

East Cornwall Catchment Flood Management Plan

Summary Report June 2012



managing
flood risk

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Introduction



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

The East Cornwall 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 affects people and property across the East Cornwall catchment, but particularly in the areas of Bude, Bodmin, Looe, Lostwithiel, Wadebridge, and Polperro. Various flood events have demonstrated that while the numbers of properties at risk across East Cornwall may be relatively low compared with other areas of the country, the risk to life, and community disruption caused by flooding can be significant.

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: Cornwall 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.

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

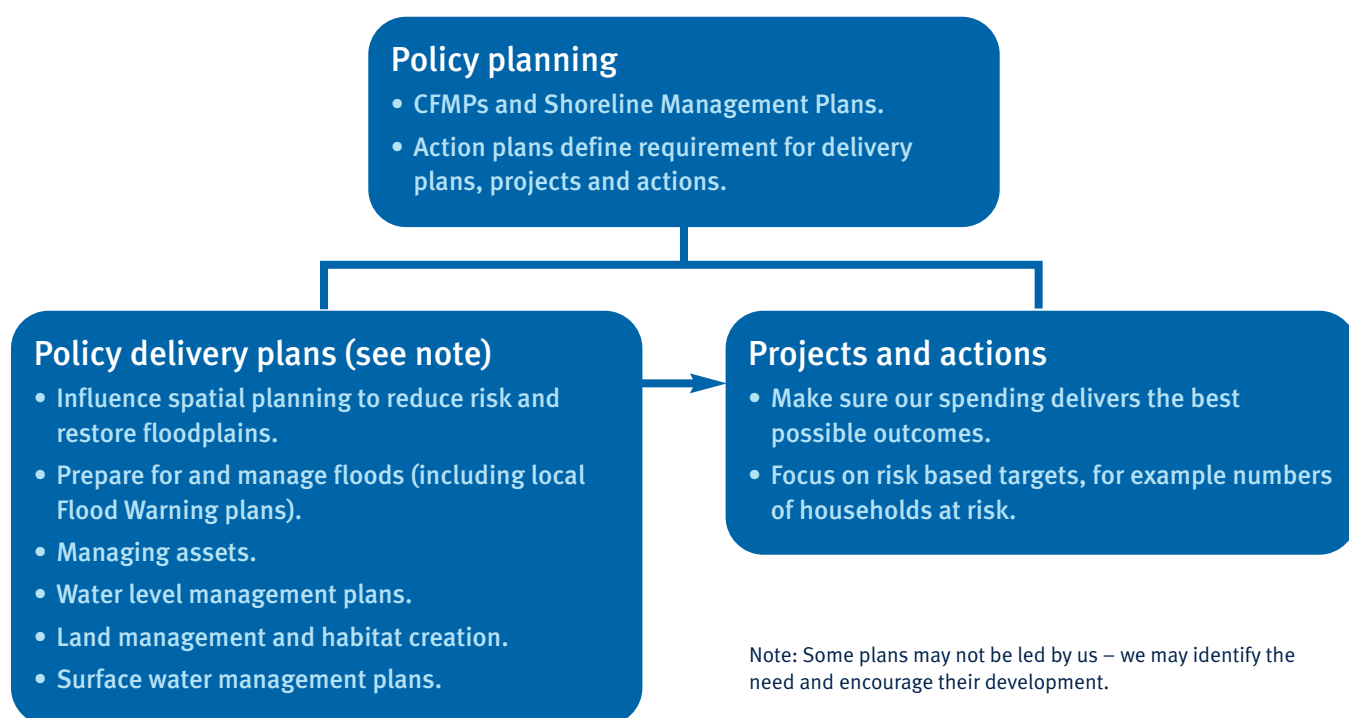
- the Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- Regional Assemblies and local authorities who can use the plan to inform spatial planning activities and emergency planning;

- 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

The East Cornwall CFMP area lies near the south-westerly tip of the UK mainland. The CFMP area is made up of two relatively large catchments, the River Fowey and the River Camel, plus a large number of smaller river catchments. This includes the two major estuaries of the Fowey and Camel. The area is environmentally rich with many important environmental locations. The area has a rich mining heritage with a number of locations in the area awarded World Heritage Site status.

The East Cornwall CFMP covers an area of some 1,400 square kilometres (540 square miles). The topography of the CFMP catchment is varied. The main area of high ground is Bodmin Moor, where the River

Camel and the River Fowey both spring. The remainder of the CFMP catchment is made up of a number of discrete catchments, many of which are small and steep.

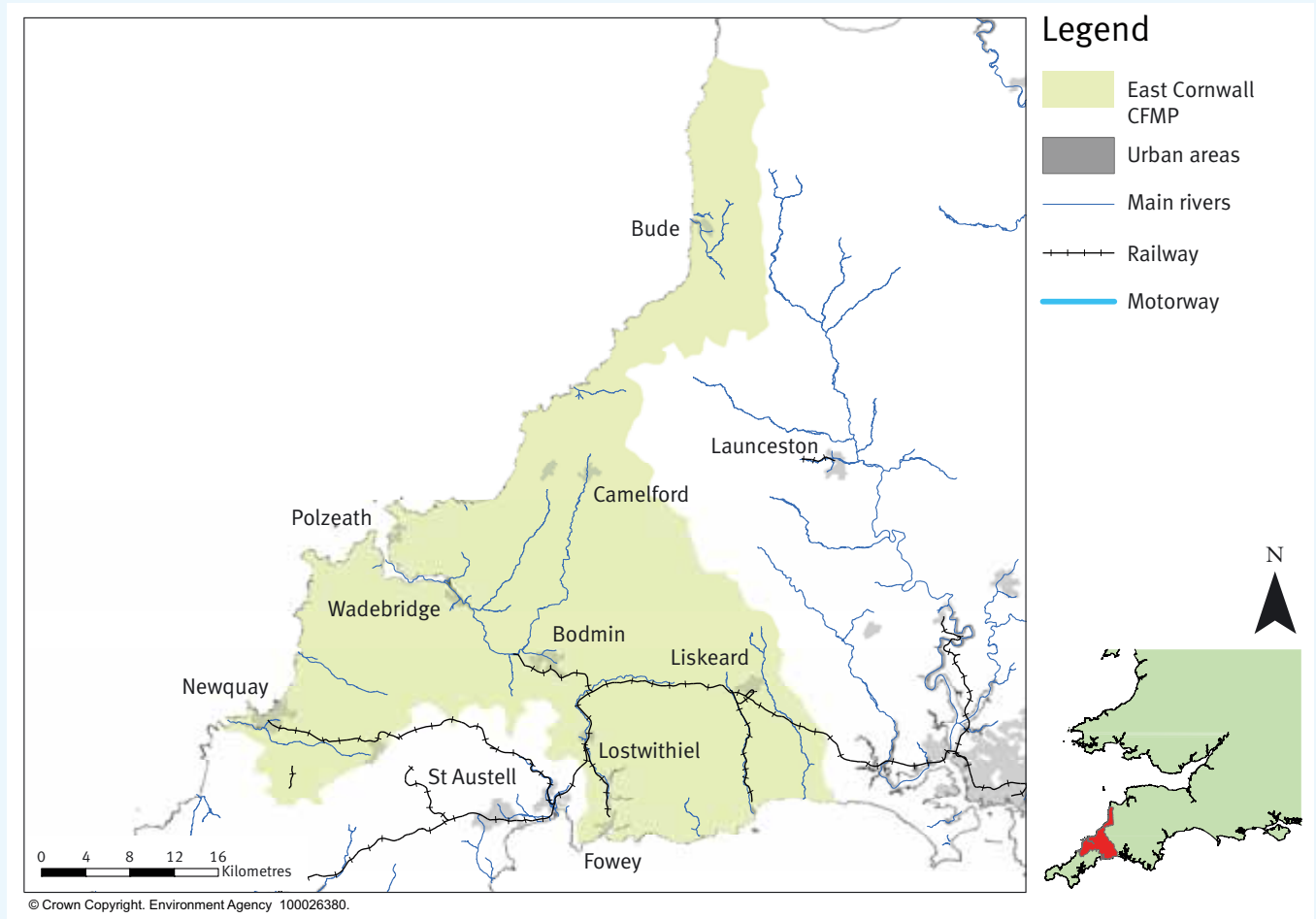
There are two underlying classes of geology in the area. The south and north of the area are dominated by Devonian slates. To the east Bodmin Moor is mainly granites that have intruded into the earlier slates. The presence of granite at the surface leads to a high percentage of surface run-off. This in combination with the steep gradient of tributaries draining off the moor, such as the Warleggan River and St Neot River, leads to a rapid (or "flashy") response to rainfall in the upper reaches and on the north coast.

The annual rainfall ranges from more than 1,800mm (70in) over Bodmin Moor to less than 850mm (33in) on the coast. The England and Wales average is 920mm (36in).

The catchment is predominantly grassland, arable, horticultural, and woodland. Only five per cent is urbanised. The principal urban centres are Newquay, Liskeard, Bodmin, Bude and Wadebridge.

There are six Areas of Outstanding Natural Beauty (AONB), eight Special Areas of Conservation (SAC), two National Nature Reserves, 46 Sites of Special Scientific Interest (SSSI), and 500 Scheduled Monuments.

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



← Cows retreat to higher ground next to the River Camel at Slaughterbridge near Camelford in August 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 a one year period. It is expressed as a percentage. For example, a 1% flood has a 1% chance or 0.01 probability of occurring in any 1 year, and a 0.5% chance or 0.005 probability of occurring in any one year.

Flood extents and depths are based on our Flood Map. These maps do not take into account the presence of any flood alleviation schemes and so show the worst case scenario for a 1% and a 0.1% annual probability flood. The CFMP considers flooding from the tide within a river catchment where the still water level of the tide creates flood risk either in isolation or in combination with river flows.

Previous flood incidents include:

- The 1976 flood in Polperro where one man was drowned and 83 properties were flooded by the River Pol;

- In August 2004, Boscastle and the surrounding area was hit by serious flooding caused by an extremely rare rain storm. Sixty properties were flooded and the risk to life was severe. A major emergency response was initiated and no lives were lost.
- The October 2004 flood event where over 70 properties were flooded by high tides in Looe and Fowey.

Although the numbers of properties at risk in East Cornwall may be relatively low, the risk to life and community disruption caused by flooding can be great. Particular areas of risk include Bude, Bodmin, Looe, Lostwithiel, Wadebridge, and Polperro.

Flood alleviation schemes that reduce flood risk have been constructed in a number of locations in response to flooding incidents. Locations include Bodmin, Bude, Camelford and Wadebridge. Along with other schemes in East Cornwall, these help reduce flood risk to 1,153 residential properties and 588 commercial properties.

What is at risk?

The main risks to people, property and the environment across the catchment are from the rivers and the tide. Currently there are around 1,200 residential and commercial properties at risk from a 1% annual probability flood, not taking into account current flood defences. Around 2200 people are at risk in the main communities of East Cornwall.

Four Special Areas of Conservation (SACs) are at risk along with one National Nature Reserve and 25 sites of Special Scientific Interest (SSSI).

Schools, health centres, surgeries and residential homes are at risk, along with Looe ambulance and police stations, and the fire stations at Wadebridge and Bude.

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

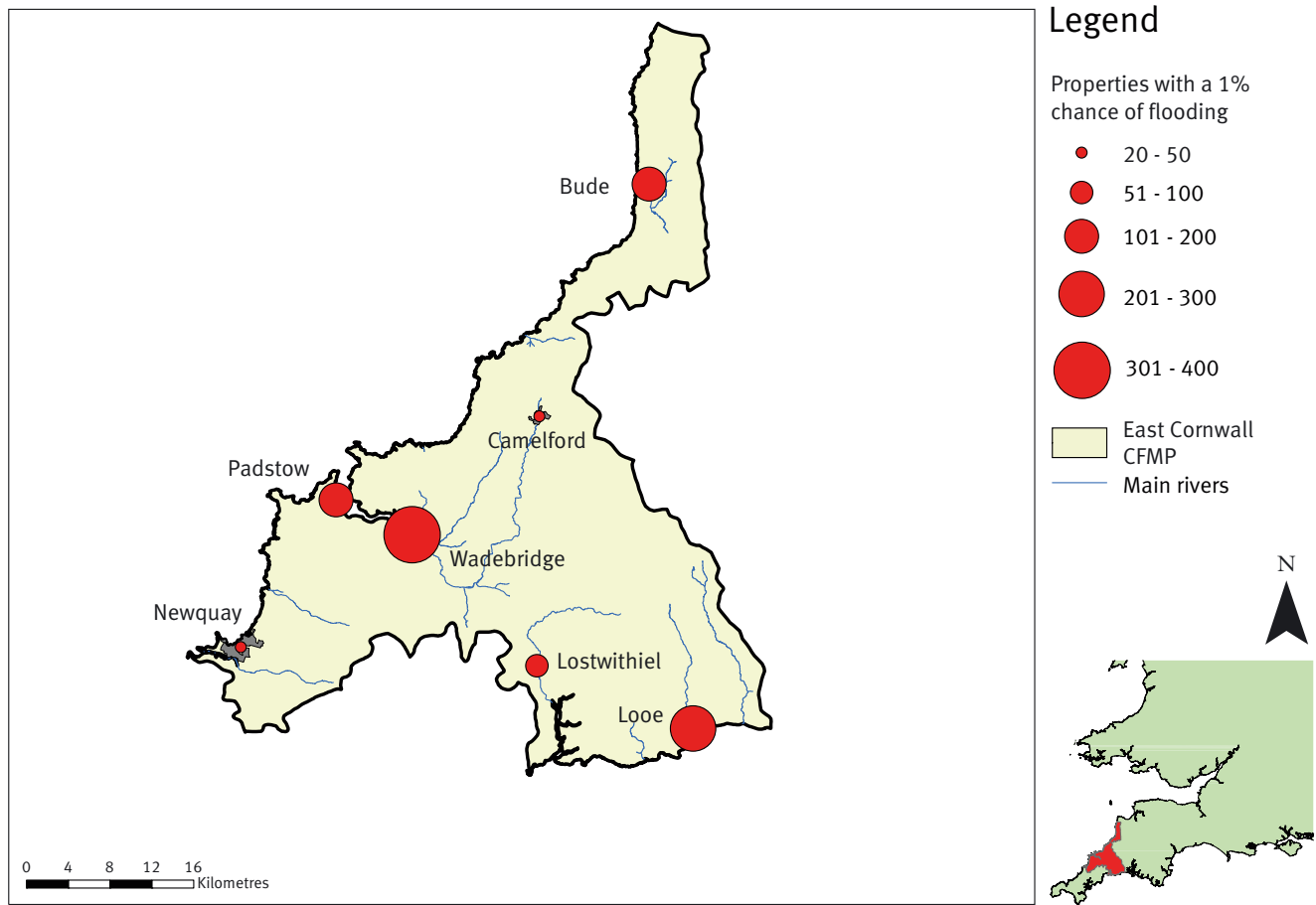


Table 1. Locations of towns and villages with 25 or more properties at risk in a 1% annual probability river flood

Number of properties at risk	Locations
100 to 500	Wadebridge, Looe, Bude, Lostwithiel
50 to 100	Padstow
25 to 50	Boscastle, Stratton, Tremar, Newquay

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 Wadebridge. Here some 357 properties are defended from both river and tidal flooding. Looe represents the next greatest concentration, with 241 properties at risk of tidal flooding.

Large numbers are at risk from both tidal and river flooding at Bude and Lostwithiel, and from river flooding at Bodmin and Polperro.

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 (Planning Policy Statement on Development and Flood Risk).
- Flood warning – Systems are in place for the following river reaches: River Camel, Camelford to Wadebridge; River Allen, Penvose to Sladesbridge; River Fowey, Trekeivesteps to Lostwithiel; River Seaton, Trebrownbridge to Seaton; River Pol at Polperro; River Neet,

Woolstone Mill to Bude, and the River Strat from Bush to Helebridge. Major Incident Plans are in place for Wadebridge, Bude, Camelford, Padstow, and Bodmin.

- Flood defence schemes – We have flood defence schemes at Bodmin, Boscastle, Bude, Camelford, Fowey, Helebridge, Lostwithiel, Polperro, Sladesbridge, Stratton and Wadebridge.
- Maintenance and operation – We operate and maintain flood defence banks and structures, with local authorities carrying out further work.



← This couple had to be rescued by helicopter from the roof of their bungalow after it was surrounded by flood waters from the River Neet in August 2004.

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 Cornwall 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 500mm by the year 2100. This will increase the probability of tidal flooding.

Using river models we estimate that by 2100, around 1,590 properties in the key settlements (Figure 2) may be at risk from a 1% annual

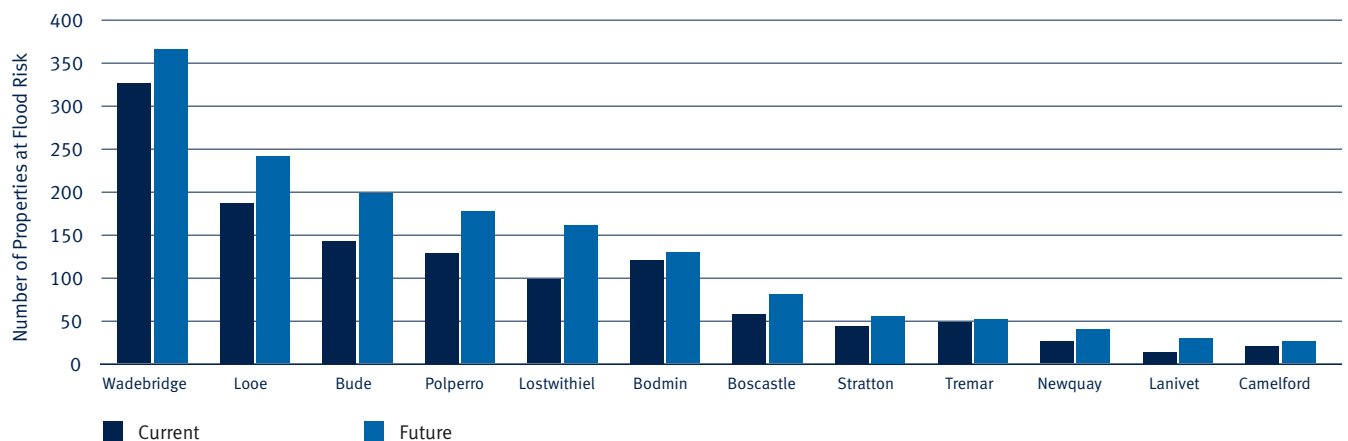
probability flood, rising from the current 980 properties. Flood risk from rivers increases mainly in the communities of Wadebridge, Looe, Bude, Polperro and Lostwithiel.

The sensitivity testing undertaken showed that urban development could affect flood risk in Bodmin and Newquay. We found that a 10% increase in urban development around these towns could increase flows by 4.5% and 6% respectively. With the rural nature of the catchment we found that run-off from agricultural land plays a part in flood risk.

An increase in run-off of 15%, combined with a reduction in the time it takes flows to peak, showed that the average increase in flows would be 10%.

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

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

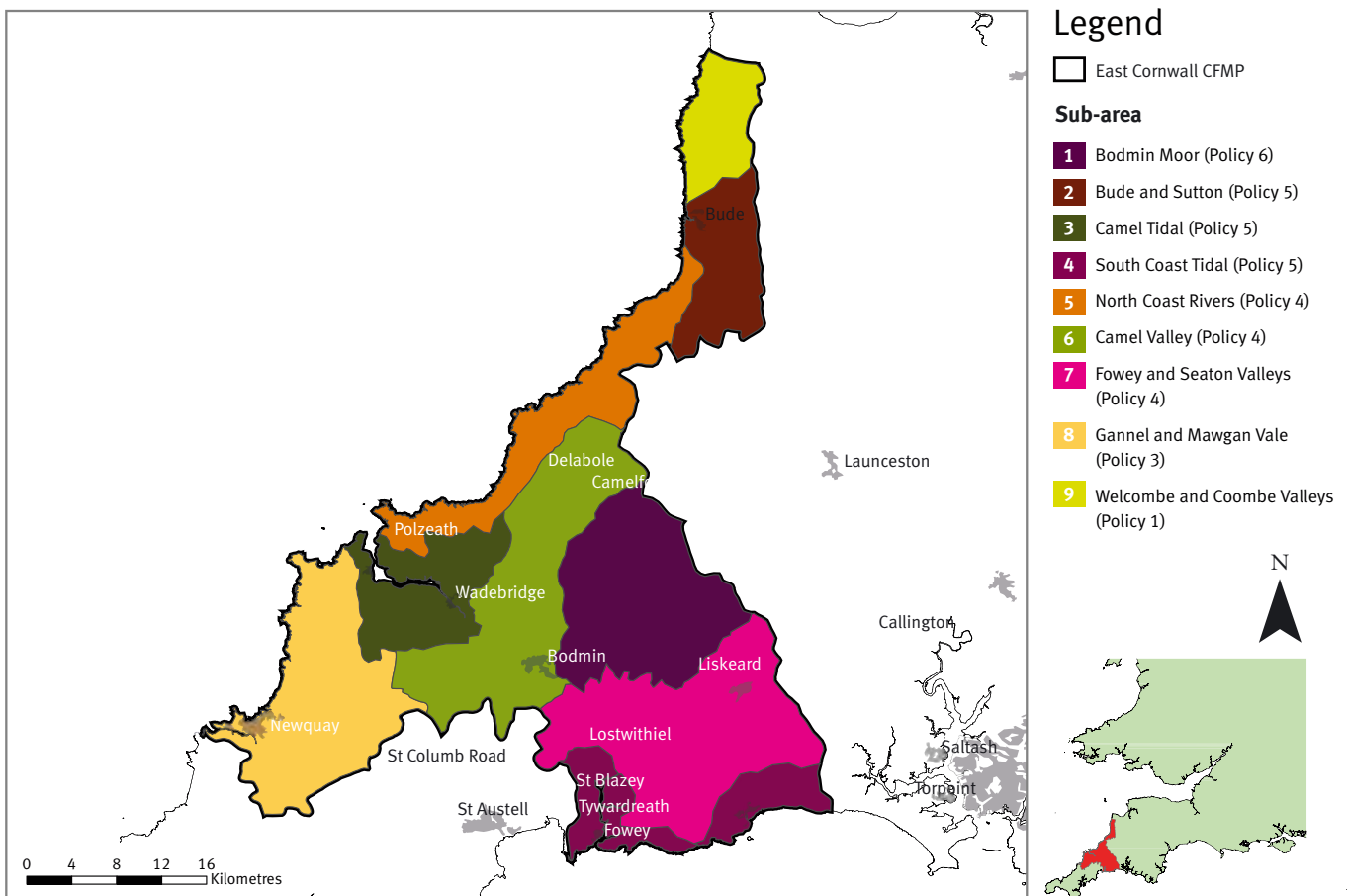
We have divided the East Cornwall catchment into nine distinct sub-areas which have similar physical characteristics, sources of flooding and level of risk. We have identified the most appropriate approach to managing flood risk for each of the sub-areas and allocated one of six generic flood risk management 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.



↑ Looe, Cornwall. March 2006

Map 3. East Cornwall sub-areas



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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.

Bodmin Moor

Our key partners are:

Department for Environment, Food and Rural Affairs (Defra)

Natural England

National Farmers Union

The issues in this sub-area

Bodmin Moor area covers the De Lank River and the headwaters of the River Fowey. The northern part of Bodmin Moor is within the catchment of the River Camel while the southern part drains to the River Fowey catchment.

The area is sparsely populated. There are a number of settlements at risk of flooding from rivers and surface water run-off including Blisland and St Neot. There are 28

properties and a number of minor roads at risk of flooding under the 1% annual probability flood. Over the next 100 years, only a further one property is expected to be at risk.

Drainage practices on the moor have reduced its capacity to store water. As a result, floodwater enter the Camel and Fowey rivers more quickly and make flooding worse downstream.

There are no flood alleviation schemes in the moor area.

Due to the rapid flood response to rainfall it is also not possible to offer specific flood warnings to communities using the current hydrometric infrastructure.

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 will have no adverse environmental impacts and will have a cumulative benefit for both the Fowey and Seaton Valley and the Camel Valley areas. Storing water on the moor will attenuate flows, prolong greater base flow, and reduce sediment loading through reduced erosion. These outcomes could contribute to a decreased risk of flooding downstream, particularly at settlements like Lostwithiel, while not adversely affecting flood risk on the moor itself.

Proposed actions to implement the preferred policy

- Investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes and changing drainage practice to attenuate run-off where this is likely to have an impact. Any studies would need to consider land management requirements of the River Camel SAC.
- Investigate opportunities to reduce flood risk downstream by creating flood storage. Options include enhancing wetland habitat in the Upper Fowey and using Siblyback Reservoir, Colliford Lake and disused china clay workings.

Should any flood storage be created the following mitigation must be implemented to avoid negative impacts to the River Camel SAC:

- Any storage options must not result in degraded water quality.
 - At least 90 per cent of the naturalised daily mean flow should remain in the river throughout the year.
 - Fish passage should not be impeded.
 - Consider changes in flow regime to ensure no detrimental change to woodland area and structure.
- Use programmes to raise and maintain awareness of flood risk and self-help measures.

Land use planners should designate floodplains and wetland areas as functional floodplain to protect and enhance their storage potential. This will also avoid introduction of further constrictions to flood flows. Where development or redevelopment is permitted in flood risk areas it is essential that robust warning and evacuation procedures are secured and maintained, and that resistant and resilience measures are fully incorporated into the buildings.

Bude and Stratton

Our key partners are:

Cornwall Council

The issues in this sub-area

The Bude and Stratton area includes the River Neet and River Strat catchments.

A number of locations are vulnerable to flooding caused by short, intense rainfall events. Flooding occurs from rivers overtopping their banks and from surface water run-off. Bude is also at risk of tidal flooding.

There are 338 properties, an emergency response centre, the fire station at Bude and one care home near Flexbury within the 1 per cent annual probability flood extent. Over the next 100 years, we estimate that around 30 additional properties will be at risk of flooding. Roads could also be subjected to flooding. There are flood alleviation schemes at Stratton, Bude, Flexbury and Helebridge.

The vision and preferred policy

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

This policy allows scope to respond to current flood risk now. A range of flood risk management measures can be used to reduce risk in the sub-area including community based tidal flood warnings at Bude and improvements to lead time warnings on the rivers Neet and Strat. This policy also allows flood risk management measures to respond to long-term risks such as sea level rise.

Limited impacts to the environment may occur from this option and they should be mitigated against through the design of flood risk management measures.

Proposed actions to implement the preferred policy

- Review existing flood risk in Bude and undertake work to reduce risk if justified.
- Use programmes to raise and maintain awareness of flood risk and self-help measures.
- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local

Development Framework Documents. Land use planners can contribute to this policy by, using Local Development Frameworks to reduce the vulnerability of development located in flood risk areas.

- Review current facility for recording tide levels at Bude and improve if required.
- Create community-based warnings for areas at risk of tidal flooding.
- Review and improve flood warnings on the Neet and Strat if feasible.
- Further investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Investigate the management of existing defences at Stratton, Flexbury and Helebridge.

Camel Tidal

Our key partners are:

Cornwall Council

South West Water

The issues in this sub-area

Camel Tidal includes the area draining to the Camel Estuary.

The major source of flood risk in the area is tidal flooding, with Wadebridge being at the greatest risk. Fluvial flooding is also a risk at places such as Polmorla and Sladesbridge. Tide-locking is a factor that makes flood risk worse in these areas.

There is little floodplain storage potential upstream of settlements and there are a number of small catchments that respond rapidly to rainfall.

There are 390 properties, including an emergency response centre and an electricity substation, as well as roads at risk of flooding. Over the next 100 years, we estimate that the number of properties at risk could increase by around 60. There are flood alleviation schemes at Polmorla, Wadebridge, and Sladesbridge, with tidal defences at Rock and Padstow.

The vision and preferred policy

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

This policy allows scope to respond to current flood risk now. Through this policy the number of commercial and residential properties at risk of flooding would be reduced and there would be a minor decrease in the extent and duration of flooding of roads. Community assets would also benefit from reduced flood risk.

Land use planners have a major role in the delivering of this policy, both now and in the future. Climate Change will increase the principal risk of flooding due to sea level rise. It is essential that Local Development Framework documents provide a robust strategy to deal with climate change adaptation, in particular for Wadebridge and the low-lying areas behind its raised defences.

Proposed actions to implement the preferred policy

- Use programmes to raise and maintain awareness of flood risk and self-help measures.
- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments

and associated Local Development Framework Documents. Ensure PPS25 implemented for development and in particular at Wadebridge. We expect this will include Planning policies to address climate change adaptation in relation to flood risks, and for allocations to be directed to areas at lowest flood risk.

- Create community-based warnings for areas at risk of tidal flooding.
- Undertake and implement Surface Water Management Plans for Wadebridge and Padstow.
- Progress with the outcomes of the Rapid Response Catchment Study when available. This is likely to apply to Polmorla in particular.
- Further investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Investigate the current management of flood risk on the rivers Allen and Camel at Sladesbridge and also at Polmorla and Wadebridge.

South Coast Tidal

Our key partners are:

Cornwall Council

National Farmers Union

Natural England

Department for Environment, Food and Rural Affairs (Defra)

The issues in this sub-area

South Coast Tidal includes the Fowey Estuary and the catchments draining direct to the coastline to the east, to just before Donderrry. The main towns are Lostwithiel, Fowey and Looe. There are 408 properties at risk of flooding from a 1% and 0.5% annual probability flood. Over the next 100 years, we estimate the number of properties at risk could increase in number by around 70 as a result of the impacts of climate change and land use management.

Tidal flooding is the dominant flood risk in the area. Looe suffers frequent flooding from high tides with around 62 properties at risk from a 10% tidal flood. Many properties, roads, and the Looe railway line are at risk of flooding. Two electricity substations are at risk, as is a police station and a St John's Ambulance centre.

The vision and preferred policy

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

This policy allows scope to respond to current flood risk now. A number of economic and social assets are currently at risk of flooding.

Land use planners must ensure that any development is carefully designed so as not to exacerbate flood risks further.

This policy also allows scope to respond to risk in the future as a result of sea level rise, particularly in the communities of Looe, Fowey and Lostwithiel.

Limited impacts to the environment could potentially occur from this option and must be mitigated against through the design of flood risk management measures.

Proposed actions to implement the preferred policy

- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local Development Framework Documents. Ensure PPS25 is implemented for developments, particularly for Fowey, Looe, Lerryn and Lostwithiel. Land use planners should consider options within their Local Development Framework and development control decisions to support opening up of culverted watercourses to manage flooding and enhance green infrastructure. We would expect planning policy to address climate change adaptation due to sea level rise, especially at Looe, Lostwithiel and Fowey.
- Create community-based warnings for areas at risk of tidal flooding. Use programmes to raise and maintain awareness of all flood risk and self-help measures.
- Investigate the possibility of installing a tide gauge at either Fowey or Looe for flood warning.
- Further investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Investigate measures for reducing flood risk at Looe, Fowey, Polperro and Seaton, from tidal and surface water flooding.
- Review options to reduce flood risk at Lostwithiel, including improving lead time for flood warning and improving the standard of protection of current defences. Undertake work to reduce risk if justified.



↑ Shops sandbagged against floods on Fowey's Town Quay in March 2006

North Coast Rivers

Our key partners are:

Cornwall Council

National Trust

Natural England

National Farmers Union

Department for Environment, Food and Rural Affairs (Defra)

The issues in this sub-area

North Coast Rivers covers the catchments between the Camel and the Strat at Bude. This includes the Valency River and River Jordan through Boscastle.

Fluvial flood risk is dominant with all watercourses springing on high ground in small catchments and flowing directly to the sea. All rivers are of high gradient and vulnerable to ‘flash’ flooding caused by short, intense rainfall events and surface run-off.

Flooding has been recorded at many locations, most notably in August 2004.

Whilst there are no major settlements, there are some 106 properties at risk of flooding from the 1% annual probability flood. Over the next 100 years, we estimate that a further 20 or so properties could become at risk of flooding as a result of the impact of climate change and land use management.

There is a flood alleviation scheme at Boscastle, although a residual risk has been identified in the Valency Valley Tree Management Study. Surface water flooding is also being addressed with Cornwall’s Highways.

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.

We propose to continue to effectively manage the flood risk to take further actions where we need to keep pace with climate change. Whilst there are no significant increases in future risks, the current risks to life justify maintaining the standard of protection.

Proposed actions to implement the preferred policy

- Sustain the current flood risk at Boscastle into the future.
- Create specific flood warnings for at risk locations, such as Boscastle.
- Use programmes to raise and maintain awareness of flood risk and self-help measures, for both permanent and temporary residents.

- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local Development Framework Documents.
- Progress with the outcomes of the Rapid Response Catchment Study when available.
- Further investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Targeted channel maintenance, including reducing the incidents of blockages.
- Act upon the outcomes of the Valency Valley Tree Management Study.



↑ Helicopters rescue people trapped in the Boscastle floods of August 2004
Photo: Pam Durrant

Camel Valley

Our key partners are:

Cornwall Council

Natural England

Department for Environment, Food and Rural Affairs (Defra)

National Farmers Union

The issues in this sub-area

The Camel Valley covers the River Camel and its tributaries upstream of Wadebridge and the tidal estuary. The major towns are Camelford and Bodmin.

The Camel and its tributaries spring on high ground and moorland, underlain by impermeable granite so that the rivers respond quickly to rainfall. They flow through narrow wooded valleys with limited floodplains to store floodwater.

There are 214 properties at risk of flooding under the 1% annual probability flood event, with protection provided for 130 properties for this scale of event.

Over the next 100 years, the expected number of properties at risk could increase by 30 as a result of the impact of climate change and land use management

The major risk of flooding is at Bodmin, from both the Bodmin Town Leat and surface water. A flood alleviation scheme in Bodmin provides protection for up to the 1 per cent annual probability river flood. The fire station is at risk from this flood.

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 impacts of climate change and land use management include reducing the standard of protection offered by existing flood alleviation schemes (at Camelford and Bodmin).

The number of social and economic assets currently at risk of flooding would not be reduced.

Any development should be carefully designed so as not to exacerbate flood risks further, especially in the Bodmin area. Land use planners should support the development of a Surface Water Management Plan and its implementation in new development within the Bodmin area.

Proposed actions to implement the preferred policy

- Investigate taking further actions in Camelford, Lanivet, and Bodmin to keep pace with climate change, while ensuring measures undertaken avoid negative impacts to the River Camel SAC. Opportunities include wetland creation at Slaughterbridge.
- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local Development Framework documents.
- Ensure PPS25 is implemented for development particularly at Bodmin and investigate feasibility to relocate the fire station in the town.
- Progress with the outcomes of the Rapid Response Catchment Study when available and undertake and implement a Surface Water Management Plan for Bodmin.
- Investigate links between land management practices, run-off and flood risk.
- Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Improve warning times on the Rivers Camel and Allen and the Bodmin Town Leat and raise awareness of flood risk and self-help measures across the area.
- Targeted channel maintenance and review of structure capacity, to reduce incidents of blockage.
- Improve understanding of the impact of mine workings on flood risk, particularly within the River Camel SAC.



↑ Surface water and Leat flooding at Church Square, Bodmin – September 1993

Fowey and Seaton Valleys

Our key partners are:

Cornwall Council

Natural England

Department of Environment, Food and Rural Affairs (Defra)

National Farmers Union

The issues in this sub-area

The Fowey and Seaton Valleys covers the Rivers Fowey, Pol, East Looe, West Looe, and Seaton after they drain from the Bodmin Moor area. The area includes the towns of Liskeard and Polperro. It excludes the tidal reaches of the Fowey and the lower Seaton Valley. The rivers flow through incised valleys with little floodplain storage so that they react quickly to rainfall.

There are 290 properties, roads, a waste water treatment works and two electricity sub stations at risk from the 1% annual probability flood. Over the next 100 years, the number of properties at risk could increase by around 14 as a result of the impacts of climate change and land use management

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 flood alleviation scheme at Polperro provides an appropriate level of flood protection today for about 130 properties, however in the future this level of protection will reduce and risks to life will increase. This policy intends to allow us to keep pace with climate change. Our studies have also shown a significant flood risk at Tremar, although this is not supported by historical records and further work is needed to assess the flood risk at Tremar.

Any development in the area should be carefully designed as not to exacerbate flood risks further.

Proposed actions to implement the preferred policy

- Take further action on the River Pol at Polperro to keep pace with climate change.
- Use programmes to raise and maintain awareness of flood risk and self-help measures and Improve flood warning lead time on River Pol.

- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local Development Framework documents. Land Use Planners should designate open floodplains and river corridors as functional floodplain to ensure that their flow capacity is not reduced. Local Development Frameworks and application decisions should seek to reduce the vulnerability of development located in flood risk areas.
- Targeted channel maintenance, including reducing the incidents of blockages.
- Investigate links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes where this is likely to have an impact.
- Review flood risk at Tremar and improve A38 drainage in the Glynn Valley.
- Progress with the outcomes of the Rapid Response Catchment Study when available. This is likely to apply to Polperro in particular.

Gannel and Mawgan Vale

Our key partners are:

Cornwall Council

The issues in this sub-area

Gannel and Mawgan Vale covers the catchments of the Rivers Gannel and Menalhyl, and the coastal streams to the north up to Trevone. The area includes the town of Newquay.

The rivers are of low gradient. Underlying geology means that rivers still respond rapidly to rainfall, with the small catchments responding quickest. The major risks of flooding are from rivers and surface water. Some tidal flooding has been recorded at Newquay. Surface water and inadequate drainage have also caused flooding at a number of locations.

There are 238 properties at risk of flooding for the 1% annual probability flood, it is also expected that three A roads, two B roads and 4km of minor roads would also be subjected to flooding. Over the next 100 years, we estimate that an additional 17 properties will be at risk of flooding in the future as a result of the impacts of climate change and land use management.

The vision and preferred policy

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

A number of economic and social assets are at risk of infrequent flooding in the long-term, and while flood risk to these assets will get worse, this remains a relatively low number of assets. Risk to life is not estimated to increase. Furthermore, this option does not result in any significant impacts on the environment.

Future impacts from urban development in Newquay need to be avoided through ensuring PPS25 requirements are met for new developments. In particular this may be achieved through strategic planning for use of Sustainable Drainage Systems.

Proposed actions to implement the preferred policy

- Continue to maintain existing defences at Mawgan Porth and St Columb Major.
- Continue to use programmes to raise and maintain awareness of flood risk and self-help measures.

- Support the local planning authority in the preparation of its Strategic Flood Risk Assessments and associated Local Development Framework Documents. Ensure PPS25 implemented for development and in particular at Newquay. We consider that this should include a Surface Water Management Policy for allocation of any major development within or around Newquay.
- Review flood risk in Newquay and take action to ensure it does not increase as a result of new development.
- Investigate the links between land management practices, run-off and flood risk. Consider options for influencing land management practice to reduce flood risk, including encouraging landowners to join Environmental Stewardship programmes. where this is likely to have an impact.

Welcombe and Coombe Valleys

Our key partners are:

Cornwall Council

The issues in this sub-area

Welcombe and Coombe Valleys covers the coastal rivers north of Bude including the Marsland Water and the villages of Morwenstow and Kilkhampton.

There are no major conurbations in the area.

Fluvial flood risk is dominant with all watercourses springing on high ground and draining small catchments directly to the sea. The rivers have high gradients and are vulnerable to 'flash' flooding caused by short, intense rainfall events and surface run-off.

There are 9 properties considered to be at risk of flooding from the 1% annual probability flood. However we are not aware of any property flooding having been recorded. Over the next 100 years, we do not expect the number of properties at risk to increase as a result of the impacts of climate change and land use management.

The vision and preferred policy

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

No active intervention is the most appropriate option to manage increasing flood risk in the long term as there is no increase in number of properties at risk of flooding, and no community assets at risk. There is the potential that Coombe Mill SSSI may be impacted by an increase in frequency, depth and duration of flooding. This impact will need to be assessed and consent may be required from Natural England.

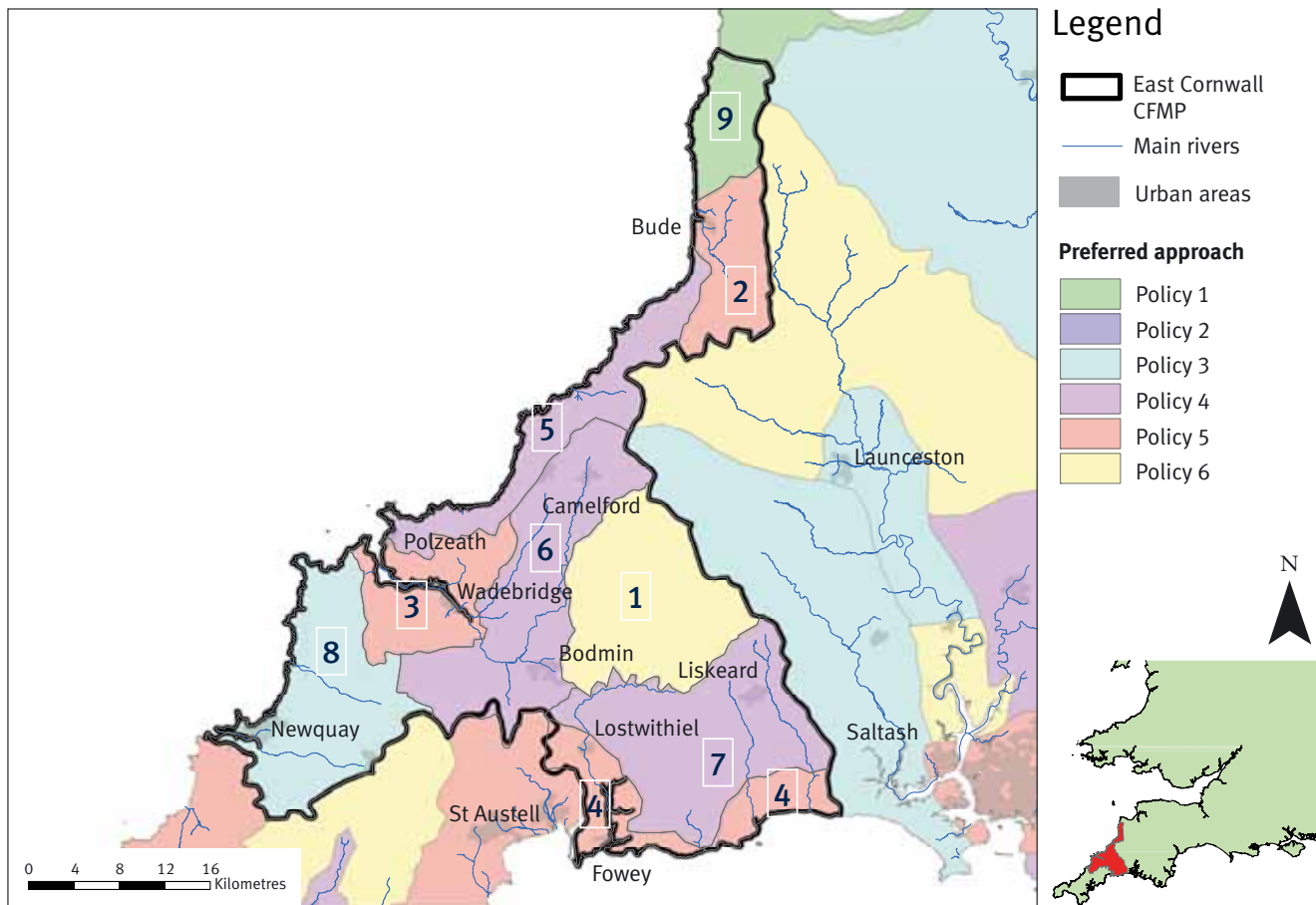
Proposed actions to implement the preferred policy

- No further action is proposed, but we will continue to monitor and advise.

Land use planners should designate all floodplains as functional floodplain to maximise their role in controlling flood risks.

Map of CFMP policies

Map of the policies in the East Cornwall catchment



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The sub-areas

- 1 Bodmin Moor
- 2 Bude and Stratton
- 3 Camel Tidal
- 4 South Coast Tidal
- 5 North Coast Rivers
- 6 Camel Valley
- 7 Fowey and Seaton Valleys
- 8 Gannel and Mawgan Vale
- 9 Welcombe and Coombe Valleys

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