

Carmarthenshire County Council's Local Flood Risk Management Strategy 2024-2030

A strategy for the management of flood risk across
Carmarthenshire.

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1 Foreword

As a society, we are faced with a climate emergency, and it is our responsibility to take proactive measures to safeguard our communities and minimize the potential devastation caused by flooding and coastal erosion.

In our pursuit to manage flood risk and coastal erosion effectively, we recognise the need to foster wider community resilience. By engaging and empowering our communities, we can collectively build a more resilient society that is better equipped to withstand the impacts of climate change. This Strategy emphasises collaboration and participation, acknowledging that individual actions contribute to the overall resilience of our entire community.

Furthermore, we understand the significance of aligning our flood risk management and coastal adoption interventions with the natural environment. Our interventions must enhance the natural landscape, working in harmony with nature to deliver multiple benefits and improve the overall well-being of our communities. By developing this approach, we not only mitigate against the flood risk but also create habitats and enhance biodiversity which will enrich the lives of our citizens and promote better health and wellbeing.

However, we must acknowledge the financial constraints faced at this time in delivering such ambitious plans. As our resources become increasingly scarce, it is vital we explore innovative solutions and seek partnerships to optimise our effectiveness. In doing so we must ensure that our limited resources are prioritised in those communities at greatest risk and that we achieve the greatest outcomes possible.

Looking ahead to the next 7 years to 2030, we recognise the importance of a community-led approach in flood risk management and coastal adaption. We understand that our citizens and businesses possess invaluable insights, experience and knowledge about their community, and it is imperative that we harness this wealth of information. By involving our communities and businesses at every stage of the decision-making process we can create tailored solutions and strategies that are rooted in the local needs and aspirations.

To accomplish our goals, we must also encourage better provision of information from our citizens and businesses. By fostering a culture of collaboration, transparency, and openness we can tap into the collective wisdom and expertise of our diverse stakeholders thereby enhancing the efficiency of our measures and actions.

Lastly we must recognise the significance of strategic partnerships with other risk management authorities (RMAs). Collaboration on a catchment scale will allow us to pool our resources, expertise and knowledge, enabling us to address flood risk and coastal erosion more effectively and efficiently. Through co-operation, we can achieve a greater level of risk management for our communities and better deliver our shared objectives.

In conclusion, this new flood risk management strategy encapsulates our commitment to managing climate change, promoting community resilience and wellbeing, and enhancing the natural environment with nature-based solutions. By adopting a community-led approach, collaborating with partner RMAs and optimising our resources we endeavour to build a safe and prosperous sustainable future for all. Only together we can navigate the challenges of climate change and empower our communities to mitigate their flood risk for their greater health and wellbeing.

2 Introduction

2.1 The need for a Local Strategy

The Flood and Water Management Act 2010 requires all 22 Lead Local Flood Authorities (LLFAs) in Wales to produce a Local Flood Risk Management Strategy (Local Strategy). The Welsh Government's National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales (National Strategy) sets out that over 245,000 properties across Wales are at risk of flooding from rivers, the sea and surface water, with almost 400 properties also at risk from coastal erosion. The National Strategy explains that, as the climate changes, we can expect those risks to increase, with more frequent and severe floods, rising sea levels and faster rates of erosion of the coast.

The National Strategy sets out the legislative context to FCERM activities in Wales. In certain cases, Local Authorities are also required to produce Flood Risk Management Plans (FRMP), under the 2009 Flood Risk Regulations.

Different Risk Management Authorities (RMAs) in Wales are responsible for different sources of flood risk. LLFAs are responsible for "local flood risk".

In Carmarthenshire, local flood risk is flooding from:

- **Surface water runoff**
- **Groundwater; and**
- **Ordinary watercourses (generally smaller watercourses)**

This Local Strategy focuses on these local sources of flood risk, but as Carmarthenshire also has 90km of coastline, we have considered these risks also.

2.2 The purpose of our Local Strategy

We published our first Local Strategy¹ in May 2013, setting out our overarching approach to managing flood risk in Carmarthenshire.

Alongside our strategy, we developed and published a flood risk management plan (FRMP)². The FRMP was a more detailed evaluation on an electoral ward level and from this analysis, fifty high risk areas were further evaluated.

This document is our second strategy. Whilst we previously published our Local Strategy and FRMP separately, several years apart, this time, we aim, to produce and publish the FRMP within three months of the strategy.

These documents will explain how flooding will be managed across Carmarthenshire, consistent with local objectives, measures, policies and national strategies.

2.3 The Structure of this Local Strategy

This document is structured as follows:

Chapter 3 gives an overview of how this Local Strategy responds to climate change.

Chapter 4 summarises how this Local Strategy aligns with our other strategic plans.

Chapter 5 sets out the roles and responsibilities for managing flood risk in Carmarthenshire.

Chapter 6 details our progress since our first flood risk management plan.

Chapter 7 discusses historical flooding in Carmarthenshire.

Chapter 8 describes our strategic Objectives or ambitions for managing flood risk in the coming years, and how these align with the objectives set out in the National Strategy.

Chapter 9 presents a strategic assessment of the risk of flooding across Carmarthenshire.

Chapter 10 presents a strategic assessment of flood risk in Carmarthenshire, on a district level.

Chapter 11 sets out our flood risk management measures. These are broad activities and ways of working which help us to meet our strategic objectives.

Chapter 12 describes how we will use a flood risk management action plan to meet our measures.

¹ [Flood Risk Strategy and Management Plan \(gov.wales\)](#)

² [Flood Risk Strategy and Management Plan \(gov.wales\)](#)

Chapter 13 set out our funding and prioritisation.

Chapter 14 sets out what environmental assessments will accompany this document to ensure we are compliant with our Environment Act duties and responsibilities.

Chapter 15 describes how we will measure and monitor our progress in delivering the objectives, measures and actions set out in this Local Strategy.

2.4 Targets within this Local Strategy – Objectives, Measures and Actions

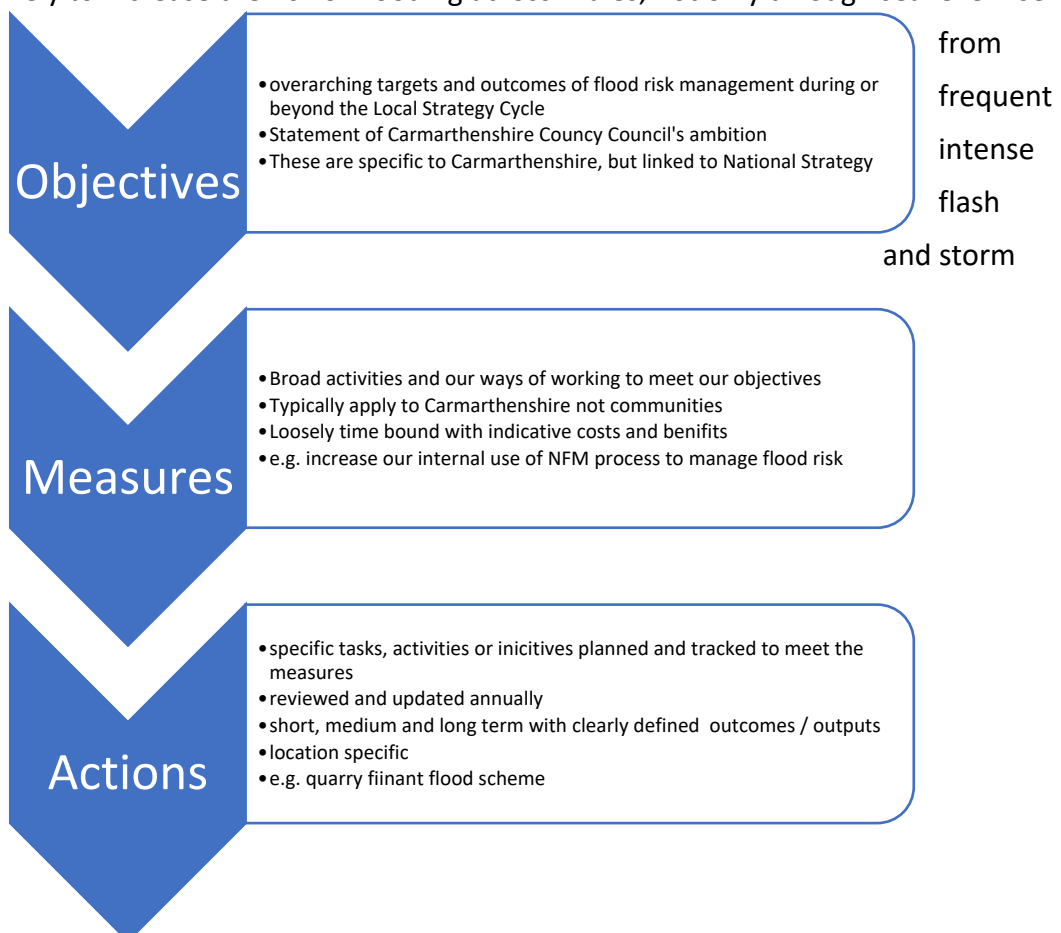
This Local Strategy sets out our flood risk management Objectives, Measures and Actions. These three groupings provide different levels of detail on how flood risk will be managed. The meaning of each is summarised below in Figure 1:

Figure 1 – How objectives, aims and measures will be utilised to deliver our FCERM Local Strategy.

3 How this strategy responds to climate change

3.1 Climate change risk in our area

The Senedd was the first Parliament in the world to declare a climate emergency. Climate change is likely to increase the risk of flooding across Wales, not only through sea level rise but also from frequent intense flash and storm surges.



Carmarthenshire County Council are committed to tackling climate change and acknowledge that we have a significant role to play in both further reducing our own greenhouse gas emissions and providing the leadership to encourage residents, businesses and other organisations to take action to cut their own carbon footprint.

In February 2019, we declared a climate emergency, and made a commitment to becoming a net zero carbon local authority by 2030. We have since become the first Local Authority in Wales to publish a [net zero carbon action plan](#)³, which was endorsed by full Council in February 2020.

We are taking a pragmatic approach towards becoming a net carbon zero local authority by 2030, with our initial focus being on our measurable carbon footprint. This does not preclude other wider actions to address the climate emergency, which are being carried out across Council departments.

In February 2022, the council also declared a nature emergency to mitigate the decline in our natural fauna and flora

This Local Strategy will help to mitigate against some of the impacts of the climate and nature emergencies in our area.

The objectives, measures and actions it identifies will help us to reduce the risk of flooding where we can, as well as adapt our communities and infrastructure to become more resilient to flooding when it occurs.

3.2 How our strategy addresses these risks

The list below, while not exhaustive, documents how our FCERM activities will seek to have positive impact on climate change.

- Use of the Flood Map for Planning (FMfP) in undertaking flood risk assessment, which includes climate change allowances.
- We will utilise the WG guidance on [Adapting to Climate Change](#)⁴, with climate change allowances for FCERM scheme designs.

³ Route Towards becoming a Net Zero Carbon Local Authority: Carmarthenshire Council Council's Strategy (Feb 2020).

⁴ The Welsh Government, 2022, Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales

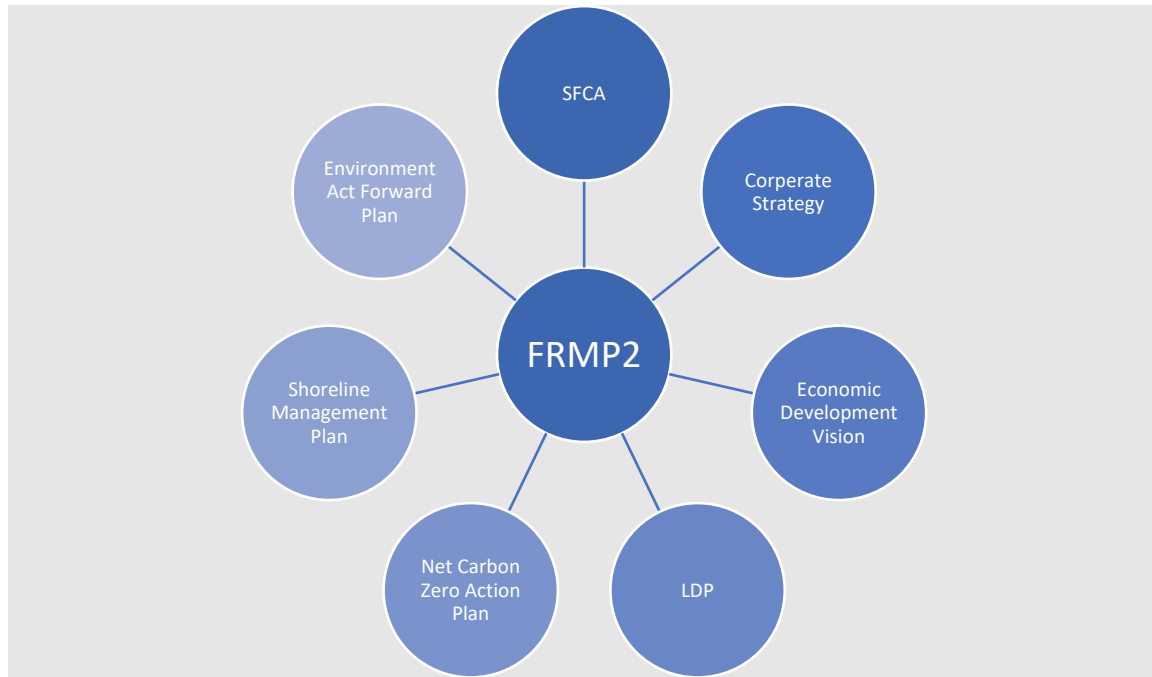
- We will develop and promote natural flood management FCERM schemes and nature-based solutions to reduce our capital works carbon footprint.
- We will implement FCERM interventions alongside and in collaboration with:
 - Our tree and woodland strategy
 - Our blue and green infrastructure strategy
 - Our phosphates and nitrates strategy
 - Our LDP
- We will continue to work with the Welsh Coastal Monitoring Centre (WCMC) to deliver the actions within the Shoreline Management Plan 2, but also monitor and develop an understanding and evidence base of how our coastline is changing.
- We will work with fellow Risk Management Agencies (RMA) such as NRW and DCWW.
- We ensure all new developments follow the latest sustainable drainage design guidance and factor in allowances for climate change.

4 Co-ordination

4.1 How this strategy aligns with our other strategic plans

In developing our Local Strategy, we have worked with the following plans:

Figure 2 details the principal plans and strategies that have been considered in the development of the FCERM Local Strategy include:.



4.2 Co-ordination with others

We are committed to working in partnership with RMAs, local communities, business and third sector organisations to achieve our FCERM goals and outcomes.

We are adopting a catchment-based approach to managing flood risk in Carmarthenshire in line with our partner RMAs. We aim to promote forward planning and a holistic, thematic approach to FCERM which promotes collaborative working, whilst also delivering wider social, economic and environmental benefits. The implementation of Natural Flood Management (NFM) measures, nature based solutions (NBS) and sustainable drainage (SUDs) will be a large part of our commitment to working closely with partner organisations.

This Local Strategy has been developed in co-ordination with the strategic planning processes and plans of other Risk Management Authorities (RMAs). A summary of which has been detailed below:

- West Wales River Basin management Plan ([NRW](#))

- NRW's FRMP
- Water Resources Management Plan
- Drainage and Wastewater Management Plan
- Network Rail's Asset Management Plan

We will continue to coordinate the delivery of our objectives, measures and actions through future consultation and engagement activities with RMAs, particularly in the development of our updated flood and water management related plans.

We also recognise the importance of enhancing our Local Strategy with the public and input knowledge they have. As such, we have undertaken public engagement and consultation activities in the development of this Local Strategy. The details and outcomes of both engagement and consultation activities are discussed in Appendix A.

5 Roles and responsibilities for managing flood risk

Flood risk in Carmarthenshire is managed by multiple agencies, depending on the source of the flooding. CCC as the LLFA, are responsible for local flood risk as defined in 2.1. We also manage elements of tidal flooding and coastal erosion in partnership with NRW. We are also responsible for parts of the sewer network that service our property and housing stock.

5.1 Sources of flooding and key points of contact

5.1.1 Surface Water Flooding

This occurs when heavy rainfall exceeds the capacity of the local drainage networks and ground to absorb it. This can lead to water flowing across the ground and ponding in low-lying areas. This type of flooding is typically caused by short, intense rainfall and is often localised with short lead-times, making it difficult to predict, albeit localised low spots are often affected.

You may report these issues to CCC using the following link [Flooding \(gov.wales\)](#)

5.1.2 Groundwater flooding

This occurs when the ground becomes saturated and water rises to ground level, or when water flows from normal springs. We are seeing more and more issues of ground water flooding, wet or waterlogged gardens and springs breaking ground. This flooding can be more prevalent after prolonged periods of rain in the autumn and spring.

You may report these issues to CCC using the following link [Flooding \(gov.wales\)](#)

5.1.3 An Ordinary Watercourse

These are defined as watercourses that are not a main river, as defined on the main river map. The definition of a watercourse is broad, but the majority of streams, ditches and rivers in Carmarthenshire will be ordinary watercourses.

Flooding from ordinary watercourses occurs as a result of flows in a watercourse exceeding their capacity, which can result in overtopping and/or breaching of flood defences following heavy rainfall. It can also be caused by debris build up causing blockages to infrastructure.

You may report these issues to CCC using the following link [Flooding \(gov.wales\)](#)

5.1.4 Main Rivers

Main rivers are classified and managed by NRW and can be viewed online [here](#). A rough rule of thumb is that these are the biggest rivers in Carmarthenshire e.g. the Teifi, Towy, Cothi, Loughor, Amman etc but their upper reaches are normally ordinary watercourses.

Flooding from main rivers occurs as a result of flows in a watercourse exceeding their capacity, resulting in overtopping and/or breaching of flood defences structures.

Report main river flooding issues to NRW [here](#)

5.1.5 Sewer flooding

Sewers are the responsibility of the asset owners. In most cases in Carmarthenshire that will be Dwr Cymru Welsh Water, but private systems will be the responsibility of their owners or those who derive benefit from them. There can be surface water and / or foul sewers. Flooding from these systems is normally due to a blockage or damage, but can also be attributed to capacity issues caused by excess surface water entering the drainage network and exceeding the capacity.

Report sewer flooding to DCWW in the first instance [here](#).

5.1.6 Highway Flooding

This is the most commonly reported problem in Carmarthenshire. Highway flooding is when water pools on the carriageway or the walkway, or when the highway gullies and culverts cannot take the volume of the water.

Blockage and blinding is a significant cause of highway flooding and during the Autumn leaf fall, we have a significant volume of incidents during this period.

You may report these issues to CCC using the following link [Flooding \(gov.wales\)](#)

5.2 Risk Management Authorities and their functions

Risk Management Authorities (RMA) across Wales include NRW, the 22 Local Authorities, water companies, and the Welsh Government. Each RMA is required to fulfil a number of statutory duties, as defined under the FWMA. In addition to these statutory duties, the Act

sets out a range of permissive powers for RMAs, enabling them to undertake defined activities if they so wish.

5.3 Other responsible partners

In Carmarthenshire, the following groups also have a key role to play in the management of flood risk:

- Riparian landowners - [guide to rights and responsibilities of riverside ownership in Wales](#)⁵.
- Local partnerships, forums and community groups
- Property owners
- Housing associations (Pobl, Bro Myrddin etc)
- Farming unions (NFU, FUW)
- Network Rail

5.4 How we manage flooding incidents in Carmarthenshire

5.4.1 Prior to flooding incidents

We undertake daily monitoring of the weather (principally rainfall) and the tides via a flood incident duty officer (FIDO) system on a weekly rota basis.

The primary duty of the FIDO is to monitor the rainfall, tides and storm surge and inform the Flood Defence and Coastal Protection Manager of any issues.

When severe weather, storms or high tides are forecast, the team instigate preparatory operational actions, which can range from media communications and pre-storm asset checks, to instigating emergency planning protocols and ensuring additional operational staff are available.

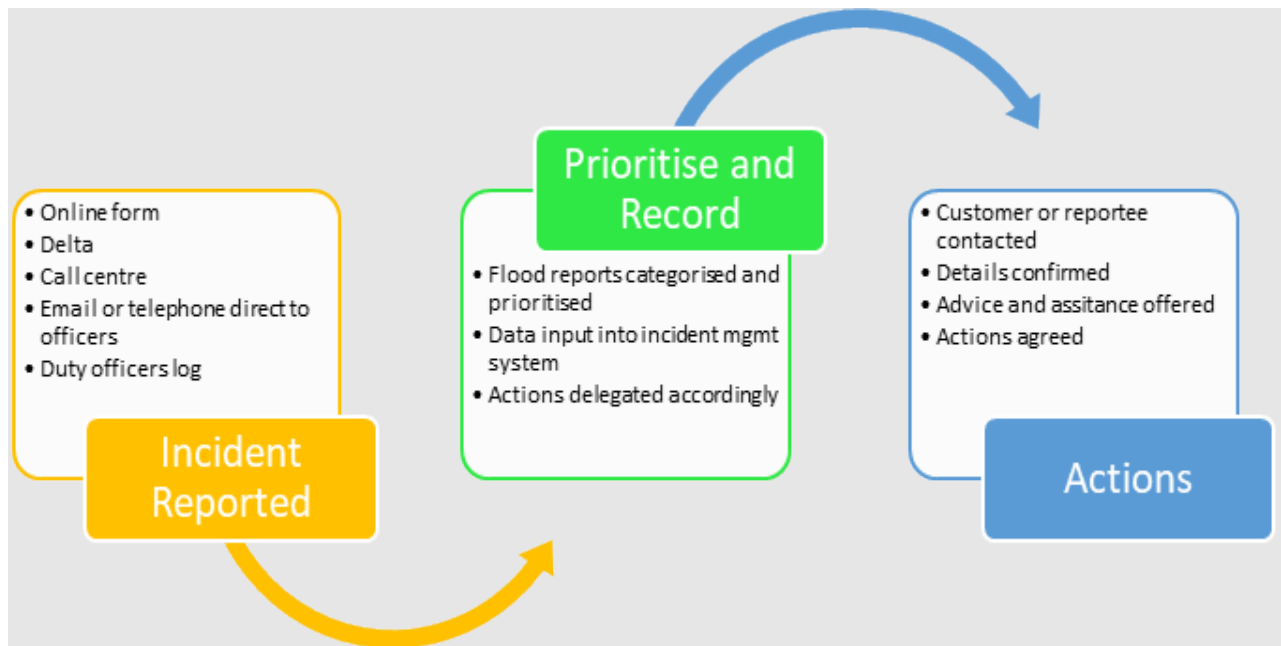
5.4.2 During a flooding incident,

Flooding issues are reported to us via an [online system](#) or via the call centre during office hours (01267 2345567) or via Delta Wellbeing out of hours (0300 333 2222).

⁵ NRW, 2017, A guide to your rights and responsibilities of riverside ownership in Wales

We operate an incident classification system and a prioritisation schedule, thus ensuring that the incidents with highest risks are actioned first e.g. risk to life, high speed roads, internal flooding.

All incidents are recorded to ensure we understand the severity of the incident. This informs future priorities and works.



5.4.3 Post the storm

This is the recovery phase and incident investigation. We ensure that residents and businesses are supported as much as is possible, and we aim to understand why flooding has happened.

When 20 or more properties have been affected by internal flooding, in any geographical area, we undertake a formal incident investigation, as required under S19 of the Flood and water Management Act 2010.

The details of who and what has been affected, and the severity are logged on our FCERM database and used to inform future works programming and studies. We submit annual applications for funding to Welsh Government, and our flood risk 'intelligence', namely data from reported incidents and investigations, helps support those applications.

5.5 Other FCERM duties

In addition to our flood incident management duties, CCC as an LLFA, also undertake the following duties:

5.5.1 Asset management

We undertake annual inspection of over 300 above ground flood risk assets⁶ and 5-miles⁷ of underground culverts.

Post these surveys we prioritise repairs and maintenance, and then procure and manage those repairs.

We undertake an annual programme of exploratory surveys and data gathering, focusing on areas of high flood risk where we are data poor.

All of this is recorded and managed via our asset management system.

5.5.2 Consenting and permitting

As the Sustainable Drainage Approval Body (SAB) we consent all SuDS drainage systems on new developments in Carmarthenshire. Where the SuDS system serves more than 1 dwelling, there is a statutory duty for us to adopt the SuDS system. This involves a legal adoption process and payment of a commuted sum. We inspect every drainage system⁸ consented at least once to ensure compliance.

We also consent works on ordinary watercourses under S23 of the Land Drainage Act 1991.

We provide expert advice and guidance to the Local Planning Authority on over 650 applications per year⁹

5.5.3 Capital works programme.

In recent years we have developed and expanded our FCERM capital works programme. We aim to upgrade two FCERM assets annually (subject to funding) plus operate a pipeline programme of flood risk management schemes. Our ambition is to feed the pipeline annually by applying for WG funding for outline business case development. If successful, these business cases, subject to funding, are taken forward to full business case and

⁶ Numbers based on inspection programme 2021-2023

⁷ Average length of culvert surveyed per year from 2021 to 2023

⁸ With the exception of forestry commission consents.

⁹ Average number of consultations 2021-2023 (Arcus)

detailed design culminating in construction in the medium to longer term. A summary of our current capital works programme can be viewed in Appendix B.

5.5.4 Reservoirs

We manage four reservoirs in Carmarthenshire in line with the Reservoirs Act 1949. All four are inspected annually by an external Supervising Engineer. Actions from these inspections are delivered within the specified timescales.

5.5.5 Coastal Adaption and Risk Management

We have over 90km of coastline in Carmarthenshire, 20km of which is afforded man-made protection from flooding and / or erosion. The Shoreline Management Plan 2 (SMP2) is the primary policy document pertaining to the management of our shoreline and we have 87 actions within this document to deliver¹⁰.

Looking forward, we are seeking to work more closely with coastal communities, to advise them on the effects of climate change and develop an understanding of how they wish to adapt to these future challenges.

5.6 Key policies

We currently have the following policies pertaining to flood and coastal erosion risk management in Carmarthenshire.

- Sandbags¹¹

Over the medium term, we will be seeking to develop policies, in collaboration with internal and external partners on

- Sustainable drainage (SuDS) infrastructure;
- Blue and green infrastructure;

¹⁰ Shoreline Management and Coastal Adaption in Carmarthenshire; CMT and Scrutiny Committee paper (2023)

¹¹ CCC Sandbag policy (2022) - <https://www.carmarthenshire.gov.wales/media/1231613/2022-sandbag-policy.pdf>

6 Our progress since FRMP-1 (2019-2023)

We published our first [flood risk management plan in 2019](#). Part-1 was an electoral ward level, high level analysis of surface water risk. It focused on higher level themes and measures, rather than operational actions.

We can report that:

- 62.5% of the measures in part-1 were implemented in the areas of greatest flood risk, in line with best practice, and more recently the Welsh Government National Strategy for flood and coastal erosion risk management.
- 12.5% of the measures in part-1 were implemented county wide and
- 25% of the measures in part-1 were superseded by other measures or operational actions from part-2 of the FRMP, as detailed below.

Part-2 of the plan was an operational analysis of the areas at greatest risk from surface water flooding in Carmarthenshire. 50 areas of highest risk were identified as 'policy unit' areas or high-risk surface water flood risk areas across Carmarthenshire, and they have been the operational focus during the life cycle of this plan.

- 90% of all actions in Part-2 have been completed.
- 6% are currently ongoing and include capital works at Newcastle Emlyn, culvert repair works at Dafen, and knotweed management in Burry Port.

Only 4% remain 'un-actioned'. actions pertaining to partnership working and liaison with other Risk Management Authorities (RMAs) has been disrupted by COVID-19, staff changes and differing priorities. New contacts are being sought with partner RMAs both locally and regionally to move these forwards in 2024.

In addition to the documented actions in the plan, in 40% of the highest risk areas, additional actions and interventions, over and above what was laid out in the plan, have been undertaken or are currently being delivered. Key delivery highlights are detailed in Figure 3 below.

Figure 3 – table of actions undertaken in higher risk areas 2019-2023

Year	Project Name	Details	No. of Properties Benefiting
2019	New school road, Garnant	New trash screen, affording greater flood resilience	
	Bishops Road, Garnant	New trash screen decreasing the flood risk	
	Llanybydder Dairy	New culvert under the BXXXX decreasing the risk of blockage and flooding	
2020	Reservoir Road, Carmarthen	New Trash Screen affording greater flood resilience	
2021	COVID-19		
2022	Brynglas, Drefach	New structure and Trash Screen affording greater flood resilience	
	1904 Outfall, Ferryside	Repair to damaged sea outfall	
	Llansteffan Middle Sea Outfall	Repair to damaged sea outfall	
2023	Quarry Ffinant Culvert, Newcastle Emlyn	Replacement of a collapsing culverted watercourse	
	Margaret Street NFM	Creation of 4 ponds and 13 leaky dams in Carmarthenshire's first Natural Flood Risk Management Scheme	
	Cae Ffynnon stream	Re-profiling of a small stream and construction of stop logs	

7 Historic Flooding in Carmarthenshire

There has been significant flooding recorded in Carmarthenshire over many years. Our records suggest that during 1987 Carmarthenshire saw its worst flooding on record, with communities in the Towy and Teifi valleys significantly affected.

More recently, Storm Callum in October 2018 caused widespread flooding, with most residents agreeing that this was the worst flooding since 1987. Again the communities across the county were significantly affected with the worst areas affected being Pont Tyweli, Llanybydder and Carmarthen¹². Post Storm Callum, Storms Dennis (February 2020) and Storm Christoph (January 2021) had a considerable impact on council services and our emergency response.

In recent years, improvements to our processes and systems have allowed us to better capture information pertaining to flooding across Carmarthenshire. However, a large percentage of our data and intelligence comes from our citizens and businesses.

In Appendix C, we have collated a list of the significant flooding events from 1929 to the present day, but we acknowledge that this not a complete picture. As such, we will use our ongoing community and public consultation events to develop this further and better understand our areas of flood risk.

¹² Investigation into Flooding – Storm Callum, 12-14 October 2018. [s19-storm-callum-vp223.pdf \(gov.wales\)](#)

8 Strategic Objectives

8.1 Strategic Objectives in Carmarthenshire

For our Local Strategy, we have developed our own strategic objectives, which align with the National Strategy objectives, and also reflect our local context and priorities.

OUR AIM IS TO REDUCE THE NUMBER OF DWELLINGS AND BUSINESSES AT RISK OF FLOODING.

Our strategic objectives are to:

- **Modernise and develop a risk based, thematic approach to flood and coastal erosion risk management.**
- **Become data and information rich.**
- **Champion NFM, sustainable drainage and nature based solutions.**
- **Educate, advise and empower our communities to become more resilient.**
- **Promote and support community adaption and partnership working.**

8.2 National Strategy Objectives

The Welsh Government National FCERM Strategy sets out an overarching aim to reduce the risk to people and communities from flooding and coastal erosion. It identifies five objectives for delivering this aim. These are summarised below in Figure 4.

8.3 How we meet the national objectives

While the focus of our Local Strategy must be Carmarthenshire, we must also have regard for the Welsh Government's National FCERM Strategy¹³ and our aims and objectives need to support the delivery of the national objectives. Figure 5 below demonstrates how our aims and objectives link into the national strategy aims and objectives.

¹³ Welsh Government 2020 [National Strategy for Flood and Coastal Erosion Risk Management in Wales | GOV.WALES](#)

Figure 4 – WG FCERM National Strategy aims and objectives.



Figure 5 – CCC FCERM Local Strategy aims and objectives.

CCC FCERM Local Strategy AIM – Reduce the number of properties and business at risk of flooding					
CCC FCERM LOCAL STRATEGY OBJECTIVES	National Strategy Objectives				
	A	B	C	D	E
Modernise and develop a risk based, thematic approach to flood and coastal risk management.	X	X	X	X	X
Become data and information rich.	X		X	X	
Champion NFM, sustainable drainage, and nature-based solutions.	X	X		X	X
Educate, advise, and empower our communities to become more resilient.	X			X	
Promote and support community adaption and partnership working.	X	X		X	X

9 What is the risk of flooding in Carmarthenshire?

9.1 How we assess flood risk (methodology)

Our assessment of flood risk is central to achieving our aims and objectives. Without an understanding of flood risk in Carmarthenshire, we are not able to prioritise our resources, or focus on helping those at greatest risk¹⁴.

There are many sources of data that can be utilised to develop our knowledge of flood risk. Flood risk maps, together with improved asset data and modelling, has provided us with a much more enhanced and accurate understanding of local flood risk.

For the purpose of identifying the areas in Carmarthenshire at greatest risk from flooding, we have used the community at risk register (CaRR)¹⁵ as our primary data set, and then supplemented that with our own flood incident data.

The CaRR has been developed to provide an objective means of identifying risk and prioritising flood risk management activities at a Wales-wide, community level. It applies a standard methodology across all flood sources to calculate a theoretical 'danger score' that allows comparative risks to be quantified and ranked (from High to Low).

The CaRR comprises a spreadsheet that identifies and ranks individual communities for,

1. a natural, 'undefended' scenario, and
2. a mitigated scenario (based on the presence of defences and flood warning).

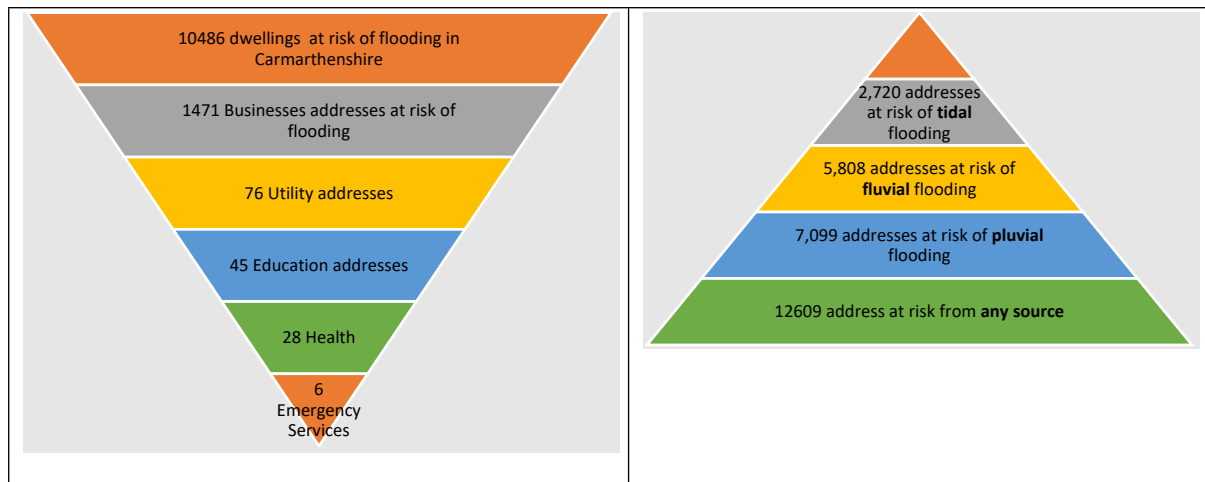
9.2 Carmarthenshire's Strategic Flood Risk

The first part of our strategic assessment was to use the CaRR data to provide a high-level overview of flood risk in Carmarthenshire. Using the GIS risk data, we have been able to calculate that there are over 12,600 addresses at risk of flooding in Carmarthenshire. This same data set also allows us to break down those addresses into categories including by the source of flood risk. This is shown in below in Figure 6.

¹⁴ WG FCERM National Strategy; objective-C

¹⁵ Data Map Wales, 2023 [Communities at Risk Register \(CaRR\) | DataMapWales \(gov.wales\)](#)

Figure 6 – Addresses at risk of flooding in Carmarthenshire by usage type and by flood risk source.



This same data source allows us to evaluate what is at risk of flooding (risk receptors) across Carmarthenshire. These risk receptors give an overview of what is at risk and for the purpose of this evaluation and to highlight changes across different scenarios we have compared high risk (3.33% AEP), medium risk (1% AEP) and low risk (0.1% AEP) scenarios. Some guidance on AEP is given in

Figure 7 and Figure 8 displays data on the risk receptor basis across the county.

Figure 7 - a definition of Annual Event Probability

Annual Event Probability AEP refers to the likelihood or change of a specific flood event occurring that year. It measures the frequency of that event in the defined period of time.

Figure 8 - Key flood risk receptors in Carmarthenshire.

Risk Receptor	High Risk 1 in 30 AEP	Medium Risk 1 in 100 AEP	Low risk 1 in 1000 AEP
Residential Properties Fluvial	754	1630	4744
Residential Properties Pluvial	1841	2633	6023
Residential Properties Tidal	1773	2125	2347
Non-residential properties Fluvial	174	393	927
Non-residential properties Pluvial	295	484	946
Non-residential properties Tidal	173	250	311
Essential Services WSP	94	168	311
Essential Services Fluvial	19	36	83
Essential Services Pluvial	54	87	158
Essential Services Tidal	21	45	70
Trunk Roads (km)	25.3	11	39
Railways (km)	19	10	23
Agri Land - Grades 1-3	7663	1442	2793
SACs	8114	158	218
SPAs	2009	158	218
Ramsar	1906	12	13
SSSIs	8942	214	373
SINC	0	0	0
National Nature Reserves	120	6.5	14
LNR	130	12	11
Ancient Woodland	574	96	233
Parks and Gardens	47	13	24
Country Parks	738	124	377
Scheduled Ancient monuments	8	1	3.3
Listed buildings	171	43	140
LDP Total Sites	129	143	198
LDP Business	72	81	104
LDP Residential	57	62	94
FCERM assets	7500		
Number FCERM Incidents	863 ¹⁶		
Main River Length (NRW Remit)	770		
Main Rivers (NRW remit)	81		

9.3 Flood risk, a national comparison

While not a primary focus of managing flood risk in Carmarthenshire, we must acknowledge that WG fund nationally, on a risk basis, and they are predominately focused on reducing and managing residential flood risk. Other national partners such as DCWW and NRW also operate nationally and prioritise on a national rather than regional level.

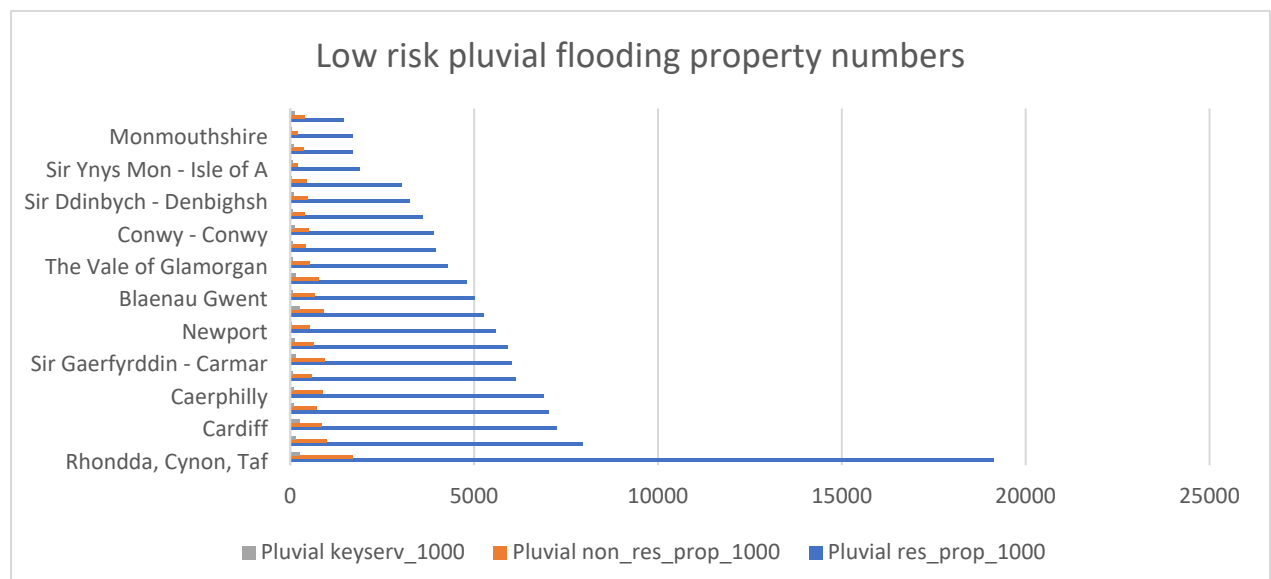
¹⁶ FCERM incident recorded post the implementation on an intergraded asset and incident management system in September 2017

9.3.1 Comparing pluvial (surface water) flood risk nationally

In terms of pluvial flood risk, the Rhondda Cynon Taf (RCT) area has the greatest number of properties at low risk of flooding with a little under 20,000 residential properties. Swansea is ranked second with just under 8,000 residential properties at low risk. In comparison Carmarthenshire has 6,023 residential properties at low risk of pluvial flooding; and we are ranked 7th nationally for the number of properties at risk, Pembrokeshire is ranked 22nd with 1,448 properties at low risk.

When you compare the numbers of residential properties at risk of medium and high risk of pluvial flooding, RCT has three to four times more properties at risk than Neath Port Talbot, which is ranked second. Carmarthenshire is ranked 6th as highlighted in Figure 9.

Figure 9 – numbers of properties at low risk of pluvial flooding per Local Authority, across Wales.

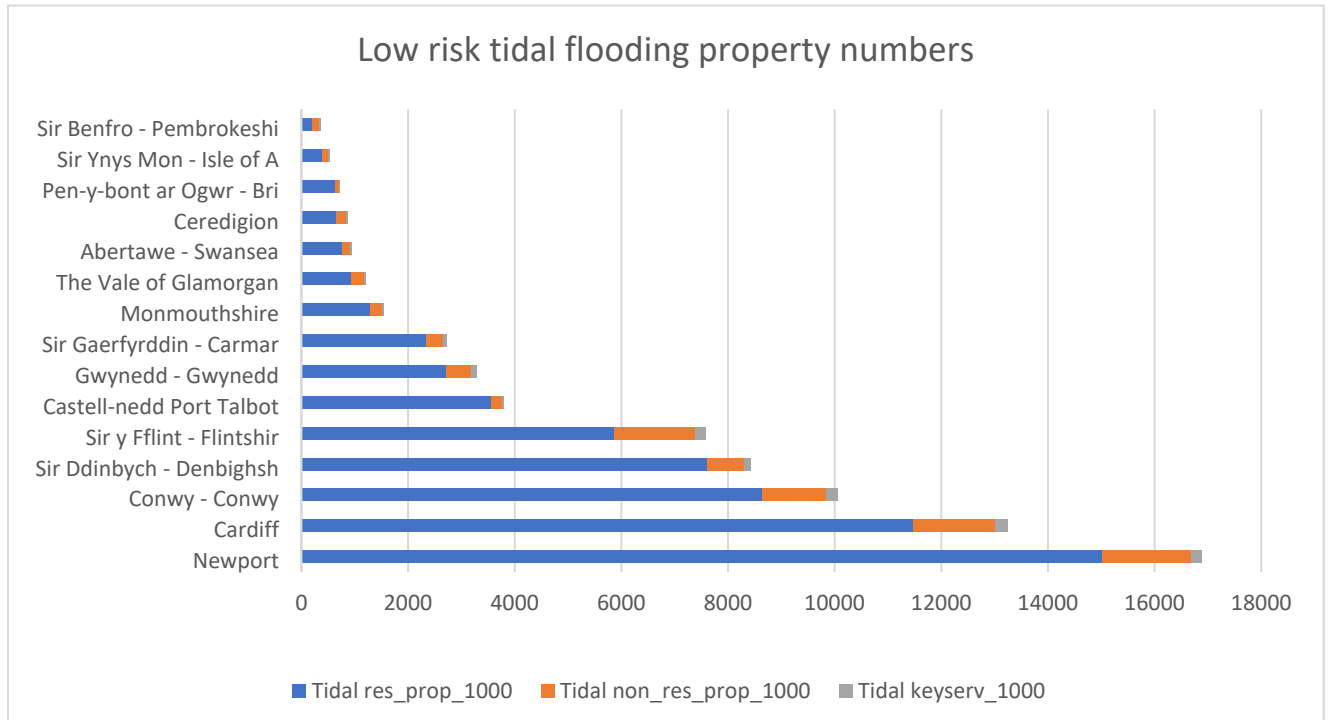


9.3.2 Comparing tidal flood risk nationally

Only 15 of the 22 Local Authorities across Wales have a tidal flood risk. Newport has the greatest number of properties at risk of tidal inundation across all three risk categories (low, medium and high). They have just over 15,000 properties at low risk and just under 12,000 properties at high risk. In comparison Carmarthenshire has 2,347 properties at low risk across its 90km of coastline and 1,773 properties at high risk. We are ranked 8th nationally across all risk categories, comparable in terms of numbers with Gwynedd and Neath Port Talbot. Pembrokeshire has the least number of properties at tidal flood risk with 198 being at low risk. For comparison the City and County of Swansea has 766 properties at low risk of

flooding and only 5 at high risk. The numbers of properties at low risk of tidal flooding per Local Authority is shown in Figure 10 below.

Figure 10 - numbers of properties at low risk of tidal flooding per Local Authority, across Wales.

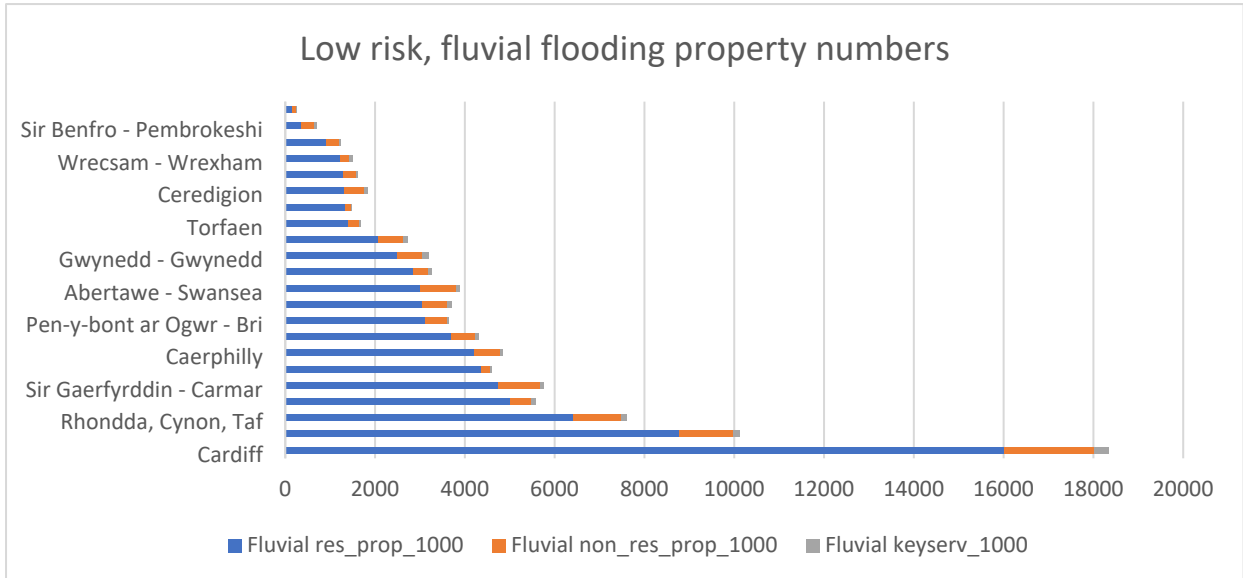


9.3.3 Comparing fluvial flood risk nationally

Carmarthenshire ranks 5th nationally in terms of low-risk fluvial flooding behind only Cardiff, Neath Port Talbot, RCT and Conwy but above Swansea and Newport. There are 4,744 residential properties at low risk of fluvial flooding in Carmarthenshire but over 16,000 in Cardiff which has the greatest number of properties at low risk of fluvial flooding, as shown in Figure 11.

In terms of our medium and high-risk areas, we have less properties at risk and our national rank falls to 8th and then 9th accordingly.

Figure 11 - numbers of properties at low risk of fluvial flooding per Local Authority, across Wales.



9.3.4 A summary of the national risk

Figure 12 below summarises Carmarthenshire's risk when compared nationally to the other Unitary Authorities.

Figure 12 - summary of the national rank of Carmarthenshire flood risk when compared across Wales

High risk (3.33% AEP)	Medium risk (1% AEP)	Low risk (0.1% AEP)
Pluvial - Rank 5 of 22	Pluvial - Rank 5 of 22	Pluvial - Rank 6 of 22
Tidal flood risk - rank 8 of 15	Tidal flood risk - rank 8 of 15	Tidal flood risk - rank 8 of 15
Fluvial - Rank 8 of 22	Fluvial - Rank 6 of 22	Fluvial - Rank 4 of 22

10 Flood risk in your River Basin Districts (RBDs)

10.1 Why have districts?

Due to the demographics of Carmarthenshire, namely that we are more heavily populated in the south and east, of the county, a local strategy looking at the whole of the county on a risk basis would result in heavy bias to the south and east. This is comparable to the national picture (as detailed in section 9 above) where the south and east of Wales is heavily populated and as such dominates the risk.

In light of this, we have taken the decision to divide Carmarthenshire into seven (7) FCERM districts, based roughly on river catchments, but conforming to the community at risk register (CaRR) community boundaries. The districts are shown in Figure 13 below and are:

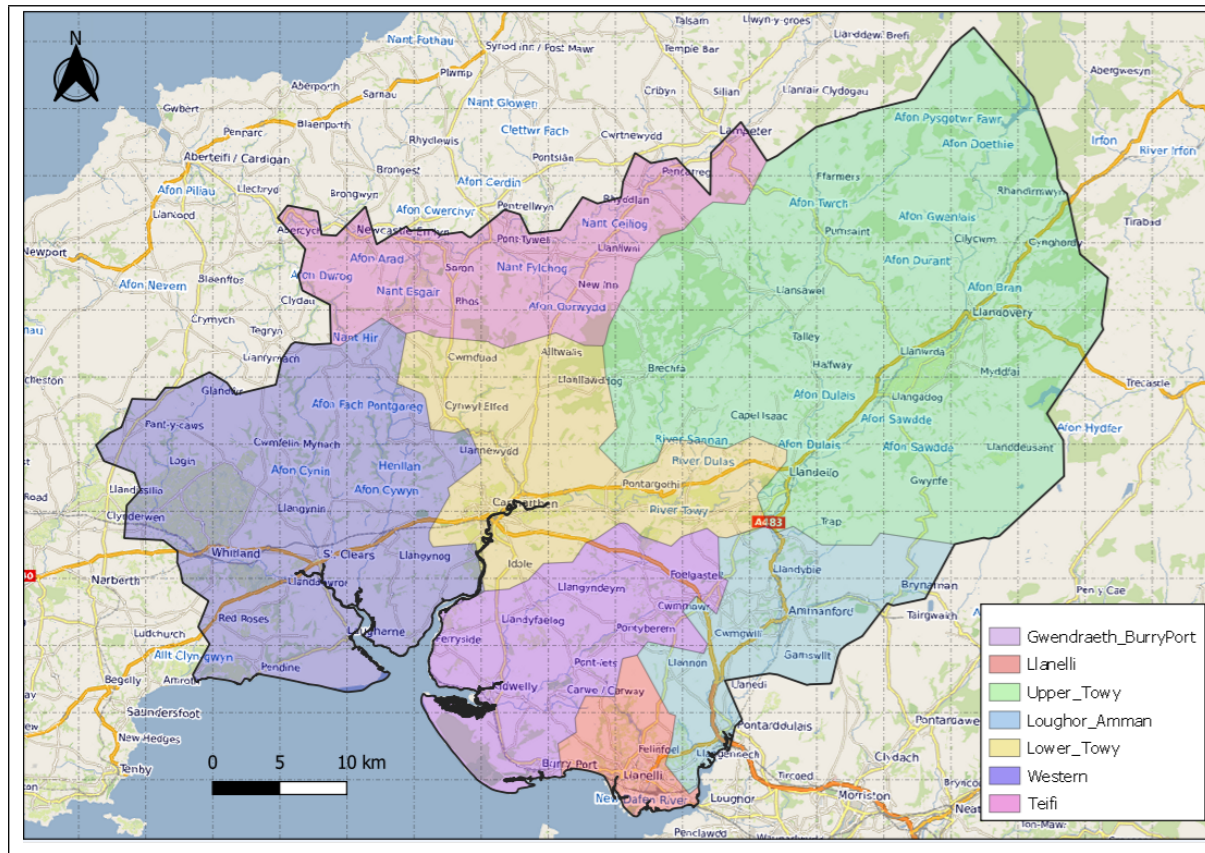
- The Teifi RBD
- The Upper Towy RBD
- The Lower Towy RBD
- The Western Valleys RBD
- The Amman and Loughor RBD
- The Llanelli RBD
- The Gwendraeth and Burry Port RBD

As mentioned above, the CaRR is our primary data set and we have used it to rank all areas of Carmarthenshire based on the three principal flood risks ie

- Fluvial
- Surface water (pluvial)
- Tidal

We will then evaluate flood risk per district, ensuring that resource is shared across the districts more evenly, while comparing districts and acknowledging that there are areas of the county with a greater risk rating than others.

Figure 13 – the 7 Carmarthenshire FCERM River Basin Districts



10.2 River basin methodology

Our methodology pertaining to our district analysis of flood risk focuses on the community at risk register data (CaRR)¹⁷ as our primary data set. The CaRR is the primary national FCERM data set and is the data set used by the Welsh Government in allocating funding. Added to the CaRR data we have used our own flood incident data, and data from Data Maps Wales.

A more detailed methodology is included in Appendix D and the outputs from the analysis are below.

10.3 RBD Strategic Analysis (high flood risk)

The high-risk flood risk areas have an annual exceedance probability of more than 3.33%. The data gathered from the CaRR, when considering the total number of residential properties at risk from all sources of flooding, ranks the Llanelli RBD at greatest risk (see Figure 14 below). However, when you evaluate the different sources of flood risk, you will

¹⁷ Data Map Wales, 2023 [Communities at Risk Register \(CaRR\) | DataMapWales \(gov.wales\)](https://www.data.gov.wales/communities-at-risk-register)

note that 36% of all properties in Carmarthenshire at high risk of flooding are at risk of tidal flooding in the Llanelli RBD area. This is the greatest flood risk in the county, and is centred on the Llanelli RBD.

As less than 50% of our RBD are impacted by tidal flood risk, it is also worth comparing risk based solely on the pluvial and fluvial risk. In the absence of tidal risk, the Loughor and Amman RBD has the greatest number of properties at risk as shown in Figure 15.

As highlighted in section 10.1 above, the south and east is heavily urbanised, and our district evaluation of the properties at risk clearly highlights that the three south and east RBDs have the greatest number of properties at risk.

The remaining four RBDs, namely the Teifi, Upper and Lower Towy and the Western Valleys RBDs have significantly less properties at risk. By means of a comparison, the four RBDs have less properties at risk in total than the Llanelli RBD and the Amman and Loughor RBDs alone.

Figure 14 – No. of properties at high risk of flooding from all flood sources per RBD

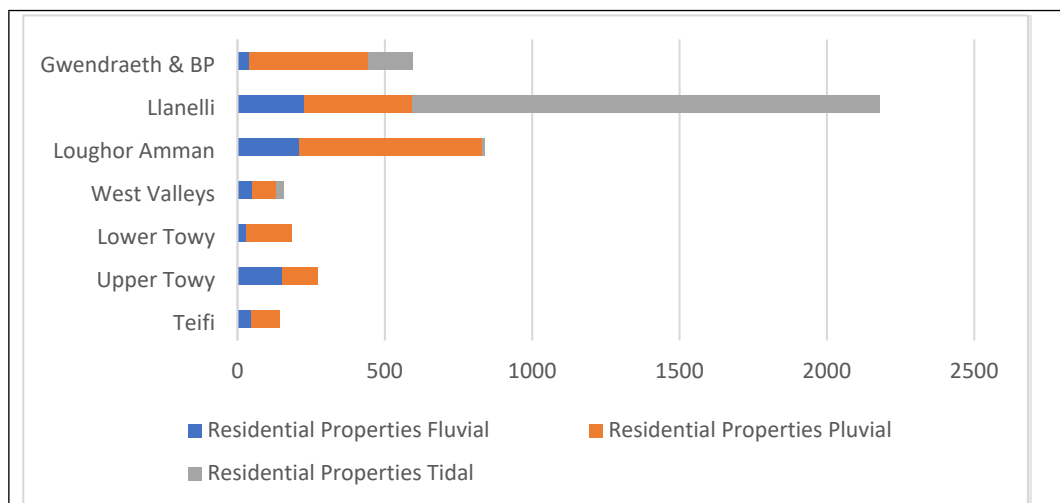


Figure 15 – No of properties at high risk of flooding from only pluvial and fluvial sources per RBD

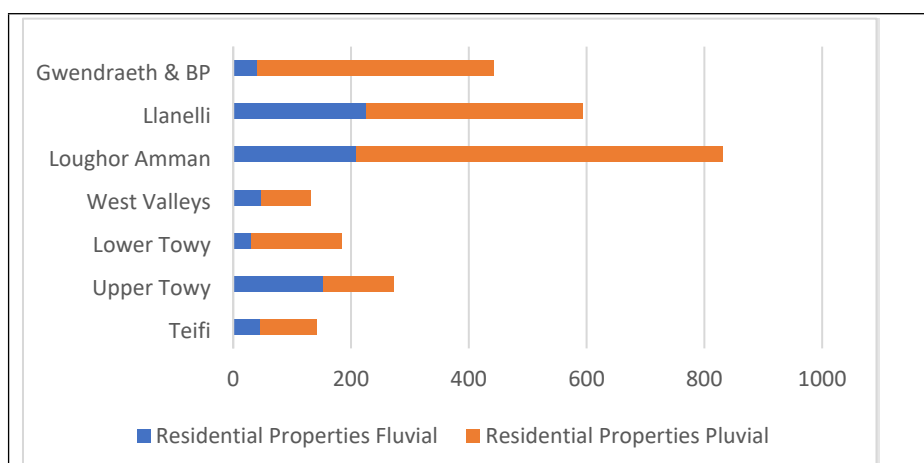


Figure 16 - Key flood risk receptors at high risk of flooding per RBD.

Risk Receptor	Teifi	Upper Towy	Lower Towy	Western valleys	Loughor & Amman	Llanelli	Gwendraeth & Burry Port
Residential Properties Fluvial	46	154	31	48	208	226	41
Residential Properties Pluvial	96	119	154	84	623	367	402
Residential Properties Tidal	0	0	0	26	9	1588	150
Non-residential properties	39	74	67	24	141	223	74
Essential Services	9	8	2	6	18	26	26
FCERM Incidents	200	84	235	36	79	95	134
Internal flooding incidents	167	52	170	16	33	62	87
Trunk Roads (km)	1.29	5.45	3.3	4.1	5	2km	4.1km
Minor Roads (KM)	11096	46625	24928	43238	27651		34365
Railways (km)	0.28	1.08	0.5	0.5	3	4.5km	9.1km
Agri Land - Grades 1-3	890	2058	1883	1279	450	65	1095Ha
SACs	173	255	283	2490	283	1411	3219
SPAs	0	90	0	1205	0	1294	612
Ramsar	0	0	0	0	0	1294	612
SSSIs	175	433	345	3013	287	1412	3275
SINC	0	0	0	0	0	0	None
National Nature Reserves	0	53	61	0.2	2		3.4
LNR	0	0.69	0	0	0	5.1	118
Ancient Woodland	49	245	54	83.7	75.5	17.7	48
Parks and Gardens	0	9	17.5	0.2	0.8	13	6.7
Country Parks	0	686	0	12.4	41		Check
Scheduled Ancient monuments	0.5	1.8	0.2	0.2	0.5	0.1	4.4
Listed buildings	23	80	22	22	11	9	9
Main river length (Km)	74	159	104	149	66.24	36km	63.79
Main river numbers	10	16	16	22	8	6	10
Local Development Plan							
Residential Sites	7	1	6	6	17	9	14
Traveller Sites	0	0	0	0	0	1	0
Employments Sites	0	0	1	1	8	1	1
Retail Parks	0	0	0	0	0	1	0
Town Centres	0	1	0	1	0	1	1
Strategic	0	0	0	0	0	1	0
Mixed Use	0	1	4	0	1	0	1
SCFA additional	0	3	6	1	13	18	6

10.4 RBD Strategic Analysis (Medium Flood Risk)

The medium-risk flood risk areas have an annual event probability greater than 30 but less than 100. When comparing the number of properties at risk per district, we can see a similar picture to the high-risk figures in that the tidal flood risk to properties in the Llanelli RBD is a major contributing factor (Figure 17). When you evaluate the numbers of properties at risk from pluvial and fluvial flooding only, the Loughor and Amman RBD has the greatest numbers of properties at risk as shown in Figure 18.

Figure 17 - No. of properties at medium risk of flooding from all flood sources, per RBD

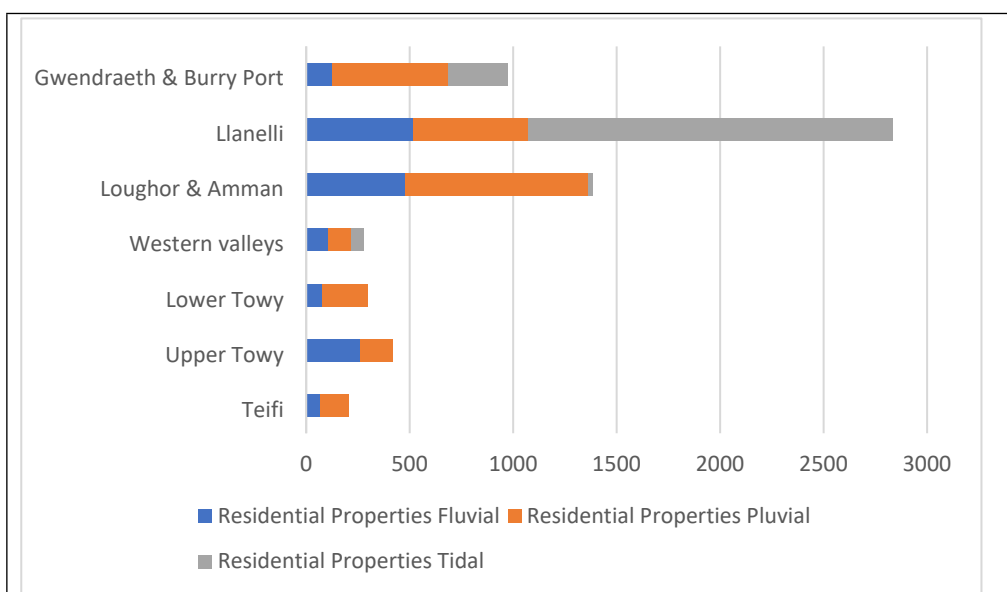


Figure 18 - No of properties at medium risk of flooding from only pluvial and fluvial sources per RBD

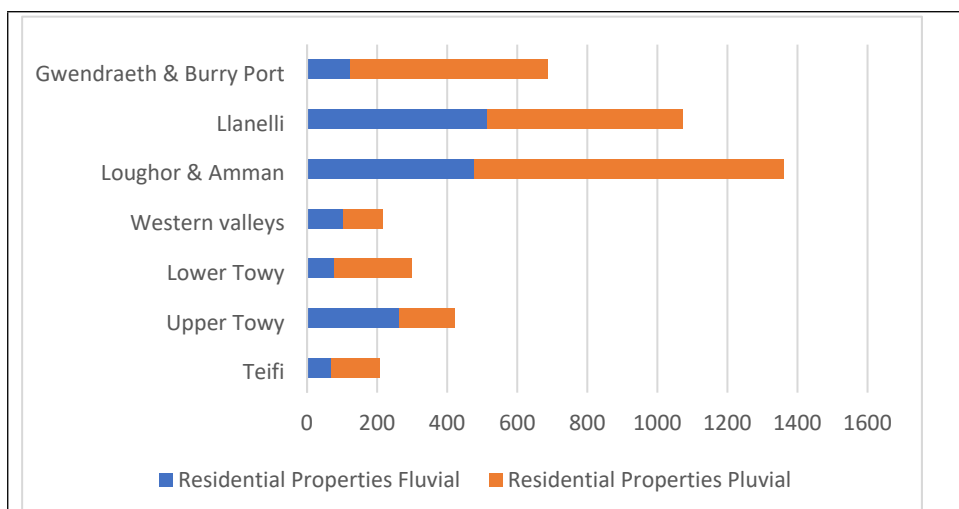


Figure 19 - Key flood risk receptors at medium risk of flooding per RBD.

Risk Receptor	Teifi	Upper Towy	Lower Towy	Western valleys	Loughor & Amman	Llanelli	Gwendraeth & Burry Port
Residential Properties Fluvial	69	262	78	104	478	515	124
Residential Properties Pluvial	139	158	221	114	884	559	564
Residential Properties Tidal	0	0	0	58	22	1759	286
Non-residential properties	74	108	132	50	207	442	127
Number FCERM Incidents	200	84	235	36	79	95	134
Internal flooding incidents	167	52	170	16	33	62	87
Essential Services	9	12	7	9	28	39	57
Trunk Roads (km)	0.65	2.88	1.14	0.6	2.5	2.1	0.7km
Minor Roads (km)	5172	18423	15129	11884	11184	16029	13497
Railways (km)	0.06	1.64	0.26	0.5	2.5	1.2	3.8km
Agri Land - Grades 1-3	134	500	352	174	112	16.4	166Ha
SACs	2	19.5	5	50	33.6	9	38
SPAs	0	17.44	0	0	0	3	9
Ramsar	0	0	0	0	0	3	9
SSSIs	2.7	50	8	65	35.4	9	44.5
SINC	0	0	0	0	0	0	None
National Nature Reserves	0	1.9	3	0.6	0.4	0	1
LNR	0	0.09	0	0	0	6.3	5.6
Ancient Woodland	7.5	41	10.3	12.8	12.6	3.6	10
Parks and Gardens	0	6.1	1.81	0.2	0.2	3.1	1.3
Country Parks	0	111	0	1.4	11.7	0	Check
Scheduled Ancient monuments	0.11	0.45	0.05	0.1	0.2	0.1	0.4
Listed buildings	2	19	8	4	3	8	1
LDP							
Residential	8	2	6	7	19	9	14
Traveller	0	0	0	0	0	1	0
Employment	0	0	0	0	9	1	1
Retail	0	0	0	0	0	2	0
Town Centres	0	1	0	2	0	1	1
Strategic	0	0	1	0	0	1	0
Mixed use	0	1	4	0	1	2	2
SFCA additional	0	6	6	1	14	20	7

The statistics and numbers of flood risk receptors at low risk of flooding from all sources can be reviewed in Appendix E.

11 Measures to manage flood risk across Carmarthenshire

11.1 What are flood measures and why?

Our strategic objectives outlined in paragraph 8.1, will be delivered through a series of 10 measures. Measures are medium level targets that will be delivered over specific time periods. Our 10 measures are detailed in Appendix F.

Each measure has been given an indicative timescale and an indicative cost for delivery.

Error! Reference source not found. below summarizes our measures and how they meet our strategic objectives.

Figure 20 – table showing how our 10 local FCERM measures will meet the 5-FCERM Local Strategy objectives.

	Objective 1 – Modern FCERM	Objective 2 – Become Data Rich	Objective 3 – Champion NFM, NBS & BGI	Objective 4 – Communities	Objective 5 – Partnership working
<i>Measure 1 - Thematic Incident Management</i>	X	X	x	x	X
<i>Measure 2 – Maintain a pipeline of capital works business cases</i>	X	X	X	X	X
<i>Measure 3 – increase community resilience</i>	X			X	X
<i>Measure 4 – increase public engagement and consultation</i>	X			X	X
<i>Measure 5 – champion innovation and technology</i>	X	X			
<i>Measure 6 – develop a catchment-based approach to FCERM</i>	X			X	X
<i>Measure 7 – provide expert advice and counsel</i>			X	X	X
<i>Measure 8 – manage FCERM permitting and consenting</i>		X	X		
<i>Measure 9 – Adopt and designate drainage systems and FCERM features</i>	X	X	X	X	X
<i>Measure 10 - Enforcement</i>	X				

12 Actions to manage flood risk across Carmarthenshire

12.1 What are flood actions and why do we have them?

The detailed objectives and measures outlined in Section 8 and 12 will be delivered through the implementation of actions. Each action which will be considered in the short (1 – 2 years), medium (2 – 5 years) and long term (5+ years). Our Flood Action Plan delivers on the requirement of the Flood Risk Regulations (2009) for LLFA's to produce a Flood Risk Management Plan (FRMP).

Whilst we previously published our Local Strategy and FRMP in 2013 and 2019 respectively, this new iteration will seek to see both the Local Strategy and FRMP published in the spring of 2024.

12.2 Our approach to the FRMP

We have adopted a river basin district approach for assessing flood risk, which allows the natural movement of water to be assessed according to geographic river catchment or sub-catchment boundaries, enabling a more holistic and integrated approach to managing flood risk.

The catchment based or RBD approach has informed the identification of 7 assessment boundaries, known as River Basin Districts (RBD). Our Flood Action Plan will focus on the 5 highest flood risk areas within each RBD and provide details on how we manage that flood risk in the short, medium and long term.

Our action plans will be contained in a separate report.

13 Funding and Prioritisation

13.1 Funding options

Measures to manage local flood risk are funded from a range of sources, including but not limited to the following:

13.1.1 CCC Internal funding

There is an annual allocation of revenue funding which is sourced from the Local Government Revenue and Capital Settlement¹⁸.

There is also internal capital funding which is administered on an expression of interest basis.

13.1.2 Welsh FCERM Government Funding

Welsh Ministers may provide revenue and capital grants in relation to FCERM activities. Applications for funding submitted by RMAs are considered by the Flood and Coastal Risk Programme Board before being agreed by the Minister for Climate Change. These are prioritised towards the communities most at risk of flooding, in accordance with WG National Strategy¹⁹, technical guidance²⁰ and grant memorandum²¹. This is why this document has focused on communities at greatest risk in Carmarthenshire and compared those nationally and locally to ensure a clear understanding of priorities. Currently the grants available include:

- **WG FCERM Capital Pipeline Grant** – a grant for the development of the business cases, design works and construction projects. Administered annually, but projects, from inception to construction, are medium to long term (5-10 years).
- **Welsh Government Small Scale FCERM Grant** – an 85% grant administered annually for small projects up to £250k, that must be delivered in one year.
- **Welsh Government NFM Grants** – a relatively new, 100% funded grant, specifically for RMAs to develop natural flood management solutions.
- **Welsh Government Revenue Grant Funding** – a 100% funded revenue grant which can and is used for core FCERM duties, principally asset management and maintenance works. This grant will be subsumed into the Revenue Support Grant for 2024-2025 .

¹⁸ [Local government revenue and capital settlement: final 2023 to 2024 | GOV.WALES](#)

¹⁹ [National Strategy for Flood and Coastal Erosion Risk Management in Wales | GOV.WALES](#)

²⁰ [Flood and coastal erosion risk management \(FCERM\): business case guidance | GOV.WALES](#)

²¹ [Flood and coastal erosion risk management: grant memorandum | GOV.WALES](#)

13.1.3 Welsh Government Local Transport Resilient Road Fund

The Local Transport fund²² is available to deliver the vision and priorities of Llwybr Newydd²³ in a way that is good for people and communities, good for the environment, good for the economy and places, good for culture and the Welsh language. It aims to deliver an accessible, efficient, sustainable transport system that is safe, well-managed and adapts to and mitigates for climate change.

The Resilient Roads fund is available to address disruptions caused by severe weather to the highway network, especially to the public transport network.

13.1.4 Section 106 Funding

Developer Contributions: Local Authorities can potentially require developers to carry out works, or make a financial contribution towards FCERM works, under Section 106 of the Town and Country Planning Act 1990.

13.2 WG prioritisation

A methodology for prioritising FCERM funding was approved by the Welsh Government in 2018 after consultation with RMAs. This breaks down as follows

- Communities at greatest risk as per the CaRR.
- Actual flood events (no. events document over last 20-years)
- Actual flood events (number of internal properties flooded in last 20-years)
- Number of homes benefiting
- Partnership working
- Wider benefits

13.3 CCC Prioritisation

As a Lead Local Flood Authority, we have a statutory obligation to act in a manner which is consistent with the national strategy and guidance²⁴. This document supports this approach and seeks to quantify and document the flood risks to Carmarthenshire and our priorities over the next 7-years. Our high level priorities include:

²² [Local Transport Fund and Resilient Roads Fund: guidance to applicants 2022 to 2023 \[HTML\] | GOV.WALES](#)

²³ [Llwybr Newydd: the Wales transport strategy 2021 | GOV.WALES](#)

²⁴ S12(1)(a) [Flood and Water Management Act 2010 \(legislation.gov.uk\)](#)

- Supporting communities and businesses at greatest risk, as defined by both our incident data and the CaRR.
- Prioritising those properties and businesses that experience internal flooding.
- Prioritising CCC assets and structures.

14 Environmental Assessments

The implementation of the Local Strategy will, in addition to managing local flood risk, also provide an opportunity to improve the natural, rural and built environment by enhancing the environment for both residents and businesses along with improving biodiversity and habitats. Assessments will be undertaken post the development of this Local Strategy to ensure our Objectives, Measures and Actions take into account our local environment. The environmental assessments consider and record how the Local Strategy contributes to the achievement of wider environmental objectives.

14.1 Strategic Environment Assessment (SEA)

We will undertake a Strategic Environment Assessment (SEA) post the development of a consultation draft of the Local Strategy.

The SEA is a way of assessing and monitoring the likely effects (positive and negative) of the Local Strategy Objectives, Measures and Actions on the environment. A SEA is a legal requirement to accompany the Local Strategy. Such assessments help to enable informed and transparent decision-making for the benefit of plan makers and the wider community in Wales. The SEA will be contained within a separate report.

14.2 Habitat Regulations assessment (HRA)

A Habitats Regulations Assessment (HRA) considers the possible harm a project or plan could cause to certain specially protected sites, with the aim of ensuring damage to these sites is avoided. Due to the potential of this Local Strategy to impact the Natura 2000 network of protected sites, namely Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites, a HRA needs to be undertaken in parallel with the SEA as soon as possible in the process. The HRA is contained within a separate report.

14.3 Water Framework Directive (WFD) Assessment

The Water Framework Directive (WFD) imposes legal requirements to protect and improve the water environment (including our rivers, coasts, estuaries, lakes, ground waters and canals). Under the WFD a management plan is required for each River Basin District, for which the responsibility for producing these lies with NRW. River Basin Management Plans (RBMPs) describe the challenges that threaten the water environment and how these challenges can be managed and funded.

Carmarthenshire falls within the West Wales RBMP.

An assessment of how this Local Strategy has considered the environmental objectives within the RBMP is contained in a separate report.

15 Monitoring Progress

15.1 Measuring the objectives, measures and actions

The delivery of our Local Strategy will be managed at Corporate Management Team (CMT) and Scrutiny level. We are proposing that a bi-annual report be produced in the spring of 2026 and 2028 detailing progress, with the new strategy following that in April 2030.

The measures will be managed through the Departmental and Divisional Business Plans. Business Plans are updated annually, and the outputs managed via the corporate performance management system (PIMs). The responsibility for the delivery of these measures will reside with the FCERM Manager and the corporate governance structure.

Actions will be managed through business unit annual works programmes and assigned to officers and engineers to deliver. These will be embedded into annual and bi-annual programmes of work and monitored via the personal objectives and appraisal process on a quarterly or bi-annual basis.

Appendix A – Results from the consultation process (see separate report)

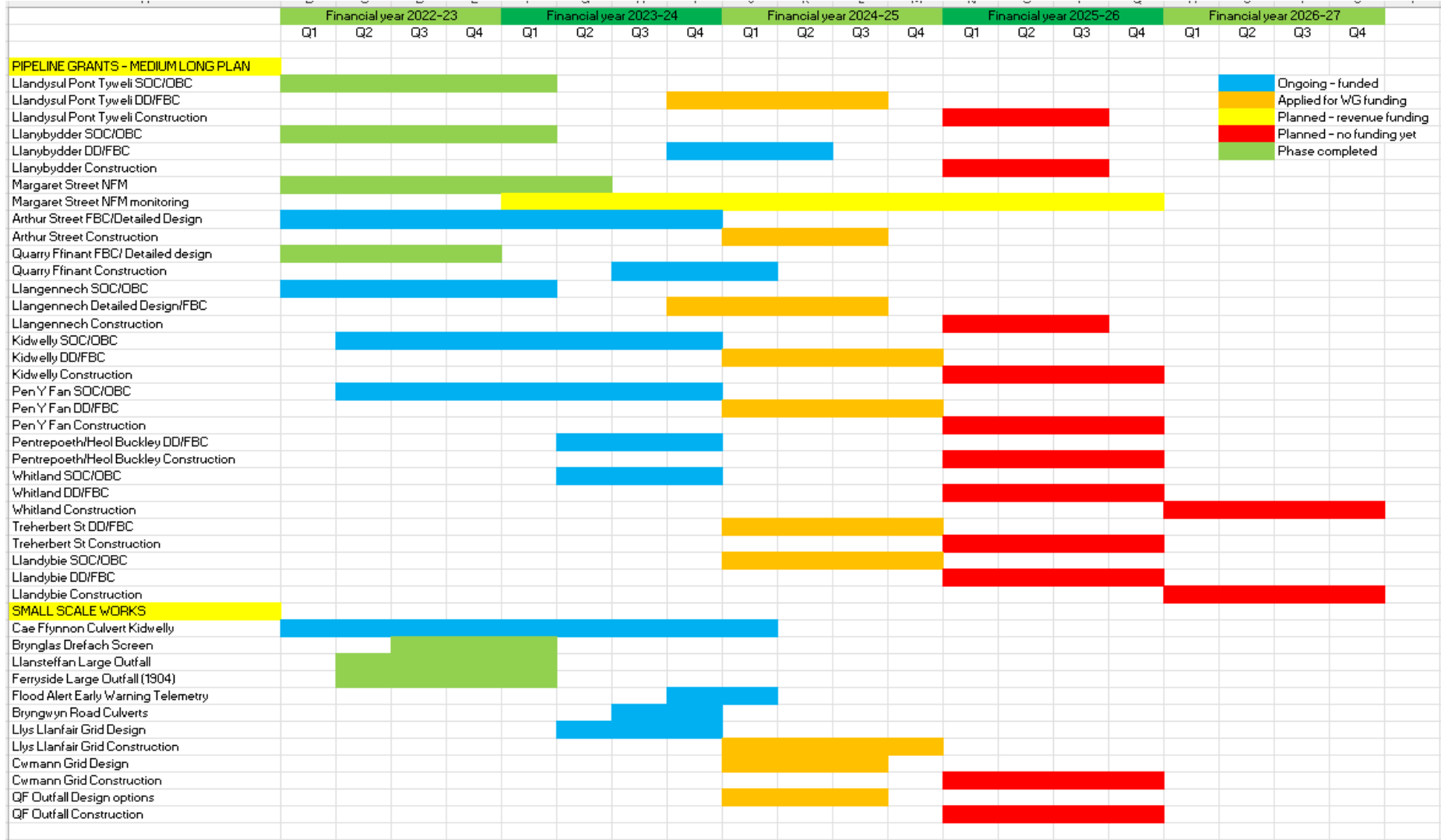
Appendix B – Capital works pipeline programme (Dec 2023)

The 2023-24 WG FCERM programme contains 11 Pipeline Schemes and 3 Small Scale Schemes.

These are summarised below:

Scheme Name	Location	Current Phase	Details
Arthur St	Ammanford	DD/FBC	Culvert replacement
Quarry Ffinant	Newcastle Emlyn	Construction	Culvert rehabilitation/replacement
Llandysul/Pont Tyweli	Llandysul/Pont Tyweli	DD/FBC	Property Level Protection (PLP) and other measures
Llanybydder	Llanybydder	DD/FBC	Property Level Protection (PLP) and other measures
Llangennech	Llangennech	DD/FBC	Property Level Protection (PLP) and other measures
Margaret St NFM	Ammanford	Construction	Natural Flood Management – 13 leaky dams and 5 storage areas
Bynea	Llanelli	SOC	Assessment of options for flood alleviation scheme
Pen Y Fan	Llanelli	SOC/OBC	Property Level Protection (PLP) and other measures
Kidwelly	Kidwelly	SOC/OBC	Assessment of options for flood alleviation scheme
Whitland	Whitland	SOC/OBC	Assessment of options for flood alleviation scheme
Pentrepoeth	Llanelli	SOC/OBC	Property Level Protection (PLP) and embankment
Telemetry	Various	Installation	Flood Alert Early Warning Telemetry installation at 6 CCC structures
Llys Llanfair Grid	Llandovery	Design	Redesign/upgrade of flood defence grid and associated infrastructure
Bryngwyn Road Culverts	Llanelli	Construction	Culvert upgrades and replacement

The FCERM Pipeline and Small Scale Programme – Schedule from April 2022 to March 2027 (as of Dec 2023)



Appendix C– Significant Historical Flooding in Carmarthenshire – a chronology

Appendix D– Methodology for the strategic district analysis

The GIS data, gathered from various government sources outlined in this note, are analysed to quantify the extent of flood risk from fluvial, pluvial, and coastal sources across Carmarthenshire.

The National Flood Risk Layers from Data Map Wales (DMW) contain the flood receptor data such as residential and non-residential property counts, key services, rail and roads, agricultural land, and some of the environmental receptor data such as Ramsar sites, SPA, SAC, SSSI, SINC and SAM. However, the Local Nature Reserves (LNR), National Natures Reserves (NNR), ancient woodlands, country parks, listed buildings and LDP data must be processed in GIS together with the Flood Risk Zone maps from DMW (fluvial, pluvial, and coastal) to calculate the at-risk areas. Additionally, the property and key service counts from the Communities at Risk Register (CaRR) is also compared to the DMW data.

The National Flood Risk Layers, split the communities in Wales into several polygons and the risk level from various flood sources is provided for each polygon. To get the risk levels for Carmarthenshire only, the polygons are matched with the Local Authority Boundaries (Figure 21 (a)) and any polygon with more than 50% surface area within the county is included in the analysis. Carmarthenshire polygons are also split into seven separate districts according to the FEH catchment boundaries as shown in Figure 21 (b).

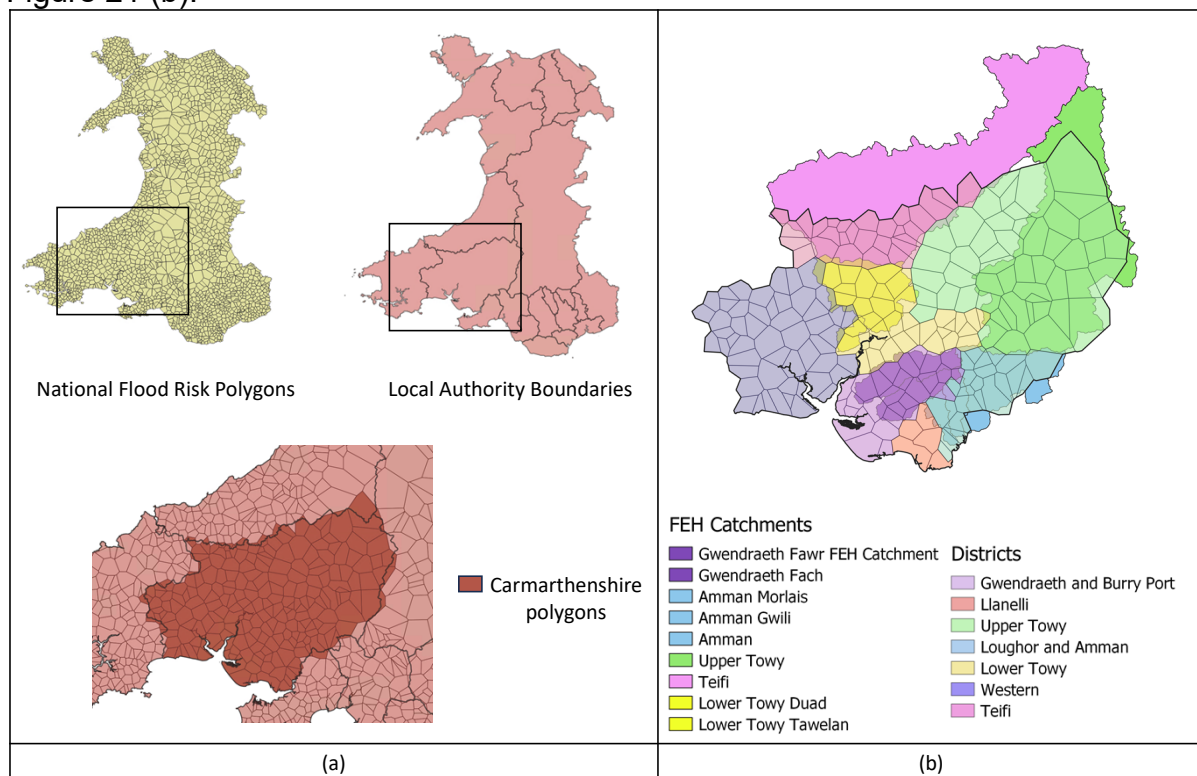


Figure 21 – (a) National Flood Risk Polygon selected for Carmarthenshire and (b) District polygons (translucent) selected according to FEH catchment boundaries (opaque)

The methodology for preparing the GIS data is demonstrated here for the county-level analysis only, since the same procedure is followed to produce the district-level data.

The Flood Risk Zone maps for fluvial, pluvial, and coastal risks are shown in Figure 22 with Carmarthenshire County Council (CCC) polygons in the background:

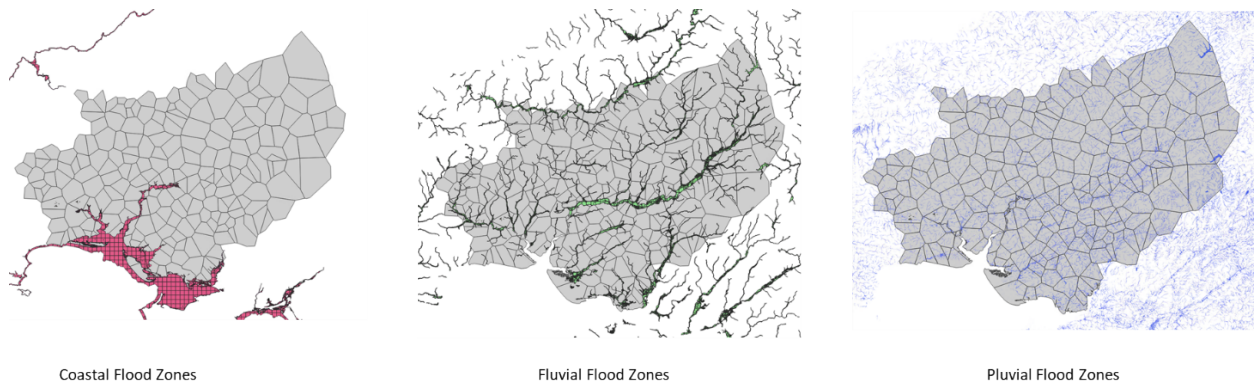


Figure 22 - Flood Risk Zone maps for Fluvial, Pluvial and Coastal Risks over the National Flood Risk Polygons

The Flood Risk Zone maps are then intersected with CCC polygons and maps of each receptor (e.g., Ancient Woodlands, Listed Buildings, etc.), and the flood risk areas from each flood source is extracted.

The example below (Figure 23) shows this process for extracting the CCC Ancient Woodlands at risk of fluvial flooding:

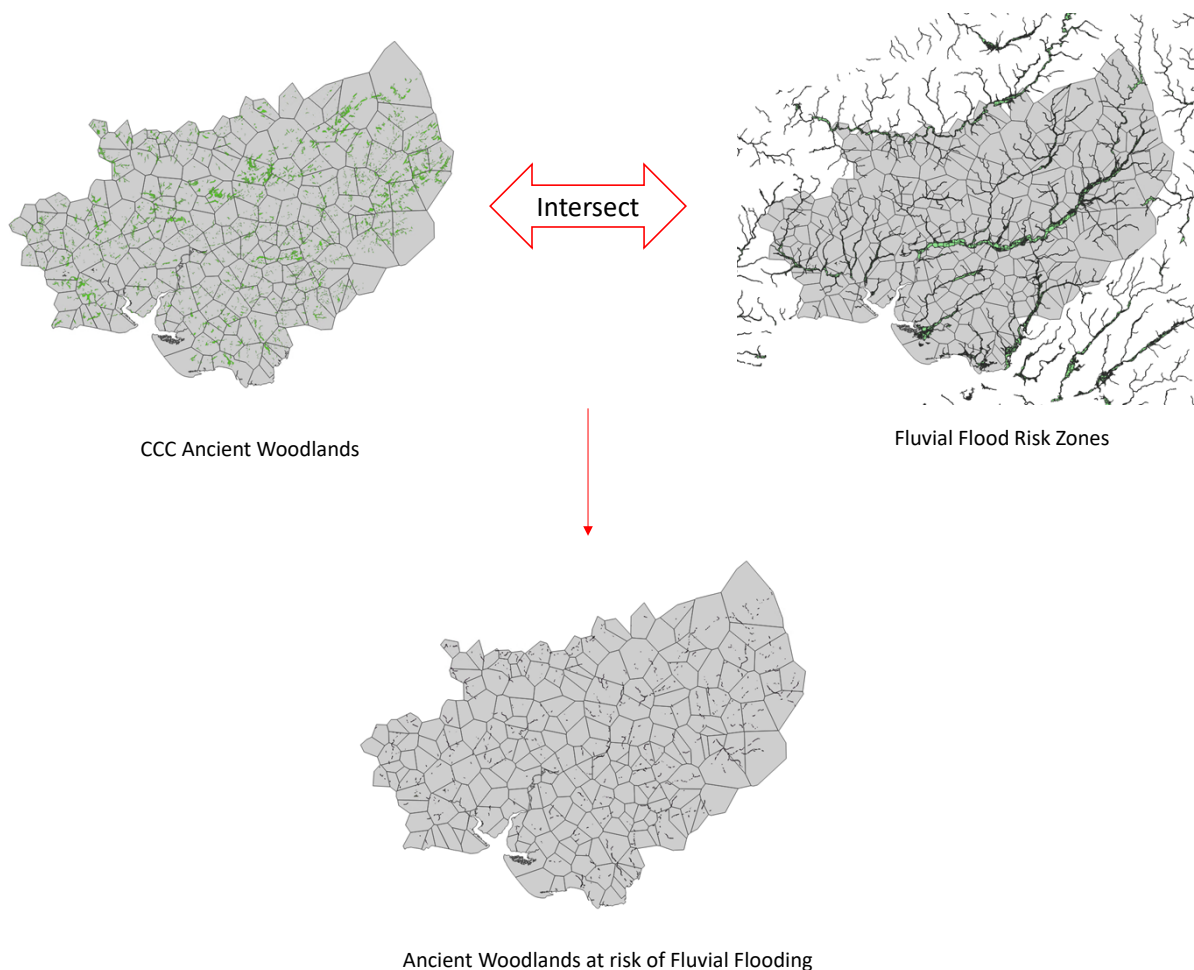


Figure 23 - Example of Intersection of Flood Risk Zones with Receptor Data

Appendix E - RBD Strategic Analysis (Low Flood Risk)

Key flood risk receptors at low risk of flooding per RBD.

Risk Receptor	Teifi	Upper Towy	Lower Towy	Western valleys	Loughor & Amman	Llanelli	Gwendraeth & Burry Port
Residential Properties Fluvial	173	681	229	319	901	2203	255
Residential Properties Pluvial	302	358	482	238	1798	1521	1327
Residential Properties Tidal	0	0	6	94	31	1840	375
Non-residential properties	124	201	302	114	358	871	223
Number FCERM Incidents	200	84	235	23	79	95	134
Internal Flooding incidents	167	52	170	36	33		87
Essential Services	21	31	35	16	45	74	85
Trunk Roads (km)	3.5	10.5	4.8	1.9	7.4	5.3	5.1
Minor Roads (km)	17902	57626	35504	34592	36148	49773	33665
Railways (km)	0.11	6.24	2.2	3.4	5.9	1.5	3.3
Agri Land - Grades 1-3	227	1103	649	315	200	45	300
SACs	3.6	52	4.2	54	48	21	34.5
SPAs	0	60	0	0	0	7	6.5
Ramsar	0	0	0	0	0	7	6.5
SSSIs	5.1	150	11.2	76	59	21	50
SINC	0	0	0	0	0	0	None
National Nature Reserves	0	2.36	3.1	1.5	1.6	0	3
LNR	0	1.08	0	0	0	6.2	4
Ancient Woodland	17.3	97	28.4	30	26.6	9	20.5
Parks and Gardens	0.01	8	5	0.2	0.6	5.5	4.4
Country Parks	0	148	0	2.3	50	0	0
Scheduled Ancient monuments	0.3	1.5	0.23	0.2	0.3	0.3	0.5
Listed buildings	7	19	14	6	6	24	14
LDP							
Residential	8	5	10	6	26	17	21
Traveller	0	0	0	0	0	1	0
Employment	0	0	1	1	9	2	1
Retail	0	0	1	0	0	2	0
Town Centres	0	2	0	2	1	1	1
Strategic	0	0	1	0	0	1	0
Mixed use	0	1	4	0	1	2	2
SFCA additional	1	7	7	2	19	28	8

Appendix F - CCC's FCERM Local Strategy Measures (see separate document)