

# Consultation Draft Local Flood Risk Management Strategy for Lancashire 2021 - 2027



Blackburn with  
Darwen Council

Blackpool Council

Lancashire  
County  
Council 

# Executive Summary

In 2010 the Government introduced the Flood and Water Management Act to give new powers and responsibilities to local authorities to better manage the risk of local flooding in their areas. Under this, County and Unitary Councils became 'Lead Local Flood Authorities' (LLFA). One of the new duties of a LLFA is to produce a Local Flood Risk Management Strategy (LFRMS).

This Strategy sets out how we intend to work with partners and our businesses and communities to manage the risk of flooding in the Lancashire up to 2027. It is of interest to all who live and work in Lancashire, as managing the risk of flooding requires action by everyone, as well as to organisations that have specific responsibilities for managing flood risk in the area such as the Environment Agency, Local Authorities and the Water and Sewerage Company.

Since the devastating flooding witnessed across Lancashire in December 2015 and other events since, it has been a priority to improve resilience to flooding as part of business planning. Considerable progress has already been made working with partners to secure funding for several large flood alleviation and coastal defence schemes, reducing risk to thousands of properties.

This Strategy sets the course for continuing this momentum, identifying where resources and efforts are to be concentrated so we can confidently say as we are continuing to improve our understanding of risk whilst delivering schemes and supporting our businesses and communities to better protect and improve flood resilience for the people of Lancashire.

The diagram below shows our vision and six priority themes for delivering effective local flood risk management, whilst our Business Plan identifies 41 key objectives for delivery to allow us to achieve our vision by 2027.



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# Part 1: Our Strategy

# 1. Introduction

## 1.1. What is a Local Flood Risk Management Strategy?

The Flood and Water Management Act (FWMA) 2010 established Unitary and County Councils as Lead Local Flood Authorities (LLFAs) responsible for leading the management of local flood risks in their area. In Lancashire, the Lead Local Flood Authorities are Blackburn-with-Darwen Council, Blackpool Council and Lancashire County Council

As Lead Local Flood Authorities we have a duty under Section 9 of the Flood and Water Management Act to produce a Local Flood Risk Management Strategy (hereafter referred to as 'the strategy').

The strategy is a document sets out actions to manage local flood risks, who will deliver them and how they will be funded and coordinated. It also explains the role of our partners (such as district and borough councils, water companies, parish and town councils) and how we will work together to manage local flood risks.

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### What is 'local flood risk'?

Local flood risk refers to the risk of flooding from surface water, groundwater, and ordinary watercourses.

More detail on local flood risk can be found in Section 2.5: Types of Flooding and Flood Risk

The strategy aims to engage communities and partnerships. Helping people to prepare for flooding is a key part of delivering the strategy as this helps communities to understand and manage flood risk.

The strategy makes us more informed and more able to help protect the communities in Lancashire from the threat of local flooding.

## 1.2. A Joint Strategy for Lancashire

Blackpool Council, Blackburn with Darwen Council and Lancashire County Council, as Lancashire's Lead Local Flood Authorities, have worked together to produce this joint strategy for managing local flood risk because we recognise that water doesn't respect administrative boundaries and there are benefits of working in partnership to deliver a shared vision.

As we are working together closely on this joint strategy, 'Lancashire' will be used to describe the area covered by Lancashire County Council, Blackburn with Darwen and Blackpool Council.

The reasons that we have developed the Local Strategy together include:-

- Blackburn with Darwen and Blackpool border Lancashire and we share many of the same catchments. Therefore, decisions that are made in Blackburn with Darwin and Blackpool can affect flood risk in Lancashire and vice versa. This is in agreement with the guiding principles of the National FCERM Strategy to have a catchment-based approach (CaBA).
- Planning decisions are often made in conjunction with each other, particularly on major developments that sit on the border of two or more councils. This helps ensure that partnership working is a fundamental aspect of our strategic decision making.
- We sit on many of the same flood risk management and coastal partnerships that exist in the North West. We can therefore present a consistent strategy and voice to others in the region, and the strategy will provide a framework to further strengthen our Lancashire Flood and Coastal Erosion Risk Management (FCERM) Partnership governance and regional profile.



**Figure 1:** Area covered by the Lancashire Flood Risk Management Strategy

### 1.3 National Flood and Coastal Erosion Risk Management (FCERM) Strategy

The Flood and Water Management Act gives the Environment Agency a national strategic overview role for flood risk management and places on them a requirement to develop the National Strategy for Flood and Coastal Erosion Risk Management in England. This strategy provides a framework for the work of all Lead Local Flood Authorities.

The National Strategy sets out the Government's national approach to flood risk and coastal erosion through its long-term vision and ambitions for managing this risk, and the measures to deliver it. It sets the context for and informs on the production of local flood risk management strategies by Lead Local Flood Authorities. Local strategies provide the framework for the delivery of local improvements needed to help communities to manage local flood risk. They also aim to encourage more effective flood risk management by enabling people, communities, business and the public sector to work together.

The vision and ambitions of the National Strategy are set out below. This strategy recognises the need to integrate flood and water management within a wide range of direct and indirect agendas to enable our businesses, communities and infrastructure to become better adapted to flood risk whilst at the same time helping to tackle climate change and biodiversity challenges.



#### National Flood and Coastal Erosion Risk Management Strategy

**Vision: A nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100.**

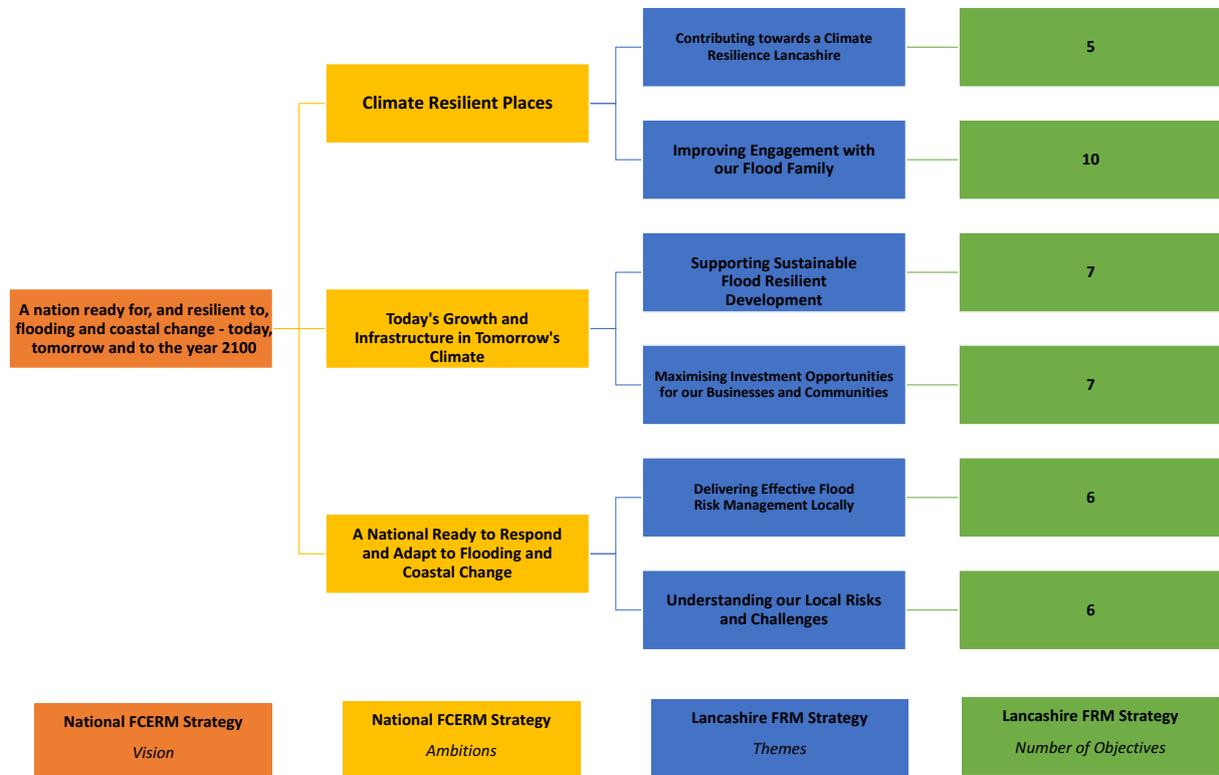
Ambitions:

- **Climate resilient places:** working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change
- **Today's growth and infrastructure resilient in tomorrow's climate:** Making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as resilient infrastructure.
- **A nation ready to respond and adapt to flooding and coastal change:** Ensuring local people understand their risk to flooding and coastal change, and know their responsibilities and how to take action



Our Local Flood Risk Management Strategy supports the local delivery of the high level ambitions set out in the Environment Agency's **National Flood and Coastal Erosion Risk Management (FCERM) Strategy** by ensuring our vision and themes are locally appropriate whilst remaining in alignment with those of the national strategy.

Figure 2 maps the national ambitions against our local themes and objectives to show this alignment. Section 2 gives an overview of other national, regional and local assessment and plans relevant to flood and water management in Lancashire.



**Figure 2:** Alignment of National FCERM Strategy ambitions with Local Flood Risk Management Strategy Delivery

# 2. Context

## 2.1. Legislative Framework

The legislative framework sets out the roles and responsibilities flood risk management authorities have in flood and water management.

### Flood Risk Regulations (FRR) 2009

These regulations transpose the EU Floods Directive into UK law and made County and Unitary Councils Lead Local Flood Authorities (LLFAs) with primary responsibility for managing local flood risk. Additionally, they imposed duties on the risk management authorities to co-operate to:

- Prepare preliminary assessment reports about past floods and identify areas of significant risk.
- Prepare flood risk maps and flood hazard maps for any areas identified as having a significant risk of flooding.
- Prepare flood risk management plans, to include objectives for managing the flood risk and proposals for how this will be achieved.

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

The Flood and Water Management Act aims to improve both flood risk management and the way water resources are managed. It creates clearer roles and responsibilities through defining flood 'risk management authorities' and instils a risk-based approach to flood and water management. There is a lead role for local authorities in managing local flood risks and a strategic overview role of all flood risk for the Environment Agency.

Section 13 of the FWMA places a duty to cooperate on the flood risk management authorities in the exercise of their functions. The way in which we deliver this is through working in partnership. The Lancashire FCERM Partnership is the forum through which this is facilitated.

### Town & Country Planning (Development Management Procedure) (England) Order 2015

In April 2015 planning legislation was amended to make LLFA's statutory consultees for all major development proposals with surface water implications during the planning process. This applies to development within any flood zone.

The Environment Agency is a statutory consultee for major development proposals within Flood Zone 2 and Flood Zone 3, and for developments in Flood Zone 1 within an area defined by the Agency as having critical drainage problems.

### [Land Drainage Act \(LDA\) 1991 \(as amended by the FWMA 2010\)](#)

On 6th April 2012, Schedule 2 (Sections 31, 32 and 33) of the FWMA amended the Land Drainage Act 1991 and transferred powers for the regulation of ordinary watercourses to the Council as LLFA. The powers of the LLFA to regulate ordinary watercourses broadly consist of two elements; the issuing of consents for any changes to ordinary watercourses that might obstruct or alter the flow of an ordinary watercourse and enforcement powers to rectify unlawful and potentially damaging work to a watercourse.

### [Coast Protection Act 1949 \(as amended by FWMA 2010\)](#)

This Act gives permissive powers to maritime local authorities (Coast Protection Authorities) to manage the risks associated with coastal erosion and flooding from the sea. The Act also defines the boundaries of “the sea” which impacts on funding arrangements for capital works.

### [Highways Act 1980](#)

Section 41 of the Act requires the Highway Authority to maintain the highway at public expense. A highway authority is under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice. It was determined in a test case that this also includes flood water.

### [Climate Change Act 2008](#)

This requires a UK-wide climate change risk assessment every five years accompanied by a national adaptation programme that is also reviewed every five years.

This legislation gives the Government power to require public bodies and statutory organisations, such as water and sewerage companies, to report on how they are adapting to climate change.

### [Water Framework Directive \(2000/60/EC\) \(WFD\)](#)

This is a European Directive which aims to protect and improve the water environment. It is implemented through River Basin Management Plans (RBMPs), and establishes a legal framework for the protection, improvement and sustainable use of water bodies across Europe.

WFD applies to all water bodies, including rivers, streams, brooks, lakes, estuaries and canals, coastal waters out to one mile from low water, and groundwater bodies.

### [Water Industry Act 1991](#)

This legislation relates to the water supply and the provision of wastewater services in England. It sets out the main powers and duties of the water and sewerage companies and defines the powers of the Water Services Regulation Authority (Ofwat).

## 2.2 National Assessments and Plans

In addition to the [\*\*National Flood and Coastal Erosion Risk Management \(FCERM\) Strategy\*\*](#), there are a number of national documents which are relevant to flood and water management.

### A Green Future: 25 Year Environment Plan

The 25 Year Environment Plan (YEP), published in 2018, sets out what government will do to improve the environment, within a generation, focusing on improving the UK's air and water quality and protecting threatened plants, trees and wildlife species. It details how those in government will work with communities and businesses to do this over the next 25 years.

[\*\*You can read the full plan here.\*\*](#)

There are 10 goals of the Environment Plan (Figure 3), and the one most applicable to flood and water management is '*reducing the risks of harm from environmental hazards*' which will be achieved through:

- making sure everyone is able to access the information they need to assess any risks to their lives and livelihoods, health and prosperity posed by flooding and coastal erosion
- bringing the public, private and third sectors together to work with communities and individuals to reduce the risk of harm
- making sure that decisions on land use, including development, reflect the level of current and future flood risk
- boosting the long-term resilience of our homes, businesses and infrastructure



- Clean air
- Clean and plentiful water
- Thriving plants and wildlife
- Reducing the risks of harm from environmental hazards
- Using resources from nature more sustainably and efficiently
- Enhancing beauty, heritage and engagement with the natural environment
- Mitigating and adapting to climate change
- Minimising waste
- Managing exposure to chemicals
- Enhancing biosecurity

### The Ten Point Plan for a Green Industrial Revolution

The Ten Point Plan aims to lay the foundations for a Green Industrial Revolution to support a green recovery mobilising £12 billion of investment in creating green jobs and a green economy. [\*\*You can read the plan here.\*\*](#)

In relation to flood and water management, the plan aims to support communities in better adapting to and offering protection from the effects of climate change by investing in flood defences and using nature-based solutions to increase flood resilience; this is covered by point nine 'protecting our natural environment'.

The government is committing £5.2 billion investment in flood defences in a 6 year programme for flood and coastal defences from April 2021, which will support 2,000 flood schemes across every region of England and better protect over 336,000 properties from risk of flooding. It will also fund new innovative approaches to work with the power of nature to not only reduce flood risk, but deliver benefits for the environment, nature and communities.

### **National Planning Policy Framework (NPPF)**

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied by Local Planning Authorities (LPA) and decision-makers, both in drawing up plans and making decisions about planning applications.

Section 14 of the NPPF sets out how the challenges of climate change, flooding and coastal change will be approached through planning and development.

**[You can view the National Planning Policy Framework here.](#)**

The interpretation of the NPPF is supported by the Planning Practice Guidance (PPG). This is a web-based resource which sets out how the government's planning policies are expected to be applied in England. The flood risk and coastal change section of the PPG advises how to take account of and address the risks associated with flooding and coastal change in the planning process.

In broad terms, this national framework requires plans and developments to:

- Take into account climate change over the longer term to avoid increased vulnerability to the range of impacts arising from climate change.
- Develop policies to manage flood risk from all sources, taking account of advice from the flood risk management authorities (RMAs).
- Ensure new development does not increase flood risk elsewhere.
- Avoid inappropriate development in areas at risk of flooding by directing development away from areas at highest risk.
- Where development is necessary, make it safe without increasing flood risk elsewhere and direct the most vulnerable development to areas of lowest flood risk.
- Be supported by an appropriate site specific Flood Risk Assessment, where one is required.
- Ensure development is appropriately flood resilient and resistant.
- Major development should incorporate sustainable drainage systems (SuDS) which should meet the Technical Standards for SuDS.

## 2.3 North West Regional Assessments and Plans

### North West Flood Risk Management Plan (FRMP)

The Flood Risk Management Plan (FRMP) explains the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. FRMPs set out how flood risk management authorities will work with communities to manage flood and coastal risk.

The North West FRMP covers the river basin catchments of Lancashire and sets out information on flood risk for the North West river basin district from 2015 to 2021 and a summary of the aims and actions needed to manage the risk. You can access the current **North West FRMP [here](#)**. The Environment Agency is leading work to produce a new, updated North West FRMP that will be available by 2022.

The FRMP is split into 6 documents. These are:

- the summary which gives a high level overview of the FRMP
- Part A includes the legislative background and information for the whole river basin district (RBD)
- Part B includes detail about each catchment, the flood risk areas and other strategic areas
- Part C includes the measures identified to manage flood risk across the river basin district
- the Strategic Environmental Assessment (SEA) statement of particulars includes the potential impacts on people and the environment when implementing the measures in the FRMP
- the Habitat Regulations Assessment (HRA) details the potential impacts on designated European sites when implementing the measures in the FRMP

### Catchment Flood Management Plans (CFMP)

Catchment Flood Management Plans (CFMPs) are written by the Environment Agency and aim to establish flood risk management policies which will deliver sustainable flood risk management for the long term across a catchment.

CFMPs consider all types of inland flooding, from rivers, groundwater, surface water and tidal flooding. The Shoreline Management Plan (SMP) consider flooding from the sea. CFMPs also include:

- the likely impacts of climate change
- the effects of how we use and manage the land
- how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs

The CFMPs are grouped by river basin district and Lancashire falls within the **North West River Basin District**. CFMPs which are relevant to Lancashire are:

- **Alt Crossens** – Covers West Lancashire
- **Douglas** – Covers Chorley, South Ribble, West Lancashire
- **Irwell** – Covers Rossendale
- **Lune** – Covers Lancaster and parts of Cumbria
- **Ribble** – Covers Blackburn, Burnley, Fylde, Hyndburn, Pendle, Preston, Ribble Valley, Rossendale
- **Wyre** – Covers Blackpool, Wyre and Preston

Whilst not fully superseded by the Flood Risk Management Plan (FRMP), any actions from CFMP which are still valid will be carried forward to the new FRMP in 2022. CFMPs are, however, still useful in setting ‘policies’ for each sub-area or ‘policy unit’. There is also much more detail at a catchment level in CFMPs, for example about how long different rivers take to rise in response to heavy rainfall.

#### **North West RFCC Business Plan**

The North West Regional Flood and Coastal Committee (RFCC) is one of twelve RFCCs in England, established under the Flood and Water Management Act 2010. The Committee brings together, with an independent Chair, the flood risk management authorities as a regional partnership to take an overview of flood and coastal erosion risk management. They also seek to promote investment and encourage innovation which is good value for money and benefits communities.

The Committee's Business Plan sets out what it wants to achieve and how. The Business Plan is not a statutory document but supports the Committee in transparently communicating and engaging with those who will benefit from the delivery of this work. Business Plan delivery is supplemented by an annual action plan setting out the actions that will be delivered in each financial year in more detail, and is closely monitored on a quarterly basis.

You can find the **Business Plan here**.

#### **Drainage and Wastewater Management Plan (DWMP)**

United Utilities will publish their draft Drainage and Wastewater Management Plan in summer 2022, to support their business plan for the 2024 Price Review.

Drainage and Wastewater Management Plans (DWMP) identify ways that organisations to work together to improve drainage and environmental water quality. It provides the basis for more collaborative and integrated long-term planning by water companies, working with other organisations that have responsibilities relating to drainage, flooding and protection of the environment. It makes use of the tools and approaches below to enable investment to be targeted more effectively and provide customers and stakeholders with better information about the UK's drainage and wastewater services.

## 2.4 District Level Assessments and Plans

### Preliminary Flood Risk Assessment (PFRA)

A Preliminary Flood Risk Assessment (PFRA), and the identification of 'flood risk areas', is required to be produced by Lead Local Flood Authorities (LLFAs) under Section 10 of the Flood Risk Regulations (FRRs) 2009. The first PFRAs were produced in 2011 and Section 17 of the FRRs required LLFAs to review their PFRA and 'flood risk areas' in 2018. Subsequent reviews must be carried out at intervals of no more than 6 years.

A PFRA is an assessment of floods that have taken place in the past and floods that could take place in the future. It considers flooding from surface water runoff, groundwater and ordinary watercourses. PFRAs are used to identify areas that are at risk of significant flooding. These areas are called 'flood risk areas.' Existing 'flood risk areas' have been identified using guidance produced Defra and represent 'clusters' of areas where flood risk is an issue and where 30,000 people or more live.

PFRAs include:

- a summary of information on significant historic floods;
- a summary of information on future flood risks based primarily on the Environment Agency's national datasets;
- a spreadsheet containing information for reporting to the European Commission.

PFRA's for Lancashire can be found on Blackburn with Darwen, Blackpool and Lancashire County Council websites.

### Strategic Flood Risk Assessment (SFRA)

A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more Local Planning Authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of the likely impacts of climate change, and to assess the impact that land use changes and development in the area will have on flood risk.

The SFRA is used by the Local Planning Authority to:

- determine the variations in risk from all sources of flooding across their areas, and also the risks to and from surrounding areas in the same flood catchment;
- inform the sustainability appraisal of the Local Plan, so that flood risk is fully taken into account when considering allocation options and in the preparation of plan policies, including policies for flood risk management to ensure that flood risk is not increased;
- apply tests (the Sequential and Exception Tests) when determining land use allocations;
- identify the requirements for site-specific flood risk assessments in particular locations, including those at risk from sources other than river and sea flooding;
- determine the acceptability of flood risk in relation to emergency planning capability;
- Consider opportunities to reduce flood risk to existing communities and developments through better management of surface water, provision for conveyance and of storage for flood water.

SFRAs in Lancashire can be viewed on the Unitary and District Council Local Planning Authority websites.

## 2.5. Types of Flooding and Flood Risk

### What causes flooding?

Flooding occurs when water inundates land which is land not normally covered by water, typically where there is too much water or because the water is in the wrong place. Some floods develop over days as a result of water taking its time to reach watercourses and overwhelming them, whilst flash floods generate quickly following intense rainfall or rapid snow melt.

Whilst flooding is a natural phenomenon, it can result in wide ranging environmental, social and economic impacts when it interacts negatively with the human environment. There is hence a need to manage water and flood risk to ensure its negative impacts are minimised.

### What is flood risk?

The definition of 'risk' is the combination of the probability (likelihood or chance) of an event happening and the consequences (impact) of it occurring. Floods can happen often or rarely and have minor or major consequences. Where the probability and the consequences of flooding are high, then an area is considered to be at a high risk of flooding.

$$\text{Flood Risk} = \text{Probability} \times \text{Consequences}$$

### Types of Flood Risk

There are many different types of flood risk and flooding can be caused by the interaction between one or more types of flood risk. This means that flooding can be complex to understand and difficult to address, so it is important that all flood risk management authorities work closely together in understanding and managing flood risks.

Figure 4 demonstrates the different types of flood risk, whilst Table 1 describes these risks and explains which flood risk management authority is responsible for managing each risk.

**THE FLOOD HUB**

## Who's responsible for managing flood risk?

**Property owner**  
The property owner is responsible for private drainage and surface water up to the boundary of the property. They may also want to consider property flood resilience (PFR) measures to protect their property from flood damage.

**Watercourse (riparian) ownership**  
You own a watercourse if it runs adjacent to, through, or under your property. This includes both main rivers, and ordinary watercourses such as streams, culverts and ditches. You are responsible for maintaining the natural flow of water and reporting incidents such as blockages and flooding.

**Main river and coastal flooding**  
The Environment Agency (EA) is responsible for managing the risk of main river and coastal flooding. Main rivers are those which are designated as such on the EA's Main River Map. To report incidents and flood risk issues, call the Incident hotline on 0800 80 70 60. To sign up for flood warnings, call Floodline on 0345 988 1188.

**Groundwater flooding**  
The Lead Local Flood Authority (LLFA) are responsible for managing the risk of groundwater flooding. This can occur when periods of prolonged rainfall cause the water table to rise and emerge in basements or above ground.

**Public sewers and utility pipes**  
Water companies (e.g. United Utilities) are responsible for managing the risk of flooding from public sewers and utility pipes. This includes shared sewer pipes where they meet between properties before joining the public sewer.

**Highway gullies and drains**  
Highway roads, footpaths, drains and gullies are the responsibility of the local highway authority which will be either the County Council or the Unitary Authority.  
**Major roads and motorway drainage**  
Responsibility of Highways England.

**Surface water flooding**  
The Lead Local Flood Authority (LLFA) are responsible for managing the risk of surface water flooding. This can occur when the capacity of drainage systems on land or roads is exceeded by heavy rainfall.

**newground** This resource has been produced by Newground who work in partnership with the Environment Agency

**Lead Local Flood Authority (LLFA)**  
The Lead Local Flood Authority is either the County Council or the District Council (provided it is a Unitary Authority). They are responsible for managing flood risk from ordinary watercourses, surface water and groundwater, and for investigating all flooding incidents where deemed necessary.

Last reviewed: February 2020  
**For more information visit:**  
[www.thefloodhub.co.uk](http://www.thefloodhub.co.uk)  
@TheFloodHub

Figure 4: Types of flood risk

**Table 1:** Types of flood risk and responsible flood risk management authority

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## Type of flood risk

**Surface water flooding** is caused by the build-up of water on surfaces because it cannot soak into the ground due to it being hard paved, frozen, baked solid etc., due to the lay of the land, or where rainfall exceeds the infiltration capacity of the soil. It often occurs during intense or prolonged rainfall events.

### Responsible Authority

**Lead Local Flood Authority** (*Blackpool, Blackburn-with-Darwen and Lancashire County Council*)

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**Groundwater flooding** occurs when the water table (the water level below ground) rises above the ground surface. During periods of heavy and prolonged rainfall, the water level in the ground may rise to such an extent that it seeps into property basements, or the emergence of groundwater at the surface (can often be a natural spring) may cause damage to properties and infrastructure. Some areas are known to be more prone to groundwater flooding than others due to the naturally high level of the water table level in that area.

### Responsible Authority

**Lead Local Flood Authority** (*Blackpool, Blackburn-with-Darwen and Lancashire County Council*)

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**Ordinary watercourses** flooding occurs when heavy and/or prolonged rainfall causes the watercourse to break its banks or when blockages occur (for example by debris or when infrastructure fails). Ordinary watercourses typically smaller brooks, drainage channels, ditches, cuts, dikes, sluices, soughs or culverts that may only convey water for a short length of time in a year.

### Responsible Authority

**Lead Local Flood Authority** (*Blackpool, Blackburn-with-Darwen and Lancashire County Council*)

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**Highway flooding (non-trunk roads)** is the accumulation of water on the adopted Highway network surface. Highway flooding may be caused by blockages or capacity issues in Highway drainage systems, or simply by sheer volume of rain water falling on the carriageway, which the existing drainage network cannot cope with has the responsibility to manage flood risk on the county's non-trunk roads.

### Responsible Authority

**Highway Authority** (*Blackpool, Blackburn-with-Darwen and Lancashire County Council*)

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**Highway flooding (trunk roads and motorways)** is the accumulation of surface water on the strategic road network.

**Responsible Authority**

**Highways England**

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**Coastal flooding** typically occurs when strong winds, wave action, high tides and/or storm surges, or a combination of these factors during storm conditions, cause coastal overtopping.

**Responsible Authority**

**Environment Agency**

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**Main Rivers** are larger rivers that can span several counties but also include some smaller watercourses (those which are deemed to require specialist management). The Department for Environment, Flood and Rural Affairs (Defra) have set the criteria for defining these rivers as Main Rivers in England and Wales.

**Responsible Authority**

**Environment Agency**

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**Sewer flooding** can occur when large volumes of rainwater enters the public sewer system or when the public sewer system becomes blocked. Flooding from private sewers is the responsibility of the land owner.

**Responsible Authority**

**Water and Sewerage Companies**

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**Reservoir flooding** occurs when a reservoir fails or breaches resulting in this water escaping and flooding on to the adjacent land. Reservoirs are artificially created ponds or lakes that are usually formed by building a dam (wall), across a river or watercourse. This type of flooding is considered to be very low risk as it is highly unlikely to occur.

**Responsible Authority**

**United Utilities**

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**Canal flooding** can be as a result of excessive surface water running off or discharging to an artificially created waterway. The water levels within canals can vary (although not as much as rivers) due to many factors including proximity to controlled/uncontrolled inflows, lock usage etc.

**Responsible Authority**

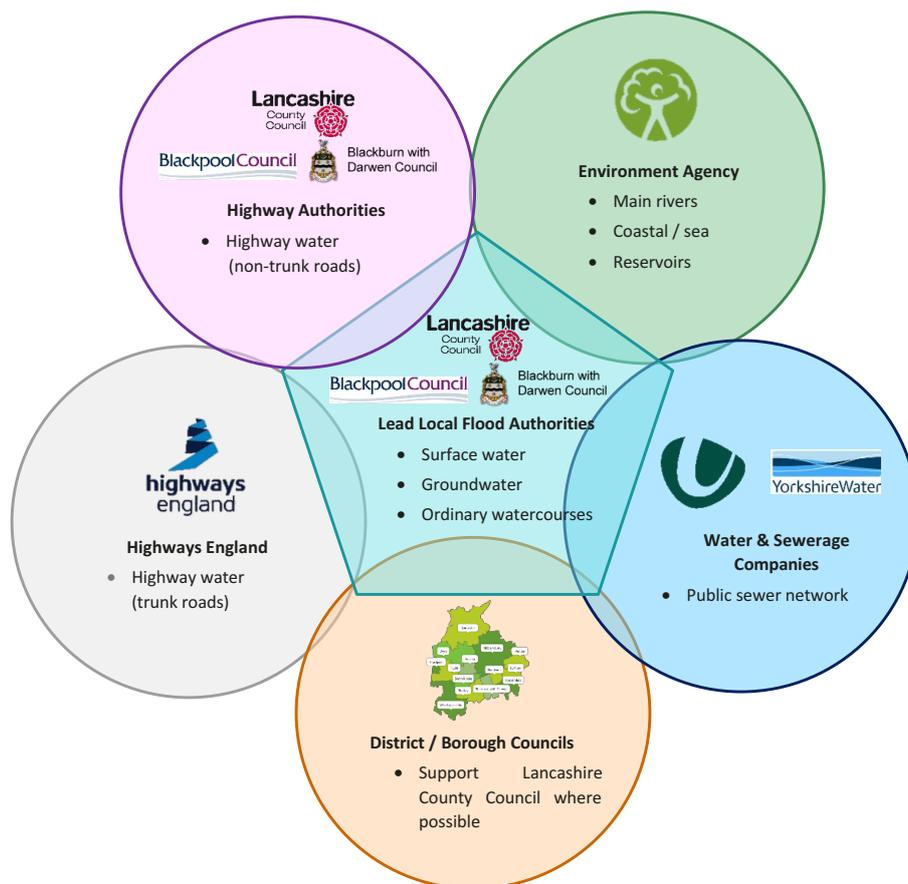
**Canal and River Trust**

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## 2.6 Responsibilities of Flood Risk Management Authorities

Lead Local Flood Authorities bring together all relevant Flood Risk Management Authorities to manage flood risk. No single body has the means to reduce all sources of flooding and therefore everyone has a part to play in effective flood risk management for Lancashire.

Figure 5 illustrates the key Flood Risk Management Authorities that work together in managing flood risk across Lancashire.



**Figure 5:** Flood Risk Management Authorities in Lancashire

Table 2 explains the key responsibilities, duties and powers placed upon flood risk management authorities in Lancashire by the Flood & Water Management Act 2010.

Under Section 13 of the Flood and Water Management Act 2010, flood risk management authorities each have a role to play in managing flood risk at a local level and must cooperate and ensure a partnership approach is taken to address concerns and maximise opportunities to holistically manage flood and coastal erosion risks.

We have clearly set out how we intend to do this through the delivery of actions set out within our Business Plan and governed through the Lancashire Flood and Coastal Erosion Risk Management (FCERM) Partnership and the regional governance of the North West Regional Flood and Coastal Committee (RFCC). You can find out more about FCERM governance in 2.8 below and on [The Flood Hub](#).

**Table 2:** Key Responsibilities, Duties and Powers of Flood Risk Management Authorities

Flood & Water Management Act		Lead Local Flood Authority	Highway Authority	District Councils	Environment Agency	Water and Sewerage Companies
Section 7	Develop the National Flood and Coastal Erosion Risk Management Strategy				✓	
Section 9	Develop a Local Flood Risk Management Strategy	✓				
Section 13	Cooperate with relevant authorities in exercising flood and coastal erosion risk management functions	✓	✓	✓	✓	✓
Section 14	Power to request information	✓			✓	
Section 17	Raise a Local Levy for Flood and Coastal Erosion Risk Management				✓	
Section 19	Investigate Flooding to a locally derived threshold.	✓				
Section 21	Maintain a register of structure and features affecting flood risk	✓				
Sections 22 - 26	Establish a Regional Flood and Coastal Committee and raise a Local Levy for FCERM				✓	
Section 27	Contribute towards sustainable development	✓	✓	✓	✓	✓
Section 39	Local Authorities are to manage flooding, water levels and coastal erosion in the interests of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment.	✓		✓		
Schedule 1	Power to designate structure and features	✓		✓	✓	
Schedule 2	Ordinary Watercourse Consenting and Enforcement <i>(by amendment to the Land Drainage Act 1991)</i>	✓				
<b>Town &amp; Country Planning (Development Management Procedure) (England) Order 2015</b>						
Part 4	Identifies statutory consultees in the development management planning process	✓	✓		✓	

## 2.7 Responsibilities of Individuals and Communities

### Business, land and property owners

Whilst there are a number of organisations and flood risk management authorities who have a responsibility for the management of the different sources of flooding, an individual property owner or business still has the responsibility to take measures to protect their property from flooding.

Flooding can still occur despite all stakeholders meeting their responsibilities and therefore, it is important that business, land and property owner take appropriate steps to ensure that their property and contents are protected where they are known to be at risk.

**The Flood Hub** is a North West regionally funded website to support our communities in understanding how they can become more resilient and resistant to flooding.

### Riparian Owners

A riparian landowner is defined as someone who owns land or property next to or over a river, stream, ditch or culvert/pipe that forms part of a watercourse. The riparian landowner is responsible for the section of watercourse which flows through their land. If a land boundary is defined next to a watercourse, it is assumed that the landowner owns the land up to the centre of the watercourse, unless it is owned by someone else.

Under the Land Drainage Act (1991), riparian landowners have a legal responsibility to maintain the free passage of water through the section of watercourse that flows through their land.

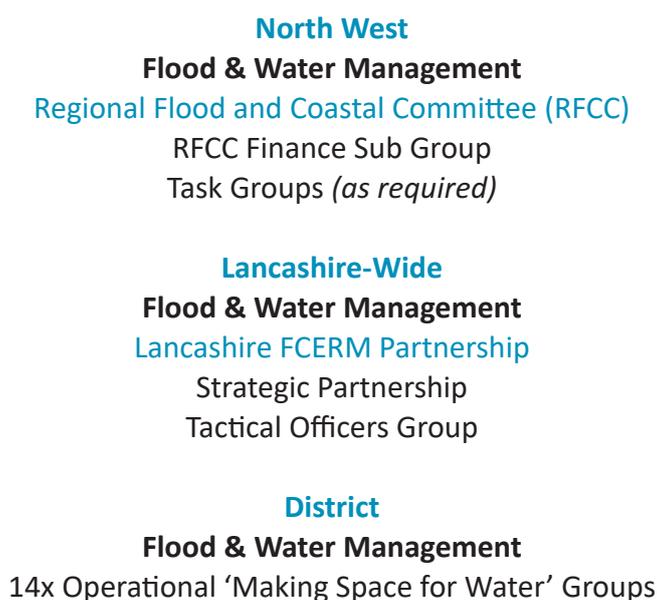
**The Flood Hub** is a North West regionally funded website and provide advices and guidance on riparian ownership.

### Developers

Developers are responsible for managing flood risk on-site during development. This should be considered as part of the site-specific flood risk assessment, where required, and in the sustainable drainage strategy for the site helping to ensure any phasing of construction considers how water will be managed. The Local Planning Authority, in consultation with flood risk management authorities, is responsible for ensuring development is carried out in accordance with approved plans and, where this is breached, taking appropriate enforcement action.

## 2.8 FCERM Governance in Lancashire

The structure of flood and coastal erosion risk management (FCERM) governance in Lancashire can be split into three hierarchal levels:



**Figure 6:** Regional and Sub-Regional Governance of Flood and Water Management

### North West Regional Flood and Coastal Committee (RFCC)

The North West Regional Flood and Coastal Committee (RFCC) is one of twelve RFCC's established in England by the Environment Agency under Section 22 of the Flood and Water Management Act. The RFCC brings together members (Councilors) appointed by Lead Local Flood Authorities (LLFAs) and independent members with relevant experience for three key purposes:

1. to ensure there are coherent plans for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines;
2. to provide a link between the Environment Agency, LLFAs, other risk management authorities, and other relevant bodies to build a mutual understanding of flood and coastal erosion risks in its area, and;
3. to use this understanding to encourage efficient, targeted and risk-based investment in flood and coastal erosion risk management that represents value for money and benefits local communities.

The chair, Adrian Lythgo, is independent and was appointed by the Secretary of State for the Department for Environment, Food and Rural Affairs. The North West RFCC has a Business Plan which provides more information about the Committee and its work.

The Committee is supported by a Finance Sub-Group which provokes more detailed discussion and consideration of financial aspects of Committee business. The Finance Sub-Group meets four times a year, typically two/three weeks before the main Committee meeting, and is chaired by another Member of the North West RFCC.

### North West and North Wales Coastal Group

The Coastal Group brings together the organisations who manage the coastline from Great Ormes Head in Llandudno to the Soloway Forth on the Cumbria – Scotland border. The Group examines the social, economic and environmental issues that arise along the changing coastline and seek to find the best policies to address these matters.

The Group is supported by two sub-groups: one for Liverpool Bay and a Northern Sub Group covering north of this. The Northern Sub Group is the sub group relevant to Lancashire and representatives from our Coast Protection Authorities – Blackpool, Fylde, Lancaster, West Lancashire and Wyre Councils - attend sub-group meetings held twice a year along with other partners including the Environment Agency and United Utilities.

The Shoreline Management Plan (SMP) is the key priority that the Coastal Group will oversee the delivery of. It makes recommendations as to whether maintenance of coastal defences should continue as they are at present ('hold the line'), whether maintenance (if any) should cease ('no active intervention') or whether defences, perhaps in years to come, might be set back further ('managed realignment'). Walls and embankments are often designed to protect against both flooding (flood defence/sea defence) and erosion (coast protection).

**[You can find out more about the North West and North Wales Coastal Group here.](#)**

### Lancashire FCERM Partnership

The Lancashire FCERM Partnership is one of five sub-regional FCERM Partnerships in the North West, alongside the Cumbria, Greater Manchester, Merseyside and Cheshire Mid-Mersey FCERM Partnerships. These partnerships were created by the North West RFCC to support local governance of flood and water management and of coastal processes, enabling local issues and priorities to be governed and reflected appropriately at the North West RFCC.

The Lancashire FCERM Partnership is a collective grouping of flood risk management authorities who come together quarterly to take an overview of flood and coastal erosion risk management across Lancashire, to identify priorities and steer the use of our resources, to vote on changes to the Local Levy, and to support investment which is good value for money and benefits our communities.

There are two levels to the partnership:

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#### **Strategic Partnership Group**

Elected Members and senior representatives from Risk Management Authorities meet four times a year.

This group is chaired by a Councillor and sets the strategic direction for joint working and management of flood and coastal erosion risk of the Partnership against its resources, local risks and challenges.

Group agrees the timetable delivery of actions identified in the Strategy's Business Plan according to many factors such as delivery timescales and what will have the greatest benefit to our at risk communities.



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#### **Tactical Officers Group**

This is chaired by a Local Authority officer and is where technical lead officers deliver actions set by the Strategic Partnership Group. The group meets four times a year to coordinate delivery, share skills and implement decisions.

Lead officers also report on issues, successes and identify ways to continually improve the management of flooding and coastal erosion risks into the future.

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### Local Authority Operational 'Making Space for Water' Groups

Operational 'Making Space for Water' Groups are district-level technical partnership groups set up to discuss locally specific flood and coastal, where applicable, issues within their Local Authority area and provide a forum to drive forward solutions, where possible, through working in partnership.

These technical meetings are arranged and chaired by Local Authorities who, where applicable, feed outcomes of this meeting up to Tactical Officers Group and to the Northern Coastal Sub-Group as well as feeding information down to the Operational 'Making Space for Water' Group.

## 2.9 Working with our Wider Partners

### Catchment Partnerships

Catchment Partnerships are local formed groups which advocate for a Catchment Based Approach (CaBA) to undertake integrated management of land and water, addressing each river catchment as a whole and delivering crosscutting practical interventions on the ground. These result in multiple benefits including improvements to water quality, enhanced biodiversity, reduced flood risk, resilience to climate change, more resource efficient and sustainable businesses and, health and wellbeing benefits for local communities as they engage with and take ownership of their local river environment.

Numerous organisations and sectoral interests are involved with Catchment Partnerships in Lancashire, including the Environment Agency, United Utilities, Local Authorities, Landowners, Wildlife Trusts, National Farmers Union, Academia and Local Businesses.

In Lancashire there are five Catchment Partnerships covering the Alt Crossens, Douglas, Irwell, Lune, Ribble and Wyre Catchments which are chaired by Rivers Trusts and Groundwork.

### **[You can find out more about them here.](#)**

Whilst not a flood risk management authority, Catchment Partnerships are a recognised and valued groups which support us in, where possible:

- delivering a catchment-based approach (CaBA) to flood and water management
- helping to drive improvements in water and bathing water quality locally
- championing the use and delivery of natural flood management techniques across Lancashire.

### Flood Action Groups (FIAGs)

A Flood Action Group (FIAG) is a voluntary group of local residents who meet on a regular basis to work on behalf of the wider community to help to try and reduce the impact of future flood events. Across Lancashire, there are around 50 FIAGs and, whilst the focus of the group can vary, is typically based around emergency planning and can also tackle local issues, whilst providing a unified voice for the community to communicate ideas and queries to others.

It is within the remit of each individual group to decide on its own roles, responsibilities, aims and objectives. **[For more information please see The Flood Hub.](#)**

Detailed information describing the achievement of a Community Group at Churchtown and future opportunities for other Flood Action groups can be found on this link:

**<https://thefloodhub.co.uk/wp-content/uploads/2019/12/Churchtown-Flood-Action-Group-case-study.pdf>**

### Lancashire Resilience Forum

The Lancashire Resilience Forum (LRF) is a multi-agency partnership made up of representatives from local public services, including the emergency services, local authorities, the NHS, the Environment Agency, United Utilities, Maritime Coastguard Agency and others. These agencies are known as Category 1 Responders, as defined by the Civil Contingencies Act.

These multi-agencies work together to prepare and respond to emergencies in Lancashire, including flooding. **[You can find out more about the Lancashire Resilience Forum here.](#)**

## 2.10 Funding for FCERM

### FCERM Investment Programme 2021 - 2027

The Flood and Coastal Erosion Risk Management (FCERM) Investment Programme is a Defra capital investment plan to better protect homes and non-residential properties, such as businesses, schools and hospitals, from flood risk and coastal erosion. The conditions of the Investment Programme are that schemes must attract at least 15% of partnership funding and deliver 10% efficiency saving on projects. This flood and coastal erosion resilience partnership funding policy was introduced to spread the cost between government funding and local funding partners.

In the 2020 Budget, the government announced that it will double its investment in flood and coastal defences in England, compared to the previous capital investment plan, to £5.2 billion to better protect a further 336,000 homes and non-residential properties as well as avoiding £32 billion of wider economic damages to the nation.

The Prime Minister also announced a new £200 million resilience fund to pilot innovative approaches to improving flood resilience between 2021 and 2027. This will support 25 local areas to take forward wider innovative actions that improve their resilience to flooding and coastal erosion.

In addition to doubling its spending on flood and coastal defences, the government has worked with the Environment Agency to update how the level of government funding is allocated to projects. The changes will take account of the wider environmental and social benefits that come with reducing the risk of flooding.

The changes will include:

- updated payments to account for inflation and based on new evidence on the overall impacts of flooding, such as mental health
- increased payments for flood schemes which also create a range of environmental benefits
- more funding for flood schemes which also protect properties that will later become at risk of flooding due to climate change
- a new risk category which will enable schemes that prevent surface water flooding to qualify for more funding
- New funding streams will also mean:
- more money for flood defence schemes that help to protect critical infrastructure such as schools, hospitals, roads and railways
- more money to upgrade existing Environment Agency defences

### Funding for Delivering Projects

The following funding sources allow the LLFA to reduce flood and coastal erosion risk through the delivery of projects:

- **Flood Defence Grant in Aid (GiA)** – This is money from Defra which is administered by the Environment Agency. The amount of Grant in Aid available to each capital scheme is calculated by the Outcome Measures delivered by the project. Outcome Measures reflect financial, environmental, health and FCERM benefits. Where there is a shortfall in Grant in Aid, funding contributions are required to achieve project viability.
- **Local Levy** – The North West RFCC (and Yorkshire RFCC for Earby) can choose to support projects that are either not eligible for Grant in Aid, or to support projects where there is a shortfall in Grant in Aid by the allocation of Local Levy.
- **Partnership Funding** – Where Grant in Aid and/or Local Levy does not fully support the delivery of a project, the LLFA can provide additional funding through their own contributions or by seeking external contributions from partners and communities who may benefit from the project.

Funding allocations for these sources are subject to a successful, approved business case.

More information on investment in FCERM can be found in the North West RFCC Business Plan (available on [The Flood Hub](#)) and statistics can also be found on [GOV.uk](#).

# 3. Local Flood Risks & Challenges

## 3.1 Local Flood Risks

### Increasing local flood risks as a result of climate change

The [UK Climate Projections 2018 \(UKCP18\)](#) illustrate a range of future climate scenarios until 2100. In relation to managing the risk of local flooding average summer rainfall could decrease by up to 47% by 2070, while there could be up to 35% more precipitation in winter. What rainfall does occur will be more intense over a shorter duration, which could lead to an increase in surface water flood risk.

This is complicated by sea levels which are projected to rise over the 21st century and beyond under all emission scenarios, meaning we can expect to see an increase in both the frequency and magnitude of extreme water levels around the UK coastline. This can impact on local flood risk by affecting the ability of catchments to discharge.

UKCP18 can be used as a tool to guide decision-making and boost resilience – whether that's through increasing flood defences, designing new infrastructure or adjusting ways of farming and land management for drier summers. It will also help us at a local level to feed into future development plans to ensure they take account of and are resilient to flood and coastal erosion risks.

Most Lancashire [Local Authorities](#) have declared a [climate emergency](#) committing to taking action to reduce carbon emissions, raise awareness about climate change and mobilise change through local action.

### Inherited local flood risk from historical development

Development today is well regulated through the planning process, and this includes measures to understand, mitigate and manage flood risks from all sources on prospective sites. As well as planning regulation, building regulations and design specifications have changed and improved over time to reflect advances in knowledge and understanding of drainage and in response to our changing climate.

It is therefore not surprising that older developments, constructed at a time when due consideration to drainage did not occur as it does now, are finding they are at flood risk today as a result of our changing climate and pressures on historical drainage systems not designed and constructed to modern standards.

### Predominant surface water flood risk

Surface water flooding from short, intense storms can occur in urban areas and along highways when drains are overloaded by the sheer amount of rainfall and/or runoff.

Sefton has the highest number of properties at high risk of surface water flooding both in Merseyside and in the North West, largely as a result of its urban areas generating surface water flows, flat topography meaning the water isn't easily moved away and the presence of sea defences.

The figures in Table 2 are 'with defences'. Those for rivers and the sea would be much higher were it not for these defences, especially in Wirral and Sefton. This underlines the importance of maintaining flood and coastal assets and periodically upgrading them.

#### Groundwater risks in low lying areas

In low-lying areas the water table is usually at shallower depths, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in areas situated over permeable rocks, called aquifers. These can be extensive, regional aquifers, such as chalk or sandstone, or may be more local sand or river gravels in valley bottoms underlain by less permeable rocks.

Hence groundwater flood risks in Lancashire tend to be prevalent in lower lying areas underlain by permeable rocks and soils as is typical throughout the West Lancashire plain and the Fylde Peninsula.

#### Drainage infrastructure which is aging and at capacity in areas

Lancashire has an intricate network of ageing culverts, sewers and drains, many dating from the 1800s when cotton industry was expanding during the Industrial Revolution.

This ageing infrastructure, along with pressures from development and a tendency for increased paving such as driveways, poses particular problems to the drainage network. As a result, some areas have experienced flooding from sewers which occurs when their capacity is overcome by the amount of water trying to enter the network.

In urban areas watercourses are typically modified with straightened and walled channels, and there are many culverts; watercourses which have been re-directed through pipes and tunnels.

#### Many watercourses reflecting land that has been reclaimed and/or managed

Lancashire's western districts are characterised by large areas of reclaimed land with a distinctive pattern of rectangular fields of dark peaty soil with deep drainage ditches. This land is highly fertile, top grade agricultural land with a vibrant intensive farming economy.

It is common to find the suffix "Moss" in the names of local places. As is usual in these types of areas, the settlements tend to be on any available hill, many formed by sandstone outcrops, to avoid the risk of flooding.

Of course, this reclaimed land relies on a series of managed ditches and dykes, providing a complex network of 'feeder' watercourses that eventually outfall into tidal estuaries or main river channels. Large parts of these catchment are pumped by satellite drains and pumping stations, many of which are maintained by the Environment Agency. There is a risk around the longevity and sustainability of these pumped catchments with multi-agency discussions ongoing between asset, business and land owners.

## 3.2 Local Challenges

The local flood risks Lancashire faces are made more complex by a number of challenges, we will work in accordance with the guidance in the National FCRM strategy to address the challenges which include

### Social deprivation in highly populated urban areas which can lead to lower uptake of flood insurance in at risk areas

Challenges in the management of flood risk are shown to exist and impact in areas where social deprivation is prevalent. The challenge is in the engagement both of flood risk exposure, which can range from receipt of flood warning, assistance during flood to the recovery stage where many residents do not have sufficient insurance cover.

Following a joint initiative between the Government and insurance companies Flood Re was established in 2016. The aim was to secure affordable and available insurance for qualifying properties that are at risk of flooding or have been flooded. However a recent study has indicated that there are still concerns around affordability of insurance in areas of social deprivation. The study, carried out by Doncaster Council with ten recommendations which, benefits many areas across the Country, is applicable to Lancashire to ensure that we address the challenge and assist residents where possible via Flood Re.

### Engagement with diverse communities

Overall, this Local Flood Risk Management Strategy aims to impact positively on everyone who lives, works or visits Lancashire.

The Equality Act 2010 introduced the term “protected characteristics” and makes it unlawful to discriminate against a person who belongs to one of the groups who are protected under the act. The groups identified by the Equality Act 2010 are: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation.

These groups with protected characteristic may require further consideration and consultation as the strategy is implemented. It is important to ensure the needs of these groups are considered as part of the Flood Risk Management, for example some groups may have difficulty in accessing interpreting or acting on flood warnings and we need to ensure that flood risk management schemes do not have a negative impact on the ability of people to use the highway and pathways and that specific places are acknowledged.

### Long term sustainability of pumped catchments

New development in low-lying areas has to be carefully managed as many of the drainage ditches and pumping stations are operating at or near full capacity. A small increase in the volume of flows or a change in the drainage regime could lead to a large increase in flood risk. One of the biggest challenges of the next 6 years is the maintenance of these assets as many are reaching capacity and are not sustainable due to the increase in capacity. Alternative integrated solutions need to be investigated to mitigate this challenge and also reduce the carbon impact of pumping stations.

### Poor water quality of watercourses

Watercourses are one of Lancashire's most natural and important assets, and help provide protection from flood risk. But often the run off from land create poor quality of water which often impacts the rivers and coast and the much needed habitats.

During the course of this strategy we will work with landowners to establish a programme to improve poor water quality of watercourses.

### Regulation and maintenance of watercourses

Lancashire contains some of the highest grade and most productive agricultural land in the UK. The rural economy plays a very important role in the region and employs a large number of people.

However, much of the land used for farming are drained by an extensive network of watercourses such as ditches, streams and river. Water levels are also managed in some locations with the aid of pumping stations.

Maintaining water infrastructure related to agriculture has a cost and in the current economic climate, funding for these activities is under significant pressure. This is especially true, when there is a strong focus on protecting people and property over agricultural land. We are working with our RMA partners to develop governance options or water management in rural areas, with a view to balancing the needs of agricultural productivity, flood risk management and sustainable drainage practices.

However the challenge may be partly mitigated if the work with landowners developing innovative solutions to ensure there is regulation and maintenance of watercourses.

LLFA's have responsibility for consenting and enforcing on ordinary watercourses, Developers have responsibility to apply for consent. The Planning Authorities can ensure that Developers pay strict attention to their responsibilities for application by applying planning conditions on developments. Lancashire expects developers to ensure that the places they are building have environmental net gain and do not have a detrimental impact on existing watercourses.

### Developing and retaining flood risk professionals for Lancashire

Strategic objective 3.5 of the National FCERM states that *“between now and 2030 the nation will be recognized as a world leader in researching and managing flooding and coastal change”* and its measure 3.4.1 states that *“by 2025 risk management authorities and other organizations will work with education providers to encourage opportunities for ongoing learning and career development in engineering and social sciences.”*

As described in this strategy Lancashire has an investment of £230m between 2021 and 2027, in order to deliver this investment, Lancashire will address the National challenge and will work with schools and universities to engage with students, appoint apprentices and graduates to ensure we can both deliver the investment but develop and retain flood risk professionals.

### 3.3 District Fact Files

#### Blackburn with Darwen

##### General Geography and Topography

- The Blackburn with Darwen Borough Council study area is located in Lancashire in the North West of England and covers an area of 137 sq km. It lies to the north of the West Pennine Moors on the southern edge of the Ribble Valley and the northern edge of the Irwell catchment.
- Blackburn is bounded to the south by Darwen, with which it forms the unitary authority area of Blackburn with Darwen Borough. The original settlement of Blackburn was located to the north of the River Blakewater with Darwen located within the steep narrow sided River Darwen valley. The two towns dominate the northern half of the borough, whilst the southern half is more rural. The Leeds Liverpool Canal flows through the northern part of the borough for approximately 7.5km and the two towns are separated by the M65 motorway.
- The Borough is characterised by relatively compact urban areas set within countryside. This is most pronounced in Darwen, much of which sits within a relatively steep-sided valley with ridgelines to the east and west. Within the main urban areas both Town Centres are surrounded by large areas of high density terraced housing, parts of which are in poor condition. Both towns also have significant areas of “suburban” development, comprising a mix of larger older properties and more recent development, some of which has spilled beyond the confines of the valley sides.
- **Topography**
- The central parts of Blackburn, where the River Darwen and Blakewater meet, lie at a height of approximately 100 metres above sea level. Darwen lies at approximately 220 metres above sea level and occupies the narrow valley between Darwen Moor and Grey Stone Hill. Darwen is surrounded to the west, east and south by moorland.
- The southern part of the Borough falls within a second river catchment, the River Irwell, which drains south to the Mersey Basin. The boundary between the Darwen and Irwell catchment rises to a height approaching 400 metres on Turton Moor and Causeway Height. The rural population centres are largely located to the west, south and east in river valley or reservoir valleys and include the villages of Edgworth and Turton Bottoms, Belmont and Hoddlesden.

##### Potential Sources of Flooding

- Flooding from rivers
  - Intense or prolonged rainfall causing runoff rates and flows to increase in rivers, which then exceeds the capacity of the channel. This can be exacerbated by wet conditions leading up to the prolonged rainfall and where there are significant contributions of groundwater;

- Constrictions in the river channel, reducing capacity and causing flood water to backup, i.e. culverts, bridges, pipe-crossings etc;
  - Blockage of structures or the river channel causing flood water to backup; and
  - High water levels and/or locked flood gates preventing discharge at the outlet of a tributary into a river
- Flooding from groundwater
  - Flooding from surface water
  - Flooding from sewers
  - Flooding from artificial sources (docks, canals, reservoirs, lakes).

### Flood mitigation carried out

- Superficial Geology/General Soil Types
- The geology of the Blackburn area yields numerous resources. Mineable coal seams have been used since the 16th century and Millstone Grit has been quarried for millstones and for providing building stone for many of the older properties. The centre of Blackburn Town Centre is where the geological strata changes from coal measures to Millstone Grit. South of the town centre Coal deposits are present in a narrow band extending south through Darwen and to the boroughs boundary. The Coal deposits are overlain by superficial glacial sand/gravel and Till deposits. North of Blackburn Town Centre the underlying geology is Millstone Grit overlain by Till.
- The relatively impermeable Coal and Millstone Grit and the steep nature of the upper catchments of the both the Darwen and Blakewater would give rise to limited infiltration and a rapid response to rainfall events. Hydrological analysis undertaken as part of a Flood Risk Management Strategy for the River Darwen and Blakewater suggests that the critical duration for the River Darwen, Blakewater and their tributaries, i.e. the time it takes for the watercourses to typically reach peak flow or level after a storm event, varies between 1.25 hours and 4.75 hours.

### Known Risks (during a major rainfall event)

- The primary source of flooding is from the Rivers Darwen and Blakewater. The heavily urbanised nature of the catchment in conjunction with the steep and narrow nature of the watercourses results in a rapid response to heavy rainfall events. The confined nature of the channel, which is a result of historical development that closely borders the watercourse, and the presence of numerous structures means that there is an inadequate capacity within the watercourse resulting in overtopping and flooding of surrounding land, primarily where there are no flood defences.
- This flooding generally results in overland flow along the path of the watercourses, impacting numerous properties and infrastructure. Where there are flood defences, the majority provide a level of protection that is greater than a 1% AEP (1 in 100yr) flood event, however, in some places the standard of protection is lower than this and approximately 7% of them provide a standard of protection equivalent to a 20% AEP (1 in 5yr) flood event or less.

## Blackpool

### General Geography and Topography

- Blackpool is flanked by the Authorities of Fylde and Wyre. The area is predominantly flat. Due to the flat topography there are extensive networks of agricultural land drains and ponds many of which have been subject to development and cannot be seen.

### Potential Sources of Flooding

- Coastal/Tidal
- Main Rivers
- Surface water including direct rainfall (pluvial), ordinary watercourses, groundwater and Surcharging drainage systems and sewers

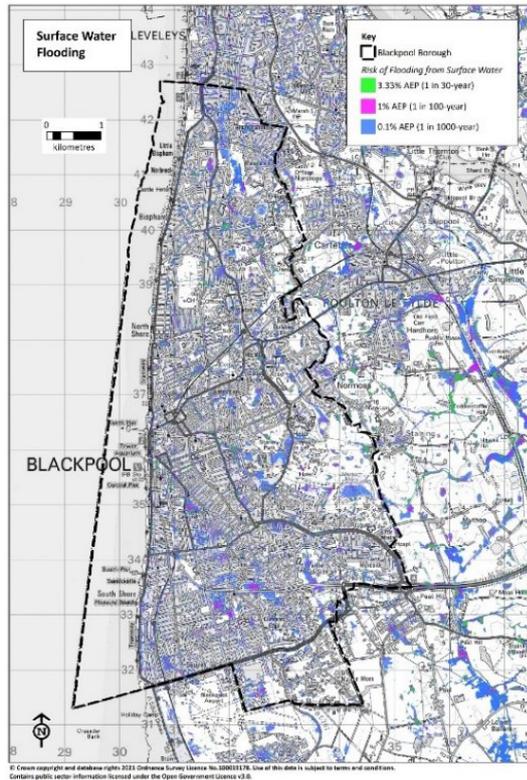
### Flood mitigation carried out

- Central and Anchorsholme Coast Protection
- SuDS installation at Carlton Cemetery
- Installation of gully monitoring
- Sand Dunes
- Ongoing studies into flood events with Partners

### Known Risks (during a major rainfall event)

- Superficial geology can influence surface water flood risk and in this area is a mixture of marine and windblown sands, gravels and mudstone along the coast and glacial till deposits.
- High groundwater levels in some localised areas.
- Local flooding is likely to be widespread but shallow with low velocity.
- In many cases flooding will be contained within the highway but may impact on access and egress and travel in general.
- Drainage systems are less effective than in hillier areas as gradients are less and pipes may be affected by siltation.
- The only main rivers is Bispham Dyke but Blackpool is flanked in the North by Wyre and the River Wyre can impact Blackpool North in addition to Royals Brook Watercourse in Wyre as they flow through and around Blackpool before discharging to the sea. As a result, it is likely that some combined flooding will occur in the event of an extreme rainfall event, with surface water and sewer flooding combining with either tidal or fluvial flooding.

## Surface Water Flooding



**Figure 7: Blackpool Surface Water Flood Risk**

### Case Study: Anchorsholme Coast Protection.

The £19 million Anchorsholme Coastal Protection Scheme provides coast protection in the North of Blackpool. It was developed through the Fylde Peninsular Coastal programme consisting of Blackpool, Wyre and Fylde Councils, working together in partnership with principal contractor Balfour Beatty Civil Engineering Limited (BBCEL) and main funding body the Environment Agency. The scheme built upon a wealth of learning from previous schemes along the Fylde coast in particular the Cleveleys and Blackpool central schemes. The physical elements of the scheme involved renewing 1km of failing sea-walls and promenade whilst preserving the beach frontage to better protect over 4,500 properties from coastal flooding from the Irish Sea. However the true value of the works is far greater than property protection alone. It is an excellent example of using opportunities to combine coast protection and regeneration. Working in Partnership with United Utilities, (the coast protection scheme) together with United Utilities bathing water investment in Anchorsholme Park and the local Community, provided the opportunity to combine these two major investments and create and enhance the environmental, social and economic opportunities in the Anchorsholme Blackpool Area.

The scheme demonstrates a broadening of the scope and vision of what coast defence schemes can achieve for society. The interaction between the users and beneficiaries of the new works in jointly developing a vision for the area in which the coastal defence scheme is a catalyst for wider neighbourhood improvements through the development of high quality public space formed a key element of the scheme.



**Figure 8:** Park and coast protection

## Burnley

### General Geography and Topography

- The main urban areas are Burnley and Padiham.
- Urban development advanced significantly during the industrial revolution as centres for coal mining and cotton spinning expanded. These centres exploited the hydropower available from the many watercourses.
- These non-residential developments were constructed immediately alongside, and in some cases, over watercourses. These former mill buildings have now been vacated, reoccupied, redeveloped or demolished. Many sites have been replaced with residential developments, which are more vulnerable to flood events.
- Outside of the urban centres, there are small settlements within the foothills and valleys and beyond these there is open moorland.
- The topography consists of flat valley floors and rising hills to upland moorland.

### Potential Sources of Flooding

- Main Rivers
- Ordinary watercourses
- Reservoirs
- Surface water
- Groundwater
- Surcharging sewers and drainage networks

### Flood mitigation carried out

- Padiham – flood risk management scheme (ongoing)
- Lowerhouse Ln – drainage survey/repairs/improvements
- Manchester Rd, Dunnockshaw – drainage survey/repairs/improvements

### Known Risks (during a major rainfall event)

- Areas of steep topography where direct run-off is likely to result in shallow high velocity flooding. Flooding is likely to occur with little warning but likely to be short in duration. Flooding of this kind can be hazardous to people and may be affected as a result of the velocity of flows channelled down roads and around buildings. The shallow nature may result in less risk to property.

- Minor watercourses within culverts in densely developed urban areas are a risk if there was to be a collapse or blockage. This could result in deep, high velocity surface water flows along the former natural course of the watercourse. Flooding may occur with little warning and will be along a defined flow path. This may result in damage to properties within the flow path. The velocity and depth will be hazardous to people.
- Areas of flatter topography, typically in valley bottoms or on river floodplains, are likely to experience widespread flooding with localised areas of deep ponding. This flooding occurs from direct run-off from steeper areas or as a result of surcharging or blocked drainage systems. This type of flooding is less hazardous to people but may result in higher levels of property damage.
- Complex interactions with watercourses, including Main Rivers are likely.



### Case Study: Padiham Flood Risk Management Scheme

Situated alongside the River Calder and a smaller watercourse, Green Brook, Padiham flooded significantly on 26/12/2015 when the River Calder reached a record water level with 149 properties were reported as flooded. Flooding again occurred on 09/02/2020 during Storm Ciara. Water levels on the River Calder were lower than in 2015 and property level resilience (e.g. floodgates) have been installed on buildings since the last floods. The flooding in Padiham causes significant impacts to residential homes, businesses, public buildings and infrastructure in the town.

Since the 2015 floods, the Environment Agency, Burnley Borough Council and partners have been working together to develop proposals for a Padiham Flood Risk Management Scheme. This includes flood walls and earth embankments as well as modifications to highways. The proposals will better protect over 150 homes, businesses, public buildings and key infrastructure in central Padiham. It will manage flood risk from the River Calder, Green Brook and surface water.

Lowerhouse Ln – drainage survey/repairs/improvements  
 08/06/2016 – localized storm event caused internal flooding to approx.29 properties. Lancashire County Council and United Utilities then carried out surveys, repairs and improvements to the local drainage systems.

Manchester Rd, Dunnockshaw – drainage survey/repairs/improvements  
 26/12/2015 - 5 properties suffered from internal flooding from surface water sources, and as a result property protection were installed by residents and highway improvements were carried out.



## Chorley

### General Geography and Topography

- The main urban centre is Chorley with smaller centres in Clayton le Woods, Whittle le Woods, Adlington, Euxton, Buckshaw Village, Coppull, Croston and Eccleston. There are other semi-rural communities around the district and large areas of farm land/open countryside.
- The district has two distinct types of topography. To the west of the M61 the area is predominantly flat and to the east the topography rises gently at first but then more steeply.
- The settlements developed extensively during the industrial revolution with mills and factories being constructed close to rivers. Over time these watercourses have been culverted and canalised through the urban areas.
- Overtime these industries have disappeared leaving poorly maintained, hidden culverts.
- The excellent transport links have attracted new development both in terms of industry and housing.

### Potential Sources of Flooding

- Main Rivers
- Ordinary Watercourses
- Canal
- Reservoirs
- Groundwater
- Surcharging drainage systems and sewers

### Mitigation projects

- Croston Dam

### Known Risks (during a major rainfall event)

- The flat topography west of the M6 motorway is likely to experience widespread shallow flooding which would result in disruption to people and services as a result of standing water. It is unlikely that large number of properties would suffer from internal flooding. Internal flooding may occur in localised low points where deeper flooding may occur.
- Superficial Geology and general soil types include:
  - Predominantly glacial till
  - Localised fluviially deposited sands, silt gravels and peat deposits.
  - Mainly peat over high ground in the east.

- There are many land drains and ordinary watercourses that are culverted, reducing capacity or introducing pinch points on drainage systems.
- Overland flows of surface water run-off are not usual and where they do occur are likely to be related to Ordinary Watercourse of Main Rivers where deeper and faster flowing flood water may be encountered. This has potential to pose a greater hazard to people and property. There is potential for flooding through the interaction of Main Rivers, Ordinary Watercourse and sewers and surface water drainage systems. Flooding would occur because Ordinary
- Watercourse and field drains would be unable to discharge into Main Rivers.
- Combined sewers (foul and surface water mixed in a single system) are likely to pose a significant risk. Surcharging combined sewers can result in surface water becoming contaminated with untreated sewage.
- Historic culverts may have capacity issues or may be in poor condition. Flooding from these watercourses represent a hazard as surcharging, blockage or collapse of a culvert can result in deep, fast flowing flooding.
- Flooding in the eastern part of the district is likely to be significantly different than that seen in the west as a result of the steeper terrain. There are likely to be distinct flow-paths and whilst flooding is expected to be less extensive run-off will be deeper and fast flowing along distinct flow paths. This will present a greater hazard to people and properties as flooding may occur with little or no warning.
- Deeper flood depths will also result in more properties suffering internal flooding, although in the steepest areas there is less concentrated development.
- Flow-paths are likely to follow roads and other artificial paths. This will represent a significant hazard to users of these routes.
- Ordinary watercourse in the east of the district will likely have a flash response to extreme events with water levels rising and also falling rapidly. This has a potential to cause flooding downstream particularly in areas that are culverted.



**Figure 9:** Working in partnership with Lancashire and Chorley Councils “Croston Dam” protects 400 homes and businesses from flooding.

## Fylde

### General Geography and Topography

- Fylde abuts the unitary authority of Blackpool.
- The main urban settlement is along the coast at Lytham St Annes and inland Kirkham. There are numerous smaller villages and hamlets spread across the district.
- The area is predominantly flat. Due to the flat topography there are extensive networks of land drains and ponds.

### Potential Sources of Flooding

- Coastal/Tidal
- Main Rivers
- Surface water including direct rainfall (pluvial), ordinary watercourses, groundwater and Surcharging drainage systems and sewers

### Flood mitigation carried out

- Fylde Coast Protection scheme 2020
- SUDS installation at Lytham Cemetery

### Known Risks (during a major rainfall event)

- Superficial geology can influence surface water flood risk and in this area is a mixture of marine and windblown sands, gravels and mudstone along the coast and glacial till deposits and peat alongside the River Ribble.
- High groundwater levels in some localised areas.
- Local flooding is likely to be widespread but shallow with low velocity.
- In many cases flooding will be contained within the highway but may impact on access and egress and travel in general.
- Drainage systems are less effective than in hillier areas as gradients are less and pipes may be affected by siltation.
- Rural areas are likely to suffer extensive shallow flooding. Likely cause being the inability of land drains and watercourses to cope with the large volumes of run-off generated.
- Two Main Rivers, Liggard Brook and Whitehill Watercourse, flow through and around Lytham St Annes before discharging to the sea. As a result, it is likely that some combined flooding will occur in the event of an extreme rainfall event, with surface water and sewer flooding combining with either tidal or fluvial flooding.

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### Case Study: Fylde Council SuDS Project

To reduce the waterlogging to the eastern extent of the cemetery and provide formal memorial foundations with maintainable drainage and, to address the introduction of a new visitor parking area (980m<sup>2</sup>) with additional access roads, utilising Sustainable Drainage Systems.

The site is not formally drained and is therefore considered to be 100% permeable. Generally, the site is Devensian Till overlying Singleton Mudstone. However, it is known that there are pockets of wind-blown sand and peat on the site.

The increased area of hardstanding and access road resulted in an increase in surface water runoff rates and volumes, discharge is controlled from the detention basin before passing through an existing small wastewater treatment facility. Storage volume in the detention basin was calculated as 344m<sup>3</sup> for the 6hr, 1 in 100 year rainfall event plus 40% climate change allowance.

The area of the proposed detention basin was discovered to have at its base granular deposits thus some infiltration proved possible. Likewise, the proposed area of the visitor parking also had a formation which allowed a permeable paved construction. Shallow swales were constructed to three sides of the parking area to contain and channel any overflow to green areas around the periphery.

Drainage beneath the memorial slabs comprised a half-perforated pipe, with crushed stone no-fines media, wrapped in filter media, in the form of trench drains. Thus, providing additional storage and filtration. Oversize carrier drains to the detention basin provide additional online attenuation within the pipe network. The extent of the existing burial plots throughout the site meant great care had to be taken during construction. The principle drainage areas are indicated in red below.

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**Figure 10:** Fylde Council SuDS

## Hyndburn

### General Geography and Topography

- There are a number of urbanised areas within Hyndburn with Accrington being the main centre.
- Smaller centres are Rishton, Oswaldtwistle, Clayton le Moors, Great Harwood and Church and these tend to lie within the foothills and valleys.
- Accrington is located in the upper reaches of the River Hyndburn catchment and the topography is very steep. The area is heavily urbanised with high density terraced houses and former mill buildings.
- The southern part of the district is mainly open moorland and part of Oswaldtwistle Moor falls within the West Pennine Moors SSSI area.

### Potential Sources of Flooding

- Main River
- Ordinary Watercourses
- Groundwater
- Surcharging drainage systems and sewers
- Culvert capacity or condition

### Superficial Geology/ General Soil Types

- Underlying geology of limestones and millstones and coal although the superficial geology is made up of mainly glacial deposits, sands and gravels.
- In low lying areas there is potential for high groundwater level.

### Known Risks (during a major rainfall event)

- The topography means the area is at high risk of surface water flooding with high velocity, shallow flooding of streets and widespread flooding of valley bottoms.
- Flash flooding is likely to represent a significant hazard.
- Historic culverts may have capacity issues or may be in poor condition. Flooding from these watercourses represent a hazard as surcharging, blockage or collapse of a culvert can result in deep, fast flowing flooding.
- Sewer flooding reflects higher population concentration but may also be linked to aging sewer and drainage networks.

## Lancaster

### Recent mitigation from flooding

- Morecambe Wave Wall

### Potential Sources of Flooding

- Coastal/Tidal
- Main Rivers
- Mill Race
- Canal
- Reservoirs
- Surface water including direct rainfall (pluvial), ordinary watercourses, groundwater and Surcharging drainage systems and sewers

### Known Risks (during a major rainfall event)

- The district has a number of large distinct areas of residence and employment, Lancaster, including Galgate and South Lancaster area, Morecambe/Heysham Carnforth and Halton.
- There are numerous other semi-rural and rural villages many of which have developed along the River Lune and other watercourses.
- The district is split divided by the M6/A6/West Coast main line and Lancaster Canal corridors. To the east are mainly villages to the west the larger population.
- The topography of the area is characterised by higher ground of the Forest of Bowland and Yorkshire Dales to the east, and the lower-lying floodplain to the west.
- Morecambe and Heysham are likely to experience widespread shallow flooding due to the flat topography with less effective drainage systems in comparison to the more hillier locations. Drainage outfalls may suffer from tide-lock. This could cause surcharging and blockage of drains and ordinary watercourses.
- Lancaster and surrounding areas are likely to experience widespread flooding of flat areas alongside the River Lune, River Condor and River Keer with high amounts of run-off along key flow paths.
- In areas with steeper topography there will be distinct flow paths. Flooding along these will be deeper and faster with ponding at low-points or pinch-points.
- There is flood risk associated with the River Keer to the North of the District around Carnforth and Wenning and the associated villages

- The centre of Lancaster is at significant risk from surface water flooding from surface water runoff and flooding from drainage systems as are Galgate from the river condor, burrowbeck and Halton from the Lune.
- The interactions of surface water drainage with water levels in Main Rivers and the sea are likely to be complex and will have a significant impact on flood risk in many areas.
- In flat areas the drainage of flood waters will be predominantly reliant on artificial drainage systems. These systems may be subject to silting, running full or tide-locking. Therefore flooding could be more prolonged.
- There are many watercourses within the study area and a blockage or collapse could result in flooding at unexpected locations.
- Low-lying coastal areas have a potential for high groundwater levels.



#### **Case Study: Morecambe Wave reflection Wall**



**Figure 11:** Case study Morecambe wave reflection wall

## Pendle

### General Geography and Topography

- The urban areas are Nelson and Colne with smaller settlements of Brierfield, Barnoldswick, Earby and Trawden.
- The landscape is diverse with historic industrialisation in the urban areas. The smaller settlements tend to be located within the foothills and valleys. Beyond the valleys there is upland farmland and moorland.

### Potential Sources of Flooding

- Main Rivers
- Ordinary Watercourses
- Surface water
- Groundwater

### Mitigation projects

#### Known Risks (during a major rainfall event)

- Areas of steep topography where direct run-off is likely to result in shallow high velocity flooding. Flooding is likely to occur with little warning but likely to be short in duration. Flooding of this kind can be hazardous to people and may be affected as a result of the velocity of flows channelled down roads.
- Minor watercourses within culverts in densely developed urban areas are a risk if there was to be a collapse or blockage. This could result in deep, high velocity surface water flows along the former natural course of the watercourse. Flooding may occur with little warning and will be along a defined flow path. This may result in damage to properties within the flow path. The velocity and depth will be hazardous to people.
- Areas of flatter topography, typically in valley bottoms or on river floodplains, are likely to experience widespread flooding with localised areas of deep ponding. This flooding occurs from direct run-off from steeper areas or as a result of surcharging or blocked drainage systems. This type of flooding is less hazardous to people but may result in higher levels of property damage.
- In low lying areas there is a potential for high ground water which could lead to flooding in localised low points such as road cuttings, basements and on open land.

## Preston

### General Geography and Topography

- Preston urban area is built across several watercourse catchments and the topography of these influence surface water flood risk across the area.
- Preston has become increasingly urbanised with many of the previously rural outskirt locations becoming developed with open fields with land drains and ditches being replaced with piped systems

### Potential Sources of Flooding

- Coastal/Tidal
- Main Rivers
- Canal
- Surface water including direct rainfall (pluvial), ordinary watercourses, groundwater and Surcharging drainage systems and sewers

### Mitigation Projects

- Preston South Ribble Proposed Scheme
- Known Risks (during a major rainfall event)
- The Preston urban area is built across several watercourse catchments. The drainage system within the centre of Preston is mainly culverted and historic; much of the system is made up of combined sewers. Surface water flooding can occur during periods of heavy rainfall.
- Preston's industrial history has resulted in man-made flow-paths. The largest is the former Longridge railway line which runs from Longridge (Ribble Valley), approximately 10km to the north-east of Preston, to join the West Coast Main Line immediately to the north of Preston railway station. This man-made feature has the potential to act as a highly efficient "watercourse" for surface water flows, channelling flooding into Preston City Centre. As this dis-used railway line connects to the West Coast Main Line route which could potentially flood this route.



## Case Study: Combined Preston and South Ribble mitigation scheme

The original defences were built intermittently from the 1920s to 1980s and are coming to the end of their life, they need repairing or replacing and ideally brought up to a 75 year standard of protection. The aim of the scheme is to improve the protection to over 4800 business and residential properties by raising the existing defences and building new walls to protect properties within the scheme. Over 200 homes and businesses flooded on boxing day, this was a near miss for other properties and businesses as the event only just missed NEAP high tides.



### Preston & South Ribble Scheme



#### Preston : Riverside



**Preston - Riverside:** Replacement of the existing concrete wall (left), with a new concrete wall with glass panels on top (right), running on the river side of the road in front of the Continental Public House restaurant.

**Existing Wall Height:** 0.90 - 1.09m

**Proposed Wall Height:** 1.78 – 2.53m (incl. 800mm high glass panel)

Official

**Figure 12:** Combined Preston and South Ribble mitigation scheme

## Ribble Valley

### General Geography and Topography

- The district is predominantly rural and dedicated to farming. However, there are large settlements in Longridge, Wilpshire and Whalley with Clitheroe being the main town.
- Villages are historically farming communities and as such have developed around ordinary watercourses and it is not uncommon to see buildings constructed (historically) immediately adjacent to a watercourse.
- Extensive networks of ordinary watercourses transfer water rapidly from hillsides to river valleys. In villages many of these watercourses have been culverted.
- The River Ribble is a relatively narrow floodplain within the wider valley bottom. Clitheroe is built on a series of flat or gently sloping terraces to the River Ribble.
- River Hodder has varying topography with areas of wider valley bottoms with constrained steeper channels.
- Bolton by Bowland has a unique geomorphology of particular note upstream it has glacial terraces which make it highly responsive to rainfall as water runs off quickly with nowhere to go, but below the village it widens significantly with a large flood plain as it approaches the confluence with the Ribble.
- The Hodder Valley is similar to Bolton by Bowland.
- The Ribble Valley also picks up the lower end of the River Calder

### Potential Sources of Flooding

- Main Rivers
- Reservoirs
- Surface water including direct rainfall (pluvial), ordinary watercourses, Surcharging drainage systems and sewers and groundwater (groundwater is not considered a significant risk due to the steep topography)

### Mitigation Projects

- Strategic Plan for Whalley

### Known Risks (during a major rainfall event)

- The superficial geology is relatively uniform. The majority of the area is covered by glacial till deposits. Within close proximity of the main rivers there are fluvial deposits of sands, gravels, silts and river terrace deposits.
- Till deposits often contain large amounts of clay and other relatively impermeable material.
- Flood risk is not likely to be uniform across the district footprint.
- Flooding would typically be varied across the area with steeper areas being characterised by flooding along distinct flow-paths, whilst flatter areas would experience more widespread, shallow surface water ponding.
- Flood risk is highly localised because of the distributed nature of urban development. Damages are likely to be localised and occur in small clusters across the district footprint.
- Flooding in some areas is likely to pose a significant hazard particularly where major flow-paths or ordinary watercourse flow through urban areas or along busy transport routes.
- The Forest of Bowland has steep topography and large numbers of ordinary watercourse. Steep areas tend to produce surface water events that are characterised by shallow but high velocity flows, often concentrated within well-defined flow-paths. The onset is short, with a small amount of time between the rainfall event and generation of surface flows. The rapid nature makes it difficult to react to incidents.
- Flood risk in flatter parts do not produce the high velocity flows and instead suffer from widespread, shallow flooding. Concentration of flood water into localised low points can result in significant depths, particularly if a drainage system becomes blocked or surcharged. Due to the lack of gradient flooding can be prolonged.
- Many watercourses within villages and larger settlements have been culverted as settlements have expanded. This has introduced pinch points which can increase the risk of flooding in extreme events.
- In some areas the combination of impermeable superficial geology and steep topography increases the risk from surface water run-off as little rainfall is likely to infiltrate into the ground.

## Rossendale

### General Geography and Topography

- The district is a combination of large towns, Bacup, Haslingden and Rawtenstall, and small former mill towns centred on the valley of the River Irwell, as well as rural villages.
- The steep hills, narrow valleys and wooded ravines change to lowland pastures to the south.

### Potential Sources of Flooding

- Main Rivers
- Ordinary watercourses
- Reservoirs
- Surface water
- Groundwater
- Surcharging sewers and drainage networks

### Mitigation Projects

- Irwell Vale - flood risk management scheme (ongoing)
- Strongstry - flood risk management scheme (ongoing)

### Known Risks (during a major rainfall event)

- Long history of flooding in these upper reaches of the Irwell catchment, to which the majority of the land drains.
- Surface water flooding has been regularly experienced and levels in the watercourses rise rapidly in response to rainfall events.



## Case Study

### Irwell Vale - Flood risk management scheme

- 26/12/2015 & 09/02/2020 – approx. 60 properties suffered from internal flooding during both storm events from surface water and main river sources.
- Lancashire County Council installed a permanent pump to deal with surface water issues in the section of the village that lays south of the River Irwell.
- Since the 2015 floods, the Environment Agency and Lancashire County Council have been working together to develop proposals for a flood risk management scheme.

### **Strongstry - Flood risk management scheme**

- 26/12/2015 & 09/02/2020 – approx. 20 to 30 properties suffered from internal flooding during both storm events from surface water and main river sources.
- Since the 2015 floods, the Environment Agency and Lancashire County Council have been working together to develop proposals for a flood risk management scheme.



## South Ribble

### General Geography and Topography

- The main urban settlements are Leyland, Penwortham, Walton le Dale and Bamber Bridge. Outside of these areas there are numerous rural settlements and farmland.
- The topography is predominantly flat.

### Potential Sources of Flooding

- Tidal
- Main Rivers
- Surface water including direct rainfall (pluvial)
- Ordinary Watercourses
- Groundwater
- Surcharging drainage systems and sewers combined

### Superficial Geology/General Soil Types

- The superficial geology of the area is relatively uniform. The majority of the area is covered by glacial deposits of till and localised deposits of fluvially deposited sands, silt gravels and peat deposits.

### Known Risks (during a major rainfall event)

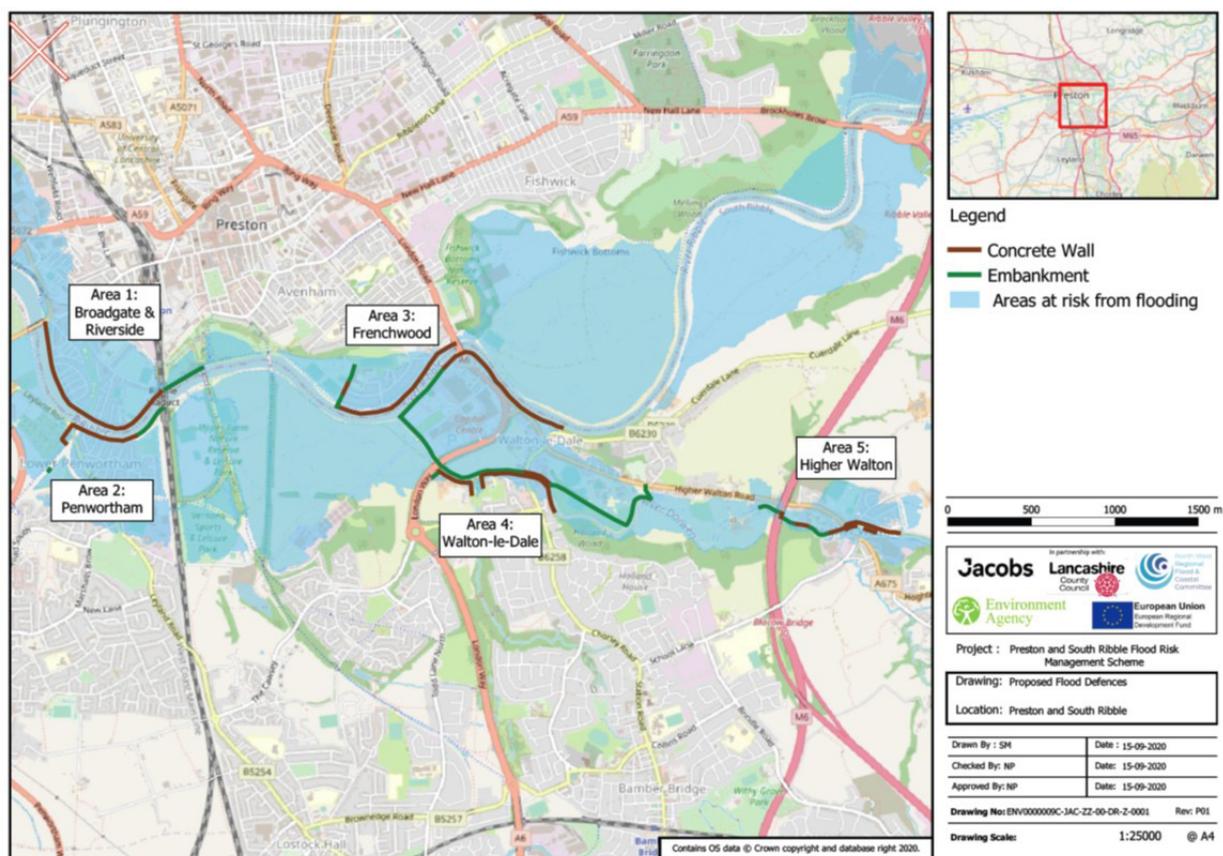
- Flooding is likely to be shallow but widespread leading to disruption. Internal property flooding is less likely but flooding contained within the highway or on land surrounding properties is more likely. Flooding may be prolonged and could be contaminated by foul sewerage where sewers are surcharged or tide locked.
- Low-lying western areas have potential for high groundwater levels, evidence by presence of ponds and network of land drains. High groundwater levels can cause flooding in localised low points such as road cuttings, basements or open land following extreme rainfall events.
- There are numerous Ordinary watercourses across the area many of which are culverted. Culverting can reduce capacity or introduce pinch points on drainage systems. Ordinary watercourses may be unable to discharge into Main River during an extreme event, when river levels are high. This may cause watercourses to back up or overtop.
- Interaction of surface water flooding with Main Rivers (combined flooding) is likely to be a key feature of local flood risk.
- Some Ordinary Watercourses may be poorly maintained and culverts and structures may be in a state of disrepair. The cost of carrying out remedial works can be high and may not be able to be met by the riparian landowner.

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### Combined Preston and South Ribble mitigation scheme:

The original defences were built intermittently from the 1920s to 1980s and are coming to the end of their life, they need repairing or replacing and ideally brought up to a 75 year standard of protection. The aim of the scheme is to improve the protection to over 4800 business and residential properties by raising the existing defences and building new walls to protect properties within the scheme. Over 200 homes and businesses flooded on Boxing Day, this was a near miss for other properties and businesses as the event only just missed NEAP high tides.

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**Figure 13:** Combined Preston and South Ribble mitigation scheme

## West Lancashire

### General Geography and Topography

- The main urban centres are Skelmersdale, Aughton, Ormskirk, Hesketh Bank and Burscough.
- Much of West Lancashire is relatively flat and gently rolling coastal plain and flat mossland situated less than 10m above sea level. However, in the east of the borough the land begins to rise to form the Upholland Ridge which extends toward the M6 and the uplands of south Lancashire beyond. More centrally, the land rises steeply out of Ormskirk to form localised high ground, before falling gently away toward the surrounding flatter areas to the south, east and west.
- Outside of the urban areas there are small rural communities surrounded mainly by arable land. On this land there are numerous land drainage networks and ponds. The complex network of raised drainage ditches and dykes is a reminder of the area's heritage of wetland reclamation.

### Potential Sources of Flooding

- Canal
- Reservoirs
- Railway
- Tidal
- Main River/Trunk drains
- Ordinary Watercourses
- Land drains
- Pump failure
- Sewer capacity
- Surcharging drainage
- Groundwater

## Superficial Geology/ General Soil Types

- Wind blown sands
- Sandstone
- Mudstone
- Clay deposits
- Peat deposits

## Known Risks (during a major rainfall event)

- There would be widespread flooding across the coastal plain and mossland areas. The lack of natural gradient means that drainage is less effective than in hillier areas and pipes are more likely to be affected by siltation.
- Many drainage systems are likely to be reliant on pumping networks to discharge effectively. Failure of these pumps, or blocked drainage systems, is likely to represent a significant flood risk.
- In the urban areas flooding would likely be shallow with low velocity. Deeper flooding will occur at localised low points. Flooding is unlikely to represent a serious hazard to people but may affect some properties internally.
- In Ormskirk the Main River has a significant flood plain and has the potential to flood large numbers of residential properties. There are also a large number of culverted watercourses which may have capacity or unknown defects which could lead to flooding.
- In Skelmersdale there is likely to be extensive flooding of pedestrian walkways and underpasses below the natural ground level. These maybe affected by deep fast flowing flood water and represent a significant hazard to people.
- Both Parbold and Appley Bridge are situated on the banks of the same Main River with land rising steeply to the east and north, respectively. These maybe affected by fast flowing flood water and each has the potential to suffer flooding to large numbers of residential properties.
- There are widespread issues with the capacity of drainage systems across West Lancashire. This is the case within Burscough and Hesketh Bank where an extreme rainfall event is likely to overwhelm the surface water drainage system and any pumping infrastructure.
- There are many land drains and Ordinary Watercourses across West Lancashire and these are likely to represent a significant flood risk due to siltation, lack of maintenance and unconsented development.

- The interaction of surface water with Main Rivers is likely to influence flooding characteristics in many areas. This is particularly true where surface water drainage outfalls into Main Rivers and maybe affected by tide locking or river levels. Due to the flat topography this could have wide-ranging impacts.



**Figure 14:** Flood risks in West Lancashire

## Wyre

### General Geography and Topography

- The district's main urban areas are Fleetwood, Thornton-Cleveleys, Poulton le Fylde and Garstang.
- The district is predominantly flat, rising in the east of the district towards the upland areas of central and eastern Lancashire.
- Wyre abuts the unitary authority of Blackpool and is a mixture of coastal, estuary, semi-rural and rural areas with smaller settlements having developed along the River Wyre and other watercourse.
- Due to the generally flat topography there are extensive networks of land drains and ponds. These are used to keep the mainly arable land drained and suitable for agriculture.

### Potential Sources of Flooding

- Coastal/Tidal
- Main Rivers
- Canals
- Reservoirs
- Surface water including direct rainfall (pluvial), ordinary watercourses, groundwater and Surcharging drainage systems and sewers

### Mitigation projects

- Rossall coast Defence
- Church Town Community Action

### Known Risks (during a major rainfall event)

- Superficial geology can influence surface water flood risk and in this area is a mixture of sands, gravels and mudstone along the coast and glacial till deposits and peat alongside the River Wyre

### Wyre District

- Interaction of surface water drainage with main Rivers, the sea and ordinary watercourse are likely to be complex.
- Drainage in many areas is likely to be reliant upon outflow into Main Rivers and then into the sea. Prolonged high flow conditions with the Main River can therefore significantly increase the risk of flooding from drains and prolong flooding for long periods after an extreme rainfall event.

- Due to the proximity of Blackpool Unitary Authority and the flat nature of the topography, many of the sewerage and other drainage networks encompass land within Blackpool or flow into Blackpool to discharge. As a result of this flooding within Thornton-Cleveleys and Poulton-le-Fylde will be cross-boundary in nature

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### Case Study: Rossall Coast Protection

The £63million Rossall Coastal Defence Scheme (Figure 1) was opened on the 1st June 2018. It was developed through the Fylde Peninsular Coastal programme consisting of Blackpool, Wyre and Fylde Councils, working together in partnership with principal contractor Balfour Beatty Civil Engineering Limited (BBCEL) and main funding body the Environment Agency. The scheme built upon a wealth of learning from previous schemes along the Fylde coast in particular the Cleveleys and Blackpool central schemes. The physical elements of the scheme involved renewing 2kms of failing sea-walls and promenade whilst preserving the beach frontage to better protect over 7,500 properties from coastal flooding from the Irish Sea. However the true value of the works is far greater than property protection alone. This includes the value added to communities, the environment and the local economy by linking engineering to social, economic and environmental improvement.

The scheme demonstrates a broadening of the scope and vision of what coast defence schemes can achieve for society. The interaction between the users and beneficiaries of the new works in jointly developing a vision for the area in which the coastal defence scheme is a catalyst for wider neighbourhood improvements through the development of high quality public space formed a key element of the scheme.

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**Figure 13:** Rossall Coastal Defences Before & After

The open promenade allows for wide areas for cycling, running and taking in the ever changing sea views as well as open access to the sea for other recreational activities.

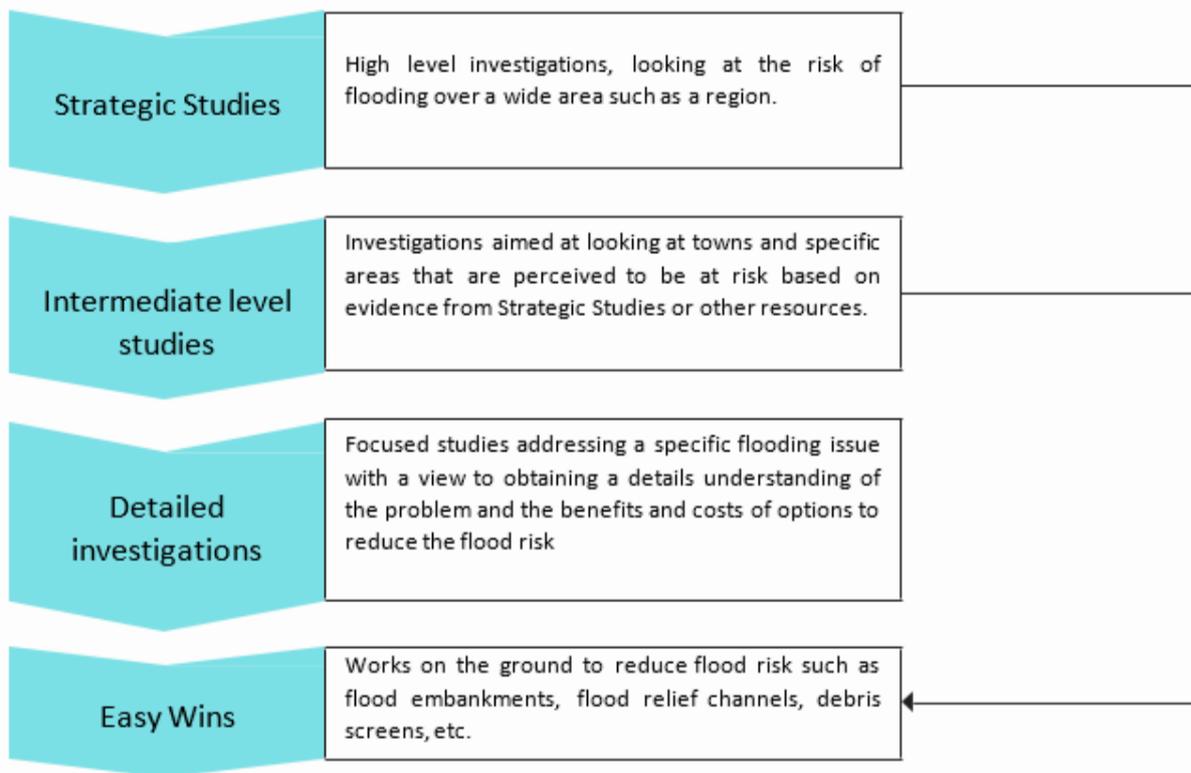
# 4. Opportunities

## New FCERM Investment Programme 2021 -2027

In the 2020 budget the Government committed expenditure of £5.2b to flood and coastal risk management. The proposed allocation in 2021 – 2027 for Lancashire is an investment of £230m to better protect 32,000 properties from coastal erosion and surface water flooding.

To allocate investment opportunities for the 2021 – 2027 investment programme used the information contained in strategies e.g. Coastal Strategies and Shoreline management plans and those that have already gone through a process as described below.

**This schematic describes how studies and schemes will be prioritised.**



**Figure 16:** How studies and schemes will be prioritised.

Given the size of Lancashire, the extent of local flood risk and our limited budgets, it is not practical to attempt to implement all the required works or studies across the whole of Lancashire in the short term, there is acceptance that we cannot invest in all areas to prevent flooding but we can address resilience and adaptation measures in all places

It is, therefore, necessary to prioritise the potential actions and target resources towards the most significant risks and where interventions can offer the best value for money.

It is important that this prioritisation remains flexible to account for emerging opportunities and local and wider priorities. Information on past flooding and future risk has been

continually assessed since the LLFA's commenced their roles in 2010. This information will assist in the future prioritisation of schemes and provide future opportunities for Lancashire.

For projects that cannot be justified through the process above or do not meet the criteria set out by the Environment Grant in aid process we will work with partners to seek opportunities for resilience measures and or innovative methods of flood risk management .

There are new and emerging investment opportunities that have been demonstrated particularly by our partners. The Wyre Investment Readiness Project that brings together investment from United Utilities, Environment Agency, Rivers trust and private investors. This proposed Wyre Catchment NFM will provide habitat creation, water quality improvements, carbon sequestration, social impact and innovative investment and opens up the opportunity for further 2021 – 2027 investment in Lancashire.

### [The delivery of multiple benefits from flood and coastal schemes](#)

In the 2015-2021 FCERM programme of works there was a £145m of investment delivering projects across Lancashire to provide protection to 28335 properties. These schemes also provided many additional benefits to communities and business. The coast protection schemes in Blackpool, Fylde Morecambe and Wyre saw an investment of £115m but with multiple benefits and protection to 23,000 properties.

These schemes demonstrated the multiple benefits of linking engineering, economic and environmental improvements.

All five schemes have provided the primary protection to people and place but also created an environment that provides amongst many benefits, multiple health benefits, providing health walks, habitat creation, horticultural therapy, and outdoor schools.

The investment in flood protection has also proved to provide confidence in investment partners enabling regeneration in many areas.

This opportunity will be driven in the 2021 – 2027 investment period, working with partners to expand and deliver multiple benefits through flood and coastal schemes.



**Figure 17:** Blackpool and Fylde Sand Dunes

Over the last 3 years, the UK's rarest lizard has been successfully reintroduced back to the Fylde Sand Dunes after coastal protection works to extend and improve the sand dune habitat made such a release programme possible. Captive bred sand lizards have been released as part of a long-term project to restore the species status and historic range within the UK. This is now the most northerly site in England and a fantastic example of nature recovery in action and organisations working together and sharing expertise.

#### Opportunities to manage local flood risks through development, as appropriate (SuDS)

Under its Business Plan, the North West Regional Flood and Coastal Committee (RFCC) has set up a Sustainable Drainage System (SuDS) Task Group to support Local Planning Authorities and Flood Risk Management Authorities understand the implications of and prepare for the introduction of new sewer adoption code, **Design and Construction Guidance** (DCG), from 1 April 2020.

The Lancashire Strategic Partnership have identified this as a huge opportunity to ensure all Local Authorities adopt the SuDS pro-forma and that planning authorities together with their lead local flood authority officers guide and encourage developers to implement suitable suds solutions in all developments in Lancashire.

Making the most of our water by integrating it within urban design and regeneration opportunities

The National Flood and Coastal Erosion Risk Management Strategy for England recognises that "every place is different" and we need to maximize opportunities for each place. In some areas there is an opportunity particularly where existing or new open water bodies can be utilized for flood resilience and as a recreation provision.

Lancashire has demonstrated by its £115m investment in coast protection schemes how flood and coast protection can provide regeneration opportunities, a boost to the economy and generate investment.

Defra define "Natural Capital is the sum of our ecosystems, species, freshwater, land soils, minerals, our air and our seas. These are all elements of nature that either directly or indirectly bring value to people and the country at large. They do this in many ways but chiefly by providing us with food, clean air and water, wildlife, energy wood, recreation and protection from hazards."

We have the opportunity to make the most of our water by integrating into design for natural capital gain.

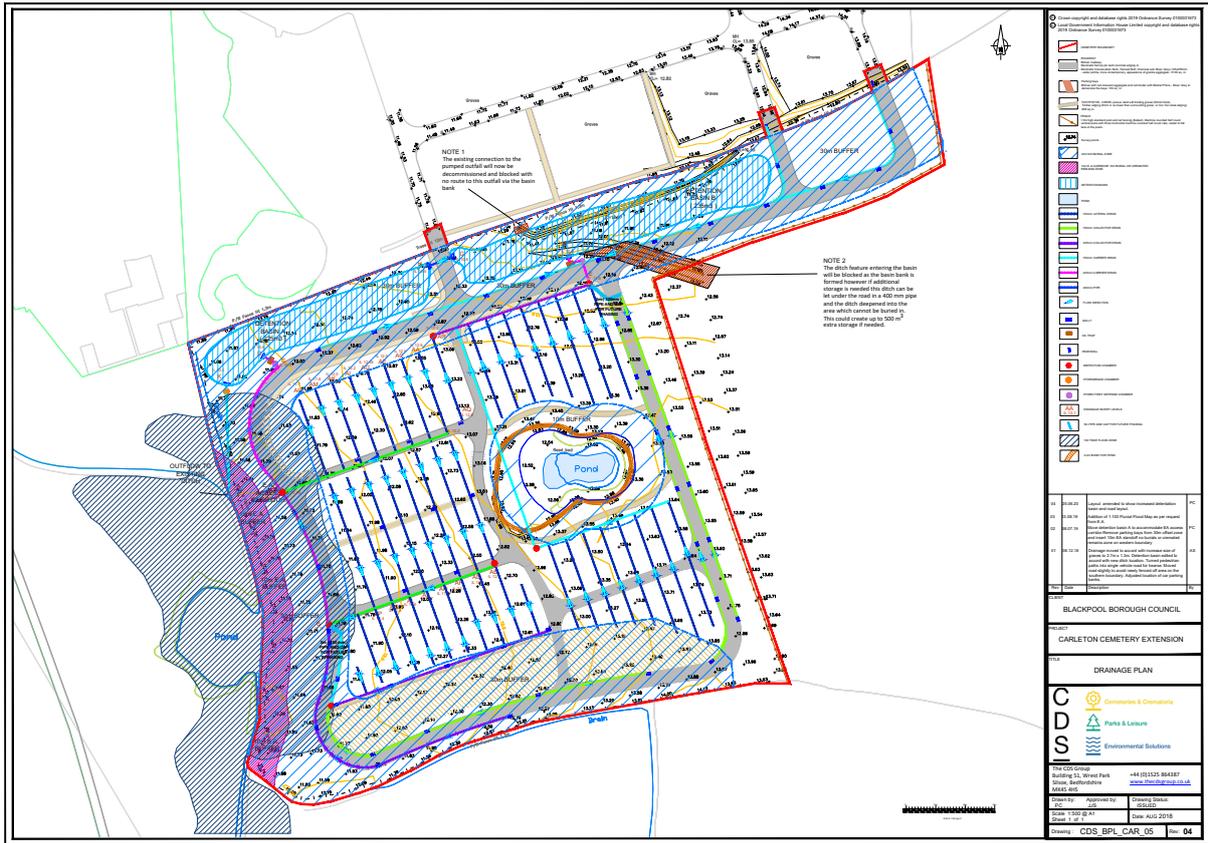


Figure 18: Carleton Crem Suds plan



Figure 19: SuDS application Carleton Cemetery, Blackpool

## Catchment based approach/ Natural Flood Risk Management/Nature Based Solutions

In certain circumstances working with natural processes can help reduce the impact of flooding. Examples of this may be tree planting, river bank restoration or storing water temporarily on open land. We should not expect that these measures alone will offer 100% protection to areas of greatest risk or during the most significant flood events but good integrated flood management will see these measures incorporated alongside more traditional measures, where appropriate.

We will develop a deeper understanding of this type of solution and work with multiagency partners and voluntary organisations and provide integrated infrastructure resilience using innovative Nature Based Solutions (NBS) and infrastructure techniques to reduce cost to, and maximise benefit for, communities and the environment.

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### Case Study: Claver Hill Natural Flood Management Scheme

The Claver Hill Natural Flood management scheme was constructed in 2020. It comprises a series of small ponds to slow the flow of water off the site, a reedbed to reduce any pollution in the flow, and a balancing pond to create a habitat for wildlife and a resource for the Community. This Community Based project also provides a working allotment and food hub.

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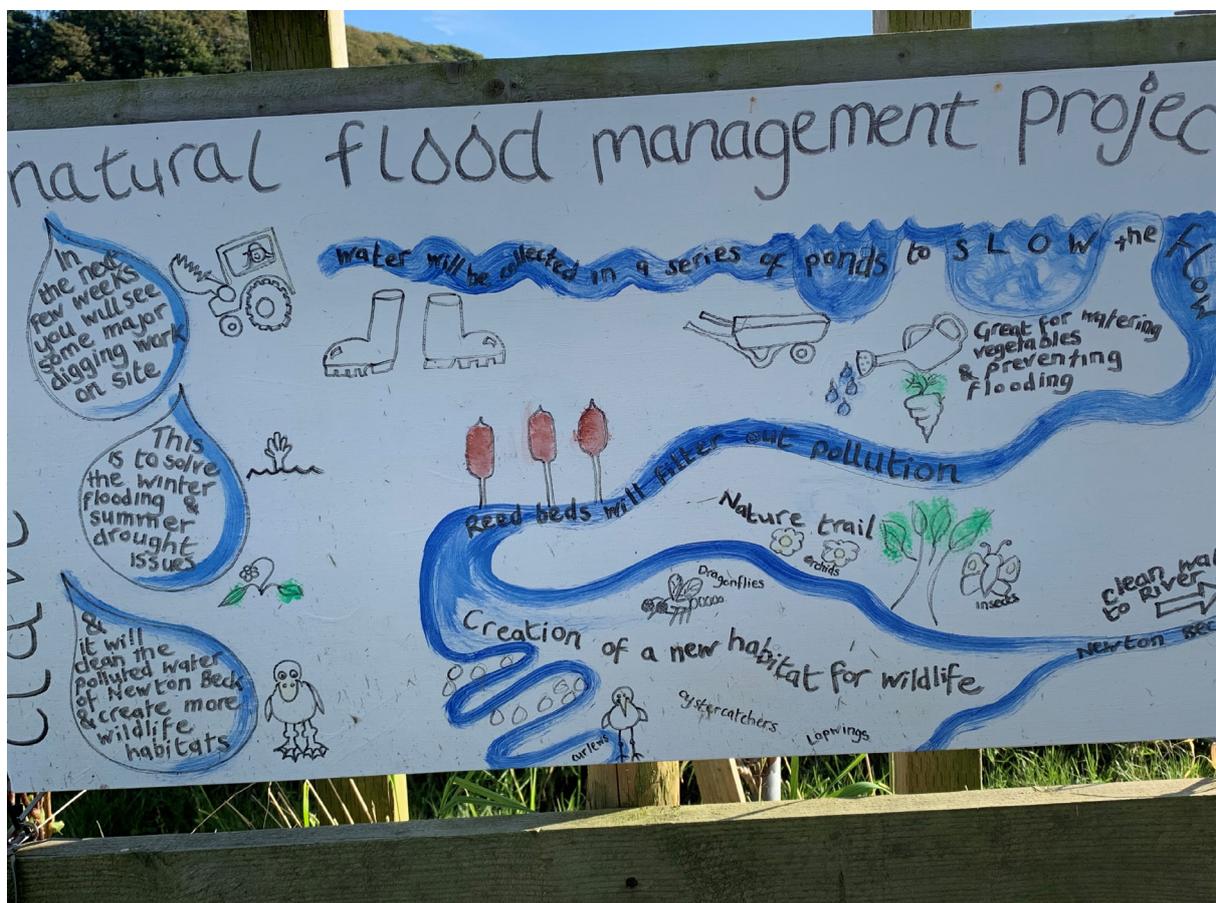


Figure 20: Claver Hill Natural Flood Management Project

### Work towards a climate resilient highway network (Smart Monitoring & SuDS)

During many of the recent storm events Lancashire has experience disruption on its highways due to flooding this has also caused significant damage to infrastructure and disruption to communities and business.

Lancashire with its Partners and Developers can mitigate flooding to highway through planning policy and evidence set out in Local Plans and Strategic Flood Risk Assessments (SFRA) ensuring development is regulated to provide protection from flooding from new development. In areas of development, Strategic Flood Risk Assessments to evaluate flood risk from development together with strong planning controls are in place to provide flood protection.

Lancashire will use this opportunity to ensure suitable sustainable drainage systems are included in the design of new roads and retrofitted in existing areas that would benefit from this solution to flooding.

Additional measures of planting of trees and grass verges to increase water infiltration provide also provide an opportunity to provide a climate resilient and a sustainable environment.

The introduction of digital monitoring provides an opportunity for early intervention in times of flood. An example of this is the introduction of gully sensors in some parts of Lancashire.

### Expansion of the Flood Hub

[The Flood Hub](#) has been funded by the Regional Flood and Coastal Committee it is unique as it is the only single point of access supporting communities across the North West.

The Flood Hub provides guidance to businesses and communities across Lancashire providing information and guidance on flood resilience. The Flood Hub provides interactive maps and information of flood schemes.

The Flood Hub provides further opportunity to create a dedicated Lancashire resource sharing and dissemination hub for the public, community groups and FLAGs, within the existing innovative Flood Hub, to maintain and increase action. In particular opportunities to work with partners on innovative digital flood monitoring solutions.

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## The Flood Hub

The Flood Hub working with its partners and communities can provide valuable information by measuring the benefits of schemes such as the Claver Hill and White Carr Lane described below, both for water volume management and water quality management so that the benefits can be understood and shared with partners. The data collected would then inform the design of other similar schemes across Lancashire.

Where future schemes were planned, comprehensive information would allow the completion of benefit: cost analyses based on proven and quantified benefits. Because Claver Hill is run by local volunteers, any intervention would be designed with them, and partly by them, so that they can operate the equipment and gather the data themselves. This will provide learning opportunities for volunteers, skills training, and project work with the local Schools. The suggested measurement & management scheme would include:

- Rainfall gauging on-site;
- Level measurement in the ponds & the lake;
- Pumping capability to allow water to be pumped from the lake to lower the level in advance of a prevailing storm;
- Pumping capacity to allow water to be pumped from the Brook into the lake in advance of a prevailing drought;
- Water quality monitoring upstream and downstream of the reedbed;
- 'Smart' control systems to link the information together and to provide a visual 'dashboard' for volunteers to see, and
- A data management spreadsheet/software.

Any equipment installed would be as innocuous as possible and would be designed so that it does not disturb the wildlife, or detract from the calm, green environment that the Community have created.

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## Management through development

Development of land can have a significant impact on the management of flood risk, in Lancashire we have an opportunity through our role as a statutory consultee to control the impact of Planning and Development by the use of planning conditions and planning enforcement.

To assist in this process Lancashire operate a pre-application service for flood risk and land drainage consents. This service provides a developer with advice in advance of the formal application to the LPA to state evidence requirements, comments on initial proposals, site constraints and land drainage consent advice (Land Drainage Act 1991) as consenting can impact on site layout. Providing a much need opportunity to influence the impact of development and managing the risk of flooding.

An excellent example of working together with developers is described in the case study.



**Figure 21:** White Carr Lane Wetland creation, September 2021

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### Case Study: White Carr Lane River and Floodplain Restoration Project

Following an invitation onto the Wyre Making Space for Water Group in 2019, the Wyre Rivers Trust have been working with the four local flood risk management authorities; Lancashire County Council (Lead Local Flood Authority), Environment Agency, United Utilities and Wyre Council. Much of this work has been focussed on Thornton, which has over 3000 houses at risk of surface water and fluvial flooding, along with 10,000 + houses at risk from coastal flooding.

Initial conversations were promising, and a morning of visits to sites with potential for the delivery of urban natural flood risk management led to an opportunity arising. A former government site at Norcross which is being redeveloped for housing was visited and the developer was very interested in the delivery of flood risk management works which went above and beyond the statutory requirement. We asked if they would consider re-meandering a section of Royles Brook which was historically straightened, disconnecting the flood plain and leaving a lifeless trapezoidal channel. The answer was yes, and we immediately set to work.

The aims of the project were to store water at the site during times of peak flow for around 12-18 hours, thus creating additional capacity within Royles Brook. This is important as it will allow local surface water drains to discharge into the brook for longer during periods of heavy rain, reducing the risk of surface water flooding in and around White Carr Lane. It will also store water upstream of Thornton, allowing other watercourses and surface water drains in Thornton to discharge. The works will also reduce the amount of surface water which finds its way into foul sewers, ensuring that capacity is retained within the United Utilities network.

Working closely with Wyre Council and using robust formulae we designed a new channel based upon the amount of water which can be held within the existing channel when it is full. The new re-meandered channel is around 7m wide along its 250m length, it also features a number of meanders and areas of varying depth to ensure that natural morphological processes can take place within the channel.

The creation of the channel began in November 2019 and was completed before Christmas, we then had to apply for permits to connect the channel to Royles Brook, thus allowing it to store water in times of peak flow. It is expected that the channel will store around 1,300m<sup>3</sup> of water, at the same time it will act as a silt trap, reducing the issue of siltation in local culverts. The connections to the channel were completed in September 2020 along with a large wetland area, that will store an additional 350m<sup>3</sup> of flood water. Along with benefits for the reduction of flood risk, the project has a wide array of other benefits, the creation of floodplain wetland will support a wide variety of species of flora and fauna, the wetland and channel will also capture silt, removing it from the watercourse and improving water quality. The reconnected floodplain will also store water itself, potentially storing an extra 1000m<sup>3</sup> of water during flood events.

The value of using natural solutions to reduce flood risk is many fold, the solutions are resilient to change, sustainable and offer excellent value for money. They also provide a wide range of benefits that go above and beyond a typical traditional flood risk project. Because of the heavily modified nature of our environment and more the more extreme weather patterns seen due to climate change, they do not offer a silver bullet to reducing flood risk, in most cases they act to augment and increase the resilience of traditional solutions and to extend their design life by reducing the number of times that they are called in to action throughout a typical year.

The project was completed in September 2020 and will be planted with a wide range of native wetland plants in Spring 2021. It is expected that around 3000m<sup>3</sup> of storage will be created at the site following the completion of phase two, which will see the reconnection of a paleochannel which runs through the site. We also expect to see reductions of FIO's such as E.coli and reductions in the concentrations of nutrients and other contaminants which enter the wetland complex. The wetlands will also have a wide range of benefits for local flora and fauna, supporting a wide range of species through creating a mix of habitats by direct intervention and benign neglect. Furthermore, the wetlands will act to sequester large amounts of carbon, helping to combat climate change. The wetlands will be subject to regular monitoring, allowing the Wyre Rivers Trust, Wyre Waters Catchment Partnership and local communities to assess the wide range of ecosystem services that these wetlands will provide.



### Influencing regional governance and national thinking

Lancashire has developed a strong Partnership and grasps the opportunity to influence governance and national thinking through its proposed innovative resilience proposals.

Lancashire's recent involvement in shaping the SuDS pro-forma and The Flood Hub are excellent examples of the strength to seize this opportunity to further influence regional governance and national thinking.

By developing a Lancashire wide policy review to produce recommendations that address the three key policy areas, and focus on facilitating ongoing innovative working to see long lasting innovation, and delivery of resilience to ensure long-term programmes, through agriculture, new developments and re-development improving urban areas flood resilience. For example, enabling developments to deliver offsite Flood Risk Management to protect both proposed developments and other existing communities

### Innovative Partnership Working and Potential for Lancashire Devolution

Through the innovative partnership, and wider associated beneficiaries, Lancashire are proposing in some areas to set up innovative investment models & projects to support multi-benefit and multi layered resilience delivery learning from the Wyre Investment Readiness Project described above.

We would like to do this, if successful, through the innovative resilience funding bid that

Lancashire submitted to the Environment Agency in January 2021.

If successful the Innovative resilience bid provides for three areas of innovative resilience, integrated water solutions, nature based solutions and innovative investment to better protect 2000 properties.

A strong partnership has been formed with multiple organisations across Lancashire and this partnership would expand into communities and integrate flood forums.

This strategy recognises the potential proposals for Lancashire Devolution and as Partnerships have formed across Lancashire whilst we recognise districts may change, water does not recognise boundaries and we would continue to maximise the opportunities of cross boundary and Partnership working.

# 5. Our Vision for Lancashire

**By 2027, Lancashire will be a flood resilient place responsive to risks, challenges and opportunities supporting a sustainable future for the people of Lancashire.**

Lancashire LLFAs will work collaboratively with partner flood risk management authorities, individuals, communities and organisations to reduce local flooding. We will achieve this through the vision and themes set out in this strategy, under which we will deliver our objectives.

The LLFAs will, through their flood and coastal erosion activities, manage the local risk to people and property through the six key themes set out below. Our objectives will sit under each of these themes, and the delivery of objectives will be monitored through our Business Plan which is appended to this Strategy.

## **Theme 1. Delivering Effective Flood Risk Management Locally**

We will review and develop updated policies and procedures to ensure compliance with new and revised legislation, national policies, standards and guidance. In doing so we will incorporate lessons learnt since the adoption of we adopted our previous Local Flood Risk Management Strategy.

## **Theme 2. Understanding our Local Risks and Challenges**

We will continue to build on our understanding of local risks of flooding by working with our partners organisations and communities to identify the causes and effects of local flooding.

We will take actions to better understand and communicate to our affected communities the challenges which complicate our efforts to address local flood risks.

Wherever possible, we will bid for and procure mapping and modelling works to continually improve our understanding of flood risks.

## **Theme 3. Supporting Sustainable Flood Resilient Development**

We will ensure that guiding principles for sustainable development are applied and inappropriate development is avoided in existing and future areas at risk of flooding and coastal erosion while elsewhere, carefully managing other land to avoid increasing the risks.

We will work with our Local Planning Authorities to ensure Local Plans fully take account of flood risks and have policies in place which manage these risks and make sure that all developments take account of them.

#### **Theme 4. Improving Engagement with our Flood Family**

We will continually improve how we work together to address flood risks through our partnership arrangements.

We will increase public awareness of the effects of climate change and the implications on flood risk by engaging with those specifically at risk of flooding to encourage them to take action to manage and/or mitigate the risks that they face and to make their property more resilient.

#### **Theme 5: Maximising Investment Opportunities to better protect our Businesses and Communities**

Where financially viable we will bid, build, maintain and improve local flood and coastal infrastructure and systems to mitigate or reduce the likelihood of harm to people and damage to the economy, environment (natural, historic, built and social) and society as a whole.

#### **Theme 6: Contributing towards a Climate Resilient Lancashire**

We will support and assist those bodies responsible for improving the detection, forecasting and issue of warnings of flooding. Plan for and co-ordinate a rapid response to flood emergencies and promote faster recovery from flooding.

## Part 2: Our Business Plan

# 6. Our Business Plan

To deliver our strategy efficiently, effectively, transparently and in a way that is coordinated with our partners and communities we have developed a Business Plan to steer and focus our actions.

A Business Plan is an action-led plan focusing on delivering tasks which meet statutory responsibilities and/or contribute towards delivering our vision.

In addition, our North West Regional Flood and Coastal Committee (RFCC) may ask flood risk management authorities in Lancashire to coordinate and deliver work on a Lancashire-wide basis. The Lancashire FCERM Partnership may also identify local priorities which are Lancashire-wide. Such work streams will be built into our Business Plan which will exist as a 'live' document with final objectives for delivery agreed annually by the Lancashire FCERM Partnership. Therefore, the Business Plan outlined in this document represents the minimum we will deliver across Lancashire to 2027.

## 4.1. Monitoring and Reporting Progress

Through the Lancashire FCERM Partnership, we will hold each other and ourselves accountable for the delivery of our Business Plan and therefore, for the delivery of our Strategy.

Delivery of objectives within the Business Plan will be closely monitored through a progress report provided to the Strategic Partnership Group on a quarterly basis. The report will monitor progress of objectives against timescales and expected outputs and outcomes.

We will also publish an annual monitoring report of our business plan, reflecting progress in delivering actions from our strategy.

## 4.2. Continually Improving: A Mid-Term Review

This Strategy will have a six year lifespan to 2027, in line with the new flood risk planning cycle and Investment Programme.

We recognise that flood and water management has a framework which is relatively fluid, in part due to the six-yearly flood risk planning cycle and also because flood and water management is a relatively new statutory function having only commenced in its current form in 2010. This means lessons are being learnt along the way and the legislation and policy frameworks amended to reflect this.

It is therefore acknowledged that a mid-term review of this Strategy in 2024 would be sensible to ensure it remains current and captures any additional actions or amendments needed to support delivery of effective local flood risk management in Lancashire in line with legislative and policy framework.

## The Lancashire FCERM Business Plan

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
<b>1. Delivering Effective Flood Risk Management Locally</b>	1.1 Maintain, apply and monitor the Lancashire Local Flood Risk Management (LFRM) Strategy 2021 - 2027	A monitoring framework for the Lancashire LFRM Strategy is established	LLFA	Lancashire FCERM Partnership ( <i>Strategic and Tactical</i> ) Partnership Officer	Ongoing to 2027
	1.2 Review and revise existing Section 19 Flood Investigation Report Policy, incorporating lessons learnt since 2010.	A new Section 19 Flood Investigation Policy is adopted by LLFAs.	LLFA	Environment Agency United Utilities Partnership Officer	March 2023
	1.3 Review and revise Consenting and Enforcement Policy for regulating Ordinary Watercourses.	A new Consenting and Enforcement Policy for Ordinary Watercourses is adopted by LLFAs, including a clear position on culverting.	LLFA	Partnership Officer	March 2023
	1.4 Work proactively with Local Planning Authorities to ensure effective local policies are in place for managing flood risk and coastal erosion through the Land and Marine Planning Processes	Local Plan policy and evidence base review are informed by direct input from flood risk management authorities.	Local Planning Authorities	Environment Agency LLFA United Utilities Coast Protection Authorities	Various and Ongoing
	1.5 Consider the need for a Highway Drainage Connection Policy.	Highway Drainage Connection Policy considered and, if appropriate, created and adopted.	Highway Authority	LLFA	March 2022
	1.6 Consider the need for a 'Designation of Flood Risk Features' Policy.	'Designation of Flood Risk Features' Policy considered and, if appropriate, created and adopted.	LLFA Environment Agency	Partnership Officer	March 2023
<b>2. Understanding our Local Risks and Challenges</b>	2.1 Deliver any outstanding Surface Water Management Plans (SWMP), and identify further studies needed.	Surface Water Management Plans are delivered and used to inform bids into the Investment Programme as appropriate. Further SWMPs are added to Investment Programme.	LLFA	Project Advisor District Councils Environment Agency United Utilities	TBC
	2.2 Bid for funding to install groundwater monitoring equipment to improve our understanding of groundwater flooding in targeted areas in Lancashire.	Groundwater monitoring equipment is installed in targeted areas agreed by flood risk management authorities, and data used to inform decision making.	LLFA or District Council(s)	Project Advisor	March 2024
	2.3 Bid for funding to map all ordinary watercourses in Lancashire, and feed this mapping and any modelling into national maps to improve all risk management authority understanding of local ordinary watercourse networks.	All ordinary watercourses in Lancashire are mapped, and fed back into national mapping collated by the Environment Agency.	LLFA	Project Advisor Environment Agency	March 2027

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	2.3 Bid for funding to improve understanding of opportunities for natural flood management and strategic surface water management across Lancashire through sustainable drainage retrofit.	GIS model and mapping showing opportunities by type of natural flood risk management / sustainable drainage			March 2024
	2.4 Continue to populate the Flood Risk Asset Register	Flood Risk Asset Register will grow in size to include new and existing flood risk assets.	LLFA	Asset Management	Ongoing
	2.5 Spatially map all historic and new known flooding incidents across Lancashire since 2013.	GIS mapping system showing locations which have flooded including key details in the attribute table.	LLFA	District Councils United Utilities Environment Agency Highway Authority	March 2022
	2.6 Support development of an 'all source' flooding map for the North West, to place all sources of flood risk on an equal footing. This could be achieved through Drainage and Wastewater Management Plan (DWMP)	All source flood risk map is created and made available to all flood risk management authorities. It is to be accompanied by a clear maintenance pathway.	United Utilities	Environment Agency LLFA Highway Authority District Councils	March 2025
<b>3. Supporting Sustainable Flood Resilient Development</b>	3.1 Support and provide input to Local Planning Authorities during plan making to ensure evidence base documents, policies and guidance are suitable and take account of best practice, climate change, biodiversity net gain and amenity aspirations.	Effective Local Plan policies for flood risk, coastal erosion and sustainable drainage are adopted, and informed by high quality evidence provided by flood risk management authorities.	Environment Agency United Utilities LLFA Highway Authority	District Councils	Various
	3.2 Work with Local Planning Authorities to encourage adoption of the SuDS Pro-forma through their Local Planning Validation Checklist for 'Major' development.	Local Planning Authorities will require a locally adapted SuDS pro-forma to be submitted for every major planning application.	Local Planning Authorities	LLFA Partnership Officer	December 2022
	3.3 Be represented on the North West RFCC's SuDS and Planning Group to ensure Lancashire is contributing to and learning from best practice across the region and nationally.	Nominated representatives represent Lancashire at the group and feed back to the partnership, flood risk management authorities and local planning authorities as required.	Nominated Representatives	Partnership Officer	June 2021
	3.4 Establish a process which ensures 'as built' SuDS assets are validated and captured in Flood Risk Asset Registers.	'As built' SuDS assets are captured in Flood Risk Asset Register.	LLFA	Local Planning Authorities	March 2022

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	3.5 Support the development of a natural capital accounting / biodiversity net gain approach for Lancashire, ensuring flood and coastal matters can be valued.	Lancashire's natural capital accounting / biodiversity net gain approach take account of flood and coastal benefits.	Environment Agency	LLFA United Utilities	March 2025
	3.6 Explore the feasibility of developing a Lancashire-wide 'SuDS Suitability' guide, based on mapping of ground conditions and integrated with other agendas such as the Lancashire Ecological Network and blue-green infrastructure network.	Feasibility of delivering a 'SuDS Suitability' guide for Lancashire is understood and, if possible, a guide developed with colleagues in planning and ecology and other technical areas to help support the delivery of high-quality SuDS and ecology across Lancashire, contributing to a blue-green Lancashire.	LLFA	Lancashire Ecological Network (LERN)	March 2025
	3.7 Encourage all flood risk management authorities in Lancashire to become members of the Association of SuDS Authorities (ASA).	Increase in member of ASA from flood risk management authorities in Lancashire.	Partnership Officer	LLFA	March 2022
<b>4. Improving Engagement with our Flood Family</b>	4.1 Improve the 'The Lancashire Partnership' webpage on The Flood Hub, including by setting out who our flood family is.	The Lancashire Partnership webpage on The Flood Hub is refreshed and improved, including a 'Lancashire Flood Family' section which identifies immediate and wider partners, and key communities and business, as appropriate, that we engage with.	Partnership Officer	Partnership Chair	December 2021
	4.2 Update Local Authority 'flooding' webpages and ensure they link to The Flood Hub to support community awareness, engagement and resilience.	All Local Authority webpages in Lancashire are refreshed and include a link to The Flood Hub website to support community resilience.	LLFA District Councils	Partnership Officer	December 2021
	4.3 Continue to support maintenance and development of The Flood Hub, including the launch of a new Education section.	Lancashire is represented at The Flood Hub website maintenance meetings, and a communications plan is developed for how changes, news and issues can be fed up to The Flood Hub team.	Partnership Officer	LLFA District Councils United Utilities Environment Agency Highway Authority	Ongoing
	4.4 Ensure Flood Action Groups (FIAGs) in Lancashire who consent to their 'get in touch' details being shared on The Flood Hub are published on the map and on the Partnership webpage.	Following GDPR consent, contact details for FIAGs in Lancashire are published on The Flood Hub so that those at risk in the community can easily find and contact their local FIAG.	Partnership Officer	LLFA	December 2021
	4.5 Work better together to deliver more effective, targeted and partner-focused asset maintenance regime for	Asset maintenance regimes are reviewed, revised and considered in a risk-based manner, and with a partnership focus to identify	Environment Agency United Utilities Highway Authority	Partnership Officer	March 2023

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	those assets owned by flood risk management authorities.	opportunities to deliver a more efficient multi-agency service.	District Councils		
	<b>4.6</b> Continue to attend and work proactively with Catchment Partnerships to identify local opportunities to work together to co-fund and co-deliver natural flood management and other schemes within the community and private landownership.	Natural flood management and other schemes and projects are funded and delivered in Partnership where possible.	Catchment Partnerships Partnership Officer	Environment Agency	Ongoing to March 2027
	<b>4.7</b> Develop a Communication and Engagement Plan showing clear lines of communication and reporting, within and amongst food risk management authorities, wider partners and the people of Lancashire. This will include proactive communications and responsive communication to, for example, flood/weather alerts. This should also include a progress for how good practice is captured from across Lancashire, including from Catchment Partnership and wider partners, and shared appropriately with our flood family and the people of Lancashire.	Communication and Engagement Plan for Lancashire.	Partnership Officer	Corporate Communications The Flood Hub	March 2022
	<b>4.8</b> Ensure Lancashire is represented at every North West Regional Flood and Coastal Committee's (RFCC) Technical Advisory Group (TAG) meeting, and other sub-groups as formed, to ensure we are working effectively with regional partners, sharing best practice and influencing any decisions or recommendations made to the RFCC and Strategic Partnerships.	The Lancashire FCERM Partnership has an appointed representative(s) to attend every RFCC TAG meeting, and other sub-groups as formed.  Lancashire shares best practice and learning with colleagues across the North West region, and feeds back to the Partnership from other areas.	Lancashire Representative(s)	Partnership Officer	June 2021
	<b>4.9</b> Ensure all flood risk management authorities are proactively engaged with the Lancashire Resilience Forum (LRF) to continually improve our multi-	Continuous improvement is built into both the LRF and operational flood responses.	LLFA District Councils United Utilities Environment Agency	Partnership Officer	June 2021

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	agency and operational responses to flooding incidents.		Highway Authority		
	4.10 Include separate Highway Authority and infrastructure provider representation on The Lancashire FCERM Partnership, at relevant levels, as appropriate, to ensure highway and other infrastructure flood risks are also captured.	Highway and other infrastructure flooding issues are better understood and, where possible, used to inform capital bids in the Investment Programme 2021 – 2027 to increase long term infrastructure resilience to help build a more flood resilient economy.	Highway Authority Infrastructure Providers	Partnership Officer	March 2022
5. Maximising Investment Opportunities to Better Protect our Businesses and Communities	5.1 Deliver schemes within the Investment Programme 2021 – 2027 to time and cost, including meeting partnership funding and efficiency requirements of grant funding.	Schemes in the Investment Programme 2021 – 2027 are delivered by March 2027.	Environment Agency LLFA Highway Authority	Project Advisor United Utilities	March 2027
	5.2 Proactively monitor the delivery of the programme at every level of The Lancashire FCERM Partnership and hold delivery leads accountable.	A collective monitoring framework is established and shared at all levels of the Partnership, and measured against quarterly with a progress report provided. Monitoring must include against delivering efficiencies and achieving the required partnership funding contributions, as well as timescales and outcomes projected.	Partnership Councillors	Project Advisor Partnership Officer	March 2022
	5.3 Share the programme with partners at all levels and with Catchment Partnerships to identify any collaboration opportunities.	Investment Programme 2021 – 2027 is shared with Catchment Partnerships, and opportunities for collaboration in delivery are identified to drive efficient and successful partnership working projects, as appropriate.	Partnership Officer Project Advisor	-	June 2021
	5.4 Continue to identify opportunities / need for investment in flood and coast defences and infrastructure and ensure these are captured in the Investment Programme 2021 – 2027 at the earliest opportunity to secure an allocation, where viable.	New schemes continue to be identified from flood risk management authority investigations, studies and partnership meetings.	LLFA Environment Agency United Utilities Highway Authority District Councils	Project Advisor Partnership Officer Catchment Partnerships	Ongoing to March 2026
	5.5 Develop a 'funding catalogue' of all potential sources of funding from public, private, voluntary and other sectors.	'Funding catalogue' is created, shared, maintained and used to enable delivery of identified projects, particularly those which are not viable or borderline.	Project Advisor	Environment Agency LLFA United Utilities District Council Highway Authority	March 2022

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	5.6 Establish a progress for the Partnership which facilitates quick allocation, approval and delivery of 'Quick Win' funding allocated annually to the Partnership. This includes governance and a re-allocation of funding if not spent as agreed.	A 'Quick Win' Protocol is established for The Lancashire FCERM Partnership and shared with colleagues across the North West as best practice.	Partnership Chair	Project Advisor Partnership Officer	March 2022
	5.7 Influence national thinking on flood insurance and grants for those affected by flooding to encourage a consistent approach from government rather than on a storm basis.	Lancashire proactively volunteers to work with national colleagues to influence and provide evidence of flooding impacts on our communities and businesses.	Environment Agency LLFA	Partnership Chair	March 2025
<b>6. Contributing Towards a Sustainable, Climate Resilient Lancashire</b>	6.1 Work with climate change action groups set up following Local Authority declaration of a climate emergency to ensure actions to address flood risk and coastal erosion are incorporated within climate change action plans.	Attendance at and input to products and outcomes from climate change action groups. Climate change action plan includes measures to address flood risk and coastal erosion.	LLFA Environment Agency United Utilities Highway Authority District Councils	Partnership Officer	As required, and ongoing
	6.2 Ensure a climate change allowance is incorporated into all proposed new sustainable drainage systems on developments consistent with national and/or local planning requirements and published guidance.	All new sustainable drainage systems on developments incorporate an allowance for climate change consistent with national and/or local planning requirements.	Local Planning Authority	LLFA Environment Agency United Utilities Highway Authority District Councils	June 2021
	6.3 Investigate the feasibility of retrofitting SuDS in schools across Lancashire to improve their resilience and provide an educational resource.	There is an increase in schools across Lancashire with SuDS retro-fitted to better manage surface water and remove, where feasible, existing flows from the public sewer network.	Education/Asset Departments	United Utilities	March 2023
	6.4 Explore the feasibility of delivering a series of 'water resilient parks' across Lancashire to retrofit SuDS and natural flood management measures to contribute towards surface water storage where evidence shows this would be beneficial and financially viable.	SuDS and natural flood management measures are retrofitted on council owned parks where feasible.	Parks and Blue-Green Spaces <i>(County and District Councils)</i>	LLFA Catchment Partnerships Environment Agency	March 2025
	6.5 In contributing towards a climate resilient highway network and economy, consider how Highway	Highway SuDS Adoption Code to be considered and, if appropriate, produced. Production to be	Highway Authority	United Utilities LLFA	March 2023

Theme	Objective	Output / Outcome	Objective Owner	Support From	Delivery Milestone
	Authorities in Lancashire could adopt SuDS components under the Highways Act 1980. Work with United Utilities to share learning following introduction of the Design and Construction Guide (DCG) for Sewers.	support by shared learning from United Utilities colleagues.			

# Appendices

# Appendix A: Key Duties and Powers of Flood Risk Management Authorities

## Local Authority Statutory Responsibilities

Local authorities are a risk management authority as both the Lead Local Flood Authority (LLFA) and Highway Authority. This section outlines their roles and responsibilities in this capacity.

As the LLFA, County and Unitary Councils are required to oversee and participate in the management of local flood risk, which includes the risk of flooding from surface water, groundwater and from ordinary watercourses.

### Section 19 Flood Investigation Reports

LLFAs have a duty to investigate flood incidents in their area and are responsible for ensuring all risk management authorities are working together to resolve flood problems in their respective areas.

The Flood and Water Management Act is clear that the LLFA's responsibility for investigation only extends as far as establishing which of the risk management authorities has a flood risk management function and whether they have, or will be, exercising that function. It may be the responsibility of one of the other risk management authorities, or even the land or property owner themselves, to take action to resolve the issue.

Section 19 of the Flood and Water Management Act allows LLFAs to define 'the extent that it considers it necessary or appropriate' to investigate a flood incident in their area and therefore to set investigation parameters.

Reports prepared under Section 19 of the Flood and Water Management Act must be published and made publicly available by the LLFA.

### Flood Risk Asset Register and Record

LLFA's are required, under Section 21 of the Flood and Water Management Act 2010, to maintain a register of structures and features which are likely to have a significant effect on flood risk in their area. This register will be called the flood risk asset register. Section 21 of the Flood and Water Management Act also requires LLFAs to record information about those registered structures and features, notably in relation to their ownership and state of repair. This will be called the flood risk asset record.

Together this register and record enable LLFAs to collate important information about assets which may help inform better local flood risk management in the long term.

### Delivering Sustainable Development

The Flood and Water Management Act 2010 requires flood and coastal erosion risk management authorities (that did not previously have such a duty) to aim to contribute towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions.

The Flood and Water Management Act also requires the Secretary of State to issue guidance on how those authorities are to discharge their duty, including guidance about the meaning of sustainable development. The [guidance for England](#) was published in October 2011.

### **Sustainable development in the context of flood and coastal erosion risk management (FCERM) includes:**

- taking account of the safety and wellbeing of people and the ecosystems upon which they depend,
- using finite resources efficiently and minimising waste,
- taking action to avoid exposing current and future generations to increasing risk, and
- improving the resilience of communities, the economy and the natural, historic, built and social environment to current and future risks.

### Designation of Flood Risk Structures and Features

About two thirds of physical flood risk management assets, such as walls, embankments and other raised features, are neither owned nor operated by public risk management authorities.

Under Schedule 1 of the Flood and Water Management Act 2010 the Environment Agency and Council, as LLFA, has the power to formally designate a structure or feature which it believes may have an effect on flood or coastal erosion risk. These authorities are referred to as 'designating authorities'.

The Flood and Water Management Act also refers to the 'responsible authority' which is defined as 'the authority which made the designation' unless the designation has been adopted by another of the designating authorities. Councils, as LLFA, will therefore become the responsible authority for the designation of any structure or feature it designates, unless that designation is adopted by one of the other designating authorities.

A designation is a legally binding notice served by the designating authority to the owner of the structure or feature and the notice is a Local Land Charge. There are implications for a landowner if a flood risk management structure or feature is designated on their land. The landowner will need to apply for consent from the relevant designating authority if they wish to alter, remove or replace the structure or feature. A designation also acts as a Local Land Charge which is attached to the property or to the parcel of land.

### Ordinary Watercourse Consenting and Enforcement

An 'ordinary watercourse' is a watercourse that does not form part of a main river and includes rivers, streams, ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.

On 6th April 2012, Schedule 2 (Sections 31, 32 and 33) of the Flood and Water Management Act 2010 amended the Land Drainage Act 1991 and transferred powers for the regulation of ordinary watercourses from the Environment Agency to the LLFA.

The powers of the LLFA to regulate ordinary watercourses are set out in the Land Drainage Act 1991 in three key sections:

**Section 21:** Enforcement of obligations to repair watercourses, bridges, etc.

**Section 23 & 24:** Prohibition on obstructions etc. in watercourses.

**Section 25:** Powers to require works for maintaining flow of watercourse.

These regulations broadly consist of two elements:

1. The issuing of consents for any changes to ordinary watercourses that might obstruct or alter the flow of an ordinary watercourse;
2. Enforcement powers to rectify unlawful and potentially damaging work to a watercourse.

### Sustainable Drainage Systems and Planning (in all flood zones)

Schedule 4 of the Town and Country Planning (Development Management Procedure) (England) Order 2015 lists the LLFA as a statutory consultee for 'major' development proposals in all flood zones validated from 15th April 2015. Major development is defined as 10 or more properties, or the equivalent for other land uses (as defined in Section 2 of **Statutory Instrument 2015 No. 595**)

This means that the Local Planning Authority (LPA) must consult with the LLFA prior to determining a planning application and that the LLFA must provide the LPA with a 'substantive response' within 21 calendar days, unless otherwise agreed.

The LLFA may also wish to ask the LPAs to consult them in non-statutory circumstances, or visa versa; for example because the LLFA has identified such circumstances as having the potential to impact on local flood risk or the management of local flood risk carried out by the LLFA. This is agreed through local arrangements with the LPAs.

As a statutory consultee, the LLFA has a legal duty to provide a substantive response to the LPA providing an informed view on development proposals which have surface water implications within 21 calendar days. The performance of the LLFA is closely monitored by the Secretary of State to whom the LLFA is required to report annually on their performance.

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## Highway Authority Responsibilities

Highways Authorities (Highways England and Local Authorities) have the lead responsibility for providing and managing highway drainage and roadside ditches under the Highways Act 1980. The owners of land adjoining a highway also have a common-law duty to maintain ditches to prevent them causing a nuisance to road users.

They co-operate with the other Risk Management Authorities to ensure their flood management activities are well coordinated.

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## Coast Protection Authorities

Local Authorities in coastal areas are Coast Protection Authorities. They lead on coastal erosion risk management activities in their area and are responsible for developing and delivering Shoreline Management Plans (SMPs) which provide a long-term holistic framework for managing the risk of coastal change on their section of the coast.

Coast Protection Authorities in Lancashire are Blackpool, Fylde, Lancaster, West Lancashire and Wyre Councils.

The Environment Agency has a strategic overview to ensure that decisions about the coast are made in a joined-up manner.

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## Environment Agency Responsibilities

The Environment Agency has a strategic overview of all sources of flooding and coastal erosion (as defined in the Flood and Water Management Act 2010) in England.

The Environment Agency's work includes:

- Developing long-term approaches to FCERM. This includes developing and applying the National FCERM Strategy.
- Working with others to prepare and deliver Flood Risk Management Plans (FRMPs) and Drainage and Wastewater Management Plans (DWMPs)
- Monitoring and reporting on flood and coastal erosion risk management. This includes reporting on how the National FCERM Strategy is having an impact across the country.
- Responsibility for flood and coastal erosion risk management activities on main rivers and the coast, including issuing **Environmental Permits** for flood risk activities and undertaking enforcement action as appropriate
- Providing planning advice during plan making and when determining planning applications in Flood Zones 2 and 3
- Regulating reservoir safety

- Working in partnership with the Met Office to provide flood forecasts and warnings and a Category 1 Responder during flood incidents (under the Civil Contingencies Act)
- Establishing Regional Flood and Coastal Committees in England
- Allocation of national government funding to projects to manage flood and coastal erosion risks from all sources
- Delivering projects to manage flood risks from main rivers and the sea
- Providing evidence and advice to support others. This includes national flood and coastal erosion risk information, data and tools to help other Risk Management Authorities and inform Government policy, and advice on planning and development issues

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## Water and Sewerage Company (W&SC) Responsibilities

Water and Sewerage Companies (WaSCs) are risk management authorities (RMAs) and manage the risk of flooding to water supply and sewerage facilities and flood risks from the failure of their infrastructure.

The majority of the public sewerage system in Lancashire is owned and maintained by United Utilities, however the northwest corner of Lancashire, around Earby, is the responsibility of Yorkshire Water.

The main roles of water and sewerage companies in managing flood and coastal erosion risks are to:

- make sure their systems have the appropriate level of resilience to flooding, and maintain essential services during emergencies
- maintain and manage their water supply and sewerage systems to manage the impact and reduce the risk of flooding and pollution to the environment. They have a duty under Section 94 Water Industry Act 1991 to ensure that the area they serve is “effectually drained”. This includes drainage of surface water from the land around buildings as well as provision of foul sewers.
- provide advice to LLFAs on how Water and Sewerage Company assets impact on local flood risk
- work with developers, landowners and LLFAs to understand and manage risks – for example, by working to manage the amount of rainfall that enters sewerage systems
- work with Local Planning Authorities during plan making
- work with the Environment Agency, LLFAs and Local Authorities to coordinate the management of water supply and sewerage systems with other flood risk management work.

Where there is frequent and severe sewer flooding, sewerage undertakers are required to address

This through their capital investment plans, which are approved and regulated by Ofwat. This happens every 5 years through the Price Review (PR) process. Water and Sewerage Companies have outcome delivery incentives (ODIs) that they agree with customers and partners. All water and sewerage companies have sewer flooding ODIs.

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## Voluntary SuDS Adoption by English Water and Sewerage Companies

In April 2020 Ofwat approved new guidance from Water UK for use by developers when planning, designing and constructing foul and surface water drainage systems intended for adoption under an agreement made in accordance with Section 104 of the Water Industry Act 1991.

The guidance is significant as it provides the mechanism by which water companies can secure the adoption of a wide range of SuDS components that are compliant with the legal definition of a sewer. This process remains voluntary i.e. the developer must offer the SuDS to the water and sewerage company for adoption.

There are however some notable exceptions to the adoptable components including green roofs, pervious pavements and filter strips. These components may form part of the drainage design as long as they are upstream of the adoptable components. You can read more [here](#) and [here](#).

# Appendix B: Strategic Environmental Assessment

## Strategic Environmental Assessment

This strategy is being informed by the Strategic Environmental Assessment (SEA) 2014. The SEA seeks to ensure that the objective and actions in the strategy's business plan take into account the environment, social and socio-economic and health concerns and take advantage of opportunities for wider benefits at the same time.

The scoping of the SEA has determined that the following issues should be investigated further in the assessment phase:-

- **Bio-diversity:** flood risk to designated sites; other habitats and associated species; changes to habitats and direct and indirect species mortality; natural flood control, enhancing the resilience of the ecological network through habitat creation and enhancement; carbon sequestration through habitat creation and restoration; maintaining and enhancing habitat connectivity.
- **Local Community:** flood risk to properties community facilities and businesses, or their connectivity; flood risk to environments in deprived areas.
- **Recreation:** flood risk to recreational facilities or features; access to recreational routes/facilities.
- **Geology and soils:** flood risk to geological features; land use conflict with soils; land use conflict with geological features.
- **Water Environment:** compliance with River Basic Management Plan; risk of water pollution; long term ability to achieve "good" status or "good potential."
- **Climatic factors:** construction CO2 emissions.
- **Landscape and Townscape:** flood risk to landscape and townscape character.
- **Historic Environment:** access to land use or design conflict with historic features designated or non-designated historic feature; flood risk to historic assets.

In order to maintain a future perspective the environmental impacts associated with the strategy, the SEA will ensure environmental monitoring is incorporated as part of the overall approach to monitoring the delivery of the strategy's objectives and measures.

The SEA assessment will also address the requirements of the Habitats Regulation Assessment (HRA) under the conservation of Habitats and Species Regulations 2010. The HRA will consider the potential effects of a development plan on the biodiversity of Designated European Sites including Special Protection Areas and Special Areas of Conservation. We have already highlighted the benefits of Partnership Working and the need to ensure that Ecologists should be an integral member of Partnerships particularly when discussing proposed flood risk management projects.

# Appendix C: Glossary of abbreviations and phrases

## Glossary of abbreviations and phrases

### Asset Register

Register of structures or features which are considered to have an effect on flood risk.

### BwDBC

Blackburn with Darwen Borough Council

### Catchment

The extent of land which catches and holds rainwater

### CFMP

Catchment Flood Management Plan, produced by the EA to give an overview of the flood risk in the primary catchments in the Lancashire region.

### Civil Contingencies Act 2004

Defines Category 1 and 2 responders to flooding emergencies

### Consenting

Process of obtaining permission to add/amend structures in/near a watercourse or flood defence structure

### Defra

Department for Environment, Food and Rural Affairs, responsible national emergency planning for flooding

### EA

Environment Agency, responsible for the strategic overview role for flood and coastal erosion risk management

### FCERM

Flood and Coastal Erosion Risk Management

### Foul flooding

Flooding that is contaminated with sewage

### Flood and Water Management Act 2010

Act introduced in response to Sir Michael Pitt's Review on the Summer 2007 floods

### Flood Risk Regulations

Transposition of the EU Floods Directive into UK law.

### Fluvial flooding

Flooding from rivers

### FRM

Flood Risk Management

### FRR

Flood Risk Regulations 2009

### FWMA

Flood & Water Management Act 2010

### Groundwater flooding

Flooding when water levels in the ground rise above the surface

### HA

Highways Authority

### LA

Local Authority

### LDA

Land Drainage Act, introduced to consolidate the functions of local authorities in relation to land drainage

### LFRM

Local Flood Risk Management

### LLFA

Lead Local Flood Authority, responsible for taking the lead on local flood risk management

### Local Flood Risk

Flooding from sources other than Main Rivers and the sea

### LRF

Local Resilience Forum

### Ordinary Watercourse

A statutory type of watercourse including river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) that is not classified as main river

### NERC

Natural Environment and Rural Communities

### Pitt Review

Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England.

**PFRA**

Preliminary Flood Risk Assessment

**Pluvial Flooding**

Flooding causing from direct rainfall runoff (before it enters drains or watercourses).

**Risk**

Risk = probability of an occurrence x its potential consequence

**RMA**

Risk Management Authority, organisations that have a key role in flood and coastal erosion risk management as defined by the Flood and Water Management Act 2010.

**SEA**

Strategic Environmental Assessment

**SFRA**

Strategic Flood Risk Assessment

**SuDS**

Sustainable Drainage System

**Surface water flooding**

Flooding caused by high intensity rainfall that generates flows over the ground and collects in low lying areas. Also known as pluvial or flash flooding.

**UU**

United Utilities



