Environment Agency

East Devon Catchment Flood Management Plan

Summary Report June 2012

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Introduction

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

The East 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.

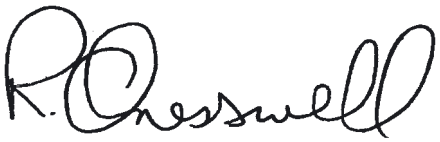
The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if we are to make the right investment decisions for the future and to help prepare ourselves effectively for the impact of climate change. We will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

Flooding in the East Devon catchment is mainly from rivers but there is also the risk of significant tidal flooding in communities along the coast. Risks to people, property and infrastructure are concentrated in Seaton, Sidmouth, Honiton, Axminster, Ottery St Mary, Budleigh Salterton and Newton Poppleford. There has been widespread flooding across the catchment, most notably in 1968 and 2000.

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 or alternatively paper copies can be viewed at any of our offices in South West Region.



Richard Cresswell
South West Regional Director

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The purpose of a CFMP in managing flood risk

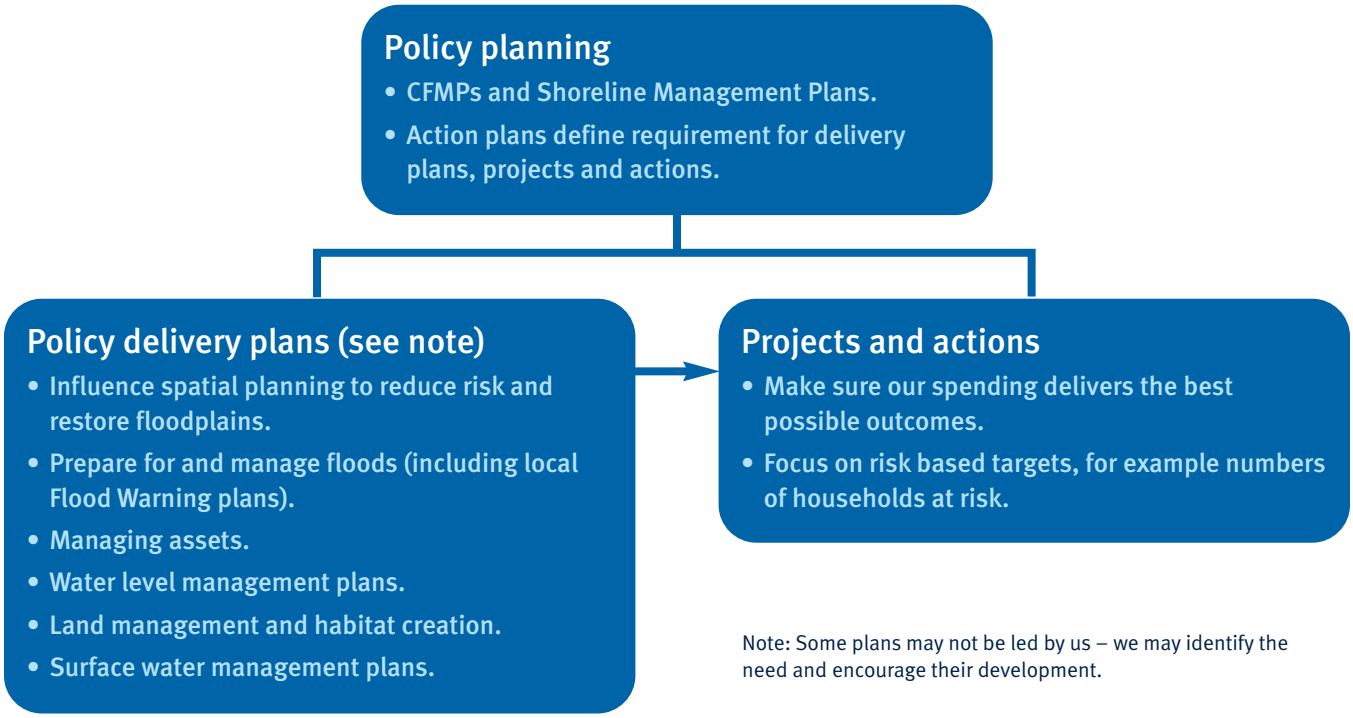
CFMPs help us to understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs should be used to inform planning and decision making by key stakeholders such as:

- 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, 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



Note: Some plans may not be led by us – we may identify the need and encourage their development.

Catchment overview

The river catchments that make up the East Devon CFMP are (from west to east) the Otter, Sid, Axe and Lim, each flowing directly into the sea. The Otter and Axe are the larger of these catchments. The Otter rises at 300m Above Ordnance Datum (AOD) in the Blackdown Hills, while to the east, the Axe rises at a lower altitude of 175m AOD in the Yeovil Scarplands. Both of these rivers have steeply sloping tributaries. The Sid and Lim are much smaller catchments with steep channel gradients from their source to the sea.

The East Devon CFMP covers an area of some 750 square kilometres (300 square miles). Annual rainfall ranges from more than 1,000mm (40in) in the Blackdown Hills to less than 800mm (32in) on the coast. The England and Wales average is 920mm (36in).

The geology tends to become progressively younger from west to east. Older Permian, Triassic and Jurassic layers are covered by younger Cretaceous layers are still present, forming plateaux at higher elevations, particularly in the Axe and Lim catchments.

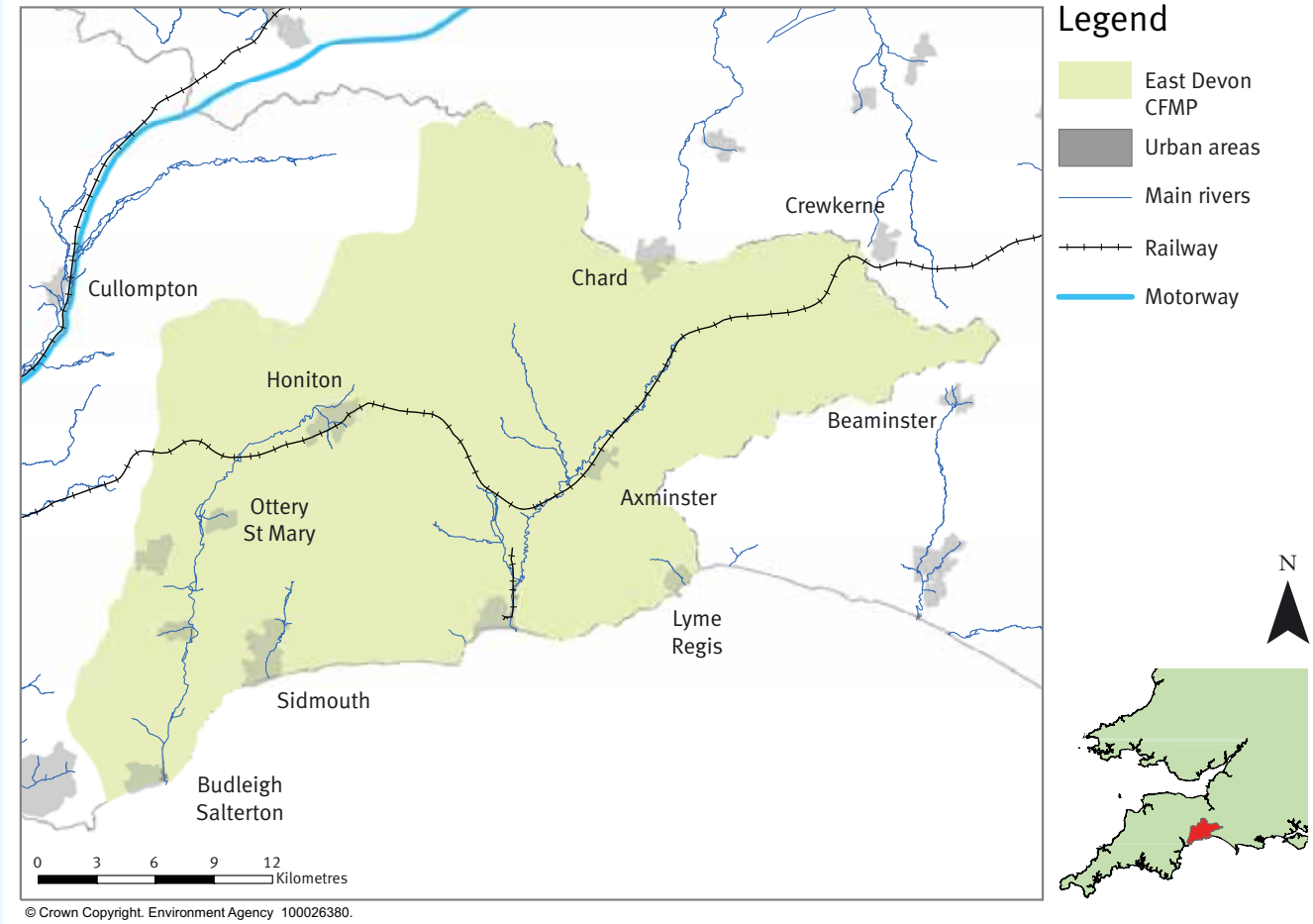
The Permo-Triassic mudstones, sandstones and pebble beds lying beneath the Otter and Sid Catchments lead to significant surface run-off. The rivers respond rapidly to rainfall, and floods are characterized by a very rapid rise and fall in water levels, with high flood peaks.

Beneath the Axe and Lim catchments there are Triassic and Jurassic calcareous clays and mudstones, and Cretaceous greensand and chalk. These rivers generally respond to rainfall, though they respond slower than the other East devon rivers. The flood peaks of the River Axe reduce as they reach wide floodplain, but the river is often slow to recede in its lower reaches. The greensand is important in storing and slowly releasing groundwater into the tributaries of the Axe, maintaining flow through dry periods.

The catchment is known for its valuable visual landscape and includes parts of the Blackdown Hills, East Devon and Dorset Areas of Outstanding Natural Beauty (AONBs). There are also four Special Areas of Conservation (SAC),one Special Protection Area (SPA), 29 Sites of Special Scientific Interest (SSSI), and 118 Scheduled Monuments.

Urban development is mainly concentrated in towns on the coast, notably Budleigh Salterton, Sidmouth, Seaton and Lyme Regis. Inland, with the exception of Honiton, Axminster and Ottery St Mary, the majority of land use is agricultural.

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



↑ Flooding at Colyford in January 2004

Current and future flood risk

Overview of the current flood risk

Flood risk has two components: the chance (probability) of a particular flood and the impact (or consequence) that the flood would have if it happened. The probability of a flood relates to the likelihood of a flood of that size occurring within one year period. It is expressed as a percentage. For example, a 1% flood has 1% chance or 0.01 probability of occurring in any one year, and a 0.5% flood has a 0.5% chance or 0.005 probability of occurring in any one year. The assessment was based on the extent of our Flood Zones (indicative flood extent with 0.1%annual probability and 1% annual probability), models for the main urban areas at risk of flooding and records of historical flood events. The models of the Rivers Otter, Sid, Axe and Lim provide sufficient details to investigate current and future flood risk in the catchment.

What is at risk?

Currently there are around 2,600 residential and commercial properties (5% of the total number in the catchment) at risk from a 1% annual probability flood, not taking into account current flood defences. Around 2,970 people are at risk in the main communities of East Devon.

The East Devon catchment has biodiversity that is rich and diverse, and includes the internationally important Sidmouth to West Bay, and River Axe SACs and 10 SSSIs that are at risk of flooding.

118 Scheduled Monuments are at risk of flooding in the catchment.

Road and rail links throughout the catchment are at risk along with some utility sites, schools and health centres.

↑ High flows in the River Sid, Sidmouth, November 1992

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

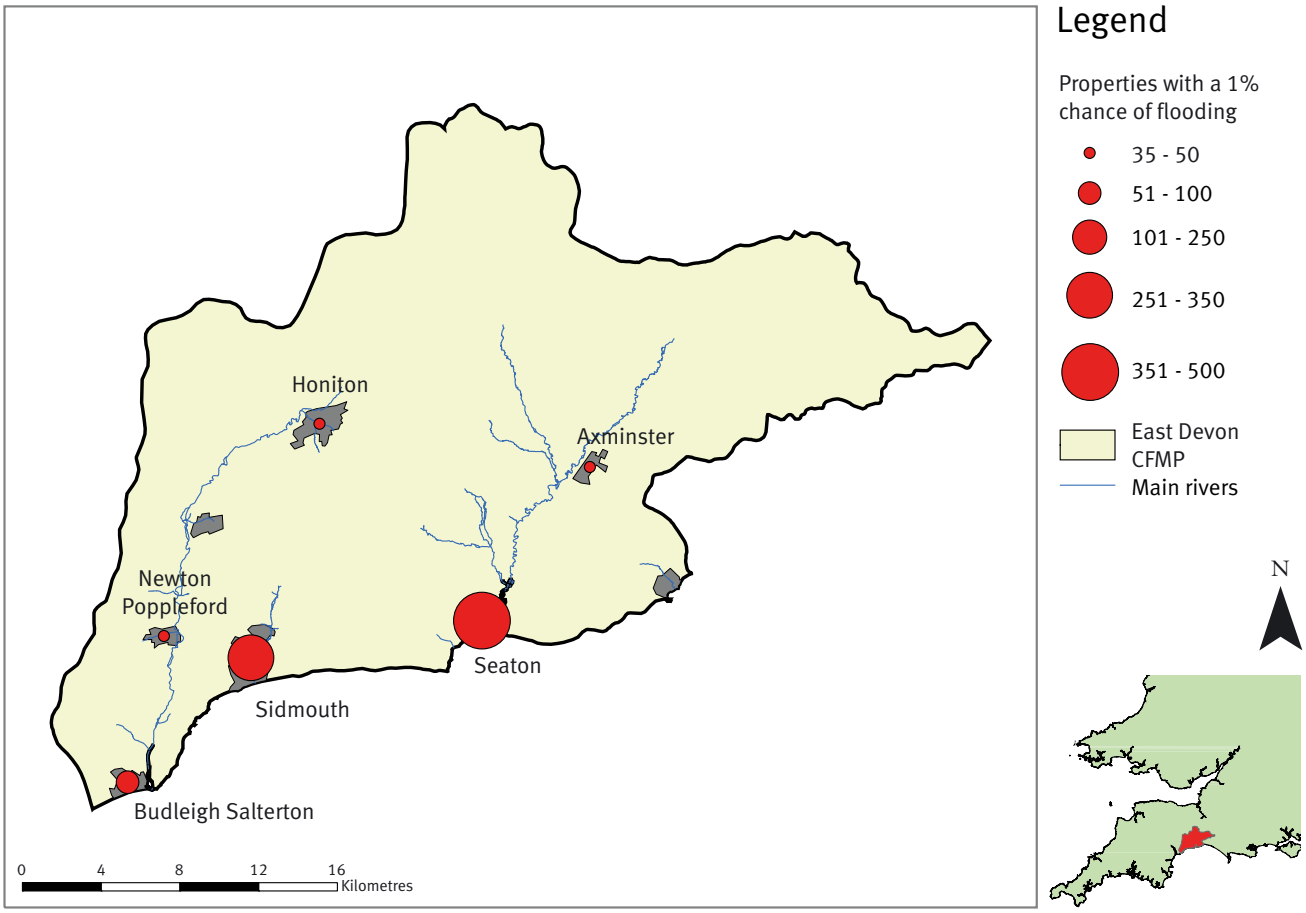


Table 1. Locations of towns and villages with 25 or more properties at risk in a 1% annual probability river flood

Number of properties at risk	Locations
100 to 500	Seaton, Sidmouth
50 to 100	Budleigh Salterton, East Budleigh
25 to 50	Newton Poppleford, Sidbury and Sidford, Honiton

Table 2. Critical infrastructure at risk:

5 electricity substations, 1 wastewater treatment works, 2 railway lines, 9 A roads, and 5 B roads

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 Seaton. Here some 450 properties are at risk from both river and tidal flooding. Sidmouth represents the next greatest concentration, with 320 properties at risk of flooding.

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 to ensure applications have the appropriate flood risk assessments and follow PPS25 (Planning Policy Statement 25 on Development and Flood Risk).
- Flood warning – In some areas there is currently no service provided, in other areas such as Sidbury, Sidford, Sidmouth, Otterton, Chard Junction, Axminster and Colyton there is less than 2.5 hours warning provided. Registered properties receive a direct message via phone, email or fax. Major Incident Plans have been developed for Sidmouth, Sidbury, Sidford and Seaton.
- Flood defence schemes – We have flood defence schemes to alleviate river flooding at Honiton, Ottery St Mary, Tipton St John, East Budleigh, Sidmouth, Sidbury, Axminster, Colyton, Seaton and Lyme Regis. In addition there are a range of local authority defences in the catchment.
- Maintenance – We operate and maintain flood defence banks and structures, with local authorities carrying out further work.

The impact of climate change and future flood risk

In the future, flooding will be influenced by climate change, changes in land use (for example, urban development) and rural land management. In the East Devon catchment, climate change is expected to have the greatest impact on flood risk. The following future scenario for climate change was used in the CFMP:

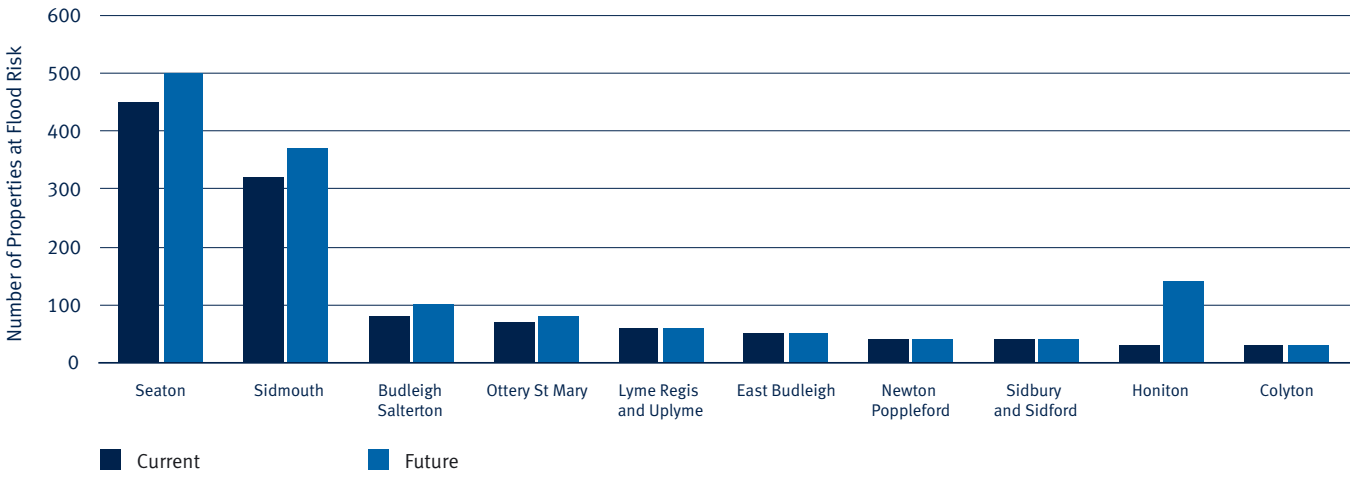
- 20% increase in peak flow in all watercourses. This will increase the probability of large-scale flood events,
- a total sea level rise of 950mm by the year 2100. This will increase the probability of tidal flooding.

Using river models we estimate that by 2100, around 1,475 properties in the key communities (Figure 2) may be at risk from a 1% annual probability flood, rising from the current 1,220 properties. Flood risk from rivers increases mainly in the communities of Seaton, Sidmouth and Honiton.

The sensitivity testing undertaken showed that urban development could affect flood risk in Seaton, Sidmouth and Axminster. With the rural nature of much of the catchment we found that run-off from agricultural land plays a part in flood risk. An increase in run-off, combined with a reduction in the time it takes flows to peak, could lead to flows increasing by up to 5% in the Axe and Otter catchments and up to 3% elsewhere in East Devon.

We have therefore considered climate change, urban development and land management in our modelling of future flood risk.

Figure 2. Current and future (2100) flood risk to property from a 1% annual probability river flood, ignoring the presence of current flood defences



Future direction for flood risk management

Approaches in each sub-area

We have divided the East 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 3.

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.

↑ Cattle marooned by floods from the River Axe near Bow Bridge in November 2005

Map 3. East Devon sub-areas

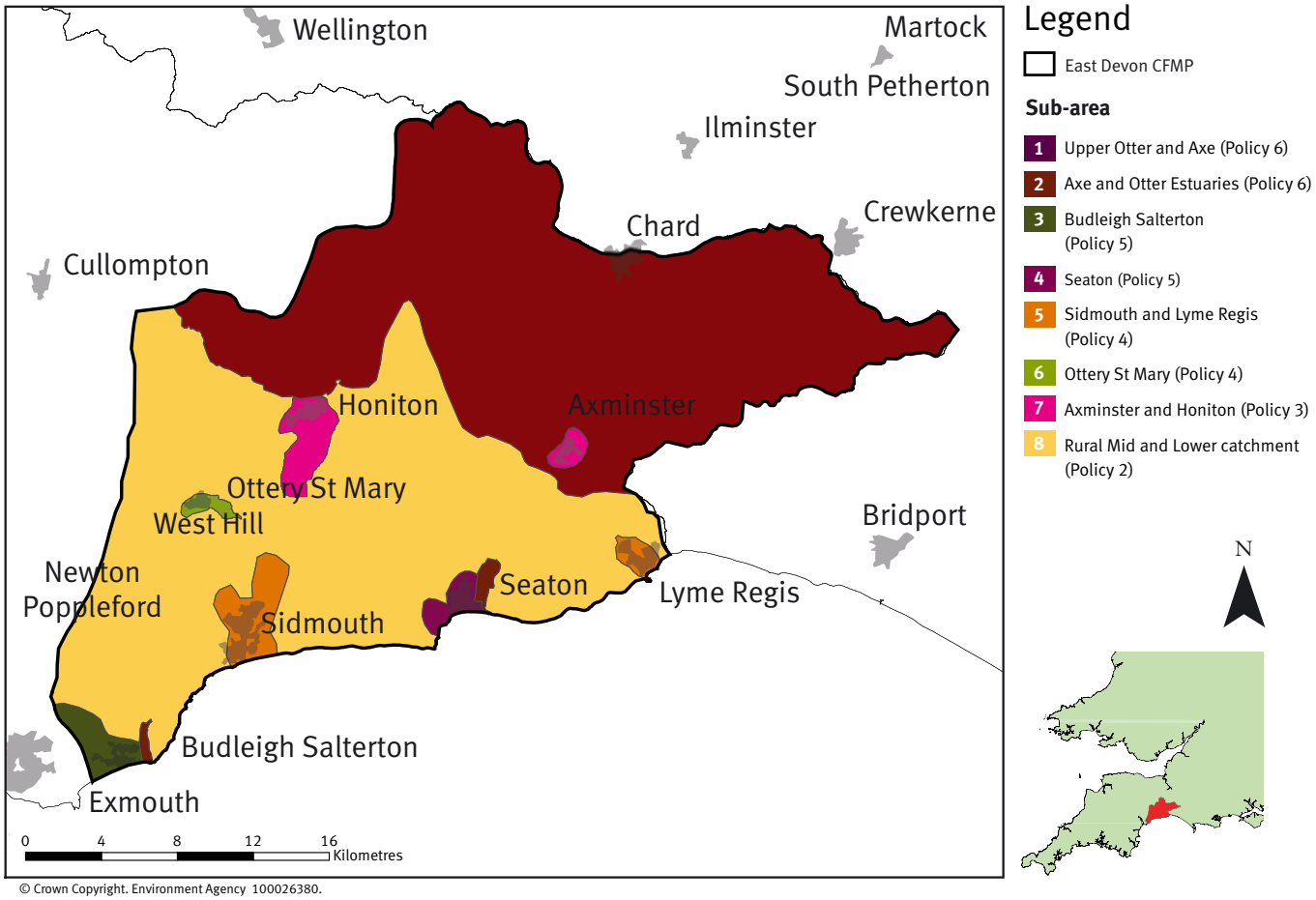


Table 3. Policy options

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.

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.

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.

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.

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.

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.

Upper Otter and Axe

Our key partners are:

- East Devon District Council
- Taunton Deane District Council
- West Dorset District Council
- South Somerset District Council
- Devon County Council
- Dorset County Council
- Somerset County Council

The issues in this sub-area

The Upper Otter and Axe sub-area extends downstream as far as, but not including, Honiton and Axminster.

The Blackdown Hills AONB covers half of the area (the Otter, Yarty, Corry and Wolf catchments) and the Dorset AONB a further quarter (the mid to upper River Axe catchment). Apart from Chard, there are no towns in the area. However, there are scattered villages and hamlets.

Approximately 15 properties and 400 people are with 0.1% flood extent, dispersed across the sub-area. These properties may be at risk from a 1% annual probability flood flood in the future.

There are no major flood defence schemes and no flood warning services for this area.

The River Axe SAC and SSSI are entirely within the 1% annual probability flood extent and four SSSIs are partially within it. However, flooding is one of the natural river processes that are important in maintaining the conservation status of these sites. The Yarty, Otter, Wolf (Otter) and Tale are at risk or probably at risk of failing the Water Framework Directive objectives as a result of diffuse pollution, and the area as a whole is classified as a Nitrate Vulnerable Zone.

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.

Increase in future flood risk will mainly be driven by climate change and, to a lesser extent, by land use and land management changes.

By increasing floodplain storage and creating wetlands it is intended to attenuate and retain floodwater, potentially reducing flood flows by up to 35% for the urban areas downstream. This presents an opportunity to enhance designated sites by creating adjacent wetland habitats and linking existing wetland habitat. The economic and social implications are difficult to quantify but are unlikely to be significant on the overall scale of the East Devon CFMP.

The policy could benefit the Blackdown Hills and Dorset AONBs. It is also likely to improve water quality by reducing agricultural runoff, soil erosion and sediment input as a result of changing the way the land is used (increased wetland habitat capable of holding water and slowing overland flows). This could contribute towards achieving Water Framework Directive objectives.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans that will reduce our level of maintenance and to utilise the floodplains more effectively.
- With partners, identify locations, and implement measures for increased attenuation and retention of floodwater by floodplain storage, creating wetland habitat and restoring natural river banks. Working with our partners, ensure that areas identified for increased attenuation or water retention do not adversely impact upon designated features (including the historic environment). This action should contribute to Water Framework Directive targets.
- Identify locations with the potential to improve land management and land use to benefit flood risk management. In addition to reducing damage from river and 'muddy' land drainage flooding, this action should also improve water quality in the Otter, Axe, Yarty, Wolf and Tale rivers.
- We will ensure that development at Chard does not increase run-off or decrease water quality. Ensuring that all new development incorporates Sustainable Drainage Systems (SuDS) will support this action.

Land use planners can support this policy by designating all floodplain and wetland areas as functional floodplain to support their attenuation and biodiversity roles.

Axe and Otter Estuaries

Our key partners are:

East Devon District Council

Natural England

Land Owners

National Farmers Union

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

The issues in this sub-area

The Axe estuary, to the east of Seaton, extends from the beach on the coast upstream for three kilometres to the A3052 bridge at Colyford. This does not include Axmouth, Colyford, or Seaton (including those behind the Seaton Marshes flood defences).

The Axe estuary is influenced by both fluvial and tidal flooding, but towards Seaton the main source of flooding is from the sea.

The Otter estuary, to the east of Budleigh Salterton, extends from the shingle beach on the coast upstream for two kilometres to the tidal limit at the confluence with the Budleigh Brook. The majority of the Otter estuary is influenced by both fluvial and tidal flooding. An earth bank runs along its west side and provides a standard of protection of 0.7% annual probability. However, this only protects Budleigh Salterton Cricket Club and possibly a few properties on Granary Lane.

The Otter Estuary is designated a SSSI. Flooding is one of the natural estuarine processes that are important in maintaining the estuary's favourable conservation status.

There are no properties within the current or future 1% annual probability flood extent. Future increases in flood risk will be mainly driven by climate change, both by increasing flows and raising sea levels.

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 policy should not increase risk to any property.

The policy provides opportunities to reconnect the estuaries with the floodplain and thereby create habitat and wildlife corridors that would make a contribution towards enhancing biodiversity.

Specific flood risk management actions under the policy will not increase flood risk to the Seaton regeneration area located at the southern end of Seaton Marshes. Defences to the marshes are considered as part of the Seaton sub-area.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans that will reduce our level of maintenance and will utilise the floodplains more effectively. This should also support improvements in the natural environment.
- Investigate, with partners, locations along the Axe estuary where improving connection to the floodplain could benefit biodiversity and reduce the risk of flooding to Seaton.
- Influence local agricultural practices on the Axe estuary to provide flood risk and biodiversity benefits.
- Investigate, with partners, locations along the Otter estuary where improving connection to the floodplain could benefit biodiversity. This has the potential to both reduce damages in Budleigh Salterton as well as support Biodiversity Action Plan species and habitats.
- Influence local agricultural practices on the Otter estuary to provide flood risk and biodiversity benefits. This should reduce damages to property and agricultural land whilst supporting the Otter Estuary achieve the 'Good' target status of the Water Framework Directive.

Land use planners can support this policy by designating all floodplain and wetland areas as functional floodplain within their Local Development Framework. This will ensure that floodplains are retained for flood attenuation and green infrastructure benefits. Only water compatible uses should be permitted behind the earth bank defences in the Budleigh Salterton area.

↑ Seaton Marshes flood in 1965

Sub-area 3

Budleigh Salterton

Our key partners are:

East Devon District Council

South West Water

Natural England

Royal Society for the Protection of Birds (RSPB)

The issues in this sub-area

The area covers the catchment of the Budleigh Salterton Brook including Budleigh Salterton and Knowle.

Budleigh Salterton is located on higher ground and there is little flood risk from the River Otter. Most of the flood risk is from the Budleigh Salterton Brook. Currently 85 properties and 200 people in Budleigh Salterton are at risk from the 1% annual probability flood. The main source of future flood risk remains from the Budleigh Salterton Brook with 230 people and 100 properties potentially at risk from a future 1% annual probability flood. Part of the Budleigh Salterton Conservation Area is also at risk of damage if the existing defences are overtopped.

There are no defences and no specific flood warning service for the Budleigh Salterton Brook.

The vision and preferred policy

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

Future increases in flood risk will mainly be driven by climate change as land use and management changes will have less of an impact. The chosen policy would protect all the properties mentioned above, although they would still be at risk from more extreme events.

It is difficult to assess whether this policy complies with the environmental objectives as the nature of the impacts will depend on the details of any proposed actions. We consider that the majority of potential impacts could be reduced at the project design and implementation level. The policy would also provide opportunities to improve land management practices, which could indirectly improve water quality to benefit Atlantic salmon. The policy should also reduce the risk of flooding within Budleigh Salterton Conservation Area.

Proposed actions to implement the preferred policy

- Investigate ways of reducing flood risk on the Budleigh Salterton Brook and implement findings.
- Promote self-help opportunities to provide protection from flooding in Budleigh Salterton.
- Ensure all new developments conform with ‘Planning Policy Statement 25: Development and Flood Risk’.
- Investigate opportunities to enhance the water carrying capacity of East Devon Pebblebeds SAC, SPA and SSSI in consultation with Natural England, East Devon District Council and the RSPB.

Land use planners should direct new development away from floodplain areas and seek reduced vulnerability of those developments remaining through change of use to less vulnerable types and increased resistance and resilience measures. Sustainable Drainage Systems should be secured for all developments, ideally strategically planned and supported by policy.

↑ Recent flooding with Budleigh Salterton

Seaton

Our key partners are:

East Devon District Council

East Devon AONB

South West Water

Natural England

The issues in this sub-area

The area covers the town of Seaton and the village of Beer, which lies two kilometres to the west of Seaton.

Seaton is at risk of flooding from combined tidal and fluvial flood events from the Axe estuary. The town is protected to a design standard of 1% annual probability by the Seaton Marshes flood defence scheme, although a recent investigation has suggested that the actual standard may be as low as 5% (1 in 20 years). Approximately 5% of the Seaton Conservation Area is at risk if the existing defences are overtopped.

The main source of flooding is from the sea. A tidal flood warning service and a Major Incident Plan is in place for Seaton for this risk. There is no flood warning in Seaton for flood flows in the River Axe.

There are 450 properties at risk from a 1% annual probability flood event.

Future increases in flood risk will mainly be driven by climate change, but land use and management changes will also have an impact. The main source of future flood risk in Seaton will continue to be tidal flooding from the Axe estuary, with 500 properties at risk from a future 1% annual probability flood event.. Many of these people live in areas of high social vulnerability.

In Beer surface water flooding causes a significant problem. This is due to run-off from agricultural land in the small and steep catchment. A third of Beer's Conservation Area is at risk of damage in a 1% flood.

The vision and preferred policy

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

The policy will help address risks at Beer, for example by seeking to influence land management changes in the Beer catchment.

The policy would also ensure that the sewage treatment works at Seaton continue to be protected from flooding, ensuring that water quality is not compromised.

Although there is some potential for adverse impacts on Natura 2000 sites, these will be assessed and mitigated to ensure that only neutral or positive effects arise. Similarly, other adverse environmental impacts could be reduced or avoided at the project design/implementation level.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans to help reduce flood risk.
- Quantify the benefit of flood risk management measures in the Axe estuary, and assess the impacts on Seaton and the Regeneration Area. This should ensure that there is no net negative impact on the natural environment.
- Improve the flood warning service for fluvial and tidal flooding and promote self-help opportunities to provide protection from flooding in Seaton.
- Improve Flood Zone maps in Seaton.
- Ensure all new developments conform with 'Planning Policy Statement 25: Development and Flood Risk'. In particular, Sustainable Drainage Systems should be incorporated to restrict surface water run-off. It should also be noted that the policy has been adopted to reduce future risks to existing residential and commercial property - it is not to enable new development to take place in areas at risk of flooding.
- Investigate ways to move people and critical infrastructure out of risk areas.
- Develop a land management strategy for Beer to reduce the number of properties at risk, damages from flooding and where possible contribute to an improvement in water quality.

↑ A resident of Beer cleans up after a muddy flood in her home in August 2004

Sidmouth and Lyme Regis

Our key partners are:

East Devon District Council

South West Water

The issues in this sub-area

The Sidmouth area extends for five kilometres inland to include Sidford and Sidbury. Currently in Sidmouth, Sidbury and Sidford, 350 properties are within the 1% annual probability flood extent. This number is expected to rise to 400 properties within the future 1% annual probability flood extent.

Sidmouth and Sidbury flood defences have a standard of protection of 3% to the left bank and 1.7% to the right bank of the River Sid. Due to the nature of the Sid catchment there is little time between the rainfall and the flood peak. Flood warning times in Sidmouth are half an hour or less although the flood hazard is generally low.

The Lyme Regis area extends, approximately two kilometres inland to Uplyme. The upper reaches of the River Lim are located within the East Devon AONB and lower reaches within the Dorset AONB.

Overall, 60 properties are within the 1% annual probability flood extent. This number is expected to rise to 90 properties within the future 1% annual probability flood extent. However, Lyme Regis and Uplyme are protected from the River Lim to a 1% annual probability standard of protection. There is currently no flood warning service in Lyme Regis as due to the nature of the Lim catchment there is little time between the rainfall and the flood peak. Flooding is likely to be both deep and fast, and is categorised as a significant or extreme hazard for approximately 80 people.

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.

Future increases in flood risk will mainly be driven by climate change. Land use management changes are likely to have less of an impact. Slightly more properties will be at risk, but the flood hazard remains generally low. This will substantially reduce the average annual damages, and will control the flood hazard to people within Lyme Regis.

Potential adverse environmental impacts could be reduced at the project design and implementation level. Therefore, we consider this policy can be environmentally acceptable.

Sustainable Drainage Systems should be implemented in problem areas, these could also help achieve Water Framework Directive objectives for the River Sid which is failing Water Framework Directive objectives for diffuse pollution.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans to sustain the current scale of flood risk.
- We will further investigate the flood risk in Sidmouth and Lyme Regis, particularly for extreme floods, and making use of our Rapid Response Catchments Project. We will influence South West Water to improve capacity of sewers. This is in order both to reduce both the number of flood incidents, and to improve water quality.
- We will develop a strategy for managing weirs to improve flood risk management and provide environmental benefits.
- Develop our programme for Flood Hazard Mapping to determine direction and velocity of flow.
- We will investigate ways of improving flood warning in Sidmouth and Lyme Regis, and promote self-help opportunities to provide protection from flooding in specific locations.
- Ensure all new developments conform with 'Planning Policy Statement 25: Development and Flood Risk'. We will encourage the planning authority to open up floodplains and culverts through redevelopment.
- Investigate ways in which people can be moved out of risk areas, particularly as poor housing stock deteriorates over the longer term. Investigate also if critical infrastructure can be moved out of risk areas.

↑ Lyme Regis has a long history of floods: the River Lim in June 1890

Ottery St Mary

Our key partners are:

East Devon District Council

South West Water

Natural England

The issues in this sub-area

The area covers Ottery St Mary and all of the Furze Brook catchment to the east of the town.

Currently 75 properties, 180 people and 20% of Ottery St Mary's Conservation Area are within the 1% annual probability flood extent. St Saviour and Cadhay Bridges (Grade II listed structures) are likely to be exposed to flooding. This number is expected to rise to 85 properties within the future 1% annual probability flood extent.

Ottery St Mary is protected from the Otter by flood banks and walls that provide a standard of protection of 1% annual probability. Defences on the Furze Brook to the same standard consist of culverts and channel improvements.

There is a flood warning service for the River Otter in Ottery St Mary with a warning time of over five hours. However, there is no flood warning service available for the Furze Brook.

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.

Increases in flood risk will mainly be driven by climate change. Land use and management changes within the Furze Brook catchment may also increase risk. As a result annual average damages in Ottery St Mary could double in the future.

The policy has been selected to sustain the current 1% standard of protection of defences into the future.

The opportunity to influence land management improvements is likely to enhance biodiversity and positively contribute towards the character of East Devon AONB.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans to sustain the current scale of flood risk.
- Identify and develop specific flood risk management measures that will sustain the current scale of flood risk in the future.
- Improve Flood Zone maps in Ottery St Mary.
- Promote self-help opportunities to provide protection from flooding in Ottery St Mary.
- Ensure all new developments conform with 'Planning Policy Statement 25: Development and Flood Risk'. In particular Sustainable Drainage Systems should be incorporated into development to restrict surface water run-off.
- Investigate whether the fire station, and other critical infrastructure currently at risk, can be relocated over the longer term.
- Influence South West Water to improve the capacity of combined sewers in Ottery St Mary to reduce damages and improve water quality.
- Carry out a study in the catchments of the Furze Brook, working with the agricultural industry, to try and change land management practices to reduce the direct run-off from agricultural land.

Axminster and Honiton

Our key partners are:

East Devon District Council

South West Water

The issues in this sub-area

The Axminster area includes both the town and the floodplain of the River Axe. Although the majority of Axminster is on higher ground, some properties and industrial units along the north west side of the town near Stoney Bridge are located within the floodplain of the River Axe. For the 1% annual probability flood, 20 properties and 45 people are at risk. In the future 1% annual probability flood the same number of properties are expected to be at risk. Approximately three quarters of these are residential properties with the remainder being commercial.

Currently flood warning times are less than two hours from the River Axe in Axminster. Flood defences provide some protection to properties at risk. An earth embankment on the right bank provides a 1.7% annual probability standard of protection. The railway embankment and stone revetments on the left bank provide a 1% annual probability standard of protection.

The Honiton area covers the Glen Brook and Gissage Stream catchments that flow north west through Honiton into the River Otter.

Defences in Honiton consist of culverts and channel improvements. These provide an overall standard of protection of 1% annual probability to 35 properties and 85 people If defences were not present 140 properties would be within the future 1% flood extent. There is no flood warning service for the Glen and Gissage Streams.

The vision and preferred policy

Policy Option 3 - we are generally managing existing flood risk effectively.

Increase in flood risk will mainly be driven by climate change. Although for Honiton, the Gissage Stream catchment land use and management changes may also increase risk. We believe that the current scale of flood risk management is sufficient and managed to an appropriate level. We consider that future increases in risk will be acceptable.

For Honiton the current standard of protection of defences may deteriorate to approximately 3% in the future but will still provide protection against more frequent flood events. In the context of the East Devon CFMP as a whole these risks are relatively low.

Honiton is likely to expand in the future and land use planners must ensure that this does not increase risks further. Axminster has also been earmarked for future development. The local planning authority will need to determine a sustainable policy approach to development in this area in line with PPS25 and in particular the sequential approach to land allocations. Where feasible land use planners should look to reduce flood risks overall.

Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans to sustain the current scale of flood risk.
- Investigate ways of improving flood warning in Honiton, and in Axminster where our target would be increase warning times to over two hours.
- Improve Flood Zone maps in Honiton.
- Promote self-help opportunities to provide protection from flooding including at Honiton.
- Ensure all new developments conform with 'Planning Policy Statement 25: Development and Flood Risk'. In particular Sustainable Drainage Systems should be incorporated into development to restrict surface water run-off. Land use planners should also seek to reduce the vulnerability of property at risk and behind defences. This can be achieved by changing uses to less vulnerable types; by incorporating flood resilience and resistance measures, and to ensure suitable warning and evacuation procedures are provided.
- Carry out a study to investigate the risk of flooding to the Wilmington water treatment works.

↑ Clapper Lane Bridge: a tree is carried down by flood waters and needs to be removed

Rural Mid and Lower Catchment

Our key partners are:

East Devon District Council

Natural England

English Heritage

National Farmers Union

Defra Catchment Sensitive Farming

The issues in this sub-area

This large area covers the Otter catchment below Honiton and the Axe catchment below Axminster. It also covers the Sid and Lim catchments, excluding the urban areas around Sidmouth and Lyme Regis.

The area is mainly rural but does contain a number of settlements, notably East Budleigh, Otterton, Colaton Raleigh, Newton Poppleford, Tipton St John, Colyton and Colyford. Much of the area is designated AONB.

Approximately 130 properties and 290 people are at risk from the 1% annual probability flood, and 200 properties and 450 people from the more extreme 0.1 % flood. For the future 1% annual probability flood we expect the number of properties to increase to around 200 at risk.

A flood warning service for urban areas in the Otter catchment gives warning times of more than two hours, so improvements here are not a priority. However, flood warning times in the urban areas of the Axe catchment could be increased. For example, the warning time for Colyton is less than 30 minutes.

There are a range of flood defences across the area. In Tipton St John defences provide a 3% annual probability standard of protection from the River Otter. In Newton Poppleford a 2% standard is achieved. In East Budleigh defences provide a 3% standard of protection from the Budleigh Brook. In Colyton a 1% standard of protection and in Colyford a 2.5% standard of protection is provided from the River Coly.

The area is within a Nitrate Vulnerable Zone and the rivers are all at risk, or probably at risk, of failing the Water Framework Directive objectives as a result of diffuse pollution. Flood risk management activities and associated land use management should contribute to reducing this problem.

The vision and preferred policy

Policy Option 2 - we can generally reduce existing flood risk effectively.

Future increases in flood risk will mainly be driven by climate change, but land use and management changes will also have an effect.

Generally, spending on flood risk management activities will be reduced, allowing for more natural river processes, creation of wetland habitats, and the reconnection of rivers with their floodplains. Localised defence measures would continue to be maintained in settlements at risk such as Tipton St John and Newton Poppleford.

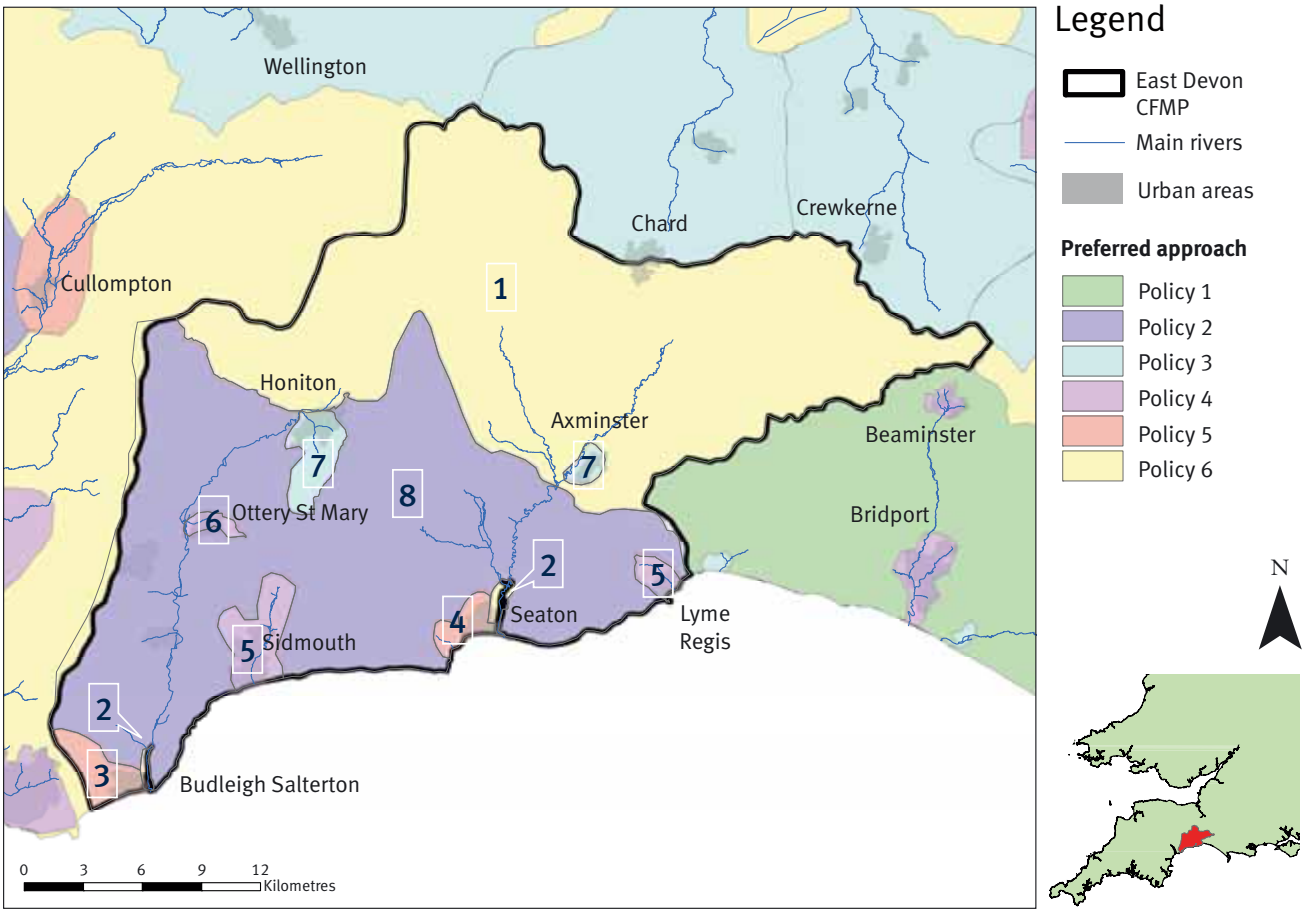
Proposed actions to implement the preferred policy

- Develop, direct and deliver System Asset Management Plans that will reduce our level of maintenance.
- Monitor the scale of flood risk, in particular in Colyton, Newton Poppleford and Tipton St John, and assess flood risk management measures.
- Identify locations with the potential to improve land management and land use to benefit flood risk management. This is intended both to reduce the consequence of flooding and also contribute towards Water Framework directive targets.
- Consider ways of reconnecting the River Otter and River Axe to their floodplains to utilise flood storage and reduce risk to people. With our partners, ensure that areas identified for increased attenuation or water retention do not adversely impact upon designated features (including the historic environment).

Floods through Otterton in February 1969

Map of CFMP policies

Map of the policies in the East Devon catchment



The sub-areas

1 Upper Otter and Axe
2 Axe and Otter Estuaries
3 Budleigh Salterton
4 Seaton
5 Sidmouth and Lyme Regis
6 Ottery St Mary
7 Axminster and Honiton
8 Rural Mid and Lower Catchment

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