

# North Devon Catchment Flood Management Plan

Summary Report June 2012



managing  
flood risk

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June 2012

# Introduction

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I am pleased to introduce our summary of the North Devon Catchment Flood Management Plan (CFMP). This CFMP gives an overview of the flood risk in the North Devon catchment and sets out our preferred plan for sustainable flood risk management over the next 50 to 100 years.

The North Devon CFMP is one of 77 CFMPs for England and Wales. Through the CFMPs, we have assessed inland flood risk across all of England and Wales for the first time. The CFMP considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding), which is covered by Shoreline Management Plans (SMPs). Our coverage of surface and ground water is however limited due to a lack of available information.

The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if we are to make the right investment decisions for the future and to help prepare ourselves effectively for the impact of climate change. We will use CFMPs to help us target our limited resources where the risks are greatest.

This CFMP identifies flood risk management policies to assist all key decision makers in the catchment. It was produced through a wide consultation and appraisal process, however it is only the first step towards an integrated approach to Flood Risk Management. As we all work together to achieve our objectives, we must monitor and listen to each others progress, discuss what has been achieved and consider where we may need to review parts of the CFMP.

Flood risk in North Devon is mainly from rivers and surface water, although there is also significant flood risk from tidal flooding in Barnstaple, Bideford and Ilfracombe. In addition to these communities there is also risk to people, property and infrastructure concentrated around Braunton, Combe Martin and Okehampton. Several significant floods have occurred in North Devon, including the Lynmouth flood in 1952. During the autumn 2000 floods severe flood warnings were issued for the lower reaches of the rivers Taw, Torridge and East Lyn.

We cannot reduce flood risk on our own, we will therefore work closely with all our partners to improve the co-ordination of flood risk activities and agree the most effective way to manage flood risk in the future. We have worked with others including: Devon County Council, Natural England, South West Water and the National Farmers Union to develop this plan.

This is a summary of the main CFMP document, if you need to see the full document an electronic version can be obtained by emailing [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk) or alternatively paper copies can be viewed at any of our offices in South West Region.

A handwritten signature in black ink that reads "R. Cresswell". The signature is written in a cursive, flowing style.

Richard Cresswell  
South West Regional Director

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# The purpose of a CFMP in managing flood risk

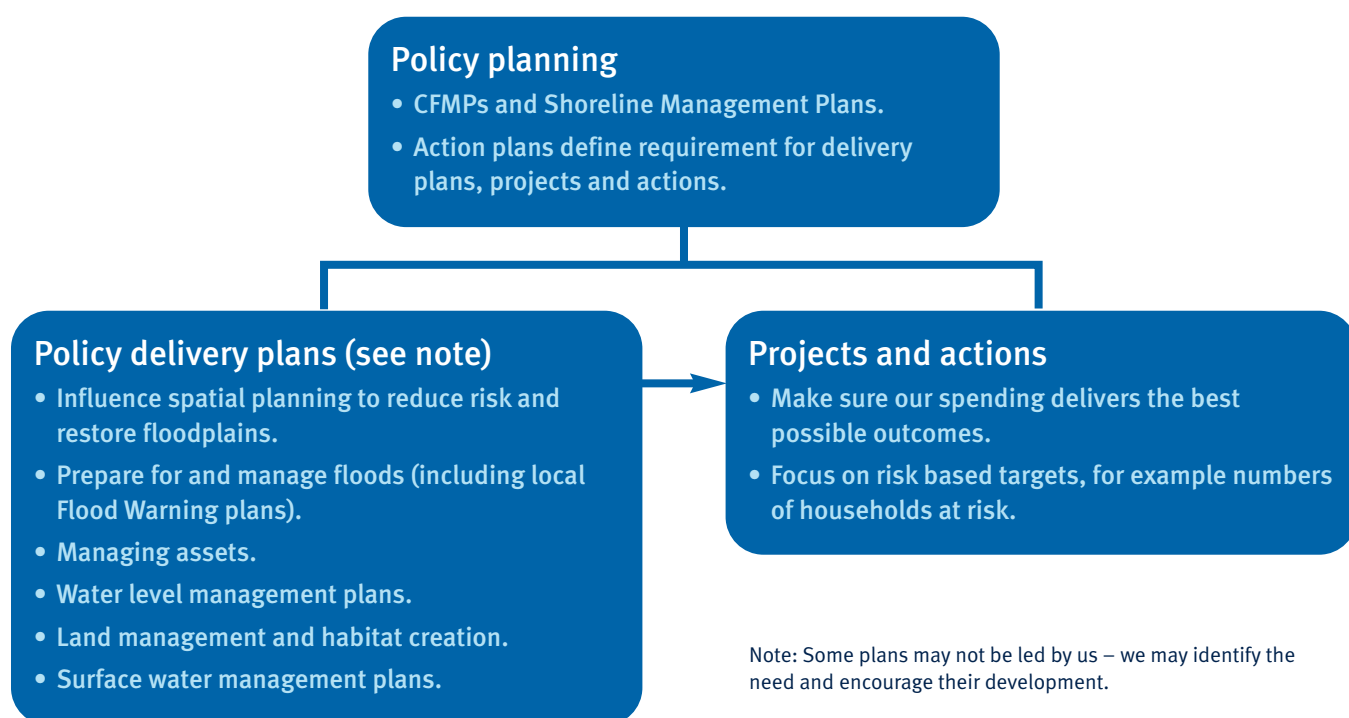
CFMPs help us to understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs should be used to inform planning and decision making by key stakeholders such as:

- the Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- Regional Assemblies and local authorities who can use the plan to inform spatial planning activities and emergency planning;
- Internal Drainage Boards (IDB), water companies and other utilities to help plan their activities in the wider context of the catchment;
- transportation planners;
- land owners, farmers and land managers that manage and operate land for agriculture, conservation and amenity purposes;
- the public and businesses to enhance their understanding of flood risk and how it will be managed.

CFMPs aim to promote more sustainable approaches to managing flood risk. The policies identified in the CFMP will be delivered through a combination of different approaches. Together with our partners, we will implement these approaches through a range of delivery plans, projects and actions.

The relationship between the CFMP, delivery plans, strategies, projects and actions is shown in Figure 1.

Figure 1. The relationship between CFMPs, delivery plans, projects and actions



# Catchment overview

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The North Devon catchment includes the areas drained by the River Taw and its tributaries, the River Torridge and its tributaries, and the North Devon Coastal Rivers that flow directly into the sea.

The North Devon CFMP covers an area of some 2,300 square kilometres (900 square miles).

North Devon is a catchment with varied landscape, including the rare Culm grasslands, marshland, parts of the two National Parks of Exmoor and Dartmoor, and woodlands. Much of the countryside is recognised for its environmental and cultural value including an Area of

Outstanding Natural Beauty (AONB) and 500 Scheduled Monuments. There are many other ecologically, socially and historically important sites in the catchment and a network of good quality river courses, with six Special Areas of Conservation (SAC) and 62 Sites of Special Scientific Interest (SSSI).

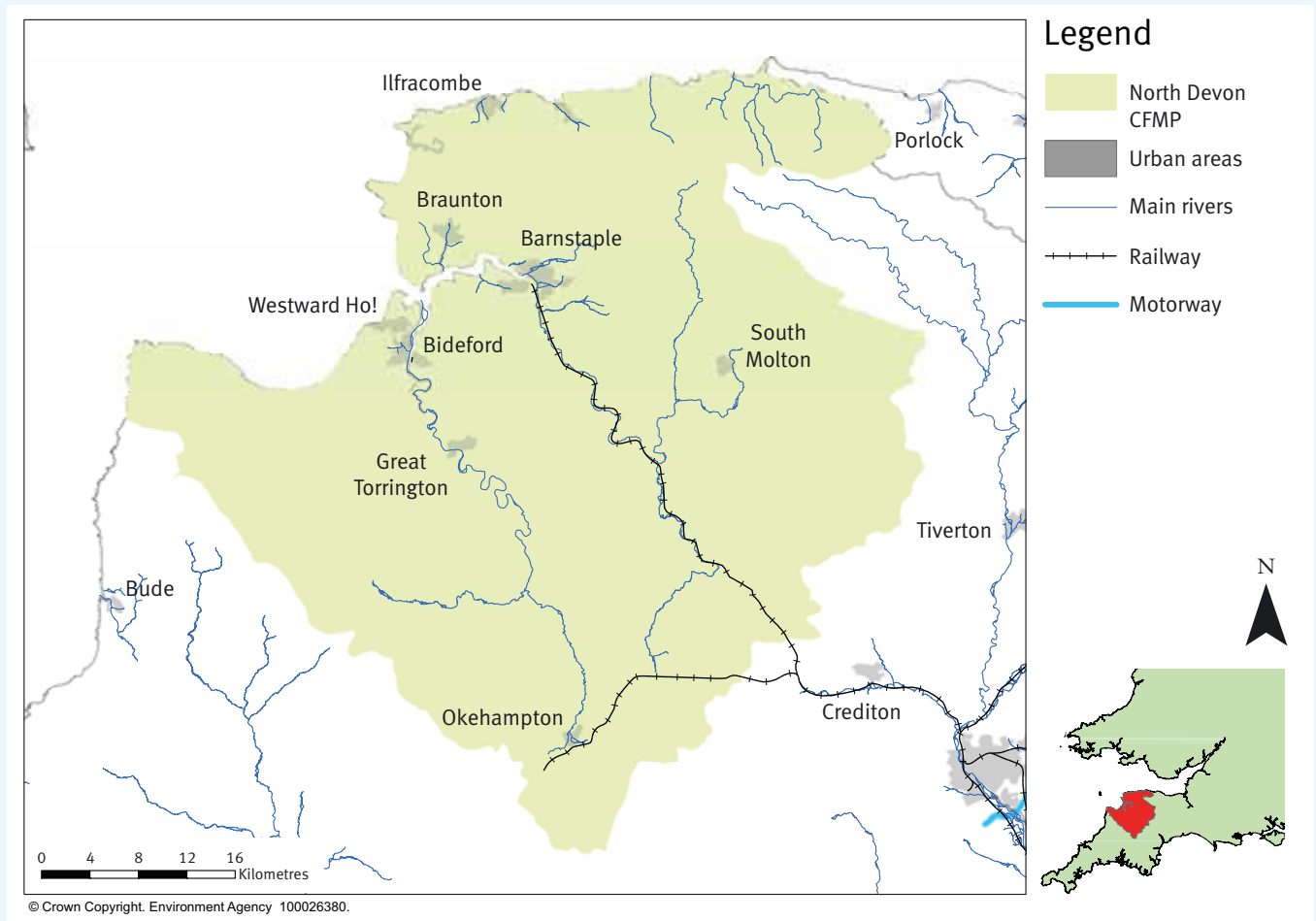
The main urban areas are Barnstaple, Bideford, Braunton, Combe Martin, Great Torrington, Ilfracombe, Lynton and Lynmouth, North Tawton, Okehampton and South Molton. These densely populated towns are surrounded by a mostly rural catchment with properties scattered over the area.

Steeply sloping tributaries drain from the high ground of Exmoor and Dartmoor to the low-lying Taw and Torridge estuary, or, for the small coastal catchments, directly to the sea. Annual rainfall ranges from more than 2,300mm (90in) in the upland areas of Dartmoor and Exmoor to 800mm (31in) at the coast. The England and Wales average is 920mm (36in).

Much of the countryside is recognised for its environmental and cultural value



Map 1. Location and extent of the North Devon CFMP area



← Blocking ditches with peat dams to increase water storage.

*Photograph courtesy of Exmoor National Park*

# Current and future flood risk

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## Overview of the current flood risk

Flood risk in North Devon comes from river, surface water and tidal flooding.

Several sites with environmental designations are affected by flooding.

A flood warning system is in place for the larger towns in the Taw, Torridge and North Devon Coastal catchments. Elsewhere, there are several towns along smaller tributaries and rivers that have no flood warning service.

Several significant floods have occurred in North Devon, including the Lynmouth flood of 1952, which resulted in 34 fatalities. During the autumn 2000 floods, severe flood

warnings were issued on the rivers Taw, Torridge and East Lyn, and more than 100 properties in Barnstaple were affected by flooding.

Surface water flooding causes more frequent small floods, affecting a small number of properties. Many of the more rural areas may flood regularly, affecting isolated properties, communities and agricultural land.

## What is at risk?

In total, some 4,508 properties (5% of all properties) are at risk of flooding from a 1% annual probability flood, although 628 of these are defended to this standard. This includes risks to schools, nurseries and health centres.

In Okehampton, the consequences of flooding may be high due to the flashy nature of its rivers and the high social vulnerability, notably high proportion of elderly residents. Other high risk groups include caravan park residents such as at South Molton.

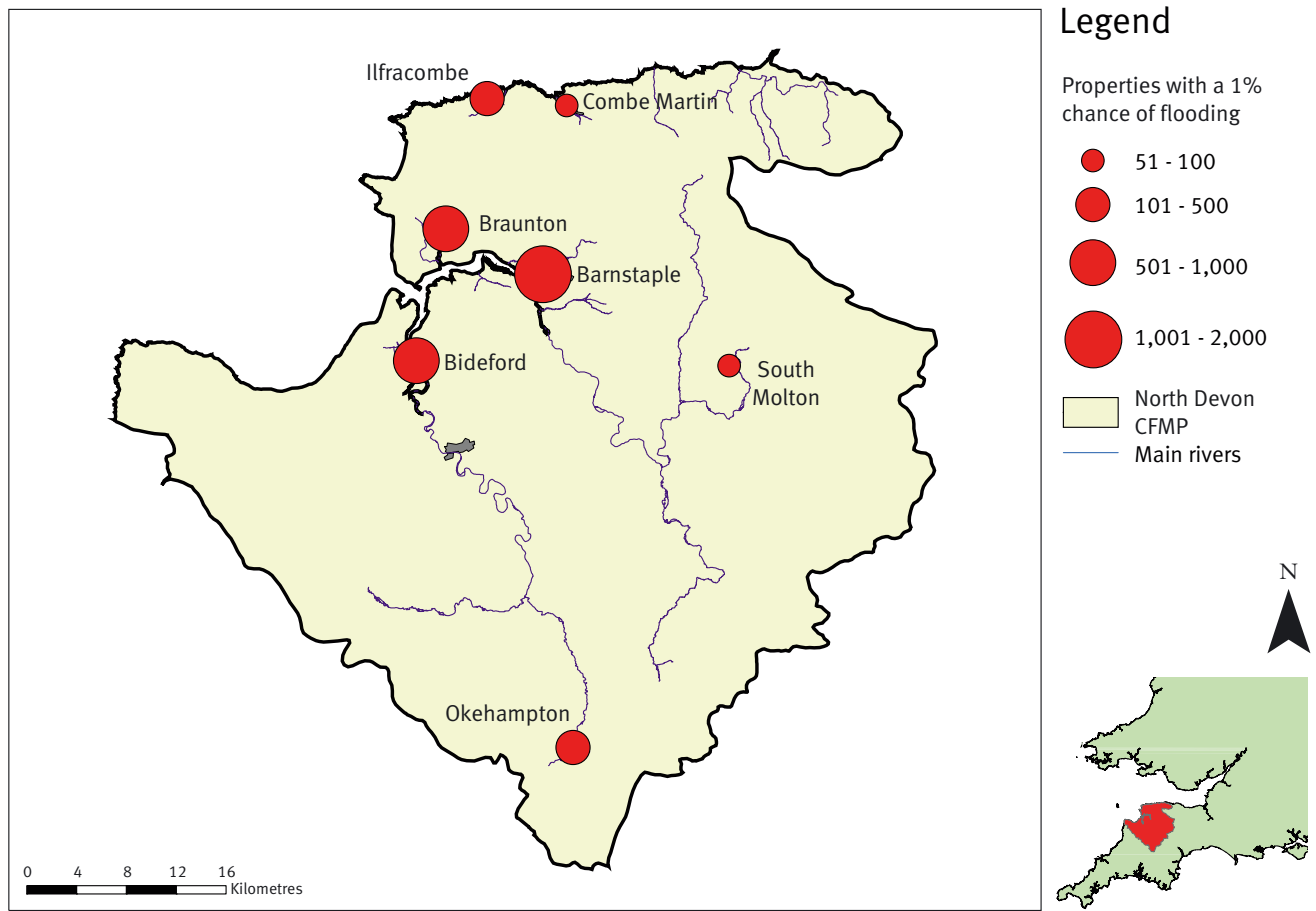
Six Special Areas of Conservation (SACs) along with 18 Sites of Special Scientific Interest (SSSIs) are at risk from flooding.

In addition nine Scheduled ancient monuments are located in the 1% annual probability flood extent.

**‘The night of 10/11th September, Barnstaple. Heavy rain such that streets were flooded. Dead birds were found in North Walk, having been washed out of the trees.’ 1885**



**Map 2. Flood risk to property in a 1% annual probability river flood, taking into account current flood defences**



**Table 1. Locations of towns and villages with 100 or more properties at risk in a 1% annual probability river flood**

Number of properties at risk	Locations
1,000 to 2,000	Barnstaple
500 to 1,000	Bideford, Braunton
250 to 500	None
100 to 250	Ilfracombe, Okehampton

**Table 2. Critical infrastructure at risk:**

14 electricity substations, 25.5 km of railway lines, 19.5 km of A roads
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## Where is the risk?

The distribution of potential flood risk from rivers and tides is illustrated in Map 2 for a flood with a 1% annual probability (0.5% for tides) of occurring or being exceeded.

The greatest concentration of properties at risk of flooding is at Barnstaple. Here some 1,900 properties are at risk from river and tidal flooding. This is set to increase due to rising sea levels.

The greatest concentrations are at Bideford and Braunton, with 800 and 500 properties at risk of flooding respectively. Again this is a combination of tidal and river flooding risks.

In addition to these locations, there are risks of surface water flooding, which can be deep and fast flowing, across much of the catchment. However, further studies following on from the CFMP are needed by us and our partners to quantify this potential risk.

## How we currently manage the risk

Our activity is prioritised on a risk basis. Our main activities include:

- Flood risk mapping – A major part of the programme is Flood Zone Improvements and Hazard Mapping. This is focused on improving the mapping at high-risk locations.
- Managing development – Our development control team supports the planning process by ensuring that new developments have the appropriate flood risk assessments and follow PPS25 (Government Planning Policy Statement on Flood Risk).
- Flood warning – A warning system is in place for several of the larger towns such as Barnstaple, Bideford and Braunton. Major Incident Plans have been developed for Bideford, Barnstaple and Ilfracombe.
- Flood defence schemes – We have flood defence schemes in Barnstaple, Bideford, Braunton, Landkey and Lynmouth.
- Maintenance – We maintain, monitor and operate defence structures. We also have an annual maintenance programme which includes channel maintenance and weed-cutting to ensure efficient flow in rivers. Other operating authorities also carry out similar works.



← Houses at Lynmouth devastated by floods from the East and West Lyn rivers in August 1952. The floods claimed 34 lives and left hundreds of people homeless after 23cm (9in) of rain fell on Exmoor in 24 hours

## The impact of climate change and future flood risk

Climate change will result in increased peak river flows from higher winter rainfall, more summer thunderstorms and in rising sea levels, which all add to increased flood risk. Land use and management changes, together with urban development in the catchment, will also affect the frequency and magnitude of flooding.

Climate change is likely to be the main factor influencing future increase in flood risk in most places.

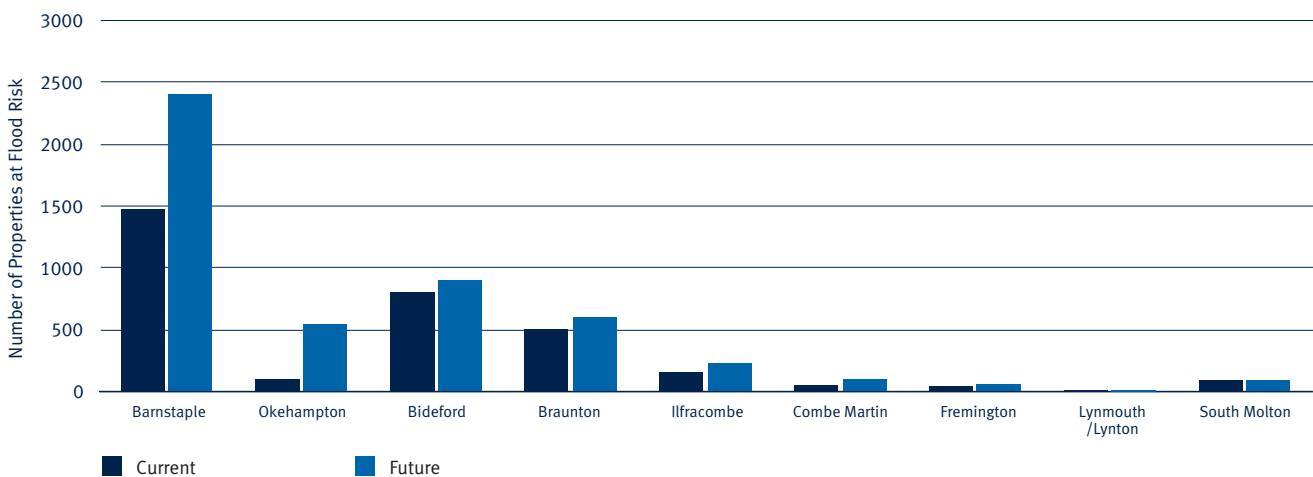
For the North Devon CFMP the future scenario used was as follows:

- 36% increase in peak flows due to the effects of land use (16%) and climate change (20%)
- a total of 500mm sea level rise by 2100.

The sensitivity testing undertaken for the catchment has shown that, in addition to climate change, changes in architectural land use and land management will have a significant impact on peak flows. Urban development is unlikely to have a large impact.

The main urban areas of Barnstaple and Bideford would see most properties affected in the future (see Figure 2).

**Figure 2. Current and future (2100) flood risk to property from a 1% annual probability river flood, taking into account current flood defences**



# Future direction for flood risk management

## Approaches in each sub-area

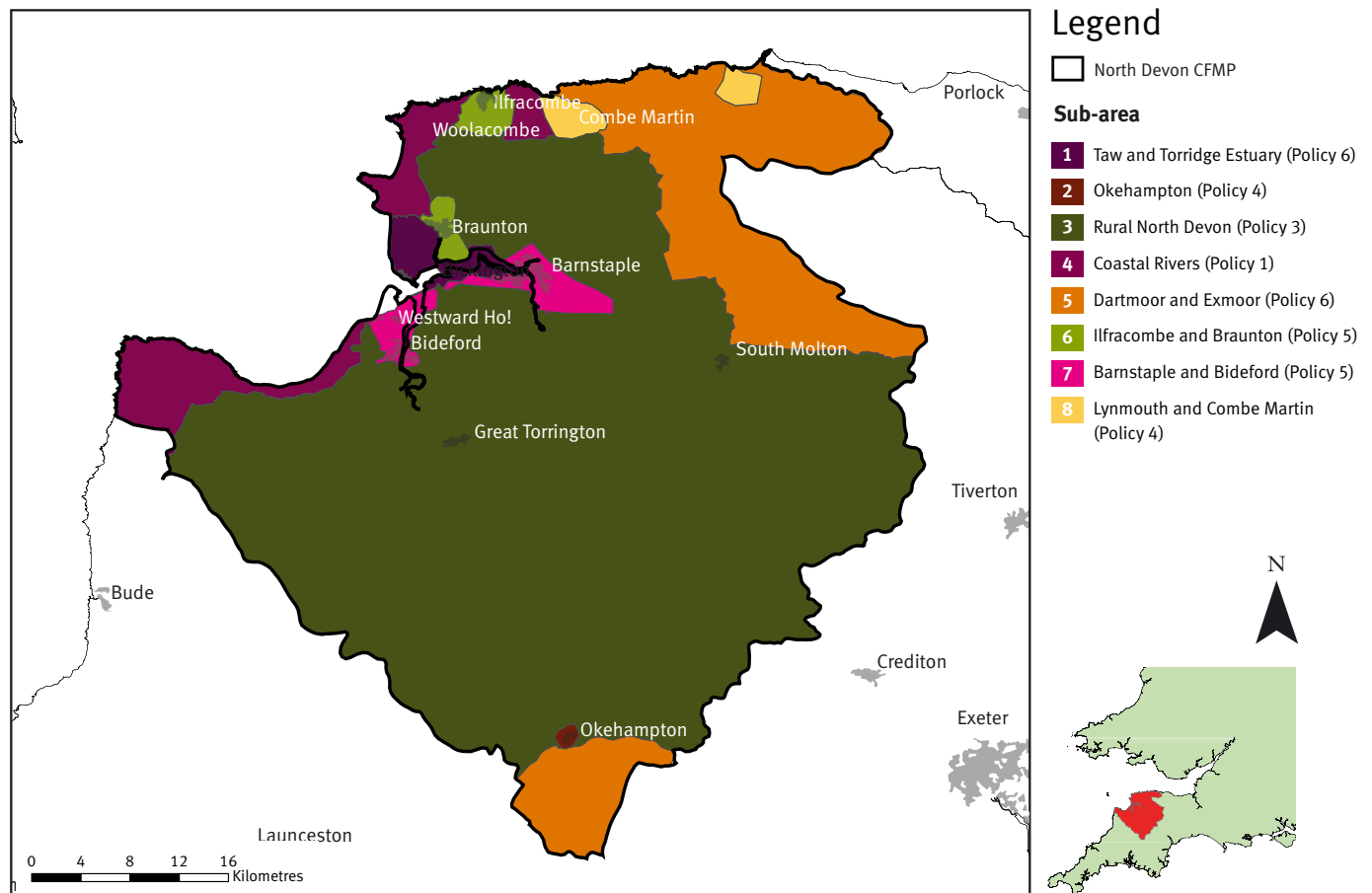
We have divided the North Devon catchment into eight distinct sub-areas which have similar physical characteristics, sources of flooding and level of risk. We have identified the most appropriate approach to managing flood risk for each of the sub-areas and allocated one of six generic flood risk management policies, shown in Table 2.

To select the most appropriate policy, the plan has considered how social, economic and environmental objectives are affected by flood risk management activities under each policy option.



↑ A house at Taddiport marooned by the River Taw in October 2000 *Photo: Clare Kendall*

**Map 3. North Devon sub-areas**



**Table 3. Policy options**

### **Policy 1**

**Areas of little or no flood risk where we will continue to monitor and advise**

This policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible.

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### **Policy 2**

**Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions**

This policy will tend to be applied where the overall level of risk to people and property is low to moderate. It may no longer be value for money to focus on continuing current levels of maintenance of existing defences if we can use resources to reduce risk where there are more people at higher risk. We would therefore review the flood risk management actions being taken so that they are proportionate to the level of risk.

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### **Policy 3**

**Areas of low to moderate flood risk where we are generally managing existing flood risk effectively**

This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

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### **Policy 4**

**Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change**

This policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future. In this case we would need to do more in the future to contain what would otherwise be increasing risk. Taking further action to reduce risk will require further appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

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### **Policy 5**

**Areas of moderate to high flood risk where we can generally take further action to reduce flood risk**

This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

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### **Policy 6**

**Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits**

This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off. The policy has been applied to an area (where the potential to apply the policy exists), but would only be implemented in specific locations within the area, after more detailed appraisal and consultation.

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# Taw and Torridge Estuary

## Our key partners are:

North Devon Council

Torridge District Council

Biosphere Partnership

Taw-Torridge Estuary Partnership

Natural England

National Farmers Union

Country Landowners Association

## The issues in this sub-area

The area includes the River Torridge up to the vicinity of the old road bridge and comprises the River Taw from its confluence with the River Caen up to its confluence with the River Yeo.

The number of people exposed to flooding now and in the future is very small and the estimated damages are low. Potential environmental benefits are therefore considered to outweigh the economic considerations.

The current number of properties at risk in the 1% annual probability flood event is 4,179. This is expected to increase to 5,600 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 6** - we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

There is the opportunity to improve the environmental status of the Taw and Torridge Estuary by removing the embankments and improving river and floodplain connectivity. Other sites also stand to benefit from having more river water present for longer periods of time. In particular Braunton Swanpools SSSI and Greenways and Freshmarsh, Braunton SSSI have habitats that would benefit from additional freshwater.

In addition, increased storage in the estuary could help to reduce flooding in areas further upstream on the River Taw and River Torridge in Barnstaple and Bideford.

## Proposed actions to implement the preferred policy

- Develop Flood Risk Management Strategy based on a review of the current maintenance activities. This includes modelling in areas of particular interest to investigate the potential impact of changes in maintenance.

- Investigate the managed realignment of the coast along the Taw-Torridge Estuary. Analyse existing modelling results and carry out new more targeted modelling (2d) and mapping work to identify the potential locations and to investigate the impact of the realignment on flood risk and the environment.
- Ensure spatial planning and development does not increase flood risk. The Local Development Framework should designate floodplains and wetland areas as functional floodplain to restrict inappropriate development and facilitate environmental enhancement. This could also be tied to the provision of green infrastructure.
- Investigate ways in which people can be moved out of flood risk areas. This applies particularly as housing deteriorates over the longer term.
- Improved flood forecasting and advice, making use of new technology as it becomes available.
- Engage the local partners and the community in increasing flood awareness.
- Combined tidal and fluvial, wave action and tidelocking risks need to be assessed at Taw/Torridge, Appledore and Instow.

# Okehampton

## Our key partners are:

West Devon District Council

Natural England

Landowners

National Farmers Union

Department for Environment, Food and Rural Affairs (Defra) Catchment Sensitive Farming

## The issues in this sub-area

Okehampton is the main settlement in the upper Torridge catchment. The East and West Okement rivers meet in the centre of the town.

At present there is a high standard of protection from defences which together with improvements to flood warning services will effectively protect over 75 per cent of the population at risk from a one per cent annual probability flood. Although 200 people remain at risk, the risk to life could be considerably reduced through improvements of the flood warning services.

The current number of properties at risk in the 1% annual probability flood event is 101. This is expected to increase to 550 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 4** - we are already managing the flood risk effectively, but we may need to take further actions to keep pace with climate change.

As Okehampton is densely populated with high social vulnerability, particularly due to its elderly population, the focus of the policy is to address social and economic impacts of flooding. West Devon planners should ensure that any redevelopment within areas at risk of flooding does not increase the vulnerability of development to flooding. All development must include adequate flood warning and evacuation procedures. Particular attention should be made the vulnerability of elderly residents in the town.

## Proposed actions to implement the preferred policy

- Improve modelling and mapping to assess current and future flood risk. This should involve detailed modelling of the East and the West Okement including all structures.
- Based on the modelling study, investigate works required to achieve the appropriate standard of protection. Implement schemes if appropriate.

- Improve flood warning services, in particular by making use of new technologies. Increase flood awareness, improve incident management and emergency response but also self help.
- Improve awareness and resilience for locations at risk of fast onset flooding with deep and fast flows, and assess if works to reduce flood risk are possible.
- Investigate opportunities to increase floodplain storage and attenuation by naturalise the river systems, creation of wet woodland along the river, hedgeplanting across the floodplain and other measures on the East and West Okement upstream of the main urban area.
- Ensure spatial planning and development does not increase flood risk. In particular, planners should ensure appropriate use types for risk areas and development includes warning and evacuation procedures, where appropriate.
- Ensure that all new developments are fitted with Sustainable Drainage Systems. This may require support from a land use planning policy, as well as support through planning decisions.

# Rural North Devon

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## Our key partners are:

Torridge Devon District Council

Mid Devon District Council

West Devon District Council

North Devon Council

Exmoor National Park Authority

Devon County Council

Natural England

Wildlife Trusts

Southwest Forests

## The issues in this sub-area

Rural North Devon covers the majority of the Taw and Torridge catchments, excluding the tidal areas. This is a large, mainly rural area with a number of small settlements, including Brayford, South Molton, Hatherleigh, North Tawton and Umberleigh.

The number of people at risk is small and the economic damages are low compared to the size of the area. There are pockets of high socio-economic risk and so a blanket approach for the whole area is not applicable. A large proportion of the properties at risk and the people living there belong to the Mill on the Mole Residential caravan park at South Molton. Measures such as relocation from the floodplain would reduce the number of people at risk and should be facilitated by the land use planning system.

The current number of properties at risk in the 1% annual probability flood event is 167. This is expected to increase to 179 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 3** - we are generally managing in the flood risk effectively.

For the majority of the area where the risk is low, existing flood risk management could be significantly reduced. Allowing increased flooding should bring environmental enhancements and reduced flood risks downstream.

In the areas of high socio-economic risk, the continuation of the current and alternative actions is required to provide protection from increased future flooding. Land use planning should seek to reduce the number of people and vulnerability of property at risk in these areas.

## Proposed actions to implement the preferred policy

- Outside of towns and villages, review the current maintenance and Flood Risk Management activities to identify where they can be reduced to allow the floodplain to naturalise with potential biodiversity benefits and where the continuation of the current activities is appropriate.
- Take actions to reduce the impact of flooding through improved flood warning in the areas identified as high risk areas.
- Identify measures to protect or relocate the industrial sites at North Tawton and Great Torrington.
- Reduce risk in the long-term through spatial planning. Specifically;
  - seek to include policies into LDF's that reduce risk in industrial areas as they are redeveloped. Either incorporating flood resistant design as they are redeveloped, or through the relocation of sites.
  - Investigate ways in which the caravan park at South Molton can be moved out of the risk area.
- Promote and influence improved land management practices to reduce Flood Risk Management activities currently carried out in areas of high socio-economic risk and deliver biodiversity benefits. This will include a review of the existing knowledge and might also include field scale trials to quantify changes in run-off.
- Work with partners to identify locations where afforestation and Culm restoration could help manage flood risk thereby reducing the FRM in areas of high socio-economic risk.



↑ Flood waters race through Umberleigh in 2000

# Coastal Rivers

## Our key partners are:

North Devon Council

Torrige District Council

Exmoor National Park Authority

Devon County Council

Tourist Information Centres

## The issues in this sub-area

The three coastal areas cover a large part of the Torrige District Council and North Devon Council's coast. They comprise a number of small watercourses, including the Abbey River, which drain direct to the sea.

The areas are predominantly rural with dwellings widely scattered over the area, and include the main settlements of Croyde and Berryarbor.

The current number of properties at risk in the 1% annual probability flood event is 429. This is expected to increase to 567 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 1** - we will continue to monitor and advise.

The small number of people at risk and low damages now and in the future, together with relatively natural rivers which are environmentally rich, make any active intervention unnecessary.

The catchments respond rapidly to rainfall. The flood watch service will be maintained to reduce the risk to life for the few people at risk.

Consequences of the preferred approach are that flood risk will increase in the future but without significant change to the impacts on people, properties and related damages. The rivers will maintain a natural regime.

## Proposed actions to implement the preferred policy

- Continue to provide flood watch services and advise communities on the risk of fast onset flooding.
- Ensure spatial planning and development does not increase flood risk. Land use planners should seek to ensure that there are no increases in numbers of people or property at risk of flooding and floodplains should be designated as functional floodplains within Local Development Frameworks.
- Continue to give advice on land management in particular river bank management and the protection of vegetated buffer zones.



# Dartmoor and Exmoor

## Our key partners are:

Exmoor National Park

Dartmoor National Park

West Devon District Council

North Devon Council

Landowners and farmers

Natural England

## The issues in this sub-area

The two sub-areas cover sections of the Dartmoor and Exmoor National Parks, including the settlements of Sticklepath (River Taw), South Zeal, Challacombe (River Bray) and North Molton (River Mole).

These are large rural areas with a small number of properties at risk now and in the future. They have unique environmental status. Designated environmental sites within the sub-areas are all water loving and need large quantities of water to maintain existing habitats in good condition. Increased flooding will enhance the existing habitats and can help to create new habitats. Increased flooding through the storage and attenuation of water (similar to the MIRE project) could also help limit the future risk to life and economic damages.

## The vision and preferred policy

**Policy Option 6** - we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

The chosen policy offers the opportunity to make space for water and to improve the environmental status of these designated areas.

It is likely that the number of people at risk would not fall significantly below 210 in Dartmoor and 250 in Exmoor.

By increasing flood storage in isolated areas it will be possible to benefit areas downstream where the risk is higher.

## Proposed actions to implement the preferred policy

- Monitor performance of existing local protection schemes.
- Identify local measures, such as self help, flood storage in upstream areas, and green corridors for settlements where the socio-economic risk is high to ensure that risk is not increased.
- Ensure third party flood risk structures are maintained.

- Investigate opportunities to increase floodplain storage and attenuation by naturalising the river systems, creation of wet woodland along the river, hedgeplanting across the floodplain and other measures..
- Review current maintenance and flood risk management activities on Exmoor to identify where they can be reduced to allow the floodplain to naturalise with potential biodiversity benefits.
- Improve awareness and resilience in communities at risk of fast onset flooding with deep and fast flows, and assess if works to reduce flood risk are possible.
- Ensure spatial planning and development does not increase flood risk. Land use planners should designate all floodplain areas, wetland and wet habitat areas as functional floodplain.
- With partners, investigate opportunities to store and attenuate surface water particularly by using naturalistic features in order to reduce flooding downstream of Exmoor.

# Ilfracombe and Braunton

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## Our key partners are:

Devon County Council

North Devon Council

South West Water

Natural England

Landowners

Farmers

## The issues in this sub-area

The sub-area includes the whole of the East and West Wilder catchments, the adjacent catchment of the Hele Valley Stream, the villages of Knowle and Braunton on the River Caen, Chivenor on the River Taw and Wrafton on the Knowle Water.

The current flood risk to Ilfracombe could significantly increase in the future. There are areas of high social vulnerability adjacent to the watercourses and within the areas at flood risk. There is currently no adequate flood protection scheme in place. The number of people at risk can seasonally increase through tourism.

The current number of properties at risk is 655 in the 1% annual probability flood event. The number of properties is expected to increase to 814 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 5** - we can generally take further action to reduce flood risk.

The current flood risk management at Braunton is inadequate, exposing a large number of people to flooding (22 per cent of the population are currently at flood risk). This number could increase further in the future which must be addressed in the Local Development Framework. There is currently a high risk to critical infrastructure such as schools/nurseries and surgeries/health centres which could increase further in the future.

Further improvements to the defences at Braunton could effectively protect people at risk from increased flood risk in the future. Upstream floodplain storage will also help to reduce the risk from river flooding. Along with other actions, the number of people at risk in the Braunton area would be reduced significantly.

Defences on the East and West Wilder in Ilfracombe designed to a 1% annual probability standard of protection could continue to effectively protect people at risk from increased flood risk in the future.

## Proposed actions to implement the preferred policy

- Investigate flood risks at Braunton through improved modelling and mapping. This should involve detailed modelling of the River Caen.
- Investigate options at Braunton to achieve the appropriate standard of protection and, where identified, implement schemes.
- Implement a flood warning service. Increase flood awareness, improve incident management and emergency response and encourage self help.
- Reduce risk in the long term through spatial and development planning. Ensure that all new developments are fitted with Sustainable Drainage Systems and work with partners to retrospectively fit Sustainable Drainage Systems in problem areas.
- Improve awareness and resilience in communities at risk of fast onset flooding with deep and fast flows. Assess if works to reduce the flood risk are possible.
- Investigate opportunities to increase floodplain storage and attenuation in particular between Braunton and Knowle and upstream of Knowle.
- Investigate opportunities to store and attenuate surface water flows particularly by using naturalistic features. This particularly applies to the upper catchments of the East and West Wilder and Hele Stream upstream of the main urban areas.
- With Natural England and others promote and influence improved land management practices to help reduce flood risk in the urban areas and deliver biodiversity benefits such as woodland planting in the upper parts of the valleys.
- Investigate the requirements for further work to reduce flood risk, and implement Schemes where appropriate. System Asset Management plans will assess flood risk maintenance with the aim to reduce flood risk in the policy unit and will include environmental constraints and targets.



↑ Flooding from the River Caen at Caen Street in Braunton in the 1930s

# Barnstaple and Bideford

## Our key partners are:

Devon County Council

Torridge District Council

North Devon Council

South West Water

Tourist Information Centres

## The issues in this sub-area

The area covers the River Taw from Barnstaple to Bishops Tawton. This includes Fremington, Yelland and Bishops Tawton. It includes the River Yeo up to Raleigh, Bradiford Water up to Westaway and the River Landkey up to Swimbridge. It also covers Bideford, Northam, Westward Ho!, Appledore and Instow.

The flood risk is currently well managed although a relatively high number of people remain at risk from large floods, such as the 1% annual probability flood. The associated damages are high. Further improvements are considered necessary to reduce the flood risk now and to address increased flooding in the future.

The current number of properties at risk in the 1% annual probability flood event is 2,656 ignoring defences. The number of properties is expected to increase to 3,314 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 5** - we can generally take further action to reduce flood risk.

Through the upgrade of the defences to a 0.5% annual probability standard of protection, if this is feasible and cost beneficial, and with local protection measures and other flood risk management activities, the number of people at risk could fall significantly to 2,500 people in the Barnstaple area and to 1,300 in the Bideford area.

Improved flood warning services together with updated Major Incident Plans will help minimise the risk to life and the economic impacts of flooding.

Land use planning can also further reduce the consequence of flooding to the major towns.

## Proposed actions to implement the preferred policy

- Investigate the impact of combined fluvial and tidal flooding and tidal locking. This includes work to existing defences and requirements for new schemes. Assess measures such as the re-alignment of embankments in the Taw-Torridge estuary and increased flood

storage and attenuation in the Rural North Devon sub-area.

- Investigate requirements for further work to the existing defences using the findings of the existing modelling and mapping. Investigate the requirements for and implement new schemes.
- Improve the flood warning services in particular by use of new technologies. Increase flood awareness, improve incident management and emergency response but also self help.
- Ensure spatial planning and development does not increase flood risk. It is essential that the land use planning system supports the reduction in consequences of flooding in Barnstaple and Bideford, including adaptation to climate change.
- Investigate ways in which people can be moved out of the flood risk areas, especially through the Local Development Framework.
- Ensure that all new developments are fitted with Sustainable Drainage Systems to control surface water run-off. Work with partners to retrospectively fit SuDS in problem areas.
- Investigate opportunities to store and attenuate surface water flows particularly using brownfield sites. This particularly applies to drainage from roads.



↑ A fire crew pumps out flooded homes in a Barnstaple street in December 1981



# Lynmouth and Combe Martin

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## Our key partners are:

North Devon Council

Natural England

English Heritage

National Farmers Union

Defra Catchment Sensitive Farming

## The issues in this sub-area

The area covers the River UMBER catchment, including the town of Combe Martin. To the east, Lynmouth and the catchments of the East and West Lyn catchments are included as far as the villages of Barbrook and Watersmeet. The Hoarok and Farley's Water are also included up to Bridge Ball.

The devastating flood of 1952 is testament to the destructive and deadly force of the rivers in this area and therefore protection needs to be provided.

The current number of properties at risk in the 1% annual probability flood event is 132. The number of properties is expected to increase to 175 in the future 1% annual probability flood event.

## The vision and preferred policy

**Policy Option 4** - we are already managing the flood risk effectively, but we may need to take further actions to keep pace with climate change.

The already high standard of protection of the existing defences at Lynmouth ensures that a high proportion of the population is protected and will continue to be protected in the future.

For Combe Martin, a densely built area with many properties close to the river, protection from flooding is critical as many properties are at risk. Improvements to the existing defences together with some localised protection measures will effectively protect people in the future.

Improvements to the flood warning service would help reduce the risk to life for those remaining at risk, as well as the high number of tourists who visit the area.

There should be no significant impact on the existing environmental features within the area as the channel is in places already heavily engineered.

## Proposed actions to implement the preferred policy

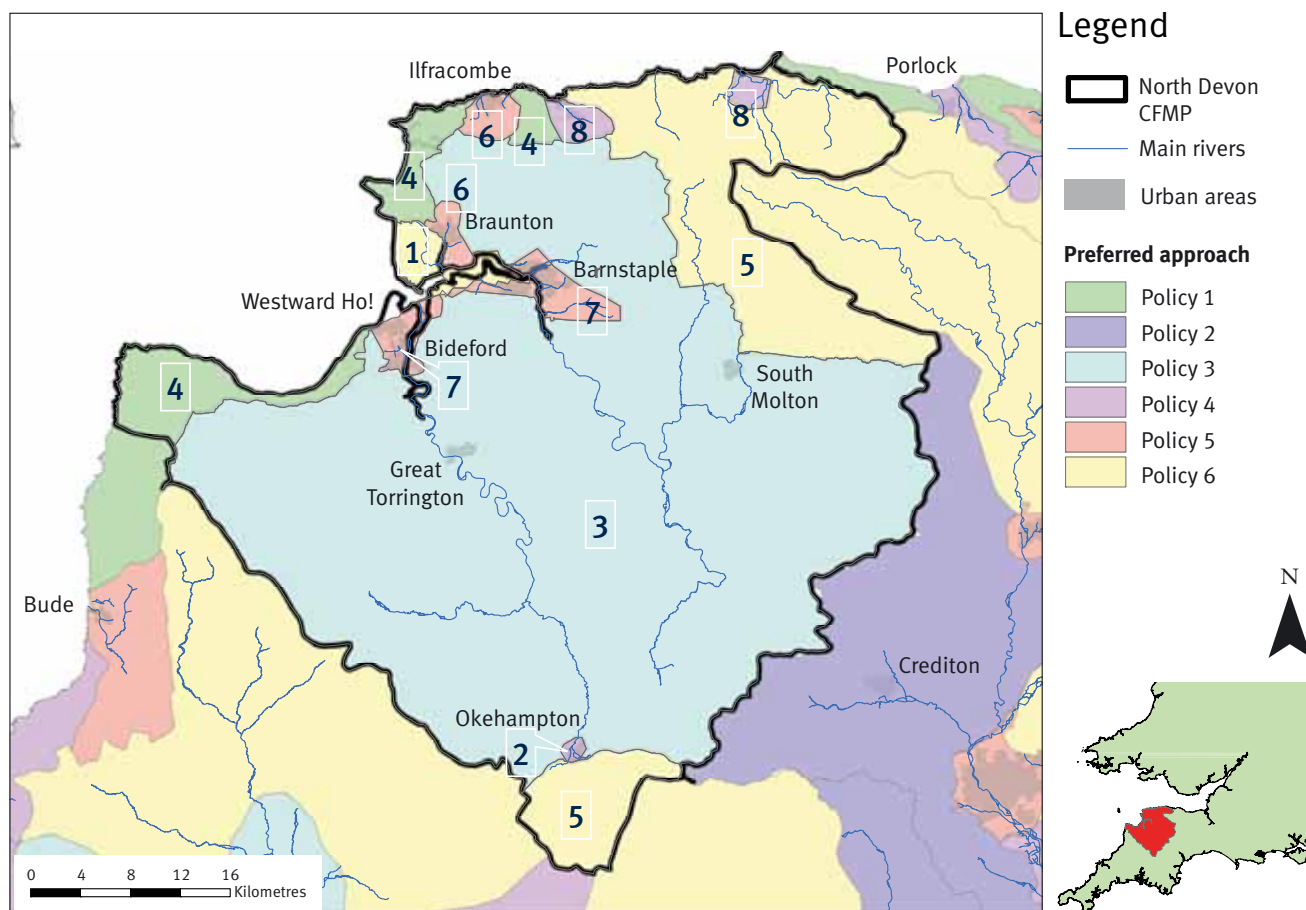
- Investigate the requirements for further work to sustain the current level of flood risk in Combe Martin. Where appropriate implement identified schemes.
- Investigate the current and future flood risk at Lynmouth through improved modelling and mapping.
- Investigate the requirements for further work in Lynmouth to maintain the current standard of protection. Where appropriate, implement identified schemes.
- Implement an improved flood warning service and increase flood awareness, improve incident management and emergency response, and self help. Improve awareness and resilience in communities at risk of fast onset flooding with deep and fast flows, and assess if works to reduce the flood risk are possible.
- Ensure spatial planning and development does not increase flood risk. Land use planning needs to ensure that it contributes to a reduction in number of people and property at risk, especially in Combe Martin. Work with partners to retrospectively fit Sustainable Drainage System in Combe Martin. Across the area, ensure that all new developments are fitted with Sustainable Drainage Systems.
- Investigate ways in which people can be moved out of the flood risk areas, especially within the Local Development framework.
- Investigate opportunities to increase floodplain storage and attenuation on the rivers UMBER, East and West Lyn. Investigate opportunities to store and attenuate surface water flows particularly by using naturalistic features and woodland planting.
- Promote and influence improved land management practices to help reduce flood risk in Combe Martin and deliver biodiversity benefits such as woodland planting in the upper parts of valleys.



↑ A car crushed by the August 1952 floods in Lynmouth – our plan aims to reduce the risk of floods like these

# Map of CFMP policies

Map of the policies in the North Devon catchment



## The sub-areas

- 1 Taw and Torridge Estuary
- 2 Okehampton
- 3 Rural North Devon
- 4 Coastal Rivers
- 5 Dartmoor and Exmoor
- 6 Ilfracombe and Braunton
- 7 Barnstaple and Bideford
- 8 Lynmouth and Combe Martin



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