

# Local Flood Risk Management Strategy

# LOCAL FLOOD RISK

This document has been prepared so that West Sussex County Council meets its duties to manage local flood risk and deliver the requirements of the Flood and Water Management Act 2010

## Incident Reporting

To report an emergency please dial **999**.

To report flooding from rivers or the sea please contact the Environment Agency Floodline on **0845 988 1188**.

To report surface water flooding or flooding of roads please call the contact centre of West Sussex County Council on **01243 642105**.

To help during an emergency, contact your Parish or Town Council to see what actions are underway.

**Contact details are on West Sussex County Council website.**

## PARTNERS OF THE WEST SUSSEX LOCAL FLOOD RISK MANAGEMENT STRATEGY



## Document information

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## Foreword (Draft)

I am pleased to introduce the 2013 – 2018 West Sussex Local Flood Risk Management Strategy. The flooding experienced in West Sussex in 2012 highlighted many of the planning and emergency response challenges we face. The unprecedented rainfall, over 10cm in 24 hours, further underlined the need for responsibilities to be identified and tightened up.

It is currently surface water flooding that causes the most regular impact to communities across West Sussex. Flooding from rivers and the sea occurs less frequently, but still presents a great impact when it does. Although the focus in this strategy is on surface water and other local flooding, we have included all flooding sources to consider the whole picture.

To manage the impacts of flooding we will invest in flood risk projects and maintenance, we will fully support the planning process and promote water sensitive urban design, and we will do all we can to make those riparian owners with responsibilities aware of their own duties with respect to maintenance.

This is the first Local Flood Risk Management Strategy for the County since we received new flood management duties and powers under the Flood and Water Management Act 2010. It sets out how we as a Lead Local Flood Authority will work alongside other risk management authorities to deliver improvements together. It represents a positive step forward for West Sussex County Council and our partners because it will allow us to prioritise and invest money in flood risk for local benefit.

Some of the immediate questions that this strategy answers are; who is the responsible authority? What is the risk? Where do you invest? What should we do next?

There are tough challenges ahead because we cannot do everything. We cannot undertake every flood reduction project which may come out of this strategy, but it is important to have risk and projects highlighted so when we can progress them is in a prioritised and sensible way. By answering these questions the strategy enables West Sussex County Council as Lead Local Flood Authority to deliver the new responsibility of local flood risk management with our partners.

This strategy identifies the actions that we need to take over the coming years to bring about a better, more sustainable approach that works with nature. It provides direction on what activities we should be undertaking and what the strategic local objectives are. It helps us to plan for the likely impacts of climate change and further development across the county. We look forward to using the strategy to help us target our efforts, use our precious resources in a better way, and reduce flood risk to the residents of West Sussex.

**Louise Goldsmith**

**West Sussex County Council Leader**

## Contents

|                              |           |
|------------------------------|-----------|
| <b>Executive Summary</b>     | <b>8</b>  |
| <b>Glossary and Acronyms</b> | <b>13</b> |

### Chapter 1 – West Sussex Flood Risk

|  |           |
|--|-----------|
| <b>What is flood risk?</b>   | <b>17</b> |
| <b>What is the likelihood of this happening and what does this mean?</b> | <b>17</b> |
| <b>What is the flood risk in the County?</b>                             | <b>18</b> |
| Historic flood events and properties at risk                             | 18        |
| Surface water flooding   | 23        |
| Groundwater flooding   | 23        |
| Main river flooding  | 24        |
| Ordinary watercourse flooding  | 24        |
| Coastal and tidal flooding   | 25        |
| Reservoir flooding   | 25        |
| Sewer flooding   | 26        |
| <b>The wet spots - areas susceptible to flooding</b>                     | <b>27</b> |
| <b>What are the priority areas at risk?</b>                              | <b>34</b> |
| Adur District  | 35        |
| Arun District  | 35        |
| Chichester District  | 36        |
| Crawley Borough  | 36        |
| Horsham District   | 37        |
| Mid Sussex District  | 37        |
| Worthing Borough   | 38        |

### Chapter 2 - Roles and Responsibilities

|   |           |
|---|-----------|
| <b>Background and National Context</b>          | <b>39</b> |
| <b>Local Context</b>                            | <b>42</b> |
| <b>Flood risk management responsibilities</b>   | <b>43</b> |
| West Sussex County Council                      | 44        |
| West Sussex Highways Authority                  | 45        |
| Environment Agency                              | 45        |
| Internal Drainage Boards                        | 46        |
| Southern and Thames Water                       | 46        |
| District and Boroughs - Second Tier Authorities | 47        |

|  |           |
|--|-----------|
| Highway Authority  | 47        |
| Other Stakeholders   | 48        |
| Utility and infrastructure providers                                       | 48        |
| Riparian owners  | 48        |
| Parish and Town Councils   | 49        |
| Property owners and residents  | 49        |
| <b>Responsibilities under the Flood and Water Management Act 2010</b>      | <b>50</b> |
| Strategic leadership   | 50        |
| Permissive powers to reduce surface water and groundwater flooding         | 50        |
| Requesting information   | 50        |
| Duty to investigate flooding   | 50        |
| West Sussex flood asset register   | 51        |
| Power to designate structures  | 51        |
| Sustainable drainage systems approving body                                | 52        |
| Ordinary watercourse consenting  | 52        |
| Enforcement  | 53        |
| Sustainable development  | 53        |
| <b>Responsibilities outside of the Flood and Water Management Act 2010</b> | <b>54</b> |
| Actions as a result of the June 2012 flooding in West Sussex               | 54        |
| Requirements under the EU Flood Directive : Flood Risk Regs 2009           | 54        |
| Planning   | 54        |
| Response, rescue and recovery  | 55        |
| The Water Framework Directive  | 56        |
| Partnership working  | 57        |
| The community and public involvement                                       | 59        |
| Flood Action Groups  | 59        |
| Parish and Town Councils   | 60        |
| West Sussex Community and Economic Development Teams                       | 60        |

## Chapter 3 – Objectives and Action Plan

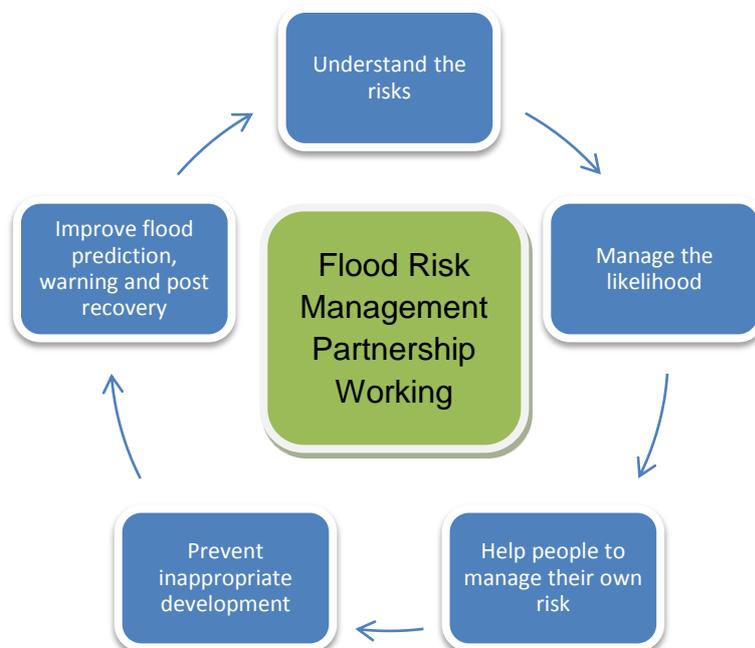
|   |           |
|---|-----------|
| <b>Objectives</b>                               | <b>61</b> |
| <b>Funding Flood Risk Management Activities</b> | <b>63</b> |
| <b>The Work Programme</b>                       | <b>65</b> |
| <b>What is being done in my area?</b>           | <b>66</b> |
| <b>Environmental Assessment of the Strategy</b> | <b>66</b> |
| <b>The Action Plan</b>                          | <b>67</b> |
| <b>Next Steps</b>                               | <b>71</b> |

|   |           |
|---|-----------|
| Appendix A  |           |
| <b>The Strategy Partners</b>  | <b>73</b> |
| Appendix B  |           |
| <b>The Wet Spot Maps (available as a separate document)</b>   | <b>74</b> |
| Appendix C  |           |
| <b>Legislation relevant to the Local Flood Risk Management Strategy</b>   | <b>75</b> |
| Appendix D  |           |
| <b>The West Sussex Work Programme (available as a separate document)</b>  | <b>76</b> |
| Appendix E  |           |
| <b>Sources of Funding for Flood Risk Management</b>   | <b>77</b> |
| Appendix F  |           |
| <b>The Strategy Action Plan</b>   | <b>82</b> |
| Figures   |           |
| Figure 1 : Properties at risk in the county by flooding source  | 19        |
| Figure 2 : The West Sussex County Council Surface Water Flood Map   | 21        |
| Figure 3 : The West Sussex County Council River and Sea Flood Map   | 22        |
| Figure 4 : The West Sussex County Council Wet Spot Flood Map  | 29        |
| Figure 5 : The Appendix B Wet Spot flood map information  | 30        |
| Figure 6 : The West Sussex Wet Spot areas and number of residential and business properties susceptible to flood risk by flood source | 31        |
| Figure 7 : Properties at risk Nationally by flooding source   | 39        |
| Figure 8 : Who overseea which type of flooding?   | 42        |
| Figure 9 : Who manages what within West Sussex?   | 43        |
| Figure 10 : Partnership groups and governance within West Sussex  | 57        |
| Figure 11 : The funding avenues available for flood risk management works   | 64        |
| Figure 12 - Levels of changes to the strategy during its lifetime 2013-18   | 72        |

This local flood risk management strategy (2013 – 2018) sets out how West Sussex County Council carries out its flood risk responsibilities that are a statutory requirement of the Flood and Water Management Act 2010. Following the 2007 floods and the independent Pitt Report, the Act transposed local flood risk leadership into UK law. As part of this fundamental change in flood risk management responsibilities, West Sussex County Council have become a Lead Local Flood Authority and are required to produce a strategy to define how local flood risk will be managed within the county.

Working in partnership is integral to the local flood risk management strategy. Regular communications between all risk management authorities are central to this partnership approach. To embrace this, all types of flooding are considered within this strategy so that the complete flood story can be told. The work of neighbouring Lead Local Flood Authorities and other risk management authority partners is taken into account so that our management of flooding risk can be joined up, and not be restricted by our administrative borders.

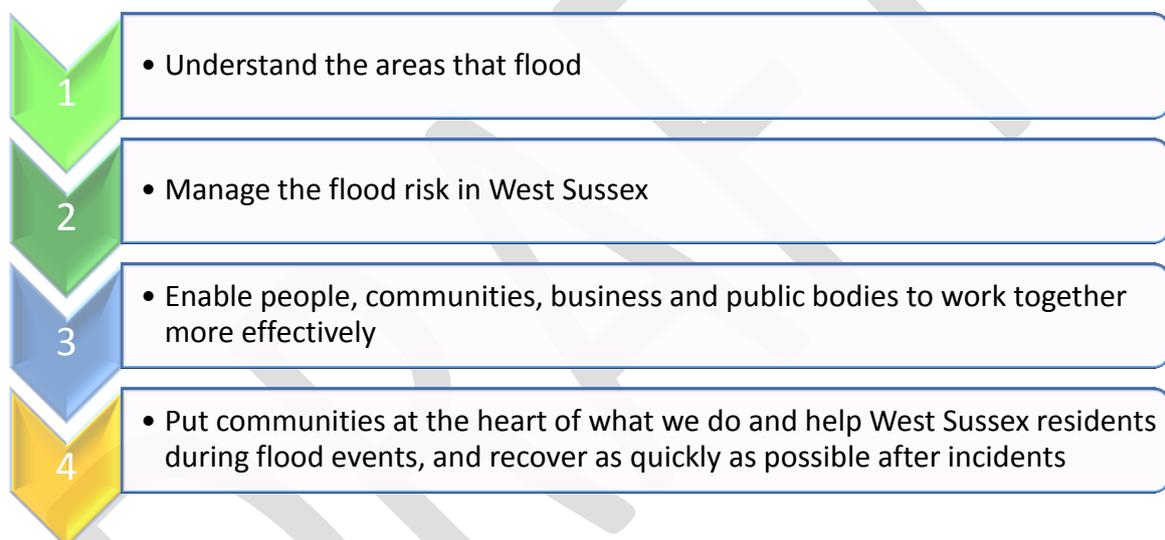
The structure and contents of this strategy are directly informed by the Environment Agency's National Strategy and the guiding principles of the Local Government Association Framework 'Living Document' (2<sup>nd</sup> Edition November 2011). The Environment Agency's National Strategy objective is to take forward a risk based approach to flood risk management.



The overall aim is to ensure the risk from flooding and erosion is properly managed by using the full range of options in a coordinated way. To do this, local authorities, communities, individuals and voluntary groups need to work together to:

1. Manage the risk to people and their property;
2. Achieve environmental, social and economic benefits, consistent with the principles of sustainable development;
3. Facilitate decision-making and action at the appropriate level – individual, community, or local authority, river catchment, coastal cell or national.

Using the approach set out in the National Strategy (shown on page 8), the Government will work with organisations, communities and individuals. To reflect the Government’s strategic objectives in the local context, the partners in West Sussex have agreed objectives to guide local focus and progress. These are to:



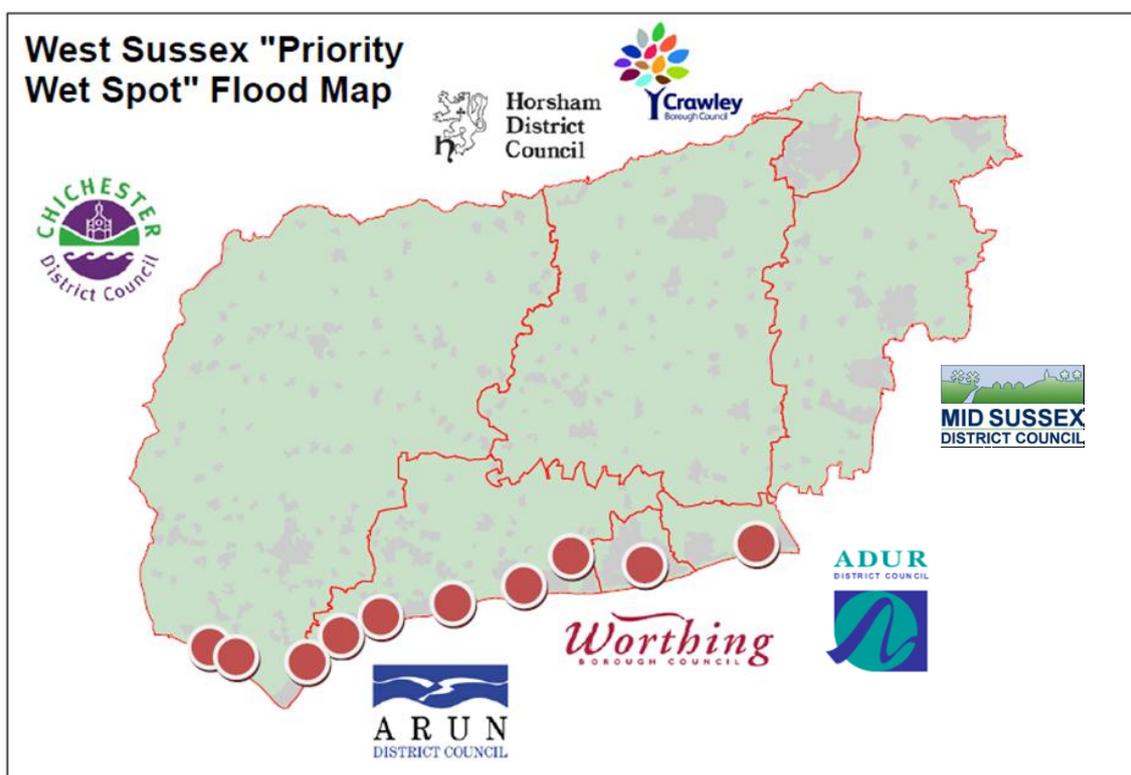
The local flood risk management strategy summarises flood risk knowledge. Historical, current and future flood risk in West Sussex has been well documented in partnership flood risk plans - Catchment Flood Management Plans and Shoreline Management Plans. The River Basin Management Plans required under the Water Framework Directive, links flood risk to the strategy for water quality. Other strategy level documents such as surface water management plans, tidal, coastal and river strategies provide further detail needed to define risk and chose options for improvement work. Our understanding of flood risk and what we need to do about it is drawn from these plans and strategies and this knowledge provides the basis for the ongoing programme of works identified by this strategy.

Around 76,600 residential properties and 20,100 business properties were identified as being susceptible to surface water flooding from a 1 in 200 year event (WSCC PFRA 2011). 15,000 residential properties and 3,000 businesses are within areas at risk from rivers or sea flooding (Environment Agency Nafra 2008/09, counting moderate and significant risk). 5,500 of these residential and business properties fall within both sets of mapping and are

susceptible to either source of flooding. Overall around 109,000 properties are judged to be at risk using the best information available at the time of writing.

Analysis of flood risk in this strategy has identified 53 'wet spots' in West Sussex. These are areas that have an increased risk of flooding compared to the rest of the county. The concentrated clusters of properties that are in flood risk areas have been identified so that this data can inform our activities, decision making and investment. This strategy brings together the outstanding actions and projects from previous reports and analysis, and informs the future work programmes agreed by the risk management authorities. The programmes enable future investment to be managed in a prioritised and organised way. There will not be the resource to design, build and maintain every option, but when funding is available, the appropriate authorities can act and reduce flood risk by carrying out the most cost effective works.

From our analysis, previously identified projects and from knowledge of historic flooding, West Sussex County Council has identified ten areas where risk management authorities will initially prioritise work. This does not guarantee work will be implemented in these locations. These are higher priority areas where risk management authorities believe the risk warrants further investigation and where improvement work will achieve the most benefit for the resources put in. Work will not be undertaken exclusively in these areas and improvement works will continue in other locations across West Sussex. These higher priority wet spot locations are subject to change as further investigation work is carried out and projects are completed. The priority areas are: Angmering, Barnham & Walberton, Bognor Regis, Earnley and Bracklesham, East Wittering, Middleton & Elmer, Pagham & Nyetimber, Littlehampton, Shoreham & Lancing, Worthing.



Since 2010 flood risk in West Sussex has been managed jointly between a number of risk management authorities that include West Sussex County Council, the District and Borough Councils, the Environment Agency, Internal Drainage Boards, the Highways Agency, Thames Water and Southern Water. This strategy explains the role that each of these organisations play. To ensure flooding is managed in an integrated way across these organisations, the strategy is inclusive and considers all functions and sources of flooding. The intention of this is to recognise where flood risk responsibilities coincide, and where partnership working and jointly funded projects could be undertaken.

As resources are limited, and in line with the new government funding policy, risk management authorities are actively looking to draw in funds from beneficiaries to boost the likelihood of projects going ahead. This is a challenging task as commercial or private contributions will not be available everywhere. The strategy has been reviewed by, and is supported by each risk management authority in the county.

West Sussex County Council as Lead Local Flood Authority are required to set out how it will deliver local flood risk management under the Flood and Water Management Act. Strategic flood risk assessments, sustainable drainage systems approval, and ordinary watercourse consents each play their part in managing development and local flood risk. The strategy explains how West Sussex County Council will perform these duties.

The strategy fully supports the existing planning processes set out in the National Planning Policy Framework to ensure development is directed away from areas at flood risk. However, recognising the development pressures within West Sussex, where proposals are within the flood plain or in an area susceptible to surface water flooding, the strategy provides further evidence and information to ensure that the development is safe. All new development near areas of flood risk needs to be appropriate, and requires building design and drainage to be scrutinised to ensure risk is managed acceptably. New development should not be granted permission if the proposals will increase flood risk to others. The planning process, operated by District and Borough Councils, the South Downs National Park Authority and West Sussex County Council, remains vital in securing a sustainable future for the residents of West Sussex.

The risk management authorities recognise the importance of forward planning, response and recovery. The June 2012 flooding events tested the resilience of all the emergency responders during one of the wettest periods on record. The local flood risk management strategy supports the recommendations of the investigation into the summer 2012 flooding, and the associated improvements to planning, warning and recovery. The Flood Report on the June 2012 Flood Event is available on the West Sussex County Council website.

Prior to 2010 and the Flood and Water Management Act there were gaps in flood management responsibility. Stronger accountability now exists, and those responsible authorities are required to cooperate and share information. The strategy provides the tools to allow joint progress. Tough decisions will need to be taken on priorities because there are

not sufficient funds to reduce the likelihood of flooding to every property, but with the correct accountability and actions outlined in this strategy, it will be possible to reduce the impact overall. Some of the actions resulting from this strategy will involve improved flood awareness, flood warning systems, community resilience and self-help for those areas, such as rural or isolated properties, where funding for reduction in flood frequency is unlikely in the short term. The strategy also highlights the role of private landowners in maintaining watercourses on their own land to reduce flood risk to themselves and to communities overall.

It is the principal aim of this strategy to oversee the direct reduction in flood risk for residents. This aim will be met by the projects that are taken forward in future work programmes, and by the actions set out in the action plan. The associated work programme (published separately) is an evolving list of flood risk management projects and will be updated regularly. Investigations, new information, changing budgets and contributions, and subsequent flood events will alter what happens over the lifetime of the strategy, and minor changes may be made to the documents including the flood maps. Regular reviews of progress against the action plan will be conducted so that we can monitor the flood risk situation and adjust priorities as necessary.

The strategy covers the period 2013-2018 and so will be fully updated in five years. Any variations during this period will be updated according to the review process (set out in Chapter 3 – next steps, page 71).

## Glossary and Acronyms

| Term / Acronym  | Definition   |
|---|--|
| Category 1 responder  | Those Category 1 responders are organisations at the core of the response to most emergencies (the emergency services, Environment Agency, local authorities, NHS bodies). Category 1 responders are subject to the full set of civil protection duties.   |
| CFMP  | Catchment Flood Management Plans (CFMPs) give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years.   |
| CLG Department for Communities and Local Government               | CLG was established in May 2006 (replacing the Office of the Deputy Prime Minister) and is responsible for building regulations, community cohesion, decentralisation, fire services and resilience, housing, local government, planning, race equality & urban regeneration. The Department works to move decision making power from central Government to local councils, helping put communities in charge of planning, increasing accountability, and enabling citizens to see how their money is being spent. |
| Cluster   | A group or concentration of properties that may be affected by flooding. These properties are considered to be at risk of having internal damage from flooding.  |
| Coastal Groups  | Coastal Groups comprise of all the key partners in coastal management – principally the coastal managers from maritime Local Authorities, Ports Authorities and the Environment Agency.  |
| Culvert   | A culvert is a watercourse that has been enclosed in a structure such as a pipe.   |
| Combined Sewer  | A separate underground pipe system designed specifically for transporting sewage, excess rain and surface water from houses, commercial buildings and roads for treatment or disposal.   |
| Defra   | Department for Environment, Food and Rural Affairs.  |
| District and Boroughs   | The second tier authorities. There are 326 district/borough level subdivisions in England, of which seven are in West Sussex County. This level runs services such as planning, waste and council housing.   |
| Flood and Coastal Erosion Risk Management Grant in Aid (FCERMGiA) | Flood and Coastal Erosion Risk Management Grant in Aid is the central funding pot of Defra (The Department of Food and Rural Affairs) that is spent each year on flood risk reduction measures.  |
| Flood Map   | The Flood Map is a multi-layered map which provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences. The flood zones do not take into account flood defences.   |
| Flood Risk Asset  | A flood risk asset is a built structure, embankment or natural feature that acts to reduce flood risk to an area. Each asset varies in terms of its type, condition, length, and maintenance.  |
| Fluvial flooding (River flooding)                                 | Flooding resulting from water levels exceeding the bank level of a river or stream.  |

|                                       |   |
|---------------------------------------|---|
| Flood and Water management Act (FWMA) | Flood and Water Management Act 2010. The FWMA implements the recommendations from Sir Michel Pitt's Review of the floods in 2007 and places a series of responsibilities on the council. The main aim of the Act is to improve flood risk management.   |
| Green Infrastructure (GI)             | Green Infrastructure (GI) refers to a strategically planned and managed network of green spaces and other environmental features vital to the sustainability of an area. It is defined as <i>'network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities'</i>  |
| Groundwater flooding                  | Flooding that occurs when water levels in the ground rise above surface levels. Most likely to occur in areas underlain by permeable geology.   |
| Internal Drainage Boards (IDBs)       | An Internal Drainage Board is a public body that has been established under statute in areas of special drainage need. An IDB holds permissive powers to undertake work to deal with matters affecting water levels, land drainage and flood risk within a defined boundary.  |
| Lead Local Flood Authority (LLFA)     | Lead Local Flood Authority – Local Authority (upper or unitary council) responsible for taking the lead on local flood risk management. In this area it is West Sussex County Council.  |
| 'Local' flood risk                    | Local flood risk is defined as flooding from surface water, groundwater and ordinary watercourses. If other sources of flood risk (river or sea risk for example) interact with local sources it is common for everything to be considered together. This Strategy considers all types of flooding.   |
| Local Levy                            | Local levy is a funding pot governed by the Southern Regional Flood and Coastal Committees for flood alleviation schemes.   |
| Local Resilience Forum (LRF)          | LRFs are multi agency partnerships made up of representatives from local public services, including the emergency services. These agencies are known as category 1 responders, as defined under the Civil Contingencies Act.  |
| Main river                            | The Environment Agency is the lead authority on main rivers. Main rivers are a Defra statutory designation and are identified on the Environment Agency's 'Main River Map'. The Environment Agency has permissive powers to carry out work on main rivers.  |
| NAFRA (flood map) Environment Agency  | The NaFRA includes flooding from all rivers with a catchment size greater than 3 km <sup>2</sup> , and all flooding from the sea (both along the open coast and tidal estuaries). Smaller rivers are included in the assessment where they fall within the area that could be affected by an extreme flood (0.1% chance in any year). It does not include other forms of flooding such as from highway drains, sewers, overland flow or rising groundwater. The assessment takes into account the type, location and condition of flood defences. |
| National Strategy                     | The Flood and Water Management Act 2010 required the Environment Agency to develop, maintain and apply a strategy, describing what needs to be done by all authorities involved.  |
| Non-public (private) sewer            | A sewer owned by a person or company that is not Water Company owned.   |

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| Ordinary Watercourse                      | The Lead Local Flood Authority is the lead authority on ordinary watercourses, they have permissive powers to carry out flood defence works. All watercourses that are not designated Main River are considered to be ordinary watercourses and are the responsibility of landowners. Note, ordinary watercourse does not imply a “small” river, although it is often the case that Ordinary Watercourses are smaller than Main Rivers. District and Borough councils carry out a consenting role as part of a delegated arrangement with WSCC. |
| Partnership                               | The term partnership is used to refer to joint work and joint leadership of investigation or implementation work undertaken by the risk management authorities. The risk management authorities are members of a West Sussex Flood Group and Flood Board, both of which discuss projects and the work programme.  |
| Preliminary Flood Risk Assessment. (PFRA) | The PFRA provides a high-level summary of significant flood risk, based on available information, describing both the probability and consequences of past and future flooding. A PFRA must consider flooding from surface runoff, groundwater and ordinary watercourses, and any interaction these sources may have with main rivers.  |
| Permissive Powers                         | These are powers set out by legislation to enable risk management authorities to carry out works where it deems necessary and appropriate. There is no legal duty which means that the authorities have to carry out works.   |
| Pitt Review                               | Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England.   |
| Property level protection (PLP)           | PLP is a term used to refer to resistance measures that slow down or stop the ingress of water to a property. Examples include door-boards, airbrick covers and non-return valves.  |
| Riparian Owner                            | If you own land or property next to a watercourse i.e. a river, stream, culvert or ditch (that is not owned by others), then you are a ‘riparian landowner’ and have riparian rights and responsibilities.  |
| Risk                                      | In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring, and the consequence of the flood.   |
| Risk management authorities               | All authorities with duties or powers to carry out work on the drainage network, as described in the Flood and Water Management Act 2010.   |
| Sewer flooding                            | Flooding caused by a blockage or overflow in a sewer or urban drainage system.  |
| South East Seven (SE7)                    | A working group of seven Local Authorities with common interests that includes Kent, East Sussex, West Sussex, Hampshire, Medway, Surrey, Brighton & Hove.  |
| RFCC                                      | Southern Regional Flood and Coastal Committee (RFCC) and Thames Regional Flood and Coastal Committee are groups of elected members responsible for scrutinising and signing off the work programme.   |
| SMP                                       | Shoreline Management Plans (SMPs) provide a long-term framework for dealing with coastal flooding and erosion over a large area. SMPs take into account risks to people and the developed, historic and natural environment. They also take climate change into account in planning long-term coastal management.   |

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|---|--|
| SuDS  | Sustainable Drainage Systems. A drainage system designed to control surface water runoff close to where it falls and mimic natural drainage as closely as possible.  |
| Surface Water                                     | Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.  |
| Surface Water Management Plan (SWMP)              | Surface water management plans are projects to investigate local flooding issues such as flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches.  |
| The council                                       | West Sussex County Council (unless stated otherwise)   |
| 'The strategy'                                    | This document, the Local Flood Risk Management Strategy for West Sussex (2013 – 2018)  |
| Watershed funding, Operation Watershed            | Operation Watershed is an £8.25 million commitment to invest in highway drainage and environmental improvements in areas of the county worst affected by floods.   |
| West Sussex Strategic Flood Risk Management Board | Made up of senior officers from WSCC, all Borough and Districts Councils, EA and Southern Water. The group's role is to take a strategic overview of the entirety of flood risk and drainage management across West Sussex.  |
| West Sussex Flood Risk Management Group           | The group comprises WSCC, the EA (Southern & Thames), Southern Water Services the seven Borough and District Councils within West Sussex. Its role is to plan and act to reduce the risk and consequence of flooding now and in the future in West Sussex.   |
| Wet Spots   | Strategy has focused on cluster areas of properties at risk. These are identified by the latest flood mapping and are referred at as 'wet spots'   |
| WSUD Water Sensitive Urban Design                 | Water-sensitive urban design (WSUD) is a land planning and engineering design approach which integrates the urban water cycle, including storm water, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal. |

# Chapter 1 - West Sussex Flood Risk

## What is flood risk?

Flooding is a hazard as it has the potential to cause harm to human health and life, and effect the natural and built environment.

The term 'risk' acknowledges the actual harm caused and is different to a hazard.

Flood Risk is a combination of the probability/likelihood of a flood event occurring and the severity of its impacts:



Flooding is only a risk when the flood water affects people, property, agricultural land or another 'receptor'. The 'source' of the flooding could be groundwater, surface water, from sewers, rivers or the sea. The route or path the flood waters take is known as the pathway.



Risk captures the severity of, or related consequences produced by, a flood event. Impacts can be social, economic and environmental, for example the number of properties flooded and the level of associated economic damages. The consequences of a flood depend on the level of exposure and the vulnerability of those people or places affected.

## What is the likelihood of flooding happening and what does this mean?

Flood risk is often measured by a percentage probability or by stating how regularly it will occur. The industry refers to 1% annual probability floods, or 1 in 100 year floods, for example. This does not mean that they only happen every 100 years. In betting terms the odds of such an event happening would be 100/1 in any year. Therefore, we may see

two within a year, but then not for another 250 years. We may also experience any number of smaller flood events between the larger events.

To explain this information in another way the Bognor Regis rainfall event in June 2012 saw over 10cm of rain fall in 24 hours. This area may see an average of 60cm annually. In Bognor Regis this downpour equated to a 1 in 200 year rainfall event. In other words, the event had a 0.5 % annual probability event, or, had the betting odds of 200/1. Clearly, it was a very rare rainfall event. These rainfall events can consist of torrential rain over a short period of time, or, prolonged showers over a longer period. The important factors are the amount of rain that has fallen, and over how much time.

Rainfall rates can vary greatly from one town to another. In 2012 Bognor Regis recorded over 10cm in 24 hours, whereas inland at Itchingfield and Haywards Heath the totals were much less. It is important to interpret the flood risk maps with this in mind, because they model a uniform 'Bognor Regis 2012' rainfall event occurring everywhere in the county at the same time. This is necessary to see where we might experience the biggest problems, which then informs our work programme. In reality it is more likely we will see certain towns flooded as predicted on the flood maps, and others that received less rainfall, to a much lesser extent.

Drainage systems and flood defences are designed to protect against a certain magnitude event occurring. Most surface water drains and sewers are designed to cope with a 1 in 30 year event, whilst river and tidal defences are generally built to protect against a 1 in 100 year or 1 in 200 year event respectively. The dilemma in flood risk management is how much do you over engineer your design to account for very rare events. This is one of the cost benefit choices that risk management authorities make.

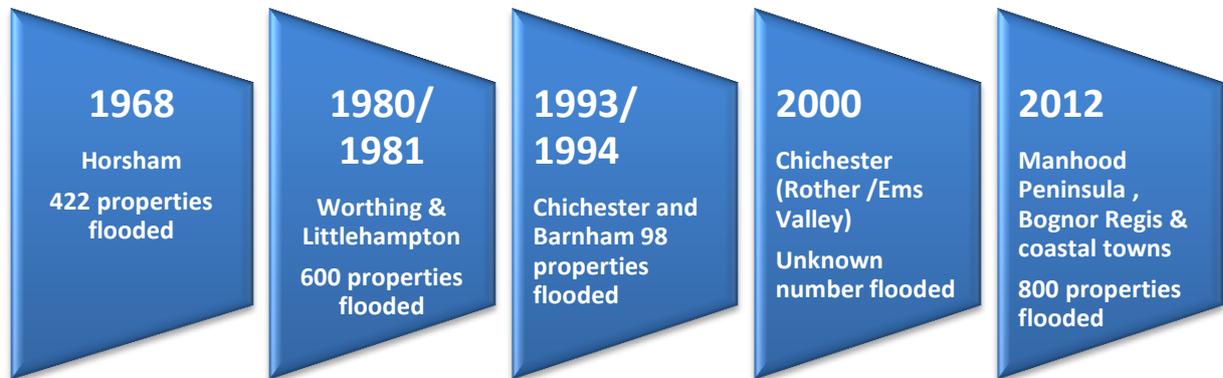


## What is the flood risk within the County?

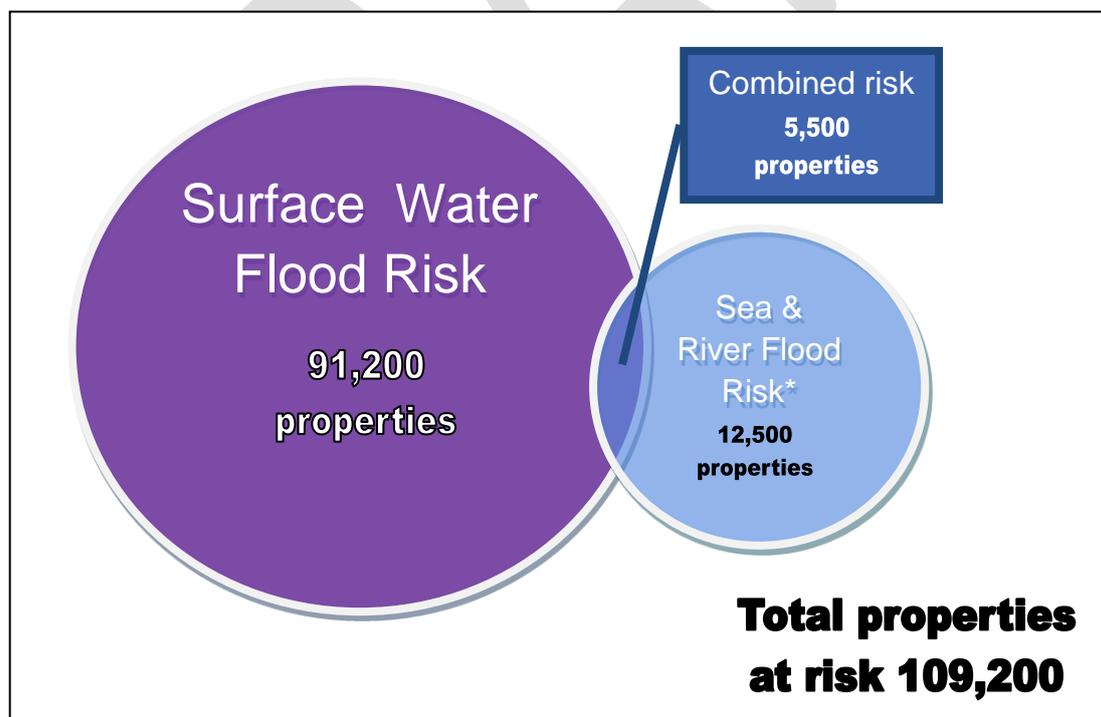
### Historic flood events and properties at risk

West Sussex has a history of fluvial, coastal, surface water and groundwater flooding. There are records that extend back hundreds of years shown in previous research from our archives, provided by the fire brigade, media, academic papers, and the British Hydrological Survey. Often it is difficult to compare different events because the towns and rivers have been modified over time, and statistical information can be incomplete. The historic flood events that have occurred since 1968, and caused approximately 100 properties or more to flood, are shown in the diagram below. Hundreds of other smaller flood events have been recorded across the county from a range of flood risk sources. Some events affected properties, others just roads, and in some instances the information does not specify.

Flooding occurs within West Sussex at many locations. To identify these areas in the county, existing plans and flood risk mapping have been reviewed.



The property counts in Figure 1 are derived from the West Sussex Preliminary Flood Risk Assessment (PRFA 2011) and latest flood risk mapping from the Environment Agency (the National Flood Risk Assessment - Nafra 2008/09). These are described on page 27. Both data sets will be updated in late 2013, and any variations in property risk numbers included in the next review of the strategy.



**Figure 1: Properties at risk in the county by flooding source** (these figures includes flats above ground floor level that would be indirectly affected, \*counting properties and businesses at moderate and significant sea and river flood risk)

76,600 residential properties and 20,100 businesses were identified as being within susceptible surface water flood risk areas in the PFRA. 15,000 residential properties and 3,000 businesses are within areas at risk from rivers or sea flooding (Environment Agency Nafra 2008/09, counting moderate and significant risk). 5,500 of these residential and business properties fall within both sets of mapping and are susceptible to either source of flooding.

This best available mapping indicates that over 100,000 properties are in areas susceptible to flood risk within the county. The flood risk in West Sussex can be attributed to the sea, rivers, watercourses, ditches, rife, sewers (foul water, surface water and combined), groundwater and from surface water. Irrespective of the source of the water, the result and impact on a property or on a community is still the same. Flood damage is expensive and can take many months to repair.

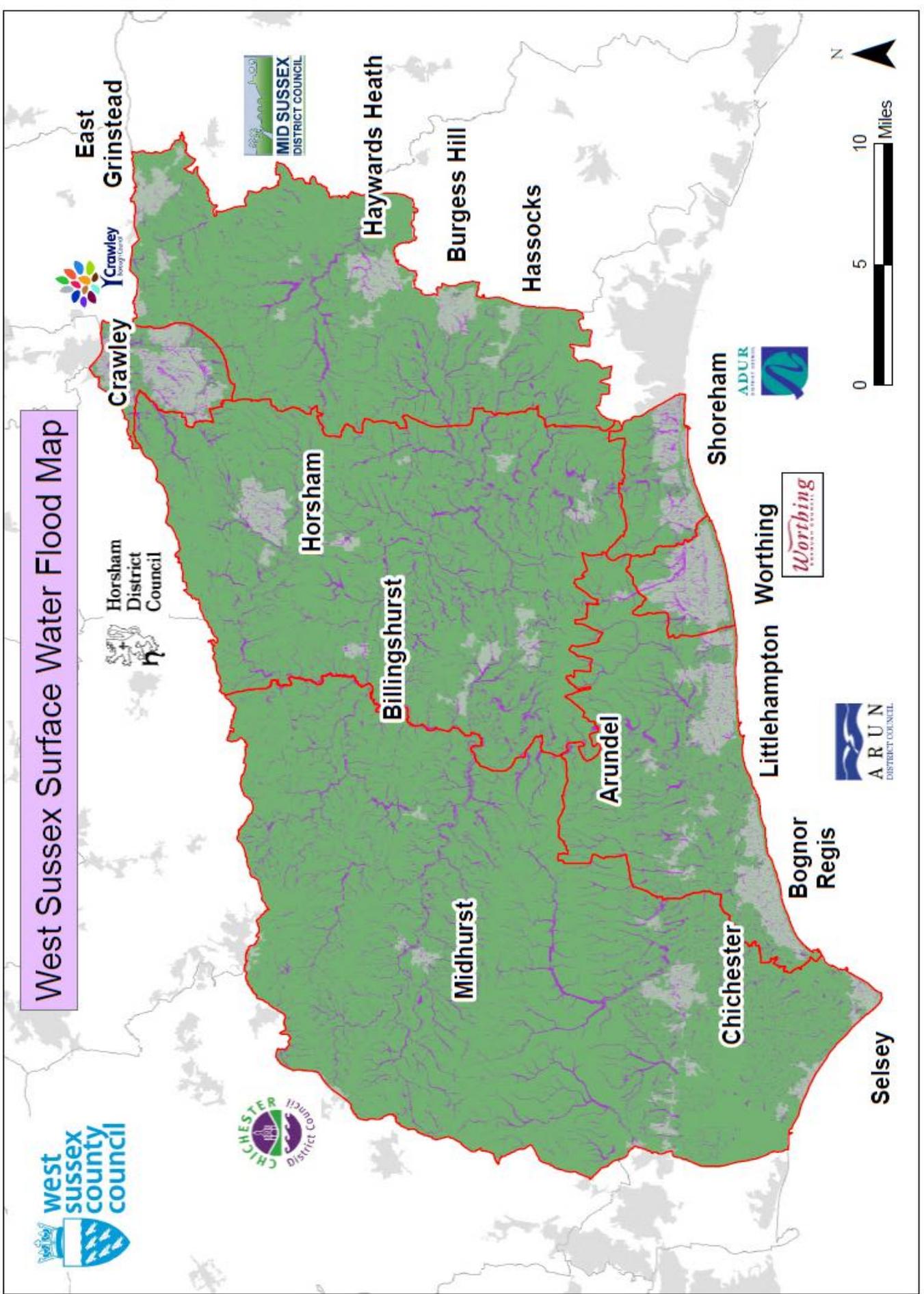
For those responsible for managing flood risk, the source of flooding is very important in order to understand what potential solutions may be. To manage flood risk an assessment should identify the source of the water so that options for management and a solution, if appropriate and feasible, can be considered.

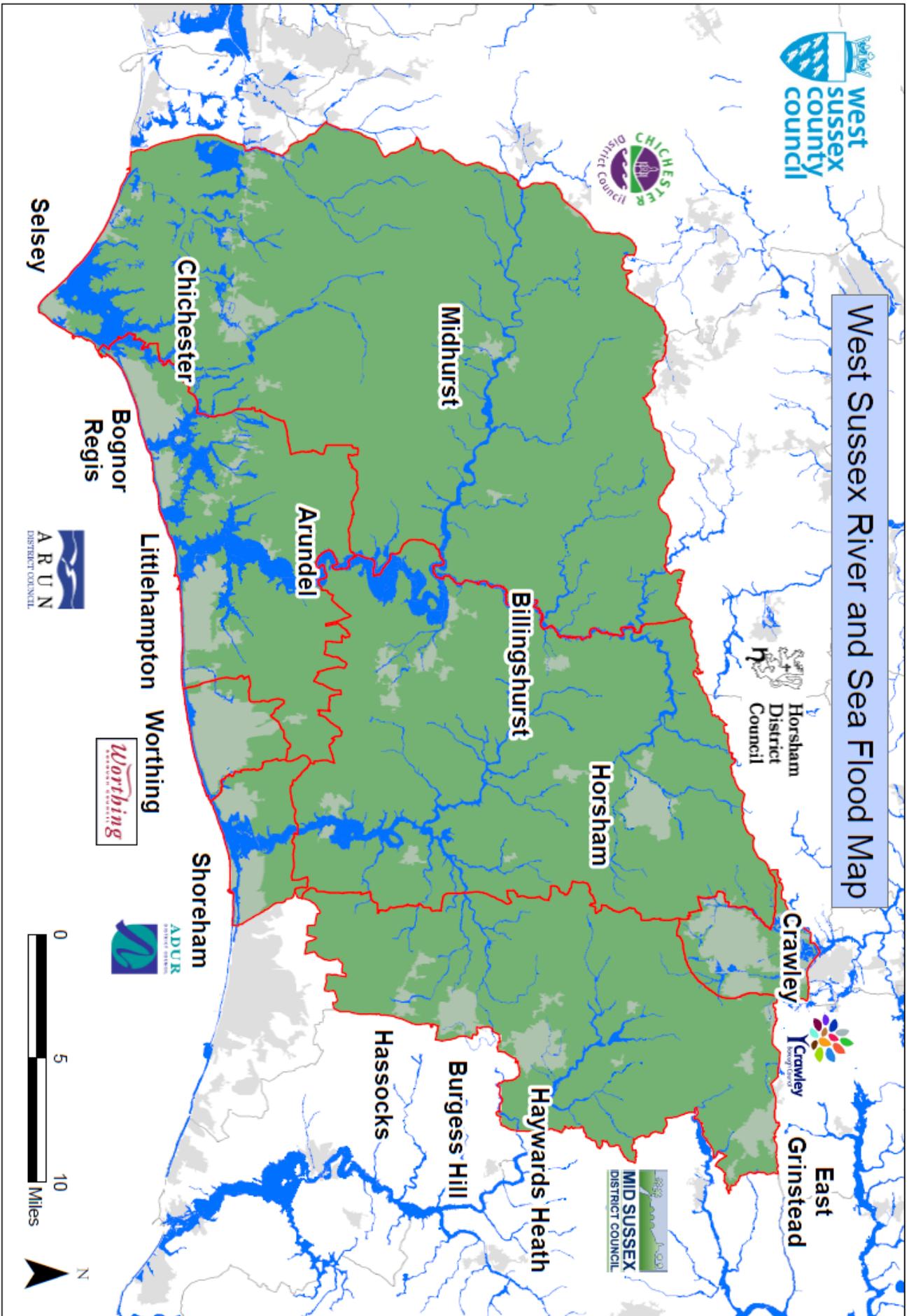
**Over page**

**Figure 2: The West Sussex Surface Water Flood Map, showing the extent of surface water flooding from a 1 in 200 year rainfall event (based on the Flood Map for Surface Water data 2010) The purple colour shows areas at risk.**

**Figure 3: The West Sussex River and Sea Flood Map, showing the extent of river and sea flooding from a 1 in 200 year river event, and 1 in 200 year sea event (The Environment Agency Flood Map, not accounting for existing flood defences, 2012). The dark blue colour shows areas at risk.**

# West Sussex Surface Water Flood Map





## Surface Water Flooding

Surface water flooding results from excess overland flow and ponding. This can be caused by intense short duration storms or by any storm when the ground is already saturated. During intense storms, the water simply does not have time to soak into the ground, and when the ground is already saturated the water cannot soak in at all.

Within the built environment surface water will tend to collect more easily because the water cannot infiltrate or drain into the ground like it would do naturally. In the urban environment and on roads, water is normally funnelled into sewers, and when the drainage network blocks or when sewer capacity is exceeded, flooding can occur. It is difficult to predict if, where and when it will occur.

The residential areas that are most susceptible include Shoreham, Lancing, Worthing, Crawley, Horsham, Bognor Regis, Felpham, Elmer, Bersted, Middleton, Bosham, Selsey, Birdham, Barnham, Pulborough, Ifold, Burgess Hill and Haywards Heath.

Surface water flooding is not restricted to urban areas and can occur in rural areas when drainage is prevented by blockages or saturated ground. The management of the land drainage network is vital in reducing flood risk. In rural areas, due to the landscape and topography of the South Downs, downland run-off can also cause flooding. Land management, such as the way farmers plough fields, the removal of hedgerows and infilling of ditches, can contribute to run-off rates. Most notably in the Rother Valley in West Sussex, the way the land is managed can significantly change run off and soil erosion.

Surface water has contributed significantly to flooding experienced in the county recently. Surface Water Management Plans will identify improvement actions that will be included in the work programme (Appendix D). Locations where surface water management plans are underway or have been carried out are;

- Elmer Sands
- Worthing
- Lidsey (Waste Water Treatment Works) Catchment
- Manhood Peninsula
- Lavant Valley
- East Lancing
- West Chichester
- Easebourne

Future Surface Water Management Plans will be carried out within West Sussex depending on available funding and priority

## Groundwater Flooding

Groundwater flooding can occur when groundwater rises up from the underlying water table. Water emerges at the ground surface, flooding both surface and subsurface infrastructure. This type of flooding is generally caused by rising water levels in permeable aquifers (primarily chalk in West Sussex) in response to prolonged above average rainfall or from high water levels in adjacent rivers. Due to the chalk geology running across West Sussex,

the lower slopes of the South Downs and the coastal plain are the area's most susceptible to experience this type of flooding. Though the underlying geology is fairly well understood it is actually difficult to predict when or where groundwater will emerge. Mapping of areas is based on the ground type and from areas historically known to have been affected. Groundwater can affect the areas in the upper reaches of the River Lavant (Singleton, East Dean and Charlton), Bosham Stream (Woodend, Funtington), River Ems (Walderton, Stoughton, Compton, West Marden), and North Lancing and Durrington. Other localised areas can be affected due to ground conditions, such as clay, or topography.

## **Main River Flooding**

Main rivers are defined by Defra and are important watercourses that carry significant flood risk. The Environment Agency has permissive powers to undertake works on these rivers. The major river catchments in West Sussex are the River Arun, the River Adur and a number smaller watercourses that make up the West Sussex Rifes. Part of the River Mole catchment that drains north into the River Thames also falls within West Sussex. The River Arun and the River Adur both flow south through the county and discharge into the English Channel at Littlehampton and Shoreham respectively.

The risk of river flooding impacts a number of West Sussex towns including Arundel, Bognor Regis, Chichester, Littlehampton, Shoreham and Crawley. The rivers help drain on average 600mm of annual rainfall. Heavy rainfall can cause rivers to overtop their banks and spill onto the adjacent floodplain. The characteristics of the river catchments are dominated by their topography, with fast flowing streams emerging from the high Weald to the north, flowing into a low lying coastal plain where the gradient is less and the river flows are much slower. The flood risk on rivers is managed strategically by Catchment Flood Management Plans. The strategy work programme includes work from these plans:

- The Arun and Western Streams Catchment Flood Management Plan
- The Ouse Catchment Flood Management Plan
- The Adur Catchment Flood Management Plan
- The Thames Catchment Flood Management Plan
- The Lower Tidal River Arun Strategy

## **Ordinary Watercourse Flooding**

An ordinary watercourse is any watercourse (river, stream, ditch, cut, sluice, rife, dyke or non-public sewer) that is not identified as a Main River. Flooding can occur from an ordinary watercourse overtopping its bank level due to the volume of water or because the channel or culverts become blocked. Ordinary watercourses in West Sussex are maintained by riparian/adjacent landowners, five Internal Drainage Boards (IDBs), the District and Boroughs, and West Sussex County Council.

The IDBs have a schedule of maintenance works. Similarly, riparian owners have responsibilities to maintain their stretch of watercourse. West Sussex County Council as Lead Local Flood Authority is responsible for undertaking consenting and enforcement on ordinary watercourses, and the District and Borough Councils have been delegated the consenting and initial enforcement role to link with their historic work and local planning role. Riparian owners have a responsibility to keep watercourses maintained and flowing freely. Together, the authorities ensure that work on ordinary watercourses is checked, approved, and that appropriate action is taken against landowners who undertake un-consented works or fail to carry out their responsibilities.

## **Coastal and Tidal Flooding**

The coastline of West Sussex stretches from Hermitage, near Emsworth, to Southwick. High water caused by the tide, waves and storm surges can cause flooding to occur. Generally, where urban areas meet the coast the line is defended (Selsey, Shoreham, Worthing, Littlehampton, Bognor Regis), and where there is no property the coastline is managed in a semi-natural state. Areas at particular flood risk are the estuaries due to the tidal locking effect where river water and sea water meet. The Environment Agency and District and Borough Authorities manage the flood risk to coastal properties by managing the groynes and sea walls, replenishing the beach material and by maintaining the natural beach defence. Shoreline Management Plans guide the strategic management of the coastline. Investment is largely directed by coastal risk and erosion strategies that analyse the detail and consider project options. Within West Sussex there are currently seven strategies in progress or completed for coastal and tidal risk.

- ❖ North Solent Shoreline Management Plan:
  - Pagham Harbour Adaptive Management Study
  - Pagham to East Head Strategy
- ❖ Beachy Head to Selsey Bill Shoreline Management Plan
  - Arun to Pagham Strategy
  - Emsworth to East Head Strategy
  - Arun to Adur Strategy
  - Lower Tidal River Arun Strategy
  - Shoreham to Brighton Marina Strategy

The associated work programme (Appendix D) that this strategy supports uses the outputs of these strategies so that the full picture of investment into flood risk is understood within the county.

## Reservoir Flooding

The Government recognises that a major reservoir flood event could have a significant impact on the downstream area. Reservoirs in the UK have an extremely good safety record with no incidents resulting in the loss of life since 1925. Reservoirs are carefully maintained to prevent flooding.

The Environment Agency oversees reservoir safety and enforces the Reservoirs Act 1975 and is responsible as an enforcement authority for some 2,000 reservoirs in England and Wales. All large reservoirs must be inspected and supervised. The Environment Agency ensures that reservoirs are regularly inspected and essential safety work is carried out.

The two largest reservoirs in West Sussex are at Ardingly and Weir Wood. Local Resilience Forums (LRFs) undertake the engagement with downstream communities to plan for emergencies. The Pitt Report recommended that communities be provided with reservoir flood maps to enable the emergency services and other responders to assess risks and plan for contingency, warning and evacuation.

## Sewer Flooding

Foul sewers carry flows from business and domestic water use, for example kitchen and bathroom waste, to a wastewater (sewage) treatment works. Treated effluent is then discharged to the environment (a local watercourse or the sea) under a consent granted by the Environment Agency. Foul sewers can overflow due to groundwater entering the pipes (infiltration) entering the pipes or through surface water overflowing the system (inundation). This can cause flooding which is contaminated with foul effluent.

Surface water sewers carry rainwater to a suitable discharge point such as a local watercourse or the sea. These discharges do not generally require treatment or a licence from the Environment Agency. Sewer flooding occurs when an increase in the amount of water entering the system is greater than the capacity of the system causing surcharging, or if blockages occur. Flooding is most likely to occur where the sewer has a dual purpose, carrying both surface water run-off and foul sewerage, termed a combined sewer.

Flooding from sewers is the responsibility of the Water and Sewerage Utility companies (Thames and Southern Water). Investment to improve the sewer network happens as part of the periodic price review that sets aside an agreed amount to be spent on reducing flood risk. Areas previously known to have experienced regular sewer flooding are Worthing and Durrington, the Manhood Peninsula, Barnham, North Lancing, Shoreham and Burgess Hill. Problems can also occur along the base of the South Downs because, when groundwater levels are high, sewers can overspill into local watercourses. The water company price review in 2014 is being agreed by the economic regulator Ofwat. This will determine investment to the sewer infrastructure over 2015 - 2020. Water Companies can contribute to flood risk projects being proposed by the Lead Local Flood Authority and other partners.

West Sussex County Council has identified 53 'wet spot' areas in the county. Wet spots have been classified as areas where a significant number (generally greater than ten properties and/or businesses) of adjacent properties may be susceptible to flooding. These property counts include flats above ground floor level.

Each wet spot area susceptible to flood risk has a corresponding map, these form Appendix B. Each community is illustrated showing the best county wide assessment of surface, river and sea flood risk. Figure 4 shows the size of the risk in terms of the quantity of housing with risk areas, and, whether the main risk is from surface water, from the rivers and the sea, or from a combination of sources.

The distribution of the wet spots in West Sussex falls into three main areas. The concentration of wet spots in Chichester District is due to the low lying land of the coastal plain. Secondly the major risk areas are the large inland towns where surface water flooding, river flooding or a combination of both can cause property to flood. Thirdly, the coastal strip of communities form a row of urban areas that are affected by both the tides and the draining of water from inland.

These locations have been highlighted in previous plans, notably Catchment Flood Management Plans, Shoreline Management Plans, the Preliminary Flood Risk Assessment and the June 2012 Flood Report. The modelled flooding data does not account for future climate change, but instead gives a flood outline of a large event with present day circumstances.

The locations are listed alphabetically in Figure 6 (page 31). Numbers of properties are reported according to which flood map they fall within (Figures 2 and 3 on page 21 and 22). Some properties fall within both maps, and are counted as 'combined risk' in the dark blue column in Figure 6. To help the reader understand this table it is necessary to read the 'What is the likelihood of flooding happening and what does this mean?' section at the start of Chapter 1. The flood risk has been assessed by considering the following size flood events:

- Surface water flooding assessed from a 1 in 200 year rainfall event (0.5% annual probability rainfall event), the surface mapping simulates flooding accounting for drainage and the build environment;
- River flooding assessed from a 1 in 200 year flood event (0.5% annual probability river flood event), the river flooding mapping simulates flooding including the current benefit from drainage and defences;
- Sea flooding assessed from a 1 in 200 year flood event (0.5% annual probability sea flood event), the sea flooding mapping simulates flooding including the current benefit from drainage and defences.

Data from each of the seven Districts and Boroughs has been considered. Mapping has been produced (Appendix B) to show where areas susceptible to flooding exist. The maps indicate the main risk from surface water, the rivers and the sea. For the purposes of this Strategy the Environment Agency's groundwater map has been considered but is not published in the mapped communities. The wet spots have been selected to include those areas that are susceptible to groundwater flooding, and the property count of the surface water statistics can be taken to include groundwater risk areas.

The wet spots identified across the county are linked to actions in the associated work programme so that West Sussex County Council can track progress and the location of investment over the lifetime of the strategy.

The method of identifying wet spots uses the most up to date county wide mapping that exists, and the most recent flood reports. These two sources provide the basis for identifying the highest risk areas. There are many isolated properties at flood risk in the county that are outside of these cluster areas. The strategy has focused on cluster areas because funding for capital projects requires a high cost benefit ratio that is generally not met by single residential property projects. Single buildings providing public benefit, for example hospitals, are given high priority. The strategy supports household property level protection (PLP) measures. Work is currently being undertaken by the Flood Resilience Community Pathfinder Scheme (2013-2015) to look at how property level protection can be implemented as well as other local resilience work.

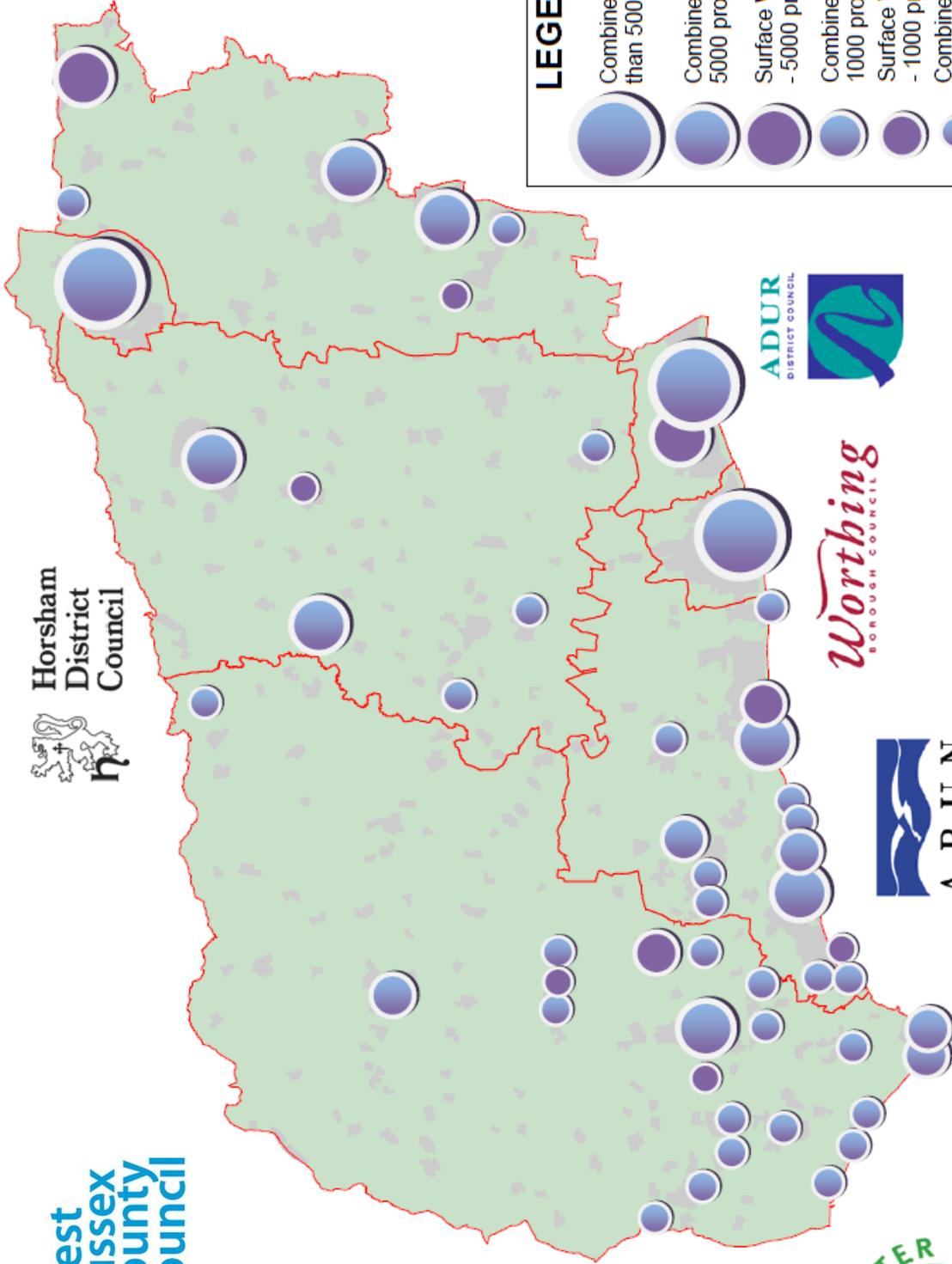
Issues in these areas will be identified through the West Sussex County Council's new flood investigatory role and ordinary watercourse consenting and enforcement responsibilities. The other Risk Management Authorities, local flood groups or parish councils should also bring flooding and maintenance issues to the attention of West Sussex County Council as Local Lead Flood Authority.

All of the wet spot areas feature in the West Sussex Preliminary Flood Risk Assessment (PFRA), and in the West Sussex County Council Report on June 2012 Flood Event (Nov 2012). They include all areas at risk from river and sea flooding as identified by the latest Environment Agency flood mapping. The wet spots have been considered by local experts at the District and Borough Councils, the County Council, Southern Water and by the Environment Agency. Historic events and previous flooding issues have been taken into account and have contributed to the West Sussex wet spot list.

The purple and light blue areas are areas susceptible to flood risk. They are shown on each wet spot map and reflect where the flood risk exists, and why the area was identified as having clusters of properties within risk areas. Information shown on the maps includes the river obstructions such as weirs, dams, and the drainage network of rivers, canals and lakes.

#### **Over page, Figure 4: The West Sussex 'Wet Spot' Flood Map**

# West Sussex "Wet Spot" Flood Map



**LEGEND**

- Combined risk greater than 5000 properties
- Combined risk 1000 - 5000 properties
- Surface Water risk 1000 - 5000 properties
- Combined risk 500 - 1000 properties
- Surface Water risk 500 - 1000 properties
- Combined risk less than 500 properties
- Surface Water risk less than 500 properties



**Figure 5: The Appendix B ‘Wet Spot’ Flood Map Information**

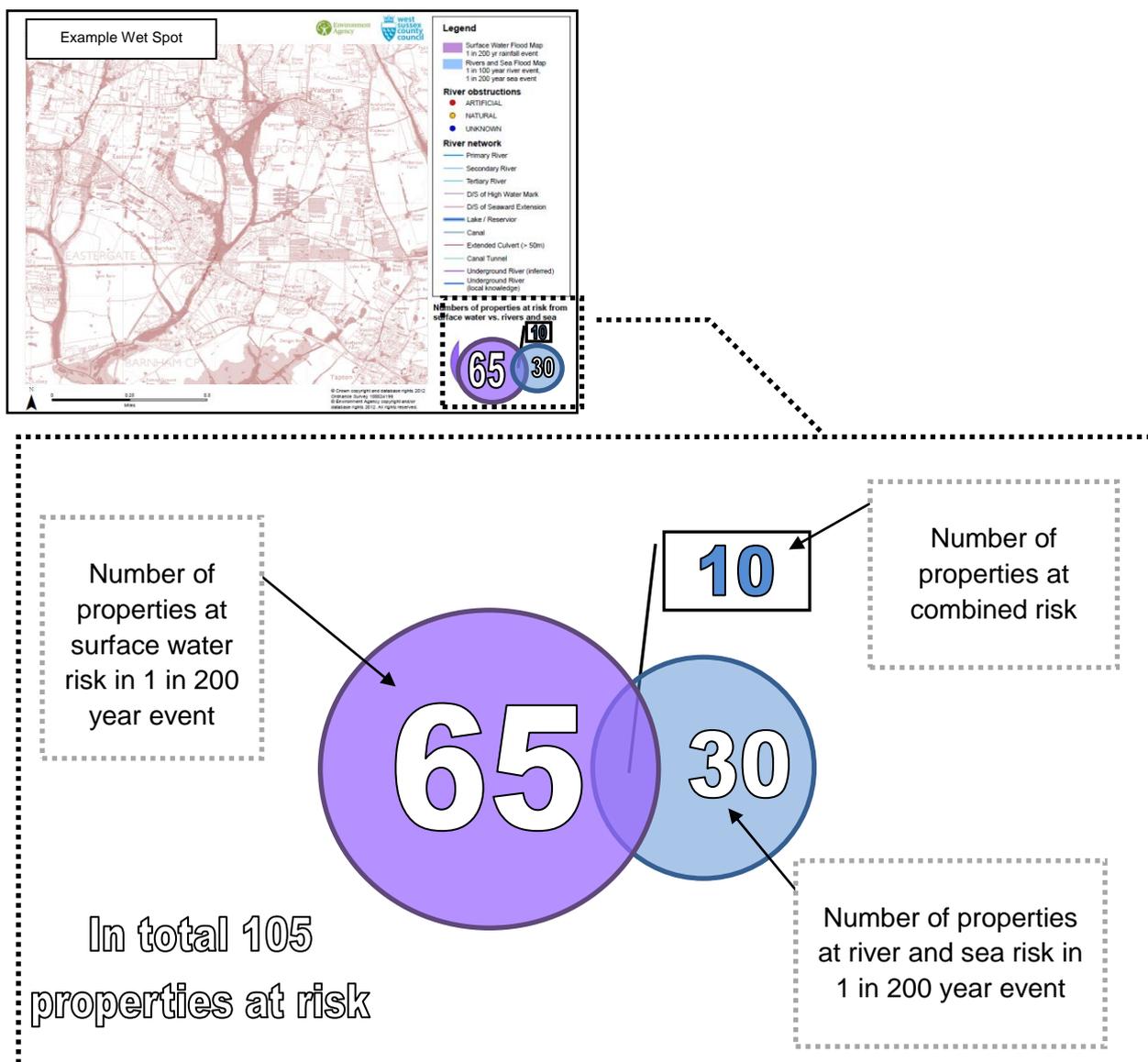


Figure 6 gives the full list of wet spots in West Sussex. The purple column (numbered 1) represents property numbers solely at surface water flood risk. This is flood risk posed from rainfall that is yet to reach a natural channel or sewer (the model accounts for drainage and buildings). The light blue column (numbered 2) represents property solely at river and sea risk. This is flood risk posed from rivers bursting their banks and from sea storms, surges and high tides (the model accounts for existing sea and river defences). The dark blue column (numbered 3) represents the property at risk from both sources. The total risk for the community (column 4) equals each number summed (the example in Figure 5 is  $65 + 30 + 10 = 105$  properties at risk). The numbers of properties are derived from address data and have been rounded to the nearest five properties, except where less than five properties are at risk.

**Figure 6: The West Sussex ‘Wet Spot’ areas and the number of residential properties and businesses susceptible to flood risk by flood source (including flats above ground floor level)**

| <b>Wet Spots</b><br>(Priority wet spots are marked)<br> | <b>Area</b>         | <b>1</b><br>Surface Water Flood Risk* (no. of properties) | <b>2</b><br>River and Sea Flood Risk* (no. of properties) | <b>3</b><br>Combined Flood Risk* (no. of properties)       | <b>4</b><br><b>TOTAL</b><br>(no. of properties) |
|--|---------------------|---|---|--|---|
|  |                     | * property only within surface water risk map             | * property only within river/sea risk map                 | * property within both surface & river/sea water risk maps |   |
| Aldingbourne, Westergate & Eastergate  | Arun District       | 300   | 110   | 85   | 495   |
| Aldwick  | Arun District       | 275   | 0   | 0  | 275   |
|  Angmering   | Arun District       | 550   | 5   | 60   | 615   |
| Arundel  | Arun District       | 215   | 15  | 0  | 230   |
|  Barnham & Walberton                                  | Arun District       | 400   | 200   | 100  | 700   |
| Billingshurst  | Horsham District    | 600   | 0   | 25   | 625   |
| Birdham  | Chichester District | 25  | 0   | 0  | 25  |
|  Bognor Regis & Felpham                               | Arun District       | 900   | 1200  | 200  | 2300  |
| Bosham   | Chichester District | 50  | 100   | 0  | 150   |
| Bramber & Upper Beeding  | Horsham District    | 325   | 60  | 0  | 385   |
| Burgess Hill   | Mid Sussex District | 2500  | 1   | 0  | 2501  |
| Charlton   | Chichester District | 25  | 0   | 10   | 35  |

|   |                     |      |      |     |       |
|---|---------------------|------|------|-----|-------|
| Chichester  | Chichester District | 1750 | 385  | 95  | 2230  |
| Chidham   | Chichester District | 15   | 15   | 10  | 40    |
| Copthorne   | Mid Sussex District | 75   | 130  | 75  | 280   |
| Crawley   | Crawley Borough     | 9000 | 625  | 425 | 10050 |
|  Earnley & Bracklesham | Chichester District | 50   | 145  | 0   | 195   |
| East Dean   | Chichester District | 30   | 0    | 1   | 31    |
| East Grinstead  | Mid Sussex District | 2200 | 0    | 0   | 2200  |
| East Preston  | Arun District       | 400  | 0    | 0   | 400   |
|  East Wittering      | Chichester District | 25   | 145  | 25  | 195   |
| Ferring Coast & Rife  | Arun District       | 30   | 0    | 60  | 90    |
| Fishbourne  | Chichester District | 180  | 5    | 0   | 185   |
| Hassocks  | Mid Sussex District | 525  | 105  | 55  | 685   |
| Haywards Heath & Lindfield  | Mid Sussex District | 2200 | 0    | 100 | 2300  |
| Horsham   | Horsham District    | 4000 | 0    | 0   | 4000  |
| Hunston   | Chichester District | 35   | 5    | 0   | 40    |
|  Littlehampton       | Arun District       | 1200 | 1200 | 240 | 2640  |
| Littlehampton West & Climping   | Arun District       | 35   | 180  | 10  | 225   |
| Loxwood   | Chichester District | 55   | 5    | 5   | 65    |

|  |                     |      |      |     |      |
|--|---------------------|------|------|-----|------|
|  Middleton-on-Sea & Elmer | Arun District       | 150  | 295  | 25  | 470  |
| Midhurst   | Chichester District | 600  | 30   | 35  | 665  |
| North Mundham & Runcton  | Chichester District | 20   | 30   | 5   | 55   |
| Oving  | Chichester District | 50   | 1    | 0   | 51   |
|  Pagham & Nyetimber       | Arun District       | 170  | 145  | 35  | 350  |
| Pulborough   | Horsham District    | 325  | 0    | 10  | 335  |
| Rustington   | Arun District       | 550  | 0    | 0   | 550  |
| Sayers Common  | Mid Sussex District | 50   | 0    | 0   | 50   |
| Selsey (West)  | Chichester District | 350  | 150  | 30  | 530  |
| Selsey East  | Chichester District | 300  | 525  | 50  | 875  |
|  Shoreham & Lancing     | Adur District       | 4500 | 2400 | 650 | 7550 |
| Sidlesham  | Chichester District | 55   | 145  | 5   | 205  |
| Singleton  | Chichester District | 75   | 0    | 15  | 90   |
| Sompting   | Adur District       | 1100 | 0    | 0   | 1100 |
| Southbourne, Hermitage & Nutbourne   | Chichester District | 200  | 105  | 35  | 340  |
| Southwater   | Horsham District    | 700  | 0    | 0   | 700  |
| Storrington  | Horsham District    | 525  | 0    | 25  | 550  |
| Tangmere & Boxgrove  | Chichester District | 350  | 0    | 0   | 350  |

|  |                     |      |      |     |       |
|--|---------------------|------|------|-----|-------|
| Thorney  | Chichester District | 25   | 145  | 0   | 170   |
| West Itchenor  | Chichester District | 10   | 15   | 5   | 30    |
| West Wittering   | Chichester District | 55   | 1    | 0   | 56    |
| Westbourne   | Chichester District | 250  | 0    | 10  | 260   |
|  Worthing | Worthing            | 8750 | 1350 | 300 | 10400 |



## What are the priority areas at risk?

Ten wet spot locations have been prioritised (marked with a  in table 6) based on areas where short term actions are required, modelled or historical risk is present or there is an existing programme of work. The priority wet spots will be considered first for flood risk reduction or investigation work by the risk management authorities. This prioritisation does not mean funding is available, or has been agreed, nor does it exclude important work from happening elsewhere if a good cost benefit is achieved. The priorities will be reviewed as progress is made.

The prioritised locations will promote the areas and allow risk management authorities to consider partnership funding and implementation. Difficult decisions will need to be taken, because there is will not be enough money to carry out every identified action. The priority wet spots highlight those areas that contain groups of properties deemed most at risk.



## Adur District

The Adur District contains the Shoreham-by-Sea & Lancing and Sompting wet spots. Both contain significant property numbers that are at risk of flooding from combined sources (river, sea and surface water flooding). Together a very large number of properties are in risk areas, largely from surface water flooding, but added to significantly by coastal flooding.

The area is predominantly urban, underlain by chalk geology with a flat topography. The wet spots are heavily influenced by the tides and coastal defences can be overtopped from purely tidal influence. The River Adur is unlikely to overtop from just heavy rainfall, but a combination of a heavy rainfall event and a high tide could cause significant flooding. Surface water flooding generated by run-off from the South Downs can cause flooding to property in Bramber, Lancing and Sompting, the Shoreham airport and West Beach Estate. The key flood risk prevention assets in the District include the existing Adur tidal wall embankments, and the coastal defences that afford Shoreham and Lancing protection. The District maintains the Lancing Brook network. The Internal Drainage Board, District Council and the Environment Agency carries out channel maintenance work on local watercourses north of the A27 to maintain good flow.



## Arun District

The Arun District contains thirteen wet spots that are susceptible to surface water, river water and/or sea flooding. These areas stretch across the coastal plain from Ferring in the east to Pagham in the west. Bognor Regis & Felpham (river and sea) and Littlehampton (surface water risk, river and sea) contain the highest numbers at risk. Middleton-on-Sea & Elmer on the coastal plain include significant property numbers at risk from the sea should an extreme event occur. Barnham & Walberton and Angmering have high property numbers at risk from surface water flooding and from combined sources.

The area is generally low lying topography with poorly drained and often waterlogged soils. The River Arun flows south through the centre of the district, with the Aldingbourne Rife, Ferring Rife, and Elmer Rife, and the upper parts of the Pagham Rife further draining the district. Some streams are tide locked as they drain into the English Channel. The characteristics of the district mean that surface water ponding and water logging due to high groundwater or extreme rainfall events can cause flooding. Groundwater flooding can also occur along a spring line across the coastal plain. Tide locking, under capacity or blockages within the drainage network also contribute towards flooding. The key management of flooding in the district is the coastal protection works, the maintenance of embankments and walls on the River Arun, and the work that maintains sufficient flow in the rivers, watercourses, ditches and urban drainage network.



## Chichester District

Chichester District has twenty-four wet spots susceptible to flooding from surface water, groundwater, sea and river flooding. The most significant risk is in Chichester from surface water and combined sources. Many clusters of properties in coastal and surface water risk areas exist across the Manhood Peninsula, rural Chichester Harbour area and south of the Downs. The area is very popular with holidaymakers. Due to the significantly higher local population during the holiday season the numbers of people at risk becomes a greater task to manage.

In the north of the district the River Rother drains the Low Weald rural area from west to east through Midhurst. Midhurst is mainly at risk from surface water flooding. In the south of the district the groundwater fed River Lavant drains through Chichester. When groundwater levels are high, this wet spot can flood from a combination of the river, surface water and drainage network pinch points. The area can become seasonally water logged causing surface water ponding due to the low lying topography and high water table. Groundwater flooding occurs most regularly through the Lavant valley, notably at Charlton, East Dean and Singleton.

Channel maintenance is carried out by riparian owners, the Internal Drainage Board and the Environment Agency in the district. The main flood defence features are the diversion channel at Chichester, channel clearance and pumped drainage from the peninsula, and the drainage through the coastal defences into the sea.



## Crawley Borough

Crawley has one wet spot made up of the urban area susceptible to surface water flood risk. This wet spot includes approximately 10,000 residential and business properties at flood risk from mainly surface water risk. Flood risk is also posed from the River Mole, from culverted watercourses, and from sewer flooding. The risk of flooding comes after a heavy rainfall event when constrictions within this drainage system cause water to back up, overtop a channel or pond in an area.

Crawley is situated in the upper part of the Mole Catchment that drains north into the Thames. Historically the River Mole and its tributary the Gatwick Stream have come out of bank and flooded, and there are a number of recorded incidents that have damaged property. Two other tributaries exist, the Ifield Brook and Crawters Brook. The Borough contains two water reservoirs the Tilgate and Titmus Lakes. Most of the flood defences in Crawley are earth embankments, and there is a diversion channel on the Gatwick Stream. While Crawley is a new town, the drainage network can experience problems with its culverted watercourses that can block or reach capacity.

## Horsham District

The Horsham District contains six wet spots that are susceptible to surface water and river flooding; Horsham, Pulborough, Storrington, Southwater, Bramber & Upper Beeding and Billingshurst. Surface water flood risk poses the most likely flood risk in each of these areas. Horsham represents the largest cluster of properties in areas susceptible to flooding from a rare rainfall event. Storrington and Southwater are susceptible to surface water flooding, and to a lesser extent Billingshurst and Pulborough. River flooding contributes to the surface water flood risk in Beeding and Bramber.

These wet spot areas are set within the Weald of Sussex underlain by sandstone and mudstone geology, and are drained by the urban sewer network and the River Arun and Rother. Serious flooding would only be expected during large-scale infrequent rainfall events, when overland flow would occur from rapid runoff and with a short response time. Flooding would occur from excess surface water run-off that cannot drain, and to a lesser degree from inundation directly from the local watercourses. The main rivers through urban areas are mainly undefended but some walls and channel straightening has occurred. The urban drainage network is maintained routinely and also on a reactive basis to ensure surface water can drain.

## Mid Sussex District

Mid Sussex contains six significant clusters of properties that are at risk of flooding. These are Burgess Hill, Copthorne, Hassocks, Haywards Heath & Lindfield, East Grinstead, and Sayers Common. The most significant clusters of properties are located in the urban centres, particularly Haywards Heath and Burgess Hill. Purely surface water flooding is known to exist in East Grinstead and on a smaller scale in Sayers Common. Properties are largely at risk from surface water flooding Hassocks.

In the centre of the District the River Ouse drains east into neighbouring Lewes District, and in the south, the Adur drains west into Horsham District. Brighton and Hove borders Mid Sussex to the South. The villages and isolated properties in the rural landscape of Mid Sussex are generally at low flood risk. It is the urban areas that are more susceptible to flooding where surface water flooding, urban drainage problems and ordinary watercourses flooding pose a risk to property. Heavy rainfall events can cause flooding in these areas. The defences in the District consist of a mixture of maintained and culverted channels. These defences are maintained and clearance are carried out by the Environment Agency, Landowners and the District Council.

Worthing District contains the Worthing wet spot covering the low lying coastal urban area. The flood risk in Worthing is posed by surface water and the sea. If an extreme rainfall event was to occur thousands of properties would be in risk areas in the town. Only in a very rare tidal and storm event would Worthing be expected to flood from the sea.

Worthing District is largely urban and is bordered by the Ferring Rife to the west and Teville Stream to the east. There are a number of ordinary watercourses that drain the two catchments. The risk of flooding is posed from a combination of groundwater, sewer, surface water run-off and coastal wave overtopping. Drainage is comprised of rainfall run-off from the South Downs and rainfall that falls on the urban area. When either or both of these inputs are high then flooding to property can occur. The low lying coastal fringe of Worthing is at risk of flooding from the sea. When groundwater is high Goring and Durrington can be susceptible to flooding. Surface water contributes significantly to the flood risk in Worthing due the urban nature of the area, and due to the drainage being compromised high tides, groundwater or blockages.

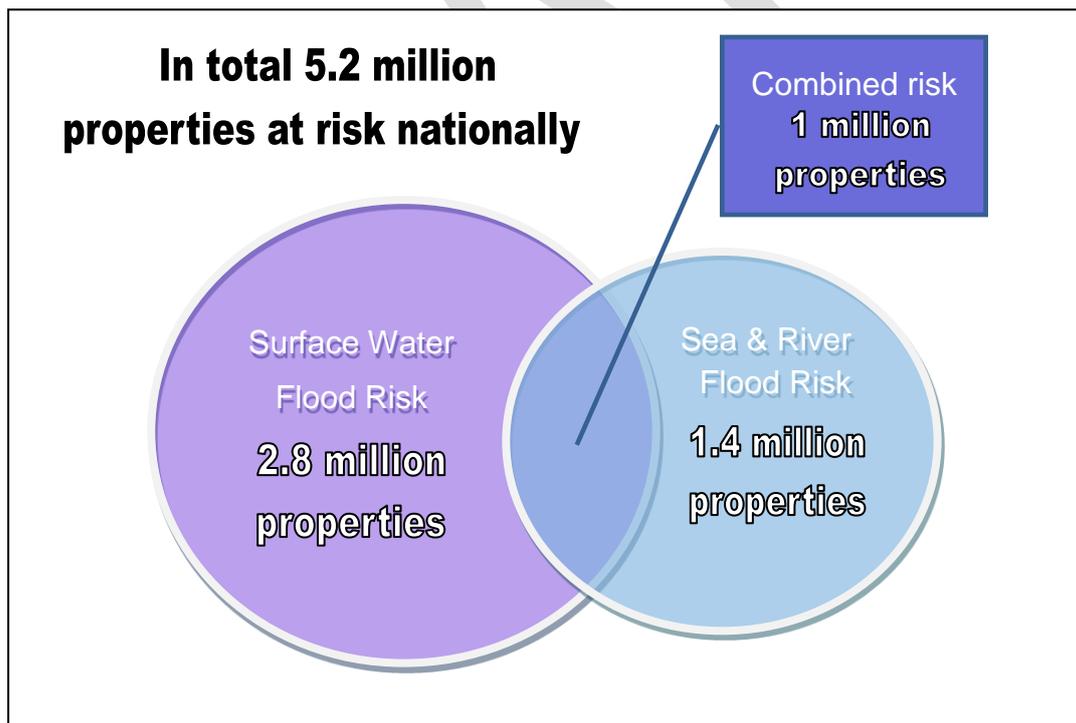
## Chapter 2- Roles and Responsibilities



### Background and National Context

In England, 5.2 million properties are at risk of flooding. Of these, 1.4 million are at risk from rivers or the sea alone, 2.8 million are at risk from surface water alone and 1 million are at risk from both sources. The Flood and Water Management Act 2010 requires upper and unitary councils to be Lead Local Flood Authorities and manage surface water, groundwater and ordinary watercourses. The Flood and Water Management Act is an important part of how the Government reacted to the 2007 floods and subsequent Pitt Report (2008). Pitt's recommendations called for urgent and fundamental changes to the way the country was adapting to increased flooding.

**Figure 7: Properties at risk nationally by flooding source (source: Environment Agency)**



Lead Local Flood Authorities, IDBs and District and Borough Councils effectively join the Environment Agency in a partnership to manage flood risk across all sources. Any combination of sources of flooding could exist in an area so partnership working and joint projects are expected.

The national and local strategies are at the forefront of this change, putting new ways of working into practice. The local strategies across England set out how people, communities, business and the public sector should work together. They are enabling Lead Local Flood Authorities and other risk management authorities to plan for the future.

Flood and coastal erosion management requires difficult decisions to be taken on where risk management activities are carried out both at national and local levels. This prioritisation process and the decisions taken are to be guided by six principles published in the National Strategy for England.



- Community focus and partnership working

The flood risk management authorities (West Sussex County Council, the seven District and Borough Councils, the Environment Agency, the four Internal Drainage Boards, the Highways Agency and Thames and Southern Water) will work in partnership with communities to understand the community perspective of flooding, help communities understand and actively prepare for the risks and encourage them to have direct involvement in decision making and risk management actions. Partnership working is also required to ensure that risk is managed in a coordinated way beyond authority boundaries, for example across catchments, with adjacent lead local flood authorities working together.



- A catchment and coastal cell approach

In understanding and managing flood and coastal risks locally, it is essential to consider the impacts on other areas that are affected or connected to what happens in that area. This whole connected area is known as a catchment. Similarly the UK coastline is divided into a series of coastal areas known as 'cells' to ensure a coordinated management approach. Authorities must seek to avoid passing risk on to others within the catchment or adjacent coastal cells without prior agreement. These agreements could potentially include the provision of funding by upstream communities for actions and measures carried out by others to manage the downstream risks. This principle asks all risk management authorities to consider the catchment or coastal cell as a whole to ensure the best outcome for the related parts.



- Sustainability

Flood risk management authorities should support communities by managing risks in ways that take account of all impacts and the whole-life costs of investment in risk management. The risk management solutions should be forward-looking, and utilise the latest thinking regarding Water Sensitive Urban Design and Green Infrastructure. Solutions should take account of potential risks that may arise in the future and be adaptable to climate change. They should also work with natural processes where possible and enhance the environment.

4

- Proportionate, risk-based approaches

It is not technically, economically or environmentally feasible to prevent flooding altogether. A risk-based management approach targets resources to those areas where they have greatest effect. Risk management measures consider both the probability over time of a flood happening and the consequences that might arise if it did, for example by assessing the damages that arise from floods. Solutions should be appropriate in complexity and cost to the level of flood risk.

5

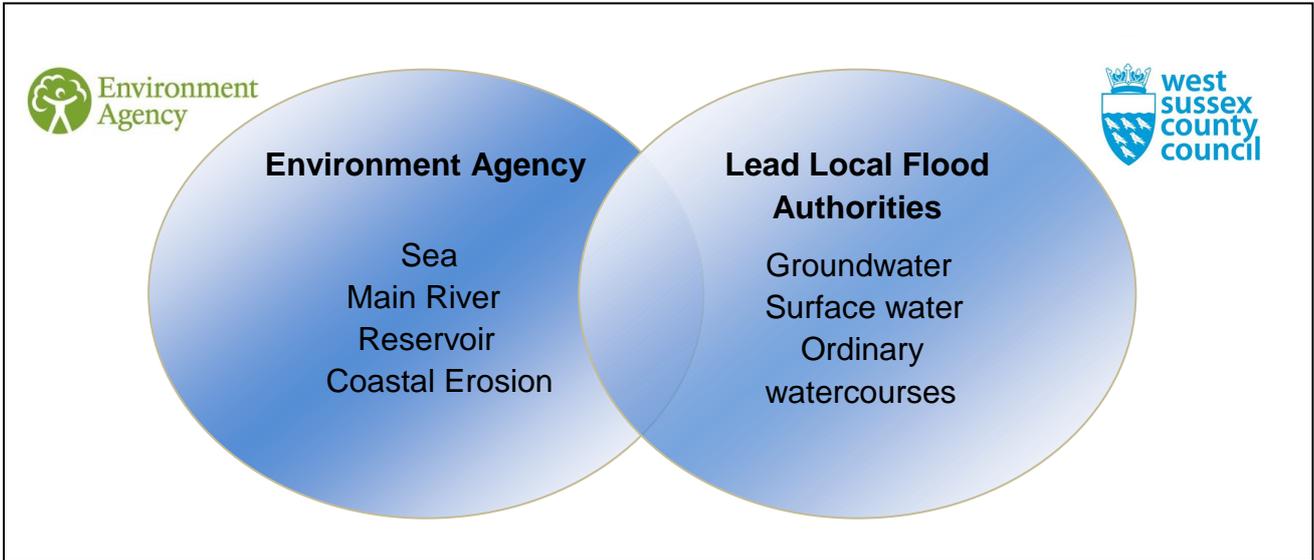
- Multiple benefits

As well as reducing the risks to people and property, which is the primary concern, flood risk management can bring significant economic, environmental and social benefits. It can enhance and protect the built, cultural heritage, biodiversity, rural and natural environments by preventing loss and damage to habitats and heritage assets and reducing pollution, for example, through the use of Water Sensitive Urban Design and Green Infrastructure. It can contribute to regeneration and income generation, protect infrastructure and transport links and contribute to economic growth.

6

- Beneficiaries should be encouraged to invest in risk management

The benefits achieved when flood risks are managed are in many cases localised and lead to personal or private gain through the protection of specific individuals, communities and businesses. They can also be public, through the reduction of future costs to society arising from incident recovery. The Government is keen to ensure that wherever possible alternative sources of funding can be secured in each area to reflect the local benefits that would be delivered. Any funding found locally can supplement the amounts available nationally and mean as many communities as possible can be protected.

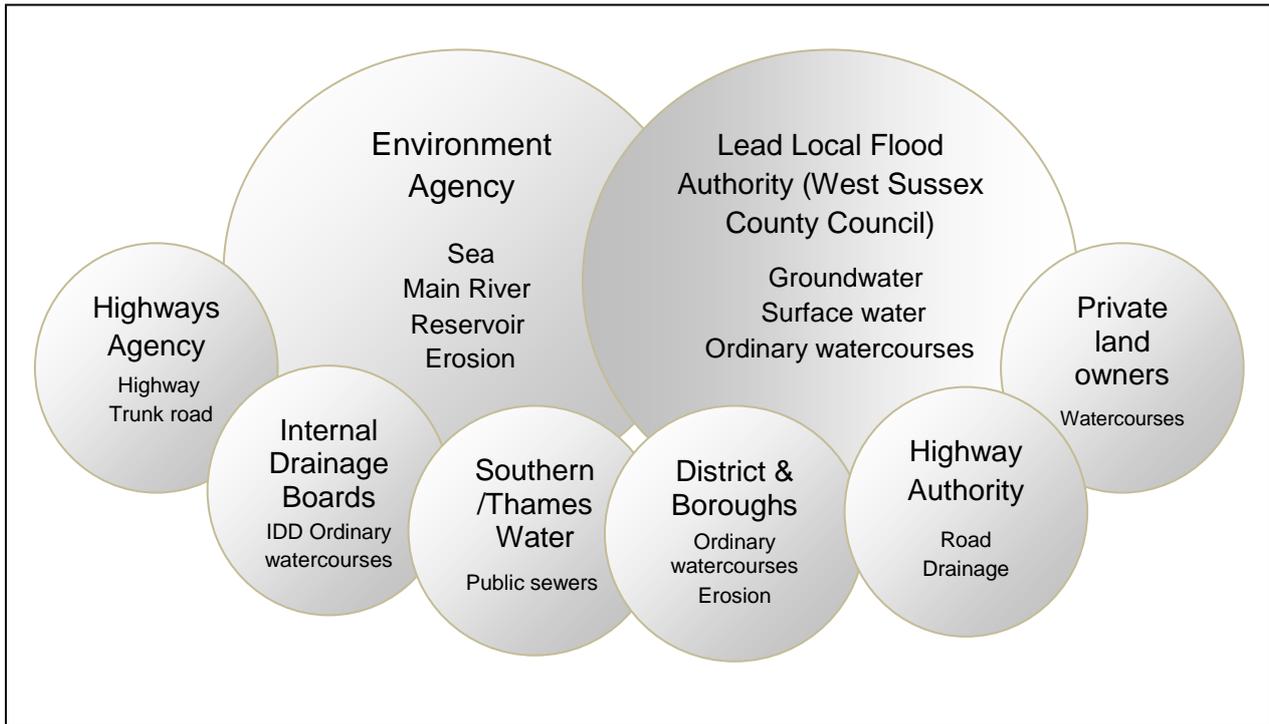


**Figure 8: Who oversees which types of flooding?**

Under the Flood and Water Management Act 2010 West Sussex County Council has the responsibility for developing, maintaining and applying a local flood risk management strategy within the county. It is intended that local authorities should reflect the content, guiding principles, aims and objectives of the national strategy in the development of their local flood risk management strategies.

West Sussex County Council will not be working in isolation. A range of partner authorities known as risk management authorities also have flood and coastal erosion management duties, powers and responsibility. The development of this strategy required input from designated ‘flood management authorities’. In West Sussex the other flood risk management authorities are the Environment Agency, the five Internal Drainage Boards (Upper Medway, Ouse, Arun, Adur and South West Sussex), the Highways Agency, Southern Water Services Ltd, Thames Water Utilities Ltd and the seven District and Borough Councils.

In West Sussex, Southern Water Services Ltd and Thames Water Utilities Ltd are responsible for managing public sewers, and for resolving flooding issues where there is no significant interaction with other types of flooding. The seven District and Borough Councils in the county are an important part of flood risk management are risk management authorities in their own right, and, all take an active role in assisting the Lead Local Flood Authority in performing some Flood and Water Management Act duties.



**Figure 9: Who manages what within West Sussex?**

The Internal Drainage Boards (IDBs) carry out maintenance works within their Internal Drainage District (IDD). Four of the five IDBs are operated by the Environment Agency (the Ouse, Arun, Adur and South West Sussex). The fifth IDB (Upper Medway) covers a small area within the county near East Grinstead and is independently managed. At the time of writing in 2013 an Environment Agency review into the management of Internal Drainage Districts was underway which may change the current set up.

 **Flood risk management responsibilities**

This strategy clarifies the roles and responsibilities for local flood risk, and the duties and permissive powers that flood risk management authorities have. It also builds on the existing partnerships developed in West Sussex. The strategy also provides a framework for local communities to develop local partnerships and solutions.

Under the provisions of the Flood and Water Management Act the following duties are common to all risk management authorities:

- Duty to cooperate with other risk management authorities

- Duty to act consistently with the national and local strategies
- Powers to take on flood risk functions from another risk management authority
- Duty to contribute towards the achievement of sustainable development
- Duty to be subject to scrutiny from the Lead Local Flood Authority's democratic process.

### **West Sussex County Council (Lead Local Flood Authority)**

The responsibilities of the county council as Lead Local Flood Authority and as a risk management authority are to:

- Provide leadership of local flood risk management authorities;
- Develop, maintain, apply and monitor a strategy for local flood risk;
- Permissive power to do works to manage flood risk from surface water runoff or groundwater;
- Permissive power to request information from any person in connection with the authorities flood risk management functions;
- Permissive power to exercise the Land Drainage Act 1991;
- Perform as a Category 1 responder to flood incident under the Civil Contingencies Act 2004, including dealing with recovery and resulting homelessness;
- A duty to investigate and publish reports on flood incidents in West Sussex (where appropriate and necessary) to identify which authorities have relevant flood risk management functions, and what they have done or intend to do;
- A duty to maintain a register of structures or features that have a significant effect on flood risk;
- Permissive power to designate structures and features with flood risk significance;
- Responsibility (once enacted) for the sustainable drainage systems approving body with responsibility for approval, adoption, inspection and maintenance of new sustainable drainage systems;
- Decision making and enforcement responsibility for whether third party works on ordinary watercourses by third parties, that may affect water flow, can take place;
- A duty to contribute towards the achievement of sustainable development in the exercise of flood risk management functions and to have regard to any ministerial guidance on this topic.

## **West Sussex Highways Authority (part of West Sussex County Council)**

The responsibility of the West Sussex Highways Authority is to:

- Undertake routine and reactive maintenance on all roads (except the A27 and M23/A23 that are the responsibility of the Highways Agency), including associated drainage provided by gullies, drains and culverts.
- Provide advice on road and road drainage issues associated with proposed development, ensuring any impact on the road network is taken into account;
- Decide whether improvements to the transport network are needed, based on access to local facilities, and the possible effects of a development on road safety and congestion.

## **Environment Agency**

The Environment Agency has the following roles and responsibilities as a risk management authority:

- A strategic overview of all types of flooding;
- Responsible for flood risk management on main rivers and the coast;
- A coastline erosion risk management authority, under the Flood and Water Management Act 2010;
- Responsible for Environment Agency reservoirs, and, to regulate and enforce the Reservoirs Act 1975 on other reservoirs with capacity over 10000m<sup>3</sup>;
- Duty to be subject to scrutiny from Lead Local Flood Authorities;
- Carrying out flood risk management functions in a consistent manor with the national and local strategies, reporting to ministers on flood risk management and implementation of strategies;
- Permissive power to request information for any person in relation to flood risk management concerning Environment Agency functions;
- Permissive power to designate structures and features with flood risk significance;
- To be a statutory consultee to the Sustainable Drainage Systems Approving Body;

- To be a statutory consultee to local planning authorities on flood risk matters;
- Perform as a Category 1 responder to flood incident under the Civil Contingencies Act;
- Consent and enforce applications for works on main river;
- A duty to contribute to sustainable development through flood risk management functions.

## **Internal Drainage Boards**

Internal Drainage Boards have the following roles and responsibilities as a risk management authority:

- Carry out maintenance work to maintain drainage;
- Use statutory powers to ensure those responsible maintain the flow of water in a watercourse and to modify or remove inappropriate structures within channels. Take the appropriate action against those who inappropriately modify the watercourse;
- Responsible for reservoirs over 10000m<sup>3</sup> capacity;
- Permissive power to exercise the Land Drainage Act 1991;
- A duty to contribute towards sustainable development;
- Permissive power to undertake flood risk management works;
- Undertake consenting on ordinary watercourse within their boundary;
- Be a statutory consultee on the Sustainable Drainage Systems Approving Body;
- Work alongside and together with neighbouring Internal Drainage Districts;
- Duty to be scrutinised from Lead Local Flood Authority democratic processes;
- Duty to act consistently with the Local and National Strategy;
- Permissive power to designate structures and features with flood risk significance.

## **Southern Water and Thames Water**

Southern Water and Thames Water have the following roles and responsibilities as a risk management authority:

- Duty to adopt new build sewers;
- Manage public sewer flooding;
- Duty to subject to scrutiny from Lead Local Flood Authority democratic process;
- Duty to have regard for the National and Local Strategies;
- Perform as a Category 2 responder to flood incidents under the Civil Contingencies Act.

### **The District and Borough Councils (Second Tier Authorities)**

The Districts and Boroughs have the following roles and responsibilities as a risk management authority:

- Permissive power to designate structures and features with flood risk significance;
- Duty to act consistently with the Local and National Strategy;
- A coastline erosion risk management authority, under the Coastal Protection Act 1949;
- Duty to be subject to scrutiny from Lead Local Flood Authority democratic process;
- Permissive power to exercise parts of the Land Drainage Act 1991 (except in an Internal Drainage District) area;
- Perform as a Category 1 responder to flood incidents under the Civil Contingencies Act 2004, including dealing with recovery and resulting homelessness;
- Perform as the local planning authority and a duty to encourage the appropriate development and promote sustainable development;
- Under delegated powers, use statutory powers to ensure those responsible maintain the flow of water in a watercourse and to modify or remove inappropriate structures within channels. Take the appropriate action against those who inappropriately modify the watercourse.

### **Highways Agency**

The Highways Agency has the following roles and responsibilities as a risk management authority:

- Duty to have regard for the National and Local Strategies;

- Responsibility to maintain the highway trunk road network under the Highways Act (in West Sussex the A23, M23 and A27) and for these roads;
- Duty to regularly inspect and maintain highways structures;
- Permissive powers to deliver works to protect the highway from flooding (for example, draining roads into private watercourses);
- Carry out maintenance and improvement works to maintain existing standards of protection for highways;
- A duty to contribute towards sustainable development.

## **Other Stakeholders**

While not designated flood risk authorities, stakeholders such as infrastructure providers, riparian owners, parishes and residents have a key part to play in flood risk management.

## **Utility and infrastructure providers**

While not risk management authorities, utility companies play an important role in flood risk management. Many assets of utility companies are in areas prone to flooding. Ensuring that the service the company provides is resilient to flooding can save the company money in the long term, so flooding is an important factor in investment and planning. Companies can achieve savings if they contribute to partnership schemes. This approach provides mutual benefit for those involved and ensures services for the public and businesses are more resilient.

## **Riparian Owners**

Home or business owners that live close to a river or ditch are likely to be riparian owners with maintenance rights and responsibilities. If the watercourse borders the property it is normal for the boundary of responsibility to extend to half way across the channel. Maintenance responsibilities include keeping the channel clear of obstructions, and maintaining a free flow of water in the watercourse. Land drainage management and maintenance is vital to ensuring that surface water is adequately managed across the county.

The key message to riparian owners is, you must let water flow through your land without any obstruction that may affect the rights of others. Importantly, you should keep the banks and bed of the ditch clear of anything that could cause an obstruction and increase flood

risk. More details can be found on the West Sussex County Council or Environment Agency websites by searching for 'riparian ownership'. The Environment Agency's 'Living on the Edge' document provides a full guide and is available online.

Risk management authorities take every opportunity to communicate publically about riparian responsibilities. The Parish and Town Councils can play a key role in supporting local knowledge and communicating the rights and responsibilities to communities. If you have a watercourse within your property boundary, such as river, brook, beck, ditch, mill stream or culvert, and are unsure on its maintenance please seek advice via the Living on the Edge document. Full contact details are available should you wish to speak to an advisor.

Any works to construct in or over a watercourse or alter the channel may require Ordinary Watercourse Consent. Please contact your local District or Borough Council for more information, or visit the West Sussex County Council website.

## **Parish and Town Councils**

Town and Parish Councils can make a significant contribution before and during a flood event. Coordinated assistance can be critical in supporting local residents and in providing the shelter for neighbours who have experienced flooding. Parish and Town Council members can also play a crucial role in the dissemination of flood alerts and flood warnings, as they have the local knowledge of the community. This local knowledge can also be used to inform the District or Borough Council or County Council about sources of flooding.

An affective Parish or Town Council will have an emergency plan, and an agreed process in place to react to a natural disaster. For more information please contact your District or Borough Emergency Planning Officer who will be able to provide guidance. For other advice please contact the West Sussex County Council Community and Economic Development Team (please see page 60 for areas covered) who will direct your query to the appropriate lead officer.

## **Property owners and residents**

It is home owners and business owner's responsibility to protect their property from risks, including flood water protection. It's impossible to completely flood-proof a property but there are lots of things that can be done to reduce flood damage. More details can be found on the Environment Agency website by searching for 'prepare your property for flooding'.

### **Strategic leadership**

West Sussex County Council chair the strategic leadership group that was formed in response to the new flood responsibilities commenced by the Flood and Water Management Act 2010. The group is comprised of the risk management authorities within West Sussex County, and meets quarterly with elected members to ensure that a joint management approach is taken.

To provide a framework for the strategic leadership role West Sussex County Council are required to produce a strategy to direct flood risk management and ways of working in accordance with legislation. The work programme associated with this strategy will schedule future projects that investigate flooding solutions or reduce the risk of flooding to residents in West Sussex. The work programme will be monitored to enable forward planning, and ensure future projects are developed for the submission for national funding allocations.

### **Permissive Powers to reduce surface and groundwater flooding**

West Sussex County Council, similarly to the Environment Agency and the District and Borough Councils, have permissive powers to construct works to protect people and property where these are economically justified. These West Sussex County Council powers are not a legal obligation, but indicate the authority to manage flood risk from surface water, groundwater and ordinary watercourses if desired. In a similar way the Environment Agency has powers but not a legal obligation to manage main rivers and the coast. There is no right to flood or erosion protection, except in very limited circumstances.

The term 'permissive powers' relates to certain legal powers. A risk management authority may choose to intervene in the public interest, where they believe works would be beneficial and / or economically viable, but has legal duty to do so. This recognises that risk management authorities have finite resources and so must prioritise how to use them.

### **Requesting information**

This partnership of risk management authorities ensures that data and information is shared across organisations. The Flood and Water Management Act 2010 gives West Sussex County Council powers to request information related to its flooding responsibilities. It is expected that the risk management authorities within West Sussex County Council boundary share data on request.

## **Duty to investigate flooding**

From April 2011 onwards West Sussex County Council has had a duty to undertake flood investigations after an incident occurs, where it deems necessary. The investigation must set out which risk management authority should lead the review, establish the reasons for the flood, and whether the response was appropriate. If flooding has occurred to more than ten properties in one incident, then a full investigation will be triggered. Depending on the circumstances of smaller flooding events, an initial investigation may still be required for flooding of less than ten properties.

West Sussex County Council has already commenced an investigation into the flooding that occurred in June 2012. The Council formed a multi agency group comprising the Environment Agency, Southern Water, Arun District Council, Chichester District Council, and Worthing Borough Council to investigate the flooding. It was identified that in the vast majority of cases flooding occurred simply due to the exceptionally high volume of rainfall. The process also highlighted some limitations in the management of drainage and the drainage infrastructure itself. Some of this work has been completed already, some is in the process of being resolved, and in some areas further detailed work is required. This investigation report has been published on the West Sussex County Council website.

## **West Sussex flood asset register**

The duty to produce and maintain a flood asset register commenced in April 2011. Assets are defined as structures that in the opinion of the Lead Local Flood Authority are likely to have a significant effect on flood risk. West Sussex County Council have used Defra guidance and local expertise in District and Borough Councils to collate this data.

The information will be added to the Environment Agency's online Asset Information Management System (AIMS) program from 2016 to which West Sussex County Council will have access. AIMS will map these drainage assets (over and underground), and include a record of their ownership and condition.

## **Power to designate structures**

West Sussex County Council as Lead Local Flood Authority, the districts and boroughs, and the Environment Agency now have powers to designate third party and privately owned artificial or natural features that are important for flood or erosion risk management. Designation means that a feature may not be altered, replaced or removed without consent. Designated features will be added to the asset register that is maintained by West Sussex County Council.

## **Sustainable drainage systems approving body (SAB)**

Increasing urbanisation and development has caused problems with increased run-off after sudden or prolonged rain. As areas of vegetation are replaced by impermeable concrete, tarmac or roofed areas the ground loses its ability to absorb rainwater. This rain is instead directed into existing surface water and highway drainage systems, often overloading them and causing floods. The idea behind sustainable drainage systems (SuDS) is to try to replicate natural systems. The designs use cost effective solutions with low environmental impact to drain away surface water run-off naturally using different techniques. The water is released slowly back into the environment, such as into watercourses or by infiltration into the ground.

Approval of SuDS is presently undertaken by District and Borough Councils through the planning process. At the time of writing (2013) the commencement date for a separate approving body (within LLFAs) to oversee installation of SuDS has not yet been confirmed by Defra. The intention is to oversee the design and installation of SuDS into all housing developments so that surface water flooding is managed by design. The introduction of this body will help move the industry closer toward the goal of water-sensitive urban design (WSUD). WSUD is a land planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

West Sussex County Council as part of the South East Seven Group is developing the new role, including a master plan as to how the SuDS Approving Bodies may operate. In summary:

- The SuDS approval process will need to work together with planning;
- Water Sensitive Urban Design and Green Infrastructure should inform all projects and infrastructure design;
- A developer will require SuDS consent before building to ensure the correct SuDS technique is employed for the local ground conditions;
- The approval, adoption and future maintenance of the SuDS will be undertaken by West Sussex County Council as Lead Local Flood Authority (as of 2013 the process for this is still under development);
- The District and Boroughs will continue to perform as the local planning authorities;

## **Ordinary watercourse consenting**

Consenting of works by third parties on ordinary watercourses under Section 23 of the Land Drainage Act 1991 were transferred from the Environment Agency to the Lead Local Flood Authorities. The consenting role for West Sussex County Council commenced in April 2012.

Consent is refused if the works (a dam, weir, culvert, mill or other obstruction) would result in an increase in flood risk or adversely affect nature conservation. An application can be made using a form that is available on the West Sussex County Council website.

The consenting role is being undertaken by the seven District and Borough Councils in West Sussex, following delegation from West Sussex County Council. The District and Boroughs or West Sussex County Council can undertake works on ordinary watercourses, except in an Internal Drainage District, where the Internal Drainage Board manage the consenting process.

## **Enforcement**

The County Council and District and Boroughs are each responsible for the enforcement of their responsibilities. At county level this includes ordinary watercourse enforcement, and this includes administering the duties of riparian owners of watercourses including keeping the watercourse free of blockages and obstructions. This enforcement role is done by the District and Borough Councils supported by West Sussex County Council legal team.

The planning process at the District and Borough Councils is supported by enforcement that ensures development is built in accordance with approved plans. Enforcement of Building Regulations stem from the Buildings Act 1984, separate to the planning function and set standards for the design and construction of buildings to ensure the safety and health of people in and around new buildings. T

he new sustainable drainage approval will also require enforcement in cases where there is a failure to build a developments drainage design in accordance with approved plans. In these cases officers will need to agree a solution or take enforcement action to put right any unauthorised works.

## **Sustainable development**

Defra guidance on sustainable development in relation to flood and coastal erosion risk management functions defines some of the ways in which West Sussex County Council will contribute. The key topics supported in this strategy are:

- Tackling climate change and to use techniques that enhance the natural environment
- Promote fairness in improving the wellbeing of communities
- Use green economic and operations decisions
- Use sound science to develop solutions
- To be transparent and be accountable to the public
- Using techniques and solutions which don't prevent future generations from meeting their own needs and effectively managing their own flood risk

### **Actions as a result of the June 2012 flooding in West Sussex**

The local flood risk management strategy supports all findings and recommendations from the West Sussex County Council Flood Report. The flood report recommends actions for each risk management authority and further investigations where more information is needed. Actions from the flood report form part of the works programme associated with this strategy. The work programme will be considered by the risk management authorities on a priority basis.

### **Requirements under the EU Flood Directive: Flood Risk Regulations 2009**

The Flood and Water Management Act must be considered alongside the EU Flood Directive that was transposed into UK law as the Flood Risk Regulations on the 10<sup>th</sup> of December 2009. The Flood Risk Regulations require three types of assessment to be carried out in England; the Preliminary Flood Risk Assessment, Flood Hazard and Flood Risk Maps, and, Flood Risk Management Plans.

### **Planning**

The District and Borough Councils are the responsible authorities for managing planning control and making decisions on what will or will not be granted planning permission. West Sussex County Council is responsible for planning control of libraries, waste sites, mineral sites and schools. Current planning policy directs development away from flood risk areas, however there remains an emphasis on development and the economy. Permitting safe housing is a constant challenge for developers and planners.

With regard to development in flood risk areas, site allocations and planning applications are informed and assessed by the planning process in a number of ways. The planning process, in accordance with the National Planning Policy Framework (NPPF), applies a principle called the Sequential Test that seeks to direct development towards areas with the lowest risk of flooding.

Where the Sequential Test is not possible, the Exception Test is undertaken whereby it must be demonstrated that any development in an area at risk of flooding will provide wider sustainability benefits to the community that outweigh flood risk, and that such development will be safe for its lifetime. Flood risk should not be increased elsewhere as a result of development. Flooding from new development cannot be allowed to impact on third parties.

The NPPF classifies flood risk into four different zones of probability (flood zone 1 (low probability), flood zone 2 (medium probability), flood zone 3a (high probability) and flood zone 3b (functional floodplain)). These zones are set out in Strategic Flood Risk Assessments which are used to inform local plans and decisions regarding development and flood risk.

## **Response, rescue and recovery**

The West Sussex Multi-Agency Flood Plan contains the Sussex Resilience Forum procedures for response, rescue and recovery. The plan sets out when a response is triggered and when adverse weather arrangements begin. This plan was activated and used during the June 2012 flooding. These plans are in place across the country to ensure good management and coordination in an emergency situation. All emergency response organisations including the police, fire and rescue, ambulance services, West Sussex County Council, the Districts and Borough Councils and the Environment Agency are signed up to the plan. Parishes and Town Councils also have an important role to play before, during and after an event.

The plan is in two sections, a generic overview and a more detailed plan for each urban centre within the county. The plan considers all types of flooding; coastal, river, surface, ground, sewer flooding. The triggers for multi-agency response are Environment Agency Flood Alerts and Warnings, Met Office Weather Warnings, and reports of flooding. Considerations involve pre agreed communication between risk management authorities to identify the level of risk and decide on the action. Depending on the size of the event this could be to do nothing, activate Part 1 of the Multi-Agency Flood Plan, or activate both parts.

If a response is activated, adverse weather arrangements are supported by the Sussex Emergency Response and Recovery Document and Multi-Agency Strategic Co-ordinating Group Guidance. The multi-agency response will either be an Adverse Weather Teleconference (chaired by the Environment Agency), a Adverse Weather Office (chaired by the Police), or, to set up Strategic Co-ordinating Group (chaired by the Police).

With regard to rescue procedures the detailed plans for each urban centre contain the processes involved to evacuate, and also include shelter arrangements. Procedures and the response to flooding can vary depending on the type of flood event, the area and the time of year. Membership of the recovery group will vary depending on the event, but will usually include all risk management authorities. A Recovery Co-ordinating Group led by West Sussex County Council will manage the recovery process.

## The Water Framework Directive

The Water Framework Directive seeks to improve the management, protection and enhancement of the water environment. In 2009 the Environment Agency produced eleven River Basin Management Plans for the basin districts across England and Wales. These plans are available online at the Environment Agency website. The work programme associated with this strategy is eligible to receive contributions from Water Framework Directive funding to implement improvement projects.

The West Sussex local flood risk management strategy supports the actions identified in the South East River Basin Management Plan. All projects are required to have regard to the ecological and chemical status of water bodies. The projects will help deliver the objectives of these plans where possible. West Sussex County Council will conduct ordinary watercourse consenting and future sustainable drainage management so that the functions contribute to the Water Framework Directive objectives.

There are 148 water bodies within West Sussex boundary. These water bodies consist of 121 river catchments, 14 groundwater bodies, 8 lake water bodies, and 5 coastal water bodies. Investigations into the quality of these water bodies have identified work that needs to be done to improve their status and the water environment as a whole. This process of investigation and identification is supported by West Sussex by the inclusion of WFD projects on the work programme.

The watercourses within the county are extensively used for water abstraction, agriculture, navigation and flood protection. To accommodate these uses our watercourses have been over widened, deepened and impounded with a variety of structures such as locks, weirs, dams and mills. These changes have interfered with the rivers natural flow, negatively impacting the wildlife and health of our watercourses. To start to remedy these issues the strategy is integrating the delivery of flood risk and WFD objectives to provide sustainable cost effective options of managing flood risk for the catchment. West Sussex County Council will support future works to deliver improvements, such as the removal of redundant structures, reconnection to floodplain where feasible and soft engineering options. Cost may restrict what work can be undertaken but options will be considered and assessed.

Pollution from agricultural land, treated waste water discharges and urban drainage are the major pressures to chemical and ecological status of water quality in West Sussex. To manage these pressures the strategy:

- supports catchment sensitive farming initiatives that seek to change agricultural practices;
- encourage planned waste water projects so that water companies can contribute to reducing the concentration of pollutants;
- Adopt water sensitive urban drainage through the planning process and prioritise on key areas.

A collaboration of interested parties including, Sussex Wildlife Trust, Arun and Rother Rivers Trust, Adur and Ouse Rivers Trust, Natural England, Environment Agency, Water Companies and many others, have founded two catchment groups, the Adur and Ouse Partnership and the Arun and Western Streams steering group, which cover West Sussex County. These groups are sharing the collective knowledge of the area and integrating their activities on the ground to deliver more for the environment. West Sussex County Council will continue to engage with the Adur and Ouse Partnership and the Arun and Western Streams steering group to further our understanding of the local water environment and help prioritise and implement work.

## **Partnership working**

Partnership working between authorities is essential to the effective delivery of flood risk management actions. Partnerships need to link authorities at Council, Cabinet, Director and Officer level so each organisation and flood risk management has the best chance of working effectively. While the Flood and Water Management Act 2010 has better clarified flood risk responsibilities, they are still distributed across different organisations.

The Environment Agency's National Strategy focuses on community partnership working. On the ground, West Sussex County Council, the District and Borough Councils, together with the Environment Agency, Thames Water, Southern Water and National Flood Forum complete this link to the public. Town and Parish Councils and the National Flood Forum play a very important role involving the public as they create community representation. This work is supported by the Defra pathfinder project which is encouraging community involvement and resilience. The project is also trialling property level protection in certain areas of the county.

Operation Watershed is a limited period fund which promotes drainage projects lead by community groups. The West Sussex County Council webpages extend an offer to community groups to get involved and lead a local project to carry out drainage work in their area. Operation Watershed is also committing investment to highway drainage and environmental improvements in the areas worst affected by the June 2012 floods.

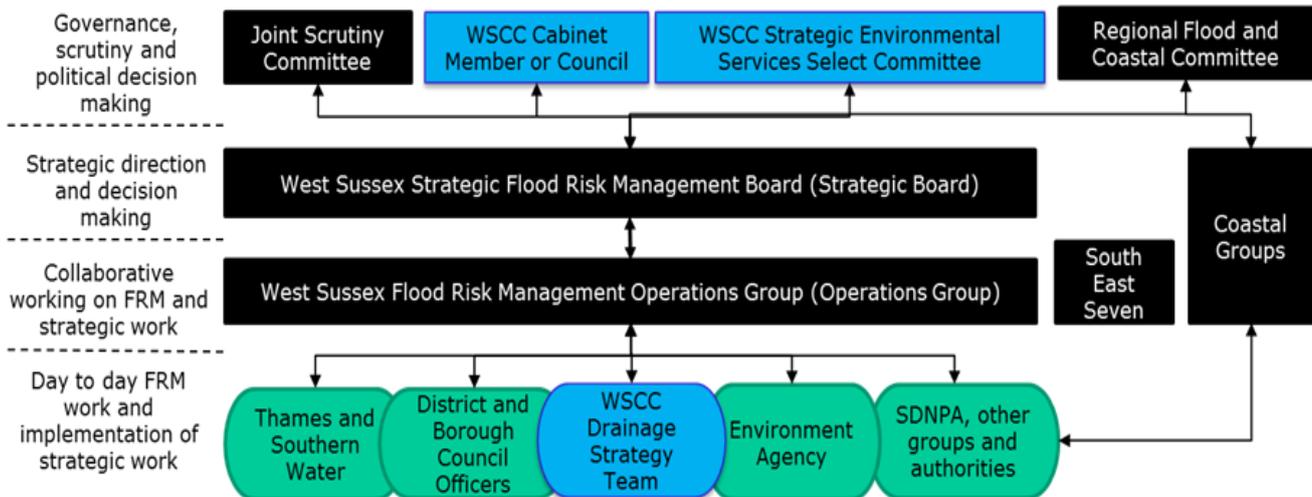
In terms of democratic representation, elected members will sign off this Local Flood Risk Management Strategy. Elected members are also able to influence the flood risk management work programme through the Strategic Board and flood risk funding via the 'Local Levy' funding allocated by RFCC (explained in Chapter 3) and their individual authority Members funds.

The national Flood and Coastal Erosion Risk Management Grant in Aid (FCERM GiA) funding for flood risk management schemes has a limited amount of money and many schemes will require Partnership Funding contributions in order to go ahead. Partnership working is therefore extremely important to flood risk management. If people are pro-active and are regularly communicating then delivery and progress is more likely to be effective. By working together we can avoid duplication, maximise available resources and funding opportunities, and share best practice, skills and expertise.

The Resilience and Emergency Teams work with the town and parish councils on emergency planning for flooding. If you are interested in getting involved please make contact with your town or parish council.

- Local Authority, Government and other Organisations

A number of partnerships at a local, national and regional level provide a forum for discussion on key issues and the delivery of projects. The key partnerships in West Sussex are listed below. The governance relationship between these groups is shown in Figure 10.



**Figure 10 : Partnership groups and governance within West Sussex.**

- South East Seven

A partnership of seven upper tier authorities (East Sussex, West Sussex, Kent, Medway, Hampshire, Brighton and Hove, and Surrey) created with the purpose of identifying savings through working together, using shared services, increasing efficiencies and generally working better.

- West Sussex Strategic Flood Risk Management Board

The board is a director level partnership of the flood risk management authorities in West Sussex which provides strategic overview and decision making around flood risk management work within the county. It also signs off the work programme.

- West Sussex Flood Risk Management Operations Group

The working group are an officer level working team that meet quarterly to solve county wide issues, progress actions and discuss future work and contributions. The aim of this group is to provide a joint resource to develop solutions at the most appropriate level. This group provides inputs to current and future projects and will develop the outline flood risk management work programme going forward.

- West Sussex Planning Policy Officers Group

A joint group which discuss planning issues across the county. A representative sits on the Operations Group above.

- Coastal Groups

Coastal Groups comprise all the key partners in coastal management - principally the coastal managers from maritime Local Authorities, Ports Authorities and the Environment Agency. Other interested organisations, such as Natural England and English Heritage, will also be members. West Sussex will work with both the southern and south eastern coastal groups, and will have representatives on the Operations Group.

- South Downs National Park Authority

Fifty per cent of West Sussex falls within the South Downs National Park, an area of national importance in terms of its landscape, wildlife and cultural heritage. In the implementation of this strategy, West Sussex County Council and its partners will work with the South Downs National Park Authority (SDNPA) to safeguard and where possible enhance the beauty, wildlife and cultural heritage of the county. The SDNPA also acts as the planning authority with the park boundary. A representative of the SDNP sits on the Operations Group.

- Water Framework Directive groups

These groups are a partnership of land owners and authorities that will lead on a programme of work to achieve ecological and chemical improvements to rivers and watercourses, including removing unneeded manmade structures and improving fish passage. The two groups in West Sussex are: the Adur and Ouse Partnership and the Arun and Western Streams Partnership.



## The community and public involvement

### Flood Action Groups

If they live within a flood risk area the best way for a member of the public to be involved is through a Flood Action Group. Flood Action Groups are a representative voice for their community and their aim is to work in partnership with the agencies and authorities whose work involves flood risk. Through the groups, members of the public can work on behalf of the wider community in finding ways to reduce flood risk.

The National Flood Forum supports communities in the formation of Flood Action Groups, gives tools to ensure their success and sustainability and initiates the first meeting with all the right professionals needed. Many groups have been formed since the June 2012 flooding. You can find out whether a group already exists in your area by contacting the National Flood Forum via their website.

## Parish and Town Councils

If you are interested in finding out more or would like to offer your time for local matters the Parish and Town Council in your area is good organisation to contact. They will already be operating and governing a range of tasks and may require assistance. You can find the contact details for your local Parish or Town Council via the West Sussex County Council website.

## West Sussex Community and Economic Development Teams

West Sussex County Council has three Community and Economic Development Team's responsible for community projects. The three teams cover the Gatwick Diamond area, the coastal area and the rural inland area. The teams are able to advise on local contribution work that members of the public can get involved with.

### **Gatwick Diamond Team** (Email: [cdbs.gatwick.diamond@westsussex.gov.uk](mailto:cdbs.gatwick.diamond@westsussex.gov.uk))

This team covers the parishes of: Albourne, Ansty and Staplefield, Ardingly, Ashurst Wood, Balcombe, Bewbush, Billingshurst, Bolney, Broadbridge Heath, Broadfield, Burgess Hill, Colgate, Crawley, Cuckfield, East Grinstead, Furnace Green, Fulking, Gatwick, Gossops Green, Hassocks, Haywards Heath, Horsham, Horsted Keynes, Hurstpierpoint and Sayers Common, Ifield, Industrial, Itchingfield, Langley Green, Lindfield, Lower Beeding, Maidenbower, Newtimber, Northgate, Nuthurst, Pound Hill, Poynings, Pyecombe, Rudgwick, Rusper, Shipley, Slaugham, Slinfold, Southgate, Southwater, Three Bridges, Turners Hill, Twineham, Warnham, West Green, West Hoathly and Worth.

### **Coastal Team** (Email: [cdbs.coastal@westsussex.gov.uk](mailto:cdbs.coastal@westsussex.gov.uk))

This team covers the parishes of: Aldingbourne, Aldwick, Angmering, Arundel, Barnham, Bersted, Bognor Regis, Burpham, Clapham, Clymping, Coombes, East Preston, Eastergate, Felpham, Ferring, Findon, Ford, Houghton, Kingston, Lancing, Littlehampton, Lyminster and Crossbush, Madehurst, Middleton-on-Sea, Pagham, Patching, Poling, Rustington, Slindon, Sompting, South Stoke, Walberton, Warningcamp, Worthing and Yapton.

### **Rural Team** (Email: [cdbs.rural@westsussex.gov.uk](mailto:cdbs.rural@westsussex.gov.uk))

This team covers the parishes of: Amberley, Appledrum, Ashington, Ashurst, Barlavington, Bepton, Bignor, Birdham, Bosham, Boxgrove, Bramber, Bury, Chichester CP, Chidham and Hambrook, Cocking, Coldwaltham, Compton, Cowfold, Donnington, Duncton, Earnley, Eartham, Easebourne, East Dean, East Lavington, East Wittering, Ebernoe, Elstead and Treyford, Fernhurst, Fishbourne, Fittleworth, Funtington, Graffham, Harting, Henfield, Heyshott, Hunston, Kirdford, Lavant, Linch, Linchmere, Lodsworth, Loxwood, Lurgashall, Marden, Midhurst, Milland, North Mundham, Northchapel, Oving, Parham, Petworth, Plaistow, Pulborough, Rogate, Selsey, Shermanbury, Sidlesham, Singleton, Southbourne, Stedham with Iping, Steyning, Stopham, Storrington and Sullington, Stoughton, Sutton, Tangmere, Thakeham, Tillington, Trotton with Chithurst, Upper Beeding, Upwaltham, Washington, West Chiltington, West Dean, West Grinstead, West Itchenor, West Lavington, West Thorney, West Wittering, Westbourne, Westhampnett, Wisborough Green, Wiston, Woolbeding and Woodmancote.

## Chapter 3 - Objectives and Action Plan

### West Sussex Local Flood Risk Management Strategy

*"I have seen what can be achieved when communities and local partners work together to solve the problems they face. I have seen apparently insurmountable problems overcome by partners working together with a common purpose, pooling their energy and resources... as a society we can rise to the challenge of our changing climate and tackle the risks we face."*

Richard Benyon, Former Parliamentary Under-Secretary of State

#### Objectives

To reflect the Government's strategic objectives in the local context, West Sussex County Council have agreed, in partnership with the Districts and Boroughs, the following objectives to guide local focus and progress. These are to:

- 1 • Understand the areas that flood
- 2 • Manage the flood risk in West Sussex
- 3 • Enable people, communities, business and public bodies to work together more effectively
- 4 • Put communities at the heart of what we do and help West Sussex residents during flood events, and recover as quickly as possible after incidents

All work undertaken by all flood risk management authorities in West Sussex will need to make progress under one or more of these objectives. The action plan (Appendix F) sets out the actions which will be taken to achieve these objectives. Each of the items in the work programme (Appendix D) will be referenced against these four objectives.



1

- Understand the areas that flood

The first step in finding solutions to flooding problems is an accurate understanding of where, when and how flooding occurs. There are some areas across the county where there is a lack of evidence and data to support decisions about the best way to reduce flood risk. The County Council will continue collect and analyse information to support this Strategy and its new role.



2

- Manage the flood risk in West Sussex

The next step, following improved information on flood risk, is what can be done to reduce the risks. There is limited funding to deliver works, so money for physical schemes must be prioritised, other funding sources utilised, and other ways to reduce local flood risk considered. Reducing local flood risk includes avoiding inappropriate development and reducing coastal erosion, and considering local resilience measures such as flood warnings and property level protection as well ensuring maintenance of drainage assets.



3

- Enable people, communities, business and public bodies to work together more effectively

West Sussex County Council will work with the flood action groups and other community groups to understand the local risks. We will ensure that information in the public domain is kept up to date and is clear and descriptive as possible. We will work with partners to ensure, that as far as possible, people making enquiries about flooding aren't passed between the relevant authorities. Between public bodies, we will seek the best ways of enabling partnership funding for schemes. We will continue to work closely with our partners, and share information.



4

- Put communities at the heart of what we do and help West Sussex residents during flood events, and recover as quickly as possible after incidents

West Sussex County Council with the Sussex Resilience Forum category 1 and 2 responders will continue to improve emergency plans. We will continue to develop these plans and other flood event responses to take into account the recommendations of the investigations into the June 2012 event and other relevant historic investigations. West Sussex County Council's Resilience and Emergencies team will work with local communities and parish, town, district and borough councils to improve community resilience to flooding and other extreme weather events.

This section outlines how flood risk management investment in West Sussex is funded. Budgets are limited so it is important to identify exactly what can be done, what will require additional contributions, and what can be programmed to happen at a later date. There are various funding streams available to fund projects, some available nationally and some from local sources. A detailed discussion on the types of local and national funding sources is available in Appendix E

Much of the day to day flood risk management work that is currently done in the county is carried out by the local authorities (County, District and Borough Councils), the internal drainage boards and the Environment Agency. This is funded from the main budgets these bodies hold as set out above based on the availability of resources and the benefits to the local communities.

West Sussex County Council and the other local authorities are funded by a Formula Grant provided by the Department for Communities and Local Government. Together with locally collected council tax and some other smaller sources of funding (set out in Appendix E), these resources fund the entire range of services administered by the councils. Flood risk management is only one of the services which must be considered alongside all the other activities the councils provide including; waste and recycling, health and social care, schools, planning and development, highways and transport, and public amenity. Each Council has to decide how much to allocate to each service, and consider flood risk management priorities against other investment needs.

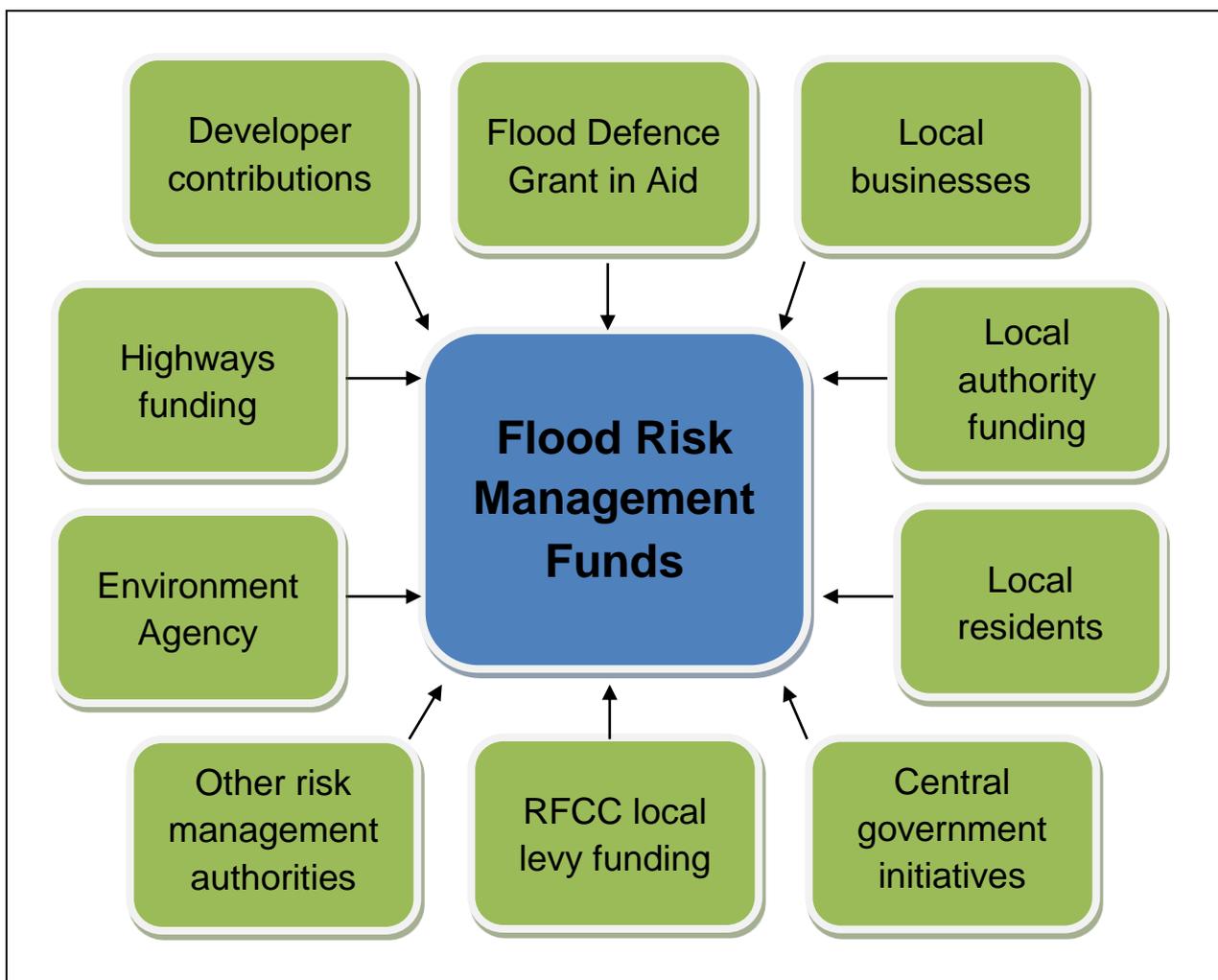
Landowners and owners of other structures and assets such as bridges, culverts, sluices, ponds etc have a duty to maintain the free flow of water through their property and so another large part of the maintenance works in the county are carried out by private individuals, companies and other landowners (including councils themselves).

Larger flood risk management schemes to protect groups of properties at risk from flooding can also be eligible for national funding. The key benefits considered in allocating funding are the reduced risks to; residential or commercial properties, infrastructure, vulnerable communities, environmental benefits, and benefit to amenity and agriculture.

The Pitt Review 2007 recommended that a new national funding scheme should be implemented to allow community and third party groups to invest in major flood risk management activities that affect them. The new funding mechanism is now active and grants money based on what benefits will be delivered by the project (a payment based on outcomes). This payment is made from the main pot of annual funding nationally which is called 'Grant in Aid' (GiA).

Under this funding policy some projects will be fully funded while some will achieve only partial funding. The level of funding is decided on the amount of benefit that the project would deliver. This is assessed through a calculation which gives a 'partnership funding' score, which sets out the total amount of money that will be paid nationally for a particular scheme. If only partial funding is achieved (ie the amount of money doesn't cover all the costs), the shortfall in the total project cost is expected to be met by local contributions or by making the scheme cheaper.

National funding can be applied for by any risk management authority (as described out in this strategy) or can be made by other bodies via the Lead Local Flood Authority to the Regional Flood and Coastal Committee.



**Figure 11: The funding avenues available for flood risk management works**

There is a work programme associated with the strategy (Appendix D) compiled of actions from existing plans, strategies and from the current list of West Sussex County Council, District and Borough and Environment Agency work. The programme is compiled of projects from these sources:

- Existing works schedules agreed from previous years (works already on the RFCC Medium Term Plan)
- Shoreline Management Plans
- Catchment Flood Management Plans
- Surface Water Management Plans
- Coastal and Fluvial Strategies
- West Sussex County Council Report on June 2012 Flood Event
- Flood Resilience Community Pathfinder Scheme
- Flood Risk Regulations 2009 work schedules
- Flood and Water Management Act 2010 work schedules
- The Water Framework Directive work schedules
- West Sussex Country Council Highways drainage works
- Asset management works
- Land drainage actions identified through investigations and inspections

The work programme will not currently include:

- Future Southern Water infrastructure work (due to commercial sensitivity issues)
- Highways Agency work

The identified projects and studies help achieve the Local Flood Risk Management Strategy's objectives. The work programme is a 'live' document and so is published separately. It will be regularly updated by the relevant risk management authorities and owned by the West Sussex Strategic Flood Risk Management Board. Some of the projects will be carried out solely using local funding and some will require the relevant risk management authorities to bid for funding from national Grant in Aid through the Regional Flood and Coastal Committee.

A number of fluvial and coastal schemes are currently being progressed across the county by the Environment Agency, District and Borough Councils. The schemes include strategy development, flood alleviation works, and ongoing management of key assets including beach management, outfall and tidal walls. They have all achieved funding through the partnership funding approach. Due to their priority some projects have secured 100% funding because of the significant level of protection they provide a community. In other cases a contribution has been required in order to unlock the funding.

## What is being done in my area?

The best way to identify projects or investigations in your area is to look at the work programme which will be published on the WSCC website and described in Appendix D. Each line on the programme is a project or investigation. Not all villages and towns will be on the programme, nor will all wet spots identified in the strategy have projects or investigations associated with them yet. The work programme will be updated regularly as new information on areas at risk becomes available and projects are developed to try and find solutions.

Alternatively contact your local District or Borough Council or the County Council who will be able to tell you activities may be planned in your area.

A full list of the current flood and coastal risk management schemes approved by the Southern Regional Flood and Coastal Committee can be found on the Gov.uk website <https://www.gov.uk/government/publications/programme-of-flood-and-coastal-erosion-risk-management-schemes>



A Strategic Environmental Assessment (SEA) has been undertaken to ensure that significant environmental effects arising from this strategy are identified, assessed and mitigated.

The Strategic Environmental Assessment is a generic tool that was introduced by the European Union Directive 2001/42/EC. The objective of the Strategic Environmental Assessment Directive is to “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”(Article 1)”. This requires national, regional and local authorities in Member States to carry out a strategic environmental assessment on certain plans and strategies that they promote, such as this strategy.

Monitoring of the significant environmental effects of implementing the strategy will be undertaken to comply with Strategic Environmental Assessment Directive - Article 10.1, to ensure that any unforeseen adverse effects of the strategy are recognised and dealt with.

The Strategic Environmental Assessment was carried out alongside the development of the Strategy. The assessment represents Stage A of the process, the scoping report. The scoping report sets the context and objectives of the environmental report, and sets the baseline information from which future environmental performance can be monitored. Both the strategy and the SEA have been consulted on, and are available as separate documents.

The projects that will be listed in the work programme are only part of the actions being taken to achieve the strategy objectives. Under each of the objectives there are a number of wider actions which will be carried out to reduce flood risk in the county. The timelines and persons likely to carry out these actions are set out in Appendix F and a description of the actions is detailed below;

## **Objective 1 – Understanding the areas that flood**

### **1A Increase the amount of evidence about local flooding that is collected and use it more wisely.**

There are some areas where there is a lack of evidence and data to support decisions due to under investment into research and investigation on local flooding in the past. The County Council will continue collect and analyse information to support this Strategy and its new role. With the regular reviewing, sharing and updating of flood risk information our understanding of local problems will improve. This will result in better use of information to carry out actions to address local flooding issues. This could be through improved mapping, changing drainage maintenance to target high risk areas, influencing planning decisions and of course through building and maintaining drainage solutions where it is appropriate to do so. Information gathering will be aided by the County Council's new flood investigation role, feedback from Town and Parish Councils and sharing of reports from District, Borough and water utility partners.

### **1B Improve Surface Water and Groundwater Flooding Maps**

Although there is a lots of very accurate data around where flooding may occur from rivers and the sea, the information surround surface water and groundwater flooding is less comprehensive and the flood warning maps are at a lower level of detail. This is mainly because until the Flood and Water Management Act no public body was given the responsibility to investigate these types of flooding. West Sussex County Council will seek to gather all the relevant data on these types of flooding and use it to improve the level of detail we hold and publish. This work will use the surface water management plans previously carried out and those proposed in certain areas. This will mean that we, our partners and the public will be able to make more informed decisions around the level of risk that is faced and what to do about it.

NOTE - New surface water flood mapping was made available on the Environment Agency's website in December 2013. Although this information came out too late to be included in the 2013 consultation and therefore the content of this version of the strategy; it will be used to update the associated maps and the best available information will be used in the next version. This recent information is available on the Environment Agency website.

## **Objective 2 – Manage the Flood Risk in West Sussex**

### **2A Create a prioritised programme of capital flood risk management works for the county**

By developing the programme associated to the strategy, we will aim to create a prioritised working list of capital works and studies from all flood risk management partners in the county including County Council, Environment Agency and District and Borough schemes. Southern and Thames Water schemes will be included where possible but the different funding regime may mean an alternative partnership approach for joint working needs to be found. The joint programme will prioritise schemes to a set of criteria (using many of the existing social, economic and environmental factors) agreed by the partners and will allow us to make decisions around where funding should come from, which schemes will be built and what happens in areas where schemes are unlikely to be built. Some priority schemes will be submitted for consideration for inclusion on the medium term plan approval by the Regional Flood and Coastal Committee; where they can attract Grant in Aid or Local Levy funding.

Due to the criteria used to assess the level of national funding available for flood risk management (i.e. number of properties protected, property value, level of social deprivation etc), there may be a bias against rural, isolated or individual properties at risk. The risk management authorities in West Sussex recognise this and are developing the local prioritised programme to ensure that all properties are considered on an equal basis when considering where to allocate flood risk management resources.

### **2B Avoid increasing flood and coastal erosion risk by encouraging best practice for the maintenance of assets and preventing inappropriate development.**

We will work together with our partners to decide what development is acceptable in areas of flood risk; recognising that land is limited and that although these areas would ideally be avoided there may be social or economic reasons for developing there. We will work to ensure that flood risk in planning is considered on a consistent level and with conditions attached for approvals to make sure the required actions are carried out. Significant flood defence assets will continue to be added to the Flood Asset Register to ensure they are managed appropriately and considered as part of future solutions. The National Planning Policy Framework requires local planning authorities (including the South Downs National Park Authority) to consider all flood risk when drafting development plans and in making decisions on development proposals. The assessment of local flood risks (which will be regularly reviewed) will assist in refining the Strategic Flood Risk Assessments which inform the Local Plan development strategies of the local planning authorities within West Sussex.

### **2C Continued working to improve surface water drainage across the county:**

West Sussex County Council will continue to work on smaller scale schemes, improvements and maintenance on the highways of West Sussex and, as well as other partners (especially District and Borough Authorities) will seek to improve local drainage in other areas where it is in the public benefit to carry out works. Surface water management plans will be carried

out in some locations to identify how flooding occurs and suggest future actions. A county wide awareness campaign will be held to increase knowledge of riparian responsibilities and the benefits for communities of working locally to increase resilience. Local authorities will continue working with landowners and developers to ensure that legal responsibilities are met with respect to ordinary watercourse drainage consenting and enforcement.

Once government commences Schedule 3 and related sections of the Flood and Water Management Act, the County Council will become a Sustainable Drainage Approving Body, or SAB. All development over certain thresholds will need to secure drainage approval before construction begins. This gives the County Council the opportunity to ensure that new developments do not contribute to flooding from the drainage network causing.

## **2.D Reducing flood risk through improved warnings, local scale works and local resilience**

The prioritised approach set out under objective 2A focusses major works on identified wetspots around the county. However this does not mean we will ignore the risk faced by the county's rural, isolated or lower risk communities. It will be necessary for these flood risk areas to be treated in the same proportionate approach. Risk reduction may be more likely to be through improved awareness and response to flooding to reduce the impacts when it does occur rather than reducing the chances of it occurring. This will be carried out in partnership through working with the Environment Agency to deliver flood warnings, improve awareness of the flooding risks, increased local resilience and direct people towards self-protection of their property. Where possible we will help facilitate local small scale works through our other functions and community working, and may carry out local schemes if they have a strong community, economic or environment benefit.

## **Objective 3 - Enable people, communities, business and public bodies to work together more effectively**

### **3A Improving communications between communities and public bodies**

West Sussex County Council will work with the flood action groups, Town and Parish Councils and other community groups to understand the local risks and ensure decisions are made with the best level of local information. We will ensure that information in the public domain is kept up to date and is clear and descriptive as possible. Explanations about what works we are carrying out and why will be made available and the limitations due to resources, technical considerations and other priorities clearly explained. We will work with partners to ensure, that as far as possible, people making enquiries about flooding aren't passed between the relevant authorities unless necessary.

### **3B Information sharing to improve awareness of flood risk**

Raising community awareness is a key activity. Flood risk cannot be removed entirely but we can work to help prepare individuals and communities by providing the right information to

those who need it. The County Council and its partners will undertake focussed awareness raising campaigns highlighting which areas are at risk and the actions communities can take to minimise the impacts of flooding. Local resilience work will identify those at risk and help them prepare for flood risk and provide support and assistance, especially for vulnerable people.

### **3C Continued partnership working with other Risk Management Authorities**

West Sussex County Council as LLFA will continue to chair both the strategic board and operations group. Where duties are best delivered at a local scale we will seek to work with our partners to agree who is best placed to carry out this work, recognising that local expertise and resources currently exist. When the SuDS Approval Body duty is implemented West Sussex County Council will work with the local planning authorities and Environment Agency in to ensure that the planning and drainage approval processes work together effectively.

### **3.D Seek the best ways of enabling Partnership Funding for schemes**

Collaborative working and joint funding across partner organisations will be key to maximising the return on investment in flood risk management. Any new capital schemes will likely require some form of partnership funding as well as central government funding in order to progress (as discussed later in the chapter), the local risk management authorities led by West Sussex County Council will develop an approach to agreeing partnership funding requirements to ensure the best use of local public funds. This will ensure that public money is used wisely, in a strategic way to protect the areas at greatest risk. Officers will also seek other sources of funding which could be used for this purpose and help communities and businesses make their own contributions which will likely increase their chances of receiving flood defence works in their area. In order to facilitate fundraising efforts a specific funding action plan will be developed for the highest priority schemes identified in the programme. This will entail research, analysis, review of contacts and experience, and discussions with partners, funders and others to better understand what potential there is for funding any identified projects.

## **Objective 4 - Put communities at the heart of what we do and help West Sussex residents; both during flood events and to recover as quickly as possible after incidents**

### **4A Continued flood event planning with other emergency responders**

West Sussex, along with the other members of the Sussex Resilience Forum category 1 and 2 responders, will continue to develop, appraise and revise its emergency plans to take account of local factors and developing information on flood risk. We will continue to develop these plans and other flood event responses to take into account the recommendations of the investigations into the June 2012 event and other relevant historic investigations.

## 4B Improving community resilience

West Sussex County Council's Resilience and Emergencies team will work with local communities and parish, town, district and borough councils to improve community resilience to flooding and other extreme weather events. Residents and communities need to harness local resources and expertise to help themselves in the event of an emergency, but in such a way that it compliments and enhances the emergency services capabilities. Local authorities across West Sussex will engage and develop community resilience and help people protect themselves and their property by making their homes and businesses more resilient to flooding.



This local flood risk management strategy for 2013 – 2018 represents the first step towards a co-ordinated county-wide approach to flood risk management. The strategy sets out the roles, responsibilities, objectives, and the priorities of the risk management authorities. The local authorities and Environmental Agency, in partnership with the other risk management authorities and key stakeholders, will use the investigations and projects on the work programme to manage local flooding issues across West Sussex over the next five years.

The key focus for the first five years is to carry out improvements to address known local flooding problems. The priority wet spots, identified by mapping and historic flood risk, are to be considered first, but any value for money project with positive benefits, irrespective of its location, will be considered. In times of austerity, funding capital works is going to be challenging, especially where projects are required to have some partnership contributions in order to proceed. It may be that in many areas the risk of flooding is managed through early flood warnings and local resilience measures. Local authorities will also help communities take action to help themselves and carry out their own riparian responsibilities.

The separate work programme (detailed in Appendix D) will be reviewed by the West Sussex County Council Operations Group and Strategic Board. The work programme will be updated with progress, new information and new projects that emerge, and will be prioritised so that all projects, be they large or small, from all sources of flooding are considered on an equal basis.

As well as physical works, the risk management authorities in West Sussex will seek to reduce flood risk through their other actions (Appendix F) such as planning and development control, highways management, consenting of watercourses and drainage works. We will seek to retain and develop the expertise already present in the County Council as well as increasing capacity where required. Through collaborative working and addressing issues at the appropriate authority level, be that at town, parish, district, borough or county council we will make the best use of the resources and funding available. All the authorities involved are committed to delivering these objectives and to reduce flood risk to the communities of West

Sussex. West Sussex County Council will continue to take responsibility and lead these meetings with the other stakeholders.

The strategy will be reviewed annually to check that objectives, actions and policies are appropriate and remain compatible and achievable. The work programme will be a continually evolving document and will be updated at least quarterly. A regular review of the action plan will be carried out at the same time and should highlight any issues which may affect the ability to deliver the objectives set out in the strategy. Minor changes to the strategy will be made as required and changes noted. If major changes are required due to new information or policies then a new public consultation will be held. For moderate changes a decision will be made by the West Sussex Strategic Flood Risk Management Board as to whether additional public consultation is required. The definitions of minor, moderate and major changes are set out in figure 12 below. The most up to date documents will always be found on the West Sussex County Council website

#### **Types of change to strategy document:**

**Minor** – text corrections that do not alter the context or outcomes of the strategy; mapping corrections; change where no further study or new information will be required.

**Moderate** – other changes to the Action Plan, Priorities or Objectives which may impact on the strategy delivery or textual corrections where context is altered; mapping corrections that affect the numbers of properties affected by flooding or erosion NOT leading to changes in the priority areas; changes impacting nationally designated sites, e.g. SSSI, NNR, AONB, Conservation Area.

**Major** – significant changes to the Action Plan, Priorities or Objectives affecting delivery of strategy objectives; mapping corrections that affect the numbers of properties affected by flooding or erosion leading to changes in the priority areas; changes of objectives; significant changes to Government policy including funding; changes impacting on internationally designated sites, e.g. SAC, SPA, RAMSAR and MCZ

**Figure 12 - Levels of changes to the strategy during its lifetime 2013-18**

# Appendix A

## The Strategy Partners

| Organisation                        |
|-------------------------------------|
| Adur District Council               |
| Worthing Borough Council            |
| Arun District Council               |
| Crawley Borough Council             |
| Horsham District Council            |
| Mid Sussex District Council         |
| Chichester District Council         |
| West Sussex County Council          |
| Southern Water Services             |
| Environment Agency                  |
| South Downs National Park Authority |

## Appendix B

### The Wet Spot Maps

Please note this Appendix to this strategy is a separate document. The wet spot maps included in the full appendix are;

|                                       |                                    |
|---------------------------------------|------------------------------------|
| Aldingbourne, Westergate & Eastergate | Littlehampton                      |
| Aldwick                               | Littlehampton West & Climping      |
| Angmering                             | Loxwood                            |
| Arundel                               | Middleton-on-Sea & Elmer           |
| Barnham & Walberton                   | Midhurst                           |
| Billingshurst                         | North Mundham & Runcton            |
| Birdham                               | Oving                              |
| Bognor Regis & Felpham                | Pagham & Nyetimber                 |
| Bosham                                | Pulborough                         |
| Bramber & Upper Beeding               | Rustington                         |
| Burgess Hill                          | Sayers Common                      |
| Charlton                              | Selsey (West)                      |
| Chichester                            | Selsey East                        |
| Chidham                               | Shoreham & Lancing                 |
| Copthorne                             | Sidlesham                          |
| Crawley                               | Singleton                          |
| Earnley & Bracklesham                 | Sompting                           |
| East Dean                             | Southbourne, Hermitage & Nutbourne |
| East Grinstead                        | Southwater                         |
| East Preston                          | Storrington                        |
| East Wittering                        | Tangmere & Boxgrove                |
| Ferring Coast & Rife                  | Thorney                            |
| Fishbourne                            | West Itchenor                      |
| Hassocks                              | West Wittering                     |
| Haywards Heath & Lindfield            | Westbourne                         |
| Horsham                               | Worthing                           |
| Hunston                               |                                    |

## Appendix C

### Legislation relevant to the Local Flood Risk Management Strategy

Flood Risk Regulations 2009  
The Flood and Water Management Act 2010  
The Coastal Protection Act 1949  
Catchment Flood Management Plans 2008  
Shoreline Management Plans  
Strategic Flood Risk Assessments  
The Climate Change Act 2008  
Conservation of Habitats and Species Regulations 2010  
Civil Contingencies Act 2004  
Strategic Environmental Assessment (SFRA) 2001  
Land Drainage Act 1991  
Making Space for Water  
The Natural Environment and Communities Act 2006  
The Reservoirs Act 1975  
The Water Industry Act 1991  
The Water Resources Act 1991  
The Building Act 1984  
The Health Act 2009  
The Highways Act 1980  
The Environment Act 1995  
The Countryside and Rights of Way Act 2000 (with respect to Areas of Outstanding Natural Beauty).  
National Parks and Access to the Countryside Act (1949)  
The Conservation of Habitats and Species (Amendment) Regulations 2012

# Appendix D

## The West Sussex Work Programme

Please note the work programme is a separate document.

A number of land drainage, surface water, river and coastal flood risk management schemes are currently being or will be progressed across the county by the Environment Agency, Council or District and Borough Councils. The schemes include strategy development, flood alleviation works, and ongoing management of key assets including flood walls, watercourses, sluices, drainage ditches, beach management, sea outfalls and tidal walls

These identified projects and studies will help achieve the Local Flood Risk Management Strategy's objectives, particularly objective two to 'Manage the Flood Risk in West Sussex'. The risk management authorities in West Sussex have committed to including all of their future projects on one common work programme. The work programme is a 'live' document and so is published separately. It will be regularly updated by the relevant risk management authorities and owned by the West Sussex Strategic Flood Risk Management Board. Some of the projects will be carried out solely using local funding and some will require the relevant risk management authorities to bid for funding from national FCERM Grant in Aid through the Regional Flood and Coastal Committee.

All of the projects that get national funding will go through the partnership funding approach. Due to their priority some projects have secured 100% funding because of the significant level of protection they provide a community. In other cases a contribution has been required in order to unlock the funding. The work programme will help identify who is best placed to make this contribution and which projects should be prioritised for local funding.

The work programme will highlight which wet spot or other area the works will be carried out in and the strategy objectives 1-4 are referenced against each project. By putting all of the relevant works on one programme, areas for future partnership working can be spotted and efficiencies identified.

This work programme will be monitored and updated by the West Sussex Flood Risk Management Group as appropriate over the lifetime of the strategy, with governance of the work programme sitting with the West Sussex Strategic Flood Risk Management Board.

# Appendix E

## Sources of Funding for Flood Risk Management

### Local Funding

#### West Sussex County Council

Central Government has committed funds to Lead Local Flood Authorities through the revenue support grant so that Flood and Water management related responsibilities can be implemented. At the time of writing Defra is providing £36 million a year to Lead Local Flood Authorities to deliver their flood risk management functions. The amount of money provided to each unitary or county council depends on the level of risk in the area. West Sussex County Council were allocated £177k for 2011/12, £414k for 2012/13, and £414k for 2013/14. The District and Borough Councils have delegated responsibilities for managing some of the flood risk responsibilities that have been outlined and receive some of the allocated amount via West Sussex County Council.

From 2013, of the £36 million Defra money, £15 million will continue to be distributed by Defra, and the remaining £21 million will transfer into the general funding of the county council or unitary authority. The grant and revenue sources describe can be boosted by small incomes generated from Ordinary Watercourse Consenting and in the future, applications for Sustainable Drainage.

Aside from the work as LLFA, West Sussex County Council carries out a programme of drainage works under its work as Highways Authority. As well as maintaining its existing assets (such as road gullies, culverts and roadside ditches) a budget of approximately £1m per year is spent on works to reduce flooding across the county.

Within the West Sussex County Council total budget there are other funding streams that can be spent on flood risk. Kickstart was a £15 million allocation for community projects flood risk projects. Operation Watershed is the money allocated by West Sussex County Council to carry out some of the recommendations in the West Sussex Flood Report on the June 2012 flooding. This was an £8.25 million pot to fund improvement works in key areas that flooded. Another Defra initiative is the £5 million Pathfinder Project. West Sussex County have successfully bid for £298,000 of the Pathfinder funding for a flooding awareness and property level protection scheme.

West Sussex also contributes via the Local Levy to the Southern Regional Flood and Coastal Committees fund for flood alleviation schemes.

## **District and Borough Councils**

All the local authorities in West Sussex have officers with responsibility for flood risk management duties. The level of funding available to complete maintenance and new flood risk management works is dependent on risk of flooding in the area, the urban and rural makeup of the communities, the level of historical activity and the political priorities for each council. Some funding is available from contributions from local development within the section 106 or CIL schemes detailed below. All of the councils carry out some level of funding to investigate, protect and improve flood risk management within their boundaries.

The councils use some local funding to maintain the flood defence assets owned by the council as landowner or to maintain vital structures which help protect their communities. Some local funding is spent on contributions, in some cases very significant funds, to larger schemes promoted either by the councils themselves or by the Environment Agency which attract some national funding. These schemes, as well as protecting existing properties, can provide some regeneration potential for local areas.

The district and borough authorities bordering the sea also have powers and duties as coastal protection authorities. They carry out works to maintain and improve the level of flooding and erosion defences through local budgets and through applying for national funding.

### **Community Infrastructure Levy (CIL)**

The community infrastructure levy came into force in April 2010 and allows Local Authorities to raise funds for flood risk management from new development. The Planning Act 2008 covers the Infrastructure Levy that states the levy can contribute toward a variety of infrastructure including transport, schools, hospitals, parks and schools and flood defences.

### **Section 106 funding – developer contributions**

Section 106 of the Town and Country Planning Act 1990 facilitates the provision of funds to support services or infrastructure. The agreement is made at the planning application stage between the developer or land owner, and the local authority. The funds can be used for flood risk management should a proposal increase flood risk. Community Infrastructure Levy (CIL) was introduced in April 2010 as a mechanism for the developer contributions.

### **Town and Parish Councils**

The Localism Act enables Town and Parish Councils to spend money on flood risk management. This means that local members can do works to protect their area or could contribute to a wider local scheme to unlock 'Grant in Aid' funding if partial funding has been achieved.

### **Internal Drainage Boards**

An Internal Drainage Board (IDB) is a local public authority that manages water levels. They are an integral part of managing flood risk and land drainage within areas of special drainage need in England and Wales. Internal Drainage Boards obtain income from rural land owners who pay agricultural drainage rates, and from District and Boroughs who are required to pay

local levies. The Internal Drainage Boards spend their income on maintaining the watercourses, capital asset renewal and refurbishment, pumping station running costs and precepts payable to the Environment Agency. At the time of writing an IDB review is assessing the Environment Agency operation of IDB's with a view to restructuring how these authorities conduct their work. The review is likely to affect the responsibility as it stands.

The three IDBs completely within West Sussex (Arun, Adur and South West Sussex) raise a total of approximately £300k per year.

### **Southern Water**

Southern Water's income and expenditure on flood risk is regulated by Ofwat the Water Services Regulation Authority. Funding is not allocated by county but an amount is allocated to tackle sewer flooding and infrastructure improvements per 5 year period. From 2010 – 2015 £2 billion was allocated for improving assets, improving services and environmental improvements. Southern Water will be able to contribute to combined sewer flood risk projects and unlock 'Grant in Aid' funding.

### **Environment Agency**

The Environment Agency contributes to toward funding its own flood risk management activities across the county; particularly flood awareness, flood warning and construction and maintenance of flood risk management assets. It is also able to contribute toward other schemes and activities where these meet its wider objectives within its remit set by Defra and central government.

### **Regional Flood and Coastal Committee**

The key streams of funding for national flood risk management are managed in West Sussex by the Southern Regional Flood and Coastal Committee. These streams are the 'Grant in Aid' (national funding from central Government), local levies (raised by the LLFAs across the region), precepts (collected from Internal Drainage Boards and general landowner drainage charges). The RFCC allocates its local funding stream, the local levy, to individual schemes across the region which may not achieve the national funding or require additional work to investigate major schemes before national funding can be applied for.

### **National Funding – Partnership Funding**

Defra has recently changed the way in which risk management authorities can access the national funding pot for flood risk management activities. This funding is known as Flood and Coastal Erosion Risk Management Grant in Aid (FCERM GiA) and nationally in 2014/15 the total amount provided by government was £343.8m. In 2014/15 the allocation of Grant in Aid across the Southern RFCC region was £43.2m. This is the amount for new projects only, maintenance for existing assets came to £226.4m nationally, and this is for the revenue work carried out by the Environment Agency only and does not include the amounts spent locally by councils or other owners of assets.

Under the scheme funding for new defences can be gained based on the benefits delivered (known as 'payment for outcomes'). Benefits are calculated by assessing indicators' such as the number of households protected, the damages being prevented, the impact on

vulnerable communities, environmental benefits, and benefits to businesses and agriculture amongst others. The Government developed the methodology in line with the Pitt Review recommendations.

Defra has devised a set of principles to support the new national funding system:

- Encourage an increase in total investment in flood risk management by operating authorities, beyond levels provided by central Government alone;
- Enable more local choice within the system and encourage innovative and cost-effective options to be promoted;
- Rather than some projects being fully funded and others not at all, now some funding will be available to all potential projects;
- Funds from central government should prioritise protecting those most at risk and least able to help themselves;
- All flood and coastal erosion projects, regardless of which risk management authority is leading it, should be treated equally based on the benefits delivered and damages avoided.
- The general taxpayer should not pay to protect new development in areas at risk of flooding, now or in the future;
- Greater local input and decision making should not come at the expense of creating a stable pipeline of projects;
- All investment should be made within a nationally consistent framework to take account of policies and findings within Catchment Flood Management Plans;
- Maintain the widespread take-up of flood insurance by helping to keep insurance affordable through risks being managed properly.

The funding process aims to encourage those that will benefit from the flood improvement works to contribute financially. This mechanism was put in place to draw in funds and bolster the Flood Defence Grant in Aid pot of money.

Using this funding process some projects will be fully funded while some will achieve only partial funding. The level of funding that can be allocated to the project from the national budget is decided on the amount of benefit that the project would deliver based on a set of calculations. This number is then compared against the actual cost of the project and this is known as the partnership funding score. A score of 100% means that the cost of the project matches exactly what can be paid from national funds.

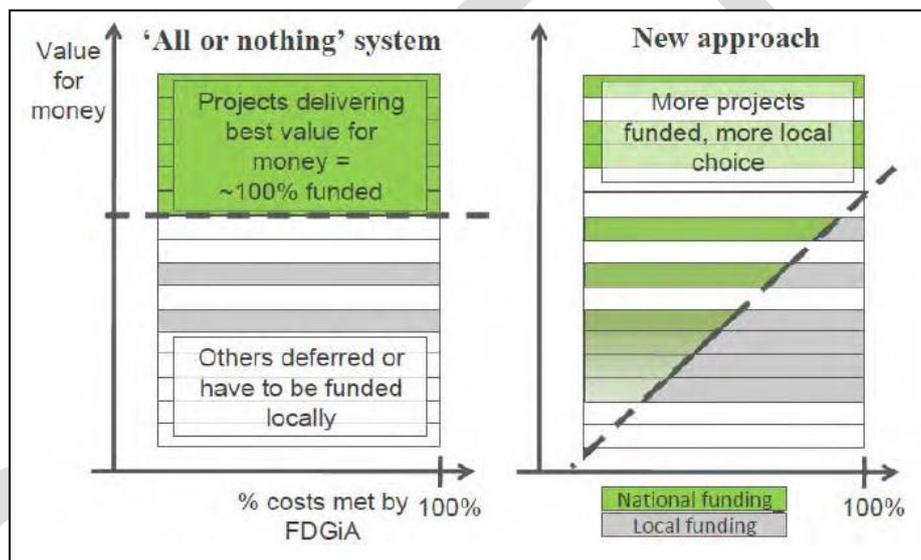
If partial funding is achieved, the shortfall in the total project cost is expected to be met by raising contributions or by revising the proposal. For example a project with a partnership score of 75% would expect 25% of the money to be found from local contributions. It is anticipated that this process will enable Defra to spread its finite resources more widely to fund more projects. The comparison between this approach and the old policy is shown in figure E1.

Each year the risk management authorities will agree which projects should be put forward for national funding and then these projects will be considered by the elected members who form the Southern Regional Flood and Coastal Committee to see if they are suitable for funding. The partnership scores of all the projects submitted nationally are compared and the national budget divided up amongst all the RFCCs across the county. Because of the limited budget and large numbers of schemes only those with best scores (or other

overriding priority such as Health and Safety requirements or duties in law) will be funded. This can mean that even if a scheme gets a partnership funding score of over 100% (and therefore should be fully funded by GiA) there may still not be enough money to go around. In general schemes with higher partnership funding score (for example of say 150% or more) stand a better chance of being allocated money than those with a lower score.

It is worth noting that additional local contributions from councils, business or communities are taken into account when considering the overall score. The greater the contributions that can be made locally the more chance a scheme has of getting national funding as well.

This process aims to encourage those that will benefit from the flood alleviation scheme, such as private householders, community businesses and developers, to contribute financially. In many cases the major contributors to schemes are the local councils themselves, who may allocate money from their normal budgets to protect the communities they serve.



**Figure E1 - Old 'all or nothing' system versus new 'Partnership Funding' policy.**

Applications are open to the Environment Agency, West Sussex County Council, District and Borough councils, and Internal Drainage Boards. The organisation which applies for funding is usually responsible for taking the project forward, organising any contributions required and for delivering the benefits. Funding from the Regional Flood and Coastal Committee's local levy is also available for flood alleviation schemes, to tackle tidal, coastal, fluvial and surface water flood risk

More information about the national funding process can be found at <https://www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-change/supporting-pages/funding-flood-and-coastal-erosion-risk-management-in-england>

# Appendix F

## The Strategy Action Plan

The following table sets out the actions that will be progressed over the coming years by the Risk Management Authorities in West Sussex and other key partners. These actions will help work towards achieving the Local Flood Risk Management Strategy's objectives. The managing and supporting partners who will deliver each action are detailed as well as the timescales over which the actions will be achieved.

The plan also includes any other strategic non – capital works which may help deliver the strategy objectives.

The Strategy Action Plan will be reviewed on an annual basis or more frequently if required.

**KEY:**

WSCC - West Sussex County Council

EA – The Environment Agency

D+B – District and Borough Councils

SDNPA – South Downs National Park Authority

SW/TW – Southern Water/Thames Water

HA – Highways Agency

SRF – Sussex Resilience Forum and other emergency responders

TC/PC – Town Councils/Parish Councils

NFF – National Flood Forum

## Objective 1 – Understanding the areas that flood

| Actions   | Delivery Partner(s)  | Other Partner(s)  | Timescale  |
|---|--|---|--|
| <b>1A Increase the amount of evidence about local flooding that is collected and use it more wisely</b>   | WSCC   | EA, D+B, SW/TW TC/PC  | Ongoing  |
| <b>1B Improve Surface Water and Groundwater Flooding Maps</b><br><br>(New national surface water flood risk mapping available Dec 2013)   | WSCC   | EA, D+B, SW/TW  | Ongoing  |
| <b>Other Actions:</b><br><br>Review of West Sussex Preliminary Flood Risk Assessment<br><br>Worthing Surface Water Management Plan<br><br>Elmer Sands Surface Water Management Plan<br><br>Lidsey Catchment Surface Water Management Plan<br><br>Surface Water Management Plans for the Manhood Peninsula, West Chichester, the Lavant Valley, Lancing and Easebourne.<br><br>Continuing capture and analysis of flood incident data and investigations into significant flood events | WSCC<br><br>Worthing BC<br><br>WSCC/Arun DC<br><br>Arun DC<br><br>WSCC<br><br>WSCC | EA, D+B, SW/TW SDNPA<br>WSCC, EA<br>EA, SW<br><br>WSCC, EA, SW<br><br>EA, D+B<br><br>EA, D+B, SW/TW SDNPA, TC/PC, HA<br><br>EA, D+B | June 2017<br><br>2013<br><br>2014<br><br>2014<br><br>2014/5<br><br>Ongoing with quarterly updates from D+B |

| <b>Objective 2 – Manage the Flood Risk in West Sussex</b>  |                            |                              |                  |
|--|----------------------------|------------------------------|------------------|
| <b>Actions</b>   | <b>Delivery Partner(s)</b> | <b>Other Partner(s)</b>      | <b>Timescale</b> |
| <b>2A Create a prioritised programme of capital flood risk management works for the county</b>   | WSCC, EA                   | D+B, SW                      | April 2014       |
| <b>2B Avoid increasing flood and coastal erosion risk by encouraging best practice for the maintenance of assets and preventing inappropriate development.</b> | D+B, EA, SDNPA, WSCC       | PC/TC, SW/TW                 | Ongoing          |
| <b>2C Continued working to improve surface water drainage across the county</b>  | WSCC                       | D+B, EA, SW/TW, TC/PC, SDNPA | Ongoing          |
| <b>2.D Reducing flood risk smaller areas at risk through improved warnings, local scale works and local resilience</b>   | SRF                        | EA, WSCC, D+B, SW/TW, NFF    | Ongoing          |
| <b>Other Actions;</b>  |                            |                              |                  |
| Operation Watershed  | WSCC                       | PC/TC                        | 2013-15          |
| Defra Flood Resilience Community Pathfinder Scheme   | WSCC, NFF                  | D+B, EA                      | 2013-15          |
| Ongoing maintenance works; including works to ensure local watercourses are maintained by riparian owners  | EA, WSCC, SW/TW , D+Bs     | Private asset owners         | Ongoing          |

**Objective 3 - Enable people, communities, business and public bodies to work together more effectively**

| <b>Actions</b>   | <b>Delivery Partner(s)</b>         | <b>Other Partner(s)</b>      | <b>Timescale</b>   |
|--|------------------------------------|------------------------------|--------------------|
| <b>3A Improving communications between communities and public bodies</b>                                       | WSCC, D+B, EA, SDNPA,              | NFF, TW/SW, TC/PC            | Ongoing            |
| <b>3B Information sharing to improve awareness of flood risk</b>   | WSCC, D+B, EA, SDNPA, TW/SW, TC/PC |                              | Ongoing            |
| <b>3C Continued partnership working with other Risk Management Authorities</b>                                 | WSCC                               | D+B, EA, SDNPA, TW/SW, TC/PC | Ongoing            |
| <b>3.D Seek the best ways of enabling Partnership Funding for schemes</b>                                      | WSCC, D+B, EA,                     | SW/TW, TC/PC                 | 2014               |
| <b>Other Actions:</b>  |                                    |                              |                    |
| Sharing information across all public bodies websites  | WSCC, D+B                          | EA,                          | Ongoing            |
| Regional liaison on flood risk matters with southern Lead Local Flood Authorities through the South East Seven | WSCC                               |                              | Ongoing, Quartley  |
| Regional Liaison through the Southern Regional Flood and Coastal Committee                                     | WSCC, EA                           | D+B, SW                      | Ongoing, Quarterly |

**Objective 4 - Put communities at the heart of what we do and help West Sussex residents; both during flood events and to recover as quickly as possible after incidents**

| <b>Actions</b>  | <b>Delivery Partner(s)</b> | <b>Other Partner(s)</b> | <b>Timescale</b> |
|---|----------------------------|-------------------------|------------------|
| <b>4A Continued flood event planning with other emergency responders</b>        | WSCC, SRF                  | TC/PC                   | Ongoing          |
| <b>4B Improving community resilience</b>  | WSCC, D+B, EA, SRF         | TC/PC, SRF              | Ongoing          |
| <b>Other Actions:</b><br><br>Defra Flood Resilience Community Pathfinder scheme | WSCC, NFF                  | D+B, EA                 | 2013-14          |

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