to flood risk. Around one in seven commercial properties and one in ten residential properties are at risk of flooding from rivers or surface water. This has an impact on the local economy and the everyday lives of the people of Warwickshire, with the fear of flooding being greater than the fear of crime in large areas of the county. There are also significant challenges, and opportunities, provided by development.

In response to this, in spite of the need to make £92 million in savings over the next four years, the County Council approved in 2014 an additional £1.1 million for flood alleviation. The Council have also established a Flood Risk Management team within the County Council.

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In managing flood risk, our vision is to reduce and mitigate flood risk to communities within Warwickshire through partnership working, by adopting a prioritised, economic and environmentally sustainable approach; we are using our statutory duties and powers to help us achieve this. As Sir Michael Pitt acknowledged in his review of the summer 2007 floods, partnership working is imperative for effectively managing flood risk. This Strategy aims to commit to writing the good partnership working which is already happening across the county and encourage further good practice.

The Strategy has been consulted on twice: (i) between January and March 2015; and (ii) between September and December 2015. Both consultations sought to reach out to those affected, including roadshows to town centres in the five Districts and Boroughs using the National Flood Forum's Flood Trailer. We received 44 consultation responses during the first round of consultation which were published on the website with associated actions for updating the Strategy. The updated Strategy then went out to consultation in September, and we received 32 consultation responses during the second round. Again, the responses and associated actions have been published on our website.

The Strategy is relevant for anyone who lives in, works in or visits Warwickshire to assist them in understanding and managing flood risk. The most pertinent sections in this document are the Executive Summary and Sections 1 and 2 which include the proposed objectives and measures. These sections comprise the Local Flood Risk Management Summary.

Cllr John Horner  
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# LOCAL FLOOD RISK MANAGEMENT STRATEGY

Warwickshire County Council

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**Appendix G: Draft Planning Advice**

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## Executive Summary

Significant areas in Warwickshire are subject to flood risk, with around one in seven commercial properties and one in ten residential properties being at risk of flooding from rivers or surface water. Recent flooding events, particularly Easter 1998 and summer 2007, as well as near misses in the winters of 2012/13 and 2013/14, and very recent flooding in February and March 2016, as well as many localised extreme events, indicate flooding is a significant ongoing risk in Warwickshire. Increased flood risk poses the most significant and specific climate change challenge to the UK economy. It is estimated that flood damages in England have risen by around 60% over the past 25 years and already exceed £1 billion per year in direct costs to communities and business. A significant number of the top risks for business with respect to climate change relate to the impacts of flooding.

Under the Flood and Water Management Act (2010) ('the Act') Warwickshire County Council (WCC) became a Lead Local Flood Authority (LLFA), responsible for managing local flood risk from surface water, groundwater and ordinary watercourses in Warwickshire. One of the new duties placed upon WCC as the LLFA, to assist in the management of local flood risk, is to 'develop, maintain, apply and monitor' a Local Flood Risk Management Strategy.

This Local Flood Risk Management Strategy ('the Strategy') provides an overview and assessment of local flood risk in Warwickshire, setting out objectives and measures for how WCC will manage and reduce local flood risk. It covers the county of Warwickshire comprising the five local authorities of North Warwickshire, Nuneaton and Bedworth, Rugby, Stratford upon Avon and Warwick.

The Strategy is relevant for anyone who lives in, works in or visits Warwickshire to assist them in understanding and managing flood risk. It is also of relevance to all authorities with flood risk management responsibilities to ensure there is a common understanding of roles and responsibilities. This Executive Summary and Sections 1 and 2 comprise the Summary document of the Local Flood Risk Management Strategy and should normally be read first. Alongside this Strategy we have produced the required Strategic Environmental Assessment (SEA) and Habitats Regulation Assessment (HRA).

To ensure that the Strategy remains relevant and fit for purpose it will be regularly reviewed and updated as necessary. It is important that the information contained within it is the best available and it is in line with national policy on the management of local flood risk.



## Our Objectives

A key aspect of this Strategy is the objectives it sets for the management of local flood risk in Warwickshire. These objectives aim to cover all aspects of local flood risk management and are consistent with the national flood risk management strategy.

**Table A – Warwickshire Local Flood Risk Management Strategy Objectives**

Objective	
O1	Develop a better understanding of local flood risk in Warwickshire to better manage flood risk to people, property, infrastructure and the natural environment
O2	Seek to reduce local flood risk in Warwickshire in an economically, socially and environmentally sustainable way
O3	Adopt a collaborative approach to local flood risk management
O4	Promote community preparedness and resilience to local flood risk
O5	Enable planning decisions to take full account of local flood risk and seek to reduce local flood risk through development

## Our Measures

To achieve these objectives, WCC has identified the necessary measures that are presented in the action plan contained within Appendix D of this Strategy. These measures address the various aspects of local flood risk management, including educating communities, raising public awareness, improving our understanding of the risks and implementing measures to manage and reduce flood risk where it is unacceptable. These actions will be led by WCC with support from its partners in local flood risk management where appropriate.

## Assessment of Local Flood Risk

The Surface Water Management Plan (SWMP) given in Appendix C is tasked with providing a prioritisation process for future flood risk management work. The SWMP will also form the risk assessment for the WCC's Local Flood Risk Management Strategy (the Strategy).

The SWMP objectives are defined as the following.

1. Develop a robust understanding of surface water flood risk across the county of Warwickshire, including a prioritised list of locations at risk of flooding, taking into account the importance of both urban and rural communities, the challenges of population and demographic change and increasing pressures on urban fringes.
2. Develop holistic and multifunctional recommendations for surface water management which improve emergency and land use planning, and enable better flood risk and drainage infrastructure investments.
3. Establish new and consolidate existing partnerships between key drainage stakeholders to facilitate a collaborative culture of data, skills, resource and learning

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sharing and exchange, and closer coordination to utilise cross boundary working opportunities.

4. Undertake engagement with stakeholders to raise awareness of surface water flooding, identify flood risks and assets, and agree mitigation measures and actions.
5. Develop a robust Action Plan and guidance to deliver change where partners and stakeholders take ownership of their flood risk and commit to delivery and maintenance of the recommended measures and actions.

Understanding the different sources of flooding and potential interactions and responsibilities between different organisations is important for the study to ensure that a comprehensive understanding of flood risk is obtained, and to identify the most appropriate measures for flood risk reduction. Flood history information was obtained from the following sources:

- Districts and Boroughs, and Parish and Town Councils and community groups; and
- stakeholders and organisations:
  - Environment Agency;
  - Severn Trent Water;
  - Network Rail; and
  - Canal and River Trust.

To develop a comprehensive understanding of surface water flood risk in Warwickshire, it is important to capture where surface water flooding has occurred in the past, and to identify where surface water flooding may be more likely to occur in the future.

Predictive flood risk information is from the Environment Agency's 'updated Flood Map for Surface Water' (uFMfSW).

To understand which 'receptors' (those who experience flooding) are at greater risk, or where there are greater consequences, a series of standardised quantitative metrics have been established in the SWMP to enable an assessment across the entire study area. Thresholds were developed to understand where there are areas of flood risk and consequences, and analysis of these locations was undertaken in a bespoke project matrix which allowed the scoring, weighting, comparison and ranking of sites. The matrix was developed to identify surface water flooding hotspots (historic and future) that met the following threshold requirements as defined in the Strategy.

1. Flooding that poses a threat to the safety of the public or may directly result in serious injury or death.
2. Five or more residential properties internally flooded.
3. Two or more commercial properties internally flooded.
4. One or more piece of critical infrastructure affected that impact on the wider area.

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5. Flooding that places vulnerable individuals or vulnerable communities at risk e.g. hospitals, care and nursing homes, schools, secure units, etc.
  6. Where one or more residential property has flooded internally from the same source on five or more occasions within the last five years.

Draft outputs were tested through sensitivity analysis and have been discussed with project stakeholders. Feedback from these workshops was combined with that from the public consultation (January to March 2015), and a ranking of sites across the study area was created, in addition to supporting thematic maps for:

- Historic surface water flood risk;
- Predictive surface water flood risk; and
- Combined (Historic and Predictive) surface water flood risk.

The matrix has been developed to enable both historic and potential future flooding hotspot reporting. For this overall summary, a combined approach has been undertaken (combining both the historic and potential future flooding scores) for each OS tile or combination of OS tiles to provide a top 40 ranking which is given in Appendix C. Note that large locations such as Leamington Spa will have a number of communities at risk of surface water flooding from different sources - these are therefore ranked separately as different flooding locations with different OS tile references. Large towns could therefore be named in the list more than once, but it is the specific area or community within the town which is being ranked.

The highest ranked locations will not necessarily have funded flood alleviation schemes. This stage of the SWMP is the risk assessment. The viability of flood alleviation schemes depends not only on the risk, but also on the nature of the flood risk and financial viability of a scheme relative to other areas in England and Wales (since it is necessary to compete with other locations to bid for funding from the national 'pot' of Flood Defence Grant in Aid available).

Subsequent stages of the SWMP process will further investigate the top ranking sites including discussions with project partners and other Risk Management Authorities (RMAs) such as the Environment Agency and Severn Trent Water to identify areas of risk overlap and develop partnership schemes. Following stakeholder engagement a prioritised list will be developed with conceptual flood risk mitigation options, supporting action plans and investment strategies.

### **Funding the implementation of the Strategy**

To implement the measures outlined by this Strategy, funding will need to be sought from a variety of sources. In consultation with its partners in local flood risk management, WCC has identified the following potential funding sources (not exhaustive):

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- Flood and Coastal Erosion Risk Management (FCERM) Grant in Aid;
  - Local Levy;
  - Section 106 developer contributions;
  - Community Infrastructure Levy (CIL);
  - WCC contributions;
  - other Local Authority contributions;
  - other partner contributions; and
  - Local Enterprise Partnership (LEP) contributions.

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# 1 Introduction

The aims of Warwickshire County Council (WCC) with respect to the management of local flood risk within the county are embodied within the following vision statement. This vision provides the overriding direction for the Strategy.

## **Warwickshire Flood Risk Management Vision Statement**

To reduce and mitigate flood risk to communities within Warwickshire through partnership working, by adopting a prioritised, economic and environmentally sustainable approach.

WCC is using its statutory duties and powers to help it achieve its vision. A key aspect of this is partnership working, and an overarching aim of this Strategy is to further clarify and develop good practice across the county.

This introductory section (**Section 1**) looks in more detail at why we are producing a Strategy for managing local flood risk and what it aims to achieve. Following this introductory section the Local Flood Risk Management Strategy document is structured as follows.

- **Section 2** sets out our strategy for local flood risk management in Warwickshire, with objectives and measures to achieve this.
- **Section 3** outlines our current understanding of local flood risk in Warwickshire and how it may change in the future.
- **Section 4** sets out legislation and policy documents that are relevant to the Strategy.
- **Section 5** summarises the roles and responsibilities of key partners and other organisations involved in flood risk management in Warwickshire.
- **Section 6** sets out the potential sources of funding for implementation of the measures set out in this Strategy.
- **Section 7** explains what will happen next, setting out how the Strategy will be in monitored and reviewed.

The Executive Summary, this Section and Section 2 comprise the Summary document of the Local Flood Risk Management Strategy and these sections should normally be read first.

The Local Flood Risk Management Strategy is supported by the following appendices.

- **Appendix A** lists a glossary of key terms and abbreviations used within the LFRMS.
- **Appendix B** gives details of the full range of legislation and policy that are of relevance to the LFRMS.

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- **Appendix C** is the Surface Water Management Plan for Warwickshire which sets out an assessment of flood risk across the county.
  - **Appendix D** sets out the action plan for implementation of the LFRMS.
  - **Appendix E** gives full details of Warwickshire County Council's flood investigation policy.
  - **Appendix F** gives details of Warwickshire County Council's sandbag policy.
  - **Appendix G** sets out Warwickshire County Council's draft advice for drainage in new developments.

## 1.1 Aims of the Strategy

This Strategy provides an overview and assessment of local flood risk, setting out objectives and measures for how WCC will manage and reduce local flood risk.

The Strategy must be consistent with the national Flood and Coastal Erosion Risk Management (FCERM) strategy, produced by the Environment Agency in September 2011. The Flood and Water Management Act ('the Act') also requires that the Strategy must specify the following.

- The risk management authorities within the county.
- The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the county.
- The assessment of local flood risk for the purpose of the Strategy.
- The objectives for managing local flood risk.
- The measures proposed to achieve those objectives.
- How and when the measures are expected to be implemented.
- The costs and benefits of those measures, and how they are to be paid for.
- How and when the Strategy is to be reviewed.
- How the Strategy contributes to the achievement of wider environmental objectives.

The Strategy must conform to the findings of the Habitat Regulations Screening report: to ensure that any works or schemes proposed by the Strategy will not lead to any negative effects on the qualifying features of any European Natura 2000 sites, specifically Ensor's Pool Special Area of Conservation (SAC) and the River Mease SAC.

Figure 1.1 illustrates how the Strategy relates to other plans and policies.

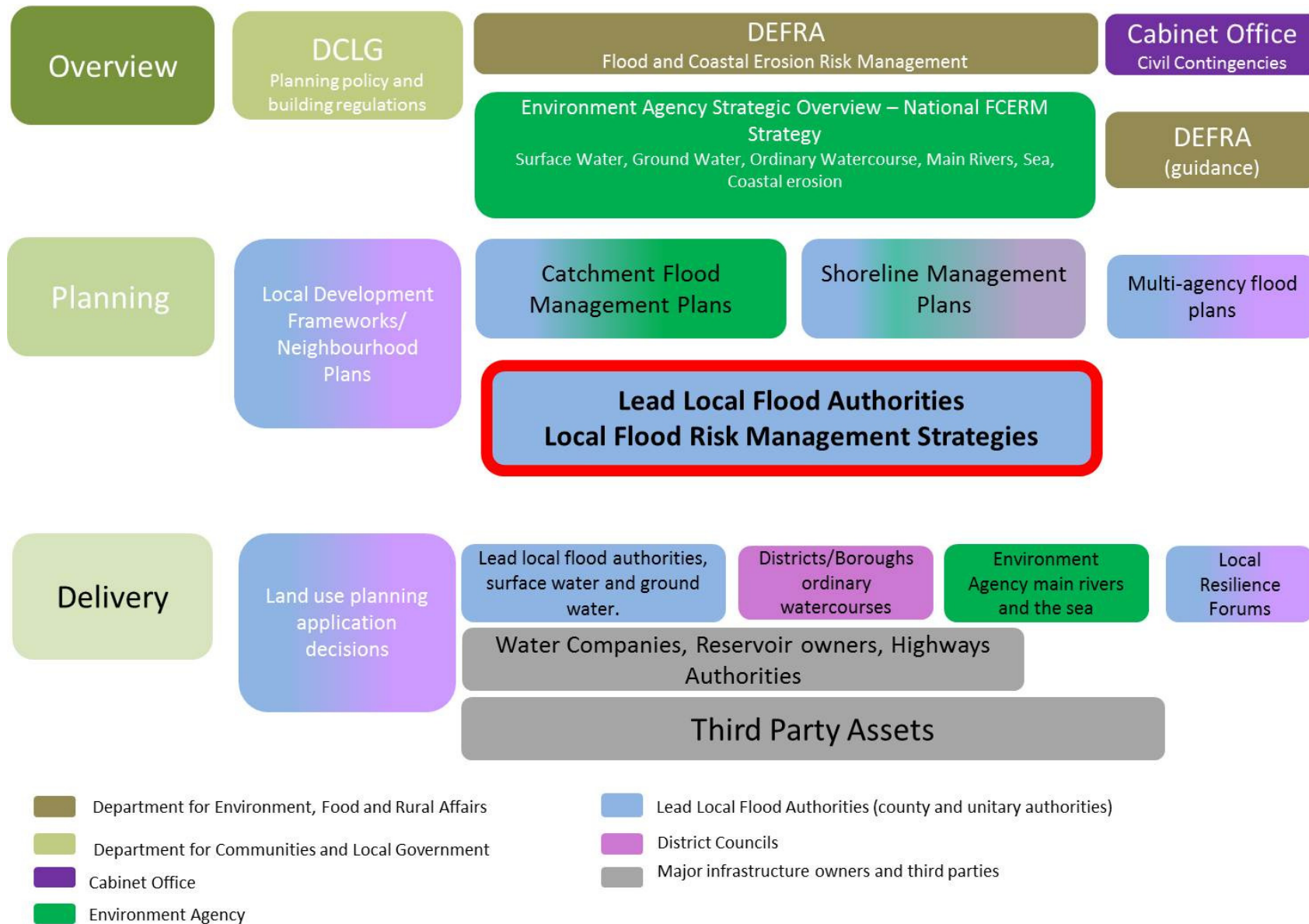
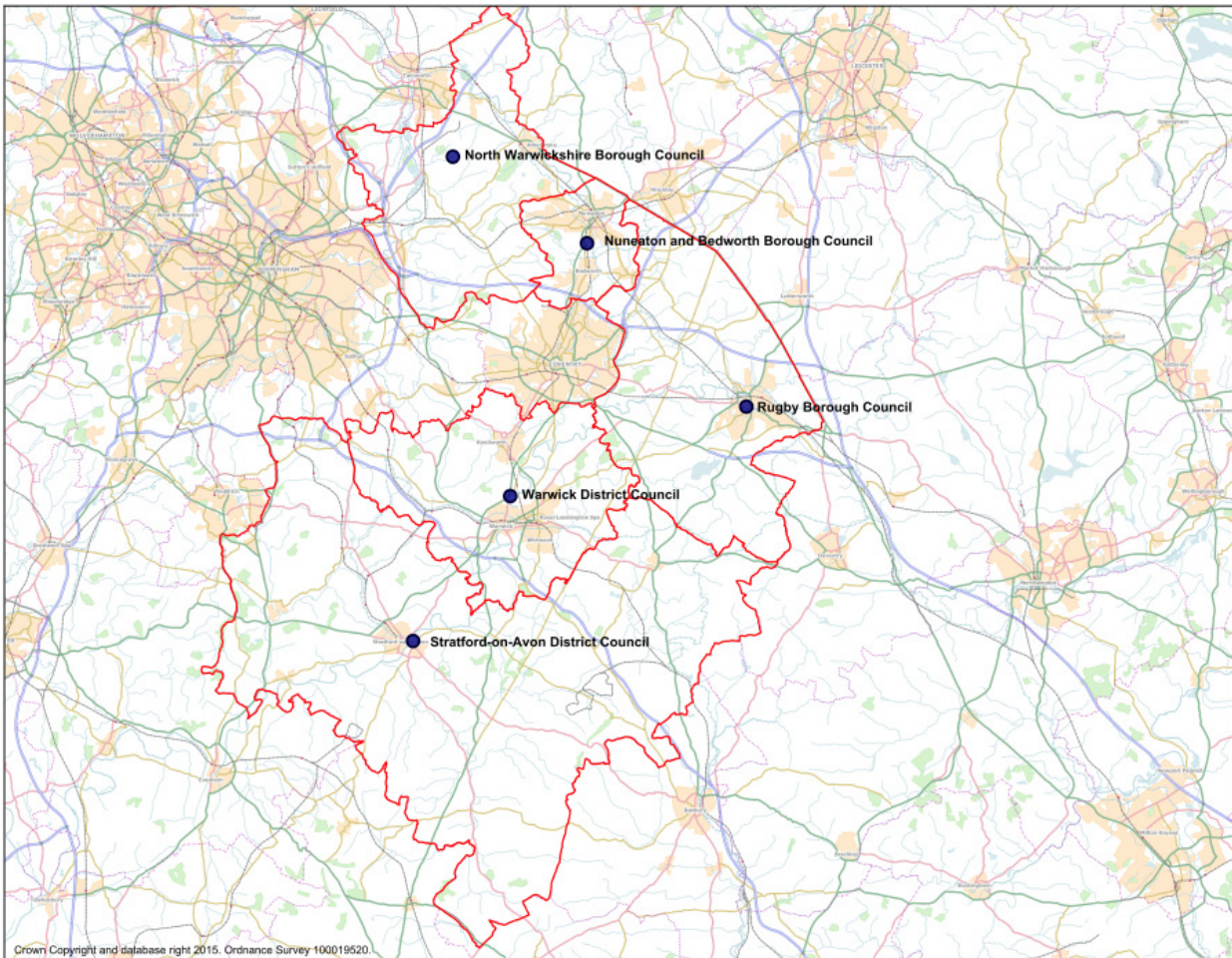


Figure 1.1: Flood Risk Management Plans and Policies

## 1.2 What is the area covered by this Strategy?

This Strategy covers the county of Warwickshire, comprising the five local authorities of North Warwickshire, Nuneaton and Bedworth, Rugby, Stratford upon Avon and Warwick. Figure 1.2 shows the county of Warwickshire with the five local authority areas.



**Figure 1.2: Warwickshire County Council Administrative Area**

## 1.3 Who is the Strategy relevant for?

The Strategy is relevant for anyone who lives in, works in or visits Warwickshire to assist them in understanding and managing flood risk. It is of relevance to all authorities with flood risk management responsibilities in Warwickshire to ensure there is a common understanding of roles and responsibilities within Warwickshire. They must take due regard of this Strategy when delivering their own flood risk management services.



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## 1.4 Who has been involved in developing this Strategy?

To assist in the development of the Strategy, WCC has undertaken county-wide engagement meetings. These have involved district and borough councils, town and parish councils and community groups. Their aim was to gather local information on flood risk and encourage local communities to take an active role in managing local flood risk at a local level. In addition assistance has been provided by neighbouring LLFAs, sharing best practice where they have already developed their strategies.

## 1.5 Period covered by the Strategy

To ensure that the Strategy remains relevant and fit for purpose, it will remain a live document with ongoing monitoring by officers along with a full review every five years, or sooner subject to the occurrence of one of the following triggers:

- significant flood events that alter our understanding of flood risk in Warwickshire;
- significant policy changes that affect the role of Flood Risk Management Authorities;
- publication of significant new flood risk information and mapping.

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## 2 Strategy for Local Flood Risk Management

### 2.1 Objectives of the Strategy

To support the strategic vision for the management of local flood risk in Warwickshire, the following five objectives have been developed to support the delivery of the Strategy (see Table 2.1). These are based on the objectives and measures originally presented at the January 2013 Warwickshire Strategic Flood Forum, and have been developed to be consistent with the objectives of the national FCERM strategy and to drive local flood risk management in Warwickshire. They are discussed in detail in the following sections.

**Table 2.1 – Warwickshire Local Flood Risk Management Strategy Objectives**

Objective	
O1	Develop a better understanding of local flood risk in Warwickshire to better manage flood risk to people, property, infrastructure and the natural environment
O2	Seek to reduce local flood risk in Warwickshire in an economically, socially and environmentally sustainable way
O3	Adopt a collaborative approach to local flood risk management
O4	Promote community preparedness and resilience to local flood risk
O5	Enable planning decisions to take full account of local flood risk and seek to reduce local flood risk through development

#### 2.1.1 Objective 1 - Develop a better understanding of local flood risk in Warwickshire to better manage flood risk to people, property, infrastructure and the natural environment

A clear understanding of local flood risk is crucial to ensuring that it can be effectively managed. This involves understanding where flooding may occur, how frequently it may happen and what impact it may have.

Developing this understanding is an ongoing process, whereby information is recorded about flooding events and these events are then investigated. WCC have developed an approach for the prioritisation of flood investigations to ensure that flooding events which have had the most significant impact are assessed first (see Box 1 – further detail is provided in Appendix E).

In addition, knowledge will be increased through improved modelling of flooding from local sources. The ongoing Surface Water Management Plan (SWMP) will make a significant contribution to this objective.

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As part of the county-wide SWMP, local intelligence on flooding locations across the county has been gathered through county-wide engagement meetings so that these flooding locations can be prioritised on the basis of historic flooding, as well as using surface water flood risk modelling outputs to ascertain potential future flooding.

With local flood risk expected to increase due to climate change, greater understanding will enable Warwickshire to plan for the future, mitigating against potential problems and advising strategic development plans.

### **Box 1 – Warwickshire County Council Flood Investigation Prioritisation**

Through careful consideration and consultation with fellow LLFAs, WCC have developed the following thresholds for prioritisation of flooding events and as such, the order in which we will investigate. These thresholds follow closely the areas of locally significant flood risk outlined in the WCC Preliminary Flood Risk Assessment (PFRA) of 2011, and these thresholds determine what will be termed historic flooding ‘hotspots’ in the SWMP (see Appendix C).

- Flooding that poses a threat to the safety of the public or may directly result in serious injury or death.
- Five or more residential properties internally flooded<sup>1</sup>.
- Two or more commercial properties internally flooded.
- One or more piece of critical infrastructure affected that, impacts on the wider area.
- Flooding that places vulnerable individuals or vulnerable communities at risk e.g. hospitals, care and nursing homes, schools, secure units, etc.
- Additionally, where one or more residential property has flooded internally from the same source on five or more occasions within the last five years.

The WCC FRM (flood risk management) team, which undertakes the LLFA function on behalf of WCC, may investigate flooding outside these categories, but only when all outstanding issues with a higher priority have been considered. These investigations will be prioritised based on the same six criteria listed above. Flooding on public land outside of the above categories will be addressed before flooding to residential gardens and on private land. Although inconvenient and possibly distressing to the individual, flooding to private land that does not affect any buildings is a lower priority that will be dealt with by the FRM team on an advice basis only. Where flooding is caused by the actions of neighbouring landowners, the First-tier Tribunal (Property Chamber) Agricultural Land and Drainage can be used to settle disputes over, amongst other matters, land drainage (see Appendix E). Smaller scale flooding affecting the highway or coming from the highway will continue to be investigated primarily by WCC Highways, with support from the WCC FRM team and Districts and Boroughs where land drainage issues exist.

These guidelines set numerical thresholds. However, in recognition of the fact that all floods will be different, a certain amount of discretion will be required in order to implement this policy effectively.

This policy only relates to how flood investigations will be prioritised and does not guarantee that any flood risk mitigation works will be installed at the locations where investigation are undertaken.

<sup>1</sup>Internal flooding is defined in Appendix A

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### 2.1.2 Objective 2 - Seek to reduce local flood risk in Warwickshire in an economically, socially and environmentally sustainable way

Where opportunities are available to implement measures to reduce local flood risk these will be explored to establish if they are economically viable and can form part of a sustainable approach to local flood risk management in Warwickshire. These will be prioritised to ensure that the most beneficial measures are implemented first. This is especially important where budgetary constraints mean that not all viable measures can be implemented. In addition this will include the protection of all Natura 2000 sites.

In the current economic climate quick wins will be sought to make best use of the available budgets to give the best value for money in actions taken to reduce local flood risk. These will be prioritised on the same basis as Flood Investigations that is set out in Box 1.

Where local flood risk issues are identified, all available funding sources will be explored to progress potential solutions in partnership with other authorities. In developing measures to tackle local flood risk, it is important to involve all relevant partners, both risk management authorities and others, including members of the public.

Another key aspect of local flood risk management is working with riparian landowners to ensure they act on their responsibilities for watercourse maintenance. WCC Highways have produced a leaflet entitled 'Farming and the Public Highway' which is freely available on the WCC website<sup>1</sup> and gives advice to rural landowners regarding their responsibility for maintenance of drainage ditches and watercourses adjacent to the highway.

Management of local flood risk includes actions taken when flooding is occurring. WCC has a sandbag policy which sets out the principles and procedures for the distribution of sandbags across Warwickshire during flood events (Appendix F).

### 2.1.3 Objective 3 - Adopt a collaborative approach to local flood risk management

Collaboration between professional partners and stakeholders is a key aspect of the Flood and Water Management Act 2010 and the national strategy. Similarly, it is a vital part of local flood risk management; the Warwickshire Strategic Flood Forum for example brings together all the relevant authorities and some other key partners to ensure collaborative flood risk management across the county.

In 2014 the first annual Flood Summit was held in Warwickshire to allow partners and stakeholders to review the progress made towards delivery of the recommendations of the Pitt review (see Box 2).

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<sup>1</sup> <http://apps.warwickshire.gov.uk/api/documents/WCCC-899-17>

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**Box 2 - Warwickshire Flood Summit**

The first Flood Summit was held on the 16<sup>th</sup> October 2014, in Benn Hall in Rugby. It was attended by more than 100 delegates, representing partners and stakeholders in Warwickshire to 'take a step back' and consider to what extent the recommendations of Pitt Review have been implemented in Warwickshire, and which direction WCC should be taking in the future in terms of flooding. The event was a great success and is being undertaken with more regularity as a forum for engaging with partners on flood risk management issues. A second flood summit was held on the 23<sup>rd</sup> October 2015.

Communication of local flood risk and raising awareness with local communities is another important element of local flood risk management. An example of this is the Defra-funded Community Flood Resilience Pathfinder Project recently undertaken by WCC in partnership with the National Flood Forum. This project has allowed WCC to work closely with local communities: nine flood action groups have been created, seven county-wide engagement workshops have been held, and local flood risk management and flood resilience has been promoted at a number of schools in areas affected by flooding.

#### 2.1.4 Objective 4 - Promote community preparedness and resilience to local flood risk

While WCC as the LLFA has a big role to play in the management of local flood risk, it is important that communities are prepared to deal with flood events if they happen and are best placed to recover as quickly as possible.

An improved understanding of local flood risk from the measures outlined under Objective 1 will allow Warwickshire to advise local communities, ensuring they are aware of the risks they face and enabling them to take appropriate action when necessary. Increased awareness can be achieved through public consultation events, newsletters and online resources. Box 3 describes some of the work WCC has already undertaken to improve understanding in local communities.

Community resilience and preparedness needs to be supported by the plans and arrangements of the relevant authorities to respond to flooding. The Warwickshire Multi-Agency Flood Plan (MAFP) has been developed by the Coventry, Solihull & Warwickshire Resilience Team (CSWRT) in liaison with the Environment Agency, Police, Warwickshire Fire and Rescue Service, and Ambulance services. It sets out appropriate multi-agency arrangements to facilitate an effective, coordinated response to flooding in Warwickshire.

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### **Box 3 - Community Engagement in Warwickshire**

Seven county-wide engagement meetings with Parish and Town Councils and community groups took place in Baddesley Ensor, Nuneaton, Lapworth, Kenilworth, Stratford, Aston Cantlow and Warwick in 2014, to discuss community flood resilience and encourage local communities to take an active role in managing local flood risk at a local level with support from Warwickshire County Council and the Districts and Boroughs of the county. The meetings were for community leaders and members of Parish and Town Councils across the county.

The Defra-funded Flood Resilience Community Pathfinder project has helped to develop a truly community-led approach to flood resilience. The Warwickshire County Council Flood Risk and Water Management (FRM) team, in association with the Coventry, Solihull and Warwickshire Resilience Team (CSWRT) have also been working with schools in Bedworth and Shipston-on-Stour as part of the ongoing Community Flood Resilience Pathfinder project. A weather station has recently been installed at both schools, and further installations are planned at other school sites within the county. This will help in monitoring local rainfall and assist in early warning of potential flooding in these communities. This project has also helped to raise awareness of potential flooding in these communities and to raise awareness of the need for individuals and communities to be prepared for unexpected extreme rainfall events.

#### **2.1.5 Objective 5 - Enable planning decisions to take full account of local flood risk and seek to reduce local flood risk through development**

The planning process has a significant role to play in ensuring that new developments do not increase flood risk and ensuring that they are not at risk from flooding. In order to ensure new development is safe and does not have detrimental impacts on local flood risk, particularly in areas of known flood risk, it should ideally be considered at the pre-application stage and the relevant flood risk management authorities should be involved in these discussions.

The National Planning Policy Framework (NPPF) is the key piece of legislation that sets out the requirements for managing flood risk in new development. This sets out the requirement that the planning process should be informed by the Strategic Flood Risk Assessment (SFRA) at all stages.

Following a key recommendation of the 2008 Pitt Review, Schedule 3 of the Flood and Water Management Act (2010) would have designated WCC as the SuDS Approval Body (SAB). However this schedule has not been fully enacted. Defra and the Department for Communities and Local Government (CLG) released a consultation on 12<sup>th</sup> September 2014 which outlined an alternative way of delivering SuDS through amendments to existing planning system. This was implemented on 15<sup>th</sup> April 2015 and The Town and Country

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Planning (Development Management Procedure) (England) Order 2015 – Schedule 4 - Consultations before the grant of permission has made LLFAs statutory consultees for major development planning applications with surface water drainage. Assessment of surface water drainage provision for all other types of development is now the responsibility for local planning authorities.

WCC actively seeks to secure and use Section 106 contributions from developers to fund flood risk management measures in the communities affected by the development.

Draft Planning Advice has been included in Appendix G of this document for comment and feedback.

## 2.2 Measures

To enable the objectives of this Strategy to be met, this section details a range of measures that will be undertaken. Measures to manage flood risk comprise more than building flood alleviation schemes, and the maintenance and management of watercourses and drainage assets. They include educating communities to be prepared for flooding, effective partnership working between the various agencies that hold flood risk management responsibilities, and effective use of the planning system, among others.

### 2.2.1 'No Regrets' Measures

While this Strategy has developed a range of measures for the management of local flood risk in Warwickshire, the development and implementation of such measures is an integral part of the work of WCC through its role as the LLFA.

The WCC FRM team have developed a range of 'no regrets' measures that comprise actions that WCC and our partners have already undertaken, are currently doing, and should continue to do to effectively manage local flood risk in Warwickshire. While these measures could have been delayed until the completion of this Strategy, doing so would have jeopardised the WCC's chances of accessing some sources of funding and progressing flood alleviation schemes in what are known to be areas of high flood risk. These have been prioritised on the basis of the number of properties at risk of flooding and the likelihood of a scheme receiving funding. These will be funded through existing revenue and capital grant funding, subject to available resources and funds.

The completion of the countywide SWMP and this Strategy may alter some of the existing priority locations and this will be reflected in bids for funding allocations and the progression of flood alleviation schemes in the future.

The 'no regrets' measures that have already been undertaken and how they have contributed to the achievement of the Strategy objectives is shown in Table 2.2 below.



**Table 2.2 – How the ‘no regrets’ measures already undertaken contribute to the Strategy objectives**

‘No Regret’ Measure	Relationship with LFRMS objective
Leading on and assisting in the completion of flood alleviation schemes where there are clearly identified flood risk management issues (such as in Aston Cantlow, Nuneaton, Gaydon, etc.).	Objective 2
Managing flood risk through the development process through supporting local authorities in reviewing planning applications and consenting work that impacts on ordinary watercourses.	Objective 5
Continuing to improve knowledge on local flood risk through flood investigations and development of a Surface Water Management Plan (SWMP).	Repeated under Objective 1
Quick win small-scale flood risk management schemes such as minor highway works.	Objective 2
Bidding for funding allocations for flood alleviation schemes (such as in Snitterfield, Fenny Compton, Ladbrooke, Cherington, etc.).	Objective 2
Engagement with flooded communities, in particular through the Community Flood Resilience Pathfinder project and its successor.	Objective 4
Solving minor drainage systems blockages during investigative work.	Objective 1

## 2.2.2 Measures to Achieve Strategy Objectives

In order to meet the objectives of the Strategy a range of longer term measures will be undertaken by the LLFA, working with our partners. More details of the partners involved in the delivery of these measures are given in the LFRMS Action Plan (Appendix D). These are set out for each of the five objectives in the following sections and further details of how these measures will be implemented are given in the Action Plan which supports the Strategy in Appendix D.

### **Objective 1: Develop a better understanding of local flood risk in Warwickshire to better manage flood risk to people, property, infrastructure and the natural environment**

- Measure 1A: Further develop the Surface Water Management Plan for the county to gain a better understanding of key flooding hotspots, risks and associated economic, social and environmental consequences.
- Measure 1B: Work with partners to investigate locally significant flooding incidents and identify sources, pathways and receptors of flooding.
- Measure 1C: Further develop and continue to maintain a register of flood risk management assets with a record of the significant structures with respect to flood risk.

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Measure 1D: Review the Preliminary Flood Risk Assessment as required by the EU Floods Directive and Flood Risk Regulations 2009 and contribute to the other requirements.

**Objective 2: Seek to reduce local flood risk in Warwickshire in an economically, socially and environmentally sustainable way**

- Measure 2A: The actions of the emerging SWMP to be progressed and, where suitable, flood risk management schemes are identified and funding to be sought.
- Measure 2B: Warwickshire County Council to work with partners to encourage flood management and maintenance activities by riparian landowners on ordinary watercourses, and flood defence and drainage structures, as well as limiting the development of constrictions on ordinary watercourses through consenting and, if necessary, enforcement.
- Measure 2C: WCC to work collaboratively with partners, including those in the Warwickshire Strategic Flood Forum (WSFF), to encourage flood schemes by third parties, riparian landowners and stakeholders and to ensure that Natura 2000 sites and Sites of Special Scientific Interest (SSSIs) are not adversely affected by flood risk management activities.
- Measure 2D: To lead on the implementation of local flood risk management schemes and to work with partners to best utilise funding streams through a prioritised risk-based approach and through promoting schemes with the most multiple benefits.
- Measure 2E: To ensure environmentally sustainable solutions are fully considered in WCC led and in all other flood risk management measures, using a catchment based approach where applicable.
- Measure 2F: Aim to ensure a no net loss of biodiversity, particularly in Local Wildlife Sites, and where possible look to provide a net gain through habitat creation and enhancement, contributing to wider environmental objectives.
- Measure 2G: To ensure no deterioration in Water Framework Directive (WFD) waterbody status as a result of flood risk management activities. and where possible look to enhance status through implementation of the recommendations of the River Basin Management Plans (RBMPs).

**Objective 3: Adopt a collaborative approach to local flood risk management**

- Measure 3A: To continue to develop the Warwickshire Strategic Flood Forum (WSFF) and relations with other partners.
- Measure 3B: To share knowledge and training opportunities with partners.

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- Measure 3C: Continue to work with and support community flood action groups, Town and Parish Councils and other community groups.
- Measure 3D: Continue to engage local communities, building on the progress made by the Community Flood Resilience Pathfinder Project.
- Measure 3E: To work with neighbouring Lead Local Flood Authorities to ensure a catchment-based approach to local flood risk management.

**Objective 4: Promote community preparedness and resilience to local flood risk**

- Measure 4A: To work with partners to reduce the impacts of flooding by enabling an efficient response to, and recovery from, flooding incidents by partners and stakeholders.
- Measure 4B: To work with partners to reduce the harmful consequences of local flooding to communities and human health through pro-active actions, community activities and education programmes that enhance preparedness and resilience to local flood risk, thereby promoting community cohesion and minimising community disruption.
- Measure 4C: Continue the work of the Warwickshire Community Flood Resilience Pathfinder project in supporting local groups to manage local flood risk and increase the resilience of their communities to flooding.
- Measure 4D: Continue to work with partners to improve communications and advice given during flooding events.
- Measure 4E: To work with partners to establish a co-ordinated approach to the provision of temporary flood risk management measures.

**Objective 5: Enable planning decisions to take full account of local flood risk and seek to reduce local flood risk through development**

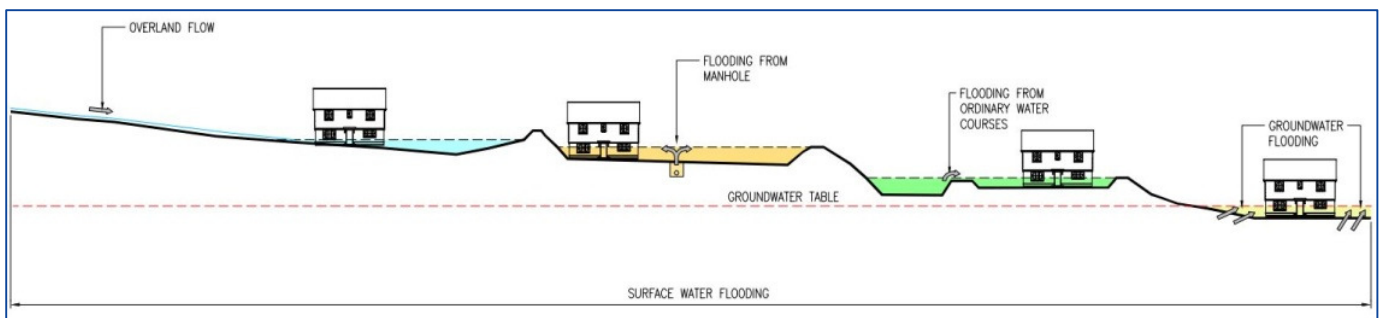
- Measure 5A: To work with partners to produce local policies and guidance, and set standards to promote a positive impact on flood risk from new development, and to prevent any increase in flood risk, including the possible impacts of climate change.
- Measure 5B: To maximise opportunities for contributions towards existing and proposed flood risk management from new development to address local flood risk.
- Measure 5C: Develop byelaws, where beneficial, to control development.
- Measure 5D: Work with relevant partners to promote SuDS measures for new developments through the role as a statutory consultee on major planning applications.

## 3 Local Flood Risk in Warwickshire

### 3.1 What is flooding?

Flooding is often defined by where the flood water comes from; Warwickshire is affected by flooding from a variety of different sources. This Strategy is focussed on local flooding which is defined as flooding from surface water, groundwater and ordinary watercourses. The different sources of flooding that may affect the county are set out below.

- Main river flooding:** When the capacity of a river (designated as Main River) is exceeded or the channel becomes blocked, causing water to spill onto the floodplain.
- Groundwater flooding:** Water in the ground rises up above the ground surface level from within permeable rocks often as a result of prolonged or heavy rainfall.
- Highway flooding:** Heavy rainfall or overflow from blocked drains and gullies causes water to pond on the carriageway.
- Ordinary watercourse flooding:** When a watercourse not designated as Main River cannot accommodate the volume of water flowing in it or the channel becomes blocked, causing water to come out of the channel and flow over the surrounding land.
- Pluvial flooding:** High intensity rainfall causes surface water runoff which flows over the ground and accumulates in low-lying areas.
- Reservoir flooding:** When a reservoir overtops or the dam is breached causing the water stored by the reservoir to be released.
- Sewer flooding:** Flooding from a sewer, usually via manholes, due to the capacity being exceeded or due to temporary problems with the system such as blockages, collapses or equipment failures (i.e. pumping stations).

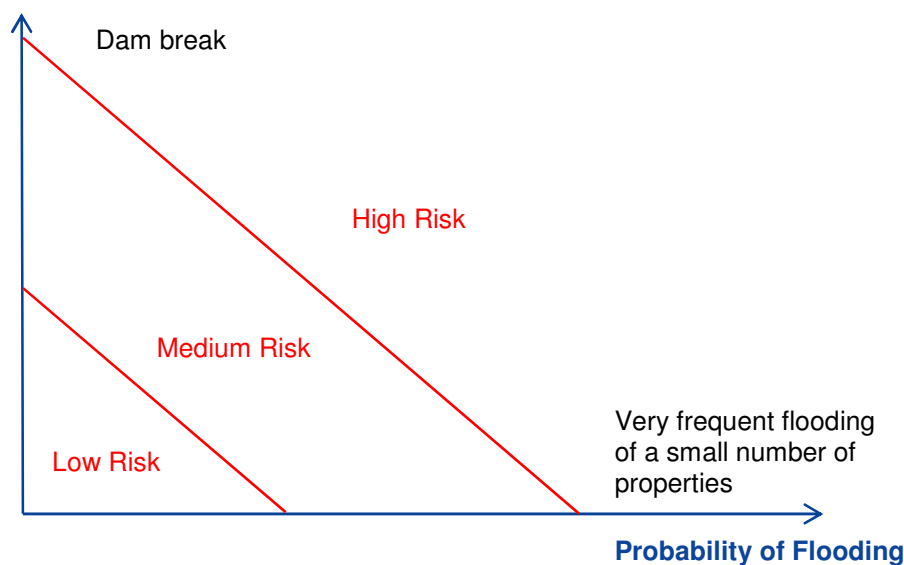


## 3.2 What is flood risk management?

Managing flood risk is about identifying the sources, pathways and receptors of flooding and trying to reduce the probability and/or impact of flooding. It is never possible to prevent all flooding (reduce flood risk to zero), which is why everywhere in the UK is identified as being in a Flood Zone (Flood Zone 1, Flood Zone 2 or Flood Zone 3). Flood Zone 3 has the greatest probability of fluvial flooding and Flood Zone 1 the least.

The concept of flood risk can be explained using the graph shown in Figure 3.2 below. A dam break scenario has a low probability of occurrence, but a very high impact if it does occur, so it is considered to be a high flood risk. Similarly, very frequent flooding of a small number of properties has a relatively low impact but a high frequency (and therefore high probability) and a high flood risk overall.

### Impact of Flooding



**Figure 3.2: Flood Risk as a function of Probability and Impact**

In practical terms this means that, while no flood alleviation scheme can ever guarantee that flooding will not happen again, they can reduce the probability and/or impact of flooding in a specific location to reduce flood risk. Similarly, community flood resilience measures can achieve reductions in flood risk on a local level by reducing the probability of flooding (by, for example, keeping a watercourse clear to reduce the risk of culverts blocking) and the impact of flooding (by, for example, having a robust community emergency plan which enables locally held stocks of sandbags to be filled and deployed, and enables residents to move furniture away from oncoming flood waters).

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### 3.3 Characteristics of Warwickshire

Warwickshire is a land-locked county in the West Midlands with an administrative area of 1,975 km<sup>2</sup>. It is bounded by Oxfordshire and Gloucestershire to the south, Worcestershire and Birmingham to the west, Staffordshire and Derbyshire to the north, and Leicestershire and Northamptonshire to the east. The county is split into five Borough and District authorities.

There are nine main towns within the county: Atherstone, Bedworth, Kenilworth, Leamington Spa, Nuneaton, Polesworth, Rugby, Stratford-upon-Avon and Warwick. The majority of the population is located in the north and centre of the county, while the southern part of the county is largely rural and reliant on the agricultural industry.

The majority of the county has gently rolling topography interspersed with low lying river valleys including the Rivers Avon, Stour, Anker and Tame. Most of the county is underlain by impermeable clay, and lies within the River Avon catchment, which drains into the River Severn. However the Rivers Tame and Anker that drain north Warwickshire are within the River Trent catchment, while a small area in the south of the county drains into the River Thames catchment.

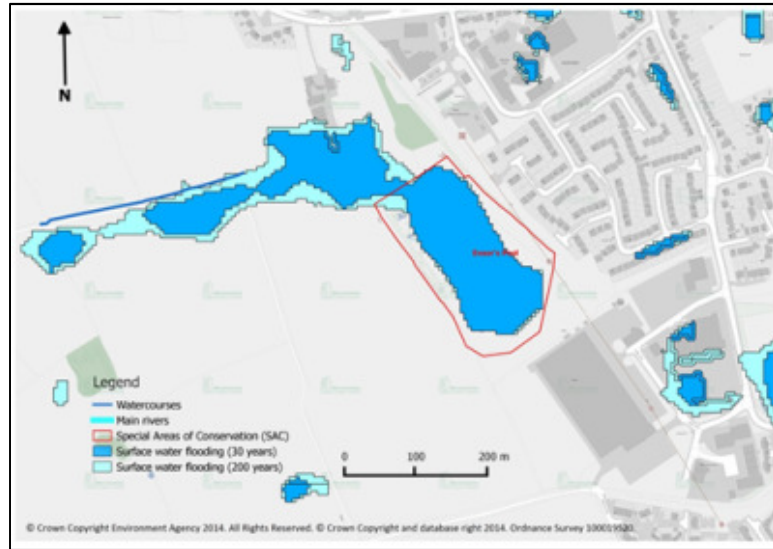
There are a number of main rivers and ordinary watercourses within Warwickshire that present a risk of flooding, these include the Rivers Alne, Anker, Arrow, Avon, Blythe, Cole, Dene, Itchen, Leam, Sowe, Stour, Swift and Tame, and the Canley Brook and Finham Brook.

In addition to flooding issues generic to urbanised areas, having significant rural areas Warwickshire is at risk of surface water flooding in towns, villages and on the highway as a result of run-off from agricultural land.

Due to a changing climate the risk of flooding within Warwickshire may increase as extreme rainfall events become more common and peak flood flows in rivers are expected to increase.

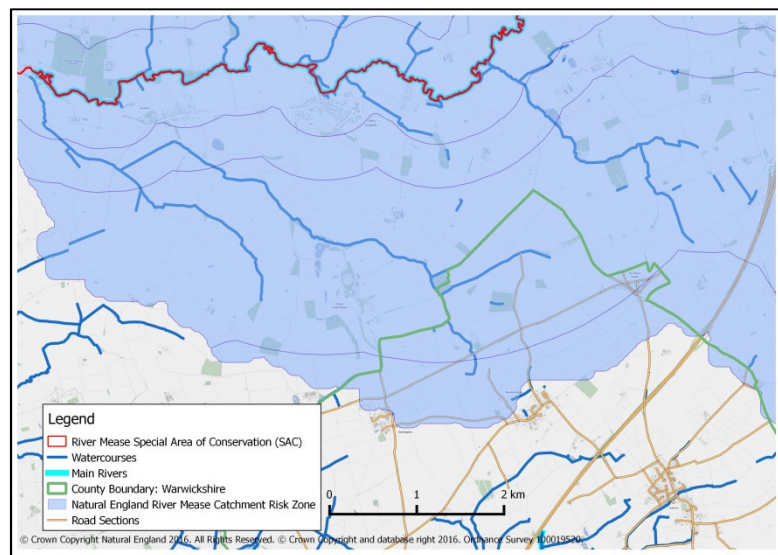
Two European Sites / Natura 2000 sites were considered in the Habitat Regulations Assessment: Ensor's Pool Special Area of Conservation (SAC) and the River Mease SAC. The specific vulnerabilities of these sites from the LFRMS are provided below.

1. Ensor's Pool (see Figure 3.3a): This site is vulnerable to pollution from surface water flooding in Warwickshire; any increase in water levels; and potential to introduce non-native species to the Pool.



**Figure 3.3a: Ensor's Pool Special Area of Conservation (SAC)**

2. River Mease. There is potential that any ordinary water course flooding within the River Mease catchment area (see Figure 3.3b) could impact the River Mease SAC. Impacts include: a reduction in water quality via pollution (especially from increased nutrient levels, particularly phosphorus), sedimentation, increased flow and the introduction of non-native species.



**Figure 3.3b: River Mease Special Area of Conservation (SAC)**

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## 3.4 Historic Flooding in Warwickshire

Our understanding of past flooding in Warwickshire had been collected as part of several previous studies.

- Warwickshire County Council (WCC) Strategic Flood Risk Assessment for Local Development Framework – Level 1 (February 2008).<sup>2</sup>
- Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC & Rugby BC Level 1 Strategic Flood Risk Assessment (September 2013).<sup>3</sup>
- Warwickshire Preliminary Flood Risk Assessment (May 2011).<sup>4</sup>
- Draft Warwickshire Surface Water Management Plan (2014).

The information on historic flooding is summarised in the following sections. However it is not intended to provide a complete list of all flood events or areas affected by flooding, but rather an indication of the main flood events that have occurred in the past. Further details can be found in the documents outlined above.

### 3.4.1 Surface Water Flooding

Surface water flooding has occurred across the county in the past, and often occurs in combination with other sources, such as sewers and watercourses. A review of previously published information shows that there have been a number of notable flood events in Warwickshire in recent times. Significant events include; January 1992, Easter 1998, August 1999, June 2005, June/July 2007, December 2008, November 2012 and July 2014, with near misses in winter 2013/14. All of these events have been attributed in part to surface water flooding.

### 3.4.2 Groundwater

There are limited records of groundwater flooding in Warwickshire. Where it has occurred, this has been in combination with multiple other sources of flooding after periods of sustained rainfall. The Warwickshire PFRA noted only one groundwater flood event that has been recorded in isolation, related to a major redevelopment beside existing properties. In addition, the Easter 1998 flood event is thought to have been caused in part by groundwater flooding.

During the winter of 2013/14, some flood events are suspected to have been the result of groundwater flooding, although this has not been confirmed. During this period, groundwater levels were high, and groundwater flooding was reported at several isolated locations across the county.

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<sup>2</sup> <http://www.warwickshire.gov.uk/sfra>

<sup>3</sup> <http://www.warwickshire.gov.uk/sfra>

<sup>4</sup> <http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/research/planning/135534.aspx#11>



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### 3.4.3 River Flooding

Fluvial flooding (from rivers including main rivers and ordinary watercourses) has occurred on a significant scale in Warwickshire in the recent past; the most significant events were Easter 1998 and summer 2007 when thousands of properties were flooded nationally.

## 3.5 Current and Future Flood Risk

The information and records on historical flooding in Warwickshire give some indication of the areas that are at risk. This does not indicate all areas that may be at risk of flooding now or in the future. To understand this risk fully computer modelling is required.

The Environment Agency has undertaken modelling of flood risk from Main Rivers for some time. Until recently the focus has not been placed upon other sources of flooding. In recent years other sources of flooding such as surface water, ordinary watercourses and groundwater have received more attention, but the level of detail of these assessments has not yet reached that which is now routine for Main Rivers. The following sections outline the best available information on current flood risk from local sources in Warwickshire.

### 3.5.1 Surface Water and Ordinary Watercourse Flooding

The Warwickshire PFRA (2011) determined that, at the time of publication, the Flood Map for Surface Water (FMfSW) was the most appropriate source of information on surface water flood risk and identified it as the 'Locally Agreed Surface Water Information' for the county.

Since publication of the PFRA, the EA has published the Risk of Flooding from Surface Water map in December 2013 (the updated Flood Map for Surface Water, or uFMfSW). At present this is the best available data for defining the current risk from surface water flooding in Warwickshire. These maps primarily represent surface runoff; they can also be used to identify flooding from ordinary watercourses, as they are produced at the national scale these maps are suitable for identification of broad areas of risk; they are not appropriate for identification of risk at the property level.

WCC is now in the process of producing a SWMP for Warwickshire. This is currently using the Risk of Flooding from Surface Water map and records of historic flooding to identify surface water flood risk hotspots. The SWMP will provide an improved understanding of surface water flood risk at key locations and identify specific measures to reduce or mitigate the risk it identifies. The SWMP will form the assessment of local flood risk for the purpose of the Strategy. The SWMP for Warwickshire is included as Appendix C to this Strategy.

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### 3.5.2 Groundwater Flooding

The current level of understanding of groundwater flood risk is limited due to the complexities of predicting groundwater flow and emergence. At present there is no mapping available which shows groundwater flood risk and existing approaches have focused on representing the potential susceptibility of an area to groundwater flooding.

The EA has produced the Areas Susceptible to Groundwater Flooding (AStGWF) map which indicates potential risk at a strategic scale. This data should be used in combination with known records of groundwater flooding to establish areas of groundwater flood risk.

The AStGWF maps are based upon the British Geological Survey's (BGS) Susceptibility to Groundwater Flooding mapping; the BGS mapping is of higher resolution and quality. The BGS mapping is only available when purchased under licence; this is considered the best current dataset for assessing groundwater flood risk.

### 3.5.3 Main River Flooding

This Strategy is focused on local flood risk, but there is significant interaction between these sources and Main Rivers in Warwickshire during flood events. This is most apparent when high river levels limits the ability of water to drain from the land, leading to surface water, sewer, highway and ordinary watercourse flooding.

Main River flooding is the responsibility of the Environment Agency and further details can be found on their website<sup>5</sup>.

### 3.5.4 Sewer Flooding

Although this Strategy is focused on local flood risk, there can be significant interaction between these sources and the sewer infrastructure.

Water and sewerage companies (WaSCs) are responsible for managing the risks of flooding from water supply and foul, combined or surface water sewer systems. This is formally defined as a duty to provide, maintain and operate systems of public sewers and works for the purpose of effectually draining their area of responsibility. This is formally specified in Section 94 of the Water Industry Act 1991 (WIA 1991).

## 3.6 Changes to current and future flood risk

Flood risk in Warwickshire is likely to change for a range of reasons including climate change, new development, urbanisation, rural land use, farming practices and maintenance and/or deterioration of flood risk management assets.

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<sup>5</sup> <https://www.gov.uk/topic/environmental-management/flooding-coastal-change>

### 3.6.1 Climate Change

There is clear scientific evidence that global climate change is happening now. Over the past century the UK has experienced rising sea levels, more winter rain has fallen in intense wet spells and seasonal rainfall is highly variable. Some of the changes might reflect natural variation; although the broad trends are in line with projections from climate models. The effects of flooding in the future may be made more severe due to the impact of climate change, especially if nothing is done in relation to the risks.

The latest UK climate projections (UKCP09)<sup>6</sup> indicate that the greenhouse gas levels in the atmosphere are likely to cause higher winter rainfall in the future, with predictions of potentially three times as many days in winter with heavy rainfall (more than 25mm in a day) by the 2080s. The amount of rain in extreme storms (with a 1 in 5 annual chance or rarer) could increase by 40%.

Increased flood risk poses the most significant and specific climate change challenge to the UK economy. As stated in the 2012 UK Climate Change Risk Assessment Government Report<sup>7</sup>, a significant number of the top risks for business with respect to climate change relate to the impacts of flooding.

The predicted impact of climate change on flood risk in England is set out in the Environment Agency's 'Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities'<sup>8</sup>. This translates the predictions of UKCP09 into quantified impacts on peak river flood flows and extreme rainfall which both affect local flood risk.

The impact upon peak river flows is provided on a regional basis by River Basin District and Warwickshire is located across three districts; the Humber, Severn and Thames. The predictions for the potential impact of climate change on peak river flows in these districts are given in Table 6.1 below.

**Table 6.1: Predicted Impact of climate change on peak river flood flows**

River Basin District	Total potential increase by 2080s
Humber	20%
Severn	25%
Thames	25%

<sup>6</sup> <http://ukclimateprojections.metoffice.gov.uk/21678>

<sup>7</sup> <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-government-report>

<sup>8</sup> <http://webarchive.nationalarchives.gov.uk/20131108051347/http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0711btzu-e-e.pdf>

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The impact of climate change on extreme rainfall intensity is less certain and therefore predictions regarding the potential impacts are only made at a national scale. Extreme rainfall intensity is expected to increase by 20% by the 2080s.

More intense rainfall will increase the risk of surface water flooding through increased runoff that drainage systems are unable to cope with. This, combined with rising river levels, will increase local flood risk through interactions with smaller watercourses and larger rivers.

Guidance is available for allowances that should be made for incorporating climate change in the assessment of flood risk and drainage for new developments. Climate change allowances for planners (Environment Agency 2013) provide guidance on appropriate allowances that should be used in planning applications and preparation of local plans.

### 3.6.2 Urban Creep

Not all development is subject to planning procedures or the development control process, and therefore its impact on flooding are less likely to be controlled. Urban creep such as property extensions is an example of this. This increases the amount of hard surfaces in towns, reducing the ability of water to filter into the ground and increasing the volume of water that has to run off into drains. In addition, it increases the peak flows within the surface water drainage system. This can increase the risk of surface water flooding in urban areas as drainage systems are unable to cope with the increased demand.

Retrofitting Sustainable Drainage Systems (SuDS) into existing urban environments is a potential approach to combatting this increase in local flood risk. WCC is currently working with Severn Trent Water (STW) to assess the potential of retrofitted SuDS measures. Attenuation water butts that partially self-drain to allow for some storage for rainfall attenuation have been trialled. When used in combination in high numbers across a catchment this research has shown that they could help to reduce flood risk. One such trial has recently been completed by STW in south Warwickshire.

### 3.6.3 New Development

New development has the potential to increase surface water runoff through new impermeable hard surfaces that reduce the ability of rainfall to soak into the ground. Unless managed, this can increase the volume of runoff, potentially increasing surface water flood risk.

The National Planning Policy Framework (NPPF) and its associated guidance require new developments to be designed such that they do not increase local flood risk. This includes provision of adequate drainage infrastructure to ensure surface water runoff is appropriately managed. This is supported by the Non-Statutory Technical Standards for Sustainable Drainage (Defra, March 2015) that set out the requirements for drainage of major development. The Local Authority SuDS Officer organisation has also published best practice guidance that builds upon these standards to aid their interpretation.

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While new development should not increase flood risk off-site, there may be occasions when areas of land are currently subject to flooding, but have yet to be developed. These have not been identified as locations of priority for investigation by WCC, since there is currently low flood risk due to the absence of buildings, for example. Such situations where known flooding exists should be investigated by the Developer in order to avoid any increase in flood risk due to the construction of new potential receptors of flood water. The Developer will determine the source, i.e. overland flooding caused by unmaintained ditches, unauthorised outfalls discharging to ditches/watercourses. This may include investigation of drainage systems to establish their structural status and whether the removal of debris or blockages is needed. If these investigations involve highway and/or public sewers, then authorisation should be obtained from the appropriate authority. It may be necessary in some instances to undertake a wider investigation involving a catchment assessment. Depending on the outcome of the investigations, the developer may present the findings to the planners or the organisation responsible for the source of the flooding. Equally, the Local Planning Authority may seek contributions or choose a Section 106 agreement to ensure that improvement works are undertaken.

WCC actively seeks that new development offers betterment with regard to flood risk in order to mitigate the potential negative flood risk impacts of development.

In addition new development must ensure that it is compliant with local planning policy that is developed by each Local Planning Authority in Warwickshire.

Draft Planning Advice has been included in Appendix G of this document and this will be developed during 2016 into a supplementary planning document for adoption by local planning authorities.

### 3.6.4 Land Use Planning

There are a number of major development proposals that are currently being progressed in Warwickshire. As these are implemented this will significantly affect the distribution of population across the county. To ensure that these changes do not result in an increase in local flood risk the evidence base used to make planning decisions must take account of this risk.

Some of the major developments that are currently being progressed include:

- Coventry/Warwickshire Gateway (Major employment development including offices, industrial uses and warehousing);
- Rugby Mast (6200 new homes and 31 hectares of employment land);
- St Modwen/Rugby College (565 homes).

Another aspect of land use planning that affects local flood risk is the management of farmland and rural catchments. Natural Catchment Management techniques are approaches to manage landscapes so that they capture and store rainfall before it reaches watercourses,

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or slowing down the flow of water towards major rivers. This can include the re-forestation of open land, or using woody debris in small watercourse to slow down the flow offering another approach for managing local flood risk. These approaches can offer a more sustainable long term approach to management of flood risk while also offering opportunities to improve the quality of ground and surface waterbodies contributing to the aims of the Water Framework Directive. However, the benefits of such approaches must be carefully balanced with the farmers' need to retain drainage capacity of the land, manage drainage infrastructure and produce food sustainably.

There is a project ongoing in the Trent catchment in the north of Warwickshire and Staffordshire in which the two LLFAs are working together, using funding from the Trent Regional Flood and Coastal Committee, to identify opportunities for Natural Flood Management. Furthermore, Shipston Area Flood Action Group is currently exploring the potential for implementing these types of measures in partnership with local landowners, the Woodland Trust and the EA.

### 3.6.5 Maintenance and Deterioration of Assets

As flood risk management assets age and deteriorate, their ability to perform the function for which they were designed will reduce. How this occurs will depend upon the type of asset: for example, drains may silt up, or ditches and culverts may become blocked with rubbish, other debris or vegetation growth reducing their capacity to convey water. As their capacity decreases, so will their ability to remove surface runoff, resulting in an increase in surface water flood risk.

Assets such as flood walls and embankments weaken over time and are less able to withstand the forces of the water they are designed to hold back. Solid walls may crack and deform over time, while embankments may suffer deterioration from root damage, animal burrows or soil erosion.

Routine maintenance such as cleaning drains, removal of trash from ditches and culverts, and vegetation management can mitigate the risk of assets failing and extend their lifetime. Without a programme of maintenance and where necessary asset replacement and remediation, the deterioration of flood risk management assets would increase local flood risk over time.

To ensure adequate maintenance can be carried out, an established programme of asset inspection and surveys is required to monitor asset condition and assess the level of maintenance required. This can involve visual inspections of above ground assets such as ditches, walls and embankments, or CCTV surveys of culverts and drainage pipes. It is the responsibility of the owners of flood risk management assets to undertake such inspection and maintenance.

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### 3.7 Existing Flood Risk Management Schemes in Warwickshire

Risk management authorities in Warwickshire are continually involved in flood risk management schemes to alleviate known or existing risk within the county. Below are details of recent schemes that have been completed. These are part of the 'No Regrets' measures described in Section 2.2.

- WCC has led on and assisted in the completion of flood alleviation schemes, working closely with partners, in various locations including: Nuneaton; Polesworth; Gaydon; Marlcliff (EA led); Cubbington (Warwick District Council led); and Five Ways, Haseley.
- WCC has been successful in finding solutions to frequent flooding problems through informal flood and drainage investigations across the county. For example, in Western Road, Stratford-upon-Avon, working in partnership with WCC Highways, the Canal and River Trust and other landowners, investigations highlighted maintenance issues which have been dealt with by the local landowners.
- The Trent Regional Flood and Coastal Committee allocated funding for the inspection of culverts in the north of Warwickshire which is being managed by WCC.
- WCC has supported STW in recently delivering £22 million of flood alleviation in Leamington Spa.
- WCC is currently undertaking appraisal studies to inform future flood risk management schemes in places such as Fenny Compton, Cherington and Ladbroke.

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## 4 Legislation and Policy

It is important that the Strategy is developed with due regard for relevant legislation and flood risk management policy. The key relevant legislation and policy documents in the context of the Strategy are summarised in the following sections.

### 4.1 Flood and Water Management Act (FWMA) 2010

Sir Michael Pitt carried out an independent review of national flood risk management practices after the widespread floods during the summer of 2007. This review called for fundamental changes to the way flood risk was being managed. It contained 92 recommendations, of which 21 were specifically aimed at Local Authorities and focused on them playing a major role in the management of local flood risk, through co-ordination with other relevant authorities.

Many of the recommendations contained within the Pitt Review were implemented within the Flood and Water Management Act (FWMA), which came into force in April 2010. The Act provides the legislation for the management of risks associated with flooding and reinforces the need to manage these risks holistically and in a sustainable manner.

It placed a number of new roles and responsibilities on WCC which is designated as a Lead Local Flood Authority (LLFA). As the LLFA, WCC is responsible for managing local flood risk; which includes flooding from surface water runoff, ordinary watercourses and groundwater. More detail on these responsibilities and those of others are discussed in Section 5.

The FWMA 2010 specifies a number of 'risk management authorities' (RMA), which for Warwickshire are as follows.

- The Lead Local Flood Authority (Warwickshire County Council).
- The Environment Agency.
- The local water company (Severn Trent Water).
- District and Borough Councils (North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Rugby Borough Council, Stratford-on-Avon District Council & Warwick District Council).
- The highway authority (Warwickshire County Council and Highways England).

The Act places high importance on the value of co-operation between these authorities to manage flood risk. It stresses the need for cross-border co-operation in flood risk management as flood water does not respect administrative boundaries. This is particularly relevant for Warwickshire which sits in the catchments of the Rivers Severn, Trent and Thames.



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## 4.2 National Flood and Coastal Erosion Risk Management Strategy for England (NFCERMS) (2011)

A requirement of the Flood and Water Management Act 2010 was for the Environment Agency to produce a strategy for flood and coastal erosion risk management in England. The strategy was published in 2011 and is available from their website<sup>9</sup>.

The national strategy aims to ensure that flood risk is managed in a co-ordinated way within catchments and that this balances the needs of communities, the economy and the environment. The strategy encourages more effective risk management through enabling people, communities, business, infrastructure operators and the public sector to work together towards the following objectives.

- Understanding the risk of flooding and coastal erosion, and working together to develop long term plans to manage these risks and ensuring other plans take account of them.
- Avoiding inappropriate development in areas of flood and coastal erosion risk, and ensuring development does not increase these risks.
- Building, maintaining and improving flood and coastal erosion risk management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society.
- Increasing public awareness of the risk that remains and engaging with people at risk to make their property more resilient.
- Improving the detection, forecasting and issuing of flood warnings, planning for and co-ordinating a rapid response to flood emergencies, and promoting faster recovery from flooding.

Local flood risk management strategies must be consistent with the national strategy and must therefore be in accordance with the following six guiding principles of the national strategy:

- community focus and partnership working;
- a catchment 'cell' approach;
- sustainability;
- proportionate, risk-based approach;
- multiple benefits;
- beneficiaries should be allowed and encouraged to invest in local risk management.

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<sup>9</sup> <https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england>

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## 4.3 Other relevant legislation and policies

Further information on other relevant legislation and policy documents is provided in Appendix B. This does not cover every piece of legislation that is related to the management of local flood risk but is intended give an appreciation of those which are most relevant. The legislation and policy documents covered in Appendix B are listed below.

### **Legislation**

- Flood Risk Regulations 2009
- The Land Drainage Act 1991
- Water Resources Act 1991
- The Localism Act 2011
- Highways Act 1980
- Civil Contingencies Act 2004
- Reservoirs Act 1975
- Habitats Directive (The Conservation of Habitats and Species Regulations) 2010
- Water Framework Directive 2000

### **Policy**

- River Basin Management Plans
- Catchment Flood Management Plans
- Planning Policy:
  - National Planning Policy Framework
  - District and Borough Local Plans
  - Strategic Flood Risk Assessments
  - Preliminary Flood Risk Assessment

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## 5 Flood Risk Management Roles and Responsibilities

In order for Warwickshire County Council (WCC) to be effective in managing local flood risk it is important that the roles and responsibilities of the key parties involved in its management in Warwickshire are clearly defined.

### 5.1 Risk Management Authorities

The Flood and Water Management Act (FWMA) 2010 requires the Strategy to specify the relevant Risk Management Authorities (RMA) in the Lead Local Flood Authority's (LLFA) area and the flood risk management functions that those RMAs may exercise.

#### 5.1.1 Warwickshire County Council as Lead Local Flood Authority

As the LLFA for Warwickshire, WCC are required to develop a strategy to tackle local flood risk, involving flooding from surface water, ordinary watercourses and groundwater. In order to undertake this role effectively WCC has established a Flood Risk Management (FRM) team which currently has 7.5 full time equivalent posts. This includes two posts being hosted through the Defra-funded Community Flood Resilience Pathfinder project, although these posts have continued after the completion of the project, being funded by WCC.

WCC's key duties and responsibilities, once all elements of the FWMA 2010 have been implemented, include the following.

1. LLFAs such as WCC are classed as RMAs (FWMA Section 6).
2. In exercising its flood and coastal erosion risk management functions, WCC must act in a manner which is consistent with the national strategy and associated guidance, and act in a manner which is consistent with local strategies and associated guidance. In exercising any other function in a manner which may affect a flood risk or coastal erosion risk, WCC must have regard to the national and local strategies and guidance (FWMA Section 11).
3. Co-operation with other RMAs in the exercise of its flood and coastal erosion risk management functions. WCC may share information with another risk management authority for the purpose of discharging its duty in exercising their Flood and Coastal Erosion Risk Management functions. In addition, they may arrange for a flood risk management function to be exercised on its behalf by another risk management authority or a navigation authority (FWMA Section 13).
4. Developing, maintain and applying, in consultation with key stakeholders, a Local Flood Risk Management Strategy for Warwickshire which will consider risks from surface water run-off, groundwater and ordinary watercourses (FWMA Section 9).

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5. Establishing local management and governance arrangements with other key stakeholders to ensure delivery of effective joined up management of flood risk. Responsibility for the co-ordination of flood risk management across the county (FWMA Section 9).
  6. Fulfilling the requirements of the EU Floods Directive by completing a Preliminary Flood Risk Assessment (Flood Risk Regulations 2009).
  7. Approving, adopting and maintaining Sustainable Drainage Systems (SuDS) that meet National Standards for development (FWMA Schedule 3 – this schedule has not been fully enacted). LLFAs are now Statutory Consultees<sup>10</sup> for major development<sup>11</sup> planning applications with surface water drainage. Through this role they will assess the provision for surface water drainage against the requirements of the National Planning Policy Framework and its supporting guidance.
  8. Establishing and maintaining a register of flood risk management assets with a record of each structure which has a significant effect on flood risk, together with details of ownership and state of repair and where appropriate the designation of such structures or features, which may affect flood risk (FWMA Section 21).
  9. Investigating flooding incidents, to the extent the LLFA considers necessary, in order to understand their cause and ensure that appropriate agencies play their role in the effective management of flooding incidents and recovery (FWMA Section 19).
  10. Consenting and enforcement on ordinary watercourses (under Sections 21, 23 and 25 of the Land Drainage Act) (FWMA Schedule 2).
  11. Power to request a person to provide information in connection with the LLFA's flood and coastal erosion risk management functions (FWMA Section 14).
  12. LLFAs are classed as designating authorities under Schedule 1 of the Act. This allows LLFAs, where the conditions outlined in Schedule 1 are satisfied, to designate a natural or man-made structural feature of the environment where the authority thinks that the existence or location of the structure or feature affects a flood risk or a coastal erosion risk. The effect of designation is that a person may not alter, remove or replace a designated structure or feature without the consent of the responsible authority. Consent is provided through notices and Schedule 1 outlines enforcement powers and powers of entry that can be used to fulfil the requirements of Schedule 1 (FWMA Schedule 1).
  13. LLFAs may carry out flood risk management work if the authority considers the work desirable having regard to the Local Flood Risk Management Strategy for its area under section 9 or 10 of the Flood and Water Management Act 2010, and the purpose

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<sup>10</sup> The Town and Country Planning (Development Management Procedure)(England) Order 2015 – Schedule 4 - Consultations before the grant of permission

<sup>11</sup> The Town and Country Planning (Development Management Procedure)(England) Order 2015 defines major development. This definition is given in full in Appendix A.

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of the work is to manage a flood risk in the authority's area from surface runoff or groundwater. Flood risk management work includes works to maintain, improve and construct flood defences (FWMA Schedule 2 – Amendment of Land Drainage Act 1991).

14. They may make byelaws to secure the efficient working of a drainage system in the authority's area, to secure the effectiveness of flood risk management work within the meaning of section 14A and/or to secure the effectiveness of works done in reliance on Section 38 or 39 of the Flood and Water Management Act 2010 (FWMA Schedule 2 – Amendment of Land Drainage Act 1991).

### 5.1.2 Warwickshire County Council as Highways Authority

WCC as Highways Authority is responsible for the provision and management of highway drainage under the Highways Act (1980). This excludes motorways and trunk roads (M6, M40, M42, M69, A5, A46, A446 and the A45) that are the responsibility of Highways England.

WCC as a Highways Authority has various duties and powers in relation flooding and drainage on the highway. They are not responsible for flooding and drainage on private land. Where flooding of the highway occurs due to the actions of another person (e.g. adjoining landowners) the Highway Authority can take action against the person responsible. The owners of land adjoining a highway have a common law duty to maintain ditches to prevent them causing a nuisance to road users.

WCC's key duties and responsibilities as the Highways Authority include the following.

1. Responsibility to maintain highways, including ensuring that highway drainage systems are clear and that blockage's affecting the highway are cleared. This is a duty under the Highways Act.
2. Powers to deliver works that they consider necessary to protect the highway from flooding. These works can either be on the highway itself or on land which has been acquired by the Highway Authority through the exercise of highway acquisition powers.
3. The Highway Authority may divert parts of watercourses or carry out any other works on any form of watercourse if it is necessary for the construction, improvement or alteration of the highway or provides a new means of access to any premises from the highway.

### 5.1.3 Water and Sewerage Companies

Water and sewerage companies (WaSCs) are responsible for managing the risks of flooding from water supply and foul, combined or surface water sewer systems. This may need to be carried out in partnership with others, for example, working with developers and landowners

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to reduce the input of rainfall into sewers through attenuation, storage and sustainable drainage.

WaSCs have no duties relating to highway drainage, land drainage and watercourses; however they do accept highway drainage by agreement with the Highway Authority under Section 115 of the Water Industry Act 1991. Their duty relates to premises for 'domestic sewerage purposes'. In terms of wastewater this is taken to mean the ordinary contents of lavatories and water which has been used for bathing, washing and cooking purposes. Whilst for surface water this relates to the removal from roofs and yards / land appurtenant to the premises.

Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. In extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

The main water company for Warwickshire is STW who deals with the majority of surface water sewer and foul water management in the county. Thames Water also has a small area of responsibility in the southern part of the county in Stratford-on-Avon District.

#### 5.1.4 The Environment Agency

The Environment Agency (EA) is responsible for the management of flood risk from the sea, main rivers and reservoirs. It has a strategic overview role for all forms of flooding in addition to responsibilities for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas.

Main rivers are watercourses shown on the statutory main river map held by the EA and Defra, and shown on the Flood Map for Planning available from the EA's website<sup>12</sup>. The EA has permissive powers to carry out works to maintain, improve and construct flood defences on main rivers. This can include any structure or appliance for controlling or regulating flow of water into or out of the channel. The overall responsibility for maintenance of main rivers, however, lies with the riparian owner.

The EA is the lead organisation responsible for all flood and erosion risk management around the coastline of England, including tidal flood risk. The EA leads the country in developing a shoreline management plan that works at local, regional and national level, with partner organisations, including local authorities, putting agreed plans into practical action. The EA supports this by giving Grant-in-Aid funding and overseeing the work carried out.

The EA enforces the Reservoirs Act 1975, which is the legislation for reservoirs in the United Kingdom. The responsibility for safety lies with the reservoir owner, the EA is responsible as Enforcement Authority for reservoirs in England and Wales. The EA is responsible for establishing and maintaining a register of reservoirs, and making this information available to the public.

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<sup>12</sup> <http://apps.environment-agency.gov.uk/wiyby/37837.aspx>

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As Enforcement Authority the EA must ensure flood plans are produced for specified reservoirs. The EA is responsible for controlling works which affect main rivers and flood defences through consenting works under the Water Resources Act 1991 and their Land Drainage and Sea Defence Byelaws.

As statutory consultee on all flooding and drainage matters, the EA is responsible for providing advice to planning authorities. It is responsible for providing fluvial and coastal flood warnings, monitoring flood and coastal erosion risks and supporting emergency responders when flooding occurs.

In its role to provide a strategic overview of all sources of flood risk, the EA provides the following.

- Advice to Government on flood and coastal erosion risk, supporting future national responses, policy and strategy.
- Supervision of flood and coastal erosion risk management.
- Allocation of flood and coastal erosion risk management capital funding.
- Support to LLFAs by providing data and guidance on assessing, planning and carrying out flood risk management for flooding from ordinary watercourses, surface runoff and groundwater.

### 5.1.5 District and Borough Councils

Warwickshire County is a two tier county and comprised of the following five Local Authorities:

- North Warwickshire Borough Council;
- Nuneaton and Bedworth Borough Council;
- Rugby Borough Council;
- Stratford-on-Avon District Council;
- Warwick District Council.

Responsibilities of District and Borough Councils under the FWMA 2010 include the following.

- Districts and Boroughs are classed as RMAs (FWMA Section 6).
- In exercising their flood and coastal erosion risk management functions, Districts and Boroughs must act in a manner which is consistent with the national strategy and associated guidance, and act in a manner which is consistent with local strategies and associated guidance. In exercising any other function in a manner which may affect a flood risk or coastal erosion risk, they must have regard to the national and local strategies and guidance (Section 11).

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- Co-operation with other RMAs in the exercise of their flood and coastal erosion risk management functions (Section 13).
  - In exercising a flood or coastal erosion risk management function, Districts and Boroughs must aim to make a contribution towards the achievement of sustainable development (Section 27). Under planning legislation, Borough and District Councils operate their development planning and control functions, having due regard to the National Planning Policy Framework and associated technical guidance.
  - Districts and Boroughs may carry out work (as specified by Section 3 (3) (a) to (e) of the Act) that will or may cause flooding, increase water below the ground or coastal erosion (Section 39), in order to improve nature conservation, preserve cultural heritage or people's enjoyment of the environment/cultural heritage.
  - Districts and Boroughs are classed as designating authorities under Schedule 1 of the Act. This allows them, where the conditions outlined in Schedule 1 are satisfied, to designate a structure or a natural or man-made feature of the environment where the authority thinks that the existence or location of the structure or feature affects a flood risk or a coastal erosion risk. The effect of designation is that a person may not alter, remove or replace a designated structure or feature without the consent of the responsible authority. Consent is provided through notices and Schedule 1 outlines enforcement powers and powers of entry that can be used to fulfil the requirements of Schedule 1.
  - District and Borough Councils have flood and drainage related responsibilities and powers specified in:
    - the Land Drainage Act 1991 (as amended by the Flood and Water Management Act);
    - the Public Health Act 1936;
    - Environmental Protection Act 1990; and
    - the Localism Act 2011.

### 5.1.6 Highways England

Highways England (formerly the Highways Agency) is the managing authority for the strategic road network, which is designated as Critical Infrastructure. They have a duty to manage and maintain those sections of the motorway and trunk road network within Warwickshire and therefore within the context of flood risk, are a Risk Management Authority under the FWMA 2010.

One recommendation of the Pitt Review was that the Highways England should consider the vulnerability of its network to flooding and prepare suitable measures to reduce the effects on road users.



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The recommendations have been divided into the following project objectives:

- identify locations on the network most sensitive to flooding;
- produce maps showing the location of recent flood events;
- compare flood events with the weather conditions to assess the risk of repeat events;
- identify quick-win options for reducing the effects of flooding to road users.

The Highways England has been engaging with its service providers to identify the extent of existing flooding problems and the way in which they are currently being recorded.

Where motorways or trunk roads are identified as being at risk from flooding, contingency plans are being prepared to warn road users and, where necessary, divert them away from the problem. Where possible, weather data from the Met Office will be analysed and, if intense rainfall events are forecast in sensitive flood areas, suitable warnings will be posted using the variable message signs.

## 5.2 Flood Risk Management Partners

### 5.2.1 Town and Parish Councils

Town and Parish Councils have no formal duties in the management of flood risk. However, they have an important role to play in establishing local groups, developing community flood plans and raising awareness of flooding and flood response with their communities. Some Town and Parish Councils recruit Flood Champions or Community Flood Wardens or people with similar interests, who help to support and prepare the community for flood events. They can also assist in identifying and reporting flood risk issues and vulnerable residents.

### 5.2.2 Flood Action Groups

Flood action groups are community-based organisations that work in partnership with the Agencies and Authorities whose work involves flood risk to represent the views of local people. Through these 'grass-root' groups, communities are able to do the following.

- Address their concerns over malfunctioning assets/and other issues.
- Be in touch with what is intended for their community.
- Know procedures that are already in place regarding routine maintenance of flood risk management and drainage assets.
- Have a voice as to the future flood risk management of their community through consultation.
- Create awareness of flood risk to the wider community.
- Prepare to reduce the impact on the community should a flood event occur.

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- Initiate their own plans and actions in partnership with councils, agencies and landowners.

### 5.2.3 Residents and Businesses

Responsibility for protecting property from flooding lies in the first instance with the property owner. While in some circumstances other organisations or property owners may be liable due to neglect of their own responsibilities, there will be many occasions when flooding occurs despite all parties meeting their responsibilities.

It is important that householders whose homes are at risk of flooding take the following steps to ensure the impact to their home is reduced.

- Check whether their property is at risk from flooding from all sources.
- Sign up to the EA Flood Alert and Warning system.
- Ensure that preparations have been made in the event of a flood.
- Take measures to ensure that the impact of flooding to their property is reduced, either through permanent measures or temporary measures to their property structure. This may require planning permission to be sought, and appropriate consent received from the EA<sup>13</sup> or LLFA<sup>14</sup>.
- Where possible, take out flood insurance.

Information on areas at risk from flooding is provided on the EA's website<sup>15</sup>. Households in Flood Zones 2 and 3 can receive flood alerts from the EA when the risk of Main River or groundwater flooding is high. In some areas the EA also issue flood warnings, these are more detailed than flood alerts. Flood alert/warning information can also be found on the EA's website<sup>16</sup> and via the Flood Alerts page on Facebook<sup>17</sup>.

Information about surface water flood risk is also available on the EA's website<sup>18</sup>. The risk of flooding from surface water is much harder to map and predict. Therefore, the EA does not currently issue specific area alerts/warnings for surface water flooding. The Met Office does provide severe weather warnings that predict rainfall which may lead to surface water flooding, and these are available from their website<sup>19</sup>

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<sup>13</sup> Flood Defence Consent is required from the Environment Agency for work on or near a Main River.

<sup>14</sup> Land Drainage Consent is required from Warwickshire County Council as the Lead Local Flood Authority for work on or near an ordinary watercourse.

<sup>15</sup> <http://apps.environment-agency.gov.uk/wiyby/37837.aspx>

<sup>16</sup> <http://apps.environment-agency.gov.uk/flood/31618.aspx>

<sup>17</sup> [https://apps.facebook.com/floodalerts/?fb\\_source=search&ref=ts](https://apps.facebook.com/floodalerts/?fb_source=search&ref=ts)

<sup>18</sup> [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

<sup>19</sup> <http://www.metoffice.gov.uk/public/weather/warnings/#?tab=map&map=Warnings&zoom=5&lon=-3.50&lat=55.50&fcTime=1415318400>

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The EA provides information on what to do to prepare a household for flooding emergencies. This includes how to make a flood plan which will help residents to decide what practical actions to take before and after a flood. For more information visit the EA's website<sup>20</sup>. Another useful document for householders to refer to is the National Flood Forum's Blue Pages Directory<sup>21</sup> which provides information and advice on what products are available to help protect homes or businesses against flooding.

#### 5.2.4 Riparian Landowners

Under common law, a riparian owner is someone who has a watercourse within or adjacent to any boundary of their property. Where a watercourse is sited between two or more property boundaries each owner may be equally responsible up to the centre line of the watercourse.

Although not defined as a flood risk management authority under the Act, Riparian owners retain their own duties and responsibilities for watercourses on or adjacent to their land as set out in the Land Drainage Act 1991. This includes the responsibility for the maintenance of any river, stream, ditch, drain, cut, dyke, sluice, culvert, sewer (excluding public sewers) or any other passage through which water flows.

If riparian owners wish to undertake certain types of work on or near a watercourse, consent is required from the appropriate authority. For work on or near a Main River, Flood Defence Consent is required from the EA. While for work on or near an ordinary watercourse, Land Drainage Consent is required from WCC as the LLFA. If riparian owners wish to undertake works which will cause an obstruction to be formed, consent is required. Examples of structures that need consent are available from the Environment Agency. Regular maintenance or clearance will not require ordinary watercourse consent.

Further information on the rights and responsibilities of riparian owners is also available on the EA's website<sup>22</sup>. In addition to ensuring their responsibilities are carried out, there are opportunities to work positively with riparian landowners to address flooding issues across the county.

In some cases flood risk issues can impact on multiple landowners. In WCC's experience of flood risk management, better results are usually achieved when adjoining landowners work together, rather than against one another, to resolve a flooding issue. Beyond this, there is the option to pursue civil proceedings. Agricultural Land Tribunals have an important role in settling disputes referred to them under the Land Drainage Act 1991 (sections 28-31), such as flooding caused by blocked drainage channels or inadequately drained land. Further details are included in Appendix E.

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<sup>20</sup> <https://www.gov.uk/prepare-for-a-flood/find-out-if-youre-at-risk>

<sup>21</sup> <http://www.bluepages.org.uk/>

<sup>22</sup> <https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities>

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Network Rail is a significant landowner in Warwickshire with specific challenges where their infrastructure is affected by local flood risk. Due to the health and safety issues posed by live railways, enhanced collaboration is required to enable WCC as the LLFA to investigate flooding and manage local flood risk in the vicinity of Network Rail assets.

### 5.2.5 Developers

Developers are responsible for properly considering flood risk to ensure occupants of new developments are not put at risk and to ensure the risk of flooding is not increased elsewhere. Developers must undertake a robust assessment of the flood risk using the best available data in order to accurately characterise the risk and mitigate this risk where necessary. As the LLFA, WCC will work to address flood risk and development. WCC actively seeks new development to offer betterment with regard to flood risk to mitigate the risk they can pose (see Section 3.6.3 above).

### 5.2.6 Regional Flood and Coastal Committees

Regional Flood and Coastal Committees (RFCCs) help to provide governance for the EA's Flood and Coastal Erosion Risk Management (FCERM) functions and cover all flood risks that are not the responsibility of the water companies.

RFCCs have three main purposes as follows.

- To ensure that there are coherent plans for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines.
- To promote efficient, targeted and risk-based investment in flood and coastal erosion risk management that optimises value for money and benefits for local communities. This includes administration and allocation of Local Levy funding.
- To provide a link between the EA, LLFAs, other risk management authorities, and other relevant bodies to develop mutual understanding of flood and coastal erosion risks in its area.

### 5.2.7 National Flood Forum

The National Flood Forum (NFF) is a national charity dedicated to supporting and representing communities and individuals at risk of flooding. They do this by:

1. helping people to prepare for flooding in order to prevent it or mitigate its impacts;
2. helping people to recover their lives once they have been flooded; and
3. campaigning on behalf of flood risk communities and working with government and agencies to ensure that they develop a community perspective.

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This is achieved by working to facilitate and support community flood groups. The NFF now has over 200 affiliated groups in England and Wales, including at least 14 within Warwickshire, and they aim to:

- help communities to recover from flooding;
- provide a telephone help line for all flood related enquiries, including insurance;
- provide information and guidance through their website and regular bulletin;
- run flood surgeries and exhibitions to help people with their problems and raise awareness;
- provide training for local authorities, agencies and the voluntary sector; and
- hold a 'Blue Pages directory' of products available on the market.

The NFF works to support the recovery of victims of flooding, to improve resilience of communities to future flood threat, speaks out to highlight the plight of flood victims and the need for adequate flood prevention investment, and works with government, agencies and local authorities on issues such as flood risk insurance, property level protection and recovery to ensure that the needs of flood risk communities are represented.

Working in Warwickshire, the NFF has helped to set up and support at least 14 flood action groups across the county, working at a grass roots level with communities to raise awareness about flood risk and allow them to build relationships with professionals who work in flood risk management. Encouragement is given to communities helping themselves and as a group they are able to be the 'eyes on the ground' (for example, reporting blockages in watercourses to landowners and RMAs).

Small local flood risk management measures by local communities can help to reduce the impacts of flooding, measures such as: ensuring important documents (insurance etc.) are accessible and waterproof, cars are moved to higher ground or furniture raised etc. This will all help manage flood risk within Warwickshire in the future.

### 5.2.8 Canal and River Trust

The Canal and River Trust is a charitable trust that manages 2,000 miles of waterways in England and Wales. In Warwickshire they are responsible for management of six canals across the county; the Ashby Canal, Coventry Canal, North Stratford Canal, South Stratford Canal, Grand Union Canal and Oxford Canal. The Trust are therefore key partners in managing water in Warwickshire and their activities have the potential to influence local flood risk in the vicinity of their waterways.

### 5.2.9 Severn Rivers Trust

The Severn Rivers Trust is an independent environmental charity established to secure the preservation, protection, development and improvement of the rivers, streams, watercourses

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and water bodies in the Severn catchment, and to advance the education of the public in the management of water and the wider environment.

In Warwickshire, the Severn Rivers Trust is assisting in the delivery of flood risk management options within the Warwickshire Avon catchment. Over the past three years, the Severn Rivers Trust have been involved in a number of projects that have made a positive impact on the Warwickshire Avon catchment, including a partnership project with the Woodland Trust and EA which involved planting over 3,500 trees on five farms to help maintain bank stability, reduce sedimentation and enrichment of the river, and to make a positive impact on peak flood flows. In addition to this, the Trust is directly involved in delivering catchment sensitive farming in the Leam catchment, and is one of a small group of key deliverers for rivers and streams in the Warwickshire Biodiversity Action Plan.

#### 5.2.10 Natural England

Natural England act as the Government's advisors on the natural environment. They are an executive non-departmental public body, sponsored by DEFRA. Its statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

They achieve this by providing planning advice and wildlife licences through the planning system, as well as providing evidence to help make decisions affecting the natural environment. Therefore they are involved in advising the development for, and consenting to, the majority of flood risk management schemes.

#### 5.2.11 Warwickshire Wildlife Trust

Warwickshire Wildlife Trust is the leading local Nature Conservation charity in Warwickshire, Coventry and Solihull. They represent over 23,000 members and own or manage 64 nature reserves spanning over 800ha across the sub-region. Warwickshire Wildlife Trust aims to protect and enhance wildlife, natural habitats and geology throughout Warwickshire, Coventry and Solihull, and to encourage a greater awareness, appreciation and participation in all aspects of nature conservation and the environment. As co-host and partner in the two Catchment Partnerships in the county, they are active in enhancing the condition of waterbodies and wetlands, and are partners in the Strategic Flood forum. The Trust is working at a landscape scale with numerous partners to maintain and restore biodiversity, in particular at present in Tame Valley Wetlands Landscape in North Warwickshire, focussing on wetland restoration, and in Princethorpe Woodlands Living Landscape area, which lies between Coventry, Stretton on Dunsmore and Royal Leamington Spa.

#### 5.2.12 Forestry Commission

The Forestry Commission is the government department responsible for protecting, expanding and promoting the sustainable management of woodlands and increasing their

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value to society and the environment. They are Britain's largest land manager and have the potential to take a significant role in managing flood risk at the catchment scale.

### 5.2.13 Woodland Trust

As the UK's largest woodland conservation charity, the Woodland Trust are the leading voice for woods and trees. They work with partners to protect precious ancient woods, restore the ones that are damaged and fight for those under threat, as well as creating new native woodland with the help of communities, schools, organisations and individuals. As with the Warwickshire Wildlife Trust, the Woodland Trust are a key partner in helping to develop natural flood management in target areas and to deliver the environmental benefits of flood risk management.

### 5.2.14 Network Rail

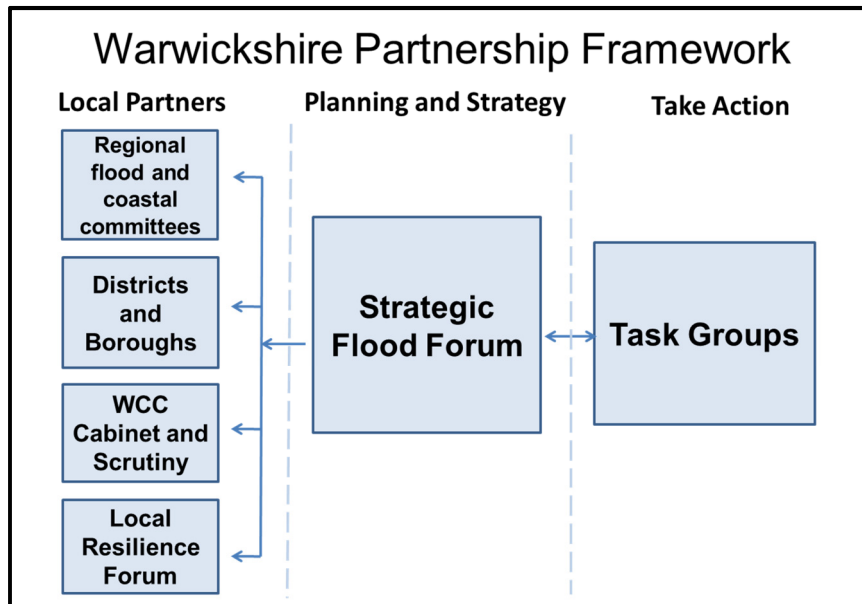
Although having no formal responsibilities for flood risk management in Warwickshire, Network Rail are a significant landowner in the county who are therefore regularly affected by the impacts of flooding. This includes railway embankments that can often act as flood defences even if they are not designed to do so, presenting barriers to water flowing across floodplains.

## 5.3 Partnerships

To enable effective management of local flood risk it is important that partnerships are established to allow those involved to work together. The main partnership forums in Warwickshire are:

- the Flood Summit with a broad range of partners including Parish, Town, District, Borough and County Councillors; and
- the quarterly county-wide Strategic Flood Forum which is discussed in more detail below.

WCC are involved in the national LLFA network where best practice is shared between flood risk management teams across the country. WCC hold specific events in Warwickshire to bring together partners to discuss and share information on local flood risk management. The partnership framework within Warwickshire is set out below in Figure 5.3.



**Figure 5.3: Warwickshire Flood Risk Partnership Framework**

### 5.3.1 Warwickshire Strategic Flood Forum

After the flooding during the summer of 2007, a Strategic Flood Forum was created within Warwickshire. The members of the forum are WCC, the five Local Authorities, the Environment Agency, Severn Trent Water, Highways England, the National Farmers Union, Warwickshire Wildlife Trust, the Canal and Rivers Trust, Coventry, Solihull & Warwickshire Resilience (CSRT), the National Flood Forum, neighbouring LLFAs and planning groups.

The Warwickshire Strategic Flood Forum (WSFF) meets on a quarterly basis and has the following aims.

- Ensure effective collaboration between Agencies and Departments (including fire and rescue).
- Review progress of Agencies and Departments in respect to the recommendations of the Pitt Review.
- Look at maintenance and drainage infrastructure improvements in the medium to long term.
- Ensure local drainage forums meet regularly with appropriate representation and to progress key projects.
- Prepare and update a list of key contact details between partners.
- Review and propose improvements to communication systems during and after emergencies.
- Help to review and influence organisational policies to ensure consistency.
- Help to explore appropriate funding sources.



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In addition to the main forum, tactical sub-groups focusing on north and south Warwickshire have been formed to allow discussion and collaboration on more localised operational issues. The WSFF's Terms of Reference are attached to this report as Appendix H.

## 5.4 Emergency Planning

CSWRT undertake the emergency planning function on behalf of WCC and sit on the Local Resilience Forum. They operate a 24/7 Duty Officer System to ensure an effective response to any incident occurring across the sub-region.

The work of the CSWRT is dictated by the Civil Contingencies Act 2004. The Act places a number of duties on Local Authorities which CSWRT carries out.

- Assessing the risk of emergencies occurring.
- Putting emergency plans in place.
- Ensuring they have robust business continuity management arrangements.
- Sharing information with other local responders to enhance co-ordination.
- Co-operating with other local responders to enhance co-ordination and efficiency.
- Providing advice and assistance to businesses and voluntary organisations about business continuity.
- Making information available to the public about civil protection matters, and maintaining arrangements to warn, inform and advise the public in the event of an emergency, working closely with the Environment Agency.

Their main role in helping to manage flood risk in Warwickshire is to develop and maintain the Warwickshire Multi-Agency Flood Plan (MAFP). This plan aims to outline appropriate multi-agency arrangements to facilitate an effective, co-ordinated response to flooding in Warwickshire. This plan is not intended to replace existing internal plans or procedures held by partner agencies. Each organisation should ensure that they have the appropriate plans in place to remain operational, deliver business as usual activity and fulfil their responsibilities as part of the multi-agency response.

The CSW Resilience Team works in partnership with other authorities and the emergency services through the Local Resilience Forum (LRF). Further information on their activities can be found on their website<sup>23</sup>.

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<sup>23</sup> <http://www.cswprepared.org.uk/home>

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#### 5.4.1 Warwickshire Local Resilience Forum

The Warwickshire Local Resilience Forum (LRF) consists of all agencies involved with emergency response. There are a range of Category 1 and 2 agencies involved in the LRF including WCC, District and Borough Councils, Police, Fire and Ambulance services, Hospital trusts, the Environment Agency, Public Health England.

The LRF is a collaboration of all statutory responders, supporting joint working, which is a key part of the Civil Contingencies Act 2004. This act requires Category 1 and 2 agencies to prepare, respond and recover from different emergencies, including flooding.

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## 6 Funding

This Strategy has set out a range of measures to help achieve its objectives. These include Lead Local Flood Authority (LLFA) processes and systems, partnership working with others, working with communities to improve their resilience to flooding and promotion of capital local flood risk management schemes. Delivery of these measures depends on sufficient funding being available, either from ongoing revenue funding or project based support for capital schemes.

The funding available for any measure will be linked to the outcomes it will provide. Measures that deliver benefits beyond flood risk management, such as enhanced ecosystems, public amenity, economic growth or cultural heritage, are likely to attract funding from alternative sources beyond those typically used to support flood risk management. Funding is therefore based on the economic viability of schemes; not all potential flood alleviation schemes will be viable and not all will achieve funding. This highlights the need to further prioritise flooding locations and potential schemes, which is the subject of the county-wide Surface Water Management Plan (Appendix C).

The following sections describe the available sources of funding that could be used to support the measures outlined in this Strategy. Warwickshire County Council (WCC) and its partners have already achieved funding for flood alleviation schemes in Warwickshire from various sources, including Local Levy, Grant in Aid, developer contributions and landowner contributions.

### 6.1.1 FCERM GiA

Defra has the national policy responsibility for Flood and Coastal Erosion Risk Management (FCERM) and provides funding through Grant in Aid (GiA) to the Environment Agency (EA), who then administers grants for capital projects; Local Authorities are one partner able to request such grants.

A different approach to funding capital maintenance and defence projects commenced in April 2012. It aimed to encourage communities to take more responsibility for the flood risk that they face, and aimed to deliver more benefit by encouraging total investment to increase beyond the levels that Defra alone can afford. The new approach sees funding levels for each scheme (provided by Defra through FCERM GiA) related directly to benefits, in terms of the number of households protected, the damages being prevented plus other scheme benefits such as environmental benefits, amenity improvement, agricultural productivity and benefits to business. Local contributions raised towards a project will help release the FCERM GiA.

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Under this system some schemes will receive complete funding, if the benefits significantly outweigh the costs, and for others partial funding would be available. Further details on how the EA allocates FCERM GiA funding are available from their website<sup>24</sup>.

### 6.1.2 Local Levy

Local Levy funding is an additional locally-raised source of income, gathered by way of a levy on Local Authorities and collected via the council tax. The levy is used to support (with the approval of the Regional Flood and Coastal Committee (RFCC)) flood risk management projects that are not considered to be national priorities and do not attract national funding through FCERM GiA. Alternatively, local levy funding can be applied to FCERM GiA projects, at the discretion of the RFCC, to meet the partnership funding requirements.

The county is covered by three RFCCs; the English Severn and Wye, the Trent and the Thames. All three RFCCs collect local levy funds from Local Authorities in Warwickshire, which are used to contribute towards locally important flood risk management schemes across their areas of responsibility.

### 6.1.3 Section 106

Under Section 106 of the Town and Country Planning Act 1990 Local Authorities can set Planning Obligations on developers. They are legally binding obligations that are attached to a piece of land and are registered as local land charges against that piece of land. These obligations enable a Local Authority to secure contributions to services, infrastructure and amenities in order to support and facilitate a proposed development.

This contribution from developers can be very specific to the issue being addressed and is negotiated separately for each development. It can be used to pay for flood defences and mitigation measures that specific developments need in order to be safe and so acceptable in planning terms.

One of the recommendations of 'Making Space for Water' was that local planning authorities should make more use of Section 106 agreements to ensure that there is a strong planning policy to manage flood risk. This means that any flood risk which is caused by, or increased by, new development should be resolved and funded by the developer. WCC are currently progressing several Section 106 agreements that include contributions towards flood risk management schemes, none have led to implemented flood risk management schemes to date.

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<sup>24</sup> <https://www.gov.uk/flood-and-coastal-defence-funding-submit-a-project>

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#### 6.1.4 Community Infrastructure Levy (CIL)

This is a locally agreed sum levied upon developers and large sums could potentially be raised over time. It is flexible in its approach as local authorities can adjust spending plans to meet priorities. Local authorities are required to use this funding for infrastructure needed to support the development. It can be used to construct new infrastructure, increase the capacity of existing infrastructure or repair failing existing infrastructure including flood defences.

In Warwickshire, CIL will be administered by the District and Borough Councils. At present none of the authorities have implemented their CIL; but they are in the process consulting on it. Use of the CIL for flood risk management will need to be balanced with the priorities for funding other infrastructure investment.

#### 6.1.5 Warwickshire County Council Contributions

Warwickshire County Council (WCC) will continue to contribute funds towards flood risk management schemes and activities. Such funding will be appropriate where schemes contribute benefits to a number of responsibilities of the WCC.

WCC has allocated an additional budget for flood alleviation, drainage and gully clearing. In the 2014/18 Budget Resolution approved by full Council in February 2014, an allocation of £1.1 million funding was made available. This is to be used for CCTV survey of drains and gullies, match-funding towards flood alleviation schemes, grants for small-scale flood alleviation works, additional resource for the LLFA team and emergency clearance of blockages on WCC owned assets. At present £320,000 is being spent on additional CCTV surveys and of jetting of drains and gullies. Parish and Town Councils and constituted groups can apply for funding in order to commission small-scale flood alleviation works to help themselves. The grants will be assigned on a priority basis to those that are likely to offer the most benefits for the sum awarded in each annual funding round. It may be possible for areas to increase their likelihood of receiving funding by bringing in their own external contributions.

#### 6.1.6 Other Local Authority Funding

The District and Borough Councils in Warwickshire may choose to contribute towards flood risk management schemes that benefit their area as part of a partnership with others. Some authorities have specific flood grant schemes as described below.

##### **Stratford District Council Flood Grants**

Stratford District Council makes £25,000 available on an annual basis for parishes in the district to apply for grants for works to provide community-wide flood risk management benefits. Other districts and boroughs in Warwickshire have shown an interest in this, and this idea could potentially be adopted more widely across the county.

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### 6.1.7 Water Framework Directive (WFD) Funding

There are some flood risk management activities which assist in meeting WFD targets. An example of this is weir removal, where the weir poses a blockage to fish migration. In such cases, it is possible to apply for 100% funding for weir removal and realise the associated flood risk management benefits. Weir removal should be preceded by an investigation into the potential impact on flood risk downstream and upstream of the weir (that there are no negative consequences) and a geomorphological study into the potential impact on sediment transport and equilibrium. It is important that the main driver for the project must be to meet the requirements of the WFD with the flood risk benefits being secondary.

### 6.1.8 Catchment Restoration Fund

This is an EA administered fund open to third sector organisations. The fund aims to restore more natural features in and around waters, and reduce the impact of small spread-out (diffuse) sources of pollution that arise from rural and urban land use.

### 6.1.9 Countryside Stewardship for woodland creation

Foresters and other land managers can apply for woodland support under Countryside Stewardship. Countryside Stewardship is funded by the European Agricultural Fund for Rural Development: Europe investing in rural areas.

Successful applicants can be paid for planting trees to create new woodland; a maximum of £6,800 per hectare was available in 2015 for planting of new woodland. This funding could contribute towards the implementation of a wider scheme for natural catchment management.

### 6.1.10 European Funding

There are a range of other potential funding sources that are available from the European Union (EU). These are usually reliant on the project meeting certain prescribed objectives and delivering specific benefits. More detail on the individual funding sources is given below.

#### **INTERREG**

These are a collection of funds aimed at promoting inter-region co-operation across the EU. These funds focus on delivering the Gothenburg and Lisbon agendas through high quality projects in innovation, the environment, accessibility and sustainable and competitive communities.

#### **European Fisheries Fund**

Primarily aimed at supporting the fishing industry, but will fund actions to protect and develop fish habitats under Axis 3 (funding for developments that will benefit groups, such as those working in the fishing industry).

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### 6.1.11 Private Funding Sources

Landowners Farmers, Natural England and other relevant agencies in some circumstances may be willing to contribute funds to flood risk management where they can see a direct benefit to reducing their flood risk or improving their land drainage.

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## 7 Next Steps

### 7.1 Development of the Strategy

The Strategy is based on the best available data at the time of writing. As new information and data becomes available it will be updated as necessary to ensure it remains relevant. The Strategy will be supplemented by the preparation of the Surface Water Management Plan (SWMP) for Warwickshire and by Warwickshire County Council (WCC). The Strategy and SWMP will be used to influence the preparation of Local plans, and the plans and strategies of other bodies.

### 7.2 Monitoring

WCC will monitor the progress of the Strategy against its aims and objectives on an annual basis. The annual Flood Summit will provide an opportunity for partners to input into this process. WCC is seeking to establish a Peer Review for the Strategy, and it has the capacity to review all strategies and plans regularly through, for example, Overview and Scrutiny panels.

### 7.3 Review of the Strategy

To ensure that the Strategy remains relevant and fit for purpose, it will remain a live document with ongoing monitoring by officers along with a full review every five years, or sooner subject to the occurrence of one of the following triggers:

- significant flood events that alter our understanding of flood risk in Warwickshire;
- significant policy changes that affect the role of Flood Risk Management Authorities;
- publication of significant new flood risk information and mapping.



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# Appendices



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## Appendix A – Glossary



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## Appendix B - Relevant Legislation and Policy



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# Appendix C - Warwickshire Surface Water Management Plan





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# Appendix D - Local Flood Risk Management Strategy Action Plan



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# Appendix E – Warwickshire County Council Flood Investigation Policy



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# Appendix F - Warwickshire County Council Sandbag Policy



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# Appendix G – Warwickshire County Council Draft Planning Advice





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# Appendix H – Warwickshire Strategic Flood Forum Terms of Reference

