

North East Northumberland Catchment Flood Management Plan

Summary Report December 2009



managing flood risk

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Introduction



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

The North East Northumberland 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.

The rural catchment of North East Northumberland has a well defined natural floodplain which is flooded regularly. The limited development on the floodplain

means that the impact of the flooding is largely dominated by agricultural land and structures such as bridges and former mills. In total less than 400 properties are at risk in the catchment. There are limited defences in the catchment which offer little protection to existing communities.

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. In developing this plan we have worked with others including Northumberland County Council, Fire and Rescue Service, National Farmers Union, Natural England, Northumberland Wildlife Trust, Northumbria Regional Flood Defence Committee, Northumbrian Water Limited and the Northumberland Park Authority.

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 the North East.

A handwritten signature in black ink, appearing to read 'DL Dangerfield', written in a cursive style.

David Dangerfield,
Director – Yorkshire and North East

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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:

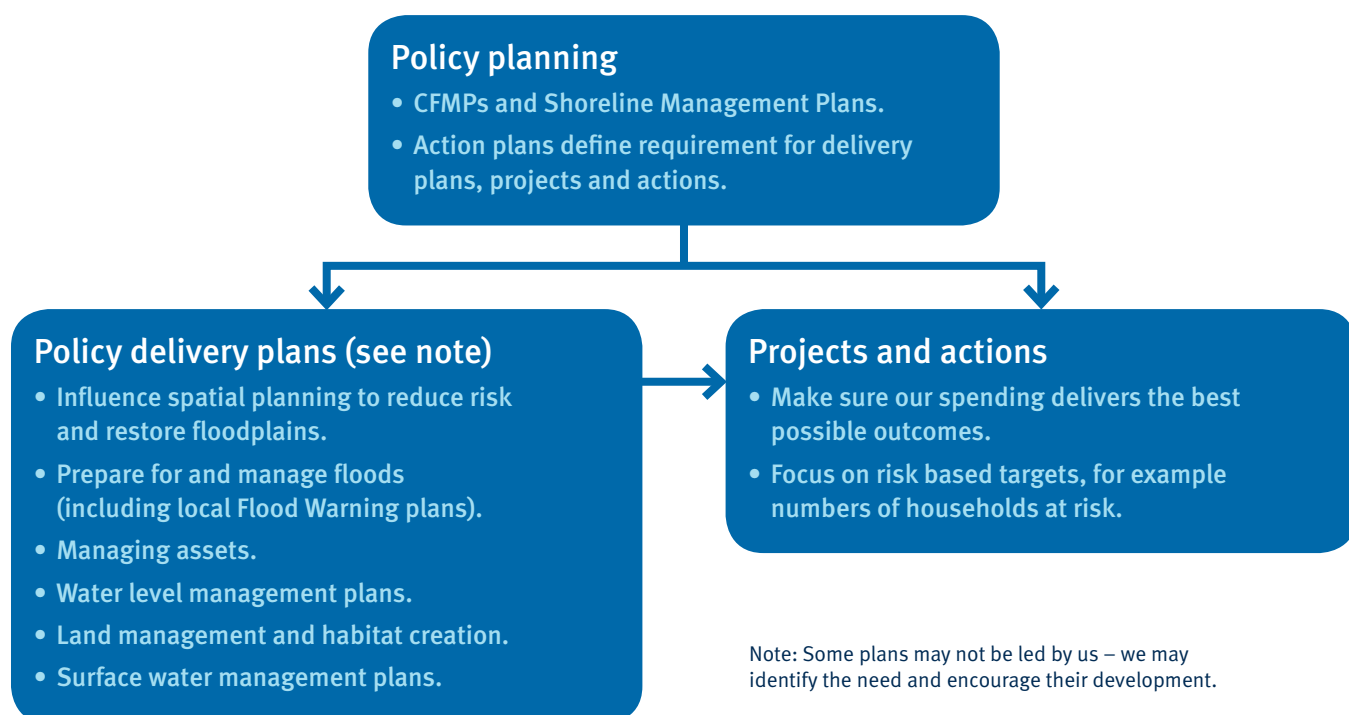
- The Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- Regional planning bodies and local authorities who can use the plan to inform spatial planning activities and emergency planning;

- IDBs, 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 North East Northumberland CFMP is located in the North East of England. The catchment drains an area of approximately 1,400 kilometres from the Cheviot Hills to the North Sea. It has two major rivers – the River Coquet and the River Aln. The River Coquet drains from the Cheviot Hills through Rothbury and Warkworth to Amble and the River Aln drains from Alnham, past Alnwick to Alnmouth. There are also many short coastal streams that drain directly into the North Sea.

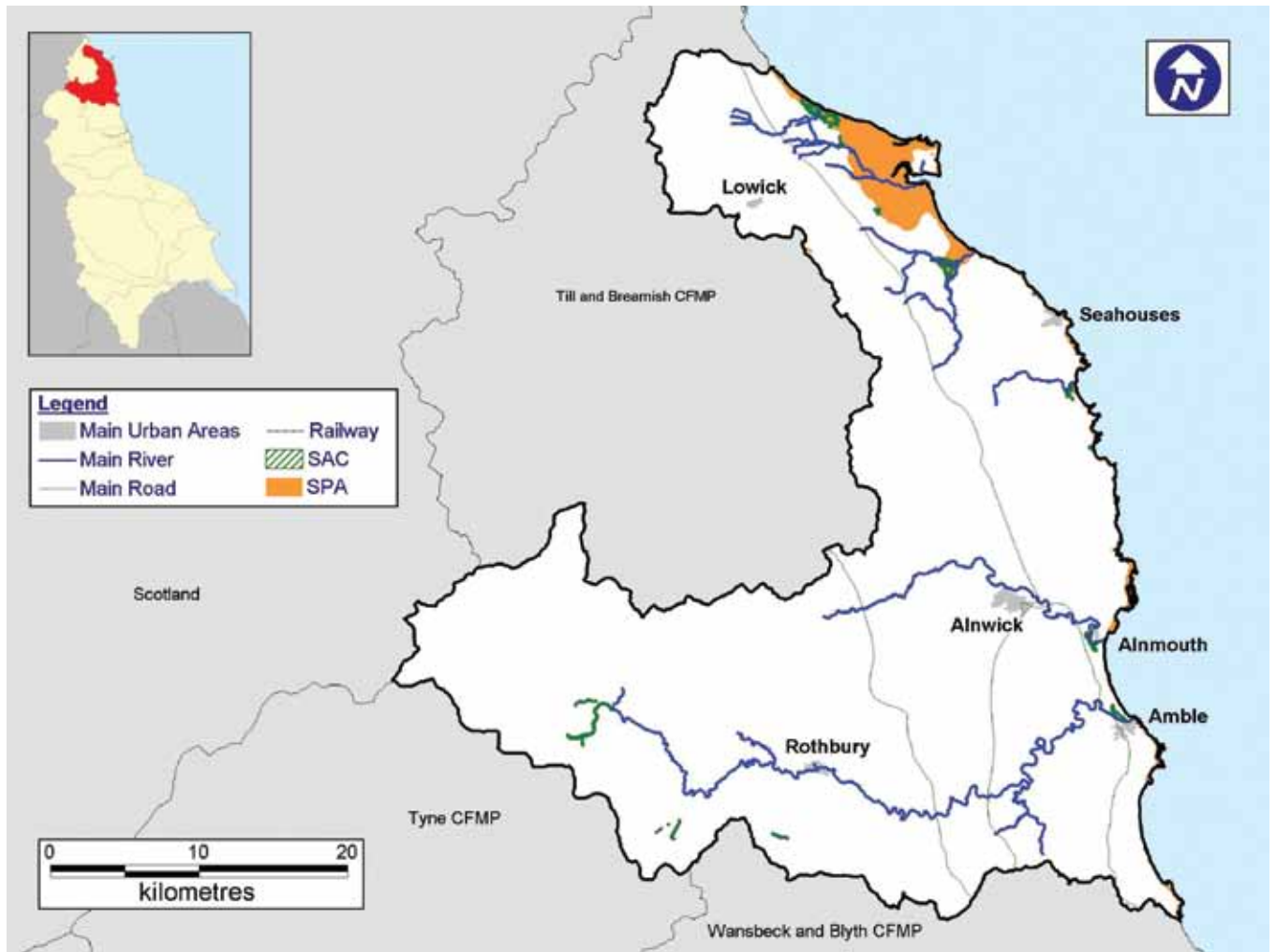
The catchment has distinct landscape characteristics. The southern and western part of the CFMP is characterised by upland heather and peat moors, steep sided valleys, narrow valleys and small villages. The northern

and eastern part of the CFMP is characterised by flat coastal plains with wide valleys.

The CFMP area is predominantly rural with small urban areas including Alnwick, Alnmouth, Rothbury, Amble, Lowick and Seahouses. There are numerous small villages dispersed throughout the CFMP area. The catchment has a population of approximately 39,700. The local economy is dominated by tourism and agriculture including small commercial fishing from a number of the coastal villages. There are nationally important transport links located within the CFMP area. These include the East Coast Main Line railway and the A1 trunk road linking Scotland and England.

The area is rich in environmental diversity, historical and cultural heritage and this is recognised through European, national and international designations within the CFMP area. There are six Special Areas of Conservation (SAC), two Special Protection Areas (SPA), 146 Ramsar sites and 33 Sites of Special Scientific Interest (SSSI) reflecting the environmental importance. The Northumberland coast from Berwick-upon-Tweed to Amble is an Area of Outstanding Natural Beauty (AONB). There are also a number of Scheduled Ancient Monuments (SAMs) and five registered parks and gardens.

Map 1 Location and extent of the North East Northumberland CFMP area



Current and future flood risk

Overview of the current flood risk

The risk of flooding can be broken down into two parts; the chance (probability) of a particular flood and the impact (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 one per cent flood has a one per cent chance or 0.01 probability of occurring in any one year. Within this document the figures for flood risk are shown as the one per cent flood assuming no formal flood defences and are taken from broadscale mathematical modelling.

The rivers in the upper part of the catchment can react quickly to rainfall events but levels also fall quickly. In the lower sections of the catchment flooding tends to last longer. Flood risk is generally low in this largely rural catchment, areas where fluvial flood risk is concentrated are Rothbury, Belford, Haggerston and Waren Mill. Within Belford and Rothbury there is some surface water flood risk when heavy rainfall can impact on the drainage systems.

In the lower reaches of the Coquet and Aln there are some areas which are at risk from tidal flooding. Areas around Warkworth and Alnmouth are effected by tidal levels although this risk hasn't been fully assessed in this CFMP.

There is a rich history of flooding, the most damaging flood occurred in 2008 when 72 properties were flooded in Rothbury. Further property flooding has occurred in Rothbury in 1996, 1992 and 1946. Flooding on the River Aln has been reported since 1770 with damages limited to bridges and agricultural land. There have been a number of flooding events in Belford with up to 34 properties and a caravan park flooding in the past.

What is at risk?

Within the North East Northumberland CFMP area there is a total of 394 properties currently at risk of flooding at the one per cent flood event.

The impact of flooding on environmental assets has been assessed. It is believed that flooding will have a negative impact on two SACs, two SPAs and nine of the SSSIs within the catchment. However, flooding will also have a positive impact on two SACs, and one SSSI.

There are limited impacts to essential infrastructure with only two electricity assets and one wastewater treatment work at risk. There are just under six kilometres of road potentially at risk of flooding which could cause some local disruption.

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

Number of properties at risk	Locations
100 to 500	Rothbury
50 to 100	Belford
25 to 50	Warkworth

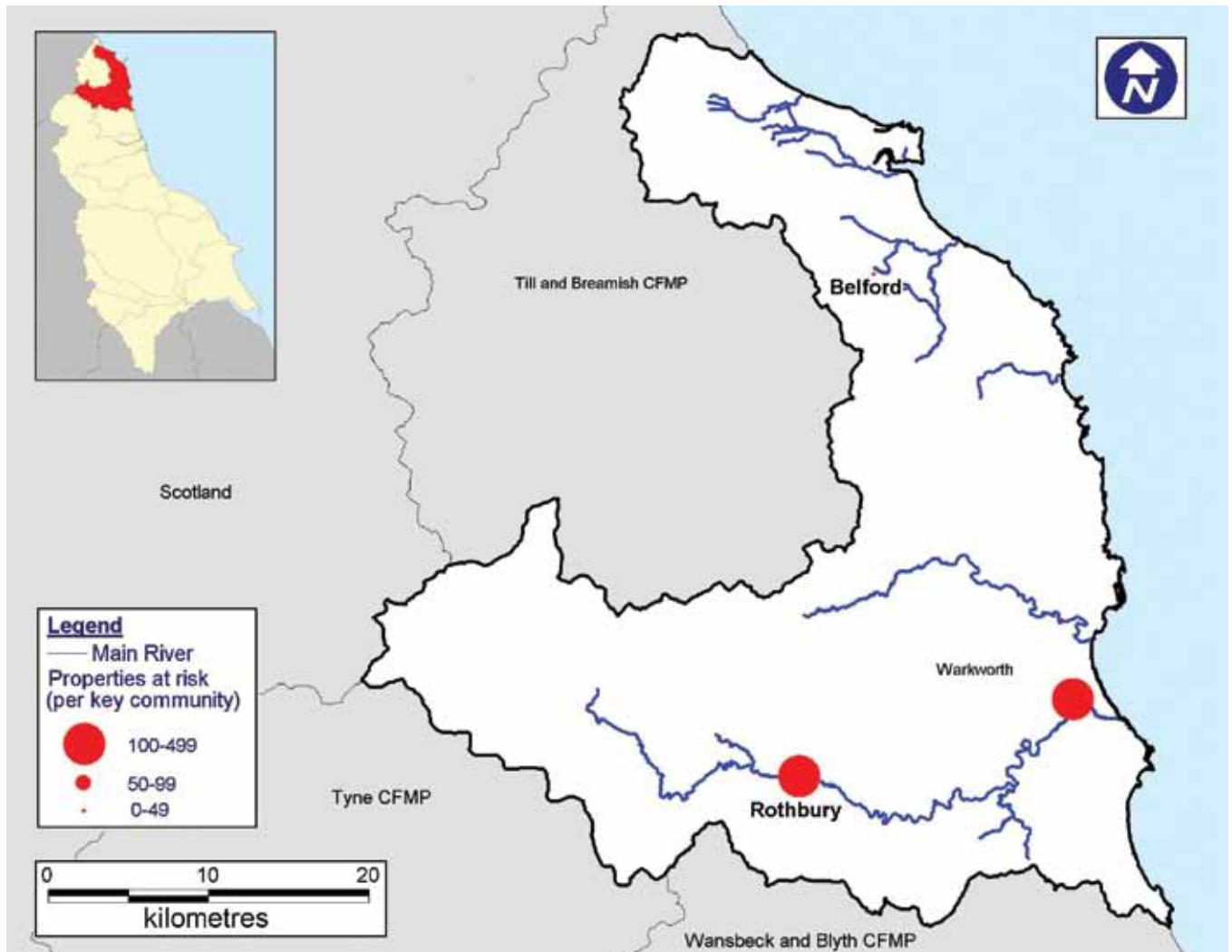
Table 2 Critical infrastructure at risk:

2 electricity assets
1 wastewater treatment work

Where is the risk?

The majority of the risk of flooding in the North East Northumberland catchment is centred on the River Coquet. The main concentration of risk is in Rothbury with the smaller areas of risk along the whole length of the Coquet including Warkworth, Thropton and Felton areas. In the rest of the catchment Belford is a key community at risk from the Belford Burn. Smaller areas of flood risk are also located in Waren Mill and Haggerston in the north of the CFMP area.

Map 2 Properties at risk of flooding in the North East Northumberland catchment



How we currently manage the risk in the catchment

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

- Maintenance of existing defences and structures** prioritised on a risk basis to ensure the effectiveness of our assets. Currently we have defences in Rothbury including a pumping station on the Coplith Burn. We also have a number of coastal defences in the north of the CFMP area which are being reviewed under the Foreshores Project and are covered by the Shoreline Management Plan.
- Capital schemes** to create new flood defences and replace existing ones. This team bids for funds nationally. However, due to the small numbers of properties at risk of flooding major capital schemes are unlikely in this catchment. A Local Levy Team spend locally raised money on smaller projects which otherwise the Environment Agency would be unable to progress within the national funding structure. The team develops partnerships with others to maximise investment in Flood Risk Management in the catchment. They have carried out works in Rothbury and Belford in recent years and worked with camping and caravan sites to raise awareness and reduce consequences of flooding.
- Flood forecasting** and warning to make the emergency responders and the public aware of predicted river and coastal flooding. We currently have warning services in place on the Coquet.

The impact of climate change and future flood risk

- **Development control** to prevent inappropriate development in flood risk areas and regulate the work of other organisations to ensure that it does not increase risk of flooding and through consultation with English Nature and other environmental bodies limits damage to the environment.
- **Strategic planning** to plan sustainable long term investment on a risk basis.
- **Flood risk mapping** to gain a more detailed understanding of flood risk in localised areas.

The effect that flooding will have in the future is influenced by a range of issues such as climate change, changes in land use (e.g. development), and changes in how land is managed. Within the North East Northumberland catchment we considered land use management changes, urbanisation and the impact of climate change in assessing future catchment scenarios. We assessed the sensitivity of the catchment to these catchment changes. However, there is little development pressure in the catchment as a whole and the scope to apply land use change to the catchment is limited so the models showed little change as a result of these scenarios. Therefore for our future scenario development we have concentrated on the impacts of climate change. The key trends for climate change are:

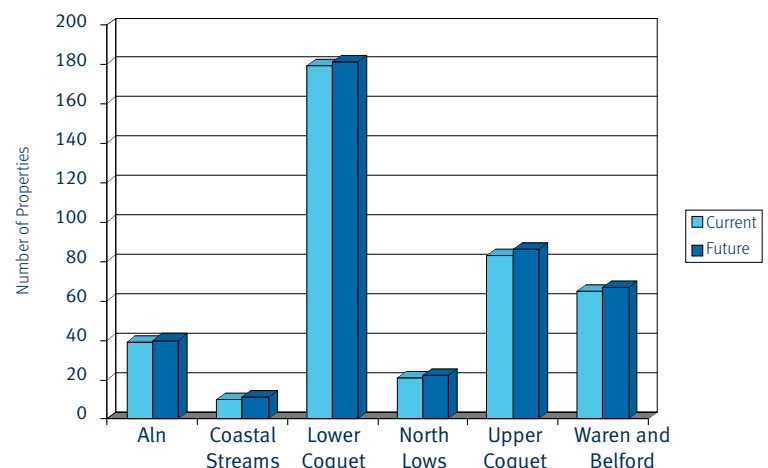
- More frequent and intense storms causing more widespread and regular flooding from drainage systems and some rivers.
- Increased winter rainfall increasing the likelihood of large-scale flood events.

The recommendation for considering the impact of climate change on flood risk is to increase current flows in rivers by 20 per cent for all flood events.

The impacts of this future flooding scenario for the catchment area is limited with only 407 properties at risk during a future one per cent flood. However, the greatest impact of flooding in the CFMP area is that flooding of the existing properties will commence at a much lower order flood with 364 properties at risk at the five per cent flood compared to 280 currently. This is due to the fact that the increased flows will result in the rivers reaching capacity more frequently and the rivers will flood more regularly. The main risk areas will remain as existing as very few new properties will be at risk in the future although small changes were noted in Harbottle, Thropton, Haggerston, Lesbury and Waren Mill along with the Rothbury area.

The predicted increase and frequency of rainfall storms will likely increase the frequency of surface water drainage flooding in the catchment although the detail is not fully explored within this CFMP.

Figure 2 Property flooding in the North East Northumberland Catchment now and in the future



Future direction of flood risk management

Approaches in each sub-area

Flood risk is not the same in all of the catchment. We have divided the North East Northumberland catchment into ten 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.

In the following sections we outline the approach in each sub-area by highlighting:

- Key issues and messages for each sub-area;
- Our policy and vision for future management;
- Key actions to deliver the policy.

Map 3 Catchment policy decisions

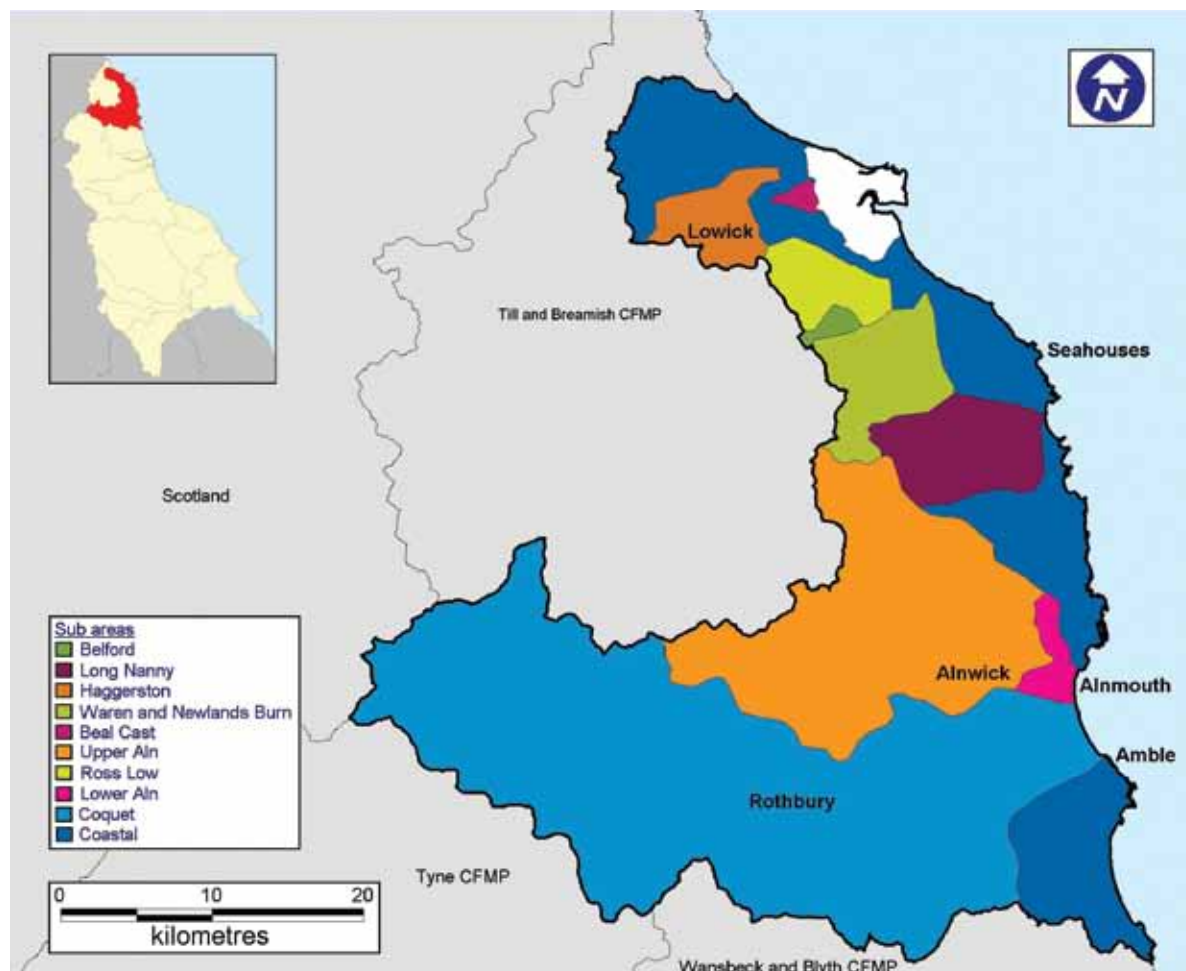


Table 3 Policy options

→ 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.

Belford

Our key partners are:

Northumberland County Council

Land and property owners

The issues in this sub-area

The Belford Burn catchment responds very rapidly to rainfall due to the narrow channel. There is a history of flooding from Belford Burn and flood risk is high in Belford. While there are currently only 30 properties (31 in future) at risk at the one per cent flood, there are 23 properties at risk at the five per cent

flood rising to 30 in the future for the same flood. Our current flood risk management measures involve channel maintenance. A local levy scheme currently aims to reduce risk through managing field scale runoff, wetland creation, storing floodwater and woodland planting.



The vision and policy

A **Policy Option 5** has been chosen for this sub-area as the currently flooding commences at a low return period of five per cent causing significant community disruption. There is a current project looking at reducing flows through Belford to reduce risk of flooding. We will also look to increase the capacity of the channel through improved maintenance. New flood defences may also be a possibility depending on funding.

This would reduce the chance of blockages and harm to life through Belford.

Awareness will be improved through other measures such as flood resilience and flood warnings. This will raise awareness of the risk of flooding and enable residents to be prepared.

The key messages

- Flash floods create a hazard in the area of Belford.
- We need to improve our flood risk management by reducing obstructions through Belford. We will do this by improving channel maintenance and look into the practicality of raising defences.
- The local levy scheme should continue to target flood risk reduction associated with Belford Burn.

Actions to implement the policy

- Produce a system asset management plan to make sure that maintenance activities are increased.
- Develop a flood risk study for Belford to investigate the feasibility of building new defences along Belford Burn.
- Continue the local levy scheme to target flood risk reduction associated with Belford Burn.
- Investigate providing a flood warning service in Belford.
- Conduct a surface water flooding study to confirm the extent of flooding in Belford.
- Produce a Surface Water Management Plan for Belford.

Long Nanny

Our key partners are:

Natural England

RSPB

Northumberland Wildlife Trust

The issues in this sub-area

There is a risk of flooding by rivers throughout the sub-area at Ellingham, Newstead, Fallodon Mill and Brunton. Flooding is caused by Brunton Burn and Long Nanny. In total there are eight properties at risk of flooding from the current one per cent flood, this does not

increase with climate change. In this catchment, the watercourses typically have gentle gradients and flat, wide valleys, so that water drains slowly through the catchment. There are three sections of raised defences, which benefit agricultural land.

The vision and policy

Under **Policy Option 2** we will scale back our activities. There is a low level of flood risk which is not expected to increase in the future. Current flood risk management expenditure is not in line with the level of risk. Efforts will be focused to manage risk in the most important areas. By reducing our actions, such as upstream channel maintenance, natural processes will be able to operate. This will allow flood flows to be stored in the rural parts of the catchment and also bring environmental benefits.

The key messages

- Flood risk is low in this rural catchment and is not expected to increase in the future.
- There is an opportunity to allow natural processes to operate and encourage biodiversity in this rural sub-area.

Actions to implement the policy

- Produce a system asset management plan for all systems within this sub-area to consider where and how we can reduce flood risk management activities.
- Monitor flood risk levels and advise if the risk of flooding increases in the future.
- Work in partnership to develop a Regional Flood Risk Management Habitat Creation Plan.
- Work closely with Natural England to advise on the impact of flooding on designated sites to enable these to be managed.

Haggerston

Our key partners are:

Northumberland County Council

Highways Authority

Property owners

Natural England

The issues in this sub-area

Flooding is caused by The Lows at Lowick Mill and at Haggerston. The catchment responds rapidly to rainfall leading to a rapid onset of flooding. There are six properties and a large caravan park in Haggerston at risk of flooding. This risk remains the same in the future. The modelling indicates

that a section of the A1 may be at risk of flooding which would cause significant disruption locally and regionally. We currently manage flood risk by maintaining channels and sections of raised defences which provide protection to farmland.

The vision and policy

Policy Option 3 has been chosen for this unit, while there is only risk to 6 properties the large caravan site would mean that a large number of people could be effected. Flooding to the A1 needs to be managed to reduce the disruption to this important transport link. We currently maintain defences and channel maintenance in this sub-area. Alternative actions such as raising flood awareness and flood resilience will be required to help the properties most at risk of flooding. We will work closely with landowners to implement land management changes that can benefit flood risk.

The key messages

- There is an opportunity to carry out alternative actions such as flood resilience and awareness to reduce the consequences of flooding to the local communities.
- The campsites in Haggerston need to be made aware of the risk of flooding and have suitable emergency plans in place.

Actions to implement the policy

- Produce a system asset management plan to review the effectiveness of current defences and channel maintenance.
- Develop greater understanding of risk of flooding to transport infrastructure.
- Raise public awareness and improve resilience to properties most prone to flooding.
- Develop an emergency plan for the caravan park in Haggerston.
- Develop a role of Sustainable Land Management Officer to work with landowners to promote worthwhile land management change.

Waren and Newlands Burn

Our key partners are:

Property owners

Natural England

RSPB

Northumberland Wildlife Trust

Northumbrian Water

The issues in this sub-area

The risk of flooding comes from small watercourses which discharge into the North Sea. The catchment responds rapidly to rainfall causing floods to happen quickly. Currently there are 25 properties, a campsite and a sewage treatment works at risk, which rises to 26 properties in the future due to climate

change. There are small pockets of flood risk at Waren Mill, where a small defence offers some flood protection, Lucker and Belford Station. We manage flood risk through channel maintenance and a flood warning service. We need to improve the take up of this service.



The vision and policy

Policy Option 3 has been chosen for this sub-area, we currently spend around £11,000 per year carrying out channel maintenance and some flood defence maintenance. Risk only increases marginally in the future so increased expenditure is not justified in the sub-area.

We will continue to maintain the channel and provide a flood warning service in the sub-area. We will consider alternative measures such as raising flood awareness, resilience and take up of our flood warning service, particularly in Waren Mill, which will help those properties most frequently flooded reduce the consequences of flooding. We will also work closely with landowners to encourage land management changes that can help manage flood risk.

The key messages

- The risk of flooding is suitably managed in the sub-area by channel maintenance and the flood warning system.
- We need to take alternative actions to help manage the risk of flooding to the sewage treatment works at Waren Mill and campsites in Lucker and Waren Mill.

Actions to implement the policy

- Produce a system asset management plan to review the effectiveness of current defences and channel maintenance. Ensure actions are targeted at the right locations to manage flood risk.
- Continue providing flood warnings to Waren Mill and improve flood warning take up in Waren Mill.
- Improve resilience to sewage treatment works and properties most likely to be affected by flooding.
- Develop an evacuation plan for campsites in Lucker and Waren Mill.
- Develop a role of sustainable land management officer to work with landowners to promote worthwhile land management change.
- Work closely with Natural England to limit the negative impacts of flooding and help improve the condition of the environmental designations.

Beal Cast

Our key partners are:

Natural England

RSPB

Northumberland Wildlife Trust

The issues in this sub-area

The sub-area contains small coastal streams that flow directly into the North Sea. There are no people, properties, critical infrastructure, community facilities, environmental or heritage designations at risk of flooding now or in the future. We

do not expect that future flood risk will increase in this sub-area. There are two raised defences which are associated with the adjacent coastal defences which benefit agricultural land and we maintain river channels.

The vision and policy

Under **Policy Option 2** we will reduce the expenditure on this sub-area in line with the risk of flooding. The current expenditure is not in line with the minimal risk in the sub-area. However, the expenditure is associated with defences which protect from tidal flooding. We will look to reduce maintenance to allow natural processes and habitat to establish within the sub-area.

The key messages

- Flood risk is low in this rural catchment and not expected to increase in the future.
- By reducing our current maintenance we will be able to direct our investment to the right areas and create a more natural river system.

Actions to implement the policy

- Produce a system asset management plan within this sub-area to consider where and how we can reduce flood risk management activities.
- Identify habitats that may be created or improved to help manage flood risk by developing a Regional Flood Risk Management Habitat Creation Plan.
- Work closely with Natural England and other partners to advise on the impact of flooding on designated sites.

Ross Low

Our key partners are:

Natural England

RSPB

Northumberland Wildlife Trust

The issues in this sub-area

Flooding is from the Belford Burn and Elwick Burn. In this catchment, the watercourses typically have gentle gradients and flat, wide valleys, so that water drains slowly through the catchment. There are ten properties at risk currently and in the future from the one per cent

flood. There is a small defence which protects a section of road which we maintain and we carry out channel maintenance in this sub-area.

The vision and policy

Policy Option 2 has been chosen for this sub-area. The risk of flooding is spread throughout the catchment and not expected to increase in the future. Current flood risk management expenditure is not in line with the low level of risk. We need to reduce our existing measures and direct our expenditure to the areas at greatest risk. By reducing some of our actions such as upstream channel maintenance, natural processes will be able to operate. This will allow flood flows to be stored in the rural parts of the catchment and reduce risk downstream.

The key messages

- The risk of flooding is low in this rural catchment and not expected to increase in the future.
- By reducing our current maintenance we will be able to direct our investment to the right areas.
- There is an opportunity to create new habitats and a more natural river system.

Actions to implement the policy

- Produce a system asset management plan within this sub-area to consider where and how we can reduce flood risk management activities.
- Identify opportunities to create or improve habitats as a result of reducing flood risk management activities by creating a Regional Flood Risk Management Habitat Creation Plan.

Upper Aln

Our key partners are:

Natural England

Land owners

The issues in this sub-area

Flooding is from the River Aln and its tributaries. This is a fast responding catchment with a number of scattered settlements, including Alnwick, Whittingham and Eglingham. There are 37 properties currently at risk of flooding and this could increase to 38 during the one per cent flood, in the future.

Although in the future 32 properties could be at risk of flooding at the five per cent flood. We currently carry out channel maintenance in the sub-area, there are no formal flood defences in the sub-area.



The vision and policy

Policy Option 3 is the chosen policy for the Upper Aln sub-area, we will continue to maintain the channel and remove blockages which, if left, could result in increased risk of flooding. Alternative actions such as raised flood awareness, flood resilience and land management change will play an important role in managing the risk of flooding in local and downstream areas.

With future development planned in Alnwick we will work together with local planning authorities and developers to create sustainable communities through sensitive design and improved drainage.

The key messages

- Flooding is a risk along the length of the River Aln.
- We should take alternative actions to raise flood awareness and resilience to reduce the consequences of flooding.
- Future development should not increase the risk of flooding elsewhere. We need to protect our floodplains.

Actions to implement the policy

- Produce a system asset management plan to review the effectiveness of current defences and channel maintenance. Ensure actions are targeted at the right locations to manage flood risk.
- Raise flood awareness.
- Improve resilience to properties most at risk of flooding.
- Ensure that any new development in Alnwick fully complies with planning policy.
- Work closely with local landowners and our partners to promote sustainable land management practices in order to reduce the risk of flooding.

Lower Aln

Our key partners are:

Natural England

RSPB

Northumberland Wildlife Trust

The issues in this sub-area

The urban centre of Alnmouth is only at risk of tidal flooding. The cause of flooding in Lesbury comes from the River Aln. There are two properties at risk now and there is no increase in numbers of properties at risk in the future

although flooding is expected to commence at lower order floods. We currently maintain the river channel in this sub-area. There are also a number of flood defences which no longer receive maintenance or investment.

The vision and policy

Policy Option 6 has been selected for this sub-area. The risk of flooding from rivers is low. The current level of expenditure is not in line with the low level of flood risk. Using the existing flood defences that we no longer maintain and natural landscape, we use the floodplain to manage risk. Encouraging best farming practices and agricultural land use management change could also help to reduce runoff and flood risk in Lesbury. This policy will also naturalise channels and create new habitats, such as wetlands.

The key messages

- There is an opportunity to allow the river system to operate naturally and create wetland habitats in this sub-area.
- We can improve land management practices in this area.
- Tidal flooding is an issue in Alnmouth. This is covered by the Shoreline Management Plan process.

Actions to implement the policy

- Produce a system asset management plan within this sub-area to consider where and how we can reduce flood risk management activities. This action will also enhance the environment by helping to improve the natural state of the river and its habitat by wetland creation.
- Monitor the risk of flooding and continue to advise in step with climate change.
- Work closely with Natural England to limit the impact of flooding and improve the condition of the environmental designations.

Coastal

Our key partners are:

Natural England

The issues in this sub-area

The sources of flooding are from the coastal streams. The risk of flooding from rivers to people and property is very low with only two properties at risk of fluvial flooding now and in the future. There are agricultural flood defences and a tidal flood warning service for Seahouses, Beadnell and Amble but no flood

warnings for risk from rivers in the sub-area.

This coastal area is dominated by flat coastal plains where the watercourses have shallow gradients and wide valleys so the water drains slowly through the catchment.

The vision and policy

Policy Option 1 is appropriate in this sub-area. The scale of flood risk is low and not expected to increase in the future. Our current expenditure is limited to the Lows area and is not in line with the low level of risk. By withdrawing maintenance from agricultural defences and other upstream channel maintenance, natural processes will be able to operate. This will allow flood flows to be stored in the rural parts of the catchment and also bring environmental benefits.

Communities and individuals will need to take an increasing role in managing the risk and consequences of flooding in the future.

The key messages

- Flood risk is low and not expected to increase in this sub-area.
- There is an opportunity to allow natural river processes to operate.
- The management of tidal flooding is covered by the Shoreline Management Plan.
- We will allow natural processes to operate and encourage biodiversity in this sub-area.

Actions to implement the policy

- Produce a system asset management plan within this sub-area to consider the most appropriate way to end current flood risk management activities.
- Work closely with Natural England to advise on the impact of flooding on designated sites.

Coquet

Our key partners are:

Northumberland County Council

Natural England

RSPB

Northumberland Wildlife Trust

Land owners

The issues in this sub-area

The physical characteristics of this catchment mean that watercourses respond quickly to rainfall leading to a rapid onset of flooding. The main cause of flooding is from the River Coquet. This sub-area contains the majority of flood risk within the CFMP area with a total of 260 properties at risk rising to 269 for the future one per cent flood. There is a history of flooding across the

catchment and 72 properties were flooded in and around Rothbury in September 2008. There are also surface water flood risks from the Coplish Burn in Rothbury.

The risk of flooding is currently managed through raised defences, channel maintenance, a recently installed pumping station at Rothbury and a flood warning service.



The vision and policy

Policy Option 5 has been selected. The risk of flooding in this sub-area is high and set to increase in the future. We need to invest more to reduce the risk of flooding and to reduce the hazard to the dispersed settlements as well as the town of Rothbury. We must protect the natural floodplain on the Coquet from future development.

There are other ways we can reduce flood risk, such as afforestation and flood storage in the gravel pits but these need further investigation. As future development is planned in Rothbury developers should be aware of the current and future risk of flooding. By increasing our channel and flood defence maintenance and improving our flood warning service the risk of flooding to people and properties can be reduced. Investigations into local levy schemes for Rothbury and the surrounding area will be progressed.

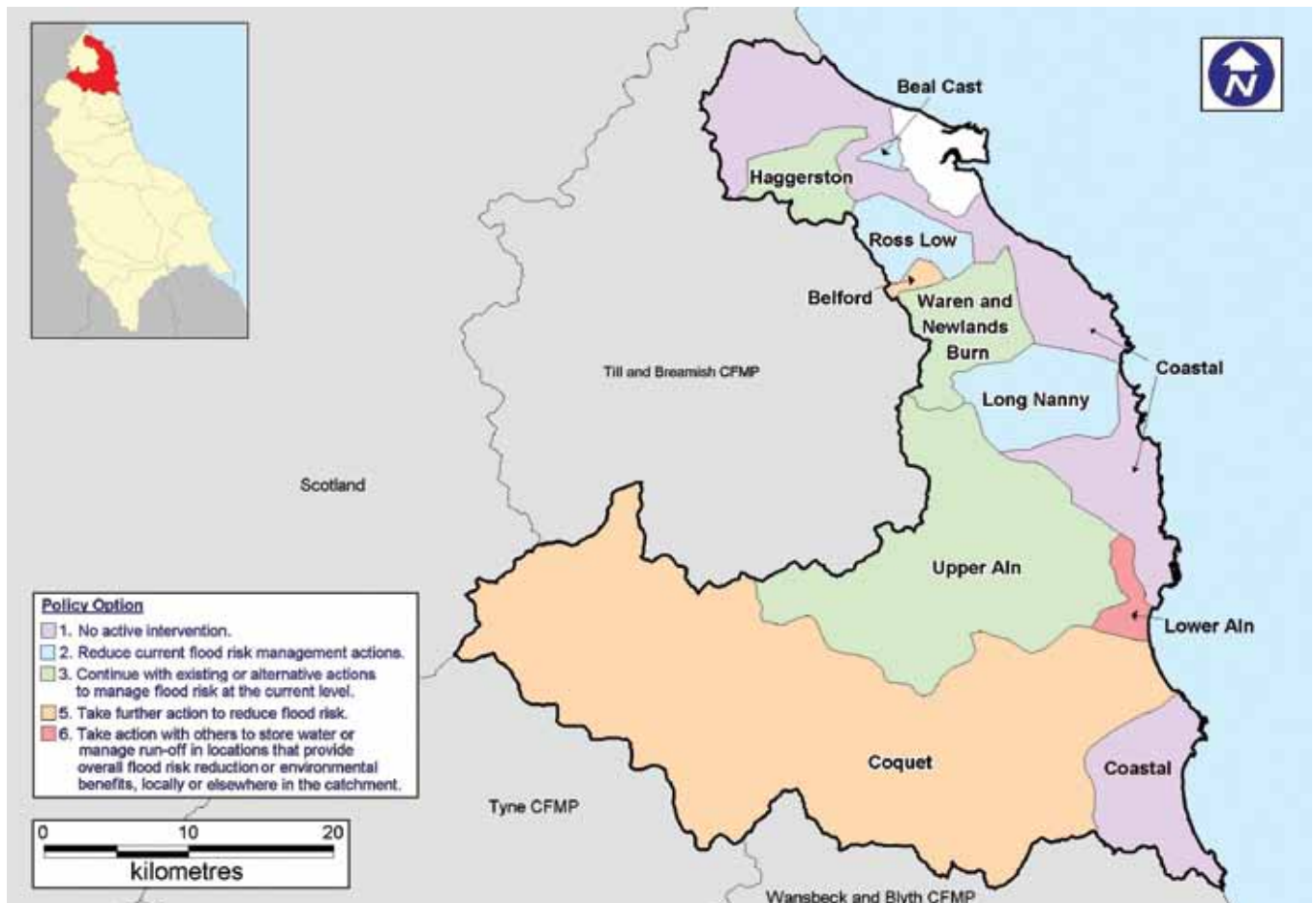
The key messages

- The hazard caused by flooding in a number of dispersed settlements is high because of the fast responding catchment.
- We need to reduce risk to people and properties as climate change happens.
- There are opportunities to reduce the risk of flooding and sustain the natural river system.
- Future development must not increase the risk of flooding locally or downstream. Upstream floodplains should be protected from development.

Actions to implement the policy

- Develop a system asset management plan for maintenance activities in this sub-area.
- Continue the local levy scheme to target reducing the risk of flooding at Coplish Burn.
- Raise flood awareness and flood resilience.
- Develop flood warning technology to increase the time available to act to rapid response rainfall and improve take up of flood warning service.
- Work closely with Natural England to limit the impact of flooding and improve the condition of the environmental designations.
- Ensure that the floodplain upstream of Rothbury is protected from development.
- Work closely with local landowners and our partners to promote sustainable land management practices in order to reduce the amount of runoff, the rate of runoff and erosion.
- Investigate the opportunity for floodwater storage in the gravel pits upstream of Rothbury and the benefit of afforestation in the upland part of the sub-area.
- Develop a Surface Water Management Plan for the Rothbury area.

Map of CFMP policies



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