

Draft Flood Risk Management Plan

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Document Control Sheet

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Revision History:

Date	Version	Summary of Changes
20/09/2023	Draft Version 1	First draft approved by the Homes and Environment Scrutiny Committee.
10/10/2023	Draft Version 2	Error corrections and addition of paragraphs explaining the SEA, HRA and WFD Assessments in preparation for consultation.
18/12/2023	Draft Version 2.1	Correction for accessibility.

Glossary

AEP	Annual Exceedance Probability
CaRR	Communities at Risk Register
DCWW	Dwr Cymru / Welsh Water
DEFRA	Department of Environment, Food and Rural Affairs
EA	Environment Agency
FCERM	Flood and Coastal Erosion Risk Management
FRMP	Flood Risk Management Plan
FWMA 2010	Flood and Water Management Act 2010
HRA	Habitats Regulation Assessment
LLFA	Lead Local Flood Authority
NFM	Natural Flood Management
NRW	Natural Resources Wales
RMA	Risk Management Authority
SAB	SuDS Approving Body
SEA	Strategic Environmental Assessment
SuDS	Sustainable Drainage Systems
WFD	Water Framework Directive
Wrexham CBC	Wrexham County Borough Council

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1. Introduction

1.1 What is a Flood Risk Management Plan

Flooding remains a key threat to communities across Wales, and managing this risk through careful planning is important to minimise the risk to communities. Flood risk management planning allows risk management authorities (RMAs) to develop a better understanding of risk from all sources of flooding and agree priorities to manage that risk.

This Flood Risk Management Plan (FRMP) has been developed with this in mind and sets out how Wrexham CBC will manage flooding over the next 6 years so that the communities most at risk and the environment benefit the most. In doing so, this FRMP takes forward the objectives and actions set out in our Flood Risk Management Strategy.

This FRMP also aim to achieve some of the objectives set out in the Welsh Government's National Flood and Coastal Erosion Risk Management Strategy¹ which provides the national framework for flood and coastal erosion risk management in Wales through four overarching objectives:

- **Reducing the consequences** for individuals, communities, businesses and the environment from flooding and coastal erosion.
- **Raising awareness of and engaging people in the response** to flood and coastal erosion risk.
- **Providing an effective and sustained response** to flood and coastal erosion events.
- **Prioritising investment** in the most at risk communities

1.2 What is included in this FRMP

The information included in Wrexham CBC's FRMP include the components set out in the EU Flood Directive. Most of this information has been gathered and updated through this first cycle, and has been drawn from the findings of our PFRA and the measures we identified and set out in our Local Flood Risk Management Strategy (LFRMS).

This FRMP sets out appropriate objectives for the management of flood risk within the areas covered by the plan. The objectives focus on reducing the adverse consequences of flooding for human health, the environment, cultural heritage and economic activity.

To do so, this FRMP highlights the areas which are most at risk from surface water flooding and ordinary watercourse flooding in the county borough of Wrexham, draws the conclusions from these risks and sets out the measures we will take over the next 6 years to mitigate these risks and make our communities more resilient.

Due to the nature of flooding and current funding situation, we have also looked at measures to reduce the likelihood of flooding using non-structural measures and covering all aspects of flood risk management, including raising awareness of flooding and better understanding of local flooding issues. All the measures identified in this plan have been classed in 4 categories:

- Prevention
- Protection
- Preparedness
- Recovery and Review

¹ <http://wales.gov.uk/topics/environmentcountryside/epq/flooding/nationalstrategy/strategy/?lang=en>

2. Legislative Context

2.1 Flood Risk Regulations 2009

Under the Flood Risk Regulations 2009, Lead Local Flood Authorities (LLFAs) are responsible for producing Flood Risk Management Plans (FRMPs) for Indicative Flood Risk Areas that were identified in the Preliminary Flood Risk Assessments (PFRAs).

While Natural Resources Wales (NRW) is responsible for producing FRMPs at a river basin district level for communities at risk of flooding from main rivers and the sea, LLFAs are only required to produce local FRMPs to manage flooding from surface water and ordinary watercourse.

The Regulations set out a six year cycle with timescales for reporting to the European Commission and the publication of 3 key outputs:

- Preliminary Flood Risk Assessments to be published by December 2011.
- Hazard and Risk Maps to be published by December 2013.
- Flood Risk Management Plans to be published by December 2015.

2.1.1 Preliminary Flood Risk Assessment

The PFRA was a high level screening exercise that compiled information on significant local flood risk from past and future floods, based on readily available information. The scope of the PFRA was to consider flooding from surface runoff, ground water and ordinary watercourses, and any interaction these sources have with main rivers with the aim of identifying flood risk areas as set out under the European Flood Directives.

2.1.2. Production of flood hazard and flood risk maps for Flood Risk Areas

Wrexham CBC based the previous FRMP on the Flood Maps for Surface Water produced by NRW. This map illustrated a number of different flooding scenarios based on rainfall from a 1 in 30, 1 in 100 and 1 in 1000 storm in the areas that the PFRA identified as being at high flood risk. However, since the publication of the original FRMP, a number of datasets have been published which better represent the factors affecting flood risk. One such dataset is the Communities at Risk Register (CaRR) which was released by NRW in 2019.

The CaRR was developed to provide an objective means of identifying risk and prioritising flood risk activities at a Wales-wide, community level. This is done through using a standard methodology across all flood sources to calculate a 'danger score' which allows comparative risks to be quantified and ranked from High to Low. This is based on both the undefended, 'natural' scenario and a mitigated scenario based on the presence of flood defences and flood warning systems.

The CaRR dataset assesses flooding scenarios as a result of rainfall with the following chances of occurring in the following scenarios:

- 1 in 10 (10% AEP)
- 1 in 30 (3% AEP)
- 1 in 100 (1% AEP)
- 1 in 1000 (0.1% AEP)

The flood maps in this FRMP are based on the 1 in 100 year scenario for the undefended scenario.

2.2 Flood and Water Management Act 2010 (FWMA 2010)

The Flood and Water Management Act 2010 was introduced in April 2010 in England and Wales. It was intended to implement Sir Michael Pitt's recommendations following the widespread flooding of 2007. The act was also intended to clarify roles and responsibilities between Risk Management Authorities (RMAs). This established Wrexham CBC as a lead local flood authority (LLFA) with a responsibility for managing flooding from surface water, groundwater and ordinary watercourses. As such, Wrexham CBC is required by the FWMA 2010 to produce a local FRMP which must be consistent with the National Strategy for Flood and Coastal Erosion Management. The first cycle of this work was completed in 2016 and this document will provide the actions that Wrexham CBC will take over the following cycle.

The FWMA 2010 established a number of duties that Wrexham CBC must perform in its role as a LLFA. These include a duty to:

- Prepare a local flood risk management strategy
- Comply with the National Strategy produced by the Welsh Government
- Co-operate with other authorities, including sharing data;
- Investigate all flooding within its area, insofar as a LLFA consider it necessary or appropriate
- Maintain a register of structures and features likely to affect flood risk;
- Contribute to sustainable development in our own works and to promote it;
- Approve, adopt and maintain sustainable drainage systems in the role as a SuDS Approving Body (SAB).
- Approve Ordinary Watercourse Consenting;

In addition, the FWMA 2010 gave Wrexham CBC a number of permissive powers. Whilst these can be used by the Wrexham CBC, they do not create any legal obligation to do so. This includes the power to:

- Request information relating to flood risk management
- Designate certain structures or features that affect flood or coastal erosion risk
- Undertake works to include broader risk management actions
- Cause flooding or coastal erosion under certain conditions

2.3 Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 defines well-being goals which set a shared vision in Wales to work towards. Under these, there are 46 indicators of national well-being, one of which is a commitment to reduce flooding to homes and businesses across Wales. This is because it is often the poorest communities that suffer the most when flooding events occur. These communities are also the least likely to be resilient to such events because the economic focus is not present.

The Act also provides a legal incentive to change the way in which we manage flooding. This is because it requires works to stand up to long term predictions for climate change to prevent flood risk from getting worse. To be done well, this requires a collaborative approach with other RMAs. Additionally, a change in the chosen methods for managing floods will better match the shared vision for Wales. By working with natural processes and identifying opportunities to utilise natural flood management (NFM) to complement traditional flood alleviation techniques, Wrexham CBC will be contributing towards the goals to sustainably manage natural resources, deliver national resources policies and maintain and enhance biodiversity.

2.4 Environment (Wales) Act 2016

The Environment (Wales) Act 2016 did not make any changes to the functions of Wrexham CBC as a LLFA. However, a core part of the Act is a focus on improving biodiversity under Section 6. As with the Well-being of Future Generation (Wales) Act 2015, this pushes the focus of flood risk management onto measures such as NFM. This is because a healthy ecosystem will naturally regulate the amount of surface water generated and the speed of flow within the environment. A focus on these greener solutions will also contribute to climate change mitigation.

3. Study Area

3.1 Administrative Area

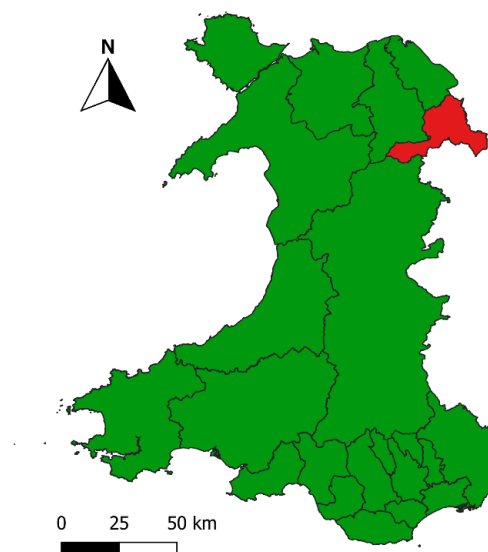


Figure 1: The administrative area covered by Wrexham CBC, shown in red, in the wider context of Wales.

Wrexham CBC is located in north east Wales and abuts the national boundary of England to the east. The county is landlocked by Cheshire to the east, Shropshire to the south east, Flintshire to the northwest, Denbighshire to the west and Powys to the south west. Wrexham CBC covers an area of approximately 50k hectares and has a population of approximately 136k people with 64k residential properties and 3k non-residential properties. Most of the population is concentrated along the north-south A483 road corridor in the central to north-west of the county.

The area is characterised by attractive countryside, varied landscapes and diverse settlements ranging from the large urban areas of the City of Wrexham and the Wrexham Industrial Estate (Wales' largest industrial estate), the rural areas of the Ceiriog valley to the south-west, the Maelor in the south-east and the former mining villages to the south and west of the County Borough. Wrexham dominates the northern part of the Borough.

The County Borough benefits from a high-quality natural environment with a number of internationally and nationally important sites for wildlife including the Dee estuaries, as well as having a rich architectural heritage with a high number of Conservation Areas, Listed Buildings and Scheduled Ancient Monuments. It is also home to the Pontcysyllte Aqueduct World Heritage Site with the far western areas of the County Borough forming part of the wider Clwydian Range and Dee Valley Area of Outstanding Natural Beauty. The vast majority of Wrexham CBC falls within the wider River Dee catchment, with a few very small isolated areas falling within the watershed of the River Severn in the far south of the Borough.

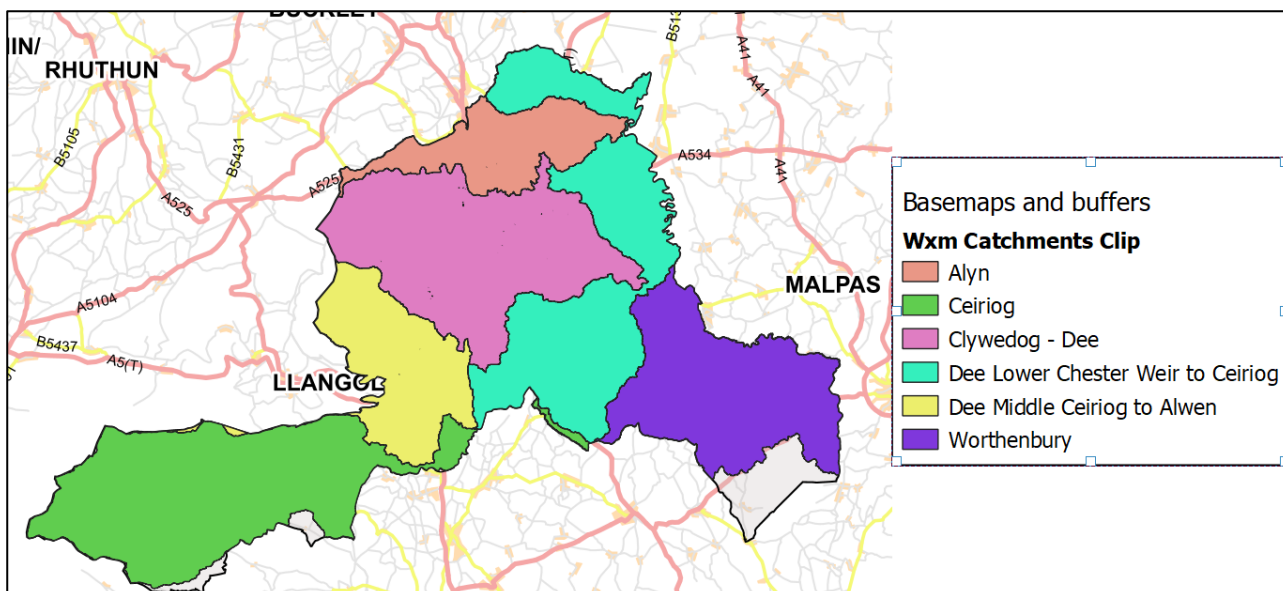


Figure 2: A map of the main catchments within the county boundary of Wrexham CBC.

There are six river catchment areas which overlap with the boundary of Wrexham CBC. The catchments, shown in Figure 3, are:

- River Alyn
- River Ceiriog
- River Clywedog
- Lower Dee from Ceiriog to Chester Weir
- Middle Dee from Alwen to Ceiriog.
- River Worthenbury

3.2 Flood risk in Wrexham CBC

3.2.1 Summary of types of flooding present in Wrexham CBC

A number of different types of flooding can impact Wrexham CBC. These include:

- Fluvial, or riverine, flooding.
- Pluvial, or surface water, flooding.
- Flooding from ordinary watercourses.
- Groundwater flooding.
- Sewerage flooding.

Some of these flooding types remain the responsibilities of other RMAs with whom Wrexham CBC works closely. These flooding types include fluvial flooding which is the responsibility of NRW and sewerage flooding which is the responsibility of Dwr Cymru Welsh Water (DCWW) as the sewerage undertaker for Wrexham CBC. The other types of flooding remain the responsibility of Wrexham CBC as a LLFA and will be the focus of this FRMP.

The number of properties at risk from flooding can be found in Table 1. Please note that figures are not available to quantify flooding from groundwater and sewer flooding. Additionally, as with the CaRR data used for the flood maps, properties affected from flooding from ordinary watercourses are listed under surface water flooding.

Table 1: The number of properties in Wrexham CBC at risk of flooding from river, surface and tidal. The data was sourced from StatsWales and was last updated in September 2021.

Flooding Types	Number of Properties at High Risk	Number of Properties at Medium Risk	Number of Properties at Low Risk	Total Number of Properties at Risk
River	367	186	881	1,434
Surface	767	821	2,407	3,995
Tidal	0	1	0	1

Whilst Wrexham CBC acknowledges that tidal risk has been identified in Table 1, flood mitigation for tidal will not be included in this FRMP. This is because the tidal defences that protect this property are located outside of the county borough.

3.2.2 Pluvial and Ordinary Watercourse Flooding

Pluvial flooding, also known as surface water flooding, is often the largest flood threat that is faced by most communities across Wrexham CBC. This is because it has the potential to occur anywhere. Pluvial flooding occurs when the volume of rainfall exceeds the capacity of drainage systems, or when the rainfall is unable to soak into the land, and so the water flows over the land instead. This typically occurs in areas where there are lots of impermeable surfaces, and it can be exacerbated by blocked gullies, sewers and drains. Pluvial flooding can also occur in the absence of hard surfaces where the land is saturated and waterlogged as this prevents the infiltration of rainwater into the ground.

Ordinary watercourse flooding is generated when the volume of water exceeds the capacity of small streams and ditches. As with pluvial flooding, this type of flooding can occur anywhere. Ordinary watercourse flooding can be exacerbated by blockages in channels and unauthorised works in the channel which has altered the shape in a way that prevents natural flow.

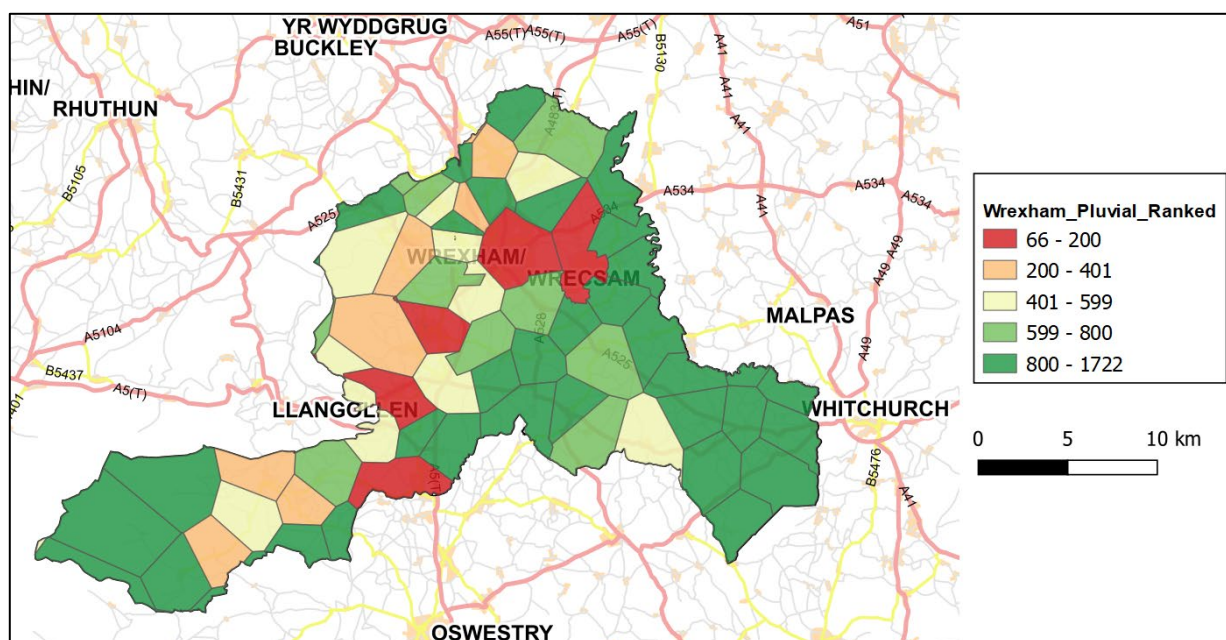


Figure 3: A map showing the pluvial, or surface water, flood risk across Wrexham CBC based on the national CaRR data generated by NRW in 2019. The map was produced using QGIS software and has been generated for the 1 in 100 year, or 1% AEP, probability event.

Figure 4 illustrates which communities are ranked by the CaRR dataset to be most at risk from pluvial flooding. As most NRW datasets consider ordinary watercourse flooding to be a form of pluvial flooding, this has been integrated into the above dataset. Notably, most of the surface water flooding is concentrated in highly populated areas or areas where other natural factors, such as topography, mean that surface water flow is more likely. This pattern is also consistent with the problematic areas for sewer flooding that have been identified by DCWW.

3.2.3 Groundwater Flooding

Groundwater flooding occurs as a result of water rising up from the underlying aquifer or from water flowing from abnormal springs. This tends to occur after long periods of sustained high rainfall, and the areas at most risk are often low-lying where the water table is more likely to be at shallow depth. Groundwater flooding is known to occur in areas underlain by major aquifers, although increasingly it is also being associated with more localised floodplain sands and gravels.

In addition, groundwater flooding can occur where there are abrupt changes in land height. This is because water travels from areas of high hydrostatic pressure to area of low hydrostatic pressure.

Hydrostatic pressure is higher in the ground and so the water will travel in the direction of open air along the flow path that provides the least resistance. For example, water may exist from under a highway which is held in place by a retaining wall because the open air has a lower hydrostatic pressure.

3.2.4 Sewer Flooding

Sewer flooding is often caused by excess surface water entering the drainage network. Flooding from sewerage can happen on highways, but it can also affect people through sewerage backing up through wastewater outlets in the home such as through toilets, sinks and washing machine pipes. This form of flooding is the responsibility of DCWW as the sewerage undertaker for the area covered by Wrexham CBC.

3.2.5 Interactions Between Local Flood Risk and Main Rivers

Despite different RMAs being responsible for different types of flooding, it is unreasonable to treat each source of flooding in isolation. This is because more than one source of flooding can be present at a location at any given time. When this occurs, it is known as combined flooding and it can make flooding in some areas worse. For example, when river levels are raised during a flood event, flap valves over outlets for surface water drainage will be forced shut. This means that the surface water cannot be discharged and the water will start to build up in the drainage network. This water may then start to spill back onto the highway via the nearest gully or manhole to the river. In such a case, water pumps may need to be deployed to remove the flood created.

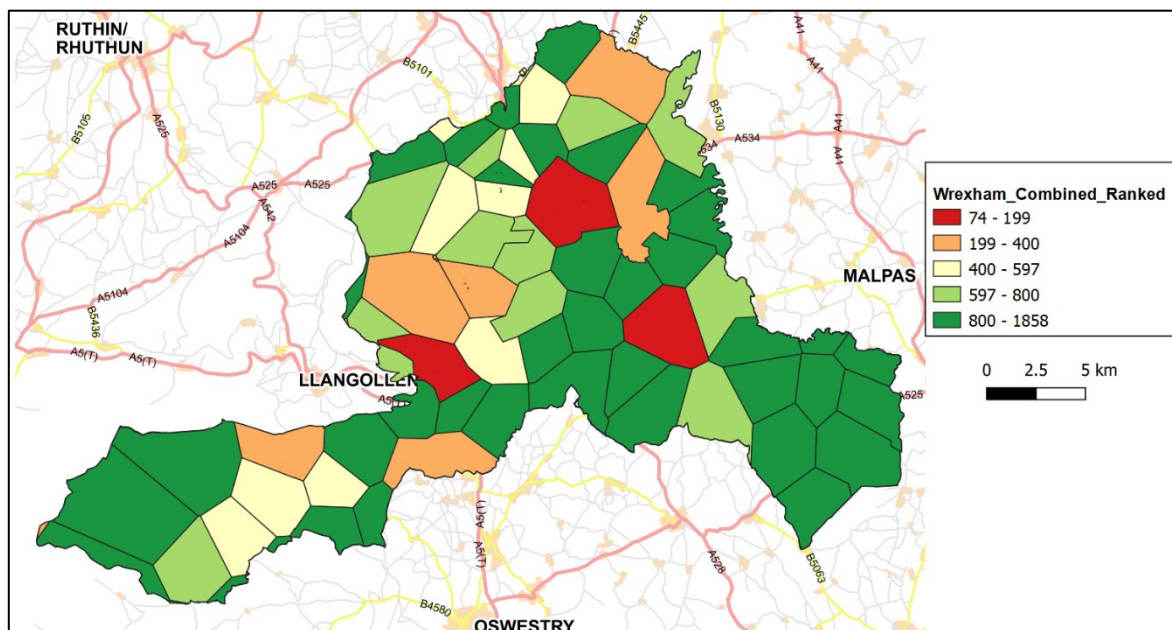


Figure 4: A map showing the combined pluvial and fluvial flood risk across Wrexham CBC based on the national CaRR data generated by NRW in 2019. The map was produced using QGIS software and has been generated for the 1 in 100 year, or 1% AEP, probability event.

Figure 5 illustrates where combined flood risk is most prevalent across the county. This is important to consider in Wrexham CBC's FRMP because the council is likely to be the organisation that responds first to these areas in times of flood. Thus, we need to be prepared to allocate our resources to these areas during high rainfall or extreme weather events to ensure that our customers are safe.

3.3 Top communities at risk from surface water flooding in Wrexham CBC

All communities across Wrexham CBC have some flood risk which must be acknowledged. However, statistics relating to the number of people at risk of flooding by ward in Wrexham CBC

have not been updated since 2011. It would not make sense to continue to use these statistics giving that Wrexham continues to grow as a place to live and work. As a result of this, Table 2 quantifies flood risk across Wrexham CBC using the communities outlined in the CaRR dataset. The communities with the highest flood risk have been highlighted from this table.

Table 2: The population, or number of people, at risk from fluvial and pluvial flooding by flood risk scenario. The areas identified as having the highest overall risk are highlighted in pale blue. These scenarios are calculated without the consideration of flood defences. The data was taken from the raw data of the NRW 2019 CaRR dataset.

Community Name	River Basin District	Population at Risk from Fluvial Flooding				Population at Risk from Pluvial Flooding			
		1 in 10	1 in 30	1 in 100	1 in 1000	1 in 10	1 in 30	1 in 100	1 in 1000
Bangor-is-y-coed	Dee	3	358	627	909	13	33	56	180
Bersham	Dee	6	17	28	96	0	2	10	79
Bettisfield	Severn	0	0	0	0	0	0	10	52
Borras Head	Dee	0	0	0	0	0	0	1	10
Bowling Bank	Dee	0	0	0	6	10	10	10	29
Bradley	Dee	0	0	4	8	0	3	5	56
Bronington	Severn	0	0	0	0	0	0	3	9
Brymbo	Dee	0	0	0	0	0	0	41	123
Brynteg	Dee	0	0	0	0	13	45	55	92
Burton Green	Dee	0	0	0	0	6	10	15	57
Bwlchgwyn	Dee	0	0	0	0	10	17	21	59
Cefn-mawr - Acrefair	Dee	282	355	416	491	232	355	566	974
Chirk	Dee	0	0	2	16	31	136	895	1284
Coedpoeth	Dee	0	0	0	0	18	41	123	367
Crabtree Green	Dee	0	0	0	0	0	15	21	41
Craignant	Dee	0	0	0	0	1	3	7	7
Cross Lanes	Dee	0	0	0	1	15	17	36	66
Eglwys Cross	Dee	3	3	3	3	0	0	0	7
Erbistock	Dee	0	0	1	13	2	6	16	36
Eyton	Dee	0	0	0	54	0	0	0	8
Froncysyllte	Dee	0	0	0	0	16	17	40	53
Garth	Dee	0	0	0	0	9	26	45	84
Glyn Ceiriog	Dee	48	50	57	116	60	82	105	139
Gresford	Dee	0	0	7	7	18	31	66	220
Gwersyllt	Dee	0	0	0	0	5	29	128	584
Gyfelia	Dee	0	2	2	50	11	48	69	87
Halton	Dee	0	0	0	0	3	5	29	92
Hanmer	Dee	0	0	0	0	0	2	2	8
Higher Wych	Dee	0	0	0	0	0	0	0	0
Holt and Plas Devon	Dee	9	17	35	79	11	11	17	35
Horseman's Green	Dee	0	0	0	2	0	18	21	29
Isycoed	Dee	0	0	0	9	0	4	7	15
Lightwood Green	Dee	0	0	0	0	7	14	19	33
Llanarmon Dyffryn Ceiriog	Dee	22	34	34	52	0	8	11	11
Llan-y-pwll	Dee	2	5	6	6	95	239	516	1628

Llay	Dee	0	0	0	0	59	131	274	508
Llechrydau	Severn	0	0	0	0	24	24	24	24
Llwynmawr	Dee	0	0	0	48	42	64	79	89
Marchwiell	Dee	0	0	0	4	10	10	47	99
Minera	Dee	0	0	0	0	79	81	118	176
Moss	Dee	0	0	0	0	18	36	107	231
New Broughton	Dee	0	16	161	206	0	7	33	209
Oldcastle Heath	Dee	0	0	0	0	0	0	0	0
Overton	Dee	0	0	0	0	0	0	0	24
Pandy	Dee	0	0	7	34	2	15	17	47
Penley	Dee	4	4	4	4	26	29	43	78
Pentre	Dee	2	2	2	2	0	0	0	0
Pentre	Dee	0	0	0	0	6	6	6	13
Penycae	Dee	0	0	3	12	73	115	191	363
Plas Nantyr	Dee	0	3	3	7	3	3	3	31
Pontfadog	Dee	0	4	16	84	17	21	32	58
Rhosllanerchrugog	Dee	0	0	0	0	117	193	394	961
Rhostyllen	Dee	0	0	0	6	0	18	44	182
Ridleywood	Dee	0	0	0	12	10	12	12	12
Rossett and Burton	Dee	31	53	114	440	0	8	32	128
Ruabon	Dee	8	19	25	46	43	71	94	214
Tallarn Green	Dee	2	5	5	5	0	0	0	6
The Chequer	Dee	0	0	0	0	0	3	31	53
Tregeiriog	Dee	0	0	0	0	33	35	57	67
Worthenbury	Dee	23	23	23	23	10	15	23	62
Wrexham (City)	Dee	103	143	258	756	36	231	909	2587

Using the information in Table 2, and the information presented in the combined flooding map in Figure 5, it is clear that there are a number of communities that need to be prioritised when considering flood mitigation. When considering the combined risk, three communities stand out as the highest priority and six further communities are shown to have moderate risk. Works in further communities will be considered where a business case can be justified and where relevant funding can be obtained.

The highest risk communities are:

- Bangor-is-y-Coed (Bangor-on-Dee)
- Wrexham City
- Cefn Mawr – Acrefair

The other community areas that exhibit elevated levels of flood risk are:

- Chirk
- Glyn Ceiriog
- Llan-y-Pwll
- Penycae
- Rhosllannerchrugog
- Rossett and Burton

4. How we currently manage flood risk in Wrexham CBC

Under the terms of the Flood and Water Management Act 2010 (FWMA) Wrexham CBC, as a LLFA, is responsible for the management of local flood risk, ensuring that flood risk from surface runoff, groundwater and ordinary watercourses are managed as part of locally agreed work programmes.

Flood risk is locally managed through:

- Operational procedures which have been developed over recent years, building on good custom, working practice and essential local knowledge. These procedures include routine inspection and maintenance of known flood risk assets and structures, including trash screen and culvert maintenance/clearance and gully emptying schedules dictated by historic risk and frequency of incidents.
- Measures identified within the Local Flood Risk Management Strategy.
- Powers given to all LLFAs through the Flood and Water Management Act 2010 and the Land Drainage Acts 1991 and 1994.
- Powers vested to Wrexham CBC as Highways Authority under the Highways Act 1980.
- Provision of awareness raising, emergency planning and incident response in conjunction with other council departments, NWCREPS and wider partners.

4.1 How we prioritise our work

Historically, frequency of flood occurrence and political pressure have strongly influenced the direction and funding of flood related work, although this is generally limited to small scale or maintenance based schemes. In more recent years, any potential capital schemes are prioritised against current Welsh Government guiding principles and are assessed against a range of factors including:

- Risk to life;
- Longer term sustainability of the community, the approach taken and the wider environment;
- Economic impacts, costs and benefits;
- Impacts of flooding on the operational capacity of critical infrastructure;
- Social impacts, costs and benefits;
- Frequency of flooding;
- Environmental costs and benefits derived from the work;
- Availability of appropriate compensation sites where work impacts designated habitats;
- Impacts on our wider cultural heritage; and
- Multiple benefits in relation to human health and wellbeing.

4.2 Who we work with to manage flood risk in Wrexham CBC

The Floods and Water Management Act 2010 clarified the roles and responsibilities of a variety of Risk Management Authorities for the different sources of flooding. In addition, the Welsh Government National Flood and Coastal Erosion Risk Management Strategy identified all the Risk Management Authorities in Wales that need to work in collaboration to deliver the measure and objectives in the National Strategy.

The LFRMS identified all the relevant RMAs with whom Wrexham CBC works in partnership to manage flood risk within the County Borough. These RMAs, whose responsibilities are outlined within the LFRMS, are listed in Table 3.

Table 3: A summary of the partner organisations that Wrexham CBC is working with to manage flood risk.

Organisation	Area Covered	Primary Roles
Welsh Government	Wales	Provide policy and guidance on both flooding and SAB issues.
Welsh Local Government Association (WLGA)	Wales	Provide guidance on flooding and SAB issues. Consult on policy changes affect FRMPs.
Natural Resources Wales (NRW)	Wales	RMA for main river fluvial flooding. Provide flood modelling. Provide flood warnings in areas affected by fluvial flooding.
Dwr Cymru Welsh Water	Wales, excluding Powys, and Herefordshire.	RMA for sewerage flooding across Wales.
North Wales Flood Risk Management Group	North Wales Local Authority areas.	Provides a partnership platform for the six LLFAs in North Wales, Welsh Government, WLGA, NRW and DCWW.

4.3 How this FRMP has been Co-ordinated

Co-ordination and development of this FRMP has been achieved through regular meetings of the North Wales Flood Risk Management Group attended by all North Wales authorities with representatives from NRW, WLGA and DCWW. In addition, the progress of the FRMP has been discussed at regular meetings with NRW and neighbouring Welsh Authorities, discussions with DCWW, and internal discussion with various departments within Wrexham CBC.

4.4 Measures already underway in Wrexham CBC to Manage Flood Risk

The measures which are currently underway across Wrexham CBC were taken from the previous FRMP. This, in turn, was based on the Local Flood Risk Management Strategy (LFRMS) published in 2013. The measures outlined under this can be found in Appendix 1. The measures that are currently underway in Wrexham CBC can be found in Table 4. Many of the actions are still ongoing due to nature of them. For example, maintenance is an ongoing issue that will always need to be addressed. However, Wrexham CBC accepts that the current progress with the FRMP has been delayed by staffing issues and budget restraints. It is hoped that several of the actions that do not require ongoing work will be completed within the next cycle of the FRMP which will come to a close in 2030.

The measures are split into four categories which are followed by European, UK and Welsh legislation surrounding flood risk. These are:

- Prepare
- Prevent
- Protect
- Recover and Review

Table 4: A summary table of the flood risk management measures which were identified in the LFRMS.

Borough Action	Measure Type	Priority	Status
L1.3 Work with other RMAs to maximise collaborative opportunities to better understand flood risk.	Prepare	2	Ongoing
L1.4 Carry out maintenance on existing defences and assets.	Prevent	1	Ongoing
L2.1 Provide comment and input to the planning system at all stages (Strategy level down to individual planning applications) to ensure the guiding principles of FRM are appropriately considered.	Prevent	1	Ongoing
L2.2 Increase awareness both internally and externally as to the importance of SuDs to ensure surface water generated from new and re-development can be managed sustainable into the future.	Prevent	1	Ongoing
L2.3 Develop and implement a system for responding to planning consultations and approving submissions of surface water drainage system.	Prevent	1	Not Started
L3.1 Combine all current asset data sets into 1 system.	Prepare	1	Ongoing
L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	Not Started
L3.3 Develop system to trigger and record repeat asset inspections, defects and maintenance.	Prevent	2	Not Started
L4.1 Investigate available technologies and systems to allow collection and collation of flood event information.	Prepare	1	Ongoing
L4.2 Develop and adopt a methodology to priorities communities at risk of flooding dependant on source, risk, consequence and benefit.	Recover & Review	3	Ongoing
L4.3 Develop links with other RMAs to develop holistic solutions to flooding issues addressing all sources of flooding.	Prevent	2	Not Started
L5.1 Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Prevent	2	Ongoing
L5.3 Promote source control methods to maximise flood risk benefit and environmental enhancement (SuDS).	Prevent	1	Ongoing
L6.1 Formalise and promote the non-culverting policy approved as part of the LFRMS.	Prevent	1	Ongoing
L6.2 Ensure compliance with culverting policy within both planning and consenting applications to ensure both flood risk and environmental protection.	Prevent	1	Ongoing
L6.3 Take all opportunities to restore culverted watercourses to natural open channels.	Recover	3	Ongoing
L7.1 As required, investigate flooding incidents as they are reported to the Authority.	Recover & Review	1	Ongoing
L7.2 As appropriate, work with other RMAs to report flooding incidents within the county borough and share knowledge.	Recover & Review	1	Ongoing
L8.1 Providing guidance and information to increase knowledge and understanding of flood risk roles and responsibilities to minimise flood risk into the future.	Prepare	2	Ongoing

L8.2 Promote community use of Flood forecasting and warning services available.	Prepare	3	Not Started
L8.3 Raise flood awareness within the community.	Prepare	1	Ongoing
L8.4 Promote the use of individual Property Protection systems.	Protect	2	Ongoing
L9.1 Engage with community to establish community flood plan. Encourage residents to prepare their own individual flood plan.	Prepare	3	Not Started
L9.2 Develop existing response and recovery plans to more effectively plan for and respond to flood events.	Prepare	2	Ongoing
L10.1 Work with partners to improve resilience within the community.	Prepare	3	Ongoing
L10.2 Work with partners to incorporate flood risk management benefits into broader environmental projects and schemes.	Prevent	3	Ongoing
L11.1 Identify affordable and cost beneficial projects and proposals that will reduce the risk of flooding to people and property.	Protect	3	Ongoing
L11.2 Maximise funding opportunities from external and alternative sources to enable projects and programmes to proceed.	Prevent	3	Not Started

5. Co-ordination with the Dee and Severn River Basin Management Plan

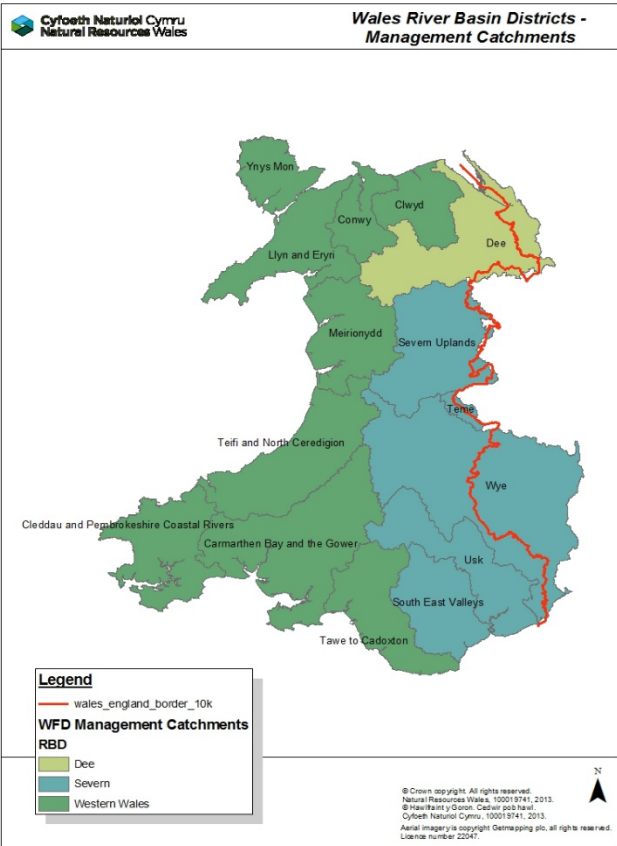


Figure 5: a map of the River Basin Districts (RBDs) across Wales.

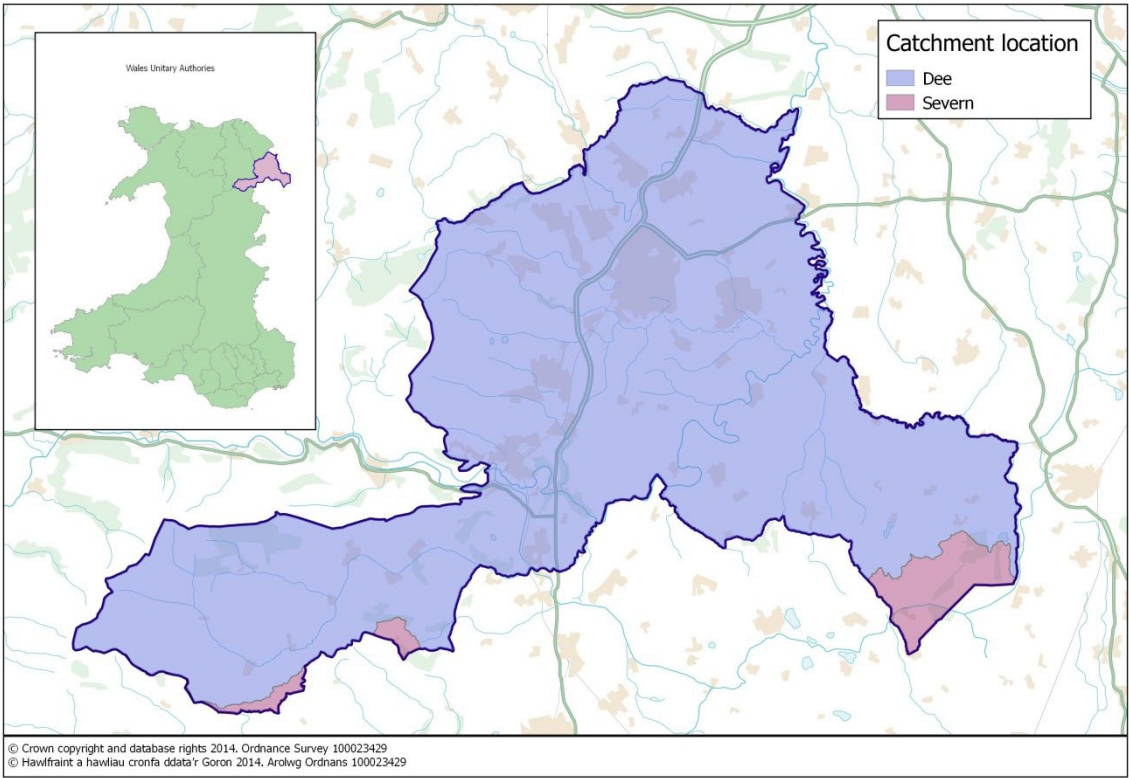


Figure 6: The RBD boundaries for the Dee and Severn catchments as encompassed in the county boundary for Wrexham CBC.

As required under the Water Framework Directive, the Environment Agency and National Resources Wales have a duty to prepare a River Basin Management Plan for each River Basin District. Wrexham CBC has catchments that contribute to both the Dee and Severn River Basin Districts. By far the vast majority of the County Borough contributes to the River Dee catchment, with only a small percentage by area sitting within the Severn Catchment. This is shown in Figure 7. RBMP documents produced by NRW and EA have been reviewed for both Dee and Severn RBMPs respectively to ensure the measures and associated actions within this plan do not conflict with, or compromise, either.

5.1 Dee River Basin Management Plan

The Dee River Basin District covers an area of 2,251 km², mainly in Wales but including a small area in England. Its source is in the mountains and lakes of the Snowdonia National Park and it runs to the internationally significant intertidal and wading bird habitat of the Dee Estuary. Chester and Wrexham are the major urban centres, but the land is mainly rural with rough grazing and forestry in the upper catchment and arable and dairy farming on the Cheshire Plain. Reservoirs in the upper part of the catchment store water and regulate flow in the Dee. They sustain abstractions for public and industrial water supply and modify flood response in the river, reducing the frequency of flooding in the Dee between Bala and Chester.

5.2 Severn River Basin Management Plan

The Severn River Basin District is home to over 5.3 million people and covers an area of 21,590 km², with about one-third of the district in Wales. The River Severn is the longest river in Britain and flows into the Severn Estuary. As well as the River Severn and its main tributaries; the district includes the rivers of South East Wales, including the Wye, Usk and Taff, and those of the counties of Avon and Somerset that drain into the Severn Estuary.

The district has several major urban centres, including Bristol, Cardiff and Coventry. However, much of the river basin district is rural in character, particularly within the Welsh Borders. About 80% of the land is managed for agriculture and forestry. The key economic sectors in the district are business services, wholesale and distribution, public administration and health. Transport equipment and metals manufacturing are also important industrial sectors.

6. Wrexham CBC Flood Risk Management Plan Objectives

6.1 National and Local Objectives

Welsh Government requested the development of a Local Strategy for the Management of Flood Risk within Wrexham CBC. The completed and adopted strategy was published in April 2013. This strategy contained a number of strategic environmental objectives to ensure sustainable flood risk management into the future. Wrexham CBCs strategic objectives are:

- To protect human health and wellbeing;
- To minimise the risk of flooding and ensure new development is located outside TAN 15 zones C1 and C2 and that all developments apply the principles of sustainable drainage and water sensitive design;
- To ensure the potential impact of flooding on existing and future critical infrastructure is minimised;
- To protect and enhance biodiversity and nature conservation in Wrexham County Borough;
- To protect the best quality soil and enhance the quality and character of the landscape;
- To maintain and/or enhance the character of townscapes, cultural heritage and assets within Wrexham County Borough;
- To maintain and enhance water resources and water quality
- Protect and enhance Wrexham's County Borough's Landscape and Visual Amenity;
- To adapt development to withstand the impacts if climate change;

These objectives are clearly linked to the WG National FCERM Strategy and its driving objectives of:

- Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- Raising awareness of and engaging people in the response to flood and coastal erosion risk;
- Providing an effective and sustained response to flood and coastal erosion events;
- Prioritising investment in the most at risk communities.

6.2 Local Measures and Actions to Achieve Plan Objectives

Individual LFRMS measures have also been linked to both the National Strategy for Flood and Coastal Erosion Risk Management in Wales (hereafter the National Strategy) and LFRMS strategic objectives (Appendix 1) with this plan aiming to identify local actions consistent with the following high level themes taken from the National Strategy:

- Development planning and adaptation (encompassing both new and adaptations to existing developments/landscapes);
- Flood forecasting, warning and response;
- Land, cultural and environmental management;
- Asset management and maintenance;
- Studies, assessments and plans;
- High level awareness and engagement (to increase individual and community resilience); and
- Monitoring (of the flood risk issues).

The 11 measures identified within the LFRMS have been further refined into a number of actions, some of which are applicable locally to individual communities and others that have a Borough wide role.

The measures and actions within this plan have been chosen following consideration of a number of relevant factors including:

- Consideration of the severity of the risk
- Understanding of the source of the risk
- Level of existing knowledge and information
- Appreciation of how risk may change into the future
- Availability of options to manage the risk
- Anticipated cost of actions

Appropriate actions have been selected after considering all of these factors and taking full consideration of the LFRMS objectives and measures, ensuring all compliment the National Strategy.

7. Managing Flood Risk at a Local Level

Wrexham CBC manages flood risk across the borough following a risk-based approach. Specific measures, and actions where appropriate, have been identified for the higher risk communities identified in Section 3.3. This does not mean that measures or actions are not proposed elsewhere across the Borough. A series of Borough specific measures and actions are identified to ensure, during the lifespan of this plan, actions or interventions are justified if required or new information becomes available. Subsequent iterations of this plan will be expected to broaden the number of community areas where specific measures or actions are identified.

7.1 A Catchment Based Approach

Traditional flood management placed a strong focus on fixing the issues in the place that was impacted by the flooding. This created a system in which rainwater was conveyed into drains and rivers as quickly as possible. This, in combination with morphological changes to the banks of rivers due to the installation of engineered structures such as floodwalls, is now widely considered to be unsustainable as it can often create additional problems downstream. Hence, flood risk management must now be considered on a catchment scale.

The catchment based approach also allows the council to consider projects that promote improved biodiversity and a better use of natural processes. These measures have previously not been prioritised because they are often best suited to be placed upstream of the area impacted by flooding.

For the purposes of the FRMP, the catchments will be based on the natural river catchments encompassed in the area covered by Wrexham CBC. However, it is important to note that these catchments are very large and all of them exceed the county boundary. Therefore, flood mitigation across the wider catchments will involve partnership working with neighbouring LLFAs and NRW. It should also be noted the rivers Alyn, Ceiriog, Clywedog and Worthenbury are all tributaries to the River Dee. Thus, any work carried out in these catchments should have positive benefits on the parts of the county downstream of the confluence of the tributaries with the River Dee. Wrexham CBC ward boundaries also do not match with the catchment boundaries. It is advised that individuals reading this plan consider both catchments that fall in to in addition to checking their own flood risk on the NRW website.

7.2 Emergency Plans

There are a number of emergency plans that aim to manage the risks associated with multiple sources including flooding. These plans include the Emergency Management and Response Team (EMRT) framework documentation and the WCBC Emergency Recovery Plan.

In addition to these plans, there are currently three Community Flood Plans that have been led by NRW. These have incorporated relevant RMAs and local communities. The plans currently cover Bangor-on-Dee, Rossett and Caia Park.

7.3 SuDS Approving Body (SAB)

As a LLFA, Wrexham CBC also holds the role of SuDS Approving Body, or SAB. The SAB process, which only looks at the technical aspects of the drainage design and on site flood risk, is separate from the planning process. Following January 2019, when Wales enacted Schedule 3 of the FWMA 2010, it became compulsory for all new developments over 100 m² to obtain SAB approval before construction could begin.

The role of the SAB process is not to mitigate flooding. Its role is to ensure that development is sensible for the conditions on site and to ensure that the downstream flood risk, be that pluvial or fluvial, does not become worsened due to development. The SAB requires that all of the surface

appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 5: A summary of the catchment delivery plan for the River Alyn Catchment.

Catchment Action	Measure type	Priority	Status
L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	Ongoing
L3.3 Develop system to trigger and record repeat asset inspections, defects and maintenance.	Prevent	2	Not Started
L1.3 Work with other RMAs to maximise collaborative opportunities to better understand flood risk	Prepare	3	Not Started
L4.3 Develop links with other RMAs to develop holistic solutions to flooding issues addressing all sources of flooding.	Prepare	3	Not Started
L5.3 Promote source control methods to maximise flood risk benefit and environmental enhancement (SuDS)	Prevent	1	Not Started
L8.3 Raise flood awareness within the community	Prepare	2	Not Started
L8.4 Promote the use of individual Property Protection systems.	Protect	2	Not Started
L10.1 Work with partners to improve resilience within the community	Prepare	3	Not Started

7.5 Ceiriog Catchment

7.5.1 Ceiriog Catchment Overview

The Ceiriog catchment covers the south western arm and a small portion of the south of Wrexham CBC. The Ceiriog Catchment includes the ward of Dyffryn Ceiriog and southern parts of Chirk North, Chirk South and Overton and Maelor South. The catchment is largely rural and the predominant land use is agriculture. Population centres are largely concentrated into a number of villages across the ward.

7.5.2 Ceiriog Catchment Hazard Map

The combined flood risk hazard map shown that there are no high risk flood areas presents in the Ceiriog Catchment. However, medium and intermediate flood risk does exist. This risk is focused primarily around flow path the River Ceiriog and where there are village populations. The topography of the land plays a key factor in this pattern. The population centres are largely concentrated in the bottom of the Ceiriog valley where flood water from the river is most likely to spread. Additionally, the steep sides of the valley encourage high volumes of surface water runoff which heads in the direction of the river where the village populations are largely located.

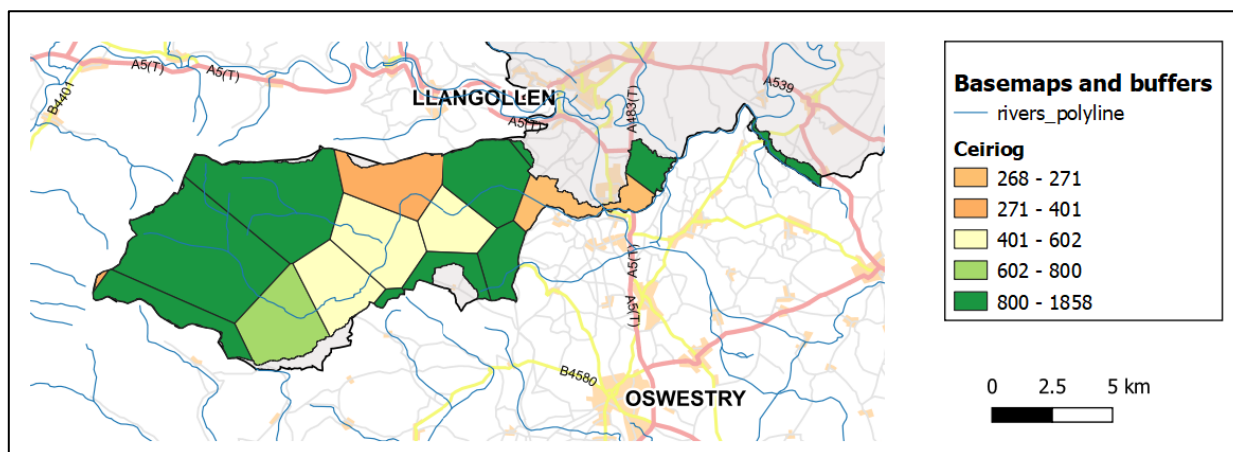


Figure 8: A map of flood risk across the part of the River Ceiriog Catchment which falls within the boundaries of Wrexham CBC. The hazard map has been produced using the NRW CaRR dataset from 2019 based on the combined flood risk rankings. The course of main rivers has been presented on top of this data, but it should be noted that ordinary watercourses are not shown on this map.

7.5.3 Ceiriog Catchment Delivery Plan

Table 6 details the actions proposed to manage flood risk within Ceiriog Catchment over the life of this plan. Actions have been allocated an indicative priority to ensure the correct information is available to make appropriate decisions. The ability to carry out these actions is dependent on appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 6: A summary of the catchment delivery plan for the River Ceiriog Catchment.

Catchment Action	Measure Type	Priority	Status
L1.4 Carry out maintenance on existing defences and assets.	Prevent	1	Ongoing
L2.1 Provide comment and input to the planning system at all stages (Strategy level down to individual planning applications) to ensure the guiding principles of FRM are appropriately considered.	Prevent	1	Ongoing
L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	Not Started
L4.1 Investigate available technologies and systems to allow collection and collation of flood event information.	Prepare	1	Ongoing
L4.3 Develop links with other RMAs to develop holistic solutions to flooding issues addressing all sources of flooding.	Prevent	2	Not Started
L5.1 Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Prevent	2	Ongoing
L6.2 Ensure compliance with culverting policy within both planning and consenting applications to ensure both flood risk and environmental protection.	Prevent	1	Ongoing
L6.3 Take all opportunities to restore culverted watercourses to natural open channels.	Recover	3	Ongoing
L8.3 Raise flood awareness within the community.	Prepare	1	Ongoing
L8.4 Promote the use of individual Property Protection systems.	Protect	2	Ongoing
L10.2 Work with partners to incorporate flood risk management benefits into broader environmental projects and schemes.	Prevent	3	Ongoing

7.6 Clywedog Catchment

7.6.1 Clywedog Catchment Overview

The Clywedog Catchment runs across the middle of the county from west to east. A notable tributary to the River Clywedog is the River Gwenfro. This catchment is a diverse mix of rural and populated areas. The wards covered by the Clywedog Catchment are Rhosnesni, Acton and Maesydre, Ruabon, Ponciau, Rhosllannerchrugog, Coedpoeth, southern Brymbo, the majority of Minera and the northern portion of Penycae and Ruabon South. The Clywedog Catchment also covers the west and southern parts of the ward of Holt and the northern and eastern part of the ward of Marchwiell.

2.6.2 Clywedog Catchment Hazard Map

Figure 10 shows that the highest flood risk in the Clywedog Catchment is concentrated in the Wrexham City community. This is because there is a large population present in this area and a lot of impermeable surfaces which generate runoff. There are also a number of watercourses in this area which generate a number of flooding issues.

Another notable area of risk, as identified by Figure 10, is the area around Rhosllannerchrugog. Again this can be attributed to the large population in a small area. However, as with the medium risks shown in the communities of Coedpoeth and new Broughton, the topography, or shape of the land also has a part to play. This is because the elevation of these communities means that they typically receive higher volumes of rainfall. In addition, the respective villages in these areas are typically built following the contours of the slopes. This can generate a lot of surface water flooding which will affect the lower houses as water travels downhill over the impermeable areas created by these settlements.

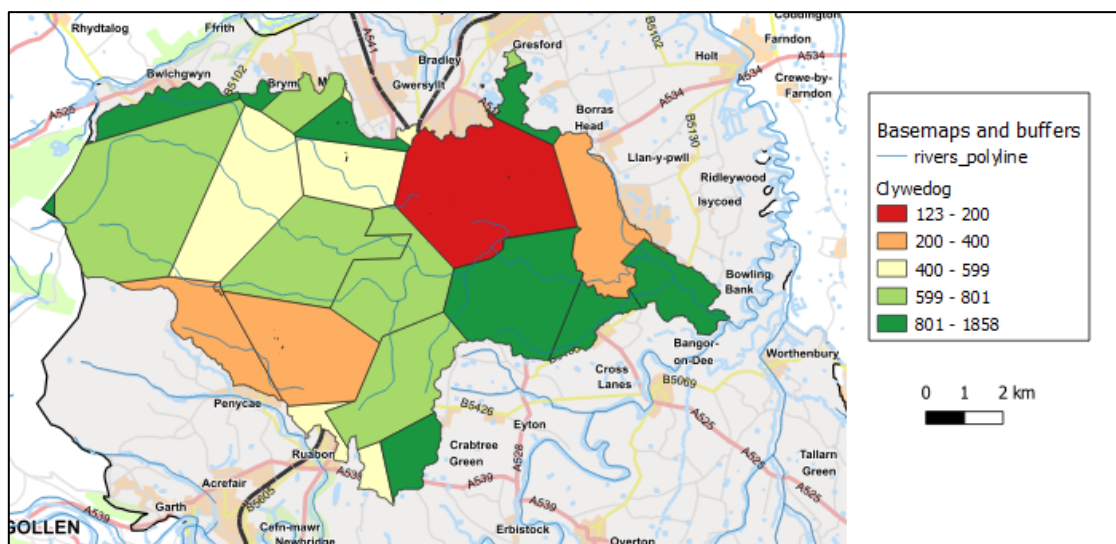


Figure 9: A map of flood risk across the part of the River Clywedog Catchment which falls within the boundaries of Wrexham CBC. The hazard map has been produced using the NRW CaRR dataset from 2019 based on the combined flood risk rankings. The course of main rivers has been presented on top of this data, but it should be noted that ordinary watercourses are not shown on this map.

7.6.3 Clywedog Catchment Delivery Plan

Table 7 details the actions proposed to manage flood risk within the Clywedog Catchment over the life of this plan. Actions have been allocated an indicative priority to ensure the correct information is available to make appropriate decisions. The ability to carry out these actions is dependent on appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 7: A summary of the catchment delivery plan for the River Clywedog Catchment.

Catchment Action	Measure type	Priority	Status
L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	Ongoing
L3.3 Develop system to trigger and record repeat asset inspections, defects and maintenance.	Prevent	2	Not Started
L1.1 Improve understanding of catchment hydrology	Prepare	1	Not Started
L1.2 Develop hydrological models to improve understanding of flood risk	Prepare	2	Not Started
L5.1 Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Prevent	2	Not Started
L5.2 Investigate wider catchment initiatives to manage flood risk (land management, upstream attenuation of flood flows etc.)	Protect	2	Not Started
L6.3 Take all opportunities to restore culverted watercourses to natural open channels.	Recover	3	Not Started
L9.2 Develop existing response and recovery plans to more effectively plan for and respond to flood events	Prepare	2	Ongoing
L9.3 Investigate feasibility for new flood warnings system.	Prepare	2	Not Started
L9.4 Progress opportunities to improve flood forecasting and flood warning capabilities.	Prepare	3	Not Started
L11.1 Identify affordable and cost beneficial projects and proposals that will reduce the risk of flooding to people and property.	Protect	3	Not Started
L11.2 Maximise funding opportunities from external and alternative sources to enable projects and programmes to proceed.	Prevent	2	Not Started
L1.3 Work with other RMAs to maximise collaborative opportunities to better understand flood risk	Prepare	3	Not Started
L4.3 Develop links with other RMAs to develop holistic solutions to flooding issues addressing all sources of flooding.	Prepare	3	Not Started
L5.3 Promote source control methods to maximise flood risk benefit and environmental enhancement (SuDS)	Prevent	1	Not Started
L8.3 Raise flood awareness within the community	Prepare	2	Not Started
L10.1 Work with partners to improve resilience within the community	Prepare	3	Not Started

7.7 Middle Dee Catchment

7.7.1 Middle Dee Catchment Overview

Wrexham County Borough covers the most eastern part of the River Dee catchment. In this catchment, there are a number of ordinary watercourses and a main river which contribute towards flooding. However, an additional threat is also posed by high volumes of surface water. The wards covered by this catchment boundary include Chirk North, the northern parts of Chirk South, Penycae, Cefn West, Cefn East, Llangollen Rural, Acrefair North and the majority of the ward of Penycae and Ruabon South.

7.7.2 Middle Dee Catchment Hazard Map

The flood hazard in the Middle Dee Catchment area is largely concentrated around the watercourses. As Figure 11 shows, these watercourses are classed as main rivers. Whilst Wrexham CBC is not the RMA with the responsibility to manage the flood risks in a preventative way, council resources will be involved in the response when there is risk to life.

Figure 11 shows that the most risk is in the Cefn-Mawr and Acrefair area. This is because a number of watercourses traverse through this community which are partially culverted. This can cause issues when the flow of water exceeds the capacity of the culverts, or where the culverts are blocked. This community also experiences elevated hazard from surface water. This is because the communities are closely built and water is often funnelled down roadways into properties.

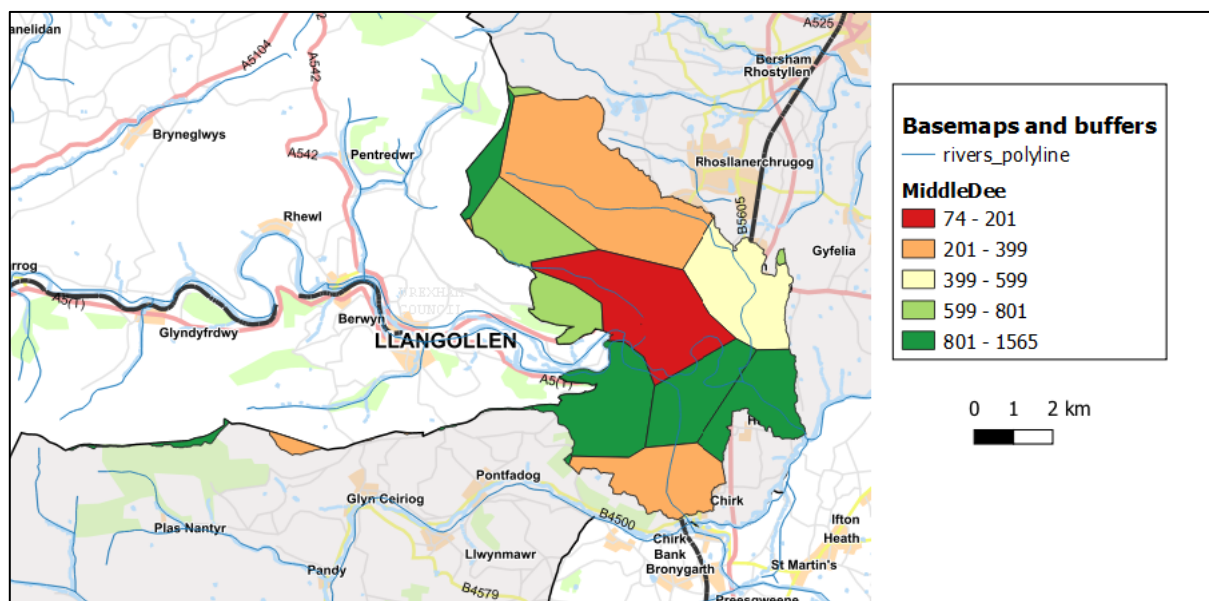


Figure 10: A map of flood risk across the part of the Middle Dee Catchment which falls within the boundaries of Wrexham CBC. The hazard map has been produced using the NRW CaRR dataset from 2019 based on the combined flood risk rankings. The course of main rivers has been presented on top of this data, but it should be noted that ordinary watercourses are not shown on this map.

7.7.3 Middle Dee Catchment Delivery Plan

Table 8 details the actions proposed to manage flood risk within the Middle Dee Catchment over the life of this plan. Actions have been allocated an indicative priority to ensure the correct information is available to make appropriate decisions. The ability to carry out these actions is dependent on appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 8: A summary of the catchment delivery plan for the Middle Dee Catchment.

Catchment Action	Measure type	Priority	Timing	Status
L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	2024 - 2029	Ongoing
L3.3 Develop system to trigger and record repeat asset inspections, defects and maintenance.	Prevent	2	2024 - 2029	Not Started
L1.3 Work with other RMAs to maximise collaborative opportunities to better understand flood risk	Prepare	3	2024 - 2029	Not Started
L1.2 Develop hydrological models to improve understanding of flood risk	Prepare	2	22024 - 2029	Not Started
L5.2 Investigate wider catchment initiatives to manage flood risk (land management, upstream attenuation of flood flows etc.)	Protect	3	2024 - 2029	Not Started
L8.3 Raise flood awareness within the community	Prepare	2	2024 - 2029	Not Started
L10.1 Work with partners to improve resilience within the community	Prepare	2	2024 - 2029	Not Started

7.8 Lower Dee Catchment

7.8.1 Lower Dee Catchment Overview

The Lower Dee Catchment represents the lowest part of the River Dee Catchment. The catchment area is predominantly located in the mid-eastern and northern part of Wrexham CBC. The Lower Dee Catchment covers parts of the wards of Rossett, Holt, Bangor Is-y-Coed, Marchwiell, the northern part of Llay, the north western part of Overton and Maelor South and the south eastern part of Penycae and Ruabon South. The catchment is primarily rural with some large village settlements such as Bangor-on-Dee, Holt, Burton and Rossett. This catchment also incorporates the eastern side of Wrexham Industrial Estate.

7.8.2 Lower Dee Catchment Hazard Map

The Lower Dee Catchment experienced frequent flooding as this is where the majority of the floodplain of the River Dee is located. However, the flood risk is predominantly associated with areas of population. Most notably, the community of Bangor-on-Dee has the highest flood risk in this catchment. Flooding in this community is largely due to its proximity to the River Dee and position on the floodplain. However, surface water flooding also has the potential to affect this community due to the number of properties located in such as small area.

It is also noted that elevated areas of flood risk are present in the communities of Rossett and Burton and in the Llan-y-Pwll. These areas are largely also at risk from surface water flooding.

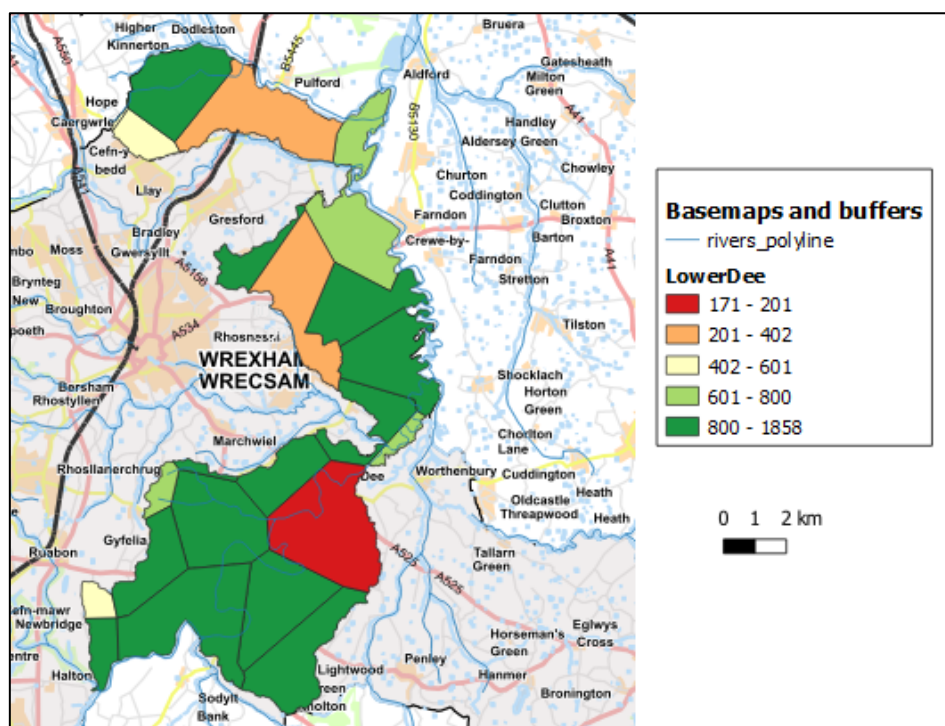


Figure 11: A map of flood risk across the part of the Lower Dee Catchment which falls within the boundaries of Wrexham CBC. The hazard map has been produced using the NRW CaRR dataset from 2019 based on the combined flood risk rankings. The course of main rivers has been presented on top of this data, but it should be noted that ordinary watercourses are not shown on this map.

7.8.3 Lower Dee Catchment Delivery Plan

Table 9 details the actions proposed to manage flood risk within the Lower Dee Catchment over the life of this plan. Actions have been allocated an indicative priority to ensure the correct information is available to make appropriate decisions. The ability to carry out these actions is dependent on appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 9: A summary of the catchment delivery plan for the lower Dee Catchment.

Catchment Action	Measure Type	Priority	Status
L1.3 Work with other RMAs to maximise collaborative opportunities to better understand flood risk.	Prepare	2	Ongoing
L1.4 Carry out maintenance on existing defences and assets.	Prevent	1	Ongoing
L2.1 Provide comment and input to the planning system at all stages (Strategy level down to individual planning applications) to ensure the guiding principles of FRM are appropriately considered.	Prevent	1	Ongoing
L2.2 Increase awareness both internally and externally as to the importance of SuDs to ensure surface water generated from new and re-development can be managed sustainable into the future.	Prevent	1	Ongoing
L2.3 Develop and implement a system for responding to planning consultations and approving submissions of surface water drainage system.	Prevent	1	Not Started

L3.2 Identifying high risk assets & owner and identifying appropriate inspection and maintenance regimes.	Prevent	1	Not Started
L4.1 Investigate available technologies and systems to allow collection and collation of flood event information.	Prepare	1	Ongoing
L4.3 Develop links with other RMAs to develop holistic solutions to flooding issues addressing all sources of flooding.	Prevent	2	Not Started
L5.1 Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Prevent	2	Ongoing
L7.2 As appropriate, work with other RMAs to report flooding incidents within the county borough and share knowledge.	Recover & Review	1	Ongoing
L8.1 Providing guidance and information to increase knowledge and understanding of flood risk roles and responsibilities to minimise flood risk into the future.	Prepare	2	Ongoing
L8.2 Promote community use of Flood forecasting and warning services available.	Prepare	3	Not Started
L8.3 Raise flood awareness within the community.	Prepare	1	Ongoing
L8.4 Promote the use of individual Property Protection systems.	Protect	2	Ongoing
L9.1 Engage with community to establish community flood plan. Encourage residents to prepare their own individual flood plan.	Prepare	3	Completed
L9.2 Develop existing response and recovery plans to more effectively plan for and respond to flood events.	Prepare	2	Ongoing
L10.1 Work with partners to improve resilience within the community.	Prepare	3	Ongoing
L10.2 Work with partners to incorporate flood risk management benefits into broader environmental projects and schemes.	Prevent	3	Ongoing

7.9 Worthenbury Catchment

7.9.1 Worthenbury Catchment Overview

The Worthenbury Catchment represents the land area in the south eastern arm of the county. It covers the wards of Bronington and Hammer, the eastern part of Bangor Is-y-Coed and the mid to southern parts of Overton and Maelor South. This area is predominantly rural with very few built up areas.

7.9.2 Worthenbury Catchment Hazard Map

Figure 13 shows that flood risk across the Worthenbury Catchment is low. Any elevated flood risk is associated with main river flooding from the watercourses within the catchment. Despite this risk being low, flooding will be investigated when reported to the Flood and Water Management Team.

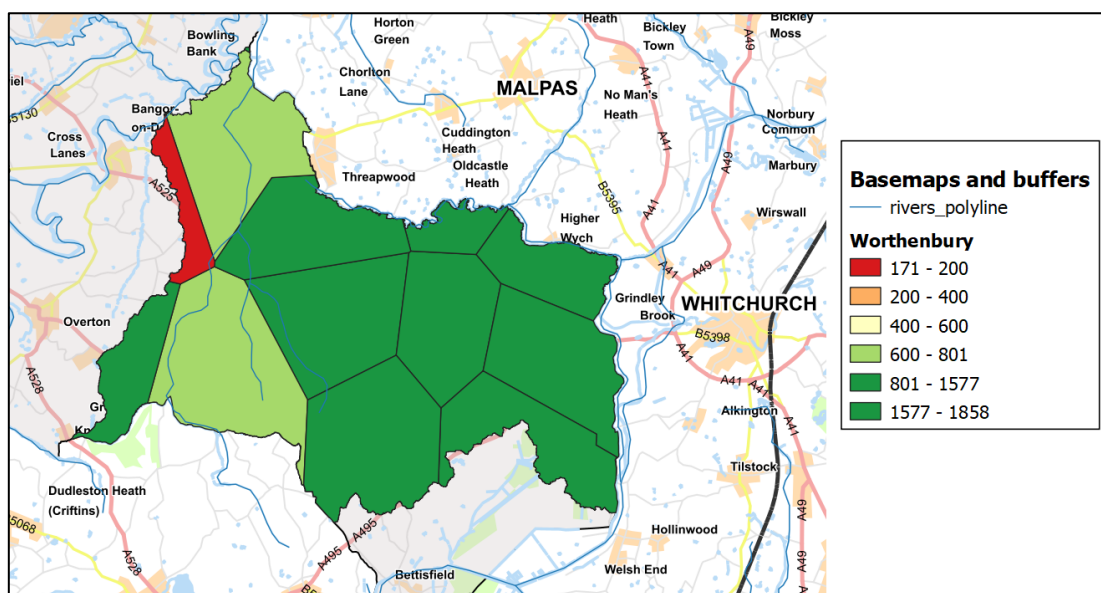


Figure 12: A map of flood risk across the part of the Worthenbury Catchment which falls within the boundaries of Wrexham CBC. The hazard map has been produced using the NRW CaRR dataset from 2019 based on the combined flood risk rankings. The course of main rivers has been presented on top of this data, but it should be noted that ordinary watercourses are not shown on this map.

7.9.3 Worthenbury Catchment Delivery Plan

Table 10 details the actions proposed to manage flood risk within the Worthenbury Catchment over the life of this plan. Actions have been allocated an indicative priority to ensure the correct information is available to make appropriate decisions. The ability to carry out these actions is dependent on appropriate funding across the life of the plan to ensure sufficient resource is available to both investigate and implement identified actions.

Table 10: A summary of the catchment delivery plan for the Worthenbury.

Catchment Action	Measure Type	Priority	Status
L1.4 Carry out maintenance on existing defences and assets.	Prevent	1	Ongoing
L2.1 Provide comment and input to the planning system at all stages (Strategy level down to individual planning applications) to ensure the guiding principles of FRM are appropriately considered.	Prevent	1	Ongoing
L2.3 Develop and implement a system for responding to planning consultations and approving submissions of surface water drainage system.	Prevent	1	Not Started
L5.1 Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Prevent	2	Ongoing
L7.1 As required, investigate flooding incidents as they are reported to the Authority.	Recover & Review	1	Ongoing
L8.3 Raise flood awareness within the community.	Prepare	1	Ongoing
L8.4 Promote the use of individual Property Protection systems.	Protect	2	Ongoing
L10.1 Work with partners to improve resilience within the community.	Prepare	3	Ongoing
L10.2 Work with partners to incorporate flood risk management benefits into broader environmental projects and schemes.	Prevent	3	Ongoing

8. Environmental Assessments

The implementation of the FRMP will provide an opportunity to improve the natural environment across all of Wrexham CBC in addition to reducing flood risk. This will enhance the environment for both residents and businesses along with increasing the number of habitats and contributing to an improvement in biodiversity.

Assessments have been made alongside the development of the FRMP to take into account the environment within the local authority area. The environmental assessments consider and record how the FRMP contributes to the achievement of wider environmental aims.

8.1. Strategic Environmental Assessment

The Strategic Environmental Assessment (SEA) is a statutory requirement of the European Union's SEA Directive. It involves the appraisal of the potential environmental affects- both positive and negative- of plans, programmes or strategies so that they can be taken into account prior to being approved or formally adopted. As a FRMP is a statutory document, it is subject to the SEA process.

The SEA is available as a separate document to accompany this report.

8.2. Habitats Regulations Assessment

The Habitat Regulations Assessment (HRA) is a document which is designed to test if the FRMP could significantly harm the designated features of a protected European site. The HRA is a separate document which will accompany this report.

8.3. Water Framework Directive Assessment

The Water Framework Directive (WFD) is a key piece of European legislation which imposes a legal requirement to improve the qualitative and quantitative health of the water environment. This includes our rivers, coasts, estuaries, lakes, groundwater and canals. Under the WFD, a management plan is required for each River Basin District. Natural Resources Wales and the Environment Agency are responsible for the publication of these plans.

River Basin Management plans (RBMPs) describe the challenges that threaten the water environment in the river catchment that they cover and how these challenges might be managed and funded. Wrexham CBC fall within the RBMPs for both the River Dee catchment and the River Severn catchment.

Table 11 demonstrates how the FRMP has considered the environmental objectives outlined in both the River Dee and the River Severn RBMPs.

Table 11: A summary of the objectives that were considered against the River Dee and River Severn RBMPs environmental objectives.

Borough Action Number	Flood Risk Management Plan Objective	Relevant RBMP	How it Considers the River Basin Management Plan
L1.3	Work with other RMAs to maximise collaborative opportunities to better understand flood risk.	Dee and Severn	Wrexham CBC will work Dwr Cymru Welsh Water to identify opportunities to reduce the amount of surface water causing hydraulic overloading to combined sewer systems. Through reducing this overloading, it is hoped that there will be a reduction in the instances of CSO releases and thus, a reduction in the pollution entering the water environment.
L1.4	Carry out maintenance on existing defences and assets.	Dee and Severn	Wrexham CBC carries out regular asset inspections. During these inspections, the presence of any invasive species is identified and reported.
L5.1	Identify and promote collaborative schemes to benefit both flood risk and the natural environment, taking all opportunities to maximise multiple benefits.	Dee and Severn	Wrexham CBC intends to use natural flood management (NFM) where possible in the delivery of the Flood Risk Management Plan. This is a flood alleviation measure that will heavily focus on benefits to the natural environment. Many NFM measures will help to promote biodiversity.
L5.3	Promote source control methods to maximise flood risk benefit and environmental enhancement (SuDS).	Dee and Severn	<p>Wrexham CBC will enforce the inclusion of SuDS on all new and re- development through the SAB function of the LLFA. This will promote water sensitive design in our urban spaces and reduce the impact of people on the water environment.</p> <p>SuDS also help to promote biodiversity within our urban areas. This is because they can create wildlife corridors that connect the often isolated green spaces in our urban areas.</p>
L6.1	Formalise and promote the non-culverting policy approved as part of the LFRMS.	Dee and Severn	<p>Wrexham CBC intends to reduce further modifications to the natural flow and bank conditions of all watercourses through non-culverting of watercourses where alternatives are available. This will be done via our Ordinary Watercourse Consenting role.</p> <p>Where possible, Wrexham CBC would like to explore the possibility of removing watercourses from culverts.</p>
L10.1	Work with partners to improve resilience within the community.	Dee and Severn	Wrexham CBC hopes to improve all aspects of resilience. However, a particular focus should be placed on resilience to flooding where a consequence could be the release of pollution into the water environment. Particular areas to target would be wastewater and agricultural pollution with coordination with our partner organisations, DCWW and NRW.

9. Public Consultation

The public consultation will be carried out between 9th January 2024 – 16th February 2024 between members of the public, other Risk Management Authorities which include the neighbouring LLFAs, DCWW and NRW. The finalised plan will then be populated and presented to Executive Board following any changes that have been made as a result of the consultation.

10. Monitoring and review

The actions listed in the plan will be reviewed annually in line with applications for FCERM grant money from the Welsh Government. This is because funding will be used on an annual basis to action each part of the plan. Proposed works are justified to both the Welsh Government and the Lead Member for Wrexham CBC Environment and Technical Department.

Despite the above, it is important to note that flooding can impact different communities in different ways between flood events. This means that there may be ad hoc additions to the planned actions if emergency works are identified from flood investigations.

The next review of the FRMP will be carried out in 2030.

Appendices

Appendix 1: LFRMS Measures Linked to Defined Categories

Prevent

- **L1.** Improve the level of understanding of local flood risk and promote a strategic approach to flood risk management within the Lead Local Flood Authority, Flood Risk Partners and Stakeholders;
- **L2.** Promote a successful development plan and management approach to local flood risk issues to address issues of urban creep, resilience, water sensitive design and sustainable drainage systems
- **L3.** Establish an effective asset management register which includes designated structures and risk based approach to maintenance schedules.
- **L5.** Promote and develop scope for natural approaches to both flood risk management and land use management, so that source control measures, flood attenuation and storage (sustainable drainage systems) are utilised to reduce surface water run off.
- **L6.** Adopt a non culverting policy approach to ordinary watercourses
- **L11** Identify projects and programmes which are affordable maximising capital funding from external sources.

Protect

- **L3.** Establish an effective asset management register which includes designated structures and risk based approach to maintenance schedules.
- **L5.** Promote and develop scope for natural approaches to both flood risk management and land use management, so that source control measures, flood attenuation and storage (sustainable drainage systems) are utilised to reduce surface water run off.
- **L10** Maximise opportunities for partnership working within the LLFA, flood risk partners and stakeholders
- **L11** Identify projects and programmes which are affordable maximising capital funding from external sources.

Prepare

- **L1.** Improve the level of understanding of local flood risk and promote a strategic approach to flood risk management within the Lead Local Flood Authority, Flood Risk Partners and Stakeholders
- **L3.** Establish an effective asset management register which includes designated structures and risk based approach to maintenance schedules.
- **L4.** Effective collection and collating of flood event information through the use of geographical information systems, and databases to identify, and prioritise sources and consequences of flood risk within communities
- **L8.** Promote greater level of community resilience, awareness and preparedness which encourages proactive and responsible maintenance of privately owned assets and flood defences
- **L9.** Improve the response and recovery to flooding events by emergency response organisations, individuals and businesses
- **L10** Maximise opportunities for partnership working within the LLFA, flood risk partners and stakeholders
- **L11** Identify projects and programmes which are affordable maximising capital funding from external sources.

Recover / Review

- **L2.** Promote a successful development plan and management approach to local flood risk issues to address issues of urban creep, resilience, water sensitive design and sustainable drainage systems
- **L4.** Effective collection and collating of flood event information through the use of geographical information systems, and databases to identify, and prioritise sources and consequences of flood risk within communities
- **L7.** To investigate flood events
- **L10** Maximise opportunities for partnership working within the LLFA, flood risk partners and stakeholders
- **L11** Identify projects and programmes which are affordable maximising capital funding from external sources.