

# Flood risk management plan

## Dee river basin district summary

December 2015

### What are flood risk management plans?

Flood risk management plans (FRMPs) explain the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. FRMPs set out how risk management authorities will work with communities to manage flood and coastal risk over the next 6 years. Risk management authorities include the Environment Agency, Natural Resources Wales, local councils, internal drainage boards, Highways England and lead local flood authorities (LLFAs).

Each EU member country must produce FRMPs as set out in the EU Floods Directive 2007. Each FRMP covers a specific river basin district. There are 11 river basin districts in England and Wales, as defined in the legislation. A river basin district is an area of land covering one or more river catchments (the Dee river basin district covers only one catchment). A river catchment is the area of land from which rainfall drains to a specific river.

Each river basin district also has a river basin management plan, which looks at how to protect and improve water quality, and use water in a sustainable way. FRMPs and river basin management plans work to a 6-year planning cycle. The current cycle is from 2015 to 2021. We have developed the Dee FRMP alongside the Dee river basin management plan so that flood defence schemes can provide wider environmental benefits.

### Flood risk in the Dee river basin district

The Dee river basin district covers an area of approximately 2,200km<sup>2</sup>. The majority of the river basin district is in north-east Wales and a smaller part from the River Dee to the east is in Cheshire (see figure 1). The River Dee is approximately 110km long from its source in the Snowdonia National Park to where its estuary meets the sea at Liverpool Bay.

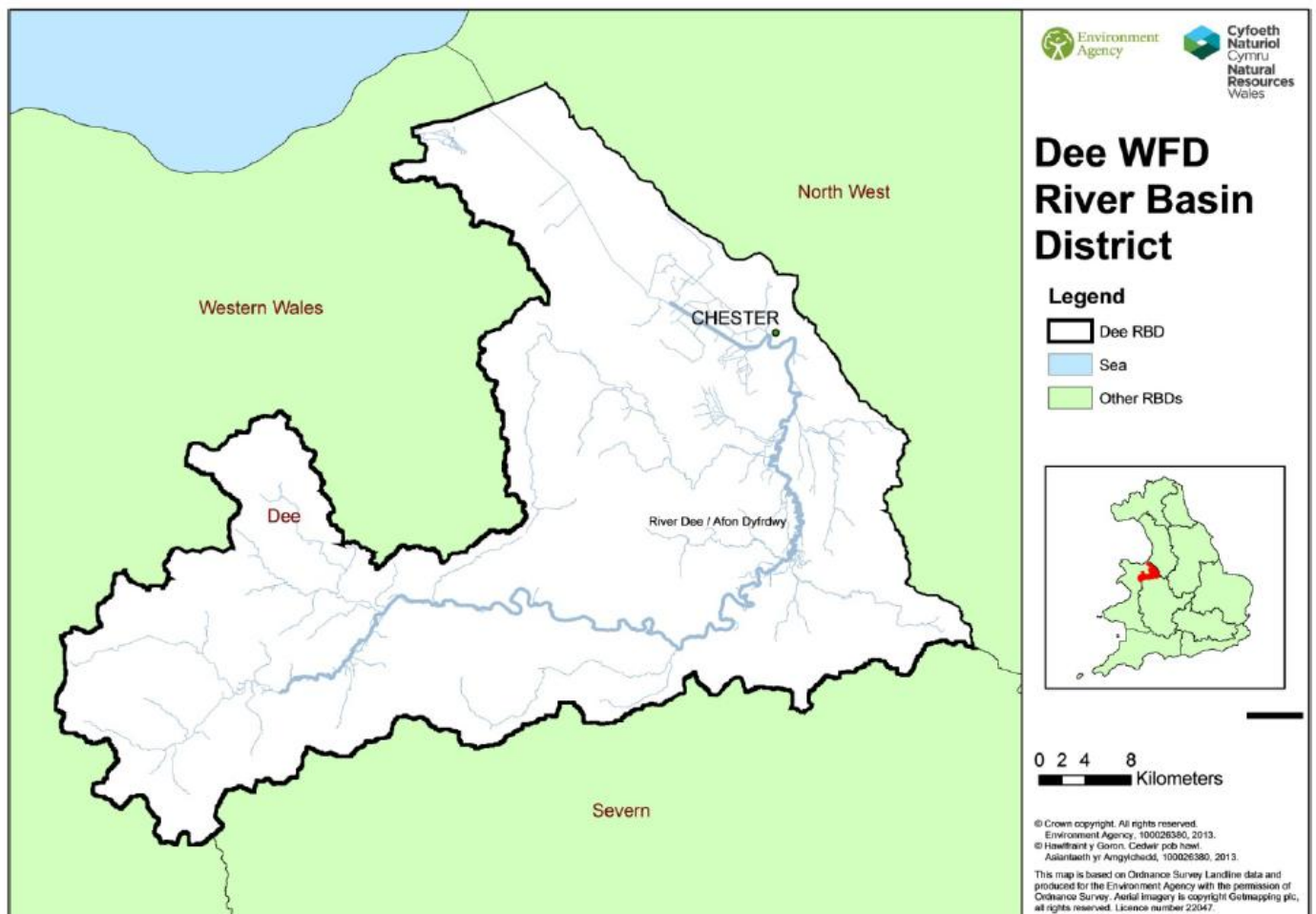
In the Dee river basin district there are approximately 26,400 people at risk of flooding from rivers and the sea. Over 3,000 of these are considered to be at high risk (more than a 1 in 30 chance of being flooded in any year (3.3%)).

Large areas of agricultural land are at risk of flooding, including 5,777 hectares at high risk of flooding. Other areas at risk of flooding include parts of the road and railway networks, and many environmentally designated sites, such as the Dee estuary site of special scientific interest (SSSI).

### Characteristics of the Dee river basin district

The river basin district is made up of a range of landscapes including mountains, steep-sided wooded valleys, the plains of Cheshire and mudflats in the estuary. The varying landscape results in different flooding responses in different areas.

In the west the steep slopes give rise to more rapid run-off and faster flooding responses. Here the catchment is mainly rural, with sheep farming and areas of commercial forest. In the east land slopes more gently and run-off occurs more slowly. Arable farming dominates on the east of the Dee estuary, and around Deeside and Sealand.



**Figure 1** Dee river basin district

Following rainfall events in the upstream upland areas of the catchment, water levels in the Dee can take a few days to peak in the downstream reaches. During very high tides, the river also becomes tidally locked – this is when the level of the incoming high tide stops the river water flowing out to sea. This tidal impact affects the river beyond Chester as far upstream as Farndon.

Frequent flooding in the lower Dee between Bangor-on-Dee and Chester (to the south of Chester) has resulted in very little urban development. The area is extensively used for agriculture, particularly intensive dairy farming on the fertile land in and around Wrexham and on the Cheshire Plain.

Approximately 6% of the catchment is urban with Wrexham, Chester and Deeside being the main towns, where over 60% of the population lives. The tidal section of the River Dee downstream of Chester was straightened in the late 1700s for navigational purposes, enabling urban development on both sides of the river. Changes in land use within the catchment have led to the modification of some rivers and pollution from agricultural run-off and industry.

The areas at highest risk of flooding are the communities situated along the tidal stretch of the river Dee, downstream of Chester. The main flood risk here is from high tide levels; however a combination of high tides and high rainfall can lead to high river levels. Isolated rural properties in the catchment are also at risk of river flooding.

In December 2013, a tidal surge (a very high tide combined with stormy weather) caused flooding along the Dee and Mersey estuaries. Flooding occurred in Chester and there were high water levels at the canal basin at Dee Lock. One business and one residential property flooded due to the tidal surge.

## Existing flood risk management in the Dee

Risk management authorities work closely with local communities to help them prepare for and recover from floods.

Important flood defences in the Dee catchment include:

- the River Dee flood embankments in Chester
- Sealand main drain flood basin at Clifton Drive, Chester
- Finchetts Gutter outfalls and debris screens at Sealand Road in Chester

The Environment Agency, Natural Resources Wales and local councils also manage and reduce flood risk through the planning system. Planning officers use advice from the Environment Agency and Natural Resources Wales to assess new developments to make sure they are appropriate and safe, and will not increase the risk of flooding elsewhere.

Appropriately located and designed woodland can help reduce flood risk. Opportunity mapping is being used to identify and then promote locations where woodland creation can deliver multiple benefits for flood risk, water quality, and the wider environment.

## Roles and responsibilities

Managing flood and coastal risks, and particularly local flood risks, requires risk management authorities to work together.

**Table 1: Roles and responsibilities of risk management authorities in managing risks**

Risk Source	EA / NRW	LLFAs	District	Water Company	Highways Authority	Internal Drainage Boards <sup>2</sup>
Strategic overview for all sources of flooding & coastal erosion	✓					
Main River	✓					
The Sea	✓					
Surface Water		✓				✓
Surface Water (on or coming from the Highway)					✓	
Sewer Flooding				✓		
Ordinary Watercourse		✓	✓			✓
Groundwater		✓				
Reservoirs	✓*	✓*	✓*	✓*	✓*	✓*

\* Please note RMAs have different responsibilities for reservoirs such as regulation, asset management and flood incident response

<sup>2</sup> As of 1 April 2015 in Wales the 3 Internal Drainage Districts that were operated by independent boards were incorporated into NRW in April 2015.

## Objectives of the FRMP

The risk management authorities have agreed social, economic and environmental objectives for 2015 to 2021 following discussion and consultation with other organisations and communities. You can see the objectives for the whole river basin district in section 9 of Part B of the [Dee FRMP](#). There are more detailed

objectives for the English and Welsh parts of the Dee catchment, which you can see in section 10 and 11 of Part B of the FRMP.

- The FRMP objectives build on the aims and objectives in the '[National flood and coastal erosion strategy for England](http://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england)' (www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england).

## Measures for 2015 to 2021

The actions in FRMPs are known as 'measures'. These are specific projects or investigations to work towards achieving the objectives. They explain where and how risk management authorities will focus effort and investment to reduce flood risk.

The measures in FRMPs are grouped under 4 categories: preventing risk, preparing for risk, protecting from risk, and recovery and review. You can read more about the categories in Section 5 of the [Dee FRMP](#).

## Examples from the Dee river basin district for each category

### Preventing risk

Measures in the Dee river basin district to prevent flood risk include:

- ensuring new development is appropriate, safe and does not increase flood risk elsewhere
- identifying reservoirs with a high risk of flooding
- working with local enterprise partnerships to encourage sustainable growth and partnerships in flood schemes

### Preparing for risk

As well as reducing flood risk through schemes and maintenance, risk management authorities will continue to work with communities to help them understand their risk and how to prepare effectively. This is particularly important in 'rapid response areas', where it's not always possible to issue flood warnings in time. Informing and warning communities remains a priority. The Environment Agency and Natural Resources Wales will continue to invest in improving real-time rainfall and river level data to provide a quality flood warning service.

### Protecting from risk

These measures are to reduce the likelihood of flooding affecting people and property in specific locations or in locations that have flooded in the past.

The Environment Agency and local councils will also continue to maintain watercourses that pose the most significant flood risk to people, responding quickly to incidents and clearing obstructions from screens and culverts during heavy rainfall. Along the coast, risk management authorities will implement the Shoreline Management Plan to manage coastal erosion and tidal flooding. The Dee FRMP includes information from [Shoreline Management Plan number 22](http://www.gov.uk/government/publications/shoreline-management-plans-smmps/shoreline-management-plans-smmps) (www.gov.uk/government/publications/shoreline-management-plans-smmps/shoreline-management-plans-smmps).

### Recovery and review

Over the next 6 years, risk management authorities will continue to carry out investigations after flooding, produce a recommendations report and help communities to recover from floods more quickly.

### Further information on measures in the Dee river basin district

You can see a full list of all measures and the categories they relate to in Part B of the FRMP.

## Monitoring progress

There is no guarantee that every measure in the FRMP will be completed. This is because priorities and funding change and new data may become available, which may mean the programme changes.

Over the 6-year cycle, the Environment Agency will monitor implementation and report on progress. All the risk management authorities involved will work together to achieve the objectives, reduce costs and get the best return on investment.

## How we listened to your comments

We consulted on the FRMP from 10 October 2014 to 31 January 2015. As a result of the consultation we have improved the information on existing flood risk management and made clearer links between the FRMP and river basin management plans. We've also shown more clearly how flood management actions help to improve the environment.

## Further information

[Find FRMPs for other river basin districts](https://www.gov.uk/government/collections/flood-risk-management-plans-frmps-2015-to-2021) (https://www.gov.uk/government/collections/flood-risk-management-plans-frmps-2015-to-2021)

[Look at the river basin management plan for your area](https://www.gov.uk/government/collections/river-basin-management-plans-2015) (https://www.gov.uk/government/collections/river-basin-management-plans-2015)

### In England

[Check your current risk of flooding on our live flood warning service](http://www.gov.uk/check-if-youre-at-risk-of-flooding) (www.gov.uk/check-if-youre-at-risk-of-flooding)

[Check your risk of flooding from different sources on our interactive maps](http://www.gov.uk/prepare-for-a-flood/find-out-if-youre-at-risk) (www.gov.uk/prepare-for-a-flood/find-out-if-youre-at-risk)

### In Wales

[Check your current risk of flooding](http://naturalresources.wales/flooding/alerts-and-warnings/flood-alerts-and-warnings) (naturalresources.wales/flooding/alerts-and-warnings/flood-alerts-and-warnings )

[Check your risk of flooding from different sources on our interactive flood risk maps](http://naturalresources.wales/our-evidence-and-reports/maps/flood-risk-map) (naturalresources.wales/our-evidence-and-reports/maps/flood-risk-map)

## Partners

This is a joint plan prepared by the Environment Agency and Natural Resources Wales in partnership.