

# Tamar Catchment Flood Management Plan

Summary Report June 2012



managing  
flood risk

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Published by:

Environment Agency  
Manley House  
Kestrel Way  
Exeter EX2 7LQ  
Tel: 0870 8506506  
Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

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# Introduction

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

The Tamar 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 within the Tamar catchment can be attributed to flooding from the rivers, estuaries, surface water run-off and drainage systems. Previous incidents include flooding in Launceston in December 1979, widespread flooding in October 2000 and a dramatic event in Canworthy Water in August 2004. While the numbers of properties at risk across the Tamar catchment may be relatively low compared with other areas of the country, the risk to life, and community disruption caused by flooding, can be just as 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 Plymouth City 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:

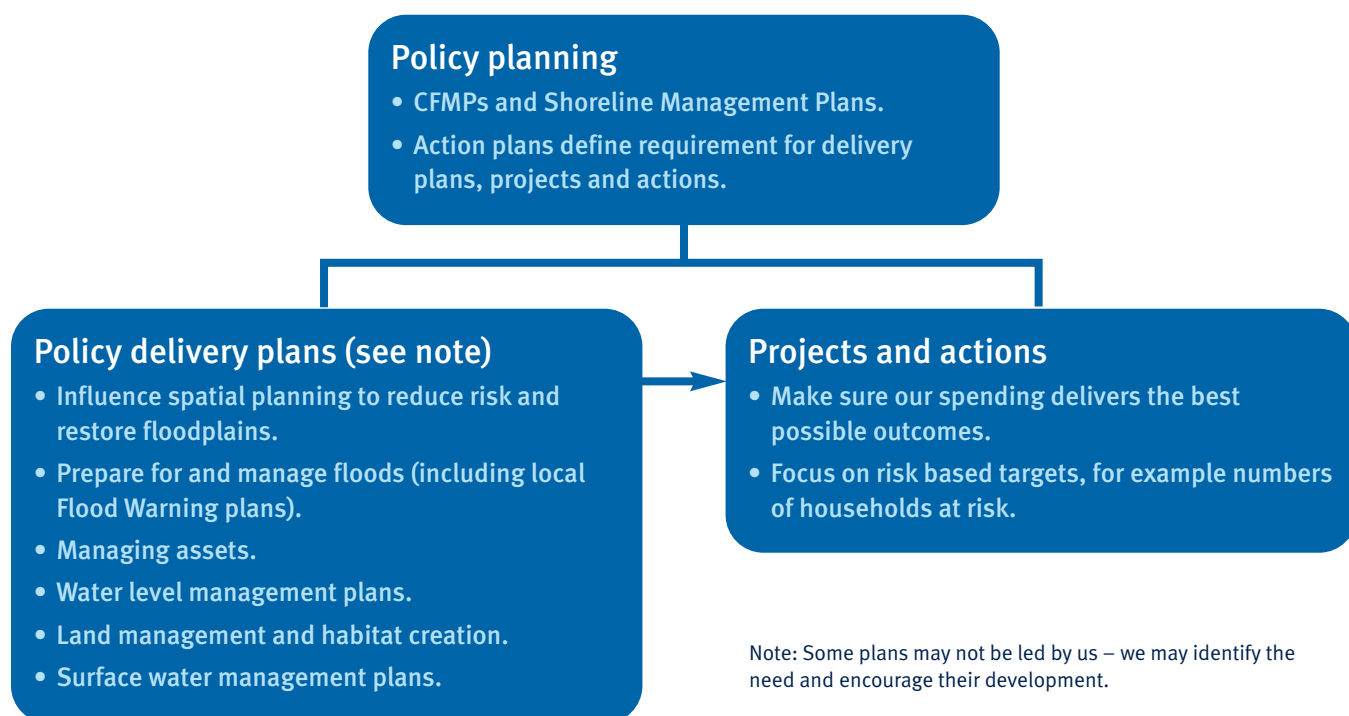
- the Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- Regional Assemblies and local authorities who can use the plan to inform spatial planning activities and emergency planning;

- 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 Tamar catchment lies between the East Cornwall, North Devon and South Devon CFMP areas. It drains an area of 1,800 square kilometres (700 square miles). The River Tamar meets the sea at Plymouth Sound, with the Tamar estuary extending approximately 22km inland to Gunnislake.

The topography of the Tamar catchment is varied. The main upland areas are west Dartmoor and east Bodmin moor, from which the Thrushel, Lyd, Tavy, Walkham, Plym, Yealm, Ottery, Kensey and Inny rivers spring. The remainder of the catchment is made up of rolling farmland, valleys and heaths. The River Tamar itself originates from the far northern part of the catchment, in the hills close to the North Devon coast. Annual rainfall ranges from more than 2,000mm (80in) on the edge of Dartmoor to less than 1,000mm (40in) on the coastal

lowlands. The England and Wales average is 920mm (36in).

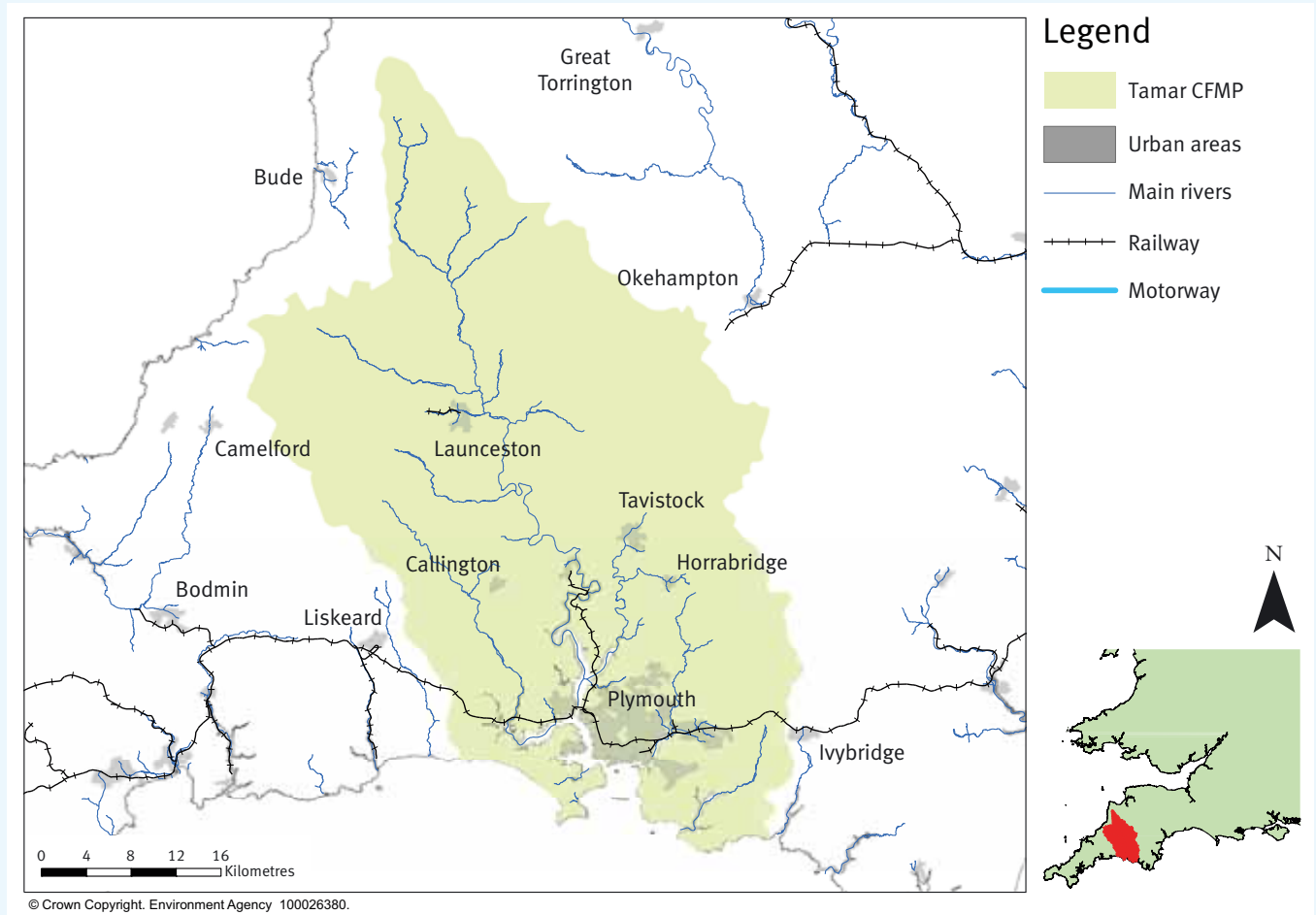
Granites make the upper catchment relatively impervious which in turn leads to the flashy nature of rivers and their tributaries, often resulting in water levels rising rapidly in a short time. The lower areas have sandstones and mudstones overlain with alluvial silts and clays and terrace deposits from rivers and sea.

The Tamar catchment is environmentally rich with many important environmental locations, and some quality river systems. The area has a rich mining heritage with the western edge of the catchment included in the Cornish mining World Heritage site. There are three Areas of Outstanding Natural Beauty, five Special Areas of Conservation (SAC), one Special Protection Area (SPA), 61 Sites of Special Scientific Interest (SSSIs) and 880 Scheduled Monuments.

Most of the catchment is rural, with only four per cent being urbanised. However the principal urban centre is Plymouth, which is the most populous city in Devon and Cornwall. Tavistock and Launceston are the other major settlements within the catchment, along with Saltash, Plympton and Plymstock (which are all within the housing market area of Plymouth). Just over 341,000 people live in the Tamar catchment. Over 250,000 of these are in the Plymouth area.

Granites make the upper catchment relatively impervious which in turn leads to the flashy nature of rivers and their tributaries, often resulting in water levels rising rapidly in a short time.

Map 1. Location and extent of the Tamar CFMP area



← Flooding from the River Kensey at Newport in Launceston in 1980

# Current and future flood risk

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## Overview of the current flood risk

There is a recorded history of flooding within the Tamar catchment that dates back to the 19th Century. This is from a range of sources: rivers, the estuaries, surface water run-off and sewer systems.

More recent flooding incidents include Launceston in December 1979, widespread flooding in October 2000 and extreme flooding in August 2004 at Canworthy Water.

The estuaries contribute to flood risk in the Tamar catchment, making flooding from the rivers worse when high tides coincide with high rainfall. For example, in February

1974, very high tides in the Tamar estuary caused areas of Calstock, Cargreen, Morwellham, and Millbrook to flood.

While the numbers of properties at risk across the Tamar catchment may be relatively low compared with other areas of the country, the risk to life, and community disruption caused by flooding can be just as great.

There are flood alleviation schemes throughout the catchment that reduce this flood risk. Over 90km of defences provide varying levels of protection.

## What is at risk?

Today, this accounts for over 2,750 properties across the catchment at potential risk of flooding from rivers and the tide (excluding those behind defences).

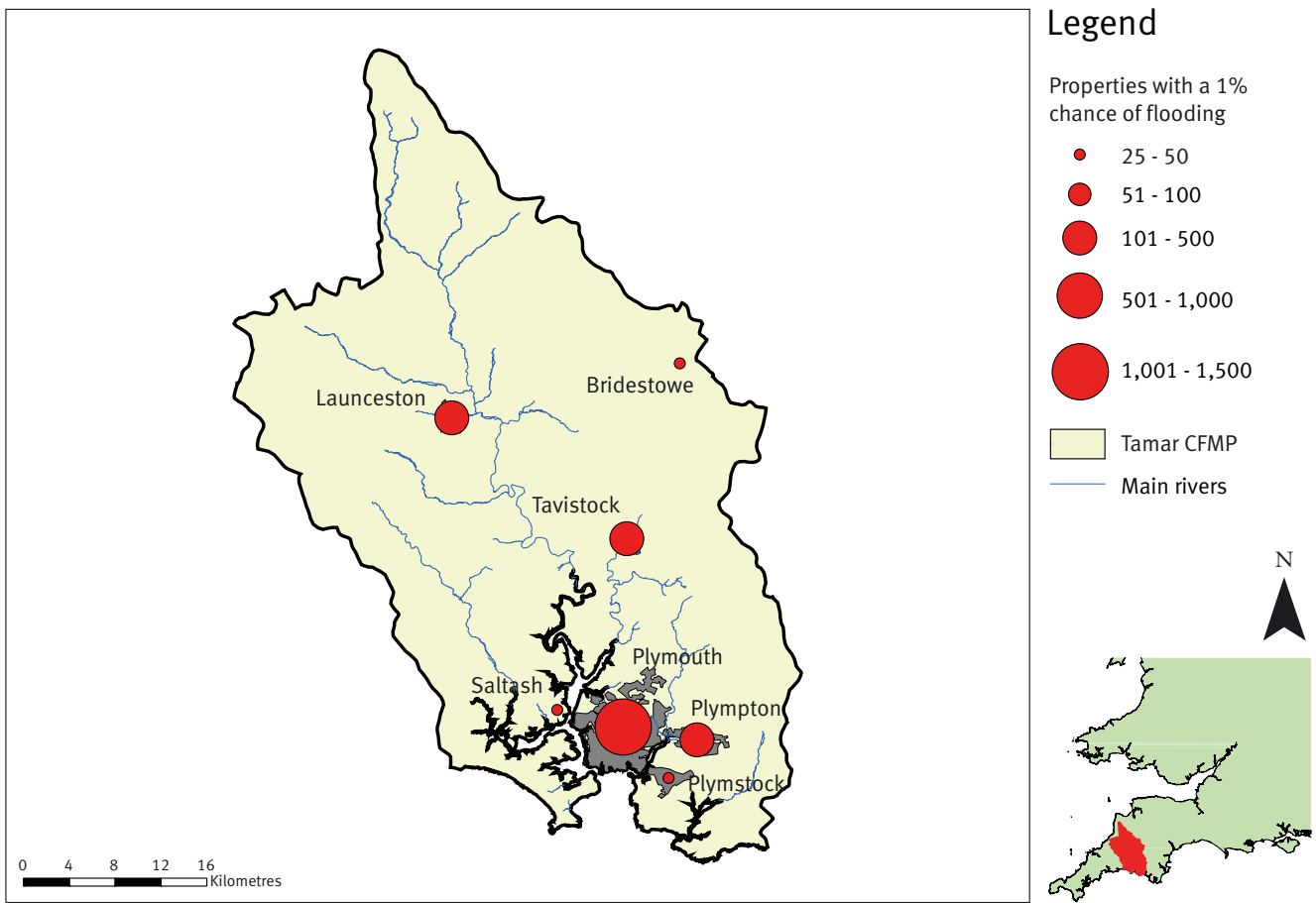
Also at risk are the police station at Tavistock, the A30 and A374, the mainline railway in at least three locations, two schools, a nursery and a health centre.

Furthermore, some designated environmental sites are within the floodplain or may be affected by actions. These include Culm Grasslands SAC and Dartmoor SAC, and SSSIs such as Dunsdon Farm, Otter Valley, Kernick and Ottery Meadows, and Grimscott and Lymsworthy Meadows.

‘... More than three-quarters being the heaviest shower I have ever witnessed; the whole of the lower part of the town (Plymouth) was flooded.’ 1871



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



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

Number of properties at risk	Locations
>1,000	Plymouth
500 to 1,000	None
100 to 500	Plympton, Tavistock, Launceston
50 to 100	None
25 to 50	Plymstock, Bridestowe, Saltash

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

7 electricity substations, 14 railway lines, 17 A roads, 1 water treatment works

## 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 Plymouth and Plympton. Here some 1,510 properties are at risk from river and tidal flooding. This is set to increase due to rising sea levels.

Tavistock and Launceston have the next highest concentrations in property at risk with some 270 and 110 properties at risk respectively.

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

- 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 multi-media warning service called Floodline Warnings Direct provides targeted warnings to people via different media methods, including telephone, email and SMS text messaging. We also provide a public access telephone service called Floodline that people can ring to check if there is a flood warning for their area. Major Incident Plans are in place for Launceston and Plympton and for tidal flooding at the Barbican, Plymouth.
- Flood defence schemes – We have flood defence schemes at Canworthy Water, Cawsand, Gunnislake and Calstock, Launceston, Notter Bridge, Bathpool, Millbrook, Plympton, Plymouth, Tavistock, Horrabridge, Walkhampton, Yealmbridge and Yealmpton.
- Maintenance – We maintain channels and defences.



← Minor roads near Launceston impassable due to flooding

## The impact of climate change and future flood risk

We have considered a range of factors that could influence flood risk over the next 100 years to find out how flood risks could change in the Tamar catchment. We have found that climate change has the greatest influence on future flood risk, increasing flooding from rivers and the sea, as well as from sewers. Land management also contributes, because of the rural nature of the catchment.

Urban development could affect flood risk in a small number of locations, including Plymouth, Tavistock and Launceston. Development in Plymouth in particular may be significant with investment and re-generation efforts in existing waterfront areas. In

addition, a new town is planned at Sherford, to the north-east of Plymstock. As with all new development, the new town of Sherford will need to be implemented in accordance with PPS25 to ensure that flood risks are not increased.

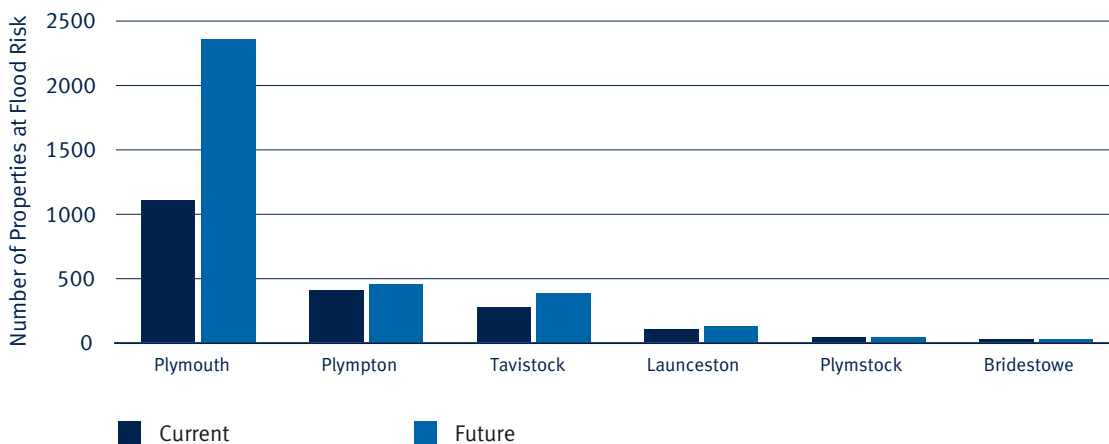
The following future scenario has been used in the Tamar CFMP.

- 20% increase in peak flow in all watercourses due to climate change.
- a total sea level rise of 900mm by 2100 due to climate change.
- 7% increase in river flows due to land use change.
- 4% increase in river flows in certain locations due to urban development.

In the future we expect flood extents to increase slightly but this is limited in most places by the topography of the catchment. However flood depths are likely to increase. This means that more people and property will be affected more frequently by flooding in the future.

Plymouth is expected to see the greatest flood risk in the future (see Figure 2).

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



# Future direction for flood risk management

## Approaches in each sub-area

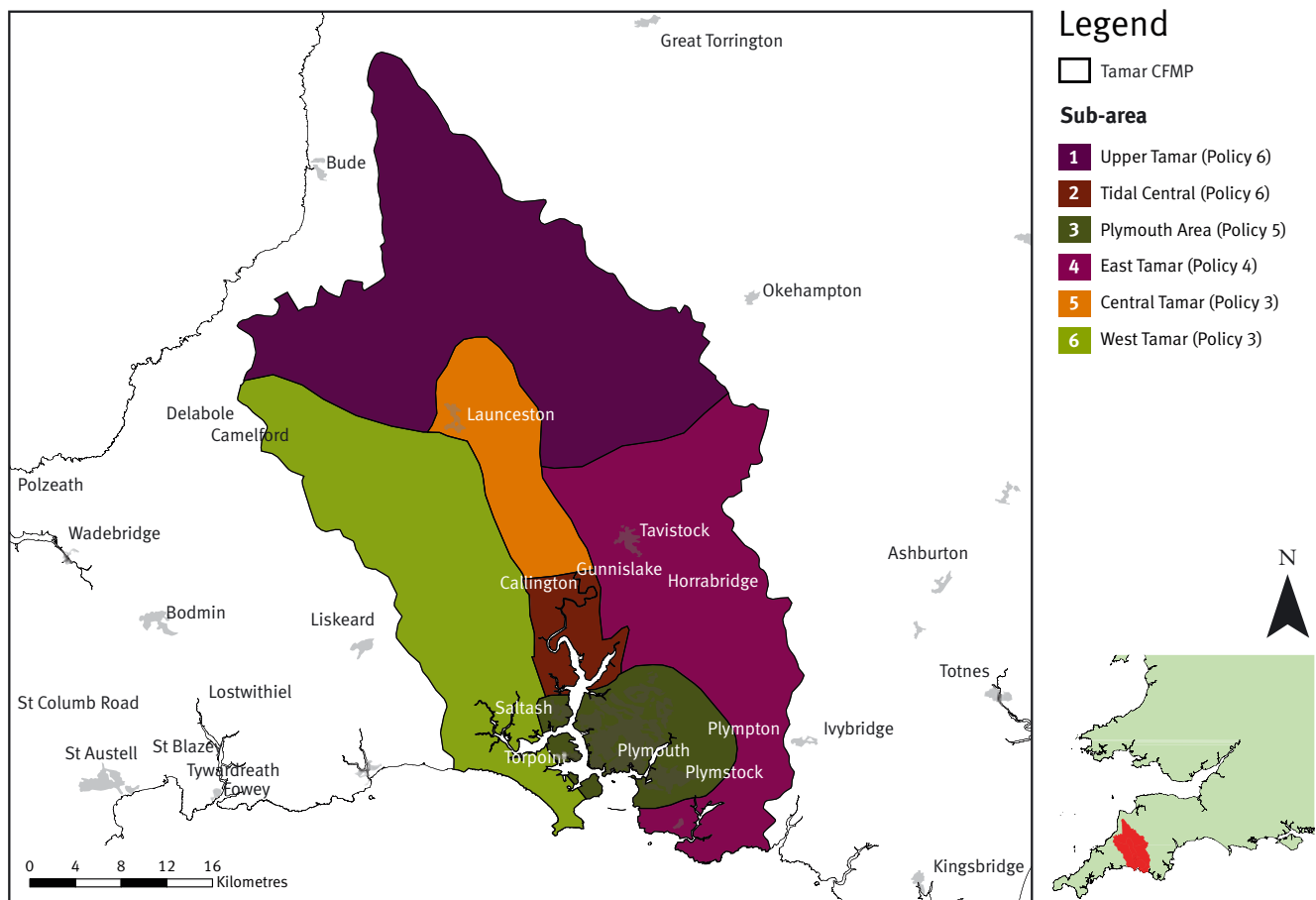
We have divided the Tamar catchment into six distinct sub-areas which have similar physical characteristics, sources of flooding and level of risk. We have identified the most appropriate approach to managing flood risk for each of the sub-areas and allocated one of six generic flood risk management 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 farmer tries to reach a bullock in floods at Polson Bridge, Launceston in October 2000

Map 3. Tamar 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.

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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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# Upper Tamar

## Our key partners are:

West Devon District Council

Torridge District Council

Devon County Council

Cornwall Council

Dartmoor National Park

National Farmers Union

South West Forestry

## The issues in this sub-area

The steeper rivers in this area react fast to localised rainfall and produce rapid increases in river flows. This affects the settlements of Holsworthy, Bridgerule, Bridestowe, Northcott Hamlet and Canworthy Water. When combined with areas of restricted natural floodplain, fast flows build up at these constrictions and cause severe localised flooding.

The 1% annual probability flood affects approximately 90 properties, a church and limited areas of environmental importance. It is estimated that in the future, by 2100, an additional 20 properties could lie within the 1% annual probability flood extent. This is mainly due to the impacts of climate change.

## 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.

This will reduce flood risk in settlements and reduce the level of risk in downstream areas. In addition, this policy would benefit the geomorphological processes of the catchment and the natural environment. Care must be taken to ensure that actions do not result in the disturbance to various SSSI and SAC habitats and features.

Actions should concentrate on floodplain attenuation (connectivity) measures to benefit the catchment downstream. Land management measures to minimise run-off should also be targeted.

## Proposed actions to implement the preferred policy

- Complete Systems Asset Management Plans for existing defences at the Tamar, Deer and Claw confluence. Consider the potential to re-establish floodplain and create wetland habitat to reduce peak flows downstream. Explore the possibilities for flood attenuation at Roadford Reservoir to reduce peak flows at Lifton and Tinhay.
- Continue with work to identify rapid response catchments.
- Increase awareness of landowner responsibility regarding land ownership, maintenance and surface water flooding across the dispersed, isolated communities.
- Investigate the potential for creating wetland habitat and flood storage in existing floodplains. For instance, upstream of Canworthy Water.
- Increase woodland and forest cover by diversifying farming and involving the community in promoting the development of woodland on upper catchment slopes.

Land use planners should designate floodplains and wetland areas as functional floodplain in order to maximise their storage potential and reduce risks downstream. This will also avoid introduction of further constrictions to flood flows.

# Tidal Central

## Our key partners are:

West Devon District Council

South Hams District Council

Cornwall Council

Devon County Council

Natural England

South West Forestry

Landowners

National Farmers Union

## The issues in this sub-area

Tidal Central covers the lower section of the River Tamar. It includes the villages of Calstock, Morwellham and Bere Ferrers, as well as part of Gunnislake.

At Morwellham flooding is largely a result of high flows in the River Tamar. At Calstock it is due to a combination of heavy rainfall and high tides. Above Gunnislake the River Tamar flows within an incised valley that naturally limits floodplain storage and confines the flow of floodwater. Inundation can also occur at periods of very high spring tides.

There are several incidents of surface water flooding recorded across the area.

The 1% annual probability fluvial flood (and 0.5% tidal) affects approximately 50 properties. There is one electricity substation at risk. The number of properties at risk in the future, as a result of the impact of climate change has not yet been assessed.

## 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 will play an important role in absorbing the impacts of sea level rise.

We would intend to review the capabilities of existing defences at locations such as Morwellham and Calstock, to ensure we can maintain flood risk at an acceptable level. The policy can also support the improvement and expansion of existing wetland areas and designated sites.

## Proposed actions to implement the preferred policy

- Develop System Asset Management Plans that will reduce our level of maintenance and will utilise the floodplains more effectively.
- Investigate the possibility of creating flood storage areas for fluvial waters linking existing limited floodplains within the estuary.
- Investigate potential for wetland habitat creation through the expansion of existing SSSI areas and other appropriate wetland areas within the Tamar estuary.
- Produce detailed studies for Morwellham, Gunnislake and Calstock to review capabilities of current defences to cope with combined high fluvial flow and spring tides.
- Review urban drainage capacity at Metherell and look at improving conveyance at times of high flows to reduce and prevent out of bank flows.

Land use planners should designate floodplains and wetland areas as functional floodplain to protect and enhance their storage potential.

# Plymouth Area

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## Our key partners are:

Plymouth City Council

Cornwall Council

South Hams District Council

Devon County Council

South West Water

Network Rail

Natural England

## The issues in this sub-area

The Plymouth Area covers sections of the Plymouth Sound, Tamar and Plym estuaries, and includes the City of Plymouth.

The City of Plymouth contains by far the largest number of properties within the Tamar catchment. The city forms an important part of the South West's Regional Spatial Strategy in providing new homes in the future. Much of this development may be around, or adjacent to, the waterside areas. Some of these areas of the city are in the floodplain of the Tamar and Plym estuaries. Infrastructure around the city such as the A374 and mainline railway is also at risk.

It is estimated that, for the sub-area as a whole, 1,600 properties are at risk of flooding within the fluvial 1% (and tidal 0.5%) annual probability flood area. The defences at these and other areas affected by flooding are regularly maintained and are in good condition although a residual flood risk remains. Approximately 500 properties are protected by defence schemes at the Barbican and Plympton.

Surface water and sewer flooding occurs due to surface water volumes exceeding urban drainage system capacity.

The number of properties at risk is expected to increase to 2,800 by 2100 as a result of the impacts of climate change and proposed development planned within the catchment.

## The vision and preferred policy

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

This policy will support sustainability objectives by reducing the future increase in flood risks to the urban environment whilst avoiding significant adverse impacts on the environment. The benefits are most significant in relation to the economy of the urban centres.

Objectives relating to geomorphology, biodiversity, and landscape may be met, but this depends on the response used to manage flood risk. However, it is envisaged that sensitive and appropriate approaches to managing flood risk (through incorporation of environmental constraints during detailed appraisal and design) could be developed that do not cause adverse impacts in the long term.



## Proposed actions to implement the preferred policy

- Develop System Asset Management Plans to help reduce flood risk and investigate the need for, and where necessary implement, Surface Water Management Plans for problem areas in Plymouth and Plympton.
- Produce detailed studies for Plymouth, Plympton, Plymstock, Tamerton Foliot, Saltash and Turnchapel to review flow capacities, obstructions to high flows and to investigate upstream attenuation.
- Use programmes to raise and maintain awareness of flood risk and self-help measures.
- Ensure development conforms to PPS25 and identify opportunities through the implementation of PPS25 to work with developers to reduce flood risk elsewhere in Plymouth area.
- Investigate adaptation measures for the mainline railway and the A374 road against increased flooding due to climate change.
- Investigate opportunities to create green corridors alongside the rivers.
- Investigate opportunities for managed realignment to restore intertidal habitat along Plymouth waterfront and estuaries.
- Continue with work to identify rapid response catchments.
- Review urban drainage capacity within Plymouth, Plympton and other major urban areas. Implement findings and provide recommendations.
- Implement strategies for flood risk management of the mine site identified at Plympton to assess the potential pollution risk from flooding.

# East Tamar

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## Our key partners are:

Devon County Council

West Devon District Council

South Hams District Council

Dartmoor National Park

Natural England

South West Water

## The issues in this sub-area

The steeper rivers in this sub-area react quickly to localised rainfall, producing rapid increases in flows that affects settlements such as Tavistock, Horrabridge, Walkhampton and Dousland. Exposed estuarine locations (Newton Ferrers/Noss Mayo) can be subject to tidal flooding when high tides coincide with heavy rainfall. There is also a history of surface water flooding in Tavistock due to the inadequacy of urban drainage systems.

It is estimated that 500 residential properties, 3 electricity substations, and a police station (in Tavistock) are at risk of flooding from the 1% annual probability flood.

Approximately 100 properties are protected by defence schemes at Dousland, Tavistock and Walkhampton. The defences at these settlements are regularly maintained and are in good condition, although a residual flood risk remains during severe events.

In the future, Tavistock is expected to see the greatest increase in the number of properties at risk, with the number increasing from 270 to 390.

## 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 chosen policy was selected to minimise potential social and economic impacts from increased flood risk in the future, whilst avoiding potentially significant environmental impacts.

Actions should concentrate on the existing key settlements, but should also include floodplain attenuation (connectivity) measures to benefit downstream areas.

Land management measures to minimise run-off should also be targeted.

## Proposed actions to implement the preferred policy

- Develop System Asset Management Plans to help reduce flood risk.
- Undertake studies for flood risk problem areas such as Tavistock, Horrabridge, Walkhampton, Milton Combe, Yealmpton, Wembury and Newton Ferrers to review flow capacities, possible obstructions to high flows, and to investigate upstream attenuation.
- Continue with work to identify rapid response catchments.
- Support Local Authorities in the preparation of Local Development Framework Plans and associated Strategic Flood Risk Assessments.
- Review urban drainage capacity within Tavistock particularly with regard to infill and new development to find out where improvements can be made.
- Investigate the potential for creating flood storage areas in the upper parts of the catchment by creating wetland habitat that are linked to existing floodplains, providing benefits to the lower parts of the catchment including Tavistock.
- Review the possibility of more woodland and forest cover by diversifying farming and involving the community in promoting the development of woodland.
- Raise and maintain awareness of flood risk and self-help measures.
- Increase awareness of landowner responsibility regarding maintenance and surface water flooding across the dispersed and possibly isolated communities.



↑ The flooded River Yealm at Yeolmbridge in 1999

# Central Tamar

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## Our key partners are:

Torridge District Council

West Devon District Council

Cornwall Council

Devon County Council

South West Water

Highways Agency

## The issues in this sub-area

Central Tamar covers sections of the Rivers Kensey, Ottery, Carey, Thrushel, Lyd and Tamar. It includes the town of Launceston which is situated within the flood plain of the River Kensey upstream of the confluences of the Rivers Kensey and Tamar.

It is estimated that 140 properties are at risk from the 1% annual probability flood, with 100 of these located in Launceston (as well as other major infrastructure in the town such as the A388) and 10 properties in the villages of Lifton and Tinhay.

Flood defences reduce risks to 130 properties at Lifton/Tinhay, Lucket, and Launceston (from both the River Kensey and the Wooda Stream). The defences at these settlements are regularly maintained and are in good condition though a residual flood risk remains during severe events.

The number of properties at risk in Launceston by 2100 will be in the order of 125 as a result of the impacts of climate change and limited further development planned within the catchment.

## The vision and preferred policy

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

There are a limited number of economic and social assets at risk of infrequent flooding in the long-term. Whilst this policy will result in the flood risk to these assets increasing, the increased risk is not considered to be significantly large to justify increased levels of flood risk management.

Actions in the Upper Tamar area have the potential to reduce flood risks in this area, which represents a more effective response to flood risk management as a whole.

The impacts of new development in Launceston should be mitigated, and overall flood risks reduced, through the application of Planning Policy Statement 25.

## Proposed actions to implement the preferred policy

- Review existing channel maintenance and defences, and deliver System Asset Management Plans. In the long term, review the effectiveness of existing flood risk management at Lifton, Tinhay and Gunnislake, through the production of the plans.
- Investigate potential for creating wetland habitat by creating flood storage areas linked to existing floodplains in the northern half of the area. This could be beneficial in reducing peak flows in this area and downstream.
- Continue with programmes to raise and maintain awareness of flood risk and self-help measures.
- Continue with work to identify rapid response catchments.
- Support Local Authorities in the preparation of Local Development Framework Plans and associated Strategic Flood Risk Assessments, including at least a level 2 assessment for development in Launceston. Consider possible land use changes to less sensitive uses.
- Review existing flood risk in Launceston particularly with regard to infill and new development.
- Promote opportunities for the Environment Agency and the Highways Agency to work together to implement Sustainable Drainage Systems.

# West Tamar

## Our key partners are:

Cornwall Council

South West Water

## The issues in this sub-area

West Tamar covers the Rivers Inny and Lynher and smaller rivers draining to the Tamar. Flooding is due to river, surface water, tidal and tidal/wave action.

- River flooding is experienced throughout the area with overtopping of defences and structure blockage leading to excessive surface water flow. This flooding can occur rapidly and is often very localised.
- Exposed coastal locations (Kingsand and Cawsand) and estuarine locations (such as Polbathic) experience tidal flooding particularly at high spring tides and have relatively low standards of defence.

There are more than 270 properties and one electricity substation at risk of flooding. Of these, 16 properties are defended by a scheme at Millbrook. A section of the A374 between Polbathic and Sheviok is also affected.

The number of properties at risk is not expected to increase by 2100.

The expected annual damages are predicted to change very little by 2100 as a result of the impacts of climate change and limited further development planned within the catchment.

## The vision and preferred policy

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

The chosen policy allows us to undertake work such as System Asset Management Plans to review the existing defence regimes. It will allow us to continue to manage the flood risk into the future at locations such as Altarnun and Millbrook - accepting that there may be a slight increase in flood risk in the longer term but not committing large expenditure to the development or improvement of new flood defence schemes.

This should provide benefits to Plymouth by allowing more resources to be concentrated in the area of greater residential and commercial development.

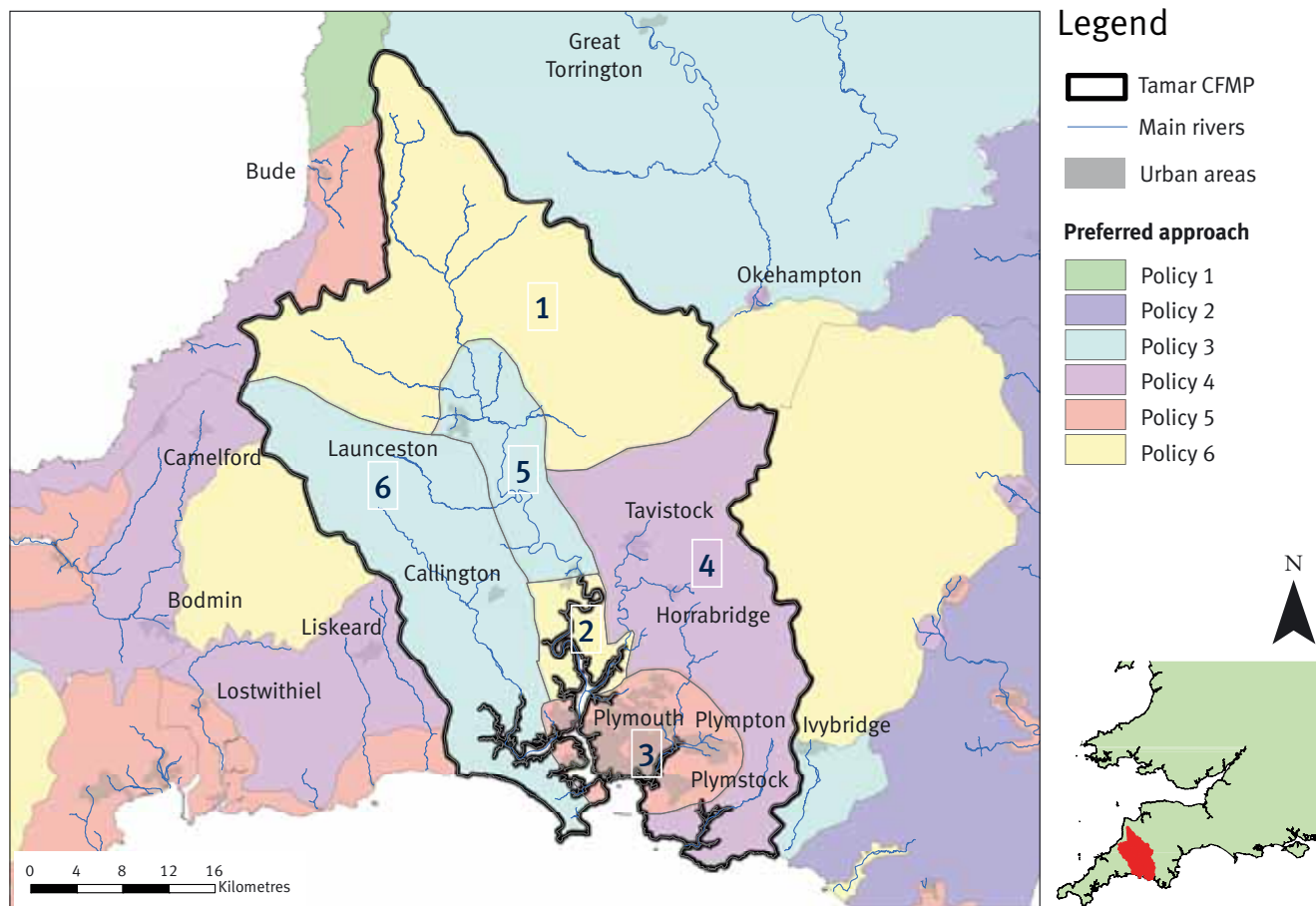
Additionally, the policy should avoid adverse impacts upon environmentally designated sites.

## Proposed actions to implement the preferred policy

- Deliver System Asset Management Plans based on existing or alternative actions.
- Review flow capacities and possible obstructions to high flows at St Germans, Tideford, and Polbathic.
- Continue to use programmes to raise and maintain awareness of flood risk and self-help measures.
- Increase awareness of landowner responsibility regarding maintenance and surface water flooding across the dispersed, isolated communities within this policy area.
- Continue with work to identify rapid response catchments.

# Map of CFMP policies

Map of the policies in the Tamar catchment



## The sub-areas

- 1 Upper Tamar
- 2 Tidal Central
- 3 Plymouth
- 4 East Tamar
- 5 Central Tamar
- 6 West Tamar

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