



Flood Risk Management Strategy

Tweed



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Foreword

Flooding can affect us all. The risk of flooding and its impacts can't be removed entirely from our lives but it can be managed. This strategy takes our knowledge and understanding of flooding and turns it into a set of actions that are planned, prioritised and co-ordinated to tackle flooding in the areas where it affects us the most.

Approximately 3,400 residential and 1,900 non-residential properties are at risk of flooding in the Tweed Local Plan District. Hawick, Galashiels and Selkirk are just some of the areas where the greatest impacts of flooding can be found. The annual damages across the region are estimated to be £13 million, largely from river flooding. Across Scotland we now estimate 108,000 properties to be at risk, with the expected annual flood damage being in the region of £252 million.

We can expect these numbers to increase. Changes to the climate, how we live and how we use the land bring more and more people and property into flood risk.

Although the risk of flooding will never be removed entirely, this strategy describes the ambition for managing flooding and the priorities for action. A Local Flood Risk Management Plan co-ordinated by Scottish Borders Council provides additional detail on the responsibility for delivery, funding and coordination of actions across the Local Plan District. Taken together, these documents describe the commitment of public bodies to address flooding.

This Flood Risk Management Strategy is published by SEPA and has been approved by Scottish Ministers. It has been produced with the support and collaboration of Scottish Borders Council, South Lanarkshire Council, Scottish Water and others with an interest in managing flooding. SEPA took account of the views received through two public consultations carried out during the development of the strategy and its supporting information.

How we plan for and manage our flood risk has far reaching consequences for Scotland's communities. As well as targeting action and resources in the areas where they can achieve most, the strategies also help to increase awareness of flood risk and improve understanding of how it can affect us.



Terry A'Hearn

Chief Executive Officer
SEPA

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Tweed Local Plan District

1 Flood risk management in Scotland

1.1 What is a Flood Risk Management Strategy?

Flood Risk Management Strategies have been developed to reduce the devastating and costly impact of flooding in Scotland. They coordinate the efforts of all organisations that tackle flooding, be it in our cities or rural areas and be it from rivers, the sea or from surface water. The strategies concentrate the work of these organisations to where the risk of flooding and benefits of investment are greatest.

By publishing these strategies, we are giving individuals, communities and businesses the information to better manage their own responsibilities. Everyone can take action with the confidence of knowing what others are doing and when they are doing it.

Flood Risk Management Strategies set out the short to long term ambition for flood risk management in Scotland. The strategies state the objectives, as agreed by responsible authorities, for tackling floods in high risk areas. Actions that will then deliver these objectives are described and prioritised in six-year planning cycles. The decisions are based on the best evidence available on the causes and consequences of flooding. Through this risk-based and plan-led approach, flood management will improve for individuals, communities and businesses at risk in Scotland.

Each strategy should be read alongside its Local Flood Risk Management Plan. The Local Flood Risk Management Plans have been developed by local authorities and provide additional local detail on the funding and delivery timetable for actions between 2016 and 2021. The publication date of the Local Flood Risk Management Plans is June 2016. Both the Flood Risk Management Strategy and Local Flood Risk Management Plan will be updated every six years.

These Flood Risk Management Strategies are approved by Scottish Ministers and published by SEPA, Scotland's strategic flood risk management authority. They have been prepared in collaboration with all 32 local authorities, Scottish Water and other organisations with a responsibility or interest in managing flooding. They are required under the Flood Risk Management (Scotland) Act 2009 and the European Commission's Floods Directive. The actions proposed to manage flood risk in high risk areas have been developed using the best available information at the time. The number of actions that are actually delivered over the six years set out in the strategy will depend on a number of factors including funding availability, and community engagement issues such as potential objections to a particular flood protection scheme.

1.2 How to read this Strategy

Each Flood Risk Management Strategy has three sections:

Section 1 contains background information on the approach taken in Scotland to manage flooding. It explains the duties and aims of organisations involved in tackling flooding, including how they work together and how flood risk management planning is linked to other government policies and initiatives.

Section 2 is the most important section for those individuals and communities seeking to understand their flood risk and its management. For priority areas (called Potentially Vulnerable Areas) there is a short description of the causes and consequences of flooding. The agreed objectives are clearly set out. And, most importantly, the actions that will deliver these objectives are prioritised and described.

Section 3 includes supporting information on the sources of flooding in wider river catchments and coastal areas. A glossary is also provided.

1.3 Managing flooding in Scotland

Flood risk management in Scotland aims to manage flooding in a sustainable way. Sustainable flood risk management considers where floods are likely to occur in the future and takes action to reduce their impact without moving the problem elsewhere. It considers all sources of flooding, whether from rivers, the sea or from surface water. It delivers actions that will meet the needs of present and future generations whilst also protecting and enhancing the environment.

The sustainable approach to managing flood risk works on a six year planning cycle, progressing through the key stages outlined below.

Identifying priority areas at significant flood risk

The first step to delivering a risk-based, sustainable and plan-led approach to flood risk management was SEPA's **National Flood Risk Assessment**, which was published in 2011. The assessment considered the likelihood of flooding from rivers, groundwater and the sea, as well as flooding caused when heavy rainfall is unable to enter drainage systems or the river network. The likelihood of flooding was examined alongside the estimated impact on people, the economy, cultural heritage and the environment. It significantly improved our understanding of the causes and consequences of flooding, and identified areas most vulnerable to floods.

Based on the National Flood Risk Assessment, SEPA identified areas where flooding was considered to be nationally significant. These areas are based on catchment units as it is within the context of the wider catchment that flooding can be best understood and managed. These nationally significant catchments are referred to as **Potentially Vulnerable Areas**. In Scotland, 243 Potentially Vulnerable Areas were identified. They are estimated to contain 92% of the total number of properties at risk.

A small number of Candidate Potentially Vulnerable Areas were identified after the National Flood Risk Assessment in light of new information that warranted further assessment and appraisal. They are included in the flood risk management planning process. The National Flood Risk Assessment will be updated to inform each subsequent planning cycle.

Improving the understanding of flooding

SEPA developed **flood hazard and flood risk maps** between 2012 and 2014. These maps improved our understanding of flooding and helped inform the subsequent selection of actions to manage flood risk in Potentially Vulnerable Areas. The flood hazard maps show information such as the extent of flooding, water level, as well as depth and velocity where appropriate. The flood risk maps provide detail on the impacts on people, the economy, cultural heritage and the environment.

In 2012 SEPA also developed an **assessment of the potential for natural flood management**. The assessment produced the first national source of information on where natural flood management actions would be most effective within Scotland.

Flood hazard and flood risk maps and the assessment of the potential for natural flood management can be viewed on the SEPA website www.sepa.org.uk.

Identifying objectives and selecting actions

The objectives and actions to manage flooding will provide the long-term vision and practical steps for delivering flood risk management in Scotland. Working collaboratively with local partnerships, SEPA has agreed the objectives for addressing the main flooding impacts. Actions that could deliver these agreed objectives have been appraised for their costs and benefits to ensure the right combinations are identified and prioritised. The actions considered in the development of this strategy include structural actions (such as building floodwalls, restoring flood plains, or clearance and repair works to rivers) and non-structural actions (such as flood warning, land use planning or improving our emergency response). Structural and non-structural actions should be used together to manage flood risk effectively.

An assessment of the potential for natural flood management was used to help identify opportunities for using the land and coast to slow down and store water. Natural flood management actions were recommended in areas where they could contribute to the management of flood risk. In such instances these actions were put forward as part of flood protection or natural flood management studies.

Climate change and future flood risk

The UK Climate Projections (UKCP09) report predicts that climate change may lead to warmer and drier summers, warmer and wetter winters with less snow, and more extreme temperature and rainfall events. The predicted increase in rainfall is expected to variably increase the potential for river and surface water flooding, and similarly, there is expected to be a rise in sea levels that will vary around the coastline.

The predicted increases in flood risk described in Section 3 are solely based on the impact of a changing climate on the magnitude of flooding; they do not take into account any potential increase due to population change, development pressures or urban creep, nor do they take into account any mitigation as a result of actions contained in this or future Flood Risk Management Strategies.

Flood Risk Management Strategies and Local Flood Risk Management Plans

For flood risk management purposes, Scotland has been divided into 14 **Local Plan Districts**. Each Local Plan District will have a set of complementary plans: Flood Risk Management Strategies produced by SEPA, and Local Flood Risk Management Plans produced by a lead local authority. Flood Risk Management Strategies and Local Flood Risk Management Plans aim to make a strong and lasting contribution to sustainable flood risk management, and will be at the heart of efforts to tackle flooding in Scotland. They will help to target and maximise the benefit of public investment.

1.4 How the Flood Risk Management Strategy was developed

Partnership working

Many organisations and individuals are involved in helping to improve flood management in Scotland. A piecemeal approach to tackle flooding does not work. Flooding is too complex, and the causes and impacts too complicated for any single

organisation to address alone. Flooding disregards local authority boundaries and cuts across the responsibilities of organisations such as SEPA, Scottish Water and emergency responders. To be successful, flood management requires coordination among organisations as set out in this strategy. A willingness to collaborate by those responsible for flood management is essential.

This strategy has been developed in partnership by:

- Scottish Borders Council (lead local authority) and South Lanarkshire Council;
- Scottish Water; and,
- SEPA.

These organisations are working more closely together than ever before. In local partnerships, here and throughout Scotland, SEPA has provided the technical analysis and ensured a consistent national approach is taken. It has provided the evidence upon which to make sensible, informed decisions. Local authorities and Scottish Water have made sure that local knowledge and expertise has informed the decision-making.

Consultation, engagement and advice

SEPA has been keen to hear from the people and communities that live under the threat of flooding to ensure that our technical analysis of the risks is accurate and that efforts to manage flooding are targeted to where most can be achieved. SEPA held two public consultations during the development of the Flood Risk Management Strategies. The first was on the general approach to flood risk management planning and the identification of priority areas (2011); the second, held jointly with local authorities, was on the understanding of flooding in these priority areas and on the objectives and actions to manage flooding (2015).

Further advice has been sought from relevant organisations at key stages. The strategies have benefited from Local Advisory Groups, providing important community and area-based knowledge on both the causes and consequences of flooding and on the appropriate actions for future management. Local Advisory Groups have been especially helpful in considering flood risk management planning in the context of wider plans and initiatives. The Local Advisory Group includes representatives from a range of sectors, including government agencies, local authorities, academia, non-government organisations, local interests and land and asset managers. In the Tweed Local Plan District SEPA also works closely with the Tweed Forum.

A Cross Border Advisory Group is also in place in the Tweed Local Plan District to advise the Environment Agency, SEPA and local authorities on flooding issues that straddle the border. The group consider how the relevant authorities should coordinate their work in order to ensure that they understand how the impact of flood risk on one side of the border is affected by actions or inactions on the other side of the border.

In producing the Flood Risk Management Strategy, SEPA has also taken advice from a National Flood Management Advisory Group. Over 50 member organisations, reflecting the national importance and impact of flooding on our communities, economy, environment and cultural heritage, have been invited at key stages to provide comment and input.

Some of the work carried out by SEPA has been complex and technical in nature for which we have sought professional advice. Through membership of the Scottish Advisory and Implementation Forum for Flooding (SAIFF), we have received

assistance from local authorities, Scottish Water, Forestry Commission Scotland, the National Park Authorities and other key interested organisations. We have also developed some of our methods by working with other organisations with similar responsibilities within the UK and Europe. We have specifically worked with the Environment Agency and English local authorities in the cross border areas.

SEPA's chief statutory function in flood risk management planning is to prioritise future actions across Scotland. To do this, SEPA made a technical, risk-based assessment of the costs and impacts of actions. This independent assessment was used alongside information from partner organisations to jointly agree priorities and identify indicative delivery dates for actions. A National Prioritisation Advisory Group, with representatives from the Scottish Government, COSLA, Scottish Water and local authorities, was established to provide guidance to SEPA on the priority of flood risk management actions, having considered both the technical ranking prepared by SEPA and issues of local priority.

Strategic Environmental Assessment and Habitats Regulation Appraisal

SEPA undertook a strategic environmental assessment to assess the significant environmental effects of the Flood Risk Management Strategies. Our assessment was published in an environmental report, and we consulted the public on our findings. We have published a post-adoption statement, which describes how we have taken account of the environmental assessment and the consultation responses, and how we will monitor any significant environmental effects of the Flood Risk Management Strategies.

We also undertook a Habitats Regulations Appraisal to ensure that the Flood Risk Management Strategies will not adversely affect the integrity of Special Areas of Conservation and Special Protection Areas. We consulted Scottish Natural Heritage and Natural England on our appraisal method and took their views into account. We have applied mitigation measures where required.

1.5 Roles and responsibilities for flood risk management planning

Individuals have a personal responsibility to protect themselves and their property from flooding. However, public bodies have responsibilities too and are working together to reduce the impacts of flooding in Scotland. Responsibility for flood risk management planning falls primarily to SEPA, local authorities and Scottish Water. Some of the key roles are outlined below and more information is available from the SEPA website.

Your responsibilities

Organisations and individuals have responsibilities to protect themselves from flooding. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life.

The first step to being prepared is signing up to Floodline so you can receive messages to let you know where and when flooding is likely to happen. Other useful tools and advice on how to be prepared are available on the Floodline website, including a quick guide to who to contact in the event of a flood. For more information visit: www.floodlinescotland.org.uk. You can also check how your area could be affected by flooding by looking at SEPA's flood maps.

SEPA

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. We have a statutory duty to produce Scotland's Flood Risk Management Strategies. As described above, we work closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted.

SEPA also has a responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced. Natural flood management uses the natural features of the land to store and slow down the flow of water.

In running Floodline, we provide direct warnings, live flooding information and advice on how to prepare for or cope with the impacts of flooding 24 hours a day, seven days a week. To help us forecast for flooding we work in partnership with the Met Office through the Scottish Flood Forecasting Service. SEPA has piloted surface water flood forecasting to help urban areas improve their resilience to and preparedness for flooding. The development and wider roll-out of this service is being considered alongside the technical, resource and communication challenges associated with providing surface water flooding guidance.

To raise awareness of flooding at a national level SEPA runs education initiatives, community engagement programmes and an annual campaign to promote the useful advice and information available through Floodline. We work in partnership with local authorities, Neighbourhood Watch Scotland, Ready Scotland and others to share our resources and help to promote preparedness and understanding of how flood risk is managed.

Local authorities and lead local authorities

Local authorities work together for flood risk management planning purposes through a lead local authority. The lead local authority must perform several important functions over and above the general flood-related duties and powers given to local authorities. Most significantly, the lead local authority, having contributed with other local authorities to the production of the Flood Risk Management Strategy, must prepare a Local Flood Risk Management Plan. Although the lead local authority is responsible for the production of the plan, its content will be drawn from and agreed by all relevant local authorities, other responsible authorities and SEPA. Local authorities have been working collaboratively in the manner described above to develop these Local Flood Risk Management Plans.

It is the responsibility of your local authority to implement its flood protection actions agreed within the Flood Risk Management Strategy, including new schemes or engineering works and their statutory requirements to monitor, clear and maintain watercourses. You can help your local authority to manage flooding by letting them know if debris is blocking watercourses or if flood defences have been tampered with.

During severe flooding, local authorities will work with the emergency services and coordinate shelter for people evacuated from their homes.

Scottish Water

Scottish Water is a responsible authority for flood risk management and is working

closely with SEPA, local authorities and others to coordinate plans to manage flood risk.

Scottish Water has the public drainage duty and is responsible for foul drainage and the drainage of rainwater run-off from roofs and any paved ground surface from the boundary of properties. Additionally, Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. Scottish Water is not responsible for private pipework or guttering within the property boundary.

National parks

The two National Park Authorities, Loch Lomond and Trossachs National Park and Cairngorms National Park, were designated as responsible authorities for flood risk management purposes in 2012. Both have worked with SEPA, local authorities and Scottish Water to help develop Flood Risk Management Strategies and Local Flood Risk Management Plans. They also fulfil an important role in land use planning, carrying out or granting permission for activities that can play a key role in managing and reducing flood risk.

Other organisations

- The **Scottish Government** oversees the implementation of the Flood Risk Management (Scotland) Act 2009, which requires the production of Flood Risk Management Strategies and Local Flood Risk Management Plans. Scottish Ministers are responsible for setting the policy framework for how organisations collectively manage flooding in Scotland. Scottish Ministers have also approved this Flood Risk Management Strategy.
- **Scottish Natural Heritage** has provided general and local advice in the development of this Flood Risk Management Strategy. Flooding is seen as natural process that can maintain the features of interest at many designated environmental sites, so Scottish Natural Heritage helps to ensure that any changes to patterns of flooding do not adversely affect the natural environment. Scottish Natural Heritage also provides advice on the impacts of Flood Protection Schemes and other land use development on designated sites and species.
- **Forestry Commission Scotland** was designated in 2012 as a responsible authority for flood risk management planning purposes and has engaged in the development of the Flood Risk Management Strategies through national and Local Advisory Groups. This reflects the widely held view that forestry can play a significant role in managing flooding.
- During the preparation of the flood risk management plans **Network Rail** and **Transport Scotland** have undertaken works to address flooding at a number of frequently flooded sites. Further engagement is planned with SEPA and local authorities to identify areas of future work. There is the opportunity for further works to be undertaken during the first flood risk management planning cycle although locations for these works are yet to be confirmed.
- **Utility companies** have undertaken site specific flood risk studies for their primary assets and have management plans in place to mitigate the effects of flooding to their assets and also minimise the impacts on customers.
- The **Met Office** provides a wide range of scientific support, forecasts and weather warnings. SEPA and the Met Office work together through our partnership the Scottish Flood Forecasting Service.

- The **emergency services** provide emergency support when flooding occurs and can coordinate evacuations. You should call the emergency services on 999 if you are concerned about your safety or the safety of others and act immediately on any advice provided.
- **Historic Environment Scotland** considers flooding as part of its regular assessments of historic sites. As such, flooding is considered as one of the many factors which inform the development and delivery of its management and maintenance programmes.

1.6 Links with other plans and policies

River basin management planning

River basin management aims to protect and improve the condition of our rivers, lochs, estuaries and coastal waters. Taking action to reduce flood risk in Scotland provides an opportunity to connect with plans to improve the quality of Scotland's water environment at the same time. For example, coordination between river basin management and flood risk management can reduce flood risk, whilst improving water quality and biodiversity.

SEPA is leading the delivery of River Basin Management Plans and Flood Risk Management Strategies and has worked to ensure that there is integration and coordination between them. This coordination, particularly in regard to consultation and engagement, will be important for stakeholders many of whom have an interest in the objectives of both plans.

Land use and spatial planning

Land use planning decisions are one of the most powerful tools available to manage flood risk. The alignment of flood risk management and land use planning policy is pivotal to achieving sustainable flood risk management. Decisions relating to flood risk management can have significant implications for the location of development and, likewise, decisions relating to the location of development can impact on flood risk. Land use planning has the potential to contribute to sustainable flood risk management through the location, use and design of new development and the redevelopment of existing areas. Actions that deliver national level land use planning policies are summarised in Annex 2.

SEPA is a statutory consultee providing advice on planning applications with regards to flood risk. Guidance aims to minimise flood risk to development and ensure no adverse effects occur elsewhere. Land use planning objectives and actions have been agreed with responsible authorities, which will ensure that flood risk is adequately taken into account throughout the planning process.

Emergency planning and response

Emergency plans are prepared under the Civil Contingencies Act 2004. They are in place across Scotland and are prepared by Category 1 and 2 Responders, such as Police Scotland and the Scottish Ambulance Service. Emergency plans ensure the effective management of response to emergencies. Emergency plans can either be generic and deal with all emergencies or specific to deal with, for example, flooding. The information contained in the Flood Risk Management Strategies can be used to inform wider emergency response plans for flooding.

Many organisations have specific roles and responsibilities during an emergency response to a flood for example, local authorities, the Scottish Fire and Rescue Services, Police Scotland and SEPA. In many cases, this response is augmented by the work of voluntary organisations, communities and individuals. During an emergency, the response by these agencies will be co-ordinated through regional and local resilience partnerships.

Scottish Water investment plans

There is a close relationship between Flood Risk Management Strategies and Scottish Water's investment plans. Sewer flooding is not considered in detail in this strategy although it remains a high priority for Scottish Water and its customers. Scottish Water's close involvement in flood risk management planning aims to ensure that there is strong coordination between the management of sewer and surface water flooding and the actions to be taken forward by local authorities.

1.7 Supporting information

Sources of flooding described in this strategy

The Flood Risk Management Strategy addresses the risk of flooding from rivers, the coast and surface water. The risk of flooding from rivers is usually due to rainfall causing a river to rise above bank level spreading out and inundating adjacent areas. Coastal flooding is where the risk is from the sea. Sea levels can change in response to tidal cycles or atmospheric conditions. Over the longer term sea levels and coastal flood risk may change due to climate change. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. There can be interactions between these sources of flooding, but for the purposes of this strategy they are dealt with independently.

The following aspects of flooding have not been incorporated to this strategy:

- **Groundwater** is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.
- **Reservoir breaches** have been assessed under separate legislation (Reservoirs (Scotland) Act 2011). Further information and maps can be found on SEPA's website.
- The Flood Risk Management (Scotland) Act 2009 does not require SEPA or responsible authorities to assess or manage **coastal erosion**. However, SEPA has included consideration of erosion in the Flood Risk Management Strategies by identifying areas that are likely to be susceptible to erosion and where erosion can exacerbate flood risk. As part of considering where actions might deliver multiple benefits, we have looked to see where the focus of coastal flood risk management studies coincides with areas of high susceptibility to coastal erosion. Subsequent detailed studies and scheme design will need to consider coastal erosion in these areas.
- **Coastal flood modelling.** The information on coastal flooding used to set objectives and identify actions is based on SEPA modelling using simplified coastal processes and flooding mechanisms at work during a storm. Wave overtopping cannot be accurately modelled at a national scale due to the importance of local factors such as prevailing wind conditions, the depth and

profile of the near-shore sea bed or the influence of any existing defences or management structures. As a result, coastal flood risk may be underestimated in some areas. Conversely, in locations with wide and flat floodplains, the modelling may overestimate flood risk. To address this, in a number of locations where more detailed local models were available they have been incorporated into the development of the Flood Risk Management Strategies. Where wave overtopping has been specifically identified as a concern – but where no further detailed modelling is available – particular compensation has been made in the selecting actions to address coastal flood risk.

Commonly used terms

Below are explanatory notes for commonly used terms in this strategy. A glossary of terms is also available.

- Reference to flood risk.** During the development of this strategy flood risk has been assessed over a range of likelihoods. For consistency in reporting information within the strategies, unless otherwise stated, all references to properties or other receptors being ‘at risk of flooding’ refer to a medium likelihood flood (up to a 1 in 200 chance of flooding in any given year). By exception, references will be made to high or low risk flooding, which should be taken to mean a 1 in 10 chance/likelihood or 1 in 1000 chance/likelihood of flooding in any given year respectively.

Chance / likelihood of flooding	
High	1 in 10 year
Medium	1 in 200 year
Low	1 in 1000 year

- Annual Average Damages** have been used to assess the potential economic impact of flooding within an area. Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur. High likelihood events, which occur more regularly, contribute proportionally more to Annual Average Damages than rarer events. Within the Flood Risk Management Strategies Annual Average Damages incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).
- History of flooding.** The history of flooding sections of this document report floods that have occurred up to July 2015.

1.8 Next steps and monitoring progress

Flood risk management planning has progressed significantly in recent years. Scotland now has the most advanced nationally consistent and locally informed understanding of the causes and consequences of flooding that it has ever had. SEPA is committed to improving this knowledge and understanding during subsequent planning cycles, accepting that these first Flood Risk Management Strategies are based on the best available current knowledge and data.

SEPA has prioritised actions based on funding assumptions provided by Scottish Government and the capacity of local authorities to deliver within the next six years. Lead local authorities will provide an interim report on the progress of delivering all actions in the Local Flood Risk Management Plan not earlier than two years and not later than three years from its publication. A final report will also be prepared at the end of the first planning cycle.

A second set of Flood Risk Management Strategies and Local Flood Risk Management Plans will be published in December 2021 and June 2022 respectively.

Licensing acknowledgements

Full data licensing acknowledgements can be found in Annex 3 of this strategy.

Flood Risk Management Strategy

Tweed Local Plan District

This section is the most relevant for individuals, communities and businesses seeking to understand their local flood risk and its management. There is an overview of the Local Plan District, as well as further detail for every Potentially Vulnerable Area. For each Potentially Vulnerable Area, there is a short description of the causes and consequences of flooding. The agreed objectives are clearly set out and, most importantly, the actions that will deliver these objectives are prioritised and described.

Section 2: Understanding and managing flooding

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• Denholm (13/11)	128
• Hawick (13/12)	137
• Bonchester Bridge (13/13)	150

2.1 Summary of flooding in the Tweed Local Plan District

The Tweed Local Plan District covers an area of 4,341km² with a population of approximately 120,000. It contains six local authorities and 13 Potentially Vulnerable Areas.

Flood risk in the Tweed

There are approximately 3,400 residential and 1,900 non-residential properties at risk of flooding within the Local Plan District. This equates to approximately 5% of all properties at risk of flooding nationally. Within the Local Plan District, approximately 6% of all residential and 20% of all non-residential properties are at risk and it is estimated that 88% of these properties are located within Potentially Vulnerable Areas. The Annual Average Damages from flooding (see glossary) are approximately £13 million.

River flooding is the main source of flood risk, followed by surface water flooding. The Annual Average Damages caused by river flooding are approximately £10 million and the damages caused by surface water flooding are approximately £2.7 million (Figure 1).

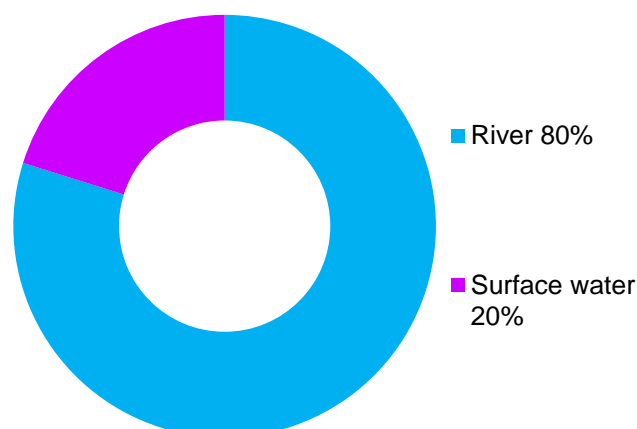


Figure 1: Annual Average Damages by flood source

Table 1 and Figure 3 show the number of properties at risk and the Annual Average Damages caused by flooding in the main towns and cities within the Local Plan District. This includes damages to residential properties, non-residential properties, transport and agriculture. Please note that economic damages to airports and rail infrastructure were not assessed, as information on damages at this scale is not available.

	Residential and non-residential properties at risk of flooding	Annual Average Damages
Hawick	990	£2.1 million ¹
Galashiels	960	£2.2 million ¹
Selkirk	640	£950,000
Innerleithen	540	£890,000
Peebles	510	£1.2 million
Jedburgh	250	£610,000
Kelso	110	£90,000
Earlston	110	£610,000
Melrose	70	£130,000
Broughton	50	£160,000

Table 1: Main areas with a risk of flooding

Background information on the Tweed Local Plan District

The extent of the Tweed Local Plan District and the location of the Potentially Vulnerable Areas are shown in Figure 2. It includes the urban areas of Galashiels, Hawick, Peebles, Selkirk, Kelso, Biggar and Jedburgh.

The Tweed Local Plan District contains the Scottish part of the River Tweed catchment which is the second largest river in Scotland. The main tributaries of the River Tweed include the Biggar Water, Lyne Water, Eddleston Water, Etrick Water, Gala Water, Leader Water, Whiteadder Water, Blackadder Water and the River Teviot. The Tweed catchment also includes part of the Bowmont Water that flows into England. The Bowmont Water is a tributary of the English River Till that meets the River Tweed north east of Coldstream.

The largest lochs in the catchment include:

- the Fruid and Talla Reservoirs in the headwaters of the River Tweed;
- the West Water and Baddinsgill Reservoirs in the headwaters of the Lyne Water;
- the Megget Reservoir and St Mary's Loch in the headwaters of the Yarrow Water;
- the Ale Water Reservoir in the headwaters of the Ale Water;
- the Whiteadder and Watch Reservoirs in the headwaters of the Whiteadder Water.

The Tweed catchment is largely rural with the headwaters flowing through steep hills and narrow valleys. The middle and lower parts of the catchment become less steep with more land used for agriculture and urbanisation. Across the area the main types of land cover include heather and grassland (55%), arable and horticultural land (22%), and coniferous and broadleaved woodland (18%). Urban areas account for less than 1% of total land cover.

Further details of flood risk from distinct sources can be found in the river and surface water sections of this report. The Tweed Local Plan District does not contain any coastline.

¹ The damages presented in this report are derived from SEPA data that is assessed at a strategic level. Scottish Borders Council has carried out more detailed assessments of flood risk that identify higher economic damages from river flooding in Hawick and lower economic damages from river flooding in Galashiels

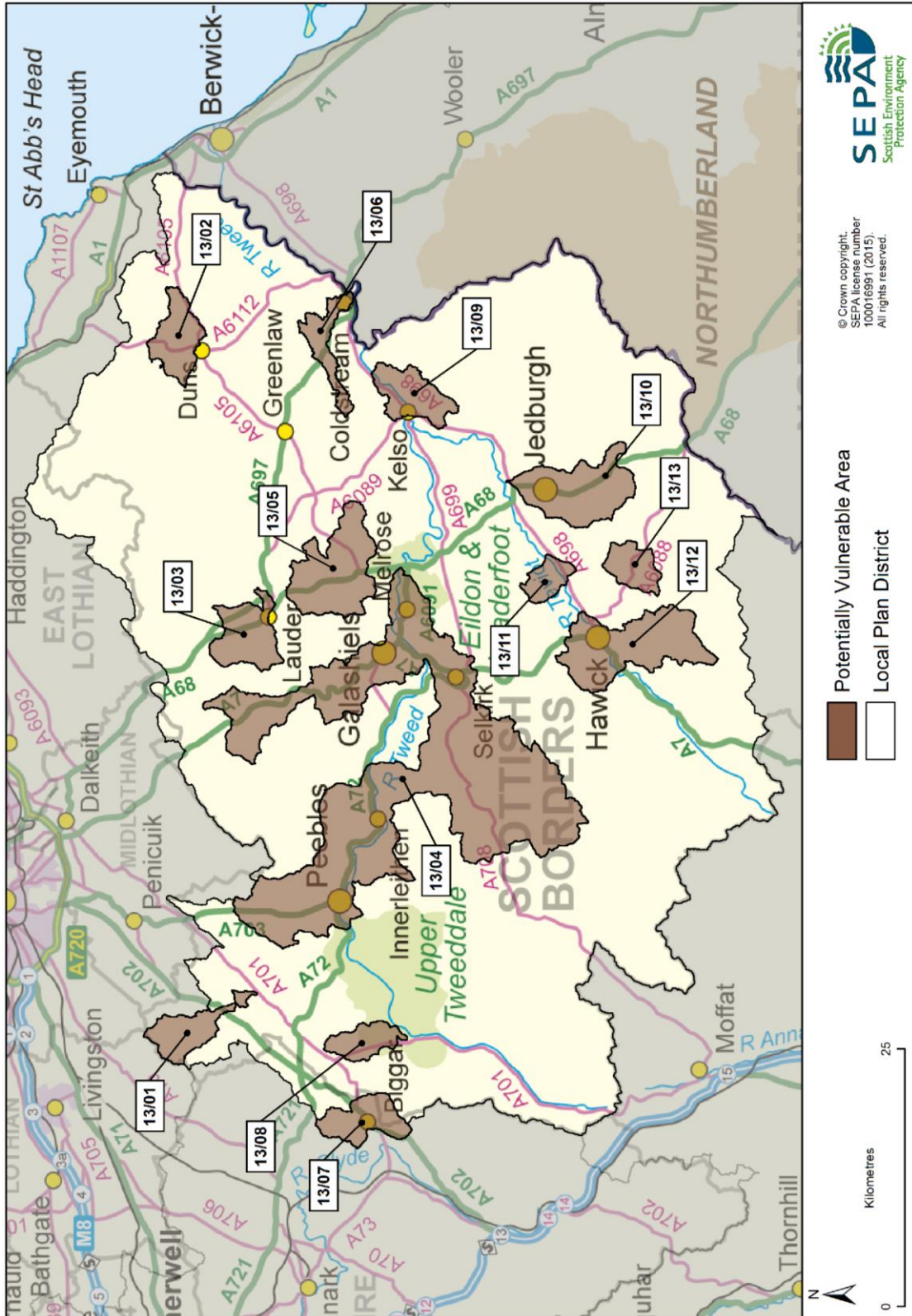


Figure 2: The Tweed Local Plan District with Potentially Vulnerable Areas identified

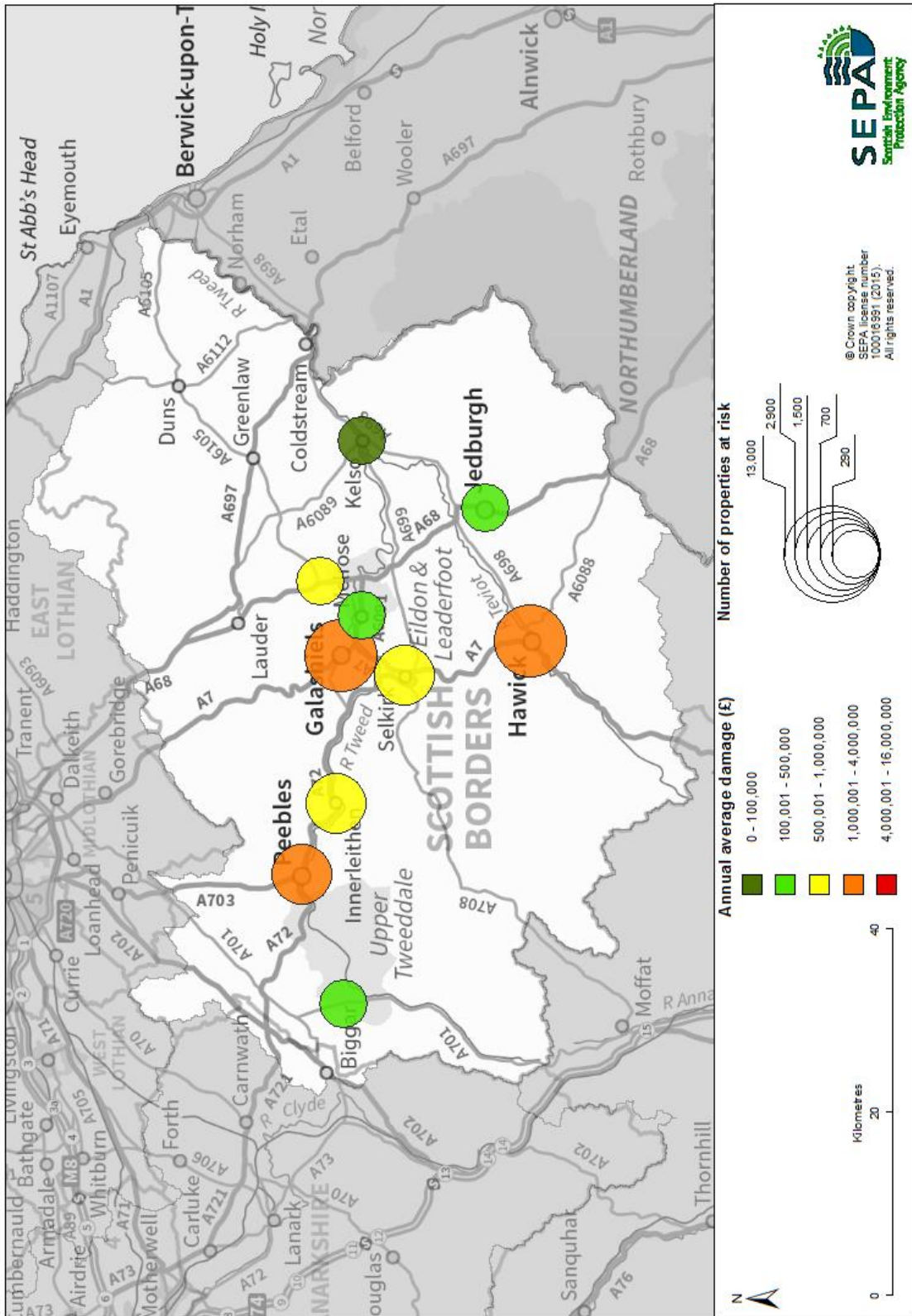


Figure 3: The Tweed Local Plan District showing areas with most properties at risk of flooding and associated damages

Objectives and actions in the Tweed Local Plan District

The objectives are the shared aims for managing flooding. Actions describe where and how flood risk will be managed. Objectives and actions have been set by SEPA and agreed by flood risk management responsible authorities following consultation.

Some flood risk management objectives and actions apply to all areas, whether designated as a Potentially Vulnerable Area or not. For example, flood risk can be managed through national planning policy or as part of ongoing statutory duties for local authorities. The focus of this Flood Risk Management Strategy is to manage flood risk in Potentially Vulnerable Areas where specific actions apply in addition to the generic actions listed below. Further detail on specific actions can be found in the relevant Potentially Vulnerable Area chapter. Local authorities may have further information on how they manage flooding across their area.

Target area	Objective(s)	ID	Indicators
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 3,400 residential properties • 1,900 non-residential properties • 7,500 people
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 3,400 residential properties • 1,900 non-residential properties • 7,500 people

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	-		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and the Resilient Communities Initiative, and ensuring that properties and businesses are insured against flood damage.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>Local authorities will be undertaking additional awareness raising activities, further details will be set out in the Local FRM Plans.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Local authority, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. The local authorities produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

Action (ID):	EMERGENCY PLANS / RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

2.2 Potentially Vulnerable Areas

The table below summarises the actions to manage flood risk in the Potentially Vulnerable Areas of this Local Plan District. Further detail is provided in each Potentially Vulnerable Area.

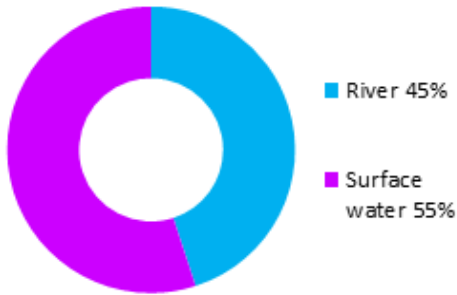
PVA	Flood protection scheme/ works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning*	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/ response	Planning policies
13/01							✓	N/A	✓	✓			✓	✓	✓		✓	✓
13/02								N/A	✓	✓			✓	✓	✓		✓	✓
13/03							✓	✓	N/A	✓			✓	✓	✓		✓	✓
13/04	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
13/05				✓			✓	✓	✓	✓			✓	✓	✓		✓	✓
13/06							✓	N/A	✓	✓			✓	✓	✓		✓	✓
13/07				✓			✓	✓	N/A	✓			✓	✓	✓		✓	✓
13/08				✓			✓	N/A	N/A	✓			✓	✓	✓		✓	✓
13/09						✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
13/10				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
13/11								✓	✓	✓			✓	✓	✓		✓	✓
13/12	✓				✓	✓	✓	N/A	✓	✓		✓	✓	✓	✓		✓	✓
13/13				✓			✓	N/A	N/A	✓			✓	✓	✓		✓	✓

*Note: N/A is used where there is no formal Flood Protection Scheme or flood warning scheme present.

West Linton (Potentially Vulnerable Area 13/01)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council, West Lothian Council	River Tweed

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- <10 non-residential properties
- £4,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

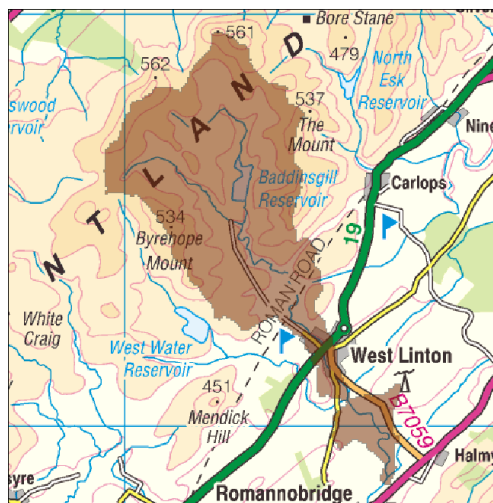
Actions

West Linton (Potentially Vulnerable Area 13/01)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council, West Lothian Council	River Tweed

Background

This Potentially Vulnerable Area is 26km². This is a small, rural area containing the village of West Linton (shown below). It extends from the A701 in the south, northward into the Pentland Hills. Its main watercourse is the Lyne Water, extending from its source in the north through West Linton.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by surface water flooding.

There are fewer than 10 residential and non-residential properties at risk of flooding.

The Annual Average Damages are approximately £4,200.

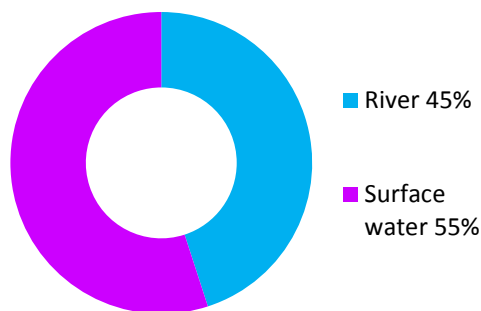


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The highest risk of flooding is to West Linton from surface water and river sources.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. Surface water damages may be under-represented in Figure 2 due to limitations in the available modelling output. For this Potentially Vulnerable Area the highest damages are to agricultural land followed by damages to a very small section of the A702 main transport route. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 470)	<10	<10	<10
Non-residential properties (total 50)	<10	<10	<10
People	<10	<10	20
Community facilities	0	0	0
Utilities	0	0	0
Transport links (excluding minor roads)	1 A road at 1 location	1 A road at 1 location	1 A road, 1 B road at 3 locations
Environmental designated areas (km ²)	0.1	0.1	0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	0.6	0.7	0.7

Table 1: Summary of flooding impacts

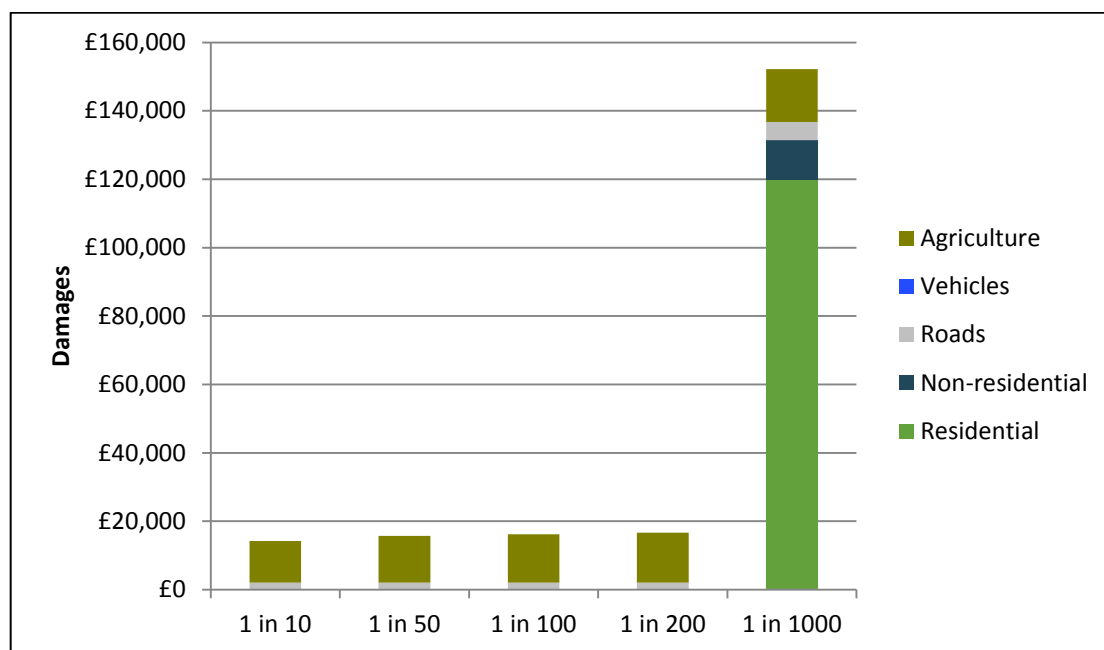


Figure 2: Damages by flood likelihood

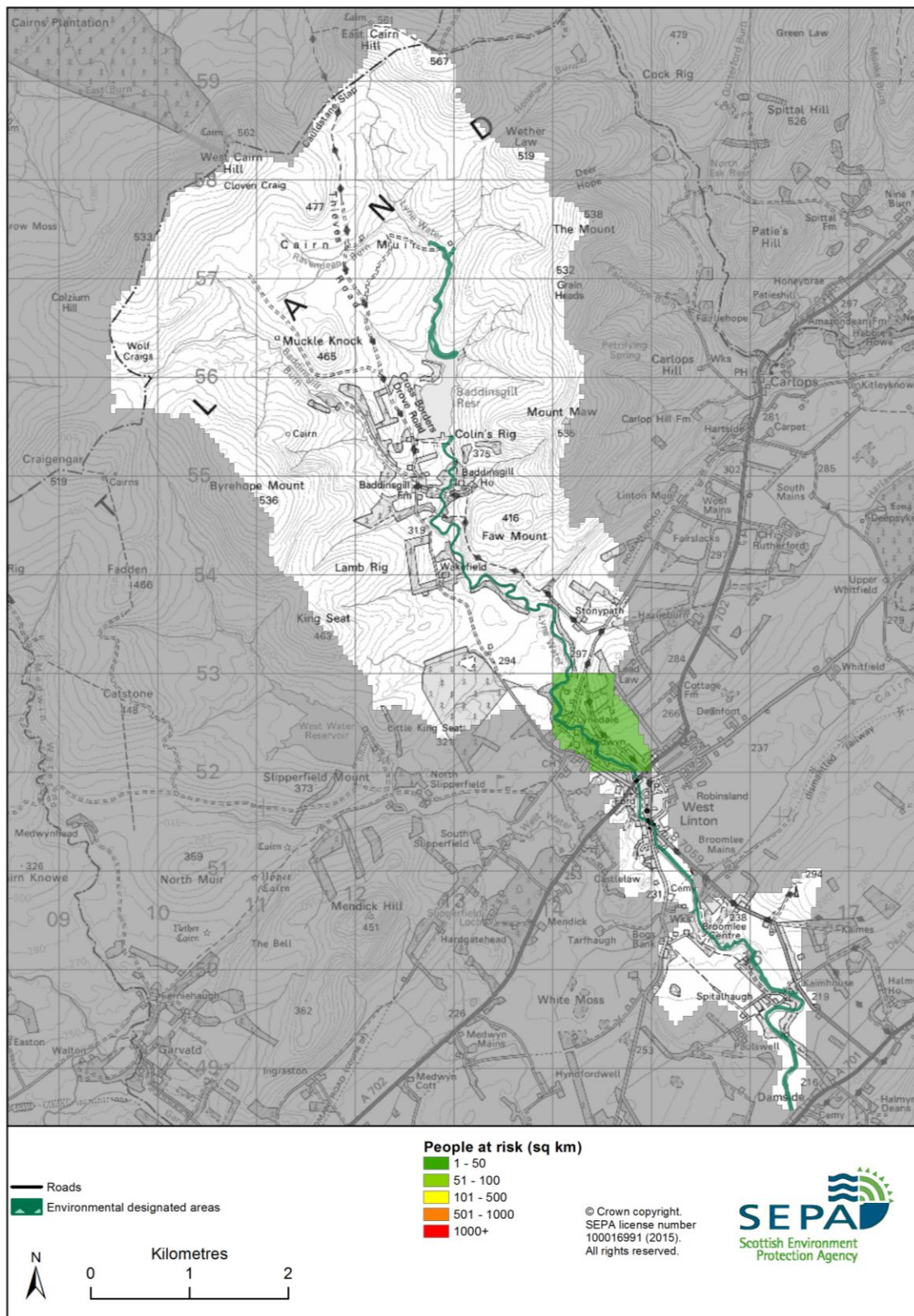


Figure 3: Impacts of flooding

History of flooding

No significant river or surface water floods have been recorded in this Potentially Vulnerable Area.

Objectives to manage flooding in Potentially Vulnerable Area 13/01

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for West Linton Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • <10 residential properties • £4,200 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • <10 residential properties • £4,200 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/01

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for West Linton Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in the Upper Tweed, Eddleston Water and Biggar Burn areas to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 800km ² of improved surface water data is currently available within this Local Plan District.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Romannobridge to Lyne Station flood warning area which is part of the Lyne Water river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Local authorities, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

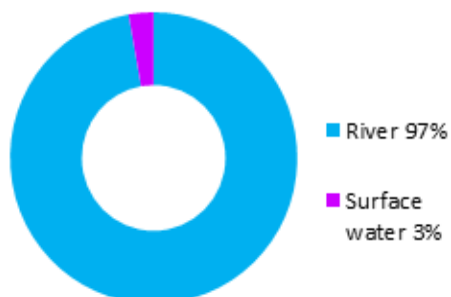
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Preston (Potentially Vulnerable Area 13/02)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	Whiteadder Water

Summary of flooding impacts



At risk of flooding

- 30 residential properties
- <10 non-residential properties
- £140,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	<i>Strategic mapping and modelling</i>	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Preston (Potentially Vulnerable Area 13/02)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	Whiteadder Water

Background

This Potentially Vulnerable Area is 29km² and part of the River Tweed catchment (shown below). This is a small, rural area containing the village of Preston. The main watercourse is the Whiteadder Water, entering from the north and flowing westward toward Chirnside.



The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding.

There are approximately 30 residential properties are at risk of flooding.

The Annual Average Damages are approximately £140,000.

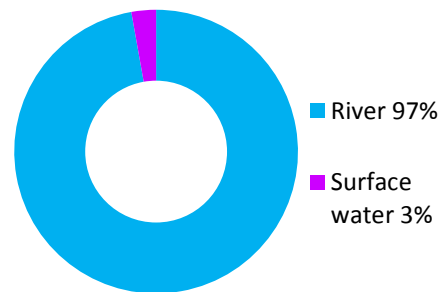


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Further work carried out since the National Flood Risk Assessment in 2011 has identified that the risk of flooding in this Potentially Vulnerable Area is now considered to be lower than previously identified. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The risk of flooding to people and property, as well as to community facilities, utilities, transport networks, designated sites and agricultural land is summarised in Table 1. The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to vehicles.

The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 220)	20	30	30
Non-residential properties (total 40)	<10	<10	<10
People	50	60	60
Community facilities	0	0	0
Utilities	0	0	0
Transport links (excluding minor roads)	1 A road, 2 B roads at 8 locations	1 A road, 2 B roads at 10 locations	1 A road, 2 B roads at 10 locations
Environmental designated areas (km ²)	0.7	0.8	0.8
Designated cultural heritage sites	2	2	2
Agricultural land (km ²)	1.6	2.0	2.1

Table 1: Summary of flooding impacts

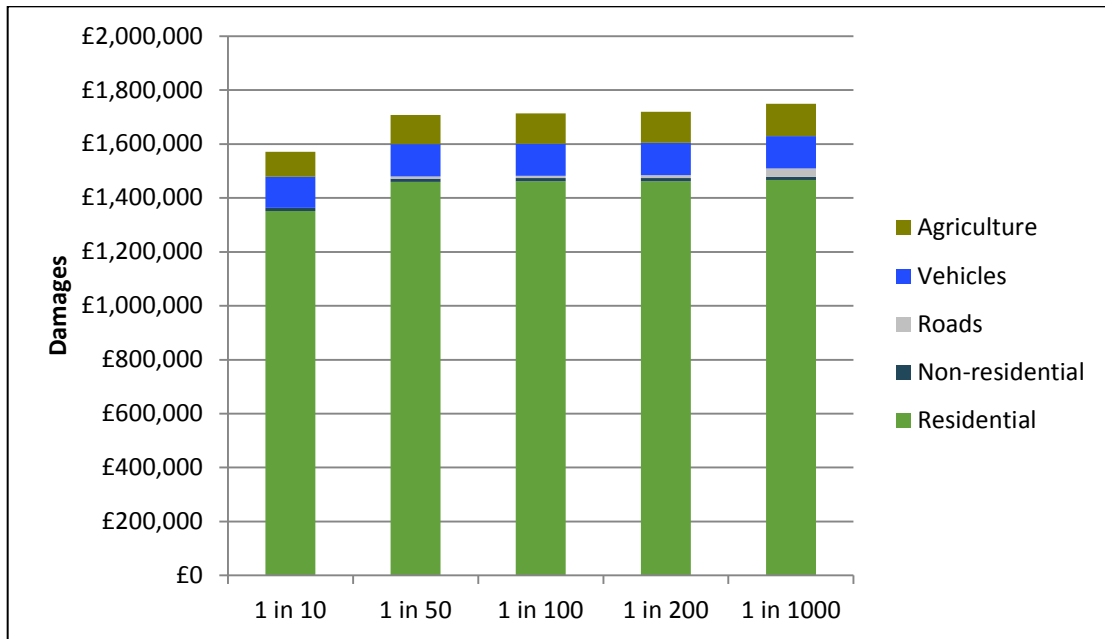


Figure 2: Damages by flood likelihood

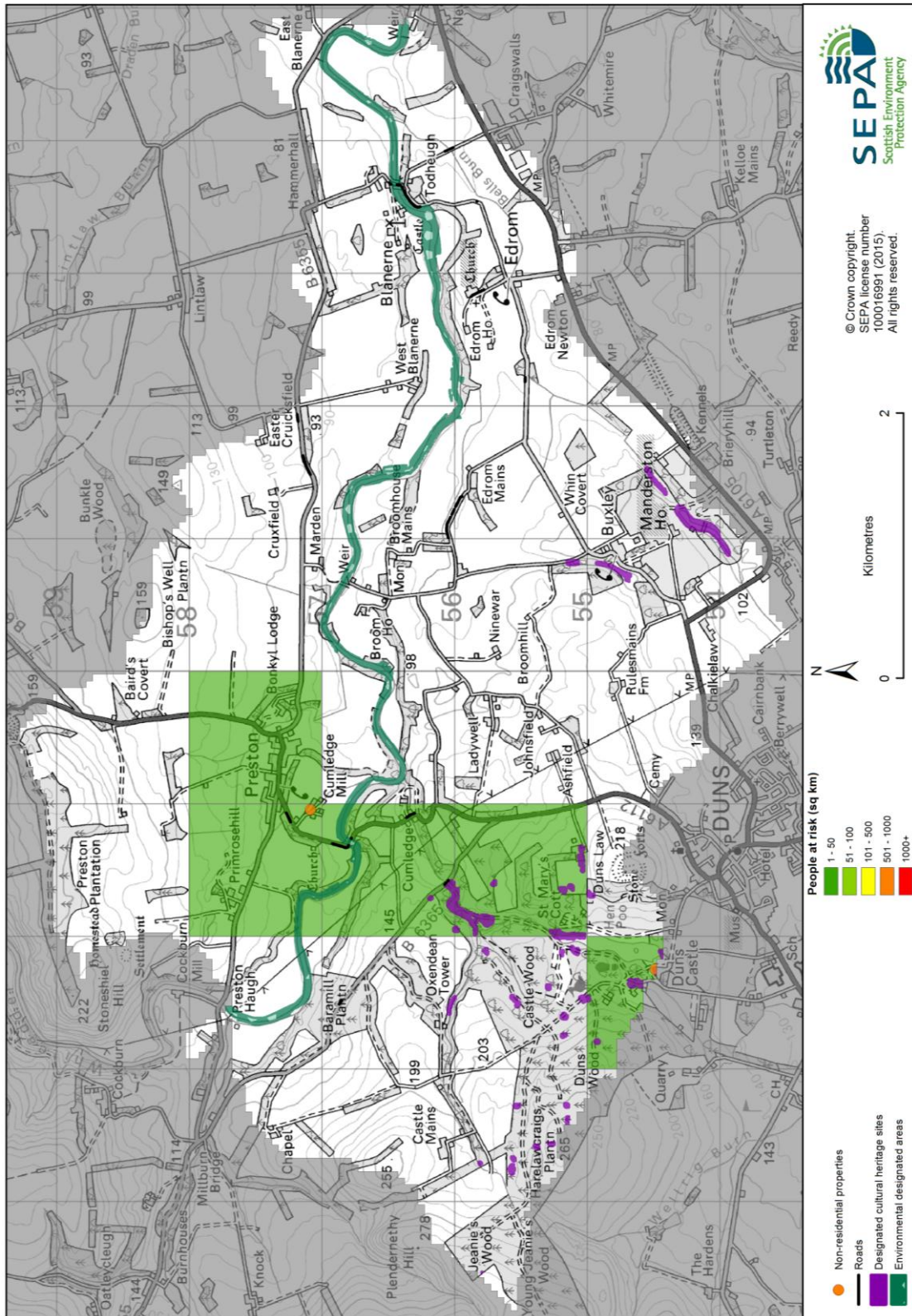


Figure 3: Impacts of flooding

History of flooding

One significant flood is known to have affected this area, this being the Great Borders Flood of 12 August 1948. Flooding affected the rivers Tweed, Blackadder, Whiteadder, Till and Eye Water when a third of the expected annual rainfall fell in just six days. A railway bridge collapsed leading to a mill being destroyed and almost all bridges spanning the Whiteadder were destroyed or damaged. One hundred and eighty residents had to be evacuated, most to Berwickshire High School. The Millburn Bridge collapsed injuring 12 people and a sawmill collapsed in Kimmerghame. Flooding also affected properties along the Whiteadder Water in 1948.

Objectives to manage flooding in Potentially Vulnerable Area 13/02

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Preston Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 30 residential properties • £140,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 30 residential properties • £140,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/02

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Preston Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	<i>Strategic mapping and modelling</i>	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Preston to Paxton flood warning area which is part of the Whiteadder Water river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.</p> <p>Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.</p>		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.</p>		

Lauder (Potentially Vulnerable Area 13/03)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- <10 non-residential properties
- £6,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Lauder (Potentially Vulnerable Area 13/03)

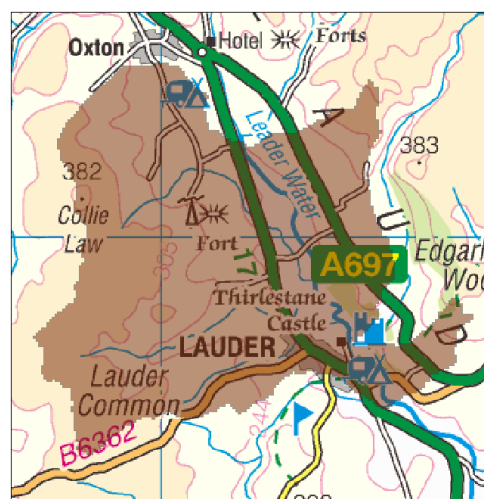
Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 34km² and part of the River Tweed catchment (shown right). This is a small, rural area containing the village of Lauder. It extends from Lauder in the south, northward to just south of the village of Oxton. The main watercourse is the Leader Water, which flows through the entire length. Flood damages are caused entirely by river flooding.

There are fewer than 10 residential and non-residential properties at risk of flooding.

The Annual Average Damages are approximately £5,900.



Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 1. For this Potentially Vulnerable Area the highest damages are to agricultural land followed by damages to roads. The location of the impacts of flooding is shown in Figure 2.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 570)	<10	<10	<10
Non-residential properties (total 100)	<10	<10	<10
People	<10	<10	<10
Community facilities	0	0	0
Utilities	0	0	0
Transport links (excluding minor roads)	1 A road, 1 B road at 2 locations	1 A road, 1 B road at 4 locations	1 A road, 1 B road at 4 locations
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	1	1	1
Agricultural land (km ²)	1.1	1.5	1.6

Table 1: Summary of flooding impacts

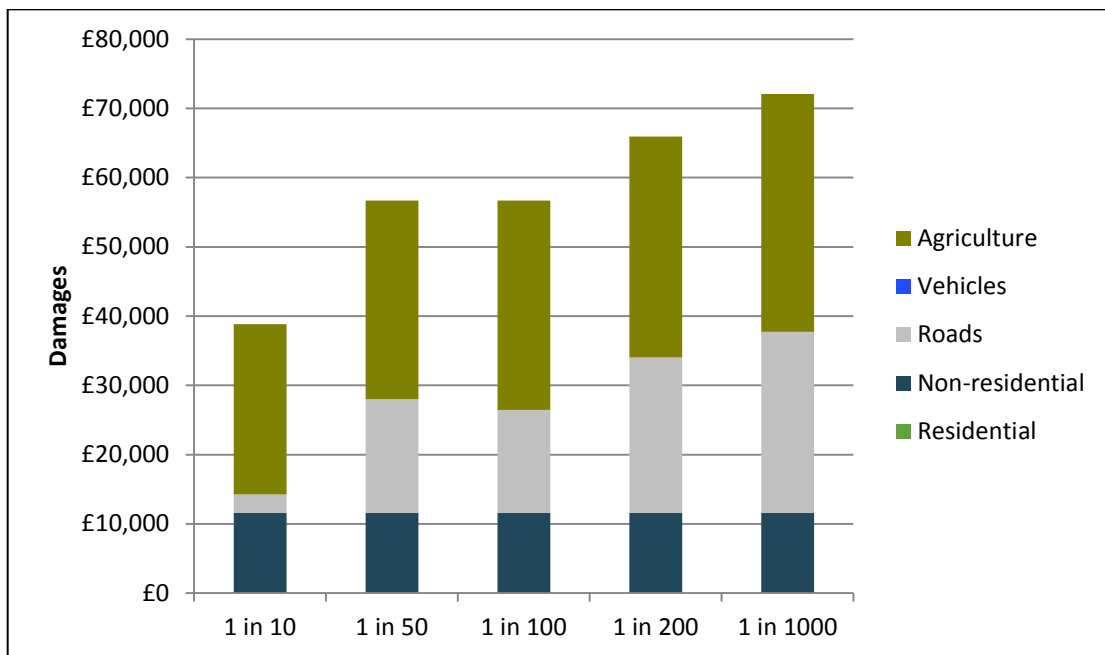


Figure 1: Damages by flood likelihood

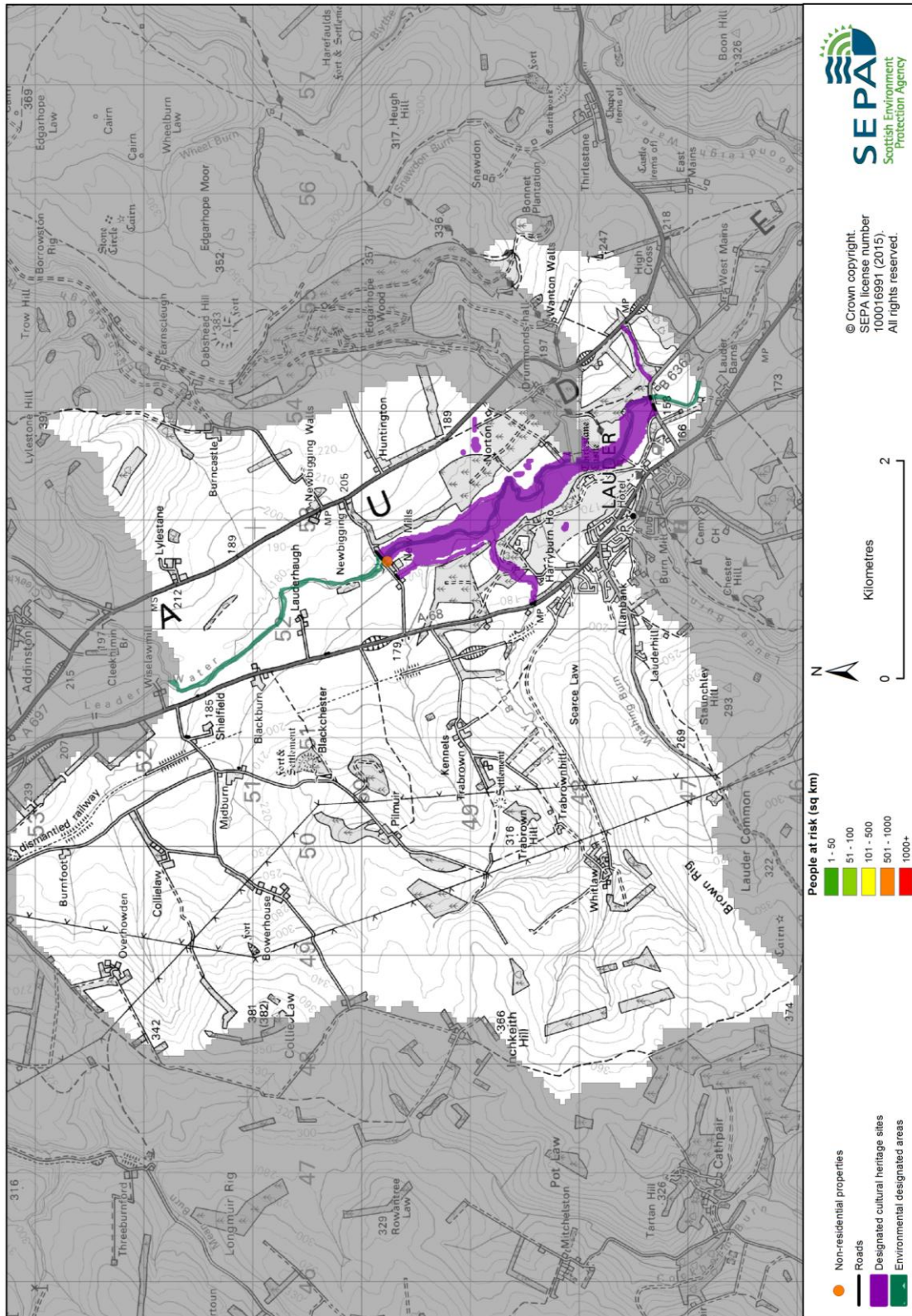


Figure 2: Impacts of flooding

History of flooding

No significant floods have been recorded in this Potentially Vulnerable Area.

Objectives to manage flooding in Potentially Vulnerable Area 13/03

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Lauder Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • <10 residential properties • £5,900 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • <10 residential properties • £5,900 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/03

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Lauder Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in Leader Water area to support the improved understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130040017)		
Objective (ID):	Avoid an overall increase in flood risk (13001)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Lauder Station Yard Flood Protection Scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

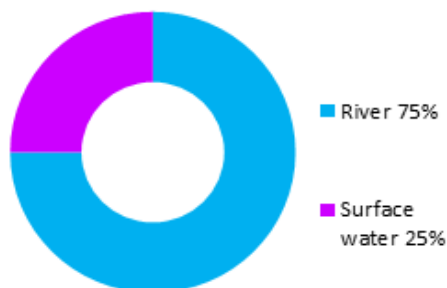
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Eddleston, Peebles, Innerleithen, Selkirk, Stow and Galashiels (Potentially Vulnerable Area 13/04)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 1,900 residential properties
- 1,000 non-residential properties
- £6.5 million Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

Flood protection scheme/works	<i>Natural flood management works</i>	<i>New flood warning</i>	Community flood action groups	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Actions

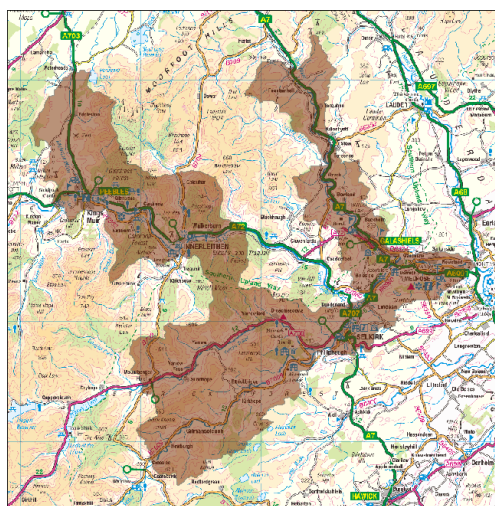
Eddleston, Peebles, Innerleithen, Selkirk, Stow and Galashiels (Potentially Vulnerable Area 13/04)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 432km² and is situated in the River Tweed catchment (shown below). It includes Peebles, Innerleithen, Selkirk, Galashiels and Melrose.

The main watercourses are the River Tweed and its tributaries, the Eddleston Water, Leithen Water, Yarrow Water, Ettrick Water and Gala Water.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding.

There are approximately 1,900 residential properties and 1,000 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £6.5 million.

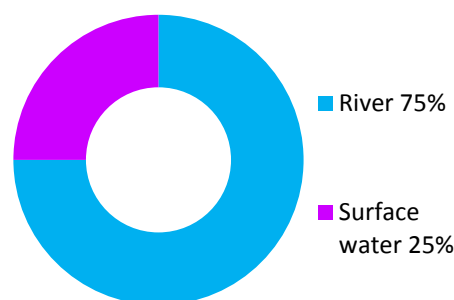


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of flooding is in Peebles from the River Tweed, Eddleston Water and surface water; in Innerleithen from the River Tweed and Leithen Water; in Selkirk from the Ettrick Water and in Galashiels from the River Tweed, Gala Water and surface water.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties. The location of the impacts of flooding is shown in Figures 3 and 4.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works and pumping stations). Within this Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

Please note that in Selkirk and Galashiels Scottish Borders Council has undertaken more detailed studies as part of the Selkirk and Galashiels Flood Protection Schemes. The information in this report uses SEPA data, which may be different from the flooding information held by the local authority due to differences in modelling approach.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 20,000)	330	1,900	2,600
Non-residential properties (total 3,200)	180	1,000	1,200
People	720	4,200	5,800
Community facilities	<10 Includes: educational buildings, emergency services, healthcare facilities	<10 Includes: educational buildings, emergency services, healthcare facilities	<10 Includes: educational buildings, emergency services, healthcare facilities
Utilities	20	60	70
Transport links (excluding minor roads)	7 A roads, 12 B roads at 204 locations	7 A roads, 12 B roads at 321 locations	7 A roads, 12 B roads at 365 locations
Environmental designated areas (km²)	3.9	4.1	4.2
Designated cultural heritage sites	25	31	33
Agricultural land (km²)	13.6	18.0	19.6

Table 1: Summary of flooding impacts

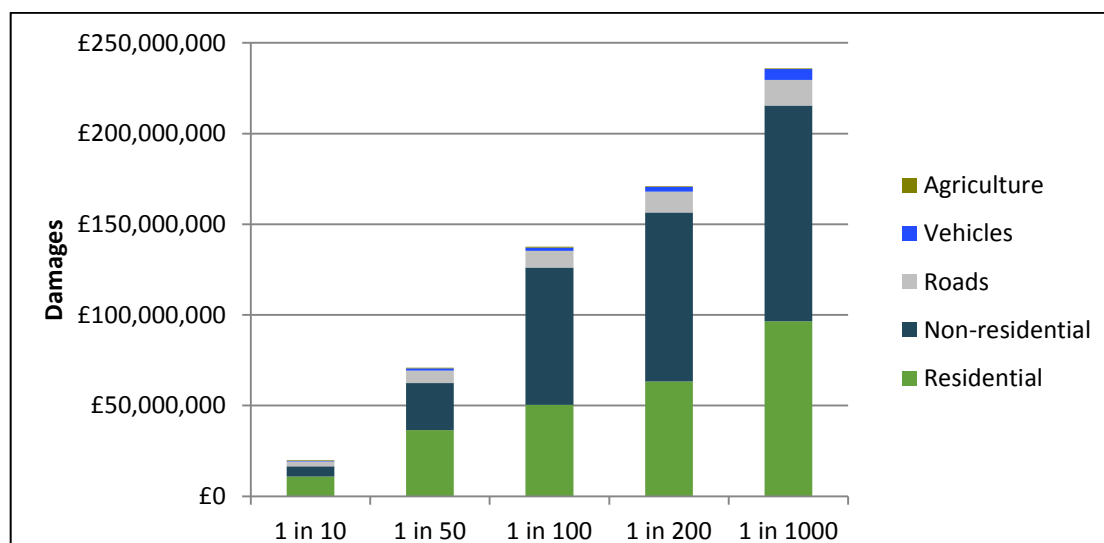


Figure 2: Damages by flood likelihood

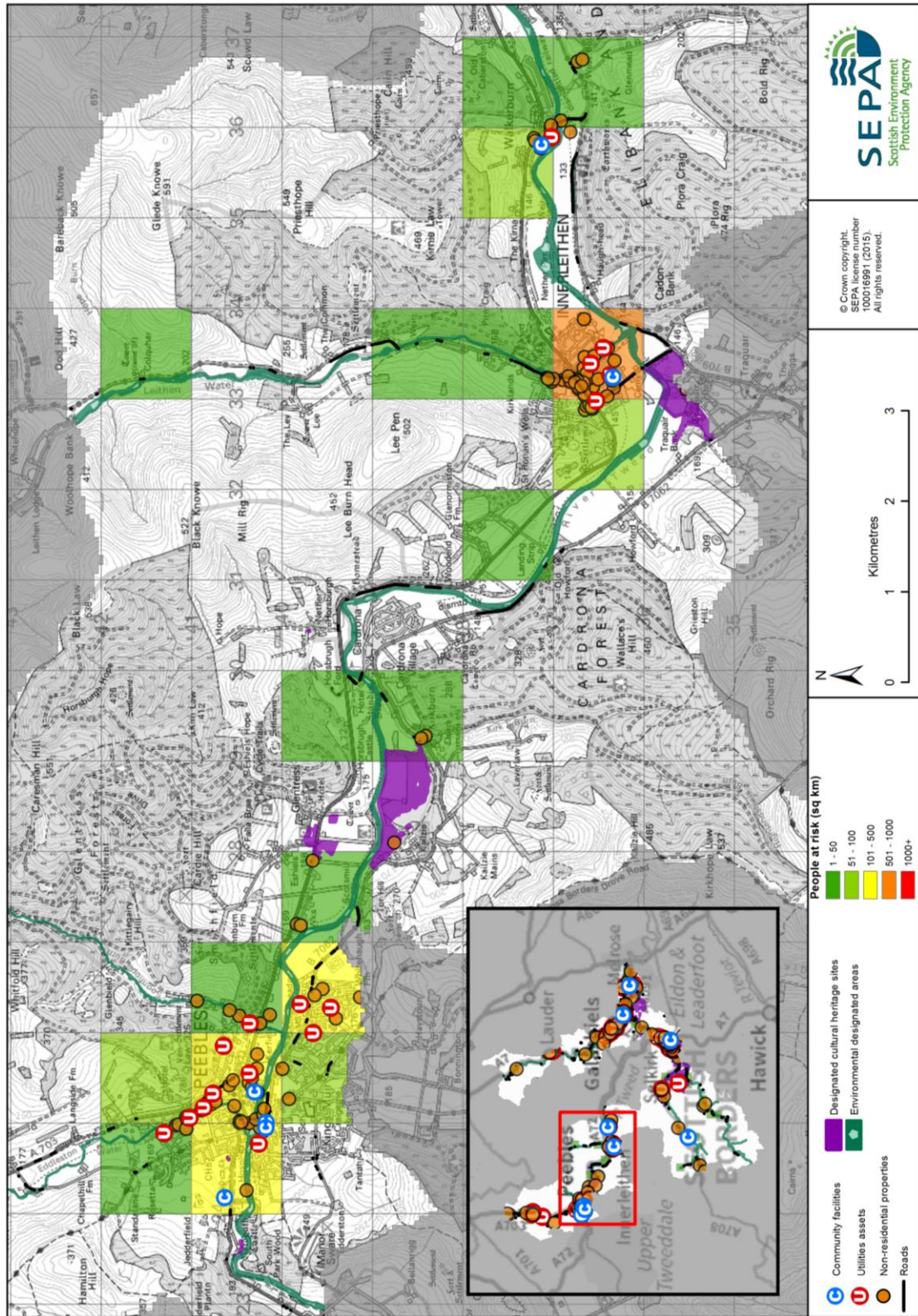


Figure 3: Impacts of flooding

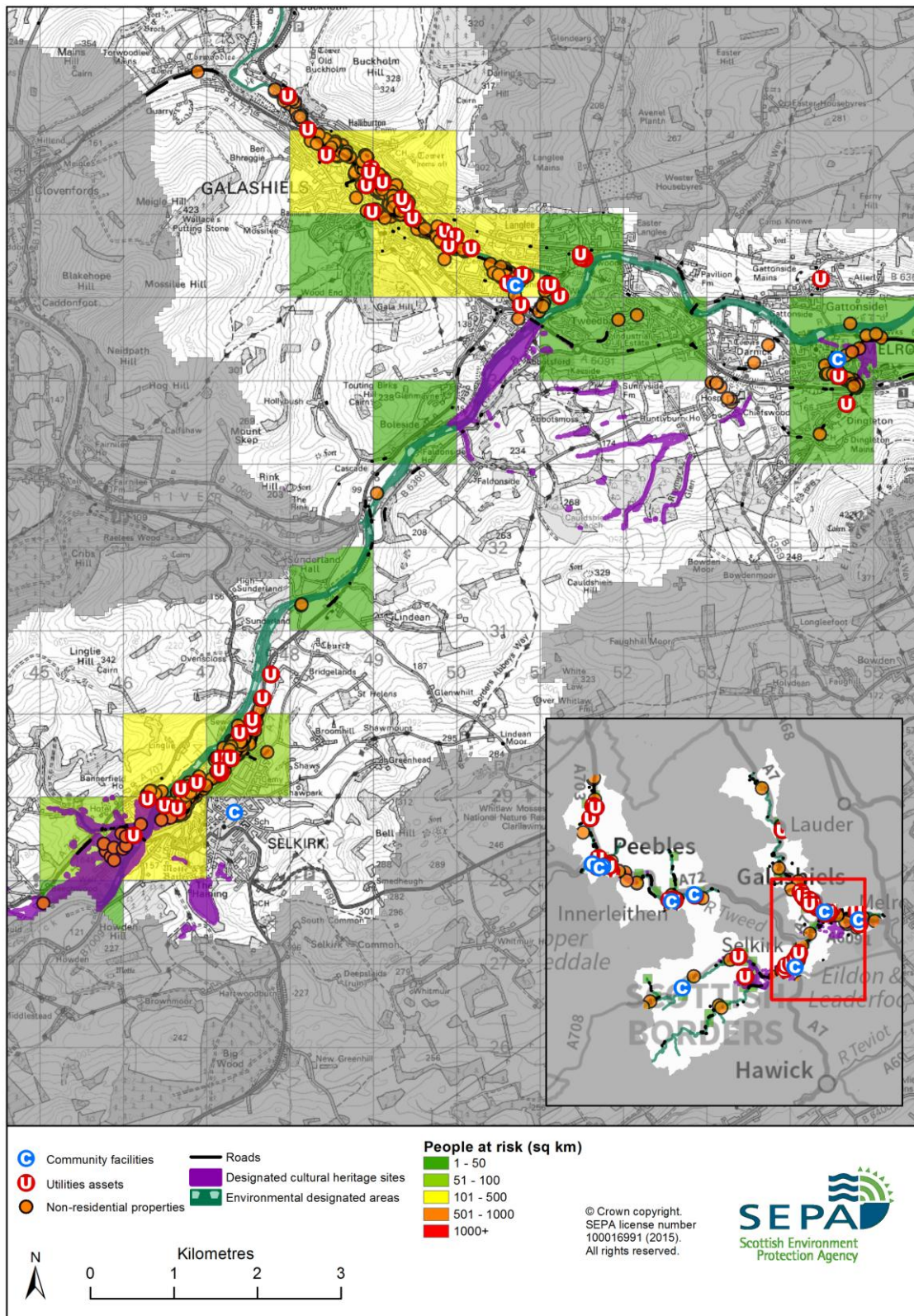


Figure 4: Impacts of flooding

History of flooding

There is a long history of flooding in this Potentially Vulnerable Area. Floods that have been recorded as significant include:

- 30 December 2013: The Tweed Green area of Peebles was inundated by water from the River Tweed. No properties were flooded, only surrounded by water.
- 14 April 2013: Flooding on the Ettrick Water.
- 22 November 2012: Flooding in Selkirk and in Bank Street, Meigle View and Riddle Dumble Park, Galashiels.
- 19 November 2009: River Tweed flooded at Tweed Green in Peebles. Property was also flooded at Cardrona. Flooding was also recorded on the Ettrick Water.
- October 2005: Peebles was affected by flooding from the Eddleston Water.
- 8 January 2005: Property at Tweed Green, Peebles was flooded from the River Tweed.
- 13 August 2004: Flooding occurred at Philiphaugh on the western edge of Selkirk from the Long Philip Burn.
- 30 May 2003: Flooding along the Long Philip Burn. Fire crews reported flooding up to 'windscreen height' in Philiphaugh area. Flooding took place at Bannerfield, where 160 homes were affected along with Selkirk Rugby Club. Roads and bridges badly damaged. The estimated cost of repair for roads and bridges was £200,000. Bannerfield had estimated damages of £1.5 million. Between 10 and 12 properties at Broadmeadows were inundated with water and gravel that had been moved due to the large flow rate caused by localised flooding. There was flooding from the River Tweed between Selkirk and Galashiels East. Property at Netherbank flooded and there were impacts on businesses and properties in Galashiels.
- 1984, Galashiels: Significant flooding to residential and commercial properties in the north and south of Galashiels.
- 31 October 1977: A flood is known to have affected a large part of the region, including Hawick, Galashiels, Selkirk, Peebles and Kelso. Several bridges were swept away. Residential and commercial properties and agricultural land were also affected.
- 30 October 1977: Ettrick Water flooding caused Philiphaugh Bridge in Selkirk to be washed away. The occupants of one house were rescued by helicopter, others rescued in boats. One person was swept away but subsequently rescued. Flooding affected Lindean Mill in Selkirk and many properties in Bowhill.
- 16 January 1962: A hospital, roads, homes and factories flooded. Many roads impassable. The flood event is known to have affected a large part of the region.
- 29 August 1956: Philiphaugh Estate flooded from Long Philip Burn.
- 17 January 1951: Multiple locations flooded. Disruption of telephone and electricity supply in Galashiels. A retaining wall was washed away in Stow, causing road and rail delays.
- 25 October 1949: Eddleston Water flooding. War memorial hospital flooded and patients were moved to the top floor. Flooding of properties forced families to shelter in St Andrew's Church. The railway line also flooded.
- 12 August 1948: Multiple location flooding. Section of railway line washed away during flooding between Newtown St Boswells and Melrose. Electrical supply disrupted at Netherdale and numerous properties and businesses flooded in Galashiels. Several bridges swept away and major

disruption to local and national transportation infrastructure. The flood is known to have affected a large part of the region.

- 1937: Flooding to Tweed Green and Tweed Avenue in Peebles.
- 24 November 1927: Flooding of Galashiels when the Gala Water reached its highest level for 36 years. One man drowned and railway infrastructure seriously affected.
- 27 November 1924: Severe flooding from the Gala Water affecting properties in Stow.
- March 1881: Extensive flooding with the Gala Water, Leader Water, River Tweed, Teviot Water and Ettrick Water affected.

Objectives to manage flooding in Potentially Vulnerable Area 13/04

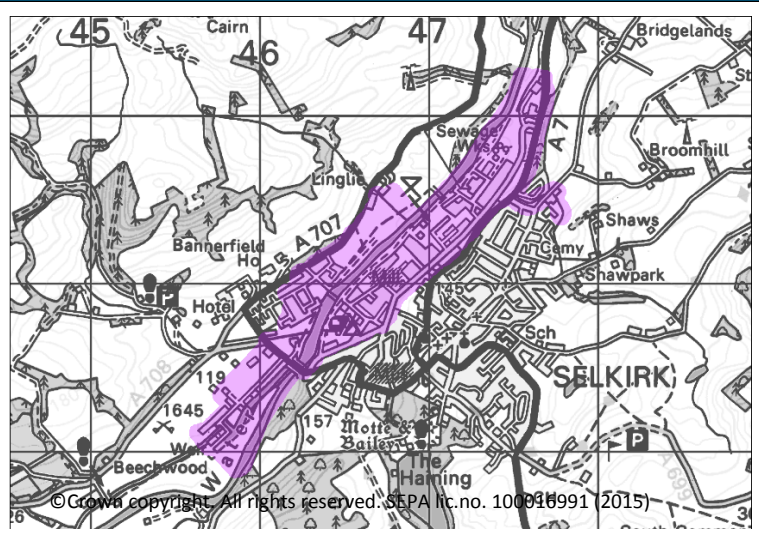
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Eddleston, Peebles, Innerleithen, Selkirk, Stow and Galashiels Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties in Selkirk caused by flooding from the Etrick Water, Long Philip Burn and Shaw Burn

Indicators:

- £140,000 Annual Average Damages from residential properties
- £510,000 Annual Average Damages from non-residential properties

Target area:



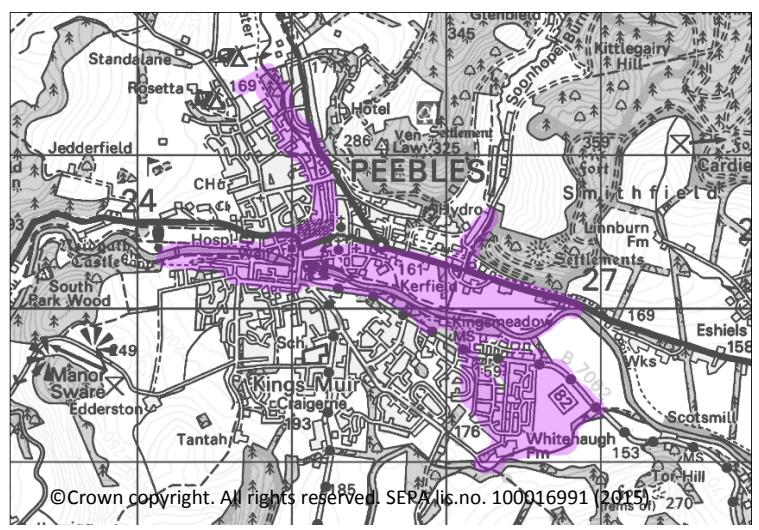
Objective ID: 13007, 13008, 13009, 13010, 13011, 13012

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Peebles caused by river flooding from the Eddleston Water and River Tweed

Indicators:

- £690,000 Annual Average Damages from residential properties
- £82,000 Annual Average Damages from non-residential properties
- Two emergency services and one healthcare facility

Target area:



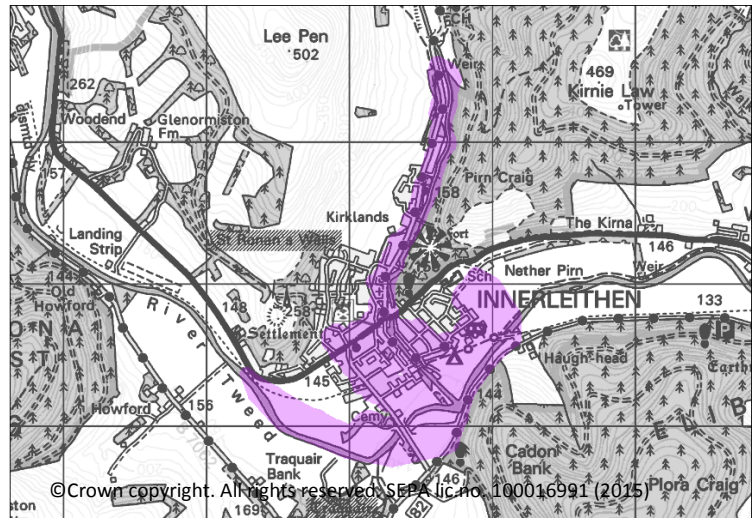
Objective ID: 13013

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Innerleithen caused by flooding from the River Tweed and Leithen Water

Indicators:

Target area:

- £660,000 Annual Average Damages from residential properties
- £140,000 Annual Average Damages from non-residential properties
- One emergency service



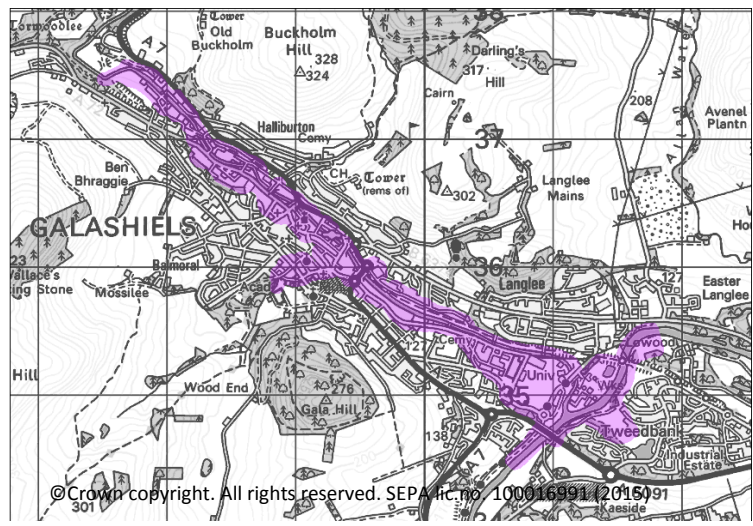
Objective ID: 13014

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Galashiels caused by flooding from the Gala Water and River Tweed

Indicators:

Target area:

- £330,000 Annual Average Damages from residential properties
- £1.3 million Annual Average Damages from non-residential properties
- Two educational buildings



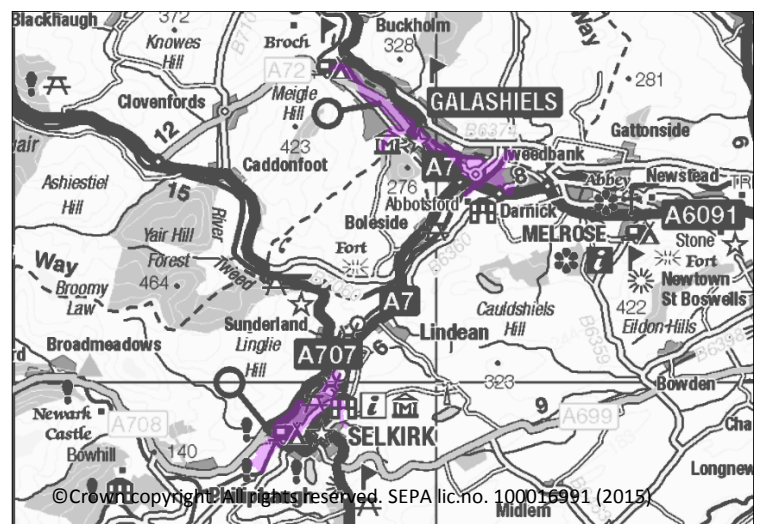
Objective ID: 13015, 13016, 13017

Reduce risk to people in Galashiels and Selkirk from river flooding

Indicators:

Target area:

- 1,800 people



Objective ID: 13018

Target area	Objective	ID	Indicators within PVA
Peebles	Reduce economic damages and number of residential properties at risk of surface water flooding in Peebles as far as practical	13005	* See note below
Galashiels, Melrose and Tweedbank	Reduce economic damages and number of residential properties at risk of surface water flooding in Galashiels, Melrose and Tweedbank as far as practical	13034	* See note below
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 1,900 residential properties • £6.5 million Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 1,900 residential properties • £6.5 million Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 13/04 there are 410 residential properties at risk and Annual Average Damages of £1.7 million.

Actions to manage flooding in Potentially Vulnerable Area 13/04

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Eddleston, Peebles, Innerleithen, Selkirk, Stow and Galashiels Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/works	Natural flood management works	New flood warning	Community flood action groups	Property level protection scheme	Site protection plans
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (130070006)		
Objective (ID):	Reduce economic damages to residential and non-residential properties in Selkirk caused by flooding from the Ettrick Water, Long Philip Burn and Shaw Burn (13007, 13008, 13009, 13010, 13011, 13012)		
Delivery lead:	Scottish Borders Council		
Priority:	National:		Within local authority:
	N/A		N/A
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	The Selkirk Flood Protection Scheme is currently under construction, scheduled to be completed in early 2017. The scheme includes flood defences, flood storage in St. Mary's Loch, bridge raising / replacement, overflow channels and natural flood management. The scheme will offer a variable standard of protection, with most areas being protected to 1 in 200 years plus climate change. Long Phillip Burn will be protected to 1 in 100 years plus climate change and the Selkirk Riverside will be offered 1 in 500 years plus climate change, which is the highest level of protection for a publically funded scheme.		
Potential impacts			
Economic:	The flood protection scheme has an estimated benefit cost ratio of 2.2.		
Social:	A reduction in flood risk will have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection scheme area. There may be negative impacts through disturbance to the local community during the construction phase and changes in visual amenity and land use as a		

Social:	result of these works.
Environmental:	The scheme has undergone detailed design and assessment including consideration of potentially significant impacts from the construction and future use of the scheme and ways in which these can be mitigated. Natural flood management will have a positive impact on the environment through restoration and enhancement.

Action (ID):	FLOOD PROTECTION STUDY (130130005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Innerleithen caused by flooding from the River Tweed and Leithen Water (13014) Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Peebles caused by river flooding from the Eddleston Water and River Tweed (13013)		
Delivery lead:	Scottish Borders Council		
Priority:	National:	Within local authority:	
	1 of 168	1 of 6	
Status:	Not started	Indicative delivery:	2016-2021
Description:	A flood protection study has been recommended for Peebles, Innerleithen and Broughton to assess whether modification of conveyance, installation / modification of fluvial control structures, direct flood defences and natural flood management could reduce flood risk. The study should also consider the viability of property level protection. Natural flood management options that should be considered include runoff control, river / floodplain restoration and sediment management. The study should co-ordinate with the Eddleston Water restoration project managed by the Tweed Forum. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream. Part of this proposed flood protection study is located in PVA 13/08. The benefits and impacts have been assessed for the whole study.		
Potential impacts			
Economic:	The study could benefit 839 residential properties and 149 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £52 million. 128 of these properties are at risk from high likelihood events and may benefit from natural flood management actions.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition the study could benefit five community facilities, three emergency services, one healthcare facility, seven utilities and five roads located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.		
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. The physical condition of a		

Environmental:	number of rivers within the study area is identified by SEPA to be at less than good status. These include: Eddleston Water, Tarth Water, Dead Burn, Biggar Water, Cairn Burn and Spittal Burn (water body IDs 5307, 5314, 5319, 5325, 5321 and 5329). Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Westwater Special Protection Area, River Tweed Special Area of Conservation or Moffat Hills Special Area of Conservation. Conservation areas, National Scenic Areas, scheduled monuments, listed buildings, Sites of Special Scientific Interest and ancient woodlands are also present in the study area and could be positively or negatively impacted.
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Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (130150003)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Galashiels caused by flooding from the Gala Water and River Tweed (13015, 13016, 13017)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	A natural flood management study has been recommended for Galashiels and Stow to assess whether runoff control, river / floodplain restoration and sediment management could help reduce flood risk. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream. The study should look to supplement the protection already provided by existing flood defences in Galashiels.		
Potential impacts			
Economic:	The economic impact of natural flood management actions is difficult to define. However, these actions can reduce flood risk for high likelihood events. Seven residential and non-residential properties could potentially benefit from natural flood management actions in this location.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.		
Environmental:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. Gala Water (water body ID 5280) is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status. Proposed actions should be coordinated with river basin management planning. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the River Tweed Special Area of Conservation or Moorfoot Hills Special Area of Conservation. The following nationally and locally designated sites are also present in		

Environmental:	the study area and could be positively or negatively impacted by the action: conservation areas and listed buildings.
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Action (ID):	SURFACE WATER PLAN/STUDY (130050018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Peebles as far as practical (13005)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	SURFACE WATER PLAN/STUDY (130340018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Galashiels, Melrose and Tweedbank as far as practical (13034)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2027
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	SURFACE WATER PLAN/STUDY (130340019)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Galashiels, Melrose and Tweedbank as far as practical (13034)		
Delivery lead:	Scottish Water in partnership with local authorities		
Status:	Ongoing	Indicative delivery:	2016-2027
Description:	An integrated catchment study will be carried out to support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	<p>SEPA will seek to develop flood mapping in the Gala Water, Ettrick Water, Upper Tweed, Eddleston Water and Biggar Burn areas to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied. SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk.</p> <p>Approximately 800km² of improved surface water data is currently available within this Local Plan District. The inclusion of additional surface water hazard data resulting from the completion of local authority surface water management plans and Scottish Water integrated catchment studies will be considered as these projects are completed.</p>		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	<p>Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.</p>		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130070017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties in Selkirk caused by flooding from the Ettrick Water, Long Philip Burn and Shaw Burn (13007, 13008, 13009, 13010, 13011, 13012)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing defences along the Ettrick Water and Yarrow Water until the new Selkirk Flood Protection Scheme is completed in December 2016. Thereafter, maintain the new flood protection scheme.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130130017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Peebles caused by river flooding from the Eddleston Water and River Tweed (13013)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing Edderston Burn Flood Prevention Scheme.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130140017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Innerleithen caused by flooding from the River Tweed and Leithen Water (13014)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing Innerleithen Hall Street Flood Protection Scheme. The scheme was designed to mitigate the flooding of St Ronan's Terrace, Hall Street and High Street from surface-runoff and watercourses upstream of Hall Street.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130150017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Galashiels caused by flooding from the Gala Water and River Tweed (13015, 13016, 13017)		
Delivery lead:	Scottish Borders Council		

Status:	Existing	Indicative delivery:	Ongoing
Description:	Maintain the new Galashiels Flood Protection Scheme completed in October 2014. The scheme includes direct defences on the Gala Water, from Wheatlands Road to Comely Bank, and provides a 1 in 75 year standard of protection to the centre of Galashiels.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Continue to maintain the Ettrick Valley, Selkirk to Lindean and the Selkirk (Bannerfield and Riverside Estate) flood warning areas which are part of the Ettrick Water river flood warning scheme.</p> <p>Continue to maintain the Stow, Galashiels (Netherdale) and Galashiels (including Bowland) flood warning areas which are on the Gala Water and are part of the Gala and Leader Water river flood warning scheme.</p> <p>Continue to maintain the Peebles and the Shiplaw to Crossburn (including Eddleston) flood warning areas which are part of the Eddleston Water river flood warning scheme.</p> <p>Continue to maintain the Leithen Water at Innerleithen flood warning area which is part of the Leithen Water river flood warning scheme.</p> <p>Continue to maintain the Tweed in Peebles, Tweed from Peebles to Yair Bridge and the Tweedbank to Floors flood warning areas which are part of the Tweed river flood warning scheme.</p> <p>Continue to maintain the Yarrow Valley flood warning area which is part of the Yarrow Water river flood warning scheme.</p>		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.</p>		

Action (ID):	COMMUNITY FLOOD ACTION GROUPS (130070012)		
Objective (ID):	Reduce economic damages to residential and non-residential properties in Selkirk caused by flooding from the Ettrick Water, Long Philip Burn and Shaw Burn (13007, 13008, 13009, 13010, 13011, 13012) Reduce risk to people in Galashiels and Selkirk from river flooding (13018)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Selkirk Long Phillip Burn Flood Warning Group operates in this area. The group is supported by Scottish Borders Council and aims to increase community resilience to flooding.		

Action (ID):	COMMUNITY FLOOD ACTION GROUPS (130150012)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Galashiels caused by flooding from the Gala Water and River Tweed (13015, 13016, 13017) Reduce risk to people in Galashiels and Selkirk from river flooding (13018)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Galashiels Bakehouse Burn Flood Warning Group operates in this area. The group is supported by Scottish Borders Council and aims to increase community resilience to flooding.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

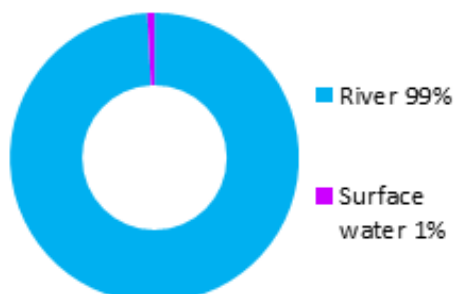
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Earlston (Potentially Vulnerable Area 13/05)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 70 residential properties
- 50 non-residential properties
- £640,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

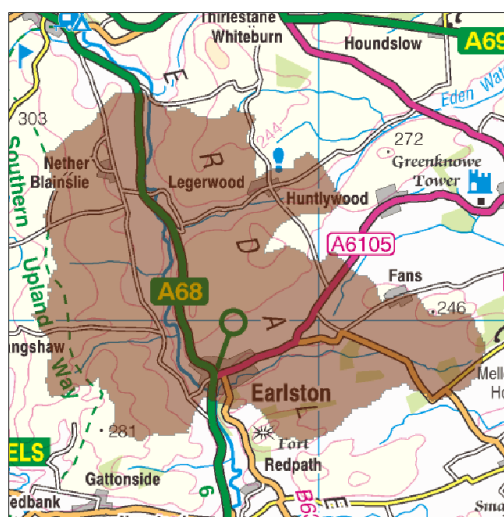
Actions

Earlston (Potentially Vulnerable Area 13/05)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 60km² and is part of the River Tweed catchment (shown below). This is a small, rural area to the east of Galashiels, extending northward to the Leader Water's confluence with the Boondreigh Water. It contains the village of Earlston in its southern limits. The main watercourse is the Leader Water which flows through the area's entire length.



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The majority of flood damages are caused by river flooding.

There are approximately 70 residential properties and 50 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £640,000.

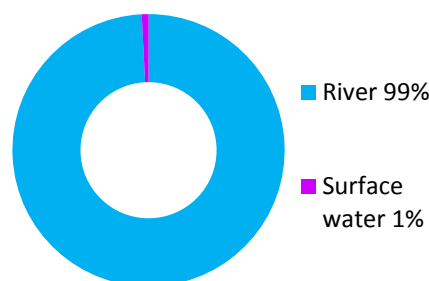


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of river flooding is from the Leader Water and Turfford Burn to Earlston.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties.

The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,100)	30	70	70
Non-residential properties (total 190)	40	50	50
People	70	150	160
Community facilities	<10 Educational buildings	<10 Educational buildings	<10 Educational buildings
Utilities	<10	<10	<10
Transport links (excluding minor roads)	2 A roads, 2 B roads at 13 locations	2 A roads, 2 B roads at 13 locations	2 A roads, 2 B roads at 14 locations
Environmental designated areas (km²)	0.2	0.2	0.2
Designated cultural heritage sites	0	0	0
Agricultural land (km²)	1.4	1.6	1.7

Table 1: Summary of flooding impacts

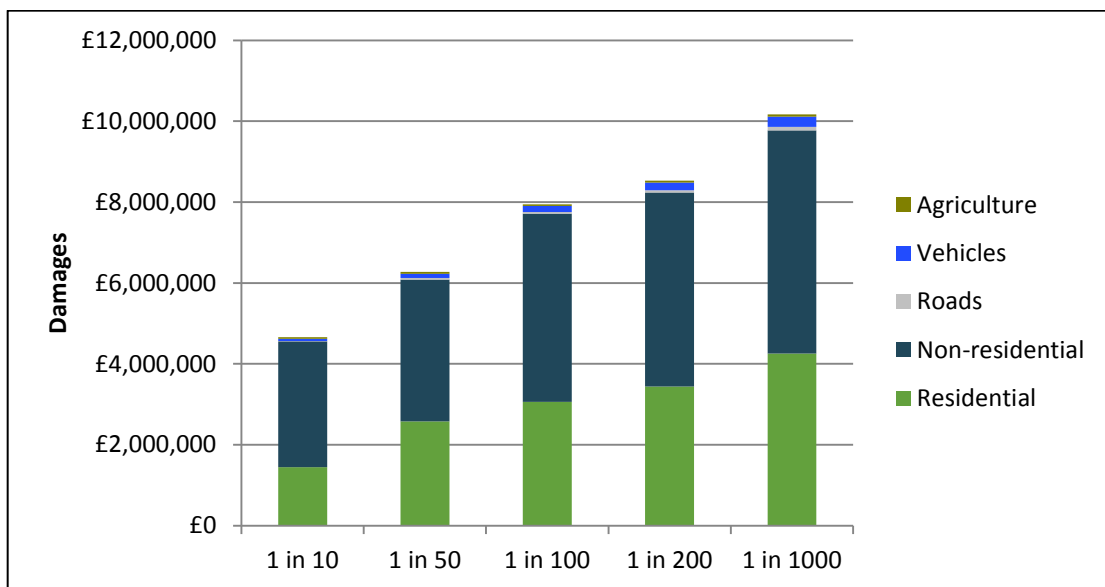


Figure 2: Damages by flood likelihood

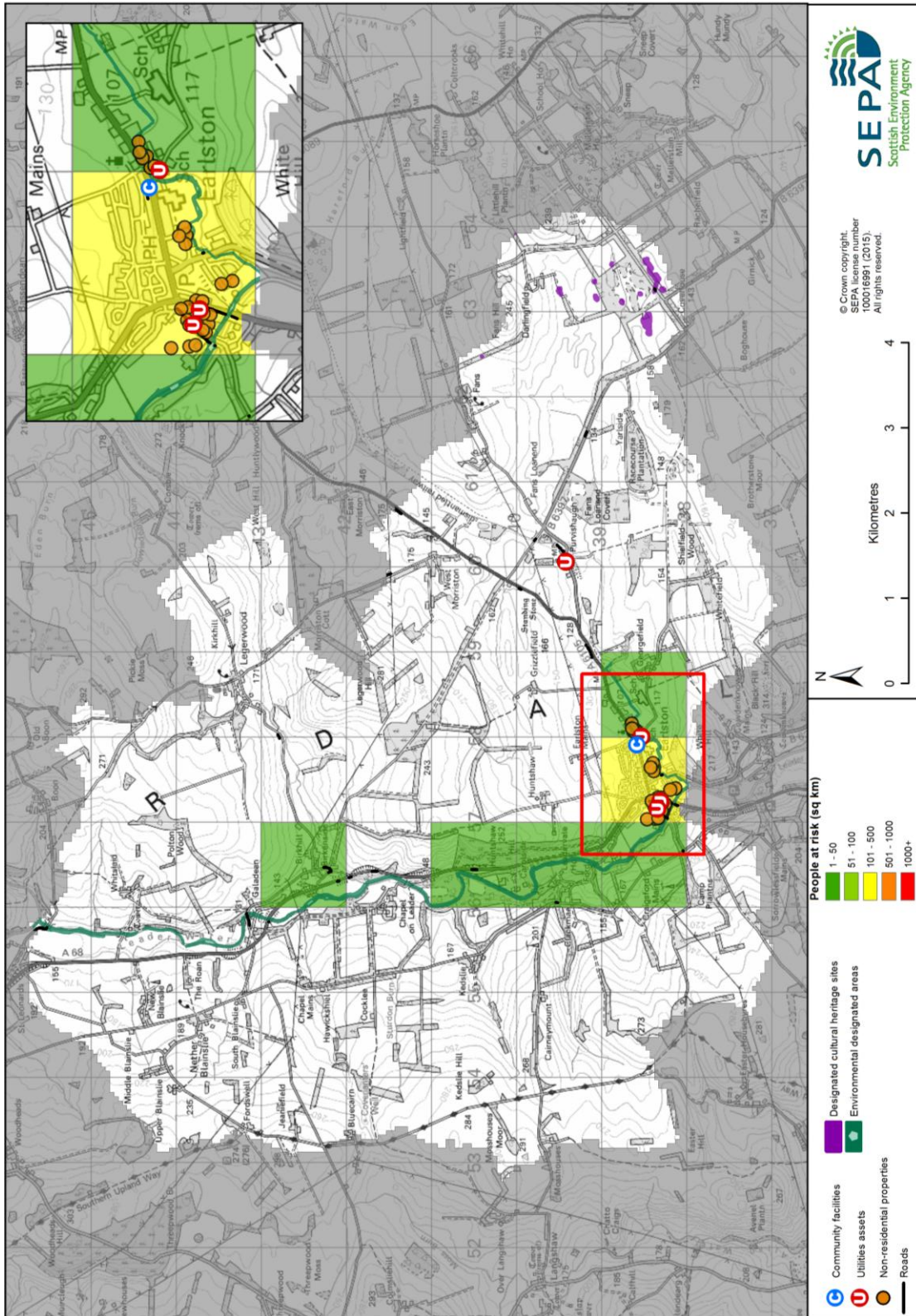


Figure 3: Impacts of flooding

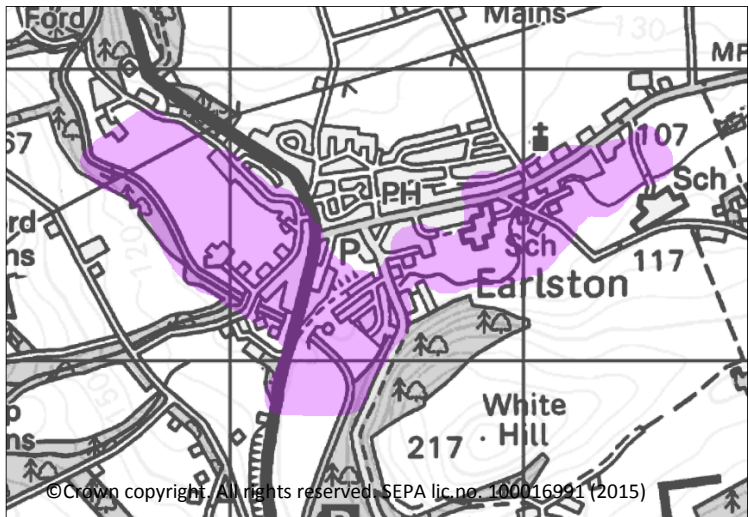
History of flooding

One significant flood has been recorded in this Potentially Vulnerable Area. On 1 October 2003 there was flooding on the Turford Burn.

Objectives to manage flooding in Potentially Vulnerable Area 13/05

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA’s flood map. The objectives below have been set for Earlston Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Earlston caused by flooding from the Leader Water / Turfford Burn

Indicators: <ul style="list-style-type: none"> £180,000 Annual Average Damages from residential properties £350,000 Annual Average Damages from non-residential properties One educational building 	Target area: 
Objective ID: 13019	

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> 70 residential properties £640,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> 70 residential properties £640,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/05

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Earlston Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION STUDY (130190005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Earlston caused by flooding from the Leader Water / Turfford Burn (13019)		
Delivery lead:	Scottish Borders Council		
Priority:	National:		Within local authority:
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Status:	Not started	Indicative delivery:	2016-2021
Description:	A flood protection study has been recommended for Earlston to assess whether modification of conveyance, installation / modification of fluvial control structures, flood defences and natural flood management could reduce flood risk. The study should also consider the viability of property level protection. Natural flood management options that should be considered include river / floodplain restoration and sediment management. The assessment should also consider these actions in combination and the potential benefits and disbenefits to locations both upstream and downstream.		
Potential impacts			
Economic:	The study could benefit 61 residential properties and 43 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £16 million. Sixty-five of these residential and non-residential properties are at risk from high likelihood flooding and may benefit from natural flood management actions.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition the study could benefit two emergency services and one healthcare facility located within the study area. Natural flood management		

Social:	actions can restore and enhance natural environments and create opportunities for recreation and tourism.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the River Tweed Special Area of Conservation. Listed buildings and ancient woodlands are also present in the study area and could be positively or negatively impacted.

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 800km ² of improved surface water data is currently available within this Local Plan District. SEPA will seek to develop flood mapping in the Leader Water area to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130190017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Earlston caused by flooding from the Leader Water / Turfford Burn (13019)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing Turfford Burn Flood Protection Scheme which reduces the risk of river flooding along the Turfford Burn.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Earlston flood warning area which is on the Leader Water and is part of the Gala and Leader Water river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.</p> <p>Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.</p>		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

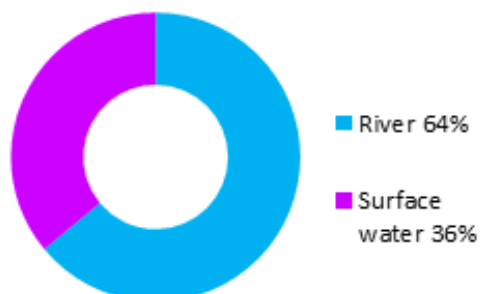
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.</p>		

Coldstream (Potentially Vulnerable Area 13/06)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- <10 non-residential properties
- £52,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

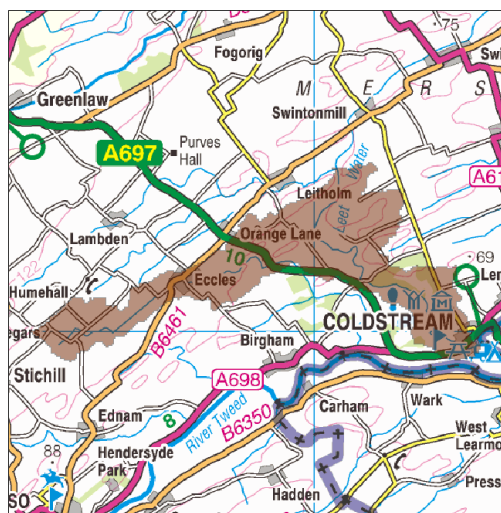
Actions

Coldstream (Potentially Vulnerable Area 13/06)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 20km² and is part of the River Tweed catchment (shown below). This is a small, rural area in the south east of the catchment and contains part of Coldstream in its southern limits and the village of Eccles in the west. Its main watercourse is the Leet Water which converges with the River Tweed at Coldstream.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding.

There are fewer than 10 residential and non-residential properties at risk of flooding.

The Annual Average Damages are approximately £51,000.

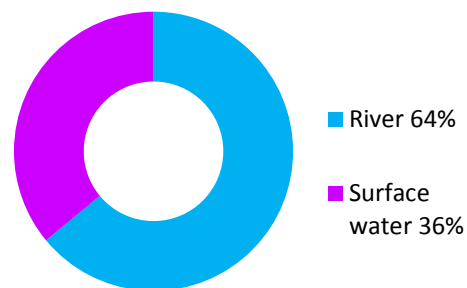


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The highest risk of river flooding is from the River Tweed to Coldstream and the highest risk of surface water flooding is in north Coldstream.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties and roads. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 940)	<10	<10	120
Non-residential properties (total 150)	<10	<10	20
People	<10	<10	270
Community facilities	0	0	<10 Emergency services
Utilities	0	0	0
Transport links (excluding minor roads)	2 A roads, 1 B road at 6 locations	2 A roads, 1 B road at 8 locations	2 A roads, 1 B road at 11 locations
Environmental designated areas (km ²)	0.1	0.1	0.2
Designated cultural heritage sites	2	2	2
Agricultural land (km ²)	0.8	0.9	1.0

Table 1: Summary of flooding impacts

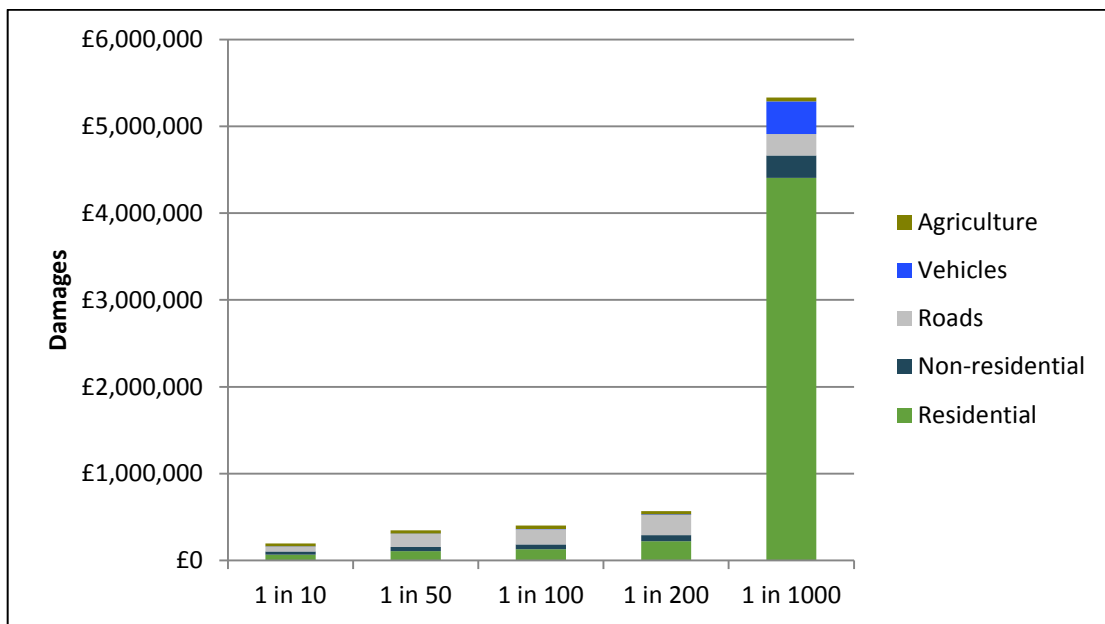


Figure 2: Damages by flood likelihood

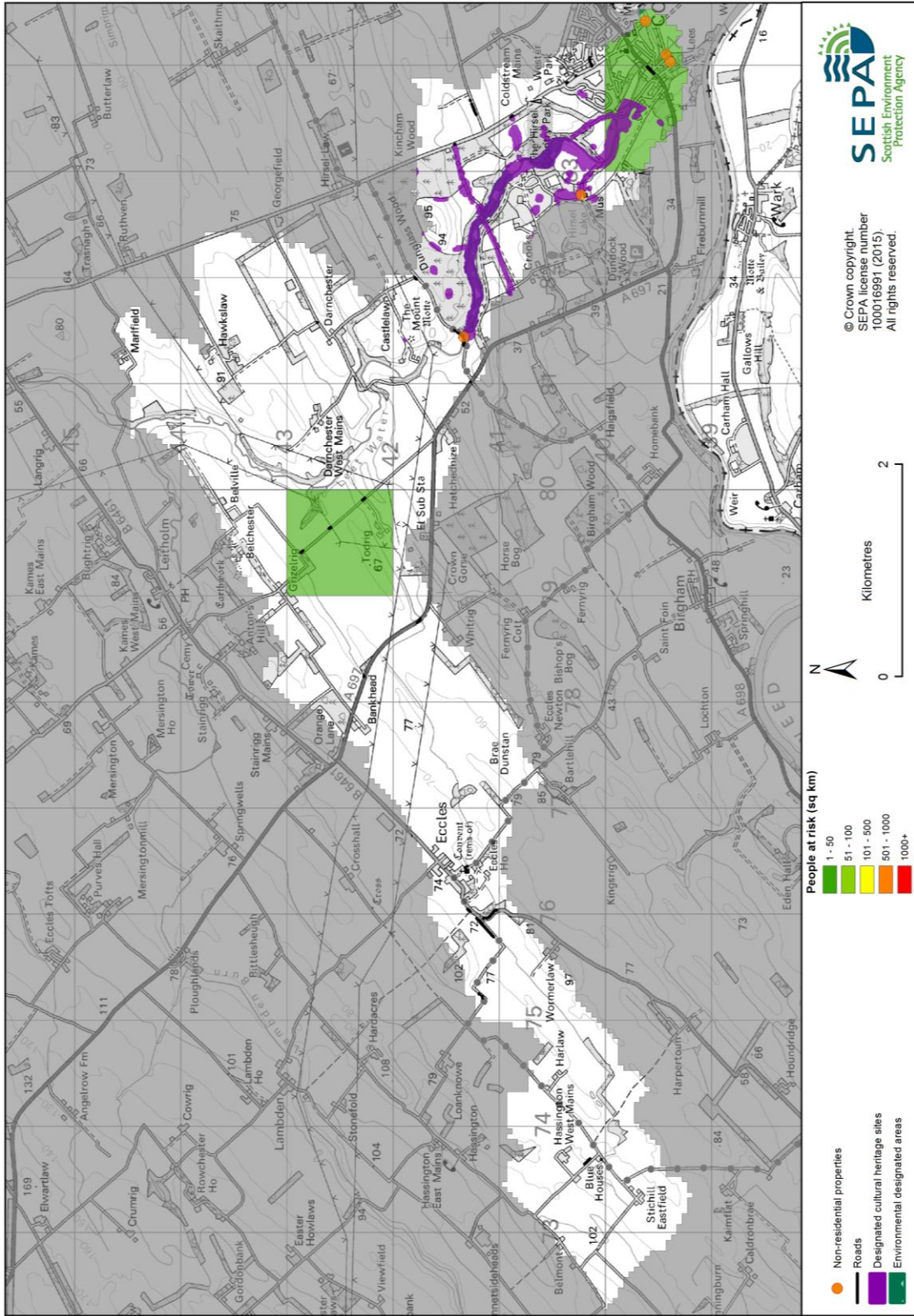


Figure 3: Impacts of flooding

History of flooding

A number of river floods have been recorded in this Potentially Vulnerable Area:

- 22 October 2002: West end of Duke Street in Coldstream flooded from River Tweed and Leet Water.
- 13 August 1948: Photographic evidence exists of the flood mark stone in Coldstream showing a flood peak level for River Tweed just above that for 1831. Extensive damage caused over a wide area.
- 10 March 1881: In Coldstream, the River Tweed was estimated to be 12 feet above normal level, inundating properties. Between Rosy Bank and Tweed Braes the water was a mile in breadth.
- 9 February 1831: At Milnegarden near Coldstream the River Tweed rose 23 feet on summer levels. Significant damage to properties and agriculture.

Objectives to manage flooding in Potentially Vulnerable Area 13/06

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Coldstream Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • <10 residential properties • £51,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • <10 residential properties • £51,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/06

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Coldstream Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Coldstream Town flood warning area which is part of the Tweed river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

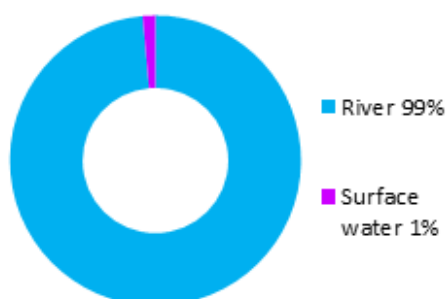
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Biggar (Potentially Vulnerable Area 13/07)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council, South Lanarkshire Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- 20 non-residential properties
- £120,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

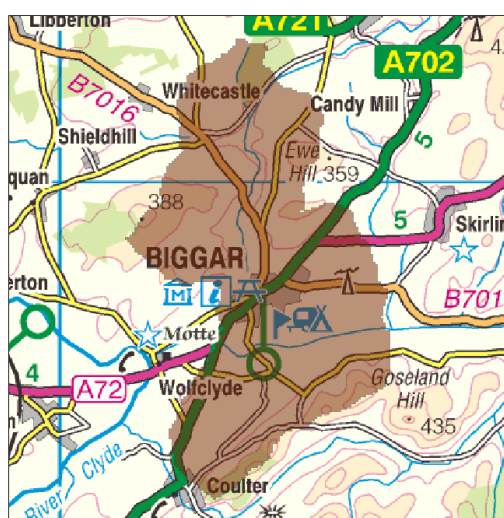
Actions

Biggar (Potentially Vulnerable Area 13/07)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council, South Lanarkshire Council	River Tweed

Background

This Potentially Vulnerable Area is 28km² and situated in the upper reaches of the River Tweed catchment (shown below). It includes Biggar and the main watercourses are the Davie's Burn, Biggar Burn and Biggar Water.



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The main source of flooding is from rivers.

There are approximately 40 residential properties and 20 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £120,000.

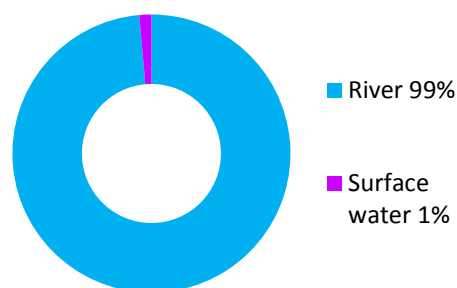


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of flooding is in Biggar from the Biggar Burn and Davie's Burn.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,400)	20	40	40
Non-residential properties (total 180)	10	20	20
People	40	90	100
Community facilities	0	0	0
Utilities	0	0	<10
Transport links (excluding minor roads)	2 A roads, 1 B road at 3 locations	2 A roads, 1 B road at 3 locations	2 A roads, 1 B road at 3 locations
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	4	4	5
Agricultural land (km ²)	1.2	1.6	1.7

Table 1: Summary of flooding impact

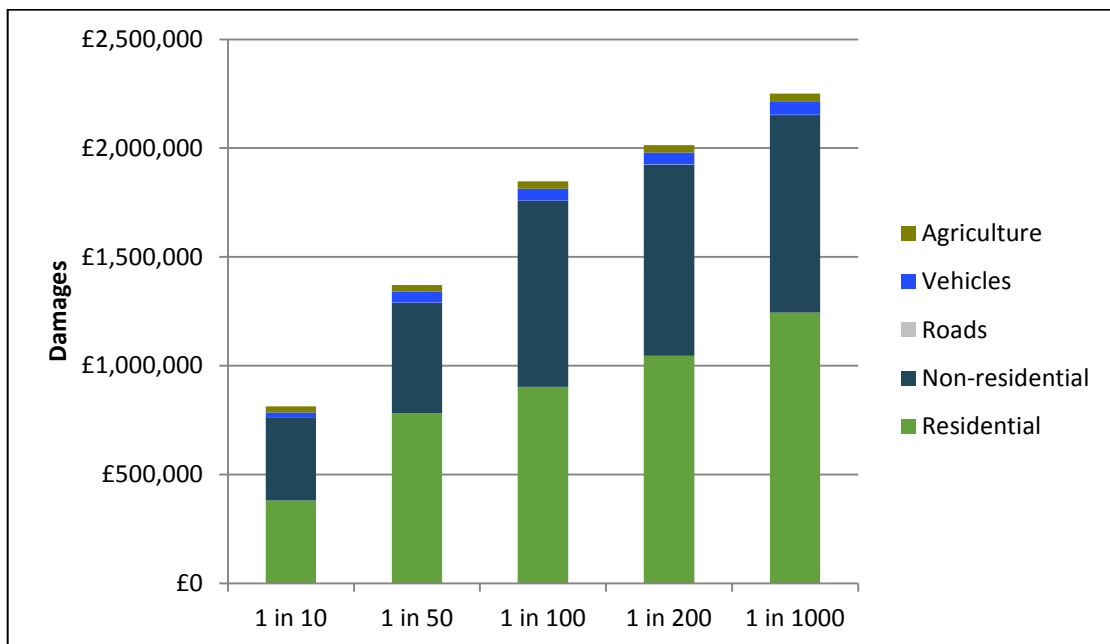


Figure 2: Damages by flood likelihood



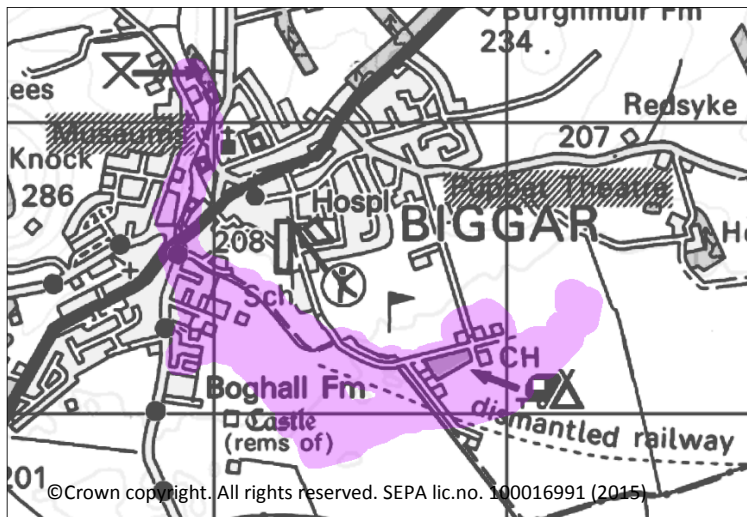
Figure 3: Impacts of flooding

History of flooding

No significant river or surface water floods have been identified in this Potentially Vulnerable Area.

Objectives to manage flooding in Potentially Vulnerable Area 13/07

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA’s flood map. The objectives below have been set for Biggar Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties in Biggar caused by flooding from the Biggar Burn	
<p>Indicators:</p> <ul style="list-style-type: none"> £59,000 Annual Average Damages from residential properties £44,000 Annual Average Damages from non-residential properties 	<p>Target area:</p>  <p>© Crown copyright. All rights reserved. SEPA lic.no. 100016991 (2015)</p>
Objective ID: 13021	

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> 40 residential properties £120,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> 40 residential properties £120,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/07

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Biggar Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION STUDY (130210005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties in Biggar caused by flooding from the Biggar Burn (13021)		
Delivery lead:	South Lanarkshire Council		
Priority:	National:	Within local authority:	
	122 of 168	4 of 4	
Status:	Not started	Indicative delivery:	2016-2021
Description:	A flood protection study has been recommended for Biggar to assess whether flood storage, modification of conveyance, flood defences, sediment management and natural flood management could reduce flood risk. The study should also consider the viability of property level protection. Natural flood management options that should be considered include river / floodplain restoration and sediment management. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream.		
Potential impacts			
Economic:	The study could benefit 38 residential properties and 12 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £2.3 million. Twenty-five of these properties are at risk from high likelihood flooding and may benefit from natural flood management actions.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.		

Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. The Biggar Water (water body ID 5325) is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status. Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. Conservation areas, scheduled monuments and listed buildings are also present in the study area and could be positively or negatively impacted.
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Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in the Upper Tweed, Eddleston Water and Biggar Burn areas to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130210017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties in Biggar caused by flooding from the Biggar Burn (13021)		
Delivery lead:	South Lanarkshire Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing flood accommodation system at Biggar High School.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Local authorities, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Broughton (Potentially Vulnerable Area 13/08)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- <10 non-residential properties
- £160,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Broughton (Potentially Vulnerable Area 13/08)

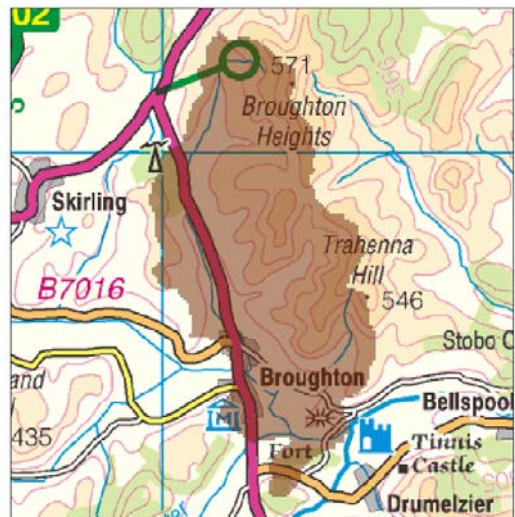
Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 18km² and part of the River Tweed catchment. This is a small, rural area in the north west of the catchment and contains the village of Broughton. The main watercourse is the Biggar Water which flows through Broughton before converging with the River Tweed south east of Broughton. The flood damages are caused entirely by river flooding.

There are approximately 40 residential properties and fewer than 10 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £160,000.



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Summary of flooding impacts

The highest risk of river flooding is from the Biggar Water and River Tweed to Broughton and the surrounding area.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 1. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads, notably the A701. The location of the impacts of flooding is shown in Figure 2.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 180)	40	40	50
Non-residential properties (total 30)	<10	<10	<10
People	80	100	120
Community facilities	<10 Educational buildings	<10 Educational buildings	<10 Educational buildings
Utilities	0	0	0
Transport links (excluding minor roads)	1 A road, 1 B road at 10 locations	1 A road, 1 B road at 13 locations	1 A road, 2 B roads at 15 locations
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	0.7	0.8	0.9

Table 1: Summary of flooding impacts

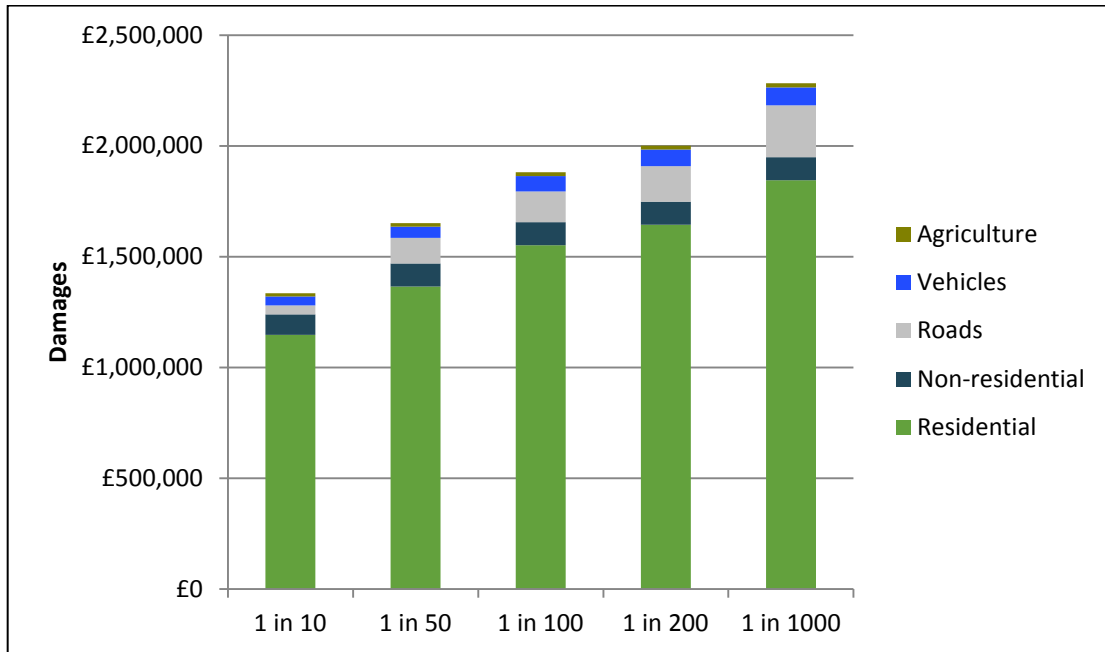


Figure 1: Damages by flood likelihood

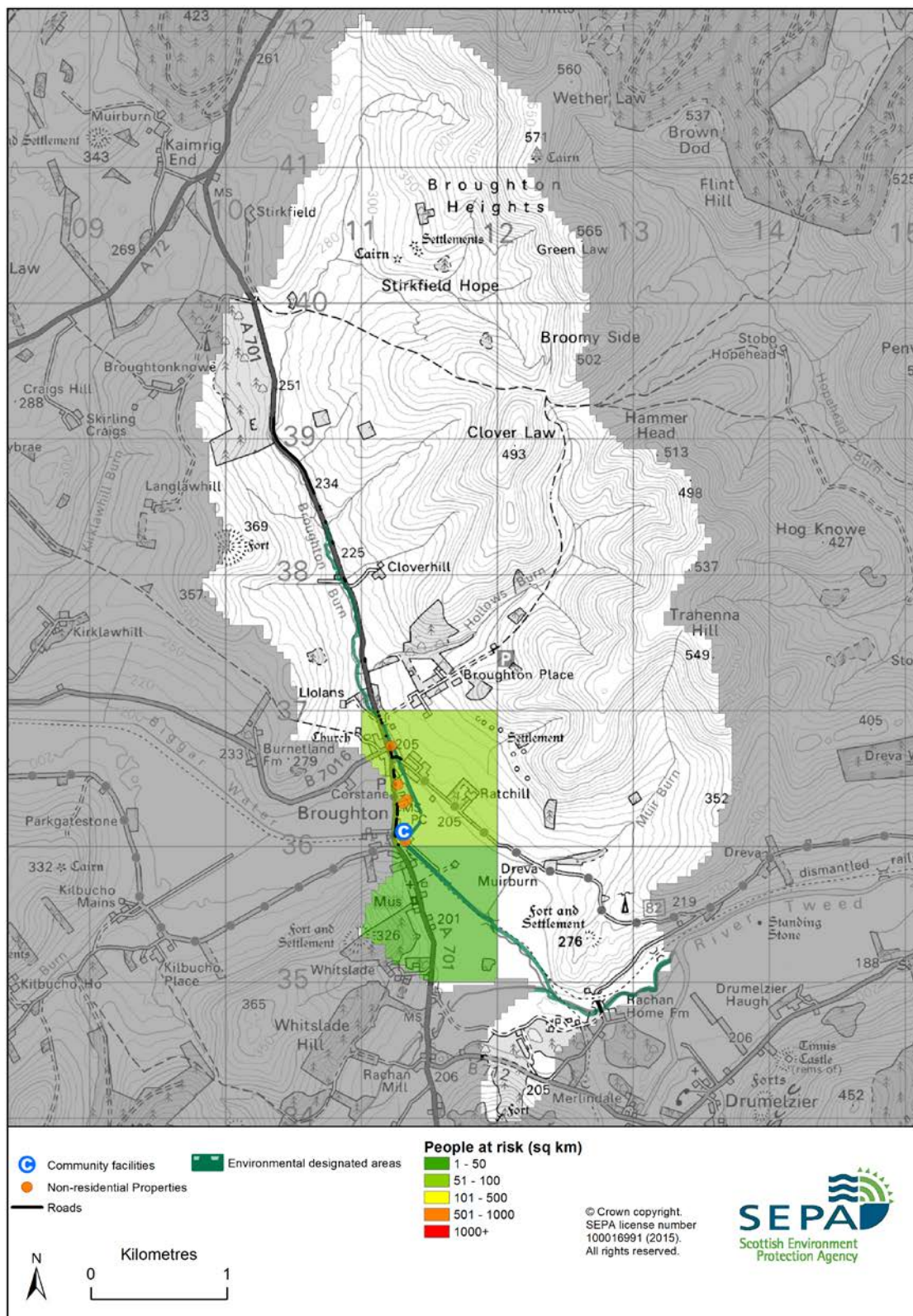


Figure 2: Impacts of flooding

History of flooding

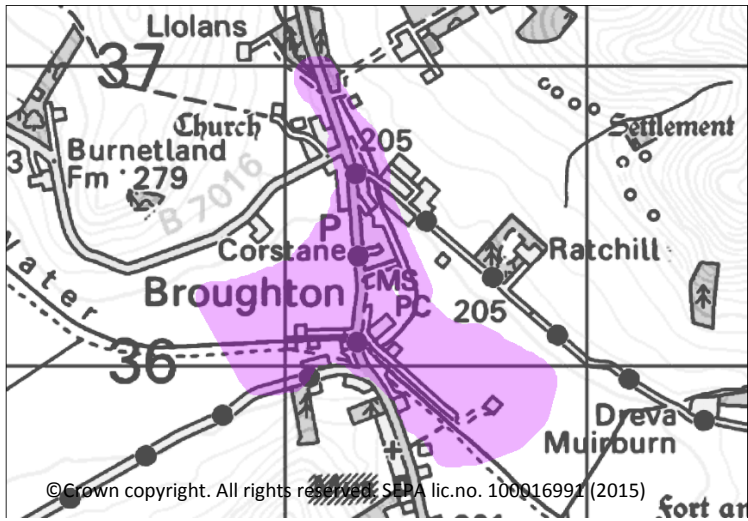
Two flood events have been recorded as significant in this area:

- 3 January 2014: A breach in the flood embankment on the River Tweed led to large areas of road in Merlindale to be inundated by water. Construction works took place to combat the breach and stop the river changing flow path towards the housing.
- 1 August 1998: Main Street in Broughton flooded from the Broughton Burn. Muir Bridge partly collapsed.

Objectives to manage flooding in Potentially Vulnerable Area 13/08

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA’s flood map. The objectives below have been set for Broughton Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Broughton caused by river flooding

Indicators: <ul style="list-style-type: none"> £120,000 Annual Average Damages from residential properties £9,100 Annual Average Damages from non-residential properties One educational building 	Target area: 
Objective ID: 13022	

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> 40 residential properties £160,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> 40 residential properties £160,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/08

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Broughton Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION STUDY (130130005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Broughton caused by river flooding (13022)		
Delivery lead:	Scottish Borders Council		
Priority:	National:	Within local authority:	
	1 of 168	1 of 6	
Status:	Not started	Indicative delivery:	2016-2021
Description:	A flood protection study has been recommended for Peebles, Innerleithen and Broughton to assess whether modification of conveyance, installation / modification of fluvial control structures, direct flood defences and natural flood management could reduce flood risk. The study should also consider the viability of property level protection. Natural flood management options that should be considered include runoff control, river / floodplain restoration and sediment management. The study should co-ordinate with the Eddleston Water restoration project managed by the Tweed Forum. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream. Part of this proposed flood protection study is located in PVA 13/04. The benefits and impacts have been assessed for the whole study.		
Potential impacts			
Economic:	The study could benefit 839 residential properties and 149 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £52 million. One hundred and twenty-eight of these properties are at risk from high likelihood flooding and may benefit from natural flood management actions.		

Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition the study could benefit five community facilities, three emergency services, one healthcare facility, seven utilities and five roads located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. The physical condition of a number of rivers within the study area is identified by SEPA to be at less than good status. These include: Eddleston Water, Tarth Water, Dead Burn, Biggar Water, Cairn Burn and Spittal Burn (water body IDs 5307, 5314, 5319, 5325, 5321 and 5329). Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Westwater Special Protection Area, River Tweed Special Area of Conservation or Moffat Hills Special Area of Conservation. Conservation areas, National Scenic Areas, scheduled monuments, listed buildings, Sites of Special Scientific Interest and ancient woodlands are also present in the study area and could be positively or negatively impacted.

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in the Upper Tweed, Eddleston Water and Biggar Burn areas to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

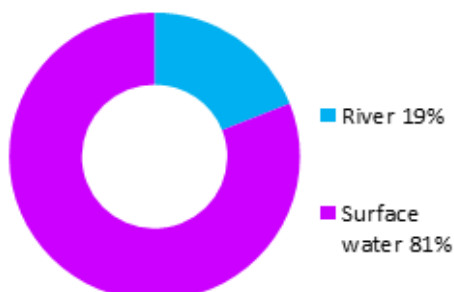
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Kelso (Potentially Vulnerable Area 13/09)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 90 residential properties
- 30 non-residential properties
- £120,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

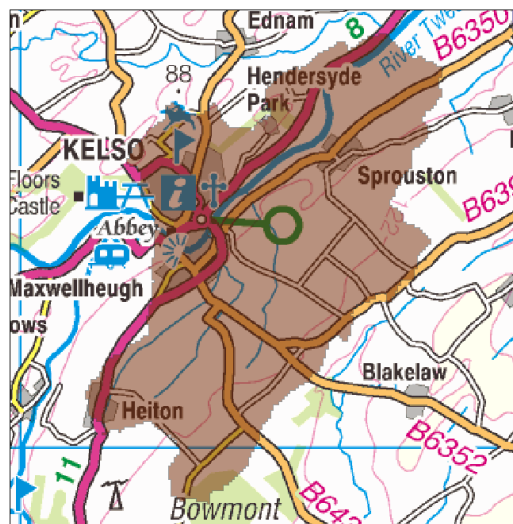
Actions

Kelso (Potentially Vulnerable Area 13/09)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 29km² and part of the River Tweed catchment (shown below). This is a small, rural area in the east of the catchment and contains the town of Kelso and village of Sprouston. Its main watercourse is the River Tweed which flows through the entire width from Kelso, flowing in a north-easterly direction.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by surface water flooding.

There are approximately 90 residential and 30 non-residential properties are at risk of flooding.

The Annual Average Damages are approximately £120,000.

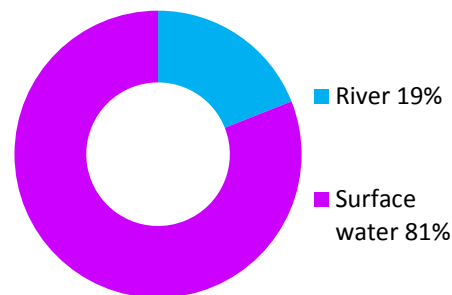


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of flooding is from surface water in Kelso and Sprouston.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads.

The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 3,700)	<10	90	140
Non-residential properties (total 610)	<10	30	50
People	<10	200	300
Community facilities	<10 Educational buildings	<10 Educational buildings	<10 Educational buildings
Utilities	<10	<10	<10
Transport links (excluding minor roads)	3 A roads, 5 B roads at 38 locations	3 A roads, 5 B roads at 64 locations	3 A roads, 5 B roads at 74 locations
Environmental designated areas (km ²)	0.8	0.9	0.9
Designated cultural heritage sites	3	4	5
Agricultural land (km ²)	0.2	0.8	1.3

Table 1: Summary of flooding impacts

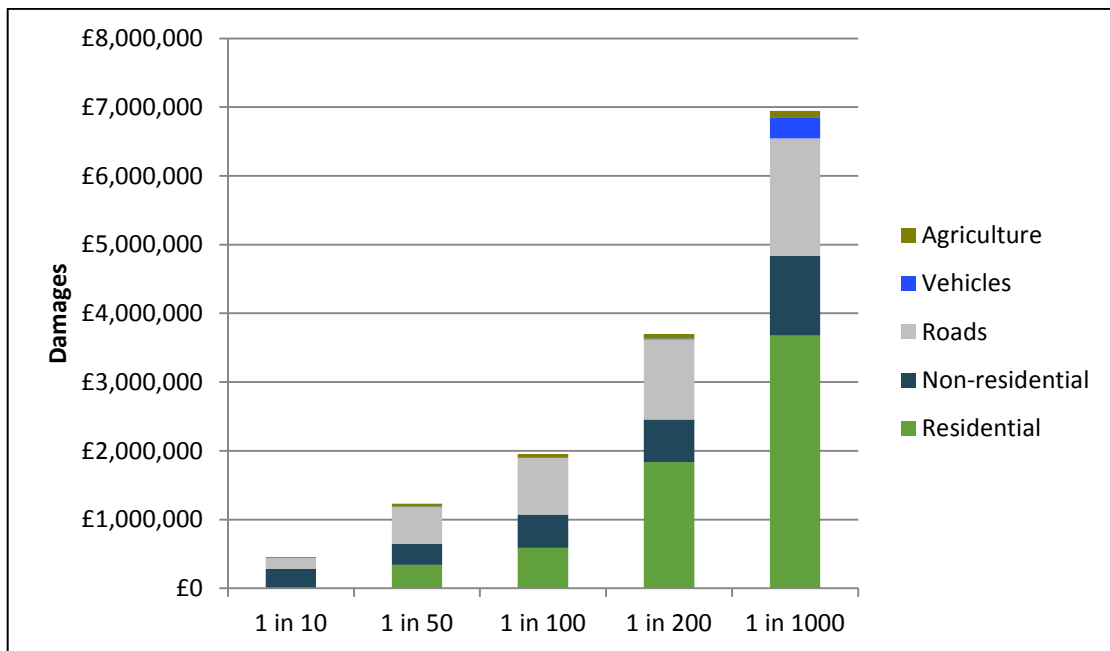


Figure 2: Damages by flood likelihood

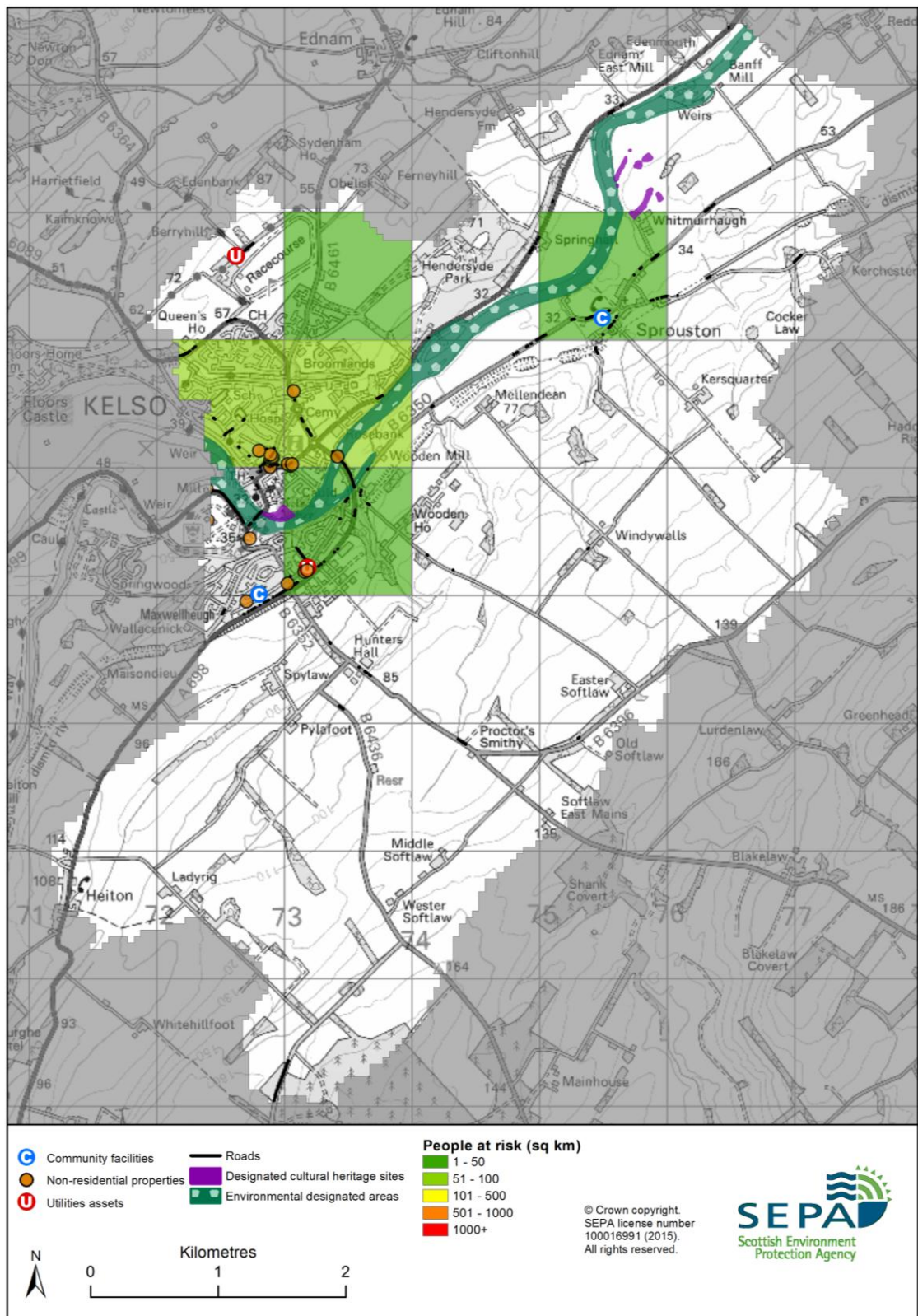


Figure 3: Impacts of flooding

History of flooding

The following floods have been identified as significant in this Potentially Vulnerable Area:

- 12 October 2005: The River Tweed overtopped its banks and affected the Mayfield area of Kelso.
- 31 October 1977: Kelso affected by flooding from River Tweed.
- 12 August 1948: River Tweed in Kelso rose above its highest previous flood mark dating from 1831. Extensive flooding of property and agricultural land with disruption to transport.
- 11 March 1881: Kelso affected by flooding from the River Tweed. Serious damage was caused between the road bridge and Mayfield and along Tweedside. Premises flooded at Woodenmill.
- 10 March 1881: Kelso affected by flooding from the River Tweed. Large tracts of land submerged, roads impassable and damage to property.
- 9 February 1831: Kelso affected by flooding from the River Tweed. Significant damage to properties and agriculture.

Objectives to manage flooding in Potentially Vulnerable Area 13/09

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Kelso Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Kelso	Reduce economic damages and number of residential properties at risk of surface water flooding in Kelso as far as practical	13023	* See note below
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 90 residential properties • £120,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 90 residential properties • £120,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 13/09 there are 70 residential properties at risk and Annual Average Damages of £97,000.

Actions to manage flooding in Potentially Vulnerable Area 13/09

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Kelso Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	SURFACE WATER PLAN/STUDY (130230018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Kelso as far as practical (13023)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2022-2027
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Kelso to Coldstream flood warning area which is part of the Tweed river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

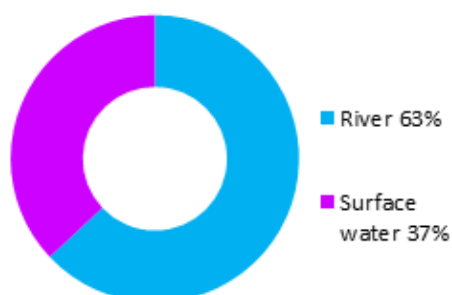
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Jedburgh (Potentially Vulnerable Area 13/10)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 130 residential properties
- 140 non-residential properties
- £720,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

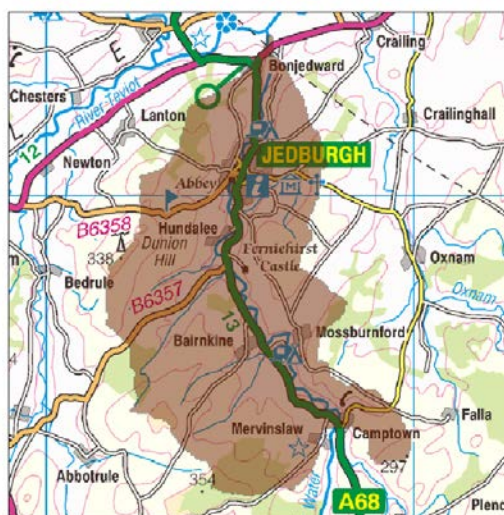
Actions

Jedburgh (Potentially Vulnerable Area 13/10)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 55km² and part of the River Teviot catchment (shown below). This is a moderately sized, rural area containing the town of Jedburgh. The main watercourse is the Jed Water which flows through the area before converging with the River Teviot just north of the boundary. There are a number of other smaller watercourses including the Skiprunning Burn, which is a tributary of the Jed Water.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding.

There are approximately 130 residential properties and 140 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £720,000.

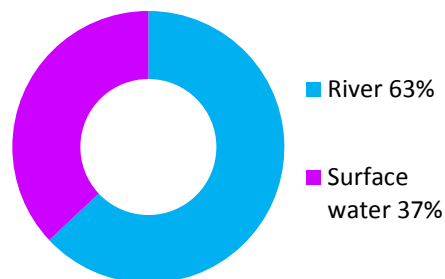


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of river flooding is from the Jed Water and Skiprunning Burn to Jedburgh. The highest risk of surface water flooding is also in Jedburgh.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties.

The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works and pumping stations). Within this Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,300)	20	130	170
Non-residential properties (total 360)	70	140	150
People	40	280	370
Community facilities	<10 Emergency services	<10 Emergency services	<10 Emergency services
Utilities	<10	<10	<10
Transport links (excluding minor roads)	2 A roads, 2 B roads at 39 locations	2 A roads, 2 B roads at 39 locations	2 A roads, 2 B roads at 39 locations
Environmental designated areas (km ²)	0.1	0.1	0.1
Designated cultural heritage sites	7	8	8
Agricultural land (km ²)	0.6	0.9	1.0

Table 1: Summary of flooding impacts

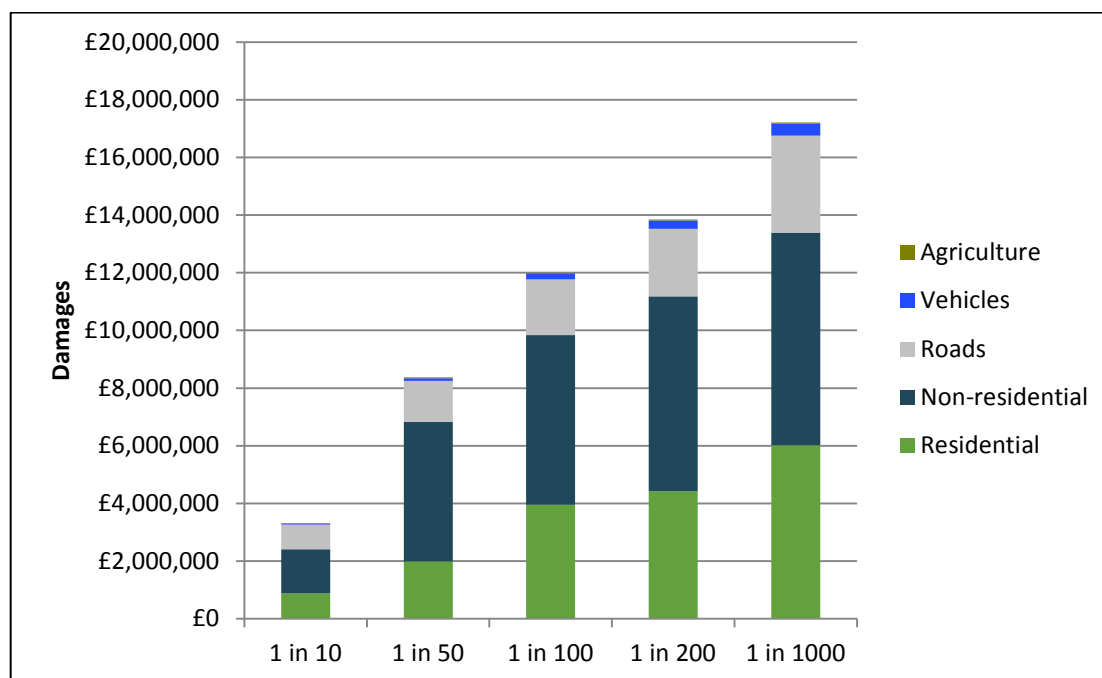


Figure 2: Damages by flood likelihood

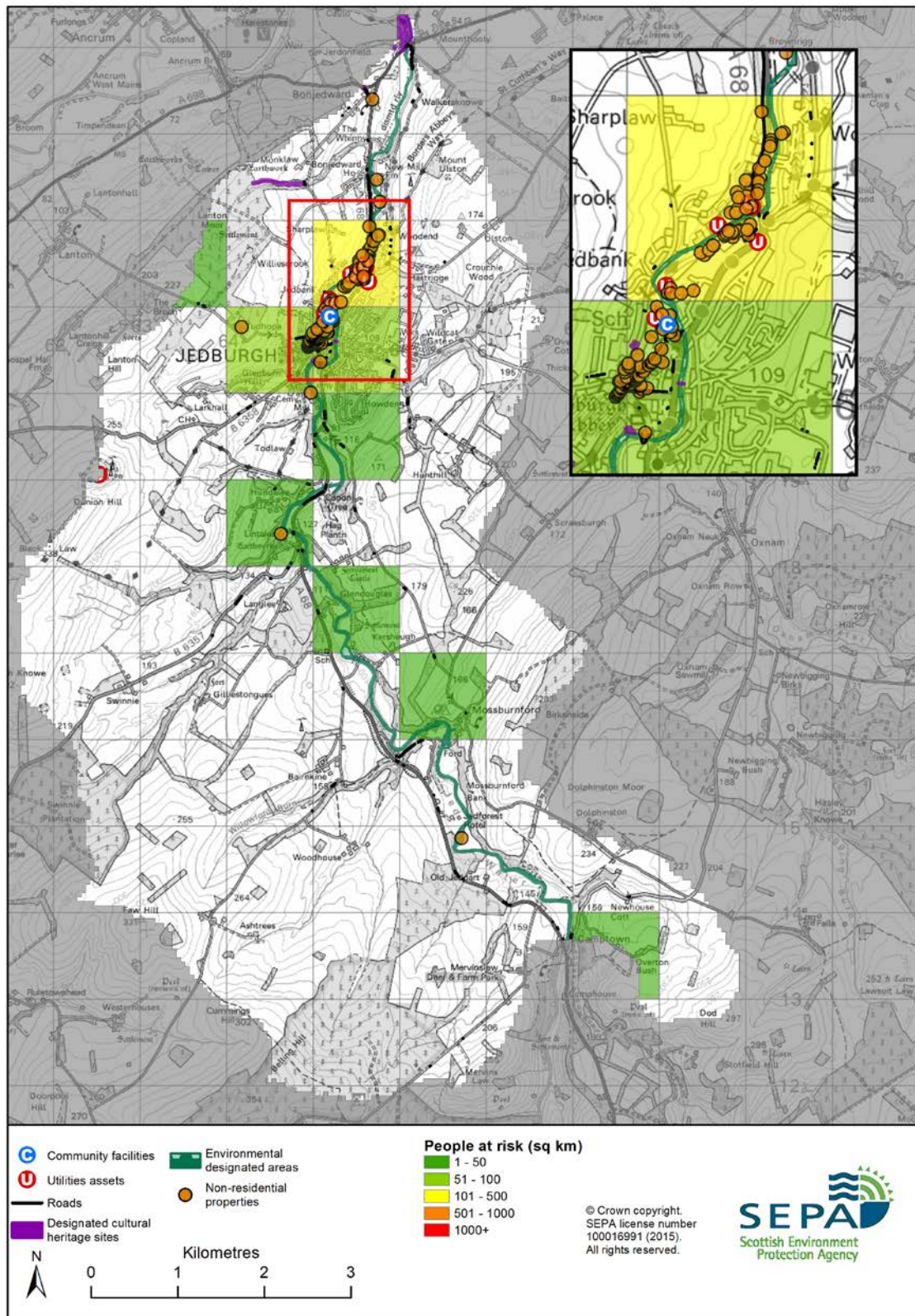


Figure 3: Impacts of flooding

History of flooding

Jedburgh has a long history of flooding. Recorded significant floods include:

- 21 December 2013: Heavy rainfall led to surface water flooding of Naggs Head Close, Exchange Street, Castlegate, Canongate and the High Street, Jedburgh.
- 2-5 August 2012: Heavy rainfall led to surface water flooding of Naggs Head Close, Exchange Street, Castlegate, Canongate and the High Street, Jedburgh.
- 3 November 1984: Highest recorded flood level on the Jed Water at Jedburgh gauge. Flooding to properties in the Bankhead Industrial Estate.
- 4 January 1982: Serious surface water flooding of Exchange Street, Jedburgh.
- 1968: Peak flow recorded as 133 m³/s on Jed Water in Jedburgh.
- 1948: It was suggested that this flood in Jedburgh caused flooding at Richmond Row, Duck Row and Bankend. Flood levels were generally a little lower than the 1926 event.
- 1926: 'The Great Flood' in Jedburgh with peak flows estimated to be similar to 1968 at 133 m³/s.

The above surface water floods were a result of overbank flow in the Skiprunning Burn due to a blocked culvert.

Objectives to manage flooding in Potentially Vulnerable Area 13/10

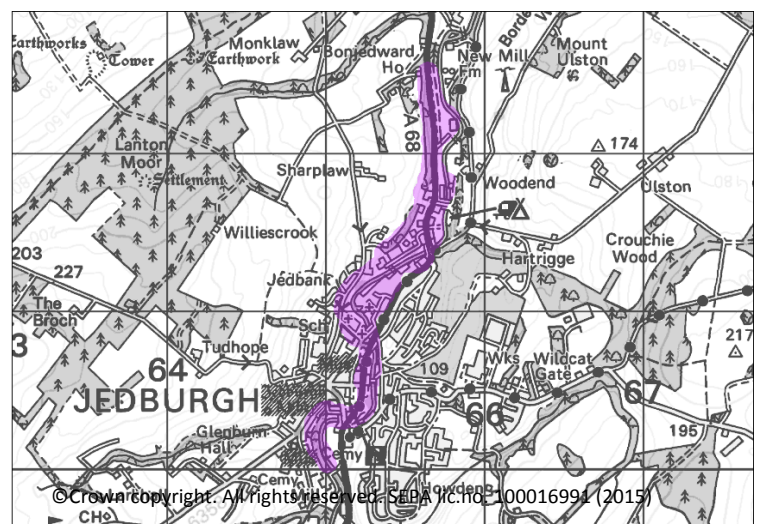
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Jedburgh Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Jedburgh caused by flooding from the Jed Water and Skiprunning Burn

Indicators:

- £86,000 Annual Average Damages from residential properties
- £260,000 Annual Average Damages from non-residential properties
- One emergency service

Target area:



Objective ID: 13026

Target area	Objective	ID	Indicators within PVA
Jedburgh	Reduce economic damages and number of residential properties at risk of surface water flooding in Jedburgh as far as practical	13024	* See note below
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 130 residential properties • £720,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 130 residential properties • £720,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 13/10 there are 50 residential properties at risk and Annual Average Damages of £270,000.

Actions to manage flooding in Potentially Vulnerable Area 13/10

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Jedburgh Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	Community flood action groups	Property level protection scheme	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION STUDY (130260005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Jedburgh caused by flooding from the Jed Water and Skiprunning Burn (13026)		
Delivery lead:	Scottish Borders Council		
Priority:	National:	Within local authority:	
	43 of 168	3 of 6	
Status:	Not started	Indicative delivery:	2022-2027
Description:	A flood protection study has been recommended for Jedburgh to assess whether modification of conveyance, installation / modification of fluvial control structures, flood defences, sediment management and natural flood management could further reduce flood risk. The study should also consider the viability of property level protection. Natural flood management options that should be considered include run off control and sediment management. The assessment should consider these actions in combination and the impacts on flood risk upstream and downstream of each action. Flooding in Jedburgh is being addressed by the Skiprunning Burn flood protection scheme; this study will consider residual risk from the Jed Water and is to be carried out in the second flood risk management cycle.		
Potential impacts			
Economic:	The study could benefit 59 residential properties and 69 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £11 million.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition the		

Social:	study could benefit one educational building and one emergency service located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example through natural flood management. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the River Tweed Special Area of Conservation. Conservation areas and listed buildings are also present in the study area and could be positively or negatively impacted.

Action (ID):	SURFACE WATER PLAN/STUDY (130240018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Jedburgh as far as practical (13024)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2022-2027
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130260017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Jedburgh caused by flooding from the Jed Water and Skiprunning Burn (13026)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing flood defences along the Jed Water including the Jed Water Flood Protection Scheme and Jedburgh Skiprunning Burn Culvert Flood Protection Scheme.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Camptown to Jedburgh and the Jedburgh to Jedfoot Bridge flood warning areas which are part of the Jed Water river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	PROPERTY LEVEL PROTECTION SCHEME (130260008)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Jedburgh caused by flooding from the Jed Water and Skiprunning Burn (13026)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Borders Council has agreed with residents and housing associations in Jedburgh that flood resilient doors will be fitted to the most vulnerable properties.		

Action (ID):	COMMUNITY FLOOD ACTION GROUPS (130260012)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in Jedburgh caused by flooding from the Jed Water and Skiprunning Burn (13026)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Jedburgh Skiprunning Burn Flood Warning Group operates in this area. The group is supported by Scottish Borders Council and aims to increase community resilience to flooding.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Denholm (Potentially Vulnerable Area 13/11)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- <10 non-residential properties
- £25,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	<i>Strategic mapping and modelling</i>	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Denholm (Potentially Vulnerable Area 13/11)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 14km² and part of the River Teviot catchment (shown right). It is a small, rural area containing part of the village of Denholm in the south and Minto Hills in the north.

All damages in this Potentially Vulnerable Area are due to river flooding.

There are fewer than 10 residential and non-residential properties at risk of flooding.

The Annual Average Damages are approximately £25,000.



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Summary of flooding impacts

Further work carried out since the National Flood Risk Assessment in 2011 has identified that the risk of flooding in this Potentially Vulnerable Area is now considered to be lower than previously identified. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The highest source of flooding is to Denholm from the River Teviot.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 1. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to agricultural land. The location of the impacts of flooding is shown in Figure 2.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 340)	<10	<10	<10
Non-residential properties (total 30)	<10	<10	<10
People	<10	<10	<10
Community facilities	0	0	0
Utilities	0	0	0
Transport links (excluding minor roads)	1 B road at 5 locations	1 B road at 5 locations	1 B road at 5 locations
Environmental designated areas (km ²)	0.3	0.3	0.3
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	1.0	1.5	1.6

Table 1: Summary of flooding impacts

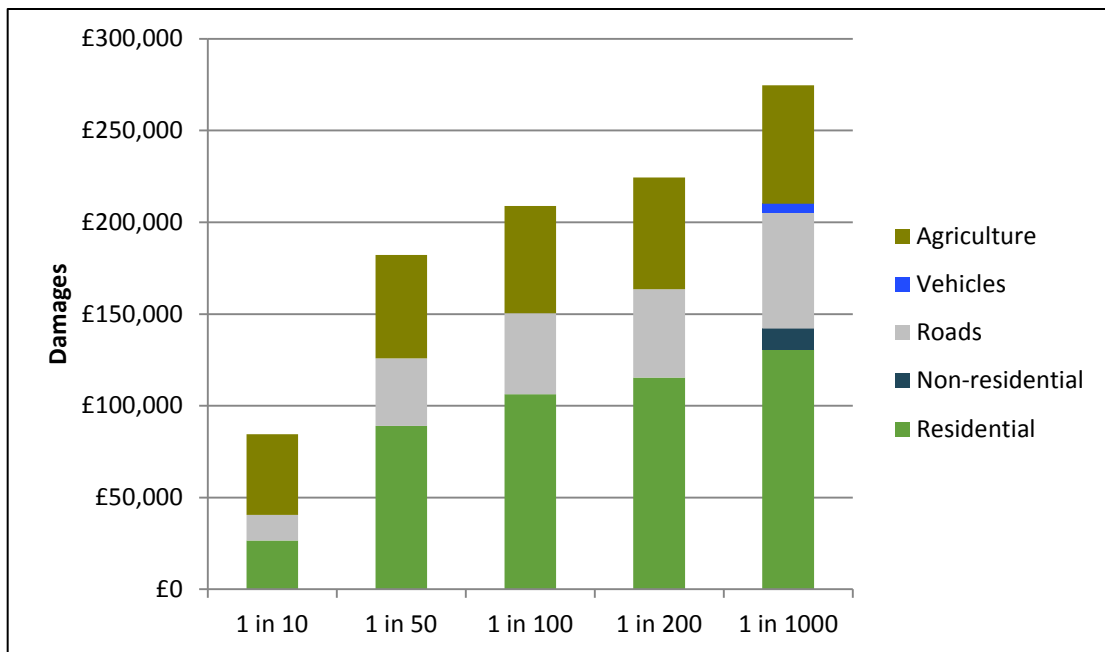


Figure 1: Damages by flood likelihood

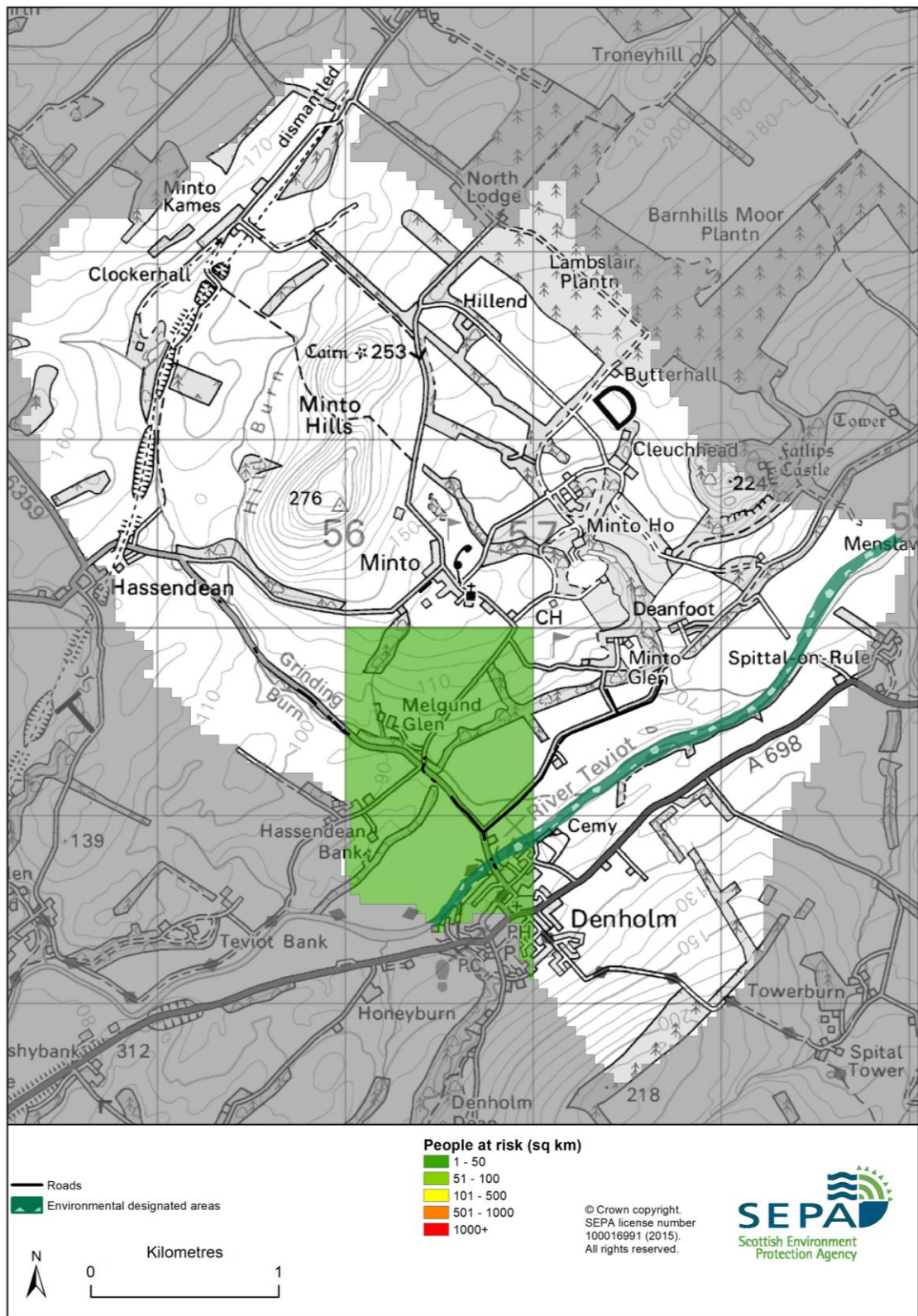


Figure 2: Impacts of flooding

History of flooding

Three significant floods have been recorded in this area:

- 19 November 2011: Flooding in Teviothead and Denholm.
- 17 July 1983: An estimated 1 in 50 year storm resulted in surface water flooding of properties at Ashloaning, The Loaning and Eastgate in Denholm.
- 31 October 1977: Flood on the River Teviot. This is ranked the second biggest event on the Teviot. The number of residential properties affected was estimated to be fewer than 60 throughout the whole catchment.

Objectives to manage flooding in Potentially Vulnerable Area 13/11

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Denholm Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • <10 residential properties • £25,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • <10 residential properties • £25,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/11

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Denholm Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	<i>Strategic mapping and modelling</i>	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (130270017)		
Objective (ID):	Avoid an overall increase in flood risk (13001)		
Delivery lead:	Scottish Borders Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing Denholm Flood Protection Scheme. The scheme is designed to divert surface water runoff from surrounding fields into a culvert system that flows into the River Teviot.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Hawick to Monteviot flood warning area which is part of the River Teviot river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

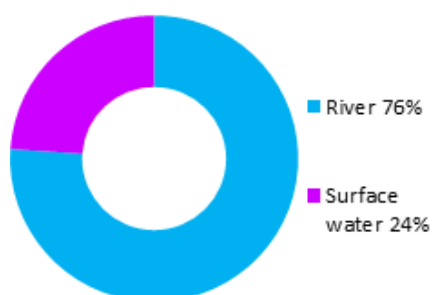
Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		

Hawick (Potentially Vulnerable Area 13/12)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 600 residential properties
- 440 non-residential properties
- £2.5 million Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

Flood protection scheme/works	Natural flood management works	New flood warning	Community flood action groups	Property level protection scheme	Site protection plans
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

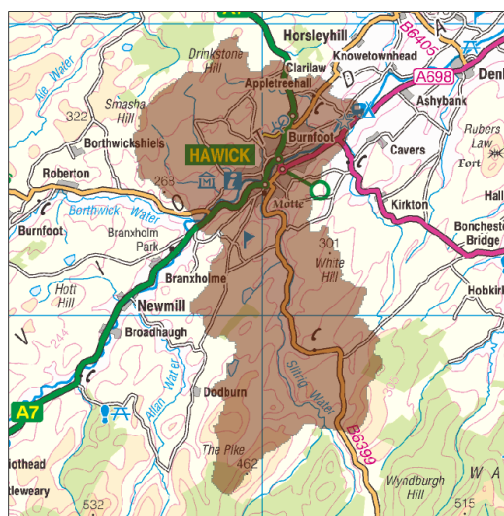
Actions

Hawick (Potentially Vulnerable Area 13/12)

Local plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

This Potentially Vulnerable Area is 71km² and situated in the upper reaches of the River Tweed catchment (shown below). It includes Hawick and the main watercourses are the River Teviot and its tributaries the Slitrig Water, Wilton Burn, Dean Burn and Boonraw Burn.



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The area has a risk of river and surface water flooding. The majority of damages in this Potentially Vulnerable Area are caused by river flooding.

There are approximately 600 residential properties and 440 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £2.5 million.

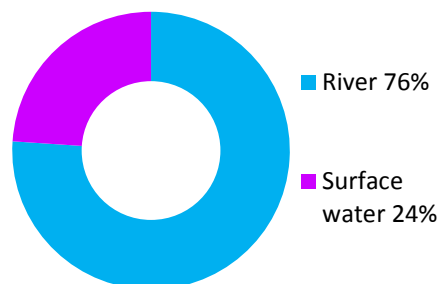


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of flooding is in Hawick from the River Teviot and surface water.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works and pumping stations). Within this Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

Please note that in the Hawick area Scottish Borders Council has undertaken more detailed studies for the Hawick Flood Protection Scheme. The information in this report uses SEPA data which may be different from the flooding information held by the local authority due to differences in modelling approach.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 7,000)	150	600	650
Non-residential properties (total 1,600)	180	440	480
People	340	1,300	1,400
Community facilities	<10 Includes: educational buildings and emergency services	<10 Includes: educational buildings and emergency services	<10 Includes: educational buildings and emergency services
Utilities	<10	20	20
Transport links (excluding minor roads)	2 A roads, 3 B roads at 62 locations	2 A roads, 3 B roads at 102 locations	2 A roads, 3 B roads at 119 locations
Environmental designated areas (km ²)	0.8	0.8	0.8
Designated cultural heritage sites	3	3	4
Agricultural land (km ²)	0.8	1.2	1.4

Table 1: Summary of flooding impacts

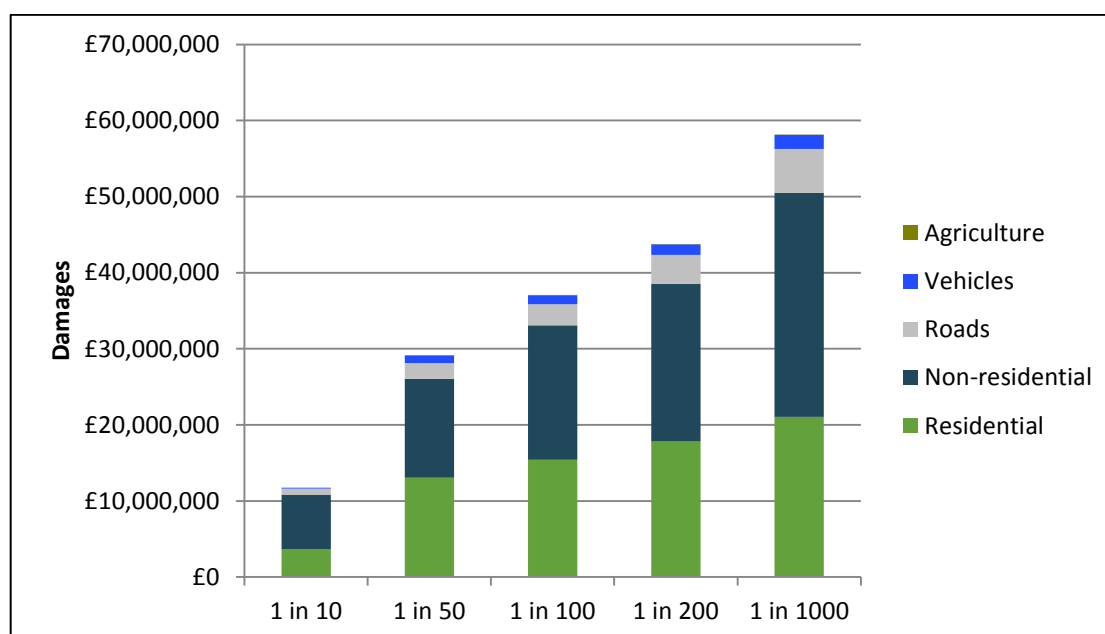


Figure 2: Damages by flood likelihood

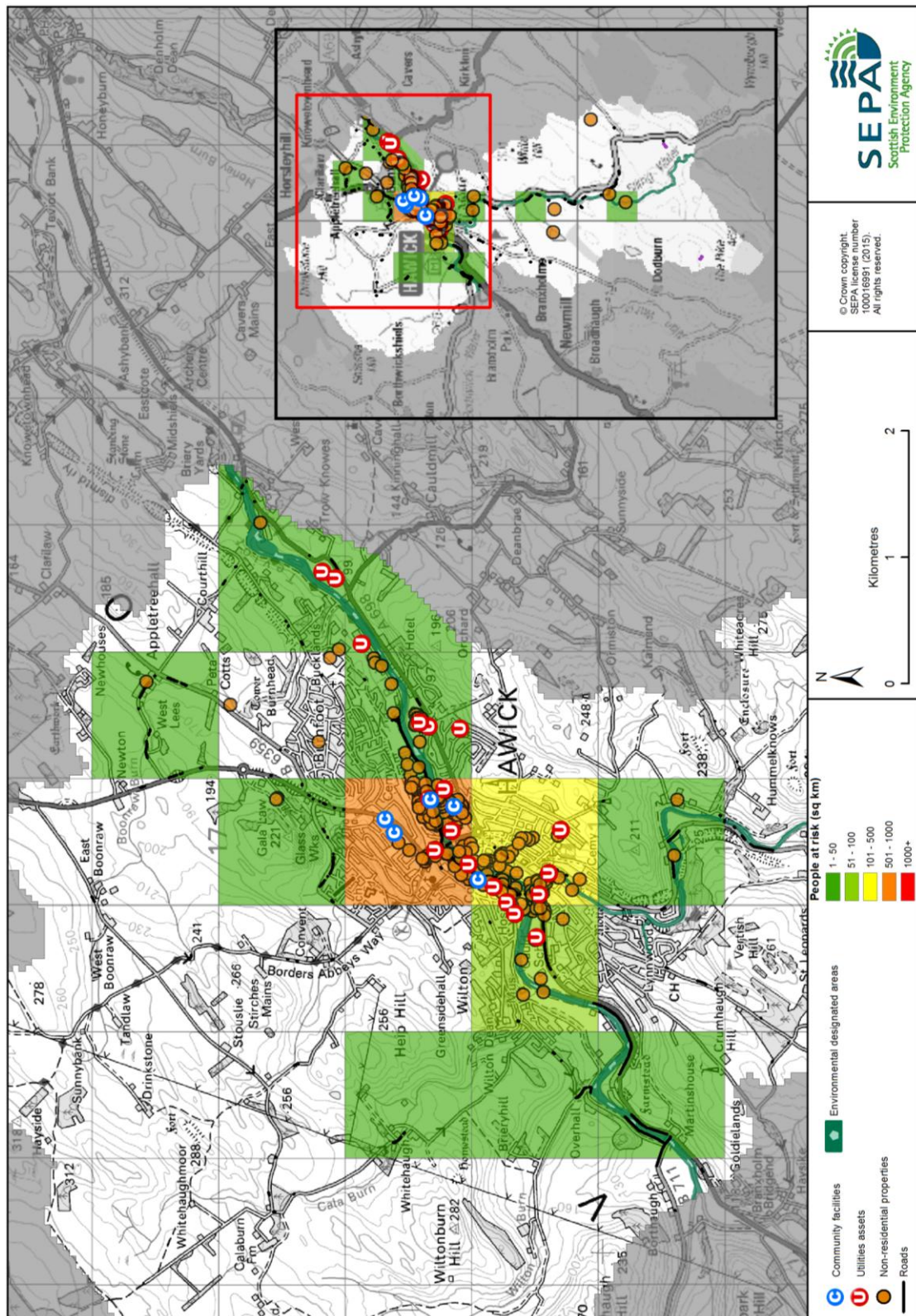


Figure 3: Impacts of flooding

History of flooding

Hawick has a long history of flooding. Floods recorded in this area include:

- 30 December 2013: Mansfield area in Hawick flooded from River Teviot.
- 20 October 2005: River Teviot flooded affecting Hawick. Walls collapsed at Commercial Road and Mansfield Park; both areas fully inundated.
- 20 October 2005: Flooding on the Slitrig Water.
- 8 January 2005: Commonhaugh, Duke Street and Mansfield Park in Hawick flooded.
- October 2002: River Teviot flooded, fully inundating the football and rugby pitches at Mansfield Park as well as the park area. Walls breached at Mansfield Park.
- 31 October 1977: Flood on the River Teviot. This is ranked the second biggest event on the Teviot. The number of residential properties affected was estimated to be fewer than 60.
- 1955: River Teviot flooded. Mansfield Park area inundated by water, the rugby pitch flooded by water to a depth of approximately two feet.
- 21 May 1952: River Teviot flooded. Basements and streets flooded at Bridge Street in Hawick.
- 3 November 1938: River Teviot flooded. Teviot Crescent in Hawick inundated with flood water. Victoria and Mansfield Bridges washed away. Many properties affected.
- 1928: Teviot Crescent in Hawick flooded with waters up to a depth of approximately two feet affecting many properties.

Objectives to manage flooding in Potentially Vulnerable Area 13/12

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Hawick Potentially Vulnerable Area.

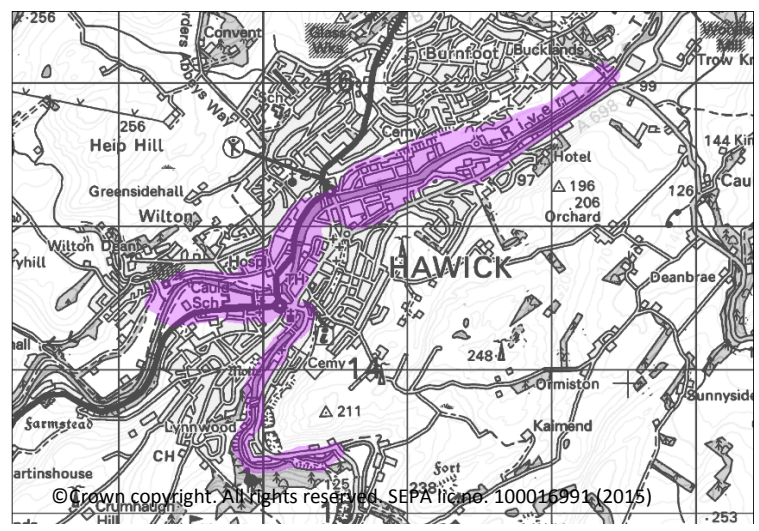
Reduce economic damages to residential and non-residential properties and flood risk to community facilities caused by flooding from the River Teviot.
Reduce risk to people in Hawick caused by flooding from the River Teviot

Indicators:

- 1,200 people
- £790,000 Annual Average Damages from residential properties
- £900,000 Annual Average Damages from non-residential properties
- Two educational buildings

Objective ID: 13030, 13031

Target area:



Target area	Objective	ID	Indicators within PVA
Hawick	Reduce economic damages and number of residential properties at risk of surface water flooding in Hawick as far as practical	13028	* See note below
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> • 600 residential properties • £2.5 million Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> • 600 residential properties • £2.5 million Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 13/12 there are 90 residential properties at risk and Annual Average Damages of £590,000.

Actions to manage flooding in Potentially Vulnerable Area 13/12

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Hawick Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/works	Natural flood management works	New flood warning	Community flood action groups	Property level protection scheme	Site protection plans
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (130300006)				
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities caused by flooding from the River Teviot. Reduce risk to people in Hawick caused by flooding from the River Teviot (13030, 13031)				
Delivery lead:	Scottish Borders Council				
Priority:	National:		Within local authority:		
	16 of 42		1 of 1		
Status:	Under development	Indicative delivery:	2016-2021		
Description:	A flood protection scheme has been proposed for Hawick. The scheme would consist of flood defence walls and embankments to provide protection to the town from flooding from the River Teviot. Scottish Borders Council is also looking at flood-proofing specific buildings and the provision of storage and pumping of seepage flows. The scheme would provide a 1 in 75 year standard of protection.				
Potential impacts					
Economic:	The proposed scheme may benefit 683 residential properties and 233 non-residential properties which are estimated to be at risk of flooding from a 1 in 75 year flood. Damages avoided are currently estimated to be £84 million. The benefit cost ratio of the scheme is calculated to be 2.88-3.03 depending on local ground conditions.				
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection scheme area. In addition there are three educational buildings which have been identified as potentially benefitting from this action. There may be negative impacts through disturbance to the local community during the construction phase.				

Environmental:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. The proposed scheme has been designed to be set back from the river to limit direct impact on the water environment. However, the detailed impact will be considered as part of Environmental Impact Assessment. To be in accord with the FRM Strategy, the responsible authority (and where applicable, the licensing authority) will seek to ensure that the works do not have an adverse effect on the integrity of the River Tweed Special Area of Conservation.
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Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (130300003)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities caused by flooding from the River Teviot. Reduce risk to people in Hawick caused by flooding from the River Teviot (13030, 13031)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	A natural flood management study has been recommended for Hawick to assess whether runoff control and sediment management could help reduce flood risk. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream. The study should look to supplement the proposed flood protection scheme.		
Potential impacts			
Economic:	The economic impact of natural flood management actions is difficult to define. However, these actions can reduce flood risk for high likelihood events. 255 residential and non-residential properties could potentially benefit from natural flood management actions in this location.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. In addition two educational buildings are located within the study area and could benefit from natural flood management actions.		
Environmental:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Whitlaw and Branxholme Special Area of Conservation, Borders Woods Special Area of Conservation or River Tweed Special Area of Conservation. Conservation areas, listed buildings, Sites of Special Scientific Interest and ancient woodlands are also present in the study area and could be positively or negatively impacted.		

Action (ID):	SURFACE WATER PLAN/STUDY (130280018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Hawick as far as practical (13028)		
Delivery lead:	Scottish Borders Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in the River Teviot area to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330019)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Water		
Status:	Not started	Indicative delivery:	2016-2021
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	MAINTAIN FLOOD WARNING (130330030)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Hawick (Slitrig) flood warning area which is part of the Slitrig Water river flood warning scheme. Continue to maintain the Hawick (Teviot) and the Hawick to Monteviot flood warning areas which are part of the River Teviot river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	COMMUNITY FLOOD ACTION GROUPS (130300012)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities caused by flooding from the River Teviot. Reduce risk to people in Hawick caused by flooding from the River Teviot (13030, 13031)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Hawick Volunteer Flood Group operates in this area. The group aims to increase community resilience to flooding.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.</p> <p>Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.</p>		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will engage with communities through the Scottish Borders Council Resilient Communities initiative.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.</p>		

Bonchester Bridge (Potentially Vulnerable Area 13/13)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- <10 non-residential properties
- £140,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Bonchester Bridge (Potentially Vulnerable Area 13/13)

Local Plan District	Local authority	Main catchment
Tweed	Scottish Borders Council	River Tweed

Background

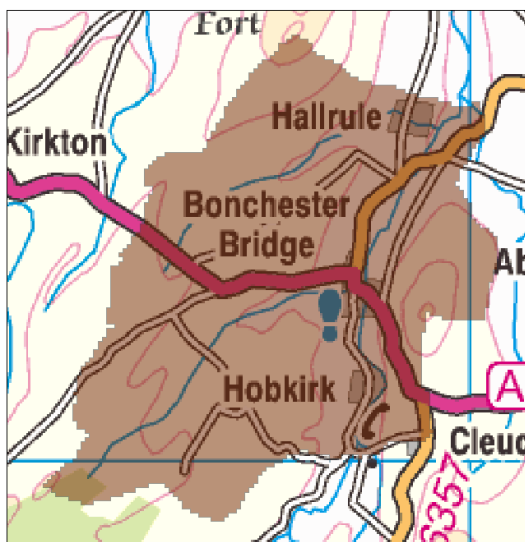
This Potentially Vulnerable Area covers 19km² and is part of the River Teviot catchment (shown right). It is a small, rural area containing the villages of Bonchester Bridge and Hobkirk.

The main watercourse and the main source of flooding is the Rule Water, which flows through the area before converging with the River Teviot.

All damages in this Potentially Vulnerable Area are due to river flooding.

There are approximately 40 residential properties and fewer than 10 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £140,000.



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Summary of flooding impacts

The highest risk of flooding is to Bonchester Bridge from the Rule Water.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

The damages associated with floods of different likelihood are shown in Figure 1. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. The location of the impacts of flooding is shown in Figure 2.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 150)	<10	40	50
Non-residential properties (total 30)	<10	<10	10
People	10	90	100
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities	0	0	0
Transport links (excluding minor roads)	1 A road, 1 B road at 4 locations	1 A road, 1 B road at 5 locations	1 A road, 1 B road at 5 locations
Environmental designated areas (km ²)	0.1	0.1	0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	0.4	0.6	0.6

Table 1: Summary of flooding impacts

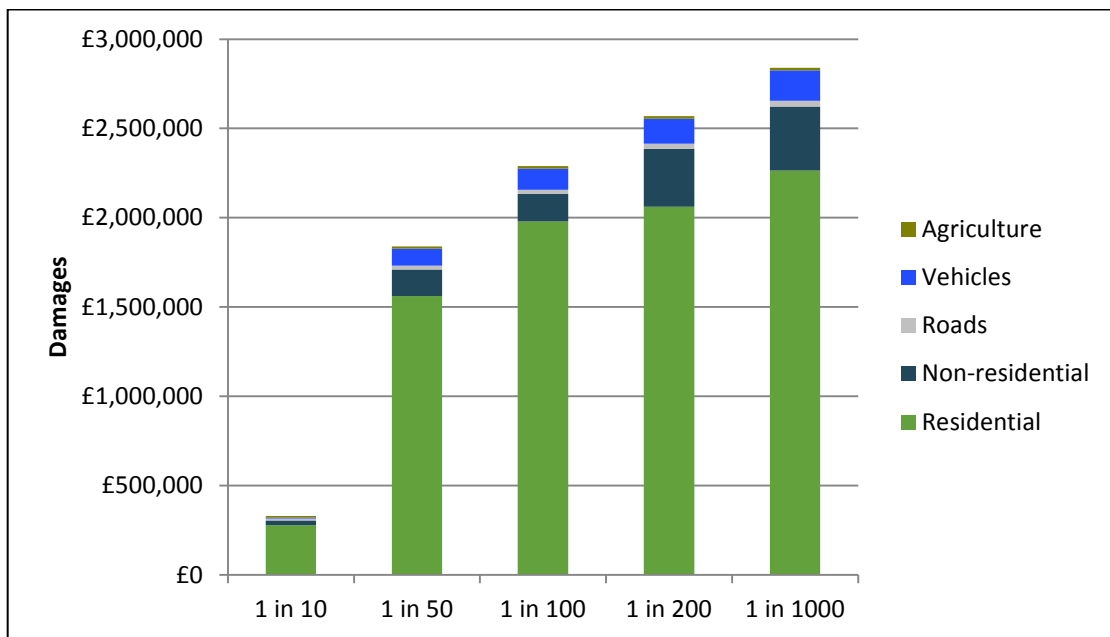


Figure 1: Damages by flood likelihood

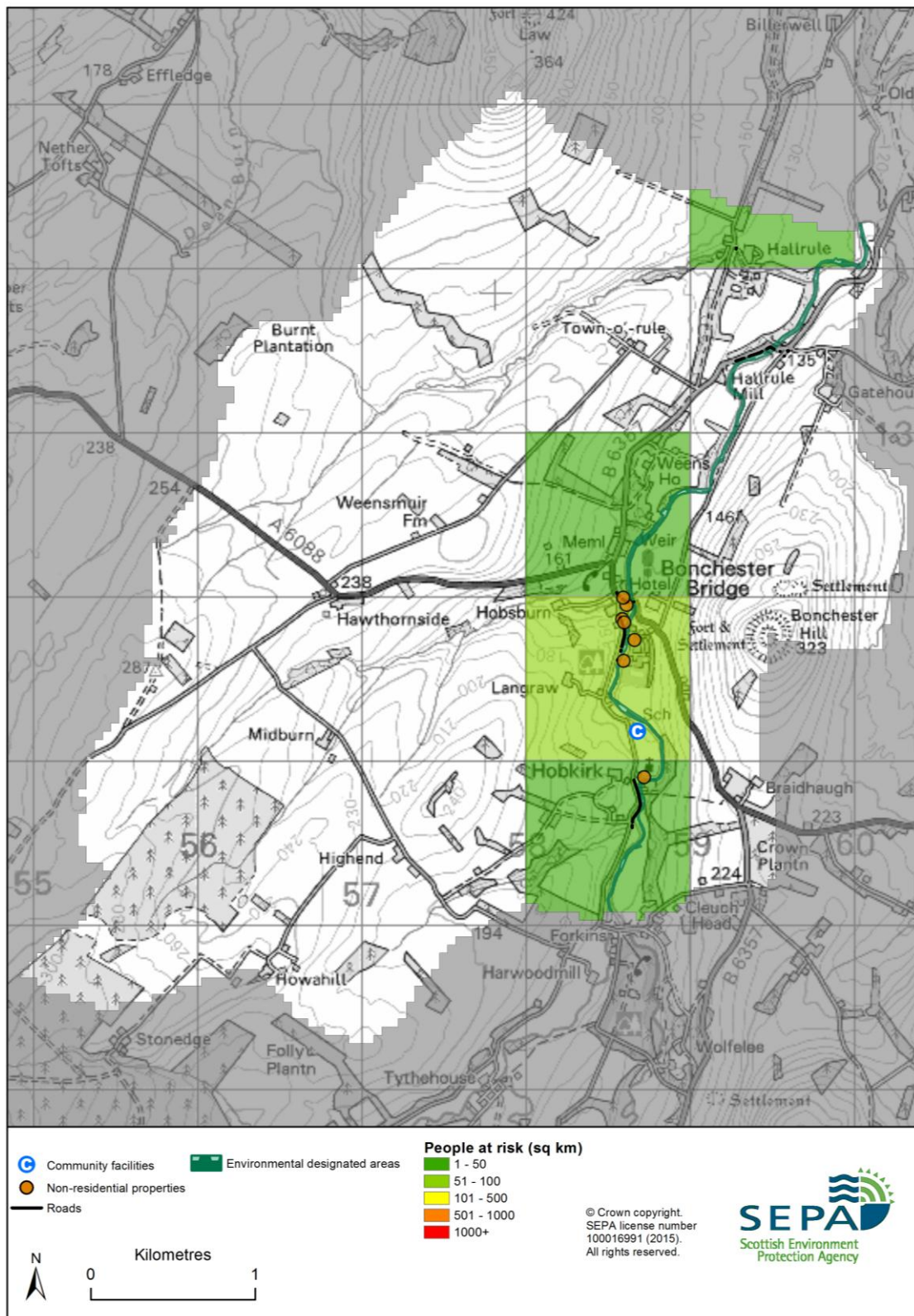


Figure 2: Impacts of flooding

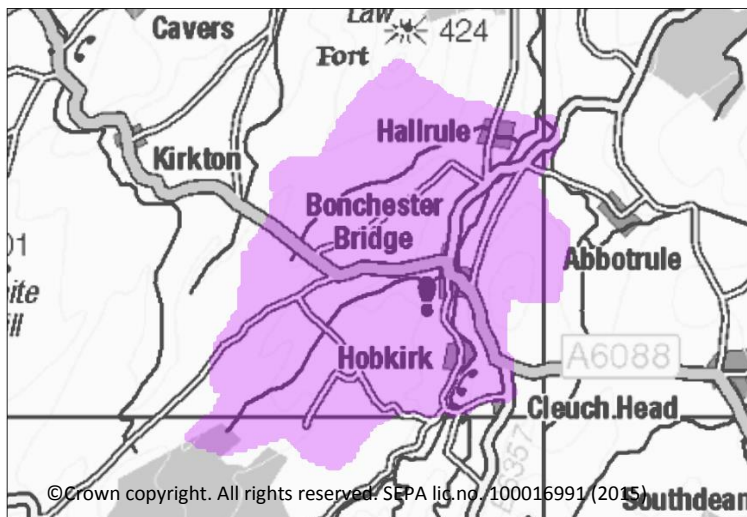
History of flooding

No significant river or surface water floods have been recorded in this Potentially Vulnerable Area.

Objectives to manage flooding in Potentially Vulnerable Area 13/13

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA’s flood map. The objectives below have been set for Bonchester Bridge Potentially Vulnerable Area.

Reduce economic damages to residential and non-residential properties and flood risk to community facilities in the Bonchester Bridge Potentially Vulnerable Area caused by river flooding

Indicators:	Target area:
<ul style="list-style-type: none"> £110,000 Annual Average Damages from residential properties £10,000 Annual Average Damages from non-residential properties One educational building 	
Objective ID: 13032	<small>© Crown copyright. All rights reserved. SEPA lic.no. 100016991 (2015)</small>

Target area	Objective	ID	Indicators within PVA
Applies across Tweed Local Plan District	Avoid an overall increase in flood risk	13001	<ul style="list-style-type: none"> 40 residential properties £140,000 Annual Average Damages
Applies across Tweed Local Plan District	Reduce overall flood risk	13033	<ul style="list-style-type: none"> 40 residential properties £140,000 Annual Average Damages
Applies across Tweed Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

Actions to manage flooding in Potentially Vulnerable Area 13/13

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Bonchester Bridge Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	FLOOD PROTECTION STUDY (130320005)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities in the Bonchester Bridge Potentially Vulnerable Area caused by river flooding (13032)		
Delivery lead:	Scottish Borders Council		
Priority:	National:		Within local authority:
	116 of 168		6 of 6
Status:	Not started	Indicative delivery:	2022-2027
Description:	A flood protection study has been recommended for Bonchester Bridge to assess whether flood defences and sediment management could reduce flood risk. The study should also consider the viability of property level protection. The study should take a catchment approach and consider the potential benefits, disbenefits and interaction between actions upstream and downstream. The study has a lower national priority and is to be carried out in the second flood risk management cycle.		
Potential impacts			
Economic:	The study could benefit 38 residential properties and seven non-residential properties at risk of flooding in this location. Potential damages avoided of up to £3.0 million.		
Social:	Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community.		
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment and designated sites. Where possible opportunities to enhance and restore the environment should be sought, for example		

Environmental: through natural flood management. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the River Tweed Special Area of Conservation.

Action (ID):	STRATEGIC MAPPING AND MODELLING (130330016)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2022-2027
Description:	SEPA will seek to develop flood mapping in the Rule Water area to improve understanding of flood risk, commencing in the second flood risk management cycle. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	FLOOD FORECASTING (130330009)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	SELF HELP (130330011)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.</p> <p>Scottish Borders Council offers discounted flood protection products to homes and businesses at risk in the Scottish Borders.</p>		

Action (ID):	AWARENESS RAISING (130330013)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (130330007)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Scottish Borders Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.</p>		

Action (ID):	EMERGENCY PLANS/RESPONSE (130330014)		
Objective (ID):	Reduce overall flood risk (13033)		
Delivery lead:	Category 1 and 2 Responders		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p>		

Action (ID):	PLANNING POLICIES (130010001)		
Objective (ID):	Avoid an overall increase in flood risk (13001) Reduce overall flood risk (13033)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.</p>		

Flood Risk Management Strategy

Tweed Local Plan District

This section provides supplementary information on the characteristics and impacts of river, coastal and surface water flooding. Future impacts due to climate change, the potential for natural flood management and links to river basin management are also described within these chapters.

Detailed information about the objectives and actions to manage flooding are provided in Section 2.

Section 3: Supporting information

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3.1 Introduction

In the Tweed Local Plan District, river flooding is reported for the Tweed river catchment and surface water flooding is reported across the whole Local Plan District. There are no coastal areas in the Tweed Local Plan District and the Scottish Borders Council coastline is contained within the Forth Estuary Local Plan District.

A summary of the number of properties and Annual Average Damages from river and surface water flooding is outlined in Table 1.

	Total number of properties at risk ¹	Annual Average Damages	Local authority
River catchments			
River Tweed catchment	4,600	£10.5 million	Scottish Borders Council South Lanarkshire Council
Surface water flooding			
Tweed Local Plan District	1,300	£2.7 million	Scottish Borders Council South Lanarkshire Council

Table 1: Summary of flood risk from various sources within the Tweed Local Plan District

¹ Total number of residential and non-residential properties at risk of flooding.

3.2 River flooding

River Tweed catchment

This chapter provides supplementary information on river flooding at the catchment level. It provides an overview of the catchment's natural characteristics, flood risk and the existing actions to manage flooding. It outlines the likely impact of climate change and the potential for natural flood management.

Detailed information about the objectives and actions to manage flooding are provided in Section 2.

Catchment overview

The River Tweed catchment is approximately 4,335km². It rises from sea level at Berwick-upon-Tweed to its highest point of 850m at Broad Law. The headwaters in the west drain steep hills and flow through narrow valleys. The lower part of the catchment becomes less steep downstream of Melrose where the Tweed and its tributaries flow through wider valleys and floodplains.

The main-stem of the River Tweed has its source at Glenbreck and flows through Peebles, Innerleithen, Melrose, Kelso and Coldstream to meet the North Sea at Berwick-upon-Tweed in England. The main tributaries of the Tweed include the River Teviot, Whiteadder Water, Blackadder Water, Leader Water, Gala Water and Ettrick Water. The River Teviot includes part of the Bowmont Water that flows into England and is a tributary of the English River Till that meets the River Tweed north east of Coldstream.

Intensive agriculture dominates the low lying areas of the catchment where the land is used mainly for arable and horticulture production. Pasture dominates in the steep hills in the west of the catchment where grasslands are most prevalent.

The average annual rainfall for this catchment is low to average for Scotland, with 600-700mm falling in the lower part of the catchment, rising to 1250-2000mm in the upper catchment.

Flood risk in the catchment

Within the River Tweed catchment approximately 3,000 residential and 1,600 non-residential properties are at risk of river flooding. It is estimated that 89% of these properties are located within Potentially Vulnerable Areas. There are 13 Potentially Vulnerable Areas at risk of river flooding in this catchment (Figure 1):

- West Linton (13/01)
- Preston (13/02)
- Lauder (13/03)
- Eddleston, Peebles, Innerleithen, Selkirk, Stow and Galashiels (13/04)
- Earlston (13/05)
- Coldstream (13/06)
- Biggar (13/07)
- Broughton (13/08)
- Kelso (13/09)
- Jedburgh (13/10)
- Denholm (13/11)

- Hawick (13/12)
- Bonchester Bridge (13/13)

Main areas at risk

The main areas at risk of river flooding can be seen in Table 1. The table shows the number of properties at risk and the Annual Average Damages caused by river flooding. This includes damages to residential and non-residential properties, transport and agriculture.

	Residential and non-residential properties at risk of river flooding	Annual Average Damages
Hawick	920	£1,700,000 ¹
Galashiels	860	£1,500,000 ²
Selkirk	630	£760,000 ¹
Innerleithen	540	£880,000
Peebles	390	£890,000
Jedburgh	150	£430,000
Earlston	110	£610,000
Stow	50	£200,000
Broughton	50	£160,000
Biggar	50	£88,000
Walkerburn	40	£160,000
Greenlaw	40	£150,000
Bonchester Bridge	40	£120,000
Melrose	30	£72,000
Eddleston	30	£58,000
Preston	20	£110,000
Kelso	20	£24,000
Yarrowford	10	£110,000
Coldstream	10	£31,000
Abbey St Bathans	<10	£8,000
Denholm	<10	£8,000

Table 1: Main areas at risk of river flooding

¹ The damages presented in this report are derived from SEPA data that is assessed at a strategic level. Scottish Borders Council has carried out more detailed assessment of flood risk in Hawick and Selkirk that identifies higher economic damages from river flooding.

² The damages presented in this report are derived from SEPA data that is assessed at a strategic level. Scottish Borders Council has carried out more detailed assessment of flood risk in Galashiels that identifies lower economic damages from river flooding.

Economic activity and infrastructure at risk

The Annual Average Damages caused by river flooding in the River Tweed catchment are approximately £10.5 million. The damages are distributed as follows:

- 45% residential properties (£4.8 million)
- 37% non-residential properties (£3.9 million)
- 7% emergency services (£710,000)
- 6% roads (£610,000)
- 3% agriculture (£300,000)
- 3% vehicles (£290,000).

Figure 2 show the Annual Average Damages throughout the catchment. The highest Annual Average Damages are in Hawick and Galashiels due to a combination of high economic damages and a large density of residential and non-residential properties.

Table 2 shows further information about infrastructure and agricultural land at risk of flooding within this catchment.

	Number at risk	Further detail
Community facilities	20	Includes: educational buildings, healthcare services and emergency services
Utility assets	70	Includes: electricity substations, fuel extraction sites and telephone exchanges
Roads (excluding minor roads)	56	17 A roads at 335 locations 39 B roads at 274 locations
Railway routes³	0	
Agricultural land (km²)	128.2	

Table 2: Infrastructure and agricultural land at risk of flooding

Designated environmental and cultural sites at risk

Within the catchment it is estimated that 104 cultural heritage sites are at risk of river flooding. These sites include scheduled monuments, gardens and designed landscapes, battlefield sites and listed buildings.

Approximately 42 protected environmental sites are at risk of river flooding. These include three Special Areas of Conservation, two Special Protection Areas and 37 Sites of Special Scientific Interest. Amongst these areas are the Borders Woods, River Tweed, St Mary's Loch and Dolphinton - West Linton Fens and Grassland.

³ This assessment was carried out prior to the reconstruction of the Borders Railway; flood risk to this railway route will be assessed in the next FRM cycle.

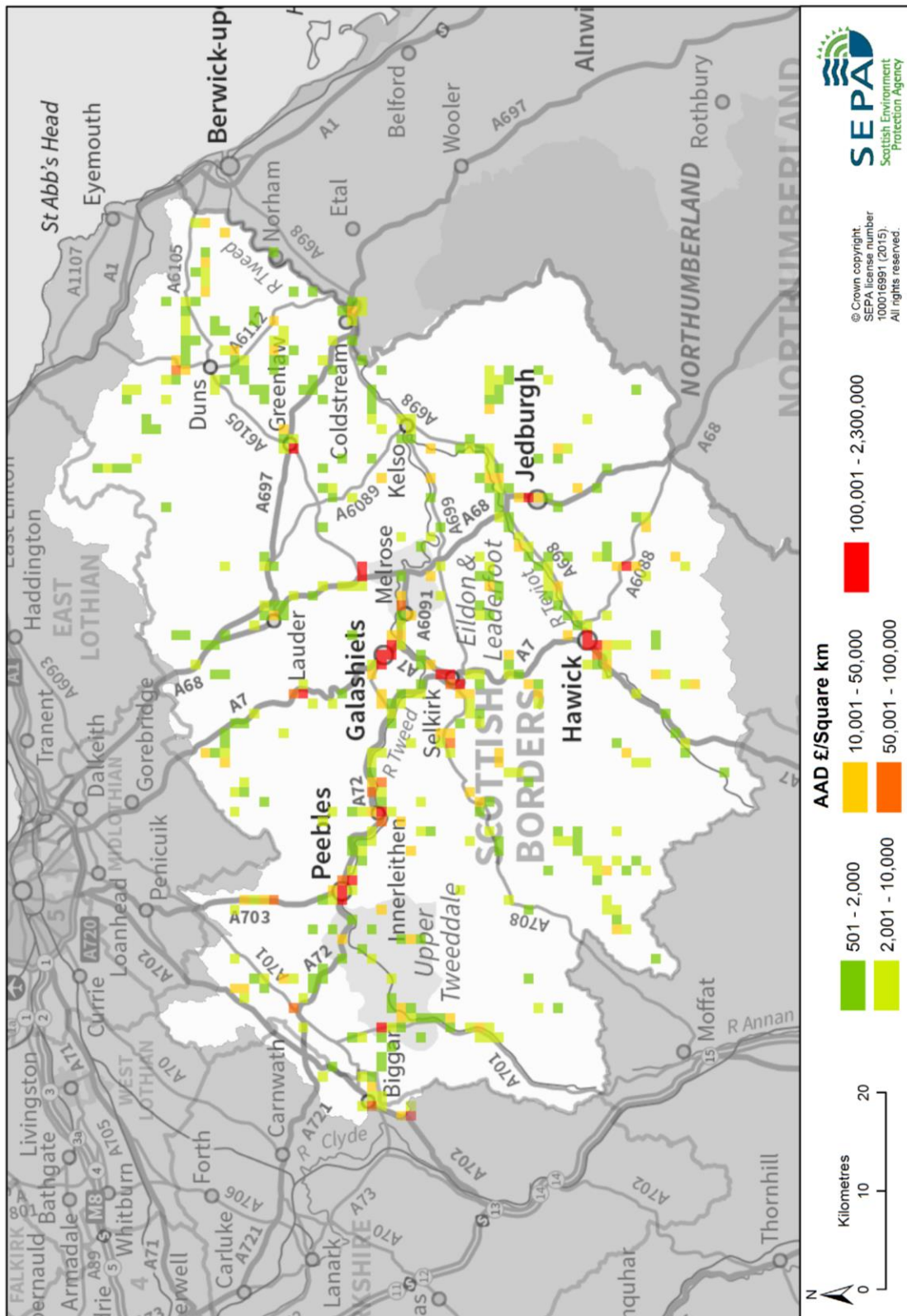


Figure 2: Annual Average Damages from river flooding

History of river flooding

The Tweed catchment has a long history of flooding with many floods recorded since 1831. Many towns have been affected including Jedburgh from the Skiprunning Burn, Peebles from the River Tweed, Selkirk from the Long Philip Burn, Hawick from the River Teviot, as well as Denholm and Keslo.

One of the most significant floods in this catchment is believed to have occurred in August 1948 when flooding from the River Tweed, Whiteadder Water and Gala Water affected numerous properties and businesses throughout the Scottish Borders. Multiple bridges were swept away during the flood, causing major disruption to local and national transport infrastructure. The flood is known to have affected a large part of the region. The most significant event on the Slitrig Water occurred in 1846. It is thought that flooding was exacerbated by upstream forests being ripped out and blocking bridges in Hawick.

The most recent flood occurred on 30 December 2013 when the Upper Tweed and the Ettrick Water flooded. Many areas were affected including Merlindale, Dawyck, Peebles, Ettrick Valley and Lindean. The Tweed Green area of Peebles was inundated and a nursing home had to be evacuated. No properties flooded internally as water ingress was stopped using property level protection.

The earliest flood was recorded in February 1831 when Kelso was affected by flooding from the River Tweed. There was significant damage to properties and agriculture as a result of this event.

Further detail about the history of flooding in this area is available in the relevant Potentially Vulnerable Area chapters.

Managing flood risk

A range of public bodies have responsibility for managing flood risk in Scotland and they are working closer than ever before to target action in the areas where the greatest benefit can be gained. Members of the public also have a role to play and are the first line of defence against flooding by taking action to protect themselves and their property from flooding. Further information about roles and responsibilities is provided in Section 1.

Existing actions to manage flood risk are detailed below and should be read alongside Section 2.

Flood protection schemes

There are 11 flood protection schemes in the River Tweed catchment:

- Turfford Burn Flood Prevention Scheme
- Ettrick Water and Yarrow Water Flood Prevention Scheme
- Denholm – The Loaning Flood Prevention Scheme
- Jedburgh – Skiprunning Burn Culvert Flood Prevention Scheme
- Galashiels – Plumtree / Wilderhaugh Flood Prevention Scheme
- Galashiels – Netherdale Flood Prevention Scheme
- Jed Water Flood Prevention Scheme
- Peebles – Southpark Area Flood Prevention Scheme
- Innerleithen Hall Street Flood Prevention Scheme
- Lauder Station Yard Flood Prevention Scheme

- Galashiels Flood Protection Scheme.

Two further schemes are currently under construction. These are Selkirk Flood Protection Scheme, due for completion in December 2016, and Jedburgh (Skiprunning Burn) Flood Protection Scheme, due for completion in February 2016.

River flood warning schemes

There are 27 river flood warning areas within this catchment as shown in Table 3 and Figure 3. Table 3 shows the total number of properties in the flood warning area and the percentage of those properties that have signed up to receive flood warnings. Note that this is not the number of properties at risk of flooding.

Flood warning area (FWA)	River	Number of properties within FWA	% of properties registered July 2014
Camptown to Jedburgh	Jed Water	23	35%
Coldstream Town	River Tweed	205	22%
Dawyck to Lyne Ford	River Tweed	16	75%
Drumelzier to Dawyck	River Tweed	9	89%
Earlston	Leader Water	82	41%
Ettrick Valley	Ettrick Water	45	36%
Galashiels (Netherdale)	Gala Water	92	36%
Galashiels including Bowland	Gala Water	945	14%
Greenlaw to Allanton	Blackadder Water	50	22%
Hawick (Slitrig)	Slitrig Water	139	39%
Hawick (Teviot)	River Teviot	937	36%
Hawick to Monteviot	River Teviot	42	98%
Jedburgh to Jedfoot Bridge	Jed Water	169	28%
Kelso to Coldstream	River Tweed	122	47%
Monteviot to Kelso	River Teviot	33	48%
Peebles (Eddleston Water)	Eddleston Water	748	15%
Preston to Paxton	Whiteadder Water	53	64%
Romannobridge to Lyne Station	Lyne Water	25	56%
Selkirk (Bannerfield and Riverside Industrial Estate)	Ettrick Water	478	29%
Selkirk to Lindean	Ettrick Water	93	92%
Shiplaw to Crossburn including Eddleston	Eddleston Water	70	39%
Stow	Gala Water	37	49%
The Leithen Water at Innerleithen	Leithen Water	338	28%
The Tweed from Peebles to Yair Bridge	River Tweed	270	30%
The Tweed in Peebles	River Tweed	119	58%
Tweedbank to Floors	River Tweed	62	32%
Yarrow Valley	Yarrow Water	76	30%

Table 3: Flood warning areas

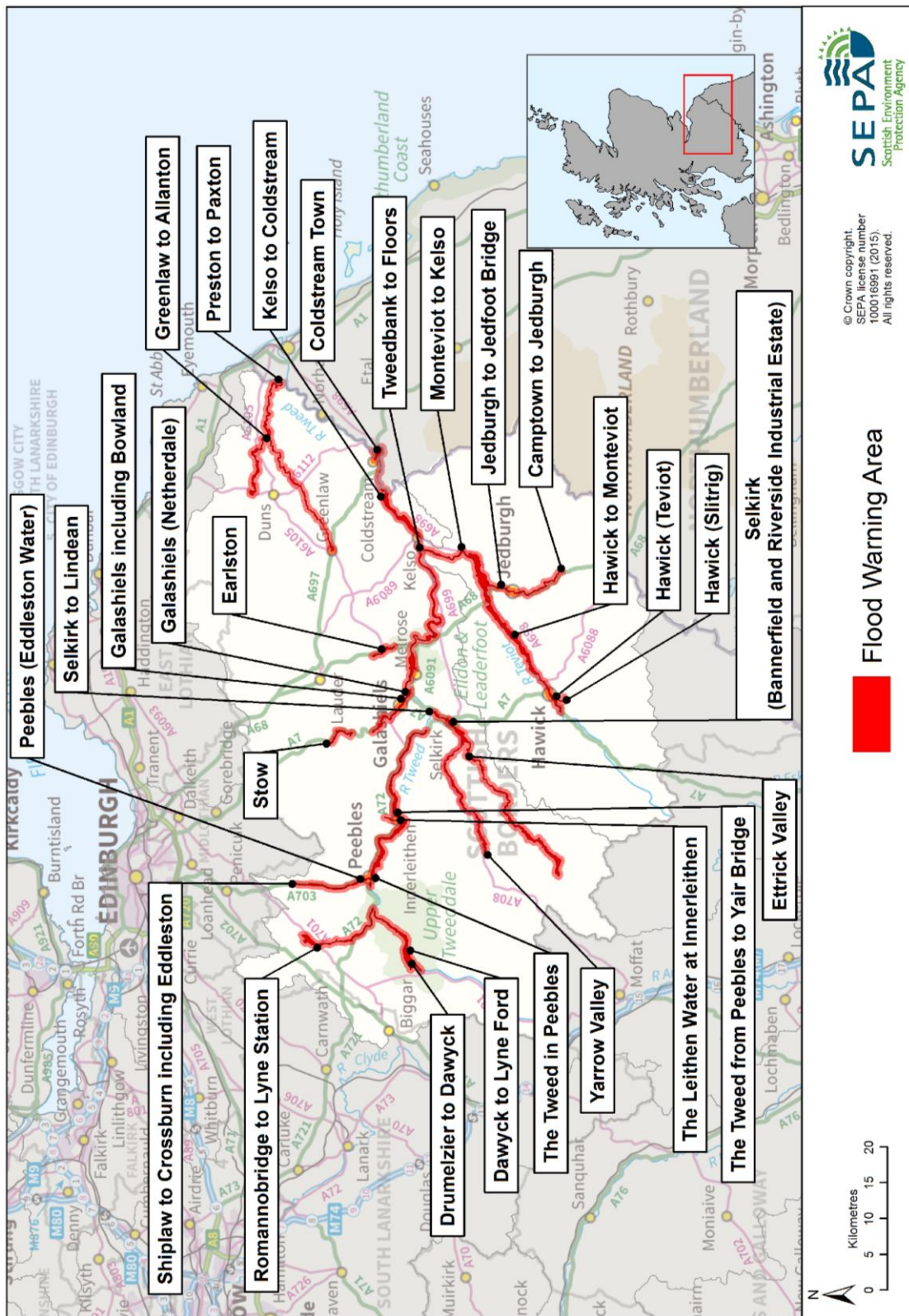


Figure 3: Flood warning areas

Community groups

There are two flood action groups operating within this catchment located in Peebles and Hawick. There are also resilient communities groups based on some community councils which respond to flooding.

In addition, there are local flood warning groups operated by the local authorities. These are:

- Scottish Borders Council, Selkirk Long Philip Burn Flood Warning Group
- Scottish Borders Council, Galashiels (Bakehouse Burn) Flood Warning Group
- Scottish Borders Council, Jedburgh Skiprunning Burn Flood Warning Group
- South Lanarkshire Council owns and operates a flood warning and routing system at Biggar High School.

Property level protection

Each local authority has its own incentives or subsidies to help property owners with property level protection:

- In the River Tweed catchment Scottish Borders Council operates a subsidised flood protection products scheme for residential and non-residential property owners in flood risk areas;
- Scottish Borders Council also provides and maintains dedicated sandbag stores in areas of flood risk to ensure sandbags are readily available to the public in the event of a flood;
- South Lanarkshire Council provides assistance during emergency situations which can include the provision of sandbags and other actions where possible to reduce the risk of flooding to properties, businesses and infrastructure.

Climate change and future flood risk

The UK Climate Projections (UKCP09) predicts that climate change may lead to warmer and drier summers, warmer and wetter winters with less snow, and more extreme temperature and rainfall. The predicted increase in rainfall and river flows may increase the potential for river flooding.

Under the UKCP09 high emissions scenario for 2080, average peak river flows for the River Tweed catchment may increase by 33%⁴. This would potentially increase in the number of residential properties at risk of river flooding from approximately 3,000 to 4,100 and the number of non-residential properties from approximately 1,600 to 1,900.

The predicted increases in flood risk are solely based on the impact of a changing climate on the magnitude of flooding; they do not take into account any potential increase due to population change, development pressures or urban creep, nor do they take into account any mitigation as a result of actions contained in this or future Flood Risk Management Strategies.

⁴ From the study 'An assessment of the vulnerability of Scotland's river catchments and coasts to the impacts of climate change' (CEH, 2011)

Potential for natural flood management

The assessment of the potential for natural flood management is shown on SEPA's flood maps (<http://www.sepa.org.uk/environment/water/flooding/flood-maps/>). The maps indicate the potential for runoff reduction, floodplain storage and sediment management. They show areas where natural flood management could be effective and where further detailed assessment should take place. This information was used to identify where local authorities could include natural flood management as part of flood risk management schemes and studies. The proposed schemes and studies are listed in the relevant Potentially Vulnerable Area chapters of this document.

A number of natural flood management projects and initiatives are underway in this catchment:

- Eddleston Water project is investigating whether changes in land use management and the restoration of natural habitats can help improve the river valley for wildlife and reduce the risk of flooding in Eddleston and Peebles.
- Gala Water habitat mitigation project due to windfarm development has created an opportunity for habitat enhancement and natural flood management on the upper Gala Water.
- Cheviot Futures aims to provide practical real-world solutions to the climate change challenges communities face. The project is a cooperative of agencies and organisations working with rural communities in north Northumberland.
- Ale Water Working Wetlands project is taking a catchment-scale approach to assessing largely undesignated, but regionally important, wetland sites and focusing on the attitudes of land managers towards the wetlands on their land holdings.
- Riparian improvements and woodland planting at Yarrow, Bowanhill and Teviothead.

Runoff reduction

A number of areas have been identified as having potential for runoff reduction. In the River Tweed the most dominant area is situated in the south east of the catchment within the Ettrick Forest and surrounding St Mary's Loch. Furthermore, a number of areas to the south east of both Peebles and Lauder also show potential.

A number of locations on the River Teviot show potential in the upper reaches of the Borthwick Water and Slitrig Water, Allan Water and Rule Water. Both of these tributaries contribute flows to Hawick Potentially Vulnerable Area (13/12). Notably, the Allan Water has absence of woodland and may have potential for tree planting.

Floodplain storage

The River Tweed includes a number of potential floodplain storage areas. The largest of these is the St Mary's Loch as well as the Talla, Fruid and Megget Reservoirs. Large sections upstream of the River Tweed at Broughton and Bellspool also indicate potential for floodplain storage.

River Teviot between Nisbet and Ancrum includes a floodplain with indicative storage potential. Within these locations are embankments that may contribute to floodplain disconnection. Sediment transport alternates markedly between high deposition and high erosion. This is unlikely to be a natural occurring process but may be a consequence of modifications to the river channel in this area. Reconnection and restoration of the floodplain could potentially reduce local flooding.

The Borthwick Water catchment, just above Burnfoot, includes a small area of floodplain with storage potential that is currently disconnected from its floodplain by embankments. There is also an area of high erosion on the Howpaisley Burn in the upper catchment just above its confluence with the Borthwick Water at Craik which may be associated with realignment at this location.

In the Slitrig Water catchment there are man-made embankments that could restrict the movement of water into floodplain. There is further evidence of realignment of the Langside Burn in the upper Slitrig catchment and on the main stem of the Slitrig just above Stobs Castle that may be linked with high sediment deposition in this area.

Potentially large areas of floodplain storage were also noted in the middle reaches of the Rule Water around Hallrule and Bonchester Bridge. A lack of vegetation in some locations may suggest that there is potential for tree planting to help reduce the flow of water.

Sediment management

Erosion and sediment levels appear to be of an appropriate level across the majority of the catchment. There are some zones prone to high levels of erosion, including the Ettrick Water approaching Selkirk and in the upper reaches of the River Teviot, leading to increased deposition downstream. There are also higher levels of deposition on the River Tweed as it nears the coast, particularly between Coldstream and Berwick. While much of the erosion and deposition will be attributable to natural processes, further investigation of actions that reduce erosion rates may be merited, such as improvement of bankside vegetation or gully planting.

3.3 Surface water flooding

Tweed Local Plan District

This chapter provides supplementary information on surface water flooding across the Local Plan District. It provides an overview of the main areas at risk and the history of surface water flooding. The predicted impacts on infrastructure are also identified. The impacts on environmental sites and agricultural land have not been assessed.

Information about the objectives and actions to manage flood risk are provided in Section 2.

Flood risk

Within the Tweed Local Plan District approximately 640 residential properties and 700 non-residential properties are at risk of surface water flooding. It is estimated that 96% of these properties are located within Potentially Vulnerable Areas.

Main areas at risk

The main areas at risk of surface water flooding can be seen in Table 1, which shows the number of properties at risk and the Annual Average Damages caused by surface water flooding. The damages include impacts to residential and non-residential properties, vehicles, emergency services and roads.

	Residential and non-residential properties at risk of surface water flooding	Annual Average Damages
Galashiels	300	£660,000
Peebles	280	£340,000
Hawick	230	£430,000
Jedburgh	120	£180,000
Selkirk	110	£190,000
Kelso	90	£67,000

Table 1: Main areas at risk of surface water flooding

Economic activity and infrastructure at risk

The Annual Average Damages caused by surface water flooding in the Tweed Local Plan District are approximately £2.7 million. The damages are distributed as follows:

- 37% non-residential properties (£1.0 million)
- 33% roads (£890,000)
- 25% residential properties (£670,000)
- 4% emergency services (£94,000)
- 1% vehicles (£23,000).

Figure 1 shows the distribution of Annual Average Damages throughout the Local Plan District. Galashiels and Hawick show the highest economic damages with surface water flooding affecting the commercial and industrial properties in the towns.

Table 2 shows the approximate numbers of further infrastructure assets which are at risk of flooding within this catchment.

	Number at risk	Further detail
Community facilities	10	Includes: educational buildings and emergency services
Utility assets	60	Includes: electricity substations, fuel extraction sites and telephone exchanges
Roads (excluding minor roads)	55	17 A roads at 300 locations 38 B roads at 200 locations
Railway routes¹	0	

Table 2: Infrastructure at risk of surface water flooding

Designated environmental and cultural heritage sites at risk

Within the Local Plan District it is estimated that approximately 98 designated cultural heritage sites have a risk of surface water flooding. These sites include scheduled monuments, gardens and designed landscapes, battlefield sites and listed buildings.

The impact of surface water flooding on environmental sites has not been assessed and is assumed to be relatively low.

History of surface water flooding

A number of areas in this Local Plan District have been affected by surface water flooding including Jedburgh, Galashiels and Selkirk.

Recent events include flooding in Jedburgh on 21 December 2013 when heavy rainfall led to flooding of Naggs Head Close, Exchange Street, Castlegate, Canongate and the High Street from the Skiprunning Burn. Jedburgh also flooded on 5 August 2012, 2 August 2002 and 4 January 1982.

Galashiels recently flooded on 22 November 2012 following heavy rainfall. Areas affected included Meigle View, Riddle Dumble Park and Bank Street. Flash flooding also affected Galashiels on 30 May 2003 with property flooding at Netherbank and Kimberley and Galashiels.

Selkirk was affected on 13 August 2004 when heavy rainfall led to flooding of Selkirk Rugby Club and Ettrickhaugh Road from the Long Philip Burn. Flash flooding affecting Yarrow Valley and Selkirk as well as the small settlement of Broadmeadows and Bannerfield housing estate in Selkirk also occurred on 30 May 2003.

¹ This assessment was carried out prior to the reconstruction of the Borders Railway; flood risk to this railway route will be assessed in the next FRM cycle.

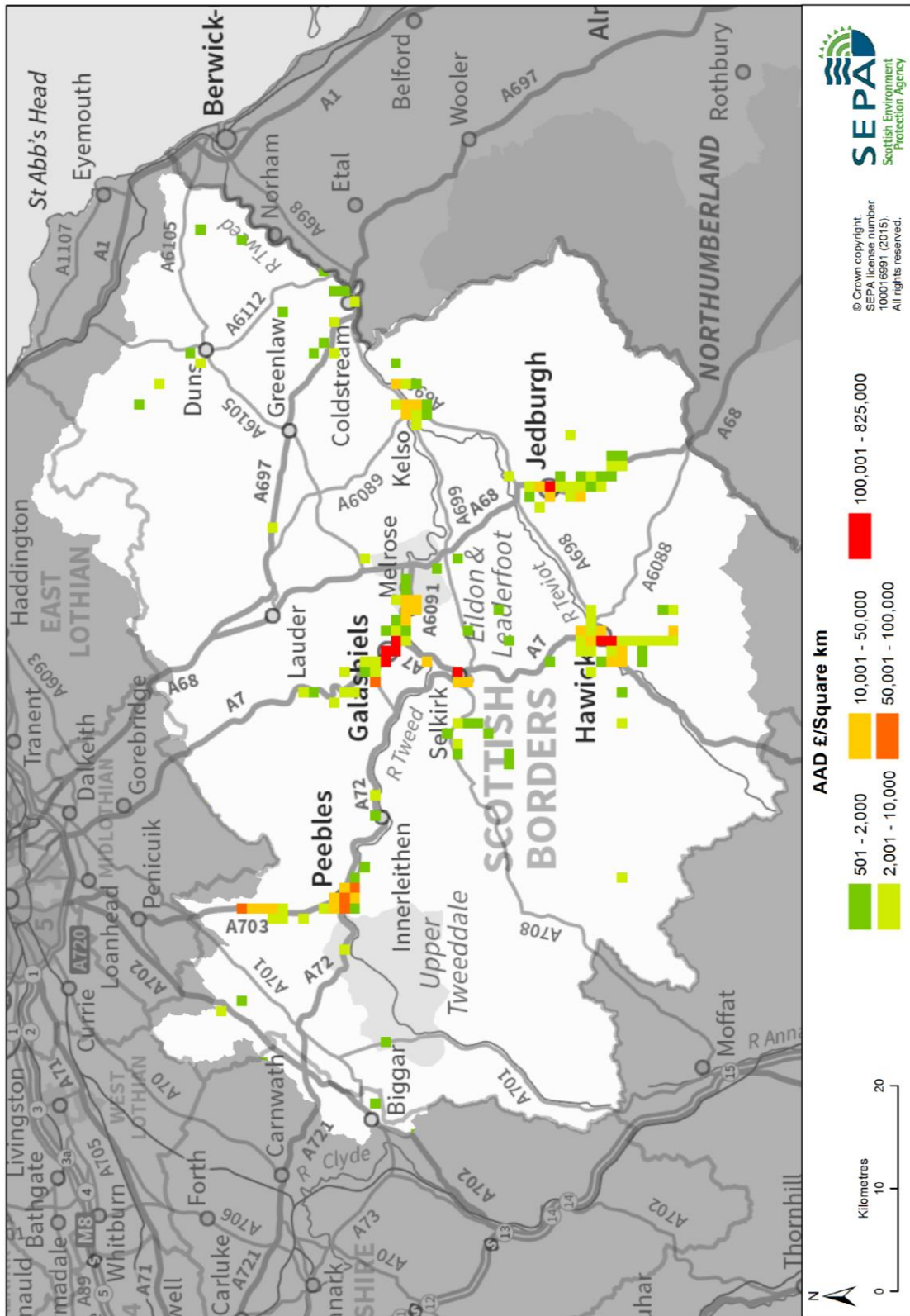


Figure 1: Annual Average Damages from surface water flooding

Managing flood risk

A range of public bodies have responsibility for managing flood risk in Scotland and they are working closer than ever before to target action in the areas where the greatest benefit can be gained. Members of the public also have a role to play and are the first line of defence against flooding by taking action to protect themselves and their property from flooding. Further information about roles and responsibilities is provided in Section 1.

Surface water management priority areas

The areas at highest risk from surface water flooding have been prioritised. These priority areas were identified using SEPA flood models, supplemented with historical flood information and, where available, more detailed modelling from local authorities. These priority areas require the preparation of surface water management plans, the details of which can be found in Section 2.

Flood protection schemes

There are five formal flood protection schemes which aid the management of surface water flooding in the Tweed Local Plan District:

- Denholm - The Loaning Flood Protection Scheme designed to divert surface water runoff from fields away from properties at Ashloaning, The Loaning, Eastgate and Eastlea Drive.
- Jedburgh - Skiprunning Burn Culvert Flood Protection Scheme designed to mitigate the flooding of Exchange Street, High Street, Friars and Pleasance areas from the Skiprunning Burn.
- Peebles - South Park Flood Protection Scheme designed to mitigate flooding to Caledonian Road, Southpark Drive and Southpark West from fields and overflows from Ederston Burn.
- Lauder (Station Yard) - Flood Protection Scheme designed to mitigate the flooding of Station Yard area surface water runoff from fields.
- Innerleithen, Hall Street - Flood Protection Scheme designed to mitigate flooding to St Ronans Terrace and High Street from surface water runoff and overflows from Chapmans Burn.

Community groups

There are three flood action groups operating in this Local Plan District, located in Hawick, Selkirk and Peebles. There are also resilient communities groups based on some community councils which respond to flooding.

In addition, there are three local flood warning groups operated by Scottish Borders Council:

- Selkirk Long Philip Burn Flood Warning Group
- Galashiels Bakehouse Burn Flood Warning Group
- Jedburgh Skiprunning Burn Flood Warning Group.

Property level protection

Each local authority has its own incentives or subsidies to help property owners with property level protection:

- Scottish Borders Council operates a subsidised flood protection products scheme for residential and non-residential property owners in its flood risk areas. Scottish Borders Council also provides and maintains dedicated sandbag stores in areas of flood risk to ensure sandbags are available to the public in the event of a flood.
- South Lanarkshire Council provides assistance during emergency situations which can include the provision of sandbags and other actions where possible to reduce the risk of flooding to properties, businesses and infrastructure.

Climate change and future flood risk

UK Climate Projections (UKCP09) predicts that climate change may lead to warmer and drier summers, warmer and wetter winters with less snow, and more extreme temperature and rainfall. The surface water modelling undertaken considered climate change scenarios with a 20% increase in rainfall intensity.

Under these conditions it is estimated that the number of residential properties at risk of surface water flooding may increase from approximately 640 to 890 and the number of non-residential properties from approximately 700 to 820.

The predicted increases in flood risk are solely based on the impact of a changing climate on the magnitude of flooding; they do not take into account any potential increase due to population change, development pressures or urban creep, nor do they take into account any mitigation as a result of actions contained in this or future Flood Risk Management Strategies.

Annex 1: Glossary

Term	Definition
Accretion	Accumulation of sediment.
Actions	Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives has been based on a detailed assessment and comparison of economic, social and environmental criteria.
Annual Average Damages (AAD)	Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur. High likelihood events, which occur more regularly, contribute proportionally more to AADs than rarer events. Within the Flood Risk Management Strategies AADs incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).
Appraisal	Appraisal is the process of defining objectives, examining options and weighing up the costs, benefits, risks and uncertainties before a decision is made. The FRM Strategy appraisal method is designed to set objectives and identify the most sustainable combination of actions to tackle flooding from rivers, sea and surface water.
Appraisal baseline	Defines the existing level of flood risk under the current flood risk management regime.
Awareness raising	Public awareness, participation and community support are essential components of sustainable flood risk management. SEPA and the responsible authorities have a duty to raise public awareness of flood risk. This is undertaken both individually and collaboratively by a range of organisations. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.
Bathing waters	Bathing waters are classed as protected areas under Annex IV of the Water Framework Directive (WFD). There are 84 designated bathing waters in Scotland. ⁱ
Benefit cost ratio (BCR)	A benefit cost ratio summarises the overall value for money of an action or project. It is expressed as the ratio of benefits to costs (both expressed as present value monetary values). A ratio of greater than 1:1 indicates that the economic benefits associated with an action are greater than the economic costs of implementation; therefore this is taken as the threshold of economic viability. It should be acknowledged that it is not always possible to accurately estimate economic values for all elements of benefit, and BCR is just one a number of techniques used in appraisal.
Blue infrastructure	Blue infrastructure is often complementary to 'green infrastructure' and includes sustainable drainage systems, swales (shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants ⁱⁱ), wetlands, rivers, canals (and their banks) and other watercourses ⁱⁱⁱ
Candidate Potentially Vulnerable Area (PVAc)	Candidate PVAs are those areas identified after the National Flood Risk Assessment (2011), as a result of new information, where the impact of flooding is potentially sufficient to justify further assessment and appraisal. They will be considered for inclusion as new PVAs in the next flood risk management planning cycle.
Catchment	All the land drained by a river and its tributaries.

Term	Definition
Category 1 and 2 Responders (Cat 1 / 2)	Category 1 and 2 Responders are defined as part of the Civil Contingencies Act 2004 which seeks to minimise disruption in the event of an emergency. Category 1 Responders are 'core' responders: local authorities, police, fire and rescue services, ambulance service, NHS health boards, SEPA and the Maritime and Coastguard Agency. Category 2 Responders are key co-operating responders in support of Category 1 Responders. These include gas and electricity companies, rail and air transport operators, harbour authorities, telecommunications providers, Scottish Water, the Health and Safety Executive and NHS National Services Scotland ^{iv} .
Channel improvement	Where work has been carried out on a river channel allowing an increase in the volume of water it can carry.
Characterisation	Provides a description of the natural characteristics of catchments, coastlines and urban areas in terms of hydrology, geomorphology, topography and land use. It also includes the characterisation of existing levels of flood risk and existing flood risk management activity.
Coastal flooding	Flooding that results from high sea levels or a combination of high sea levels and stormy conditions. The term coastal flooding is used under the Flood Risk Management (Scotland) Act 2009, but in some areas it is also referred to as tidal flooding and covers areas such as estuaries and river channels that are influenced by tidal flows.
Combined sewer	Combined sewers transport sewage from homes and industry as well as carrying surface water runoff from gutters, drains and some highways. Heavy or prolonged rainfall can rapidly increase the flow in a combined sewer until the amount of water exceeds sewer capacity.
Combined sewer (overflow) (CSO)	Combined sewer overflows are purposely designed structures to ensure any excess water from sewerage systems is discharged in a controlled way and at a specific managed location.
Community facility	Within the FRM Strategies this term includes: Emergency Services (Police, Fire, Ambulance, Coastguard, Mountain Rescue) Educational Buildings (crèche, nursery, primary, secondary, further, higher and special education premises) Healthcare facilities: hospitals, health centres and residential care homes
Community flood action groups	Community flood action groups are community based resilience groups which, on behalf of local residents and business, help to prepare for and minimise the effects of flooding. They reflect the interests of their local communities and may differ in composition and remit. There are over 60 groups already established in Scotland. The Scottish Flood Forum provides support for both new and existing groups.
Confluence	Where two or more rivers meet.
Conveyance	Conveyance is a measure of the carrying capacity of a watercourse. Increasing conveyance enables flow to pass more rapidly and reducing conveyance slows flow down. Both actions can be effective in managing flood risk depending on local conditions.
Cultural heritage site	Historic Environment Scotland maintains lists of buildings of special architectural or historic interest; these buildings are referred to as 'listed buildings'. The highest level of designation is a World Heritage Site. Other designations included in this assessment are scheduled monuments, gardens and designed landscapes, and battlefields.
Culvert	A pipe, channel or tunnel used for the conveyance of a watercourse or surface drainage water under a road, railway, canal or other obstacle.
Damages	Flood damages are categorised as direct or indirect i.e. as a result of the flood water itself, or subsequent knock on effects. Damage to buildings and contents caused by flood water are an example of direct damages, whilst loss of industrial production, travel disruption or stress and anxiety are indirect. Some damages can be quantified in monetary terms, and others can only be described.

Term	Definition
	<p>The potential damages avoided by implementation of a flood risk management action are commonly referred to as the benefits of that action. When comparing the effectiveness of different actions, it is useful to consider estimated damages and damages avoided across the lifespan of the action. Within the FRM Strategies, a 100 year appraisal period has been used as standard. This allows costs, damages and benefits across this time frame to be compared in present value terms.</p> <p>See also 'Annual Average Damages'</p>
Demountable defences	<p>A temporary flood barrier is one that is only installed when the need arises, that is, when flooding is forecast. A demountable flood defence is a particular type of temporary defence that requires built-in parts and therefore can only be deployed in one specific location.^v</p>
Deposition	<p>A natural process leading to an accumulation of sediment on a river bed, floodplain or coastline.</p>
Economic impact	<p>An assessment of the economic value of the positive and negative effects of flooding and / or the actions taken to manage floods.</p>
Embankment	<p>Flood embankments are engineered earthfill structures designed to contain high river levels or protect against coastal flooding. They are commonly grass-covered, but may need additional protection against erosion by swiftly flowing water, waves or overtopping.</p>
Emergency plans / response	<p>Emergency response plans are applicable for all types of flooding. They set out the steps to be taken during flooding in order to maximise safety and minimise impacts where possible. Under the Civil Contingencies Act, Category 1 Responders have a duty to maintain emergency plans. Emergency plans may also be prepared by individuals, businesses, organisations or communities.</p>
Environmental impact	<p>A change in the environment as a result of an action or activity. Impacts can be positive or negative and may vary in significance, scale and duration.</p>
Environmental Impact Assessment (EIA)	<p>Environmental Impact Assessment (EIA) is a process which identifies the potential environmental impacts, both negative and positive, of a proposal.</p>
Environmental sites / environmental designated areas/ environmentally designated sites	<p>Areas formally designated for environmental importance, such as Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) or Special Areas of Conservation (SAC).</p>
Episodic erosion	<p>Erosion induced by a single event, such as a storm.</p>
Erosion	<p>A natural process leading to the removal of sediment from a river bed, bank or floodplain or coastline.</p>
Estuarine surge attenuation	<p>A reduction in the wave energy caused by storm surge. Breakwaters (barriers built out into the sea to protect a coast or harbour from the force of waves) or habitats such as saltmarsh can slow down and reduce the inland impact of storm surges (the rising of the sea due to wind and atmospheric pressure changes associated with storms), thereby reducing coastal flood risk.</p>
Estuary	<p>A coastal body of water usually found where a river meets the sea; the part of the river that is affected by tides.</p>
Fault (fault line)	<p>A break or fracture in the earth's crust as a result of the displacement of one side with respect to the other. In Scotland the Great Glen Fault is a major geological fault line cutting diagonally across the Highlands from Fort William to Inverness.</p>
Flash flood	<p>A flood that occurs a short period of time after high intensity rainfall or a sudden snow melt. A sudden increase in the level and velocity of the water body is often characteristic of these events, leaving a short time for warning or actions.</p>
Flashy watercourse	<p>A 'flashy' river or watercourse has a short lag time (the delay between peak rainfall intensity and peak river discharge), high peak discharge, and quickly returns to average flow. Rivers with these characteristics</p>

Term	Definition
	can be prone to flooding and leave a short time for warning or actions.
Flood	In the terms of the FRM Act, 'flood' means a temporary covering by water, from any source, of land not normally covered by water. This does not include a flood solely from a sewerage system, as a result of normal weather or infrastructure drainage. A flood can cause significant adverse impacts on people, property and the environment. drainage.
Flood bund	A constructed retaining wall, embankment or dyke designed to protect against flooding to a specified standard of protection.
Flood defence	Infrastructure, such as flood walls, embankments or flood storage intended to protect an area against flooding to a specified standard of protection.
Flood extent	The area that has been affected by flooding, or is at risk of flooding from one or more sources for a particular likelihood.
Flood forecasting	SEPA operates a network of over 250 rainfall, river and coastal monitoring stations throughout Scotland that generate data 24 hours a day. This hydrological information is combined with meteorological information from the Met Office. A team of experts then predict the likelihood and timing of river, coastal and surface water flooding. This joint initiative between SEPA and the Met Office forms the Scottish Flood Forecasting Service.
Flood frequency	The probability that a particular size/severity of flood will occur in a given year (see likelihood).
Flood gate	An adjustable, sometimes temporary, barrier used as a flood defence to control the flow of water within a water system or during a flood. Flood gates can also be part of operational flood defences or protect individual buildings or sites.
Flood guard	Flood guards cover a variety of types of door and window barriers that can be fitted to individual properties and operated by the owners / occupiers prior to a flood event. They act as a physical barrier to water entering the property and can provide protection against frequent and relatively shallow flooding.
Flood hazard	In terms of the FRM Act, hazard refers to the characteristics (extent, depth, velocity) of a flood.
Flood hazard map	Flood hazard maps are required by the FRM Act to show information that describes the nature of a flood in terms of the source, extent, water level or depth and, where appropriate, velocity of water. Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website.
Flood Prevention Scheme / Flood Protection Scheme (FPS)	A flood protection scheme, as defined by the FRM Act, is a scheme by a local authority for the management of flood risk within the authority area. This includes defence measures (flood prevention schemes) formerly promoted under the Flood Prevention (Scotland) Act 1961.
Flood protection study	Flood protection studies aim to refine understanding of the hazard and risk associated with flooding in a particular area, catchment or coastline. They will involve detailed assessment of flood hazard and / or risk and may develop options for managing flood risk.
Flood protection works	Flood protection works can include the same flood defence measures that would make up a formal Flood Protection Scheme but without the legal process, protections and requirements that would come by delivering the works as a scheme.
Flood risk	A measure of the combination of the likelihood of flooding occurring and the associated impacts on people, the economy and the environment.
Flood Risk Assessment (FRA)	Flood Risk Assessments are detailed studies of an area where flood risk may be present. These are often used to inform planning decisions, may help to develop flood schemes and have also contributed to the National Flood Risk Assessment.

Term	Definition
Flood Risk Management (Scotland) Act 2009 (FRM Act)	The flood risk management legislation for Scotland. It transposes the EC Floods Directive into Scots Law and aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity.
Flood risk management cycle	Under the FRM Act flood risk management planning is undertaken in six year cycles. The first planning cycle is 2015 – 2021. The first delivery cycle is lagged by approximately 6 months and is from 2016 - 2022.
Flood Prevention (Scotland) Act 1961	The Flood Prevention (Scotland) Act 1961 gave local authorities discretionary powers to make and build flood prevention schemes. It was superseded by the Flood Risk Management (Scotland) Act 2009.
Flood Risk Management Local Advisory Groups	FRM Local Advisory Groups are stakeholder groups convened to advise SEPA and lead local authorities in the preparation of Flood Risk Management Plans. SEPA and lead local authorities must have regard to the advice they provide.
Flood Risk Management Plans (FRM Plans)	A term used in the FRM Act. FRM Plans set out the actions that will be taken to reduce flood risk in a Local Plan District. They comprise Flood Risk Management Strategies, developed by SEPA, and Local Flood Risk Management Plans produced by lead local authorities.
Flood Risk Management Strategy (FRM Strategy)	Sets out a long-term vision for the overall reduction of flood risk. They contain a summary of flood risk in each Local Plan District, together with information on catchment characteristics and a summary of objectives and actions for Potentially Vulnerable Areas.
Flood risk map	Complements the flood hazard maps published on the SEPA website providing detail on the impacts of flooding on people, the economy and the environment. Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website.
Flood wall	A flood defence feature used to defend an area from flood water to a specified standard of protection.
Flood Warning area (FWA)	A Flood Warning area is where SEPA operates a formal Flood Monitoring Scheme to issue targeted Flood Warning messages for properties located in the area. ^{vi}
Flood warning scheme	A flood warning scheme is the network of monitoring on a coastal stretch or river, which provides SEPA with the ability to issue Flood Warnings.
Floods Directive	European Directive 2007/60/EC on the Assessment and Management of Flood Risks builds on and is closely related to the Water Framework Directive (see river basin management planning). It was transposed into Scots Law by the Flood Risk Management (Scotland) Act 2009. The Directive requires Member States to assess if all watercourses and coastlines are at risk from flooding, to map the flood extent, assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk ^{vii} .
Floodplain	Area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would naturally flow but for the presence of flood defences and other structures where they exist.
Floodplain storage	Floodplains naturally store water during high flows. Storage can be increased through natural or man-made features to increase flood depth or slow flows in order to reduce flooding elsewhere.
Gabion	A metal cage filled with rocks often used in river bank protection.
Green infrastructure	The European Commission defines green infrastructure as “the use of ecosystems, green spaces and water in strategic land use planning to deliver environmental and quality of life benefits. It includes parks, open spaces, playing fields, woodlands, wetlands, road verges, allotments and private gardens. Green infrastructure can contribute to climate change mitigation and adaptation, natural disaster risk mitigation, protection against flooding and erosion as well as biodiversity conservation.” See also ‘blue infrastructure’ ^{viii}

Term	Definition
Groundwater flooding	This type of flooding is caused by water rising up from underlying rocks or flowing from springs. In Scotland groundwater is generally a contributing factor to flooding rather than the primary source.
Integrated catchment study (ICS)	In urban areas, the causes of flooding are complex because of the interactions between rivers, surface water drainage and combined sewer systems and tidal waters. Scottish Water works with SEPA and local authorities to assess these interactions through detailed studies.
Land use planning (LUP)	The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups.
Lead local authority	A local authority responsible for leading the production, consultation, publication and review of a Local Flood Risk Management Plan.
Likelihood of flooding	<p>The chance of flooding occurring.</p> <p>High likelihood: A flood is likely to occur in the defined area on average once in every ten years (1:10). Or a 10% chance of happening in any one year.</p> <p>Medium likelihood: A flood is likely to occur in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.</p> <p>Low likelihood: A flood is likely to occur in the defined area on average once in every thousand years (1:1000). Or a 0.1% chance of happening in any one year.</p>
Local Flood Risk Management Plans (Local FRM Plan)	Local Flood Risk Management Plans, produced by lead local authorities, will take forward the objectives and actions set out in Flood Risk Management Strategies. They will provide detail on the funding, timeline of delivery, arrangements and co-ordination of actions at the local level during each six year FRM planning cycle.
Local Nature Reserve (LNR)	A Local Nature Reserve is a protected area of land designated by a local authority because of its local special natural interest and / or educational value. Local authorities select and designate local nature reserves using their powers under the National Parks and Access to the Countryside Act 1949 ^{ix} .
Local Plan District	Geographical areas for the purposes of flood risk management planning. There are 14 Local Plan Districts in Scotland.
Local Plan District Partnerships	Each LPD has established a local partnership comprised of local authorities, SEPA, Scottish Water and others as appropriate. These partnerships are distinct from the FRM Local Advisory Groups and they retain clear responsibility for delivery of the FRM actions set out in the Local Flood Risk Management Plans. It is the local partnership that makes decisions and supports the delivery of these plans.
Maintenance	Sections 18 and 59 of the Flood Risk Management (Scotland) Act 2009 put duties of watercourse inspection, clearance and repair on local authorities. In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or defences.
Montane habitat	This habitat encompasses a range of natural or near-natural vegetation occurring in the montane zone, lying above or beyond the natural tree-line.
National Flood Management Advisory Group (NFMAG)	The National Flood Management Advisory Group provides advice and support to SEPA and, where required, Scottish Water, local authorities and other responsible authorities on the production of FRM Strategies and Local FRM Plans.
National Flood Risk Assessment (NFRA)	A national analysis of flood risk from all sources of flooding which also considers climate change impacts. Completed in December 2011 this provides the information required to undertake a strategic approach to flood management that identifies areas at flood risk that require further appraisal. The NFRA will be reviewed and updated for the second cycle of FRM Planning by December 2018.

Term	Definition
Natural flood management (NFM)	A set of flood management techniques that aim to work with natural processes (or nature) to manage flood risk.
Non-residential properties	Properties that are not used for people to live in, such as shops or other public, commercial or industrial buildings.
Objectives	Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding.
One in 200 year flood	See 'likelihood of flooding' and 'return period'.
Planning policies	Current national planning policies, Scottish Planning Policy and accompanying Planning Advice notes restrict development within the floodplain and limit exposure of new receptors to flood risk. In addition to national policies, local planning policies may place further requirements within their area of operation to restrict inappropriate development and prevent unacceptable risk.
Potentially Vulnerable Areas (PVA)	Catchments identified as being at risk of flooding and where the impact of flooding is sufficient to justify further assessment and appraisal. There were 243 PVAs identified by SEPA in the National Flood Risk Assessment and these are the focus of the first FRM planning cycle.
Property level protection	Property level protection includes flood gates, sandbags and other temporary barriers that can be used to prevent water from entering individual properties during a flood.
Property level protection scheme	Some responsible authorities may have a formal scheme to provide, install and maintain property level protection for properties.
Ramsar sites	Ramsar sites are wetlands of international importance designated under the Ramsar Convention.
Receptor	Refers to the entity that may be impacted by flooding (a person, property, infrastructure or habitat). The vulnerability of a receptor can be reduced by increasing its resilience to flooding.
Residual risk	The risk that remains after risk management and mitigation. This may include risk due to very severe (above design standard) storms or risks from unforeseen hazards.
Resilience	The ability of an individual, community or system to recover from flooding.
Responsible authority	Designated under the FRM (Scotland) Act 2009 and associated legislation as local authorities, Scottish Water and, from 21 December 2013, the National Park Authorities and Forestry Commission Scotland. Responsible authorities, along with SEPA and Scottish Ministers, have specific duties in relation to their flood risk related functions.
Return period	A measure of the rarity of a flood event. It is the statistical average length of time separating flood events of a similar size. (see likelihood)
Revetment	Sloping structures placed on banks or at the foot of cliffs in such a way as to deflect the energy of incoming water.
Riparian	The riparian area is the interface between land and a river or stream. For the purposes of FRM this commonly refers to the riparian owner, which denotes ownership of the land area beside a river or stream.
River basin management planning (RBMP)	The Water Environment and Water Services (Scotland) Act 2003 transposed the European Water Framework Directive into Scots law. The Act created the River Basin Management Planning process to achieve environmental improvements to protect and improve our water environment. It also provided the framework for regulations to control the negative impacts of all activities likely to have an impact on the water environment.
Runoff reduction	Actions within a catchment or sub-catchment to reduce the amount of runoff during rainfall events. This can include intercepting rainfall,

Term	Definition
	storing water, diverting flows or encouraging infiltration.
Scottish Advisory and Implementation Forum for Flooding (SAIFF)	The stakeholder forum on flooding set up by the Scottish Government to ensure legislative and policy aims are met and to provide a platform for sharing expertise and developing common aspirations and approaches to reducing the impact of flooding on Scotland's communities, environment, cultural heritage and economy.
Sediment balance	Within a river where erosion and deposition processes are equal over the medium to long-term resulting in channel dimensions (width, depth, slope) that are relatively stable.
Sediment management	Sediment management covers a wide range of activities that includes anything from the small scale removal of dry gravels to the dredging of whole river channels and the reintroduction of removed sediment into the water environment. Historically, sediment management has been carried out for several reasons, including reducing flood risk, reducing bank erosion, for use as aggregate and to improve land drainage.
Self help	Self help actions can be undertaken by any individuals, businesses, organisations or communities at risk of flooding. They are applicable to all sources, frequency and scales of flooding. They focus on awareness raising and understanding of flood risk.
Sewer flooding (and other artificial drainage system flooding)	Flooding as a result of the sewer or other artificial drainage system (e.g. road drainage) capacity being exceeded by rainfall runoff or when the drainage system cannot discharge water at the outfall due to high water levels (river and sea levels) in receiving waters.
Site protection plans	Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network.
Shoreline Management Plan (SMP)	A Shoreline Management Plan is a large scale assessment of the coastal flood and erosion risks to people and the developed, historic and natural environment. It sets out a long-term framework for the management of these risks in a sustainable manner.
Site of Special Scientific Interest (SSSI)	Sites of Special Scientific Interest are protected by law under the Nature Conservation (Scotland) Act 2004 to conserve their plants, animals and habitats, rocks and landforms ^x .
Source of flooding	The type of flooding. This can be coastal, river, surface water or groundwater.
Special Area of Conservation (SAC)	Special Areas of Conservation are strictly protected sites designated under the European Habitats Directive. The Directive requires the establishment of a European network of protected areas which are internationally important for threatened habitats and species ^{xi} .
Special Protection Areas (SPA)	Special Protection Areas are strictly protected sites classified in accordance with the European Birds Directive. They are classified for rare and vulnerable birds (as listed in the Directive), and for regularly occurring migratory species ^{xii} .
Standard of protection (SoP)	All flood protection structures are designed to be effective up to a specified flood likelihood (Standard of Protection). For events beyond this standard, flooding will occur. The chosen Standard of Protection will determine the required defence height and / or capacity.
Storage area	A feature that can be used to store floodwater, this can be natural in the form of low lying land or manmade such as a reservoir or modified landform.
Strategic Environmental Assessment (SEA)	A process for the early identification and assessment of the likely significant environmental effects, positive and negative, of activities. Often considered before actions are approved or adopted.
Strategic Flood Risk Assessment (SFRA)	A Strategic Flood Risk Assessment is designed for the purposes of specifically informing the Development Plan Process. A SFRA involves the collection, analysis and presentation of all existing and readily available flood risk information (from any source) for the area of interest. It constitutes a strategic overview of flood risk.

Term	Definition
Strategic mapping and modelling	Strategic mapping and modelling actions have been identified in locations where SEPA is planning to undertake additional modelling or analysis of catchments and coastlines, working collaboratively with local authorities where appropriate, to improve the national understanding of flood risk.
Surcharge	Watercourses and culverts can carry a limited amount of water. When they can no longer cope, they overflow, or 'surcharge'.
Surface water flooding	Flooding that occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead ^{xiii}
Surface water management plan (SWMP)	A plan that takes an integrated approach to drainage accounting for all aspects of urban drainage systems and produces long term and sustainable actions. The aim is to ensure that during a flood the flows created can be managed in a way that will cause minimum harm to people, buildings, the environment and business.
Surface water plan/study	The management of flooding from surface water sewers, drains, small watercourses and ditches that occurs, primarily in urban areas, during heavy rainfall. FRM Strategy actions in this category include: Surface Water Management Plans, Integrated Catchment Studies and assessment of flood risk from sewerage systems (FRM Act Section 16) by Scottish Water. These have been selected as appropriate for each Potentially Vulnerable Area.
Sustainable flood risk management	The sustainable flood risk management approach aims to meet human needs, whilst preserving the environment so that these needs can be met not only in the present, but also for future generations. The delivery of sustainable development is generally recognised to reconcile three pillars of sustainability – environmental, social and economic.
Sustainable drainage systems (SuDS)	A set of techniques designed to slow the flow of water. They can contribute to reducing flood risk by absorbing some of the initial rainfall and then releasing it gradually, thereby reducing the flood peak and helping to mitigate downstream problems. SuDS encourage us to take account of quality, quantity and amenity / biodiversity.
UK Climate Change Projections (UKCP09)	The leading source of climate change information for the UK. It can help users to assess their climate risks and plan how to adapt to a changing climate. The high emissions scenario refers to the SRES A1F1 emission scenario. See Annex 1 of the UKCP09 Climate change projections report for details. ^{xiv}
Utility assets	Within the FRM Strategies this refers to electricity sub stations, mineral and fuel extraction sites, telephone assets, television and radio assets.
Voe	A dialect term, common in place names and used to refer to a small bay or creek in Orkney or Shetland.
Vulnerability	A measure of how likely someone or something is to suffer long-term damage as a result of flooding. It is a combination of the likelihood of suffering harm or damage during a flood (susceptibility) and the ability to recover following a flood (resilience).
Wave energy dissipation	Process by which a wave loses its energy.
Wave overtopping	Wave overtopping occurs when water passes over a flood wall or other structure as a result of wave action. Wave overtopping may lead to flooding particularly in exposed coastal locations.

ⁱ <http://apps.sepa.org.uk/bathingwaters/> accessed 14/10/2015 last updated 2015

ⁱⁱ <http://www.susdrain.org/delivering-suds/using-suds/suds-components/swales-and-conveyance-channels/swales.html> accessed 12/10/2015 last updated 2012

ⁱⁱⁱ <http://www.gov.scot/Resource/Doc/362219/0122541.pdf> accessed 12/10/2015 last updated 2011

^{iv} <http://www.legislation.gov.uk/ukpga/2004/36/schedule/1> accessed 12/10/2015 last updated 2004

^v <http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter9.aspx?pagenum=10> accessed 12/10/2015 last update 07/03/2012

^{vii} http://ec.europa.eu/environment/water/flood_risk/ accessed 12/10/2015 last updated 17/09/2015

^{viii} <http://www.gov.scot/Resource/Doc/362219/0122541.pdf> accessed 12/10/2015 last updated 2011

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- ^{ix} <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/local-designations/lnr/> accessed 12/10/2015 last updated 12/07/2015
- ^x <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/sssisi/> accessed 12/10/2015 last updated 21/01/2015
- ^{xi} <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/international-designations/sac/> accessed 12/10/2015 last updated 01/03/2013
- ^{xii} <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/international-designations/spa/> accessed 12/10/2015 last updated 01/03/2013
- ^{xiii} <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw#x=357683&y=355134&scale=2> accessed 12/10/2015 last updated 12/10/2015
- ^{xiv} <http://ukclimateprojections.metoffice.gov.uk> Document © Crown copyright 2009 accessed 01/12/15 last updated 30/04/2012

Annex 2: Land use planning

Flood risk management actions from national planning policies
<p>AVOID DEVELOPMENT IN MEDIUM TO HIGH RISK AREAS</p> <p>a) Planning authorities work in partnership undertaking catchment-wide Strategic Flood Risk Assessments to inform their development plan allocations in line with SEPA's guidance and Land Use Vulnerability.</p> <p>b) Planning authorities and SEPA require the submission of flood risk assessments that accord with SEPA's <i>Technical Flood Risk Guidance for Stakeholders</i>, to support planning applications where there is a potential flood risk. The flood risk assessment should be used to demonstrate as far as possible that the development will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, takes opportunities to reduce flood risk overall.</p> <p>c) SEPA ensures that its flood risk advice to planning authorities is clear and appropriate. SEPA, in consultation with planning authorities, undertakes an annual assessment of planning advice and its contribution to flood risk.</p> <p>d) SEPA and planning authorities engage at an early stage of the development plan process to agree appropriate forms of development to help inform the preparation and implementation of Strategic Flood Risk Assessments.</p>
<p>REDUCE IMPACTS TO EXISTING BUILDINGS</p> <p>a) SEPA, planning authorities and local communities are required to engage at an early stage of the development plan process to agree the best long term land uses for areas where relocation, abandonment and/or change of use have been identified to deliver sustainable flood risk management. Where possible, new land uses should aim to achieve multiple benefits for local communities such as the creation of blue / green infrastructure and increased resilience to climate change.</p>
<p>PROTECT AND ENHANCE NATURAL FEATURES THAT HAVE A POSITIVE IMPACT ON REDUCING OVERALL FLOOD RISK</p> <p>a) SEPA and planning authorities are required to engage early in the development plan process to identify opportunities for the restoration and protection of natural features which help manage flood risk. Opportunities should be maximised to achieve multiple benefits such as the development of green / blue infrastructure and improved place making. Areas of land that may contribute to flood management should be identified and protected.</p>
<p>NEW DEVELOPMENTS ARE DESIGNED TO ENSURE THAT SURFACE WATER DRAINAGE DOES NOT INCREASE FLOOD RISK ON OR OFF SITE</p> <p>a) SEPA prepares guidance for planning authorities and developers on the use of surface water hazard maps for land use planning purposes.</p> <p>b) Planning authorities support the implementation of Surface Water Management Plans, developed by the local authorities, through development plan allocations and policies. Surface Water Management Plans should take account of development opportunities that could contribute to the reduction of surface water flood risk.</p> <p>c) SEPA engages at an early stage of the development plan process to progress exemplar projects that demonstrate the potential for land use planning to mitigate surface water flooding and contribute to wider environmental benefits.</p>
<p>a) NEW DEVELOPMENT IS RESILIENT TO PREDICTED FUTURE CHANGES IN CLIMATE Planning authorities ensure that climate change is considered in Strategic Flood Risk Assessments and Flood Risk Assessments, based upon the best scientific evidence and the information requirements of planners to make informed decisions.</p>

Table 1: Objectives and actions that reflect national Land Use Planning policies and guidance

Annex 3: Acknowledgements

SEPA gratefully acknowledges the cooperation and input that various parties have provided, including *inter alia*, the following organisations:

Ordnance Survey

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Local authorities

SEPA acknowledges the provision of flood models and other supporting data and information from local authorities in Scotland and their collaboration in the production of flood risk management information.

Scottish Water

SEPA acknowledges the inclusion of surface water flooding data generated by Scottish Water in preparation of flood risk information.

Further detail on the datasets that have been used in the development of the Flood Risk Management Strategies can be found in the Strategic Appraisal Methodology, which is available from the SEPA webpage.

