



Draft Part A National Overview of Flood Risk Management in England for Second Cycle Flood Risk Management Plans 2021 to 2027

October 2021

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We cannot do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

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Foreword

There are over 5.2 million homes and businesses in England at risk of flooding and coastal erosion. With a rapidly changing climate, the need to plan together to improve the overall resilience of our local places is more important than ever before.

Partnerships are vital. The more we plan together, the more we can achieve together for local people, places and our environment.

Over the last 2 years we have worked in partnership with Lead Local Flood Authorities and other partners to develop these Flood Risk Management Plans (FRMPs). This has been a challenging time with winter flooding and the impact of coronavirus. These tests have served as a reminder. They have reinforced how precious the environment around us is for our health and well-being, and the importance of protecting and enhancing it.

The FRMPs mark an important contribution towards helping to deliver the ambitions of the 'National Flood and Coastal Erosion Risk Management Strategy for England' and the government's 25 Year Environment Plan. They focus on the more significant areas of flooding and describe the risk of flooding now and in the future.

These plans will help us:

- identify measures (actions) that'll reduce the likelihood and consequences of flooding
- refresh plans to improve resilience while informing the delivery of existing flood programmes
- work in partnership to explore wider resilience measures. These include nature-based solutions for flood and water
- set longer-term, adaptive approaches to help improve our nation's resilience

We've developed the [Flood Plan Explorer](#) to support these plans. This new, online, map-based tool will make plans more accessible and will show all the second cycle measures in a visual format. It'll also help people to see what's planned and where and when. This means we can stimulate even more opportunities for working together and co-operation across all we do.

The Environment Agency knows the next 6 years will be both exciting and challenging. We need to innovate and adapt, making sure our thinking changes faster than our climate. The tragic flooding in China, Germany and Belgium is a stark reminder of why we need to act. The race to resilience is well and truly on! The more we plan and work together, the more we can achieve. I'm pleased we have this opportunity to share the FRMPs, and I encourage you all to get involved and have your say.



CDouglass

Caroline Douglass, Executive Director of Flood and Coastal Risk Management
Environment Agency.

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Introduction

This 'part A' document provides a high-level overview of Flood Risk Management Plans (FRMPs) and flood risk management in England. It's relevant to all 10 of the individual draft FRMPs and should be read alongside them.

It includes information on:

- the context of FRMPs in strategic flood risk management planning
- the legislative background to FRMPs and why we produce them
- flood risk management at a national level

You can find more detailed information about some of the topics in this document by following the links.

Strategic flood risk management planning

Strategic flood risk management planning plays an essential role in informing the choices made to manage flood risk.

Good strategic planning can help to:

- bring partners together to set the strategic direction for flood risk management and identify common priorities for places
- inform flood risk capital investment programmes and identify interventions, including building new flood defences
- align wider investment plans and work programmes between partners
- identify innovative solutions, for example nature-based solutions, integrated water management and adaptive approaches

FRMPs make an important contribution to strategic working and planning as they help partners plan locally across administrative boundaries. FRMPs are statutory plans. This means they are required by law and are guided by legislation, policy and local priorities. They provide a basis for local engagement and consultation with partners and communities.

FRMPs are also one of many important steps in achieving the ambitions of the [National Flood and Coastal Erosion Risk Management Strategy for England](#) (FCERM strategy) and the government's 25 Year Environment Plan – [A Green Future: Our 25 Year Plan to Improve the Environment](#) (25 YEP). They also support the direction set by government policy in the [FCERM policy statement](#).

National FCERM strategy and the 25 YEP

[The Flood and Water Management Act 2010](#) places a statutory duty on the Environment Agency to develop a National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England. This strategy describes what all Risk Management Authorities

(RMAs) involved in flood and coastal erosion risk management for the benefit of people and places need to do.

The Environment Agency published the updated national FCERM strategy in 2020. The strategy's long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100.

The FCERM strategy has 3 long-term ambitions.

These are:

- climate resilient places
- today's growth and infrastructure resilient in tomorrow's climate
- a nation ready to respond and adapt to flooding and coastal change

The strategy provides a framework for guiding the operational activities and decision making of practitioners. It supports the direction set by government policy which includes its [FCERM policy statement](#). The strategy sets out the long-term objectives the nation should take over the next 10 to 30 years. It also includes shorter-term, practical measures RMAs should take working with partners and communities.

Producing an updated FCERM strategy was an important commitment in the 25 Year Environment Plan (25 YEP). The 25 YEP sets out aims for improving the environment, within a generation, and leaving it in a better state than we found it.

- The plan includes goals to: bring a thriving, natural environment with cleaner air and water
- reduce harm from hazards such as floods and drought
- improve sustainable use of natural resources

This is in the context of climate change, increasing populations and ambitious goals for economic growth and prosperity.

This challenge calls for a long-term, strategic approach to flood risk management that will both reduce risk and help future growth and make sure people live in climate resilient places. The Environment Agency, other RMAs and stakeholders will need to work together in a way that respects and improves the water and wider environment.

Aim of second cycle FRMPs

[The Flood Risk Regulations 2009](#) (FRRs) set out a statutory process for flood risk planning over a 6 year cycle. The second cycle FRMPs (2021 to 2027) are to be strategic, place-based plans. They include objectives and measures closely aligned to the ambitions and goals of the FCERM strategy and 25 YEP. They also aim to support achieving wider environmental and growth ambitions of society. They aim to show what's happening to address flood risk in identified flood risk areas (FRAs) and across the river basin district. The second cycle FRMPs will encourage RMAs to work closer together to achieve the objectives and measures.

You can find more information about the FRRs and how FRAs were identified in the 'Purpose of the FRMP' section of this document.

Flood risk management

Flood risk management information in this section covers all sources of flooding which is relevant to all river basin districts (RBDs) and Flood Risk Areas (FRAs).

Definition of flooding

[The Flood and Water Management Act \(2010\)](#) defines a flood as any case where land not normally covered by water becomes covered by water'.

RMA's describe the risk of flooding by both the:

- likelihood that a location will flood from any source
- impact or consequence that the flooding could cause if it occurred

The purpose of managing flood risk is to mitigate any harmful impacts caused by flooding on:

- people
- the environment
- buildings and infrastructure (such as roads, railways, hospitals and schools)

This could involve taking action to reduce the likelihood and/or consequences of flooding should it occur.

Flood risk information

The Environment Agency's [long-term flood risk service](#) provides information on:

- the longer-term flood risk for an area in England
- the possible sources of flood risk
- how to manage flood risk.

This service uses computer models to assess an area's long-term flood risk from:

- rivers and the sea
- surface water
- reservoirs

The results are an indicator of an area's flood risk. There are 4 bands of risk representing the likelihood of flooding in any given year.

The bands of risk are:

- high risk – this means that each year an area has a chance of flooding of greater than 3.3%

- medium risk – this means that each year an area has a chance of flooding between 1% and 3.3%
- low risk – this means that each year an area has a chance of flooding of between 0.1% and 1%
- very low risk – this means that each year an area has a chance of flooding of less than 0.1%

The results for flood risk from rivers or the sea consider the effect of any flood defences in the area. These defences reduce, but do not completely stop, the chance of flooding as they can be overtopped or fail.

Flooding from surface water is difficult to predict as the exact location and volume of rainfall are difficult to forecast. Local features can also greatly affect the chance and severity of flooding.

The results for reservoirs show the risk of flooding from reservoirs in the unlikely (managed to be very low risk) event of a dam failure.

National Flood Risk Assessment

The Environment Agency is currently developing a new National Flood Risk Assessment. This will provide a single picture of the current and future flood risk from rivers, the sea and surface water. It'll use both existing detailed local information and improved national data. It's due to be published in 2024 and will be available as open data. This means it can be used for free by anyone.

Other sources of flooding

The Environment Agency monitors groundwater levels and provides a groundwater alert or warning service for some areas that have historically experienced groundwater flooding. The groundwater vulnerability maps for England were produced in 2013 and are available on [Defra's MAGIC map service](#).

Sewer and surface water flooding resulting from wastewater networks and associated infrastructure is monitored and managed by water companies.

The [Canal & River Trust](#) are responsible for managing the level of water in canals across England and Wales to mitigate flooding.

Roles and responsibilities in flood risk management

RMA's

RMA's are:

- the Environment Agency
- Lead Local Flood Authorities (county councils, unitary authorities, London boroughs and Metropolitan boroughs)
- district councils (which may also be called borough or city councils)
- water companies
- internal drainage boards
- highways authorities

The Environment Agency has a strategic overview role covering all sources of flooding and coastal change. This includes sources where other RMAs have operational responsibilities. The Environment Agency provides strategic leadership for the management of flooding and coastal change from all sources including:

- rivers
- the sea
- groundwater
- reservoirs
- surface water

This strategic overview role is distinct from the Environment Agency's operational role. The Environment Agency also has permissive powers to manage flood risk from main rivers (these are usually, larger rivers and streams on the main river map), the sea and reservoirs. It can also make landowners take action to minimise flood risk to others.

As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency has a statutory duty to manage reservoir flood risk by securing compliance. This is in addition to its permissive powers under the Reservoirs Act.

Lead Local Flood Authorities (LLFAs) are the county council or unitary council. They have a leadership role on local flood risk management in their area.

This includes risks from:

- ordinary watercourses. These are watercourses that are not part of a main river and not on the main river map outside internal drainage districts
- surface water
- groundwater

They have permissive powers to manage this risk and enforcement powers like the Environment Agency. LLFAs work with other RMAs to develop and maintain a strategy for local flood risk management.

District councils have a role to carry out works to manage flood risk from ordinary watercourses outside internal drainage districts. They are also planning authorities and work with their LLFA to manage flood risk. District councils that are next to the sea also

have the role of **coast protection authorities** as defined under the [Coast Protection Act 1949](#).

Internal drainage boards are local independent public authorities established in areas of special drainage need in England.

Internal drainage boards:

- are responsible for managing water levels within their internal drainage district
- have powers like LLFAs and the Environment Agency
- work with RMAs to manage local flood risk

Water companies manage:

- the sewerage and water supply networks and any flood risk arising from them
- flood risk to their infrastructure, such as water treatment plants and pumping stations

Highway authorities include county and unitary authorities and Highways England.

Highway authorities are RMAs responsible for:

- providing and managing highway drainage and some roadside ditches
- making sure that road projects do not increase flood risk

Emergency responders

Some RMAs also have a statutory role to play in planning for emergencies. These roles are classed as category 1 or 2 responders.

RMAs who also hold an emergency response role are:

Category 1:

- Environment Agency
- county councils
- unitary authorities
- district councils

Category 2:

- water companies
- Highways England
- Transport for London
- The Secretary of State for Transport

Category 1 and 2 responders come together within local resilience forums (LRFs). LRF members aim to plan and prepare for local incidents and catastrophic emergencies.

LRFs help responders work together to:

- identify potential risks
- produce emergency plans to either prevent or mitigate the impact of any incident on their local communities

Other organisations and people with statutory roles

Regional Flood and Coastal Committees (RFCCs) are a mechanism for sharing information and help to achieve the best use of resources across a whole region. They are responsible for making sure there are coherent plans for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines.

They bring together individuals appointed by:

- government
- the Environment Agency
- LLFAs

RFCCs have a vital assurance role to promote efficient, targeted and risk-based investment in flood and coastal erosion risk management. This role optimises value for money and benefits to local communities.

Riparian landowners are landowners who have a stretch of watercourse that runs on, under or alongside their property. They are normally responsible for that watercourse and are required to take reasonable steps to avoid causing a risk of flooding to others. Riparian landowners must also comply with any byelaws in place for watercourses on, under or alongside their land.

Large, raised reservoir owners and operators are responsible for managing the flood risk from reservoir failure, by complying with the [Reservoirs Act 1975](#).

Ofwat is the economic regulator of the water sector. It plays a role in helping to manage flooding and secure the resilience of water supply and sewerage systems.

The Department for Environment, Food and Rural Affairs (Defra) sets the direction and policy for flooding and coastal change. It also provides funding for activities undertaken by RMAs through Grant-in-Aid.

Other organisations and people

Communities including flood action groups

Across the country there are many formal and informal community groups, Flood Action Groups (FAGs), partnerships and charities which have been set up to support those who

have been affected by flooding and coastal change. They also help people plan for future risks.

These groups are vital in providing support, advice and practical help. They can also support RMAs by engaging in discussions or taking action to manage the risk of flooding or coastal change.

It's important that all **homeowners and renters** take time to consider and understand the risk of flooding and coastal change to their property. It's also important for them to think about the options they must adapt to and how to manage this risk. They should for example, consider incorporating property flood resilience measures or signing up for flood warnings.

Housebuilders/developers should consider the role they have in improving the resilience of people and places to flooding and coastal change. They should for example consider the role of sustainable drainage systems and property flood resilience measures in new or existing developments.

Insurers can provide help and support to those affected by flooding by providing repairs and finance. They also have an interest in promoting resilience both at community and individual property level. [Flood Re](#) is a reinsurance scheme backed by government and the insurance industry. It aims to improve the availability and affordability of flood insurance for households at high risk of flooding.

Infrastructure providers have a vital role to play in helping to improve the resilience of people and places to flooding and coastal change. This includes understanding the current and future resilience of different types of infrastructure and the best way to improve it.

Businesses should understand the impact of flooding and coastal change to their premises and operations. They should consider the options to manage this risk and increase their resilience to a changing climate.

You can find a more detailed explanation of the current roles and responsibilities of the organisations with statutory flood and coastal erosion risk management responsibilities in the [FCERM strategy](#) and its [Annex A](#).

Purpose of the FRMPs

The principal purpose of a Flood Risk Management Plan (FRMP) is to set out how to manage significant flood risk in nationally identified flood risk areas (FRAs). These are areas where there is the potential for significant risk or impacts should major flooding occur. However, it is recognised that there are areas at risk of flooding outside of these FRAs. Therefore, the Environment Agency and RMAs will continue to plan for and manage the risk of flooding to all communities. This is regardless of whether they are in an FRA or not. Flood risk management interventions such as warning and informing, capital

investment and maintenance programmes are not limited to FRAs. They are informed by all levels of risk, not just those identified as nationally significant.

FRMPs highlight the hazards and risks from flooding. They describe how RMAs will work together, and with partners and communities to manage flood risk in the places where we live, work and play.

RMAs produce FRMPs every 6 years. FRMPs:

- describe the sources and risks of flooding within a river basin district
- include information about how RMAs plan to work with communities and businesses to manage and reduce flood risk
- help to promote a greater awareness and understanding of the risks of flooding, particularly in communities at significant risk
- encourage and enable householders, businesses and communities to take action to manage the risks

FRMPs, together with other plans and strategies, help everyone involved in managing water to make decisions that are best for people and the environment. These other plans include:

- River Basin Management Plans (RBMPs)
- Local Flood Risk Management Strategies (LFRMS)
- Shoreline Management Plans (SMPs)
- Drainage and Wastewater Management Plans (DWMPs)

Legislative background

The Flood Risk Regulations 2009 (FRR) set out a statutory process for flood risk planning over a 6 year cycle.

The FRR require the Environment Agency and Lead Local Flood Authorities (LLFAs) to:

1. assess risk from flooding for human health, the economy and environment including cultural heritage
2. decide where there is significant risk and identify these areas as flood risk areas (FRAs)
3. prepare maps that show the flood hazard and flood risk in FRAs
4. prepare FRMPs that set objectives and measures to reduce the risk in FRAs

Preliminary flood risk assessment

The first stage of the planning cycle is a preliminary flood risk assessment (PFRA). A PFRA is an assessment of:

- floods that have taken place in the past

- floods that could take place in the future

A PFRA identifies FRAs where the likelihood and impact of flooding is likely to be significant nationally for:

- people
- the economy
- the environment, including cultural heritage

PFRA for main rivers, the sea and reservoirs

The Environment Agency is responsible for producing a PFRA for main rivers, the sea and reservoirs in England. In 2018 the [PFRA for the second cycle](#) was published. The PFRA:

- describes how flood risk from main rivers, the sea and reservoirs in England was assessed
- gives a high-level overview of the risk
- describes how FRAs were identified
- identified FRAs at significant risk from river and sea flooding in England

The Environment Agency did not identify any significant FRAs for reservoirs. The reasons for this are included in the PFRA. The Environment Agency has [long-term flood risk maps](#) that show the potential area that could flood in the unlikely event of a reservoir dam failure.

Parts of the Severn and Dee River Basin Districts (RBDs) lie in Wales. The [PFRA reports](#) for the whole of these RBDs were produced jointly by the Environment Agency and Natural Resources Wales (NRW).

A part of the Solway Tweed RBD lies in Scotland. A separate [national flood risk assessment](#) (Scotland does not use the term PFRA) was produced by the Scottish Environment Protection Agency (SEPA).

PFRA for local sources of flood risk

LLFAs are responsible for producing PFRA for local sources of flood risk for their administrative areas. This includes flood risk from surface water, groundwater and smaller (ordinary) watercourses. Each of the 152 LLFAs in England produced a [PFRA for the second cycle](#) in 2017 in partnership with the Environment Agency.

The PFRA:

- review the first cycle FRAs for local sources of flood risk
- identified surface water FRAs

Information for local sources of flooding in the English part of the Dee RBD is in the PFRA for:

- Chester West and Chester Borough Council

- Shropshire Council.

Information for local sources of flood risk in the English part of the Severn RBD is in the PFRAs for:

- Bath and North East Somerset Council
- Bristol City Council
- Coventry City Council
- Dudley Metropolitan Borough Council
- Gloucestershire County Council
- Herefordshire Council
- North Somerset District Council
- Sandwell Metropolitan Borough Council
- Shropshire Council
- South Gloucestershire Council
- Telford and Wrekin Council
- Wolverhampton Council
- Warwickshire County Council
- Worcestershire County Council

Information for local sources of flooding in the English parts of the Solway Tweed RBD is included in the PFRAs for:

- Cumbria County Council
- Northumberland County Council.

The Environment Agency produced indicative FRAs for the LLFAs to review and confirm in their PFRAs. You can find the [guidance the LLFAs used to review the FRAs](#) online.

The LLFA remains involved with wider flood risk management work and national objectives if an LLFA does not contain FRAs.

Flood hazard and risk maps

The third stage in the planning cycle is to prepare maps that show the flood hazard and flood risk in FRAs. Flood hazard maps show the probability or likelihood of flooding occurring in a location.

Flood risk maps show what is potentially at risk of flooding such as:

- people
- the economy, including infrastructure and services
- the environment, including cultural heritage

The [long-term flood risk information](#) and the [flood risk maps published in 2019](#) have been used to prepare the draft second cycle FRMPs. It should be noted that the flood risk maps show the risk at a fixed point in time. They use data and risk assessment information available in December 2019. The maps do not show information at a property level. You can find more detailed information about how they were developed and what they contain by accessing them.

The [long-term flood risk information](#) is regularly updated. It covers all communities and should be used to check your current flood risk. You can use this information to see the likelihood of flooding in a particular area or postcode.

Producing the draft second cycle FRMPs

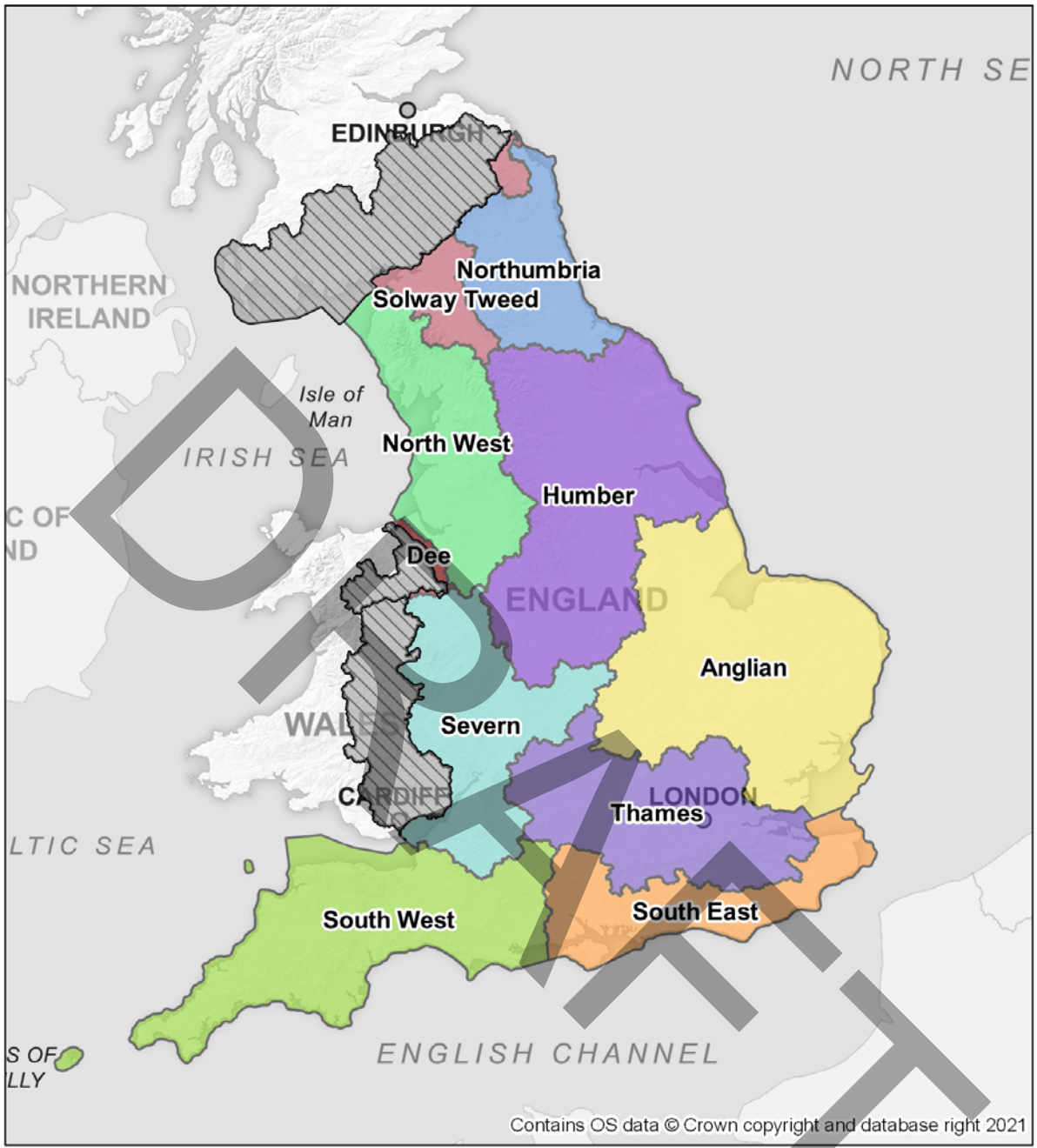
Approach to the draft FRMPs

The Environment Agency and Lead Local Flood Authorities (LLFAs) worked together and with other RMAs to develop the first cycle Flood Risk Management Plans (2015 to 2021). This was to create plans to manage the risk from all sources of flooding. The second cycle FRMPs (2021 to 2027) will build on this approach.

10 draft second cycle FRMPs have been developed for England. There is one for each river basin district.

The 10 river basin districts are:

- Anglian
- Dee
- Humber
- Northumbria
- North West
- Severn
- Solway Tweed
- South East
- South West
- Thames



Legend

River Basin Districts (RBDs)	Humber	Severn	South West
Anglian	North West	Solway Tweed	Thames
Dee	Northumbria	South East	RBDs outside of England

Figure 1: Map showing the 10 River Basin Districts in England

In preparing the draft FRMPs, RMAs reviewed the first cycle FRMP objectives and measures. These were reviewed alongside existing and evolving plans and strategies, on a local and national level.

For the second cycle of FRMPs, there is a nationally consistent set of draft objectives which are closely linked to the:

- Flood Risk Regulations 2009
- National Flood and Coastal Erosion Risk Management (FCERM) Strategy
- 25 Year Environment Plan

You can find the full list of these draft objectives in the 'Objectives and measures for second cycle FRMPs' section of this document. The measures (proposed actions to manage flood risk) have been developed in a consistent format.

In drawing the objectives and measures together, RMAs have revisited the priorities and made sure that there is a shared understanding of the main flood risks and how to manage them.

Developing the draft FRMPs

The approach to the second cycle plans is different to the first. In the first cycle, Flood Risk Areas (FRAs) were identified for surface water only. For this second cycle, the Environment Agency chose to broaden the approach and apply the methodology to main rivers and the sea. This means that for the second cycle, there are FRAs for surface water and main rivers and the sea. It should be noted that the number of surface water FRAs has increased as the understanding of surface water mapping has improved.

With FRAs from main rivers, the sea and surface water, it provides the opportunity to produce each FRMP and its content to suit the particular characteristics of the River Basin District (RBD).

For example:

- the South East FRMP concentrates on the areas with the highest risk of flooding (FRAs)
- the Dee and the Solway Tweed FRMPs consider the RBD as a whole
- other FRMPs include additional information such as locally defined strategic areas, like the Humber Estuary

Each FRMP differs as to the level of detail included, depending on the characteristics and location of the RBD.

Catchment Based Approach and FRMPs

The [Catchment Based Approach](#) encourages local engagement and participation in decision making.

The objectives for the Catchment Based Approach are:

- to deliver positive and sustained outcomes for the water environment by promoting a better understanding of the environment at a local level
- to encourage local collaboration and more transparent decision-making when both planning and delivering activities to improve the water environment

These Catchment Based Approach objectives informed how measures in the FRMPs were developed. When preparing FRMPs and in carrying out FCERM activities, consideration has been given to how:

- the processes across the catchment and coastline work and interact
- drainage systems respond to different flood events
- natural processes operate

FRMPs for RBDs which are also partially in Wales and Scotland

The Environment Agency is producing FRMPs for the English part of the Dee and Severn RBDs. Natural Resources Wales (NRW) are producing FRMPs for the Welsh part of the Dee and Severn RBDs. The Environment Agency is working closely with NRW to ensure a catchment-based approach has been taken and that the plans complement each other's. This is a change from the first cycle FRMPs where the Environment Agency and NRW worked together to produce a joint Severn FRMP and a joint Dee FRMP.

The Environment Agency and the Scottish Environment Protection Agency (SEPA) are producing separate FRMPs for the English and Scottish parts of the Solway Tweed RBD respectively. This is the same as in the first cycle FRMPs. The cross-border nature of the RBD means both English and Scottish authorities work together to coordinate flood risk management plans and proposed activities.

Where FRMPs are developed separately, RMAs work together to:

- ensure measures proposed in cross-border areas are coordinated
- reference each other's plans
- signpost to where each other's plans are published

Flood Plan Explorer

[Flood Plan Explorer](#) (FPE) is a new, online, interactive map-based tool developed for this second cycle of flood risk planning. It has been developed specifically to display information about all the measures included within the second cycle FRMPs.

This information mainly includes:

- where the measure is
- a description of the measure and what it aims to achieve

- which objectives the measure will help to achieve
- who is responsible for implementing the measure
- when the measure is planned to be implemented

FPE displays the measures on a map. FPE will also show how measures are progressing over the second planning cycle.

Objectives and measures for second cycle FRMPs

Two important elements of the Flood Risk Management Plans (FRMPs) are the objectives for managing flood risk and the measures proposed to achieve those objectives.

Draft objectives for second cycle FRMPs

18 nationally-consistent draft objectives have been written for this second cycle of flood risk planning. In setting the draft objectives RMA's had regard to the Flood Risk Regulations' aims. These are to:

- reduce the adverse consequences of flooding for human health, economic activity and the environment
- reduce the likelihood of flooding

Climate change was also taken into account when developing these objectives.

They are consistent with the National FCERM strategy ambitions of:

- climate resilient places
- today's growth and infrastructure resilient in tomorrow's climate
- a nation ready to respond and adapt to flooding and coastal change

The 18 draft objectives have been grouped under headings from the FCERM strategy and the FRRs.

FCERM strategy ambition: climate resilient places

Flood risk regulations - reducing the likelihood of flooding

1. By 2027 risk management authorities will have developed a long-term strategic vision and delivery plan for managing future flood risk from all sources
2. By 2027, risk management authorities will have worked together to develop and / or implement adaptive approaches that plan for a range of future flood and coastal change scenarios.

3. By 2027, risk management authorities will have worked with those communities that may be significantly affected by flooding and / or coastal change in the future and will have identified and / or be progressing the most appropriate flood risk management options.
4. By 2027, risk management authorities will have worked with communities, landowners and businesses to determine the level of maintenance of flood risk assets needed to manage flood risk, and they will have taken a risk-based approach to decide how or if they will be maintained in the future.
5. By 2027, risk management authorities will have worked with communities, landowners and businesses to understand wider maintenance activities needed to manage the risk of flooding and coastal change and who will contribute to make that happen.
6. By 2027, risk management authorities will have worked with communities and landowners to identify and carry out schemes which work with natural processes to reduce the risk of flooding and coastal change.

Flood risk regulations - minimising the consequences of flooding for human health

7. By 2027, risk management authorities will have developed and/or delivered a programme of flood risk management capital schemes and/or maintenance to reduce risk of flooding and coastal change and its adverse consequences for human health and well-being.

Flood risk regulations - minimising the consequences of flooding for the environment including cultural heritage

8. By 2027, actions by risk management authorities to address current and future risk of flooding and coastal change will have helped achieve the environmental objectives set out in the river basin district's river basin management plan.
9. By 2027, risk management authorities will have worked with catchment and coastal partnerships, landowners and managers and communities to make use of nature-based solutions to reduce the risk of flooding and coastal change and contributed to achieving wider environmental benefits.
10. By 2027, risk management authorities will have worked with Natural England and other partners to ensure that the delivery of flooding and coastal change risk management programmes have contributed to the local nature recovery strategies so that new and restored habitats contribute to reducing flood and coastal risk.

FCERM strategy ambition: today's growth and infrastructure resilient in tomorrow's climate

Flood risk regulations - minimising the consequences of flooding for economic activity

11. By 2027, risk management authorities will have worked with infrastructure owners, businesses and the community to identify priority infrastructure that needs to be made resilient to current and future risk of flooding and coastal change and will have discussed in partnership how this will be achieved and / or worked together to increase resilience.
12. By 2027, risk management authorities will have provided evidence and advice to infrastructure providers and supported them to take account of future flooding and coastal change in their infrastructure investment.
13. By 2027, risk management authorities will have worked with communities and businesses to understand and implement a plan for how flood and coastal erosion risk management activities can contribute towards sustainable growth and prosperity in a climate resilient way (and vice versa).
14. By 2027, and in line with national planning policy, new development in areas at risk will take into account the risk of flooding and coastal change now and in the future.

FCERM strategy ambition: a nation ready to respond and adapt to flooding and coastal change

Flood risk regulations - minimising the consequences of flooding for human health

15. By 2027, risk management authorities will have worked with communities to: raise awareness of the level of flood risk that they face; help them understand the role of emergency responders and ensure they know what to do in an emergency to help themselves.
16. By 2027, risk management authorities will have worked with communities to help them understand the potential impact of flooding and coastal change on their lives and livelihoods to encourage them to act.
17. By 2027, risk management authorities will have supported people living in places at risk of flooding and / or coastal change to develop and / or implement community led initiatives to be better prepared for, and resilient to, flooding.
18. By 2027, risk management authorities, local responders and other partners will have worked together to help people and businesses recover more quickly after flooding.

Draft measures for second cycle FRMPs

RMA identified the likely approach (the measures) to achieve these objectives using the categories: **preventing, preparing, protecting, and recovery and review.**

These categories are described as:

- preventing – by avoiding putting people or the environment at risk of flooding
- preparing – by taking actions that prepare people for flooding
- protecting – by protecting people from the risk of flooding
- recovery and review – by learning from flood incidents

RMA also identified whether these measures were:

- ongoing – measures already being carried out from the first cycle FRMP and have been transitioned to the second cycle FRMP
- agreed – measures that have emerged since the first cycle FRMP was published and are included in the second cycle FRMP
- proposed – new measures or significant changes to first cycle FRMP measures and are included in the second cycle FRMP

For this second cycle of flood risk planning, the Environment Agency and Lead Local Flood Authorities (LLFAs) have developed measures that apply at a national level. This is in addition to local measures for each individual draft FRMP.

In determining the proposed measures for the draft FRMPs, the main factors the RMA considered were:

- the costs and benefits of different methods of managing the flood risk
- information included in the flood hazard map and the flood risk map
- the draft River Basin Management Plan for the RBD
- the effect of floodplains that retain flood water
- the environmental objectives for the RBD
- the likely effect of a flood and of different methods of managing a flood, on the local area and the environment

In addition, there are also several other factors which the RMA have considered when developing measures. These include other relevant legislation and local and national flood risk management policies and strategies.

The Environment Agency and other RMA will work with partners and communities to carry out the measures. Not all measures in the draft FRMPs have secured funding and so they will not definitely be implemented. For some of these measures, RMA can apply for Grant-in-Aid to help pay for the work. The Environment Agency administers this funding and allocates it in line with government policies and priorities.

Draft national level measures for second cycle FRMPs

There are several measures which are applicable to every Flood Risk Area (FRA) in England. The Environment Agency plans to implement these national-level measures as part of its routine day-to-day work as an RMA. The Environment Agency is responsible for the national-level measures that apply to every FRA for main rivers and the sea.

LLFAs are responsible for the national-level measures that apply to every FRA for surface water. Some of these measures are statutory (the work is required by law), and others are optional. LLFAs implement their routine work in different ways depending on local priorities and resources. You should look at LLFA websites and their local flood risk management strategies for more information on how they carry out their routine work.

These national level measures are in addition to any measures which have been developed locally for each FRMP.

You can find information about all the national level measures and those which have been developed locally in the interactive mapping tool, the [Flood Plan Explorer](#).

FCERM activities

The draft Flood Risk Management Plan (FRMP) measures include a range of flood and coastal erosion risk management (FCERM) activity. This section provides short descriptions of what some of these FCERM activities involve.

Strategic planning

RMA's use strategic planning to prioritise flood risk management activities, align investment with priority areas and achieve value for money. Where areas are at risk from more than one source of flooding, RMA's work in partnership to strategically plan across administrative and water boundaries.

Investigations

Lead Local Flood Authorities (LLFAs) have a duty under [Section 19 of the Flood and Water Management Act](#) to formal investigations for some incidents of flooding in their area. These investigations identify which RMA's have relevant flood risk management functions, and whether they have exercised, or are proposing to exercise, those functions in response to the flood. The LLFA must publish the results of its investigation and notify any relevant RMA's.

Flood records and evidence

Records of past flooding are vital in informing flood risk management actions.

They are useful for:

- understanding the sources, seasonality, frequency and impacts of flooding
- identifying the likely locations, scale of expected flooding and the contributing factors
- improving the response to future flood events
- verifying and improving models which simulate floods

Communities and residents who have been affected by flooding are encouraged to report any floods to the relevant authority. This helps to improve the accuracy of evidence and information held by RMAs.

Hydraulic modelling and hydrology

Computerised hydraulic modelling is a process of simulating what happens to river levels during periods of rain and how water spreads across the floodplain. Hydrology, the science of estimating rainfall and river flows is used as input to the computerised hydraulic models. Analysis of past flood events is used to support the models' predictions and improve their accuracy.

Coastal modelling looks at a combination of astronomical tides and storm surges, plus the impact of waves to assess the risk of flooding in coastal areas.

Surface water modelling assesses the impact of intense rainfall on a local area. It can also consider how overland flows interact with watercourses, sewers and drains.

RMAs use these models to predict where and when flooding is expected to occur and for how long, considering storm intensity and duration.

Hydraulic modelling also informs decisions about how flood risk could be managed. For example, to:

- improve assets
- provide planning advice to local councils to avoid inappropriate development
- provide flood warnings and support flood incident management

Flood forecasting and warning

Weather forecasts can be used to predict how river flows and levels are expected to respond to changes in weather. The Environment Agency provides a [flood warning service](#) which uses rainfall and river level data for accuracy. Computer models of weather and tide conditions predict tidal flood forecasts. By providing flood forecasts and warnings, people can act in advance of potential flooding.

Providing an accurate flood forecasting and warning service is critical in managing the consequences of flooding. The [Flood Forecasting Centre](#) is a partnership between the Environment Agency and the Met Office. It combines expertise in meteorology and hydrology into a specialised hydrometeorological service to provide forecasts for all natural forms of flooding.

Incident planning and management

The Environment Agency, local councils, water companies, emergency services and other utility companies all plan for incidents of many types, including floods. These plans inform how the RMAs work together to respond to an incident and inform more strategic multi-agency response plans. Incident management exercises are used to test and improve planned response procedures. Following flood incidents partners review the plans to further improve procedures and share data.

Asset and river maintenance

To ensure flood risk management assets remain 'fit for purpose,' RMAs use permissive powers to carry out regular inspections and maintenance.

Examples of these assets include:

- raised defences, such as earth embankments
- river channel walls
- culverts
- outfalls and flap valves
- pumping stations
- flood storage reservoirs

The Environment Agency maintains an asset condition database which is updated after asset inspections. This information is used to inform maintenance decisions and funding requirements.

The Environment Agency uses its permissive powers to carry out river maintenance such as:

- weed cutting
- desilting
- mowing banks
- tree works
- clearing blockages

You can find the Environment Agency's [5 year asset maintenance programme](#) online.

Other RMAs also maintain information relating to their assets, for example asset registers that are maintained by LLFAs. Using their permissive powers, LLFAs and IDBs undertake maintenance where they decide it is needed.

Improvement works

The Environment Agency produce flood maps using modelled and historic flood data to show areas where properties, communities and land are at risk of flooding. RMAs work with communities and partners to identify options that improve flood resilience and submit initial proposals to develop projects.

The Environment Agency coordinates [a 6 year investment programme](#) which allocates funding to projects that deliver improved flood resilience in line with the government's [Partnership Funding policy](#).

Nature based solutions

[Nature based solutions](#) involve a range of local activities.

These are often undertaken through partnerships between:

- RMAs
- farmers
- landowners
- environmental groups
- communities

In some places solutions involve making space for water away from vulnerable development. Examples include, reconnecting rivers with their natural floodplain or creating new areas where water can be stored. Where there is space, natural flood management techniques can store and slow water running off land in response to rainfall, to help reduce flood levels downstream. This can include tree planting.

Nature based solutions for flood risk management can make an important contribution to improving the environment for wildlife and people by enhancing river and coastal waters and creating and improving natural habitats

Sustainable drainage systems and green infrastructure

Sustainable drainage systems (SuDS) and green infrastructure are a way of managing surface water by reducing or delaying rainwater run-off. They aim to mimic the way rainfall drains naturally rather than conventional piped methods. This helps to manage flooding with other benefits such as reduced pollution, improved water quality and creation of habitats.

Common types of SuDS and green infrastructure are:

- ponds which change in level with rainfall
- swales
- soakaways
- permeable pavements.

These methods use infiltration primarily and attenuation where infiltration cannot be achieved. Retro-fitting of SuDS to sites is also a way of reducing peak flows in watercourses and so helping to reduce flooding and pollution.

Managing flood risk in rural areas

Many rural areas, particularly low-lying and pumped drained areas can be at high risk of flooding from rivers, the sea and surface water. Farming can contribute to flooding through poor land management practices through increasing the speed that water enters rivers or by causing localised surface water problems. Communities and businesses, including landowners and farmers in the countryside, have an important role to play in managing and reducing flood risk and increasing their resilience to floods.

This can include:

- putting in place nature-based solutions to enable land to slow the flow or store water
- maintaining gullies and roadside ditches to manage surface water
- taking action to keep livestock and equipment safe during a flood

Resilience and adaptation

The National FCERM Strategy calls for the nation to embrace a broad range of resilience actions including better protection to flooding and coastal change. It frames resilience in terms of the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change.

This includes:

- making the best land use and development choices
- protecting people and places
- responding to and recovering from flooding and coastal change

This is at the same time as adapting to climate change.

Flooding and coastal change is not static but constantly changing. It requires an iterative and dynamic approach for places that can be reviewed over time in response to changing risks.

Looking out to 2100, RMAs will need to:

- help places plan and adapt to flooding and coastal change
- be agile to the latest climate science, growth projections, investment opportunities and changes to our environment and natural systems

This is called 'adaptation pathways' that enable local places to better plan for future flooding and coastal change and adapt to future climate hazards.

Development planning and control

RMA's work together to avoid inappropriate development in areas at risk of flooding. They also work together to seek opportunities through sustainable development to reduce the causes and impacts of flooding. The National Planning Policy Framework (NPPF) includes policies on flood risk and coastal change. These must be applied by local planning authorities (LPAs) when preparing local plans and determining planning applications.

The Environment Agency and LLFAs are statutory consultees for certain planning applications with flood risk or drainage implications. They provide advice to local planning authorities who make the final decision. Other RMA's may also be consulted and may choose to provide advice on development proposals.

Regulation – permitting and enforcement

Construction works or maintenance activities can increase flood risk, impede drainage and/or cause environmental damage if poorly executed. The public and businesses must therefore apply for permission from the relevant RMA to carry out certain types of activities on or near rivers, streams and defence structures. This is to avoid these problems being created. This regulation is a legal duty. RMA's must consider proposals submitted under legislation and decide whether to allow them or not. If problems arise, RMA's may have powers to take enforcement action against someone acting without formal permission, or in breach of it. This is to correct the damage caused by their actions.

Working with communities

RMA's, non-governmental organisations (NGOs), communities and individuals work together to manage flood risk.

They do this through:

- RMA support of community planning for and response to flood incidents
- collaborative decision-making on flood and coastal change mitigation options and long-term strategic planning.

RMA's work in partnership with community representatives such as flood groups and NGOs who represent flood volunteers. These include the [National Flood Forum](#) and [Action with Communities in Rural England](#).

Strategic environmental assessment

The Environment Agency must carry out a Strategic Environmental Assessment (SEA) of some of its plans. This is to meet the legal requirements of the [Environmental Assessment of Plans and Programmes Regulations \(England\) \(SI 2004 1633\)](#) - the 'SEA Regulations'. An SEA enables the development of plans that will lead to better and more sustainable environmental outcomes.

The Environment Agency determined that an SEA was needed for the second cycle Flood Risk Management Plans (FRMPs) to meet the requirements of the SEA Regulations. The likely significant effects of measures on the environment were assessed as the plans were developed. This has enabled RMAs to make changes to the plans to protect the environment by avoiding or reducing harmful effects. It has also allowed RMAs to make the most of opportunities to enhance the environment.

The findings of the SEA are documented in an Environmental Report (ER) which is published alongside each of the draft second cycle FRMPs. Each ER is accompanied by a Non-Technical Summary (NTS) which provides an easily understandable summary of the SEA and its findings.

Habitats regulation assessment

The Conservation of Habitats and Species Regulations 2017 (as amended) requires that the plans consider the potential for direct and indirect effects on the integrity of sites designated for their international importance. These sites are collectively referred to as European sites because they contain species and habitats that are the best examples at a European scale. The potential for effects on the integrity of these sites is assessed through a Habitats Regulation Assessment (HRA). HRAs are being undertaken alongside the consultation on the draft second cycle FRMPs. Comments received during consultation will be used to inform the HRAs and in turn the HRAs will inform the FRMPs as they are finalised. A report of the HRAs will be published alongside the final second cycle FRMPs.

Climate change and FRMPs

The [2018 UK Climate Change Projections](#) suggest that average sea level could increase by over a metre by the end of the century and that there could be up to 59% more precipitation in winters by 2050. This could lead to more river flooding. Rainfall intensity will increase, which will lead to more surface water flooding. There is already evidence of more frequent and more extreme flooding and faster and more extreme coastal erosion.

Climate change has been considered in the FRMPs by:

- aligning the FRMP objectives with the ambitions of the FCERM strategy
- developing FRMP measures to meet those objectives

- including national and local FRMP measures which seek to reduce carbon emissions
- considering the likely impact of climate change on the occurrence of floods for each river basin district

You can find out more about the potential impacts of climate change on the likelihood of coastal, river and surface water flooding for each river basin district in the 10 individual draft FRMPs.

Our changing climate will also affect coastal erosion and the wider water environment. The impacts on these is explored further in Shoreline Management Plans (SMPs) and River Basin Management Plans (RBMPs) respectively.

Links between the draft FRMPs and the draft RBMPs

Alongside flood risk management planning, the Environment Agency works with others to protect and improve the quality of the water environment. It does this through river basin management. The Environment Agency aims to co-ordinate the FRMPs and the River Basin Management Plans (RBMPs) so that all organisations can do more for the environment. By developing the plans together, ways to achieve objectives for flood risk management and the water environment and biodiversity can be joined together wherever possible.

This is particularly important to achieve the main aim of the Water Environment (Water Framework Directive (WFD) England and Wales) Regulations 2017. The main aim of these regulations is to establish a framework for the protection of inland surface waters, estuaries, coastal waters and groundwater. You can find more information about this in the [draft RBMPs](#).

In a consultation in 2019/20 the Environment Agency sought views on:

1. the challenges that our waters face
2. the choices and changes we all need to make to help tackle those challenges

Further information on the responses received can be found in [the Challenges and Choices consultation summary report](#).

The Environment Agency has worked with LLFAs and other RMAs to develop joint measures to reduce flood risk and improve the wider water environment. Aligning measures also helps to simplify the delivery of outcomes and make it more efficient.

By visiting the [draft RBMPs](#), you can find more information on the objectives and measures for the draft RBMPs.

FRMPs and other plans and strategies

FRMPs are part of a small number of strategic plans that form a framework to manage flooding, coastal change and the wider water environment. These strategic plans:

- are produced by the Environment Agency, LLFAs and other RMAs
- cover different spatial scales for example national, river basin district, coastal cell, or a local area
- are produced for different purposes, such as emergency flood management, strategic flood management or land management
- are both statutory (required by law) or non-statutory

The framework allows for the assessment of risk from all sources of flooding and coastal change. It requires close engagement across all RMAs, to ensure an integrated range of solutions in creating a better place for people and wildlife.

In its 2020 [FCERM Policy Statement](#), the government made a commitment to reform local flood and coastal erosion risk planning by 2026. This is so that every area of England will have a more strategic and comprehensive plan that drives long-term action and investment.

Some of the other main plans in flood and coastal erosion risk management (FCERM) are included in this section, together with a brief description of what they are. These are in addition to the national FCERM Strategy and RBMPs which have been described previously in this document.

Local flood risk management strategies

All LLFAs have a duty under the [Flood and Water Management Act 2010](#) to prepare a local flood risk management strategy (LFRMS) for their area. The LFRMS includes aims and actions to reduce the risk of all sources of local flooding to communities.

Sources of local flooding are:

- surface water
- groundwater
- ordinary watercourses

The LFRMS also includes information such as:

- RMAs within the LLFA's area
- costs, benefits and an assessment of funding sources to manage local flood risk
- how and when the strategy is to be reviewed
- how the strategy contributes to wider environmental objectives

You can find a copy of each LLFAs' LFRMS on their individual websites.

Drainage and wastewater management plans

[Drainage and wastewater management plans](#) (DWMPs) are the new way for organisations to work together to plan for the future of drainage, wastewater and environmental water quality. They are long-term strategic plans which include the actions needed across England to ensure wastewater systems and drainage networks are sustainable and resilient to future pressures. These pressures include population growth and climate change.

A DWMP will be produced for each of the wastewater areas served by water companies in England. Water and sewerage companies will publish draft DWMPs in the summer of 2022.

Shoreline management plans

[Shoreline management plans \(SMPs\)](#) are large-scale assessments of the risks associated with coastal processes.

They help to reduce these risks to:

- people
- the developed, historic and natural environments

They are developed by Coastal Groups, with members mainly from local councils (coast protection authorities) and the Environment Agency. SMPs are non-statutory, policy documents which identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the:

- short-term (0 to 20 years)
- medium-term (20 to 50 years)
- long-term (50 to 100 years)

The Environment Agency is working closely with the Coastal Groups to update all the SMPs covering the English coastline. This is to make sure they remain fit for purpose. The updated SMPs are due to be published in 2023.

Other strategic plans in managing the water environment

Multi-agency flood plans (MAFPs) are non-statutory plans produced by Local Resilience Forums (LRFs). These plans contain information of possible flood sources and areas of risk and the associated emergency response arrangements.

The [National Planning Policy Framework](#) (NPPF) sets out the government's planning policies for England and how these should be applied. This includes how the planning system should consider flood risk and coastal change. It is produced by the Ministry of Housing Communities and Local Government.

[Local plans](#) are statutory plans produced by local planning authorities. They set out the planning policies in a local authority area. They must be consistent with national policies, including the NPPF.

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