# Flood Risk Management in Worcestershire

Annual Report 2017

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#### **GLOSSARY**

Acronym	Definition
CFMP	Catchment Flood Management Plan
CIL	Community Infrastructure Levy
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EU	European Union
FDGiA	Flood Defence Grant in Aid
FMfSW	Flood Map for Surface Water
FRM	Flood Risk Management
FRMSCG	Flood Risk Management Strategic Co-ordinating Group
FRR	Flood Risk Regulations
FWMA	Flood & Water Management Act
GIS	Geographical Information System
HRA	Habitats Regulation Assessment
IDB	Internal Drainage Board
LEP	Local Economic Partnership
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LRF	Local Resilience Forum
LSIDB	Lower Severn Internal Drainage Board
MAFP	Multi-agency Flood Plan
NFU	National Farmers Union
OWC	Ordinary Watercourse
PFR	Property Flood Resilience
PLP	Property Level Protection
PLR	Property Level Resilience
PFRA	Preliminary Flood Risk Assessment
RFCC	Regional Flood & Coastal Committee
RMA	Risk Management Authority
SAB	SUDS Approving Body
SEA	Strategic Environmental Assessment
SEP	Strategic Economic Plan
SFRA	Strategic Flood Risk Assessment
SLA	Service Level Agreement
STWL	Severn Trent Water Limited
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
SWDP	South Worcestershire Development Plan
WCC	Worcestershire County Council
WLDG	Worcestershire Land Drainage Group

#### 1. INTRODUCTION

Although Worcestershire has not experienced any significant flooding during 2017 the severe flood events in the north of England have been a reminder of the need for a continued focus on reducing flood risk. This has been reenforced by the heavy rain and high watercourse levels experienced in Worcestershire over the Christmas 2017/18 period, leading to the closure of several roads and river crossings.

Accordingly flood risk management remains a high priority for Worcestershire County Council and the other Risk Management Authorities ie the District Councils, the Environment Agency (EA), Severn Trent Water Ltd (STWL) and the Lower Severn Internal Drainage Board (LSIDB).

Implementation of the Local Flood Risk Management Strategy action plan over the last 12 months has led to progress on a significant number of schemes and initiatives and it has been regularly scrutinised and updated.

During the last 12 months the RMAs have continued to scrutinise planning application drainage plans in order to ensure that new developments are at minimal risk of flooding and that they have a neutral or positive impact on flood risk elsewhere.

The increasing emphasis on using natural solutions to hold back and slow water down upstream of where it can have a negative impact has been significantly bolstered by confirmation that the Environment Agency has secured £750kof Government funding for a natural flood management project in Worcestershire and Gloucestershire.

The Risk Management Authorities have continued to work increasingly closely with each other in Worcestershire over the last 12 months and with other partners, local communities and landowners. By working together on the delivery of more flood alleviation schemes, management of watercourses and surface water, increased community resilience and improved drainage, sewerage and flood defence infrastructure more homes, businesses and pieces of important infrastructure have had their risk of flooding reduced.

#### 2. UNDERSTANDING AND PRIORITISING FLOOD RISK

#### 2.1. Local Flood Risk Management Strategy

Flood risk management in Worcestershire has continued to be guided by the Local Flood Risk Management Strategy (LFRMS) and particularly its regularly updated action plan. This contains a number of key actions which have ensured a continuing increase in the understanding of flood risk and efficient prioritisation of resources such as the installation and scrutiny of water level gauges and weather monitoring stations and the review of the Preliminary Flood Risk Assessment.

#### 2.2. Preliminary Flood Risk Assessment review

The Preliminary Flood Risk Assessment (PFRA) for Worcestershire was first produced in 2011 in response to the EU Flood Directive, transposed into the Flood Risk Regulations in the UK.

The Flood Risk Regulations assessed the risk of flooding at a strategic level and identified a number of 'Areas of Significant Risk' across the country, of which one was centred on the West Midlands conurbation and bordered Worcestershire.

During 2017 PFRAs underwent their six-year review, as required by the Flood Risk Regulations, first at a strategic level by the EA and then more locally by the LLFAs.

As part of the review a new methodology was introduced by the EA for identifying 'areas of significant risk' and in Worcestershire this spotlighted the central area of Redditch. As a result a multi-RMA group was established to assess the flood risk in Redditch in more detail and produce a plan for its mitigation. The assessment stage is currently ongoing.

#### 2.3. Worcestershire Surface Water Management Plan

The Worcestershire Surface Water Management Plan (SWMP) continues to provide the key evidence base for the Local Flood Risk Management Strategy. It identifies over 1,700 known floodspots across Worcestershire – each one a location where a flood is known to have occurred which had an impact on property, business or infrastructure.

Detailed information is held about each location which enables them to be investigated and prioritised. This information is updated as investigations are carried out, mitigation schemes completed and new floodspots identified following further flood events.

The SWMP data has continued to help prioritise the procurement and deployment of resources and to inform plans for new infrastructure development.

Information about known past floodspots is currently being augmented by the identification and investigation of locations which haven't flooded but which are considered to be potentially at risk of flooding in the future

#### 2.4. Local Flood Risk Management Plans

Multi-RMA working groups have continued to assess and plan mitigation measures to address flooding where there are high concentrations of past and future potential floodspots.

A standard 'Local FRMP' process and reporting structure has been adopted and followed at a number of locations such as Bromsgrove, Droitwich, Hagley and, more recently, Redditch.

#### 2.5. Investigations

The RMAs have continued to carry out onsite and desk top investigations of hundreds of floodspots throughout the County to clarify how and why flooding occurred, confirm the impact and determine what, if any, interventions are appropriate. These investigations also help to confirm relevant roles, responsibilities, timescales and necessary resources.

In addition, more than 300 land drainage investigations and 1,500 highway drainage surveys and investigations have been carried out over the last 12 months.

#### 3. REDUCING THE LIKELIHOOD AND IMPACT OF FLOODING

#### 3.1. Flood alleviation schemes

A number of flood alleviation schemes have been completed or further developed over the last 12 months reducing the risk of flooding to more properties, businesses and pieces of critical infrastructure. Locations include:

- Callow End
- Hagley
- Bewdley
- Broadway
- Kidderminster
- Feckenham
- Redditch
- Ripple

During the last year the RMAs have worked with the Regional Flood & Coastal Committee (RFCC) to secure a place within its Medium Term Plan for schemes worth over £5m, which will reduce the risk of flooding for 555 homes over the next 4 years. In addition, a number of other schemes have been prepared for introduction into the programme which will see the investment rise to over £7.5m and protect another 400 homes.

A GIS-based 'Register of FRM Schemes' has been developed over the last 12 months which includes all recent, current and forthcoming schemes in Worcestershire. This is the first time that information about schemes being led by all of the RMAs has been captured and made visible to them in one place.

#### 3.2. Highway drainage improvement schemes

Over 100 more highway drainage improvement schemes have also been completed over the last 12 months bringing the total number over the last 10 years to over 1,000.

In addition, delivery of the three year, Worcestershire Local Enterprise Partnership-funded programme of larger scale capital highway flood adaptation schemes has made good progress as follows:

- A44 Wood Norton complete
- A44 Powick complete
- A44 Craycombe complete
- A44 Worcester planning permission secured and construction to commence early 2018
- A4104 Upton-upon-Severn detailed scheme design developed and due to be constructed in 2018
- B4084 Pershore scheme designed for future potential implementation

The schemes will increase the resilience of these key transport routes, helping to reduce congestion and ensure that Worcestershire stays open for business.

#### 3.3. Review of highway 'wetspots'

Locations on the highway where there is water on the surface even when it's not raining are known as 'wetspots'. They represent the highest priority for attention due to the level of risk to highway users, particularly in the winter when ice can greatly exacerbate the danger.

During the last 12 months the 'wetspot' policy, the 'wetspot' register and the locations on the register have all been reviewed and updated.

The 'wetspot' locations which remain on the register are either being mitigated or undergoing rapid investigation ahead of mitigation.

In the meantime, all 'wetspots' on the register continue to be given priority gritting attention and have warning ice boards erected.

#### 3.4. Highway drainage maintenance

Essential ongoing maintenance of highway drainage infrastructure has continued over the last 12 months. For example another 200 broken gully connections have been repaired over the last 12 months and approximately 30,000 gullies emptied.

# 3.5. Spatial Planning & Sustainable Drainage Systems (SuDS) The RMAs have assessed and commented on the drainage plans of over 1,500 planning applications over the last 12 months.

In addition, draft local SuDS guidelines have been produced to augment the revised National Guidelines and they will be finalised in early 2018.

Other planning related work has included:

- Contribution to the development of the Wyre Forest Local Plan and its water and flood risk management policies
- Contribution to the development of Game Changer sites including Worcester Six and the Redditch Eastern Gateway
- Contribution to the draft Infrastructure Strategy for the County and the Infrastructure Development Plans which support the adopted and emerging District Local Plans.
- Response to and work with communities developing their Neighbourhood Plans
- Contribution to the emerging Minerals Local Plan and its water and flood risk management policies
- Contribution to key infrastructure projects including :
  - Worcestershire Parkway station
  - Southern Link Road phase 3 and 4

#### 3.6. Ordinary Watercourse management

The district council land drainage partnerships and the Lower Severn Internal Drainage Board have continued to ensure that the extensive network of smaller watercourses and ditches are appropriately managed and maintained. This has been achieved through:

- Inspection of over 100km of the watercourse network
- Liaison with riparian owners about maintenance and management of watercourses on their land
- Implementation of land drainage consenting duties and powers including more than 60 applications processed and numerous others avoided by pre-application discussions
- Implementation of land drainage enforcement powers including more than 100 successful informal enforcement actions
- Recording and monitoring of flood risk management assets on the statutory 'Register & Record of Structures & Features'
- Direct maintenance by the Lower Severn Internal Drainage Board of 34km of watercourse in the Longdon and Eldersfield area of the County

#### 3.7. Main River management

The Environment Agency (EA) has continued to deliver its responsibility for the management of flood risk on the 'Main Rivers' including:

- Construction of the £4m flood alleviation scheme on the Badsey Brook at Broadway. This scheme will reduce flood risk for approximately 250 properties, completion due summer 2018.
- Further implementation of the Beales Corner Property Level Resilience (PLR) scheme in Bewdley. The innovations and solutions being developed at Beales Corner will help to reduce flood risk on historic properties across the country.
- Development of flood alleviation schemes at Severn Stoke and Toronto Close in Powick. All partners are working closely with the local communities to develop affordable and effective schemes.
- Further development of PFR schemes in Worcester, Himbleton, Evesham, Wickhamford and Droitwich.
- Maintenance of the EA's existing flood defences and structures in good condition, ensuring they are fit for purpose when next called upon in times of flood.
- Proactive maintenance works on more than 20 watercourses in Worcestershire including vegetation, debris and silt removal.

In its strategic role, the EA has, during the last 12 months:

- Co-ordinated the ongoing review and development of the Regional Flood & Coastal Committee 6 year medium term plan of FCRM schemes, working with RMA's to develop new schemes and further reduce flood risk to communities within Worcestershire.
- Secured significant extra national funding for a programme of natural flood management projects with £750K secured for Worcestershire.
- Processed more than 30 Environmental Permitting Regulation applications.
- Responded to over 50 planning application consultations.
- Provided flood risk technical support and guidance on a number of major infrastructure projects including the New Road and Upton highway flood adaptation schemes, Southern Link Road Phases 3 and 4,
- Worked with partners to align economic growth and local development plans with flood and environmental risks but moreover align the opportunities across all programmes.
- Worked in partnership with the Canals and River Trust, Natural England and the Severn Rivers Trust to develop the £19 million 'Unlocking the Severn' scheme. This will improve the free movement of fish, including the rare twaite shad, and involve amendment of a number of weirs on the Rivers Severn and Teme to allow fish passage.

In order to deliver its Warn, Inform and Winter Ready campaign the EA:

- Is prepared to take action this winter wherever it is needed. It
  has further improved its flood response and invested £12.5m
  in new kit including vehicles, 40km of temporary flood
  barriers and 250 pumps (12 of which are ultra-high volume)
  and 500,000 sand bags. It has around 6,500 trained staff
  across the country, ready to respond to flooding, including
  500 flood support officers.
- Regularly trains and exercises with the military to ensure that their support can be called upon when required. At any time the military have approximately 1200 soldiers trained to support flood incident response.
- Is making the most of new technology to prepare for and respond to floods including:
  - drones and aeroplanes to map river channels and the extent of flooding
  - nimble, remote-controlled boats to help monitor river flows and collect data
  - a flood warning system to directly alert over 1.2 million people at the touch of a button when flooding is expected.

- a wide range of social media and media channels to increase the reach of warning messages.
- the ability to dispatch incident command vehicles to the scene to gather up-to-the minute intelligence and inform response
- Has awarded a new Incident Management Logistics Contract to store and deploy its temporary flood defences to ensure that they are wherever they need to be across the country within 12 hours.
- Has signed up over 1.2 million people to the Environment Agency's free flood warning service, which sends a message directly by voice message, text or email when a flood warning is issued. This winter the EA is automatically adding thousands more mobile customers to the service.

#### 3.8. Natural flood management

Over the last 12 months the RMAs and other key partners have continued to explore ways in which water can be held back and slowed down upstream of where it has a negative impact.

A number of so called 'catchment based' or 'natural flood management' initiatives have emerged which, in addition to reducing flood risk, have had multiple potential benefits including improved biodiversity, landscape, water quality, soil quality and recreation.

Within the last 12 months the EA has secured £2.3m funding from Defra for a programme of natural flood management projects across the West Midlands. This programme includes £750k for a project within Worcestershire and Gloucestershire which will focus on three specific catchment areas:

- The River Avon tributaries River Isbourne, Merry Brook and Badsey Brook
- Dowles Brook and
- Barbourne Brook

The EA and WCC are working closely together on this project which includes funding for a project officer and a number of small scale schemes. The project will be delivered by a close partnership between WCC, the EA, the other RMAs, other local partners within Worcestershire and across the Gloucestershire border and the relevant local communities.

#### 3.9. Sewerage system management

Severn Trent Water Ltd has continued to deliver its flood risk management duties through a range of activities and schemes over the last 12 months, in close collaboration with the other RMAs, including:

 Responding to and dealing with reports of sewer flooding – over 100 internal sewer flooding and nearly 600 external

- sewer flooding incidents dealt with in the STWL Worcestershire & Gloucestershire operational area
- Monitoring and management of the sewerage network through telemetry, CCTV, asset surveys and hydraulic modelling
- Preparing sewerage network modelling projects in Kidderminster, Malvern and Evesham
- Increasing the proactive sewer surveying, cleansing and repairing programme to reduce the risk of flooding from sewers
- Repairing and improving nearly 700 metres of sewer in Droitwich to compliment the County Council's town centre public realm improvement scheme
- Replacing nearly a mile of sewer and upgrading a pumping station at Madresfield
- Delivering customer education programmes to reduce the incidents of sewer misuse (incorrect items being disposed of into sewers) which can lead to blockages and flooding including more than a dozen visits to schools in Worcestershire
- Responding to pre-planning developer enquiries seeking new connections to the sewerage system (350 during 2017) and responding to local planning authorities on planning applications
- Delivering a flood alleviation scheme at Hagley in partnership with Worcestershire County Council, the EA, North Worcestershire Water Management and the local community
- Contributing to implementation of the EA property flood resilience scheme at Beale's Corner in Bewdley
- Delivering a partnership flood alleviation scheme at Linnet Rise in KidderminsterDeveloping other flood alleviation schemes at Bromsgrove, Bournheath, Childswickham, Wythall, Broadmarston, Broadway and Kinsham
- Progressing proposals to increase the capacity of the sewerage system at Ryall and Malvern
- Installing Property Flood Resilience at 90 properties across the region including a number in Worcestershire
- Improving and exercising deployment of the pumps at Hylton Road in Worcester
- Supporting the Worcestershire Wildlife Trust, the Environment Agency and Bromsgrove District Council with the 'Love your Rivers' Bromsgrove project
- Contributing to a number of ongoing multi-agency engagements with community flood groups

#### 3.10. Emergency planning and response

WCC and district council emergency planning and drainage officers have worked with other RMA partners, responders and the overarching West Mercia Local Resilience Forum in order to:

- Develop a network of local rain gauges to assist in future investigations and flood warning
- Finalise an updated and improved resilience plan for Beale's Corner in Bewdley
- Review and produce streamlined versions of the Multi-Agency Flood Plans for each district
- Review and produced a streamlined strategic overview Multi-Agency Flood Plan document for use by Silver Command
- Administer and support the Worcestershire Severe Weather Group
- Attend parish council emergency planning for aand work with local communities to develop local resilience plans
- Further develop individual organisation response plans
- Install more remote watercourse monitoring equipment
- Monitor and respond to watercourse gauge triggers
- Review sandbag policies
- Further develop the Dick Brook Rapid Response Catchment resilience plan
- Undertake multi agency exercises with all partners to test plans, incl Bewdley and Hylton Road Worcester

#### 4. GOVERNANCE & PARTNERSHIPS

#### 4.1. Regional Flood & Coastal Committee

The English Severn & Wye Regional Flood & Coastal Committee (RFCC) comprises elected representatives from each of the LLFAs within the catchment area along with a number of EA representatives and co-opted specialists.

The RFCC plays an important role in co-ordinating flood risk management including assessing proposed flood related schemes and allocating both Local Levy and Central Government Flood Defence Grant in Aid capital funding via its 6 year medium term plan of flood alleviation schemes. It has met 5 times over the last 12 months and its next meeting is on 16<sup>th</sup> January 2018 in Worcester.

#### 4.2. Other groups, partnerships and fora

Representatives from WCC, the district councils and often the other RMAs have attended meetings and fora including:

- Worcestershire FRM Strategic Coordinating Group
- · Worcestershire Land Drainage Group
- District Council Land Drainage Partnership Boards
- Regional EA / LLFA Networking Group
- The West Mercia LRF (Worcestershire) Severe Weather Group
- The Local Government Flood Forum
- The Worcestershire Local Nature Partnership
- The Worcestershire Green Infrastructure Partnership
- The Worcestershire Infrastructure Steering Group
- The Worcestershire Local Transport Board

#### 5. COMMUNICATIONS & ENGAGEMENT

#### 5.1. Local flood groups

Officers from the RMAs have worked closely with a number of community flood groups over the last 12 months and some examples include:

- Sedgeberrow about upstream catchment management on the River Isbourne
- Himbleton about a range of drainage issues throughout the parish
- Astley about early warning systems on the Dick Brook and community resilience plans
- Callow End about their community led flood alleviation scheme
- Bewdley about the temporary barriers and Property Flood Resilience
- Wolverley about a range of local flood risk management mitigation measures
- Tenbury about the re-establishment of a local flood group, the potential for a flood alleviation scheme and community resilience measures

This work has largely been facilitated by the Community Engagement Officer, employed via the Bewdley-based charity the National Flood Forum and shared with Warwickshire County Council.

#### 5.2. Parish Lengthsmen

Parish Lengthsmen have continued to play an increasingly important local role in contributing to the maintenance of local drainage infrastructure such as clearing gullies and maintaining gripps in the highway verge.

#### 5.3. Flood action campaigns

The EA's Autumn 2017 '#flooding' campaign targeted young people and their awareness of flood risk.

The campaign included engagement with students at the University of Worcester and communications via social media, web site bulletins and press releases. It promoted awareness and use of social media to receive flood information and warnings

In early 2018 a multi-agency flood awareness campaign will take place in and around the City of Worcester.

#### 5.4. Anniversary of 2007 flood event

The RMAs produced a number of media releases to respectfully mark the 10 year anniversary of the 2007 flood event. A number of them also participated in a public event in Upton upon Severn.

#### 6. PLANS, POLICIES & STRATEGIES

#### 6.1. Local Flood Risk Management Strategy

The Strategy Action Plan articulates a number of challenging targets for the RMAs over the coming five years. Progress with implementation has been monitored by the Worcestershire Flood Risk Management Strategic Co-ordinating Group.

#### 6.2. Other related plans, policies and strategies

A range of other related plans, policies and strategies have been produced and / or contributed to by the RMAs over the last 12 months including:

- Preliminary Flood Risk Assessment
- Worcestershire Surface Water Management Plan
- Local Flood Risk Management Plans
- Multi-Agency Flood Plans
- Green Infrastructure Concept Plans
- Emerging Worcestershire Minerals Local Plan
- District Local Plans
- Neighbourhood Plans
- Catchment Flood Management Plan

#### 7. FUTURE SCOPING

#### 7.1. Future actions

Significant progress has been made over the last 12 months but momentum needs to be maintained and investment continued in order that flood risk and its potential impacts can be further reduced.

Priorities for the next 12 months include:

- Continued implementation of the Local Flood Risk Management Strategy Action Plan
- Development and implementation of the flood risk management plan for the new Redditch Area of Significant Flood Risk, as identified by the review of the Preliminary Flood Risk Assessment
- Implementation of the Worcestershire Natural Flood Risk Management Project
- Securing additional, supplementary sources of funding for FRM delivery
- Completion of schemes already on the RFCC 6 year Medium Term Plan
- Introduction of new schemes onto the RFCC 6 year Medium Term Plan
- Further development of plans for the STWL Asset Management Plan 7 (2020-2025)
- Ongoing delivery of the highway drainage scheme programme
- Greater use of natural solutions / upstream catchment management
- Further development and testing of emergency plans
- Continued maintenance of FRM infrastructure inc highway drainage and flood defences
- Further development and monitoring of the Register & Record of flood risk assets and features
- Further development and updating of the Register of FRM Schemes
- Further engagement with communities and landowners focusing on the development of local engagement and resilience
- Ongoing commitment to scrutinise planning application drainage plans
- Exploration of options for the future maintenance of SuDS
- Further integration between economic growth, infrastructure development and flood risk management
- Development of a new 'vocabulary' to better describe the size and likelihood of flood events, linking to work by the Met Office, Cambridge University, Defra Science Advisory Group and others

#### **APPENDIX 1. RISK MANAGEMENT AUTHORITY ROLES**

Risk Management Authority	Core flood risk management role
Environment Agency	Main rivers, the sea and reservoirs
Water Authority (STWL)	Sewerage system
Lead Local Flood Authority (WCC)	Surface water, groundwater, ordinary watercourses, Local Flood Risk Management Strategy, local leadership
Highway Authority (WCC)	Flooding caused by rain falling on the highway, highway drainage
District Councils (BDC, MHDC, RBC, WCityC, WDC, WFDC)	Ordinary watercourses
Internal Drainage Board (LSIDB)	Ordinary watercourses

## APPENDIX 2. ROLE OF WORCESTERSHIRE COUNTY COUNCIL AS LEAD LOCAL FLOOD AUTHORITY

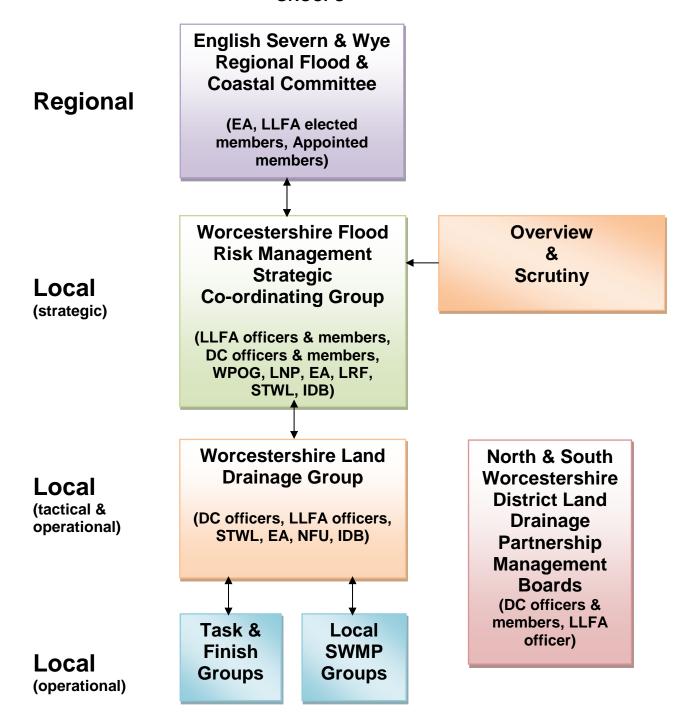
The Flood and Water Management Act 2010 (the Act) designated upper tier / unitary local authorities as Lead Local Flood Authorities (LLFA) and gave them a number of duties and powers including those listed below.

LLFA Role	Summary of requirements
Duty to publish a Local Flood Risk Management Strategy	Develop, maintain, apply and monitor a strategy for local flood risk management of the area.
Duty to investigate flooding	Co-ordinate the investigation of significant flood events.
Duty to produce an asset register	Maintain a register and record of structures and features which have a significant impact on flood risk.
Power to designate flood risk assets	Designate structures and features that affect flooding in order to safeguard them.
Power to carry out works	Undertake works to manage flood risk from surface runoff and groundwater.
Duty to administer and enforce the Land Drainage Act with regard to Ordinary Watercourses	Discharge consent applications for significant changes to ordinary watercourses and take enforcement action under the provisions of the act as required.

Under the Flood Risk Regulations (2009) LLFAs have some additional duties listed below.

LLFA Role	Summary of requirements
Duty to produce a PFRA	Produce a Preliminary Flood Risk Assessment by 2011 in partnership with the EA
Duty to review the PFRA every six years	Carry out a review in partnership with the EA
Duty to produce a map and Flood Risk Management Plan for 'Areas of Significant Risk'	Production of Maps and Flood Risk Management Plans led by the EA supported by LLFAs

### APPENDIX 3. MAIN FLOOD RISK MANAGEMENT GOVERNANCE GROUPS



#### APPENDIX 4. OTHER FLOOD RISK MANAGEMENT RELATED GROUPS

