Flood Risk Management Strategy

North East

SEPA

Scottish Environment Protection Agency

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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 13,000 residential and 3,600 non-residential properties are at risk of flooding in the North East Local Plan District. Aberdeen City, Stonehaven and Inverurie 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 £29 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 Aberdeenshire 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 Aberdeenshire Council, Aberdeen City Council, The Moray Council, Scottish Water and others with an interest in flood management. 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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Section 1: Flood risk management in Scotland

North East 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:

- Aberdeenshire Council (lead local authority), Aberdeen City Council, and The Moray Council;
- Cairngorms National Park;
- 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, Scottish Water and the Cairngorms National Park 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 North East Local Advisory Group includes representatives from a range of sectors, including government agencies, National Park Authorities, local authorities, non-government organisations, utility companies and land and asset managers.

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 into 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 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

North East 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

2.1 Summary of flooding in the North East Local Plan District

The North East Local Plan District extends from the Outer Moray Firth in the north, to the central and eastern Grampians in the south. It has an area of approximately 6,500km^2 and a coastline with a length of approximately 220km. There are 23 Potentially Vulnerable Areas in the North East Local Plan District.

Flood risk in the North East

There are approximately 13,000 residential properties and 3,600 non-residential properties at risk of flooding within the Local Plan District. This equates to approximately 15% of all properties at risk of flooding nationally. Within the Local Plan District, approximately 5% of all residential properties and 10% of all non-residential properties are at risk and it is estimated that 87% of these are located within Potentially Vulnerable Areas. The Annual Average Damages from flooding (see glossary) are approximately £29 million, with an estimated 69% of the total damages for the entire Local Plan District accounted for in the Potentially Vulnerable Areas.

The main source of flooding is from rivers which accounts for approximately 81% of the Annual Average Damages (Figure 1). The Annual Average Damages caused by river floods are £23.5 million with those caused by surface water and coastal floods being approximately £5.2 million and £270,000 respectively. Note however that flooding from wave overtopping is not fully represented in the general assessment of flood risk. The number of properties at risk of flooding and the Annual Average Damages from coastal flooding may be underestimated.

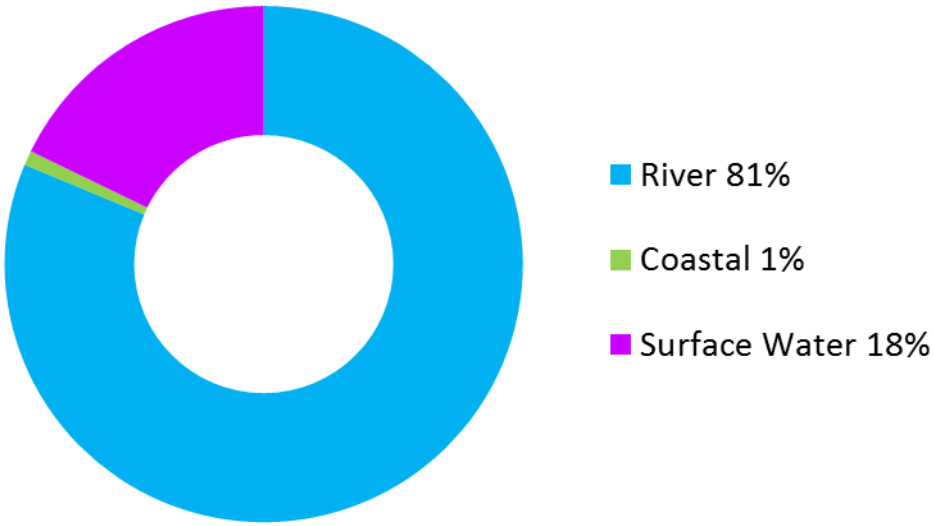


Figure 1: Annual Average Damages by flood source

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 are not included as information on damages at this scale is not available.

	Residential and non-residential properties at risk of flooding	Annual Average Damages
Aberdeen City	11,000	£15 million
Stonehaven	860	£980,000
Inverurie and Port Elphinstone	340	£460,000
Ballater	230	£220,000
Peterculter	200	£310,000
Dyce	190	£2.6 million
Huntly	150	£440,000
Ellon	110	£290,000
Banff and Macduff	100	£280,000
Peterhead	90	£580,000

Table 1: Main areas at risk of flooding

Background information on the North East Local Plan District

The extent of the North East Local Plan District and the location of the Potentially Vulnerable Areas are shown in Figure 2.

The population of the Local Plan District is approximately 500,000. The largest urban area is Aberdeen with a population of approximately 220,000 people. The Local Plan District contains three local authorities (Aberdeen City Council, Aberdeenshire Council and Moray Council) and parts of the Cairngorms National Park.

Approximately 3% of the area of the North East Local Plan District is classified as urban. The two main types of land cover are arable and horticulture, and improved grassland. Each covers approximately 23% of the area. Coniferous woodland, heather and montane habitats are also present, each covering between 9% and 12% of the area.

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

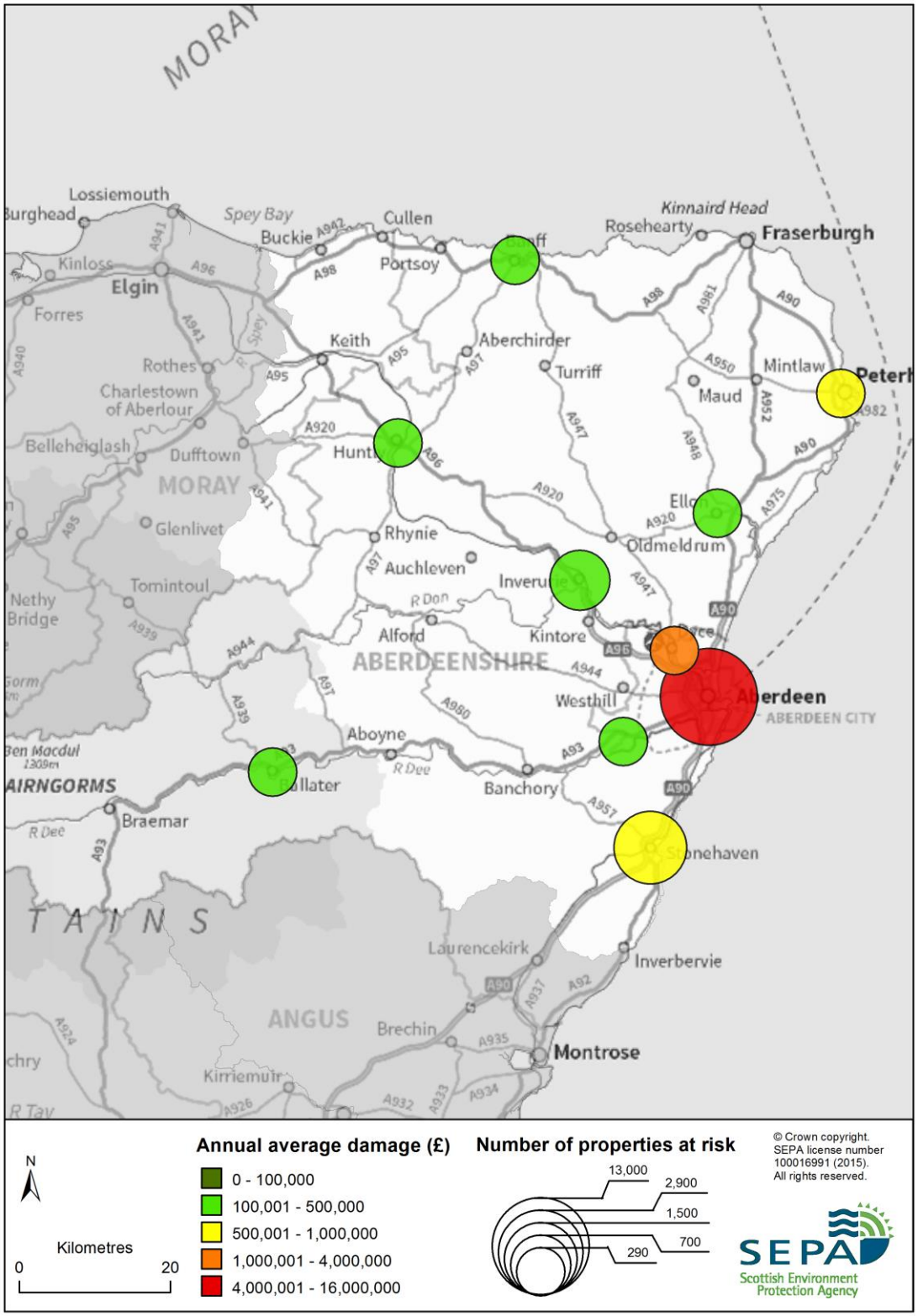


Figure 3: The North East Local Plan District areas with most properties at risk of flooding and associated damages

Objectives and actions in the North East 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 the North East Local Plan District	Avoid an overall increase in flood risk	600001	• 13,000 residential properties • 3,600 non-residential properties • 28,000 people
Applies across the North East Local Plan District	Reduce overall flood risk	600002	• 13,000 residential properties • 3,600 non-residential properties • 28,000 people

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	**Reduce overall flood risk.** (600002)		
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** (6000020011)		
Objective (ID):	**Reduce overall flood risk.** (600002)		
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** (6000020013)		
Objective (ID):	**Reduce overall flood risk.** (600002)		
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. Local authorities will be undertaking additional awareness raising activities, further details will be set out in the Local FRM Plans.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	**Reduce overall flood risk.** (600002)		
Delivery lead:	Local authority, 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. 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.		

Action (ID):	**EMERGENCY PLANS / RESPONSE** (6000020014)		
Objective (ID):	**Reduce overall flood risk.** (600002)		
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** (6000010001)		
Objective (ID):	**Avoid an overall increase in flood risk.** (600001) **Reduce overall flood risk.** (600002)		
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.

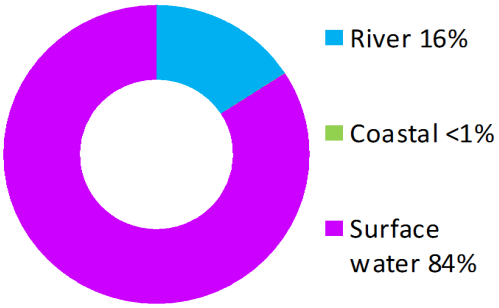
PVA	Flood protection scheme/ works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning*	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/ response	Planning policies
06/01				✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/02				✓			✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/03				✓			✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/04							✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/05						✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/06	✓					✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
06/07							✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/08			✓	✓		✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/09			✓					N/A	N/A	✓			✓	✓	✓		✓	✓
06/10	✓					✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/11				✓			✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/12			✓	✓			✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/13	✓			✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/14								N/A	N/A	✓			✓	✓	✓	✓	✓	✓
06/15			✓	✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/16				✓		✓	✓	✓	N/A	✓			✓	✓	✓		✓	✓
06/17						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/18			✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
06/19	✓				✓	✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
06/20				✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/21							✓	N/A	✓	✓			✓	✓	✓		✓	✓
06/22				✓			✓	N/A	✓	✓		✓	✓	✓	✓		✓	✓
06/23	✓		✓	✓		✓	✓	N/A	✓	✓		✓	✓	✓	✓		✓	✓

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

Portgordon (Potentially Vulnerable Area 06/01)

Local Plan District	Local authority	Main catchment
North East	The Moray Council	Banff coastal

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- <10 non-residential properties
- £8,500 Annual Average Damages

(damages by flood source shown left)

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.

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

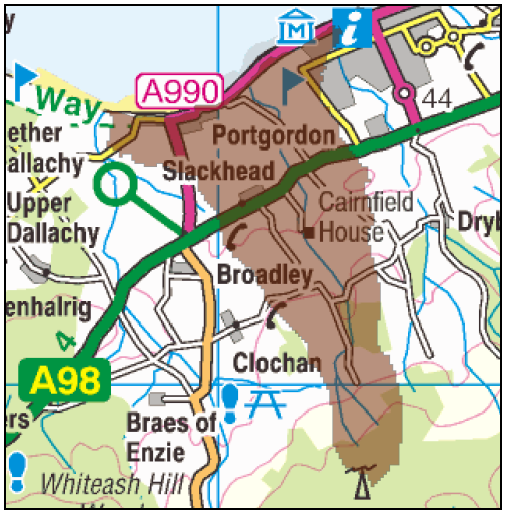
Portgordon (Potentially Vulnerable Area 06/01)

Local Plan District	Local authority	Main catchment
North East	The Moray Council	Banff coastal

Background

This Potentially Vulnerable Area is located on the Moray Firth, covering approximately 13km^2.

The area covers the coastline from Seatown, Buckie to the outfall of the Burn of Tynet in the west, together with the mainly rural areas to the south.



The A98 and A990 pass through this Potentially Vulnerable Area.

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

The Annual Average Damages are approximately £8,500. The majority of these are attributed to surface water flooding, however it is recognised that wave overtopping causes flooding to a number of properties in Portgordon and Buckie.

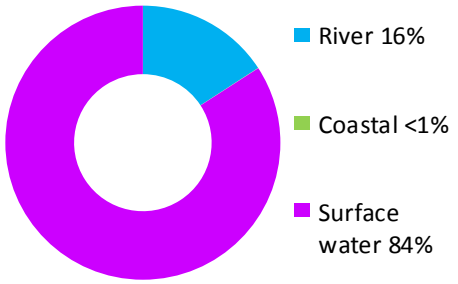


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flooding from wave action is not fully represented in the assessment of flood risk in this Potentially Vulnerable Area and it is known that the number of properties at risk and the damages from coastal flooding are currently underestimated. Coastal flooding from overtopping waves is known to occur at Portgordon and Buckie and this has been taken into account in the setting of objectives and evaluating of actions.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. The A98 and A990 are at risk of flooding in addition to small areas of agricultural land and a designated environmental site.

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 roads.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,200)	<10	<10	10
Non-residential properties (total 60)	<10	<10	<10
People	<10	10	20
Community facilities	0	0	0
Utilities assets	0	<10	<10
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km^2)	<0.1	<0.1	<0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.2	0.2	0.2

Table 1: Summary of flooding impacts[1]

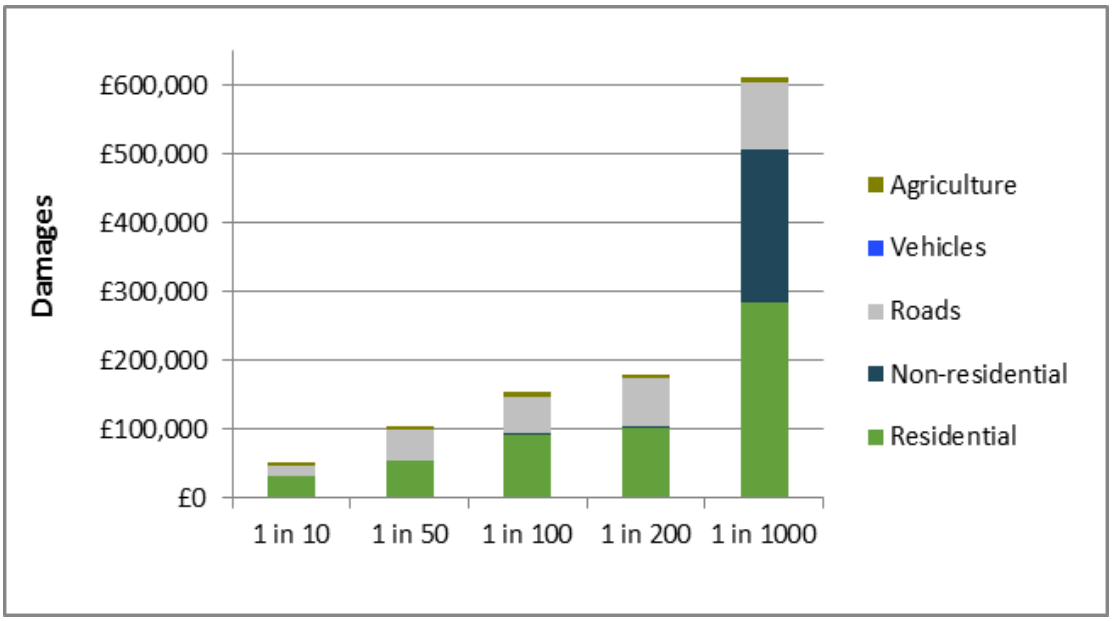


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

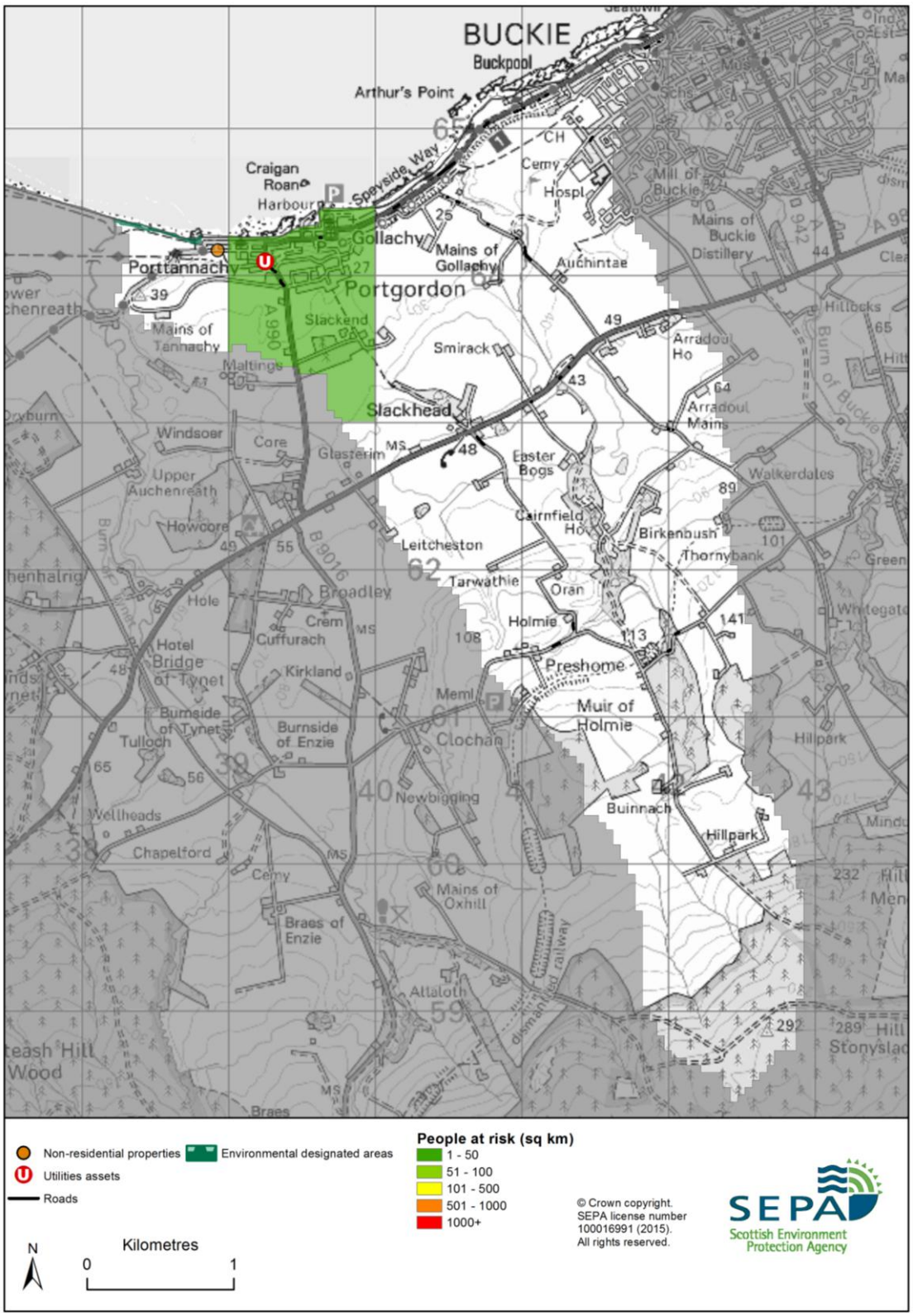


Figure 3: Impacts of flooding

History of flooding

The highest impact flood on record is the January 1953 North Sea flood which resulted in evacuation of residents, flooding to properties and collapse of the harbour wall. The majority of properties in Lennox Place and Stewart Street were flooded. When flood waters retreated many properties were disinfected to eradicate colonies of sea lice, which had accompanied the flooding.

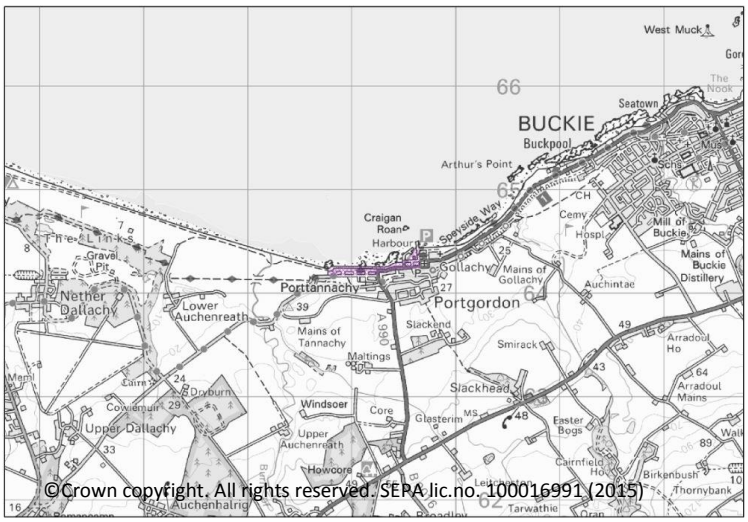
In January 1978, storms caused wave overtopping which flooded Stewart Street and Lennox Place in Portgordon. Coastal flooding of properties in the Portgordon area also occurred in 1983 and 1985. In September 1999 a heavy downpour overwhelmed gullies and water flowed onto the A990 and into Portgordon. In 2002 and 2004 there were various instances of flooding to gardens and garages in Richmond Place, Portgordon due to a piped watercourse becoming blocked.

Some properties in Buckie are also subject to coastal flooding from wave action.

Objectives to manage flooding in Potentially Vulnerable Area 06/01

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 Portgordon Potentially Vulnerable Area.

Reduce risk in Portgordon from coastal flooding

Indicators:	Target area:
• 80 people • £25,000 Annual Average Damages from residential properties	
Objective ID: 600101	

Target area	Objective	ID	Indicators within PVA
Portgordon	Reduce risk from surface water flooding in Portgordon and Buckie	600102	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• <10 residential properties • £8,500 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• <10 residential properties • £8,500 Annual Average Damages
Applies across North East 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 06/01 there are <10 residential properties at risk and Annual Average Damages of £7,000.

Actions to manage flooding in Potentially Vulnerable Area 06/01

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 Portgordon 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 STUDY** (6001010005)		
Objective (ID):	Reduce risk in Portgordon from coastal flooding (600101)		
Delivery lead:	The Moray Council		
Priority:	National:	Within local authority:	
	150 of 168	**2 of 2**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of coastal flooding to Portgordon. The flood protection study should include the investigation of coastal management actions and direct defences. Other actions may also be considered to develop the most sustainable range of options.		
Potential impacts			
Economic:	The study could benefit 37 residential and three non-residential properties at risk of flooding in this location, with potential damages avoided of up to £790,000. It is thought that risk to properties is underestimated. With further information on the impact of wave overtopping and flood depths the number of properties at risk and damages avoided could change.		
Social:	The development of flood protection works following the study would potentially reduce flood risk to 81 people. Stewart Street would also benefit from reduced risk, improving access to the properties along the frontage. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.		

Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should ensure the actions avoid or minimise the potential loss of natural habitat, do not interfere with coastal processes and ensure no negative effects to the Spey Bay Site of Special Scientific Interest. 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 Spey Bay Special Area of Conservation.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6001020018)		
Objective (ID):	Reduce risk from surface water flooding in Portgordon and Buckie (600102)		
Delivery lead:	The Moray Council		
Status:	**Ongoing**	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** (6001010016)		
Objective (ID):	Reduce risk in Portgordon from coastal flooding (600101)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the Banff to Lossiemouth area to improve understanding of the coastal flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Portgordon to Cullen' flood warning area which is part of the Moray Firth coastal flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	The Moray 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.		

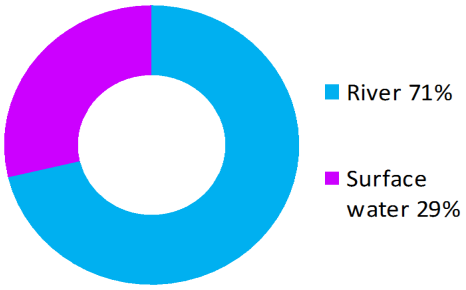
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Portsoy (Potentially Vulnerable Area 06/02)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council, The Moray Council	Banff coastal

Summary of flooding impacts



At risk of flooding

- 10 residential properties
- <10 non-residential properties
- £53,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

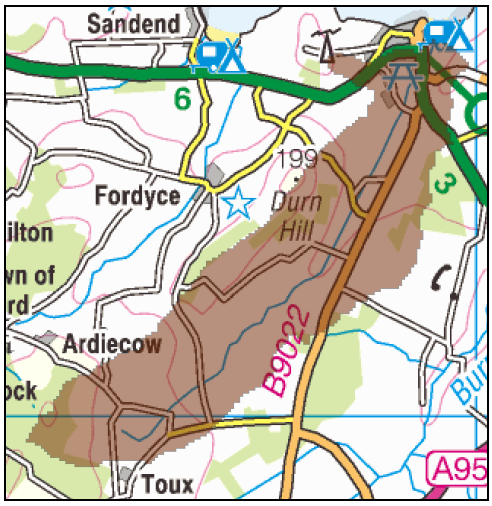
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	*Maintain flood warning*	Awareness raising	*Surface water plan/study*	Emergency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

Portsoy (Potentially Vulnerable Area 06/02)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Banff coastal

Background

This Potentially Vulnerable Area includes the south east of Portsoy and rural areas along the Burn of Durn to the south west. It is approximately 17km^2.



The Burn of Durn and Soy Burn flow through the area.

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

The Annual Average Damages are approximately £53,000 with the majority of these from river flooding.

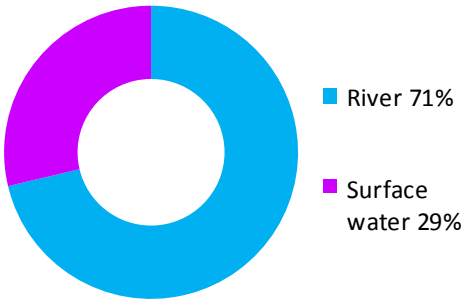


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flood risk in this area is from the Burn of Durn and from the Soy Burn which is a small watercourse flowing to the south of the A98 and draining into Loch Soy.

The risk of flooding to people and 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. This includes damages to the transport network notably the A98, B9022 and the B9139. For this Potentially Vulnerable Area the highest damages are to residential properties.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 390)	10	10	10
Non-residential properties (total 670)	<10	<10	<10
People	20	20	30
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 20 locations	Roads at 20 locations
Environmental designated areas (km^2)	<0.1	<0.1	<0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.3	0.4	0.4

Table 1: Summary of flooding impacts[1]

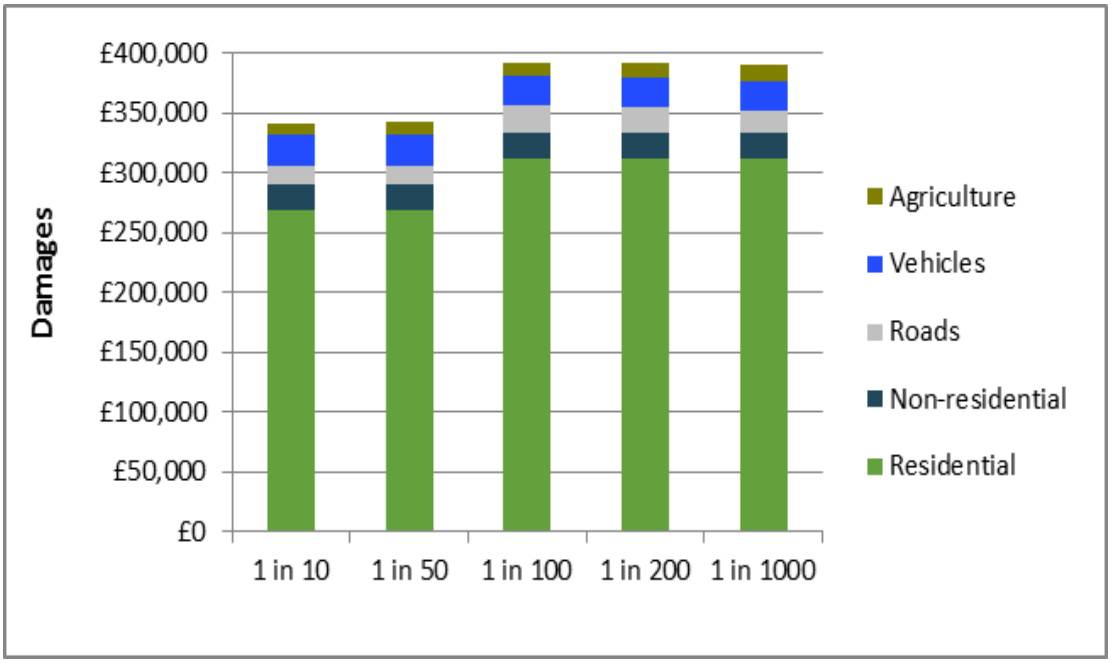


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

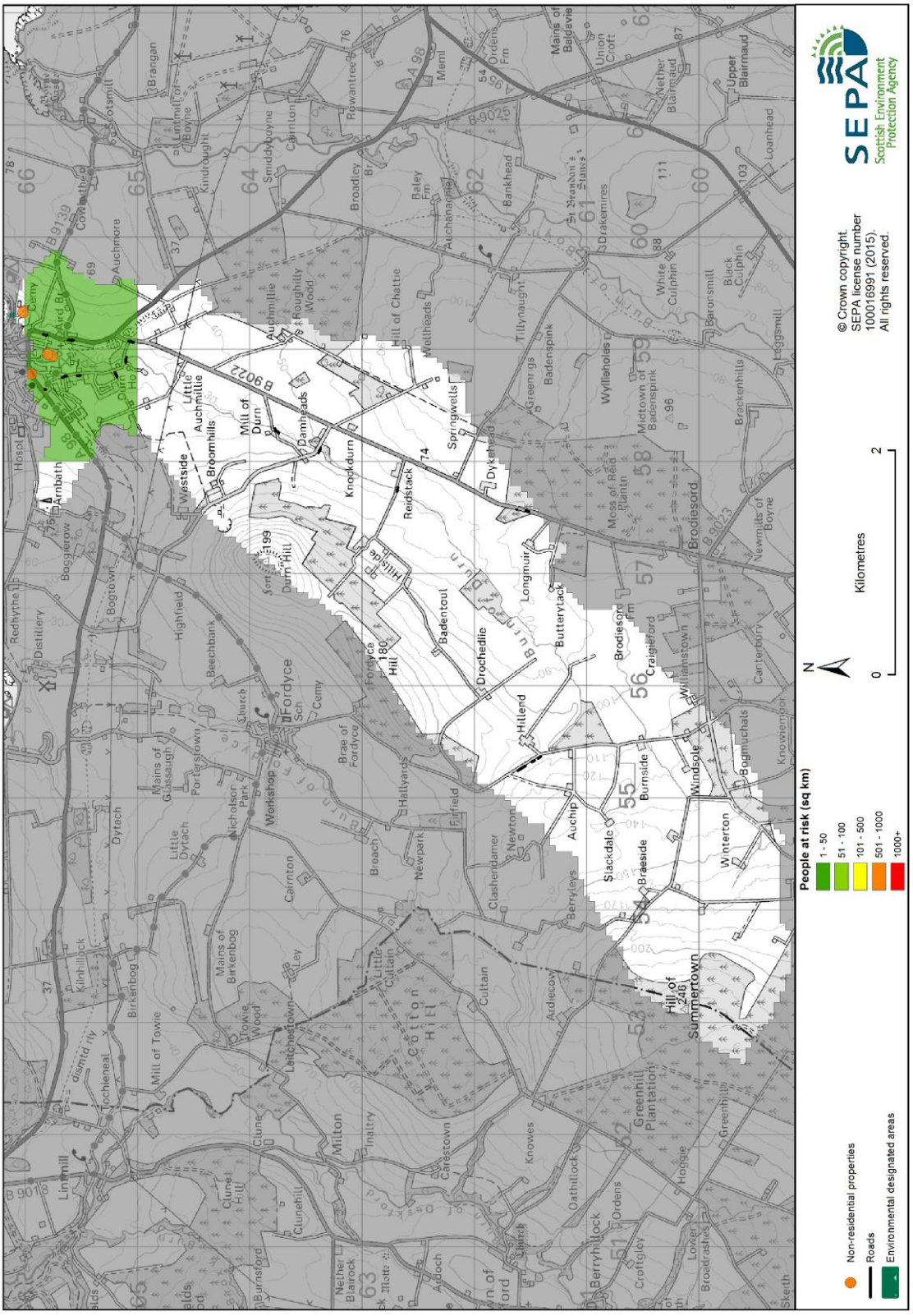


Figure 3: Impacts of flooding

History of flooding

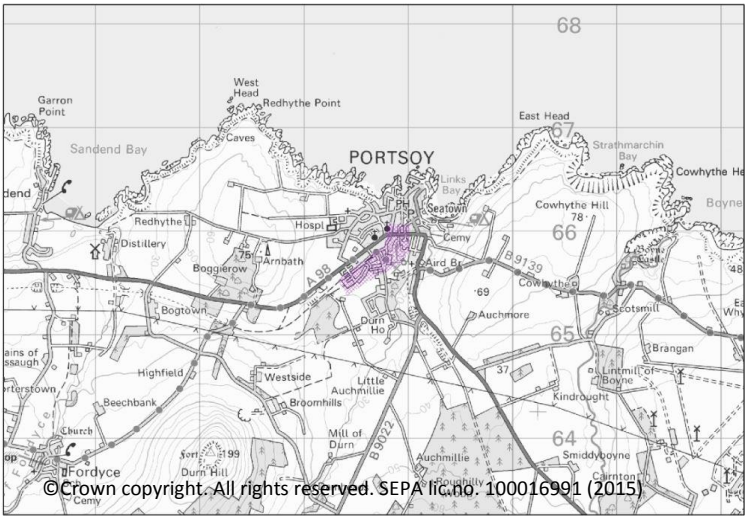
The Soy Burn and Loch Soy are known sources of flood risk with a number of properties having been repeatedly flooded. For example, the Soy Burn caused flooding of properties in Soy Avenue, Portsoy in 2001, 2008, and 2009.

Just outside of this Potentially Vulnerable Area, there are issues with coastal erosion and flooding around the mouth of the Burn of Durn. A graveyard is affected by erosion and in the past, a landslip near the mouth of the Burn of Durn caused a blockage in the burn, resulting in the flooding of a listed building.

Objectives to manage flooding in Potentially Vulnerable Area 06/02

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 Portsoy Potentially Vulnerable Area.

Reduce flood risk in the vicinity of Loch Soy and Soy Avenue from the Soy Burn

Indicators:	Target area:
• 20 people • £4,700 Annual Average Damages from residential properties	
Objective ID: 600201	

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 10 residential properties • £53,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 10 residential properties • £53,000 Annual Average Damages
Applies across North East 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 06/02

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 Portsoy 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 STUDY** (6002010005)		
Objective (ID):	Reduce flood risk in the vicinity of Loch Soy and Soy Avenue from the Soy Burn (600201)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	166 of 168	**12 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of flooding to Soy Avenue. This should build on a previous study on Soy Burn. The flood protection study should primarily focus on storage and natural flood management (sediment management, runoff control, river/floodplain restoration), modification of conveyance, property level protection and relocation to reduce the likelihood of flooding from the Soy Burn, but other actions may also be considered in order to develop the most sustainable range of options.		
Potential impacts			
Economic:	The study could benefit ten residential properties at risk of flooding in this location, with potential damages avoided of up to £140,000.		
Social:	The development of flood protection works following the study would potentially reduce risk to 22 people - however this is to be confirmed as part of the study. The people at risk have greater vulnerability to flooding as the residential properties at risk are single storey with elderly residents. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Natural flood management actions can restore and enhance natural environments and create opportunities for		

Social:	recreation and tourism. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should consider how to avoid or minimise potential negative effects such as disturbance of sediment and barriers to fish passage. The preferred action should be designed to work with natural processes where feasible.

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire Council and The Moray 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.		

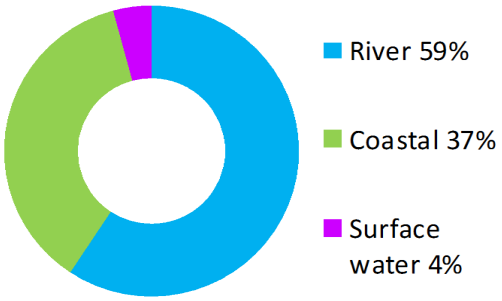
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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. There is a level gauge and camera at the upstream end of Soy Burn culvert to provide an early warning of high water levels for properties on Soy Avenue.		

Action (ID):	**PLANNING POLICIES** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Banff (Potentially Vulnerable Area 06/03)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Banff coastal

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- 30 non-residential properties
- £50,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

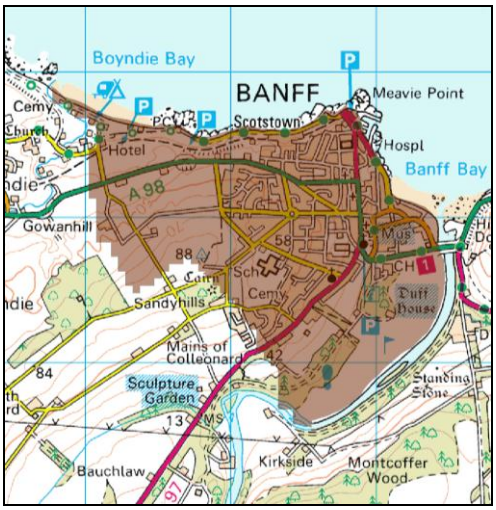
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	Maintain flood warning	Awareness raising	*Surface water plan/study*	Emergency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

Banff (Potentially Vulnerable Area 06/03)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Banff coastal

Background

This Potentially Vulnerable Area covers the town of Banff. The area is on the west bank of the River Deveron and extends to the Burn of Boyndie. It is approximately 3km^2.



The A97 and A98 pass through the area and the River Deveron is the main river.

There are approximately 40 residential and 30 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £50,000 with the majority due to river flooding.

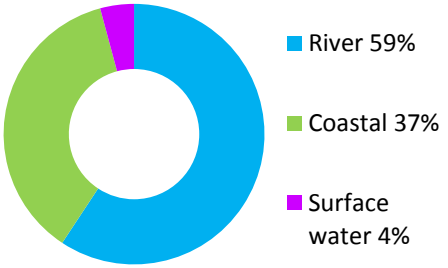


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Coastal flood risk is mainly limited to properties immediately adjacent to the seafront in Scotstown and Banff Bay. Flooding from wave action is not fully represented in the assessment of flood risk in this Potentially Vulnerable Area and the number of properties at risk and the damages from coastal flooding are thought to currently be underestimated.

The risk of river flooding is associated with the River Deveron and mainly affects the Duff House Royal Golf Course. River flooding is also shown to extend north and east from the A98. However, there is some uncertainty as to whether this would actually occur due to the damming effect of the A98 embankment.

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

Five designated cultural heritage sites and a small area of designated environmental sites are at risk of flooding within this area. This includes the Whitehills to Melrose Coast Site of Special Scientific Interest.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,000)	<10	40	210
Non-residential properties (total 420)	<10	30	70
People	<10	90	470
Community facilities	0	0	0
Utilities assets	0	0	<10
Transport links (excluding minor roads)	Roads at 10 locations	Roads at 20 locations	Roads at 30 locations
Environmental designated areas (km^2)	<0.1	<0.1	<0.1
Designated cultural heritage sites	4	5	5
Agricultural land (km^2)	0.1	0.4	0.5

Table 1: Summary of flooding impacts[1]

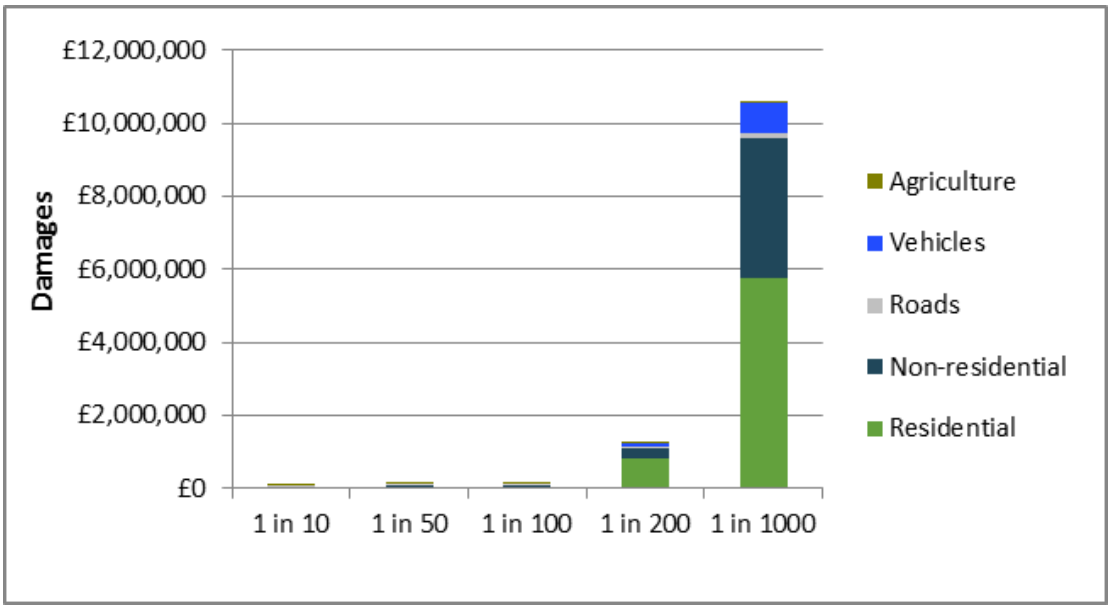


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

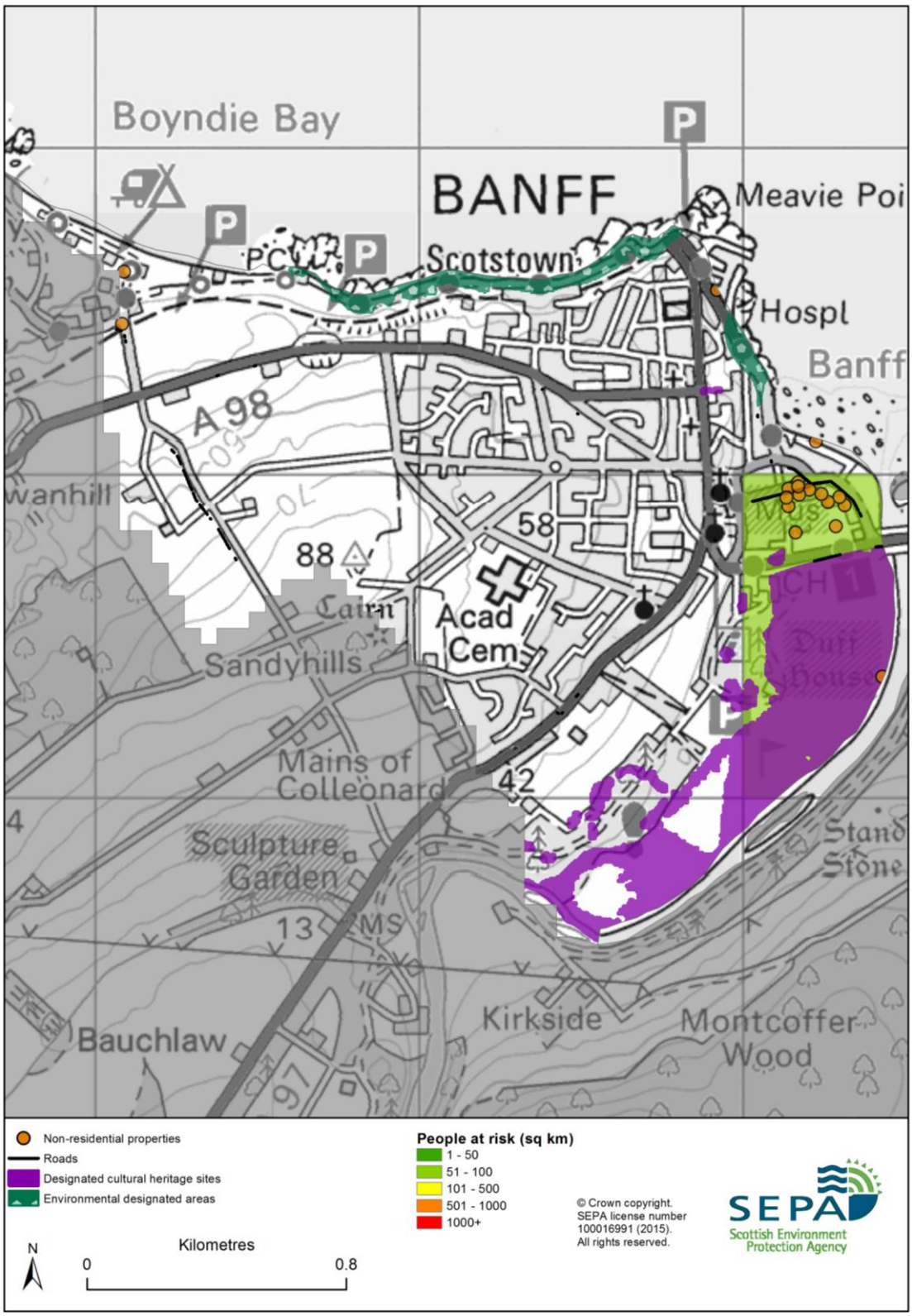


Figure 3: Impacts of flooding

History of flooding

There is a long history of flooding in Banff from the River Deveron. The earliest recorded flood was in 1768 when the Deveron flooded and destroyed an important bridge. The Deveron has also flooded at Banff in 1835, 1855, 1859, 1873, 1875 and 1882 affecting property, farmland and the railway line. The golf course was badly flooded in 2009 however the flooding did not extend to Duff House or the town.

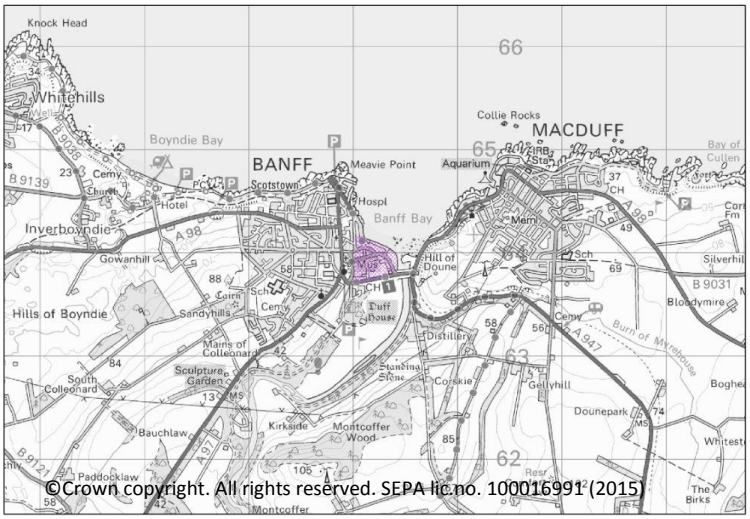
The most damaging flood on record is the 1953 North Sea flood. A gasworks was washed into the sea, buildings and their protective wall were destroyed and many properties inundated with floodwater. In December 2013 there was localised coastal flooding of five properties and significant wave damage in the inner part of Banff Bay. Coastal flooding from overtopping waves is also known to impact on some local access roads including the road to the community centre.

Surface water flooding affected Low Street, Banff in August 2006.

Objectives to manage flooding in Potentially Vulnerable Area 06/03

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 Banff Potentially Vulnerable Area.

Reduce risk in Banff from the River Deveron and coastal flooding

Indicators:	Target area:
• 100 people • £18,000 Annual Average Damages from residential properties	
Objective ID: 600301	

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 40 residential properties • £50,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 40 residential properties • £50,000 Annual Average Damages
Applies across North East 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 06/03

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 Banff 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 STUDY** (6003010005)		
Objective (ID):	Reduce risk in Banff from the River Deveron and coastal flooding (600301)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	164 of 168	**11 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of coastal flooding to Banff. The study should primarily focus on coastal management actions, direct defences, relocation and property level protection, but other actions may also be considered in order to develop the most sustainable range of options. The study should assess the impact from wave overtopping to confirm the existing risk and define the height and extent of flood protection works required.		
Potential impacts			
Economic:	The flood protection study should confirm the economic impacts and number of properties at risk. Currently it is estimated that seven residential and three non-residential properties are at risk. This estimate is based on local knowledge as the properties are at risk from wave overtopping which could not be assessed in SEPA flood maps. Potential damages avoided of up to £150,000 could be achieved. With further information on the impact of wave overtopping and flood depths, these values could change.		
Social:	The development of flood protection works following the study would potentially reduce risk to 15 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community		

Social:	and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should ensure the actions avoid or minimise the potential loss of natural habitat and do not interfere with coastal processes. It should also ensure the actions have no negative effects to the Whitehills to Melrose Coast Site of Special Scientific Interest to the north of the area at risk or on Banff conservation area.

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6003010016)		
Objective (ID):	Reduce risk in Banff from the River Deveron and coastal flooding (600301)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the Banff area to improve understanding of the coastal flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6003020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The road embankment potentially provides some protection to the properties at risk. This needs to be investigated to confirm the standard of protection provided by the embankment and any residual risk. SEPA will review existing modelling for this area in partnership with Aberdeenshire Council to determine if any improvements can be made to the flood maps. SEPA will support the local authority if further work beyond a strategic scale is required.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Banff' flood warning area which is part of the Deveron river flood warning scheme. Continue to maintain the 'Portsoy to Macduff' flood warning area which is part of the Moray Firth coastal flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

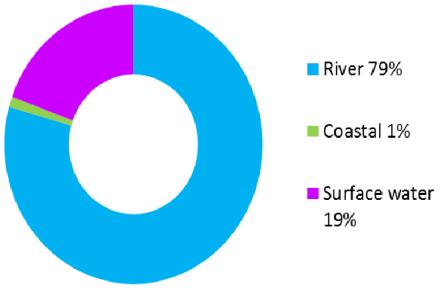
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Macduff (Potentially Vulnerable Area 06/04)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Banff coastal

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- 20 non-residential properties
- £240,000 Annual Average Damages

(damages by flood source shown left)

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.

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

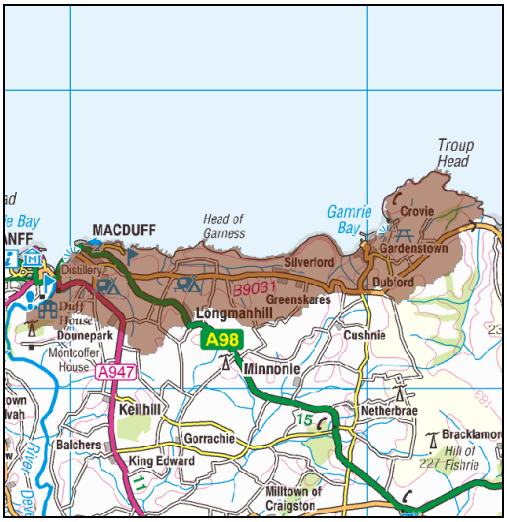
Macduff (Potentially Vulnerable Area 06/04)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Banff coastal

Background

This Potentially Vulnerable Area is located in the Moray Firth to the east of Banff. It is approximately 36km^2 and extends from the River Deveron at Banff Bay to the Tore Burn east of Troup Head.

The A98 passes through the area.



The River Deveron is the main river in this area with smaller burns draining northwards into the Moray Firth.

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

The Annual Average Damages are approximately £240,000 with the majority from river flooding. It is recognised however that wave overtopping contributes to coastal flooding which is not fully represented in this analysis.

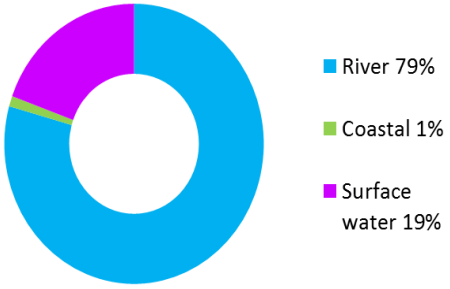


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flooding from wave action is not fully represented in the assessment of flood risk. It is likely that the number of properties at risk of coastal flooding and the associated damages are underestimated. For example, coastal flooding from overtopping waves is known to occur at Macduff, Gardenstown and Crovie.
River flood risk is associated with the Burn of Myrehouse, particularly adjacent to its confluence with the Deveron.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. Several road locations are at risk of flooding including sections of the A947, B9026 and B9031. There are ten designated cultural heritage sites and a small area of designated environmental sites at risk.

The damages associated with floods of different likelihood are shown in Figure 2. Non-residential properties experience the greatest economic impact. Note that there is some uncertainty around the high level of damages estimated for river flooding, which is mostly attributed to a single site and which will require further investigation. The location of the impacts of flooding is shown in Figure 3.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,400)	<10	40	40
Non-residential properties (total 360)	<10	20	20
People	10	80	80
Community facilities	0	0	0
Utilities assets	0	<10	<10
Transport links (excluding minor roads)	Roads at 30 locations	Roads at 40 locations	Roads at 40 locations
Environmental designated areas (km^2)	0.5	0.5	0.5
Designated cultural heritage sites	9	10	10
Agricultural land (km^2)	0.2	0.3	0.3

Table 1: Summary of flooding impacts[1]

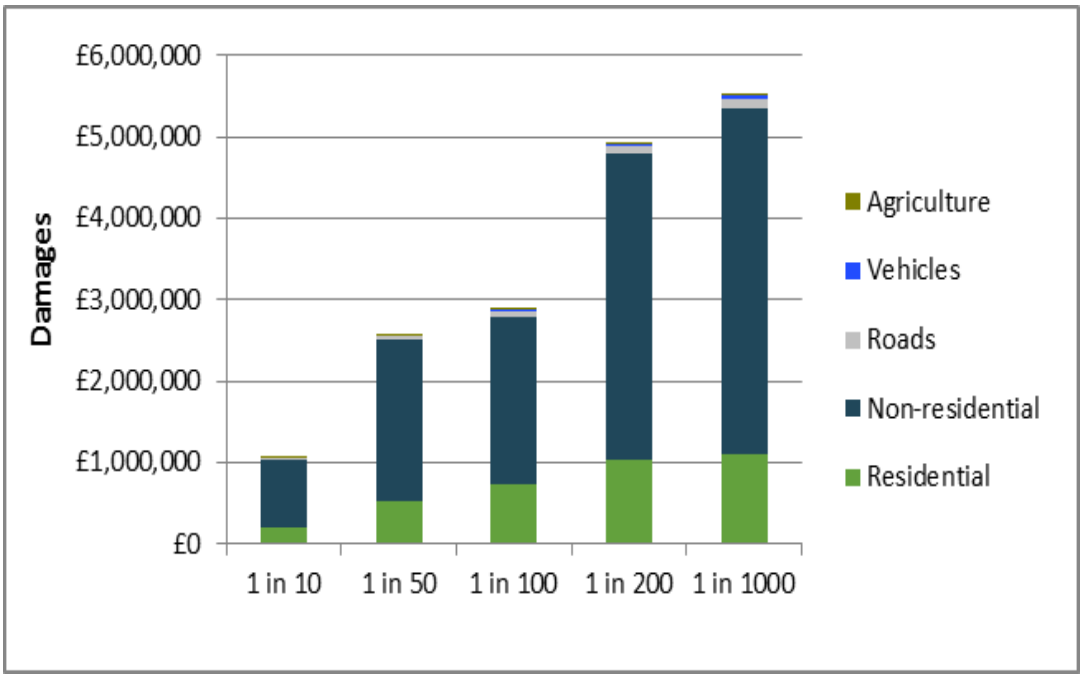


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

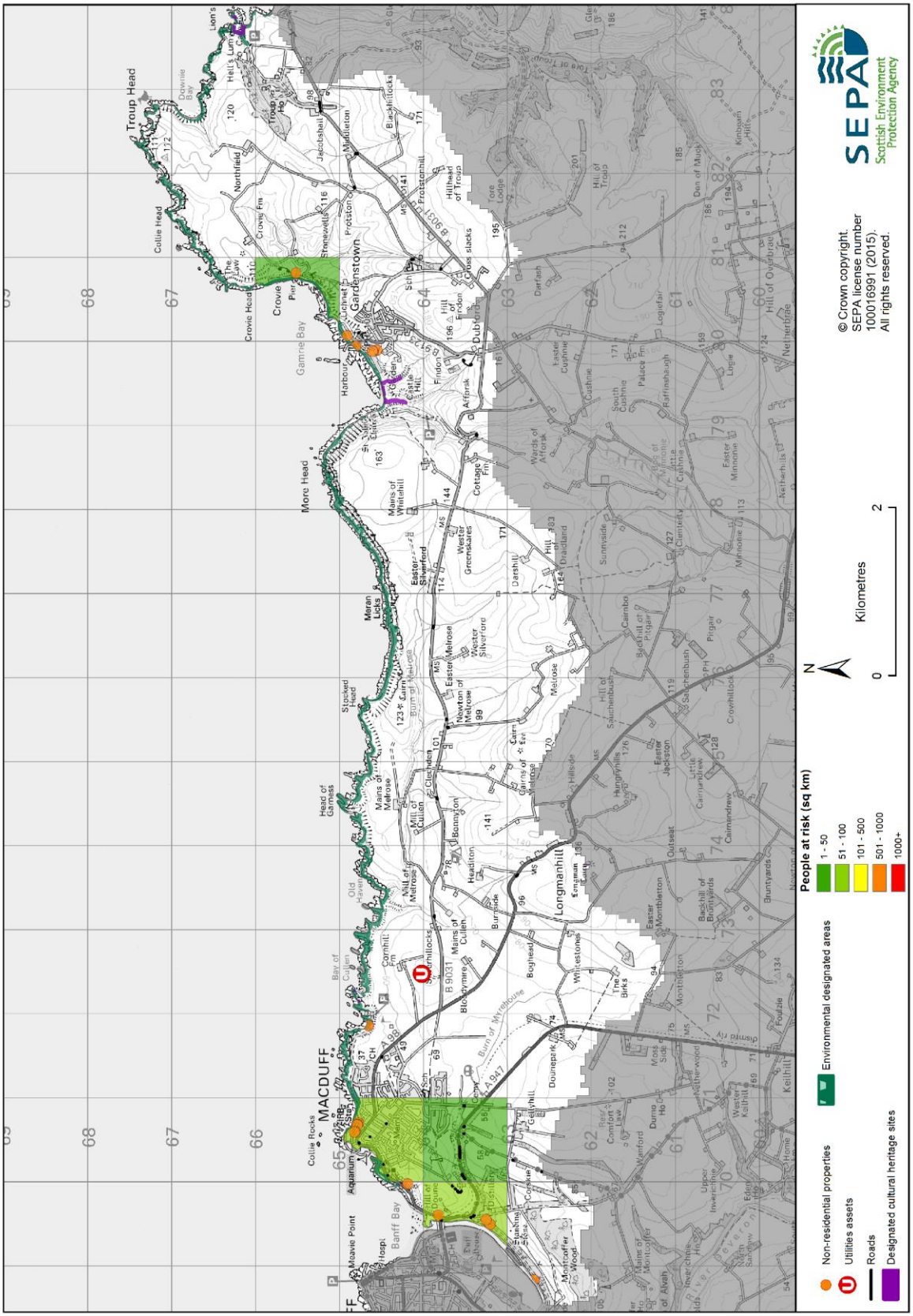


Figure 3: Impacts of flooding

History of flooding

The earliest recorded flood was in 1880, when waves overtopped the sea wall in Macduff causing damage to the harbour and boats. The 1953 North Sea flood undermined and washed away sections of seawall and damaged the slipway and boat launching beach. In addition wave overtopping caused flooding to properties in Macduff and Gardenstown. In Crovie the flooding was so severe the village was abandoned after the 1953 storm event.

In 1957 coastal flooding affected properties on the sea front, washed away the cliff road, and required the evacuation of families. In August 2008 surface water flooding in Macduff affected properties in Duff Street, Commercial Street, and George Street. Old Gamrie Road in Macduff flooded in 2009 following a heavy rainstorm.

Objectives to manage flooding in Potentially Vulnerable Area 06/04

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 Macduff Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 40 residential properties • £240,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 40 residential properties • £240,000 Annual Average Damages
Applies across North East 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 06/04

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 Macduff 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):	**STRATEGIC MAPPING AND MODELLING** (6000020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the Banff area to improve understanding of the coastal flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Banff' flood warning area which is part of the Deveron river flood warning scheme. Continue to maintain the 'Gardenstown to Pennan' and 'Portsoy to Macduff' flood warning areas which are part of the Moray Firth coastal flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 and promote Floodline. This will be achieved through SEPA led community education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

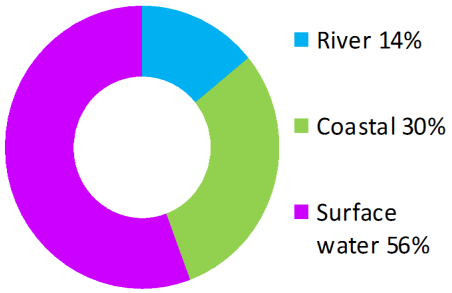
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Fraserburgh and Rosehearty (Potentially Vulnerable Area 06/05)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Buchan coastal

Summary of flooding impacts



At risk of flooding

- 60 residential properties
- 80 non-residential properties
- £84,000 Annual Average Damages

(damages by flood source shown left)

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.

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

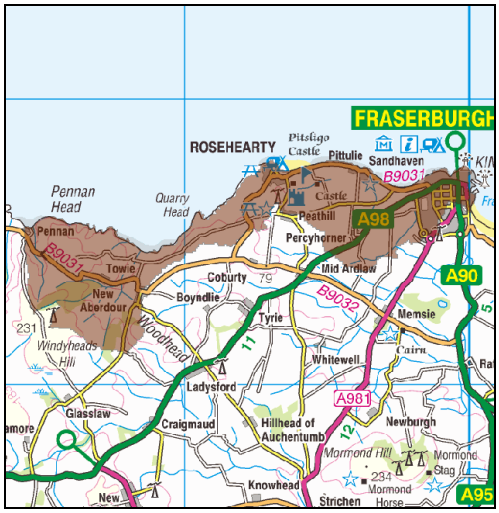
Fraserburgh and Rosehearty (Potentially Vulnerable Area 06/05)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Buchan coastal

Background

This Potentially Vulnerable Area is located in the Moray Firth from Pennan to Fraserburgh. It is approximately 37km^2.

The main urban areas are Fraserburgh, Rosehearty, New Aberdour and Sandhaven.



There are several small watercourses within the area including The Dour.

There are approximately 60 residential and 80 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £84,000 with the majority from surface water flooding. It is recognised that wave overtopping contributes to coastal flooding which is not fully represented in this analysis.

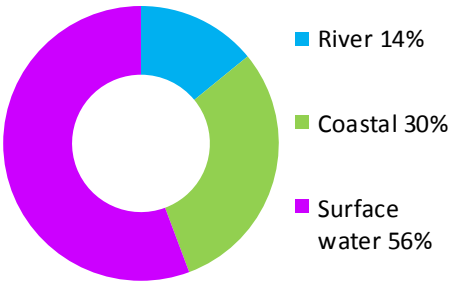


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The main areas of coastal flood risk are Rosehearty, Sandhaven and the Broadsea and harbour areas of Fraserburgh. Rosehearty benefits from protection against coastal flooding by the Port Rae breakwater. Provided that the original 200m section of the breakwater remains intact, the threat of erosion and flooding from the sea should not be significant. Surface water flood risk is scattered across the area, most notably in the urban areas of Fraserburgh and Rosehearty.

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

A nursing home, Westfield School in Fraserburgh and sections of the A98 are at risk of flooding. Five designated cultural heritage and small areas of designated environmental sites are also at risk.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 6,000)	<10	60	110
Non-residential properties (total 890)	20	80	100
People	10	140	240
Community facilities	0	<10 Includes: educational buildings and healthcare facilities	<10 Includes: educational buildings and healthcare facilities
Utilities assets	<10	10	10
Transport links (excluding minor roads)	Roads at 30 locations	Roads at 60 locations	Roads at 60 locations
Environmental designated areas (km^2)	0.3	0.3	0.4
Designated cultural heritage sites	2	5	5
Agricultural land (km^2)	0.3	0.3	0.3

Table 1: Summary of flooding impacts[1]

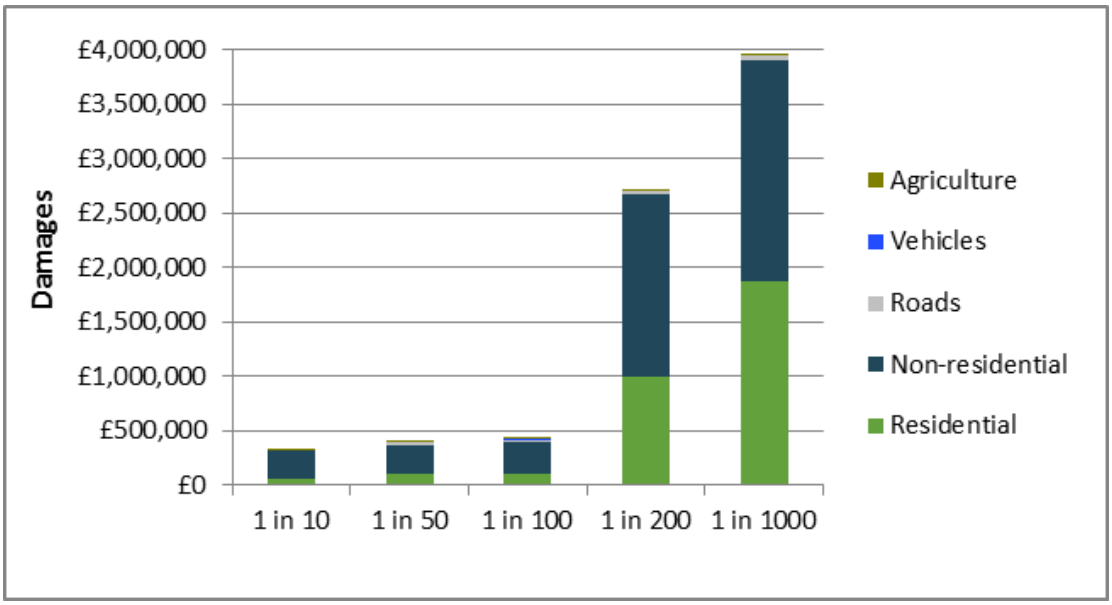


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

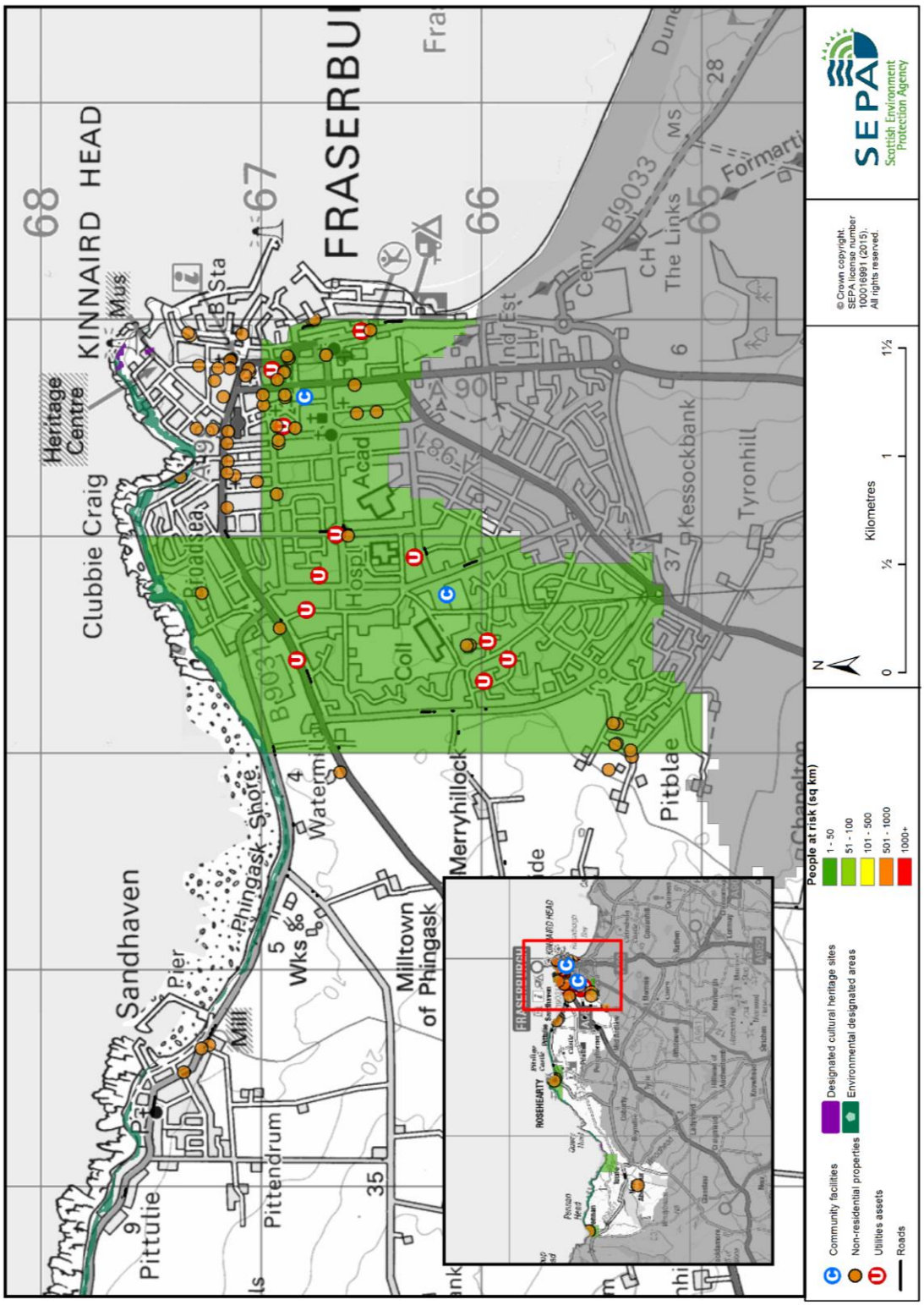


Figure 3: Impacts of flooding

History of flooding

Fraserburgh suffered from flooding in 1863 and 1895. Between 2002 and 2012 there were seven floods caused by various small burns including the Kessock Burn, and surface water runoff. These floods were generally due to heavy rainfall overwhelming road drainage and the small burns. In August 2006, the road and public park flooded due to water backing up behind a trash screen on the Kessock Burn and overtopping the culvert entrance.

Properties at Murison Drive in Rosehearty have also flooded several times in the last few years including in 2002 and 2009 due to excess surface water runoff and overflow from a small watercourse.

During the 1953 North Sea flood properties were destroyed by coastal flooding in Rosehearty and flooding occurred in various locations across the area, including Sandhaven and Pennan. Rosehearty and Sandhaven harbours both suffered damage from the coastal storms in December 2012 and 2013. Coastal storms also caused erosion at Kinnaird Head in Fraserburgh affecting a public footpath.

Objectives to manage flooding in Potentially Vulnerable Area 06/05

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 Fraserburgh and Rosehearty Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Fraserburgh	Reduce risk from surface water flooding in Fraserburgh	600501	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 60 residential properties • £84,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 60 residential properties • £84,000 Annual Average Damages
Applies across North East 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 06/05 there are 60 residential properties at risk and Annual Average Damages of £47,000.

Actions to manage flooding in Potentially Vulnerable Area 06/05

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 Fraserburgh and Rosehearty 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):	**SURFACE WATER PLAN/STUDY** (6005010018)		
Objective (ID):	Reduce risk from surface water flooding in Fraserburgh (600501)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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** (6000020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to incorporate additional surface water hazard mapping information into the flood maps to improve understanding of flood risk. Approximately 1,700km² of improved data is currently available within this Local Plan District.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Gardenstown to Pennan' and 'Rosehearty to Fraserburgh' flood warning areas which are part of the Moray Firth coastal flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

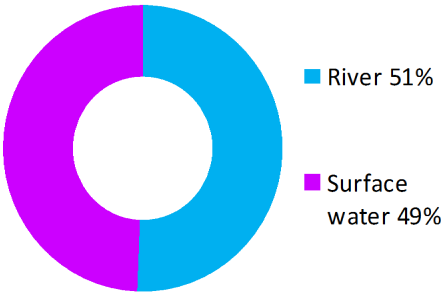
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Newmill (Potentially Vulnerable Area 06/06)

Local Plan District	Local authority	Main catchment
North East	The Moray Council	River Deveron

Summary of flooding impacts



At risk of flooding

- 10 residential properties
- <10 non-residential properties
- £24,000 Annual Average Damages

(damages by flood source shown left)

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.

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

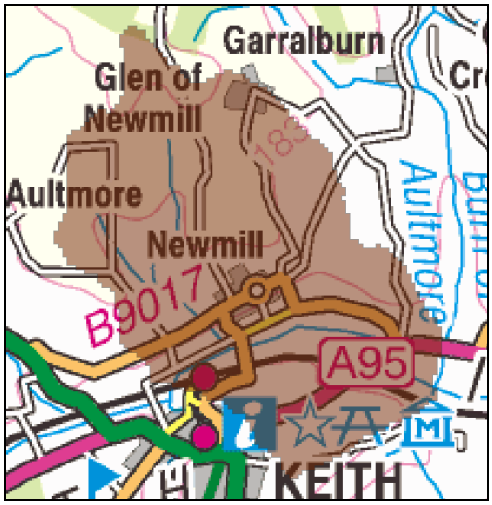
Newmill (Potentially Vulnerable Area 06/06)

Local Planning District	Local authority	Main catchment
North East	The Moray Council	River Deveron

Background

This Potentially Vulnerable Area is located to the north of Keith. It is approximately 13km^2 and includes the Newmill and Glen of Newmill areas.

The A95, B9017 and B911 roads, a railway line and railway station are all within the area.



The largest river in the area is the River Isla.

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

The Annual Average Damages are approximately £24,000. These are evenly distributed between surface water and river flooding.

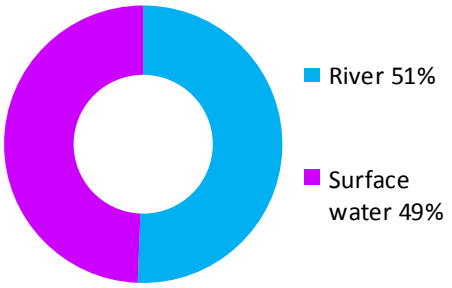


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk is associated with the River Isla as it flows to the north of Keith notably in the vicinity of the railway line and A95 at Montgrew. There are small areas of surface water flood risk in Newmill and within Keith itself, although most of the areas at risk in Keith are outside the southern boundary of this Potentially Vulnerable Area.

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

Roads potentially affected by flooding include the A95, B9017 and B911. Sections of the Aberdeen to Inverness railway are also at risk of flooding.

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.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 350)	10	10	10
Non-residential properties (total 80)	<10	<10	<10
People	20	20	20
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations Rail at 10 locations	Roads at 20 locations Rail at 10 locations	Roads at 20 locations Rail at 10 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.6	0.8	0.9

Table 1: Summary of flooding impacts[1]

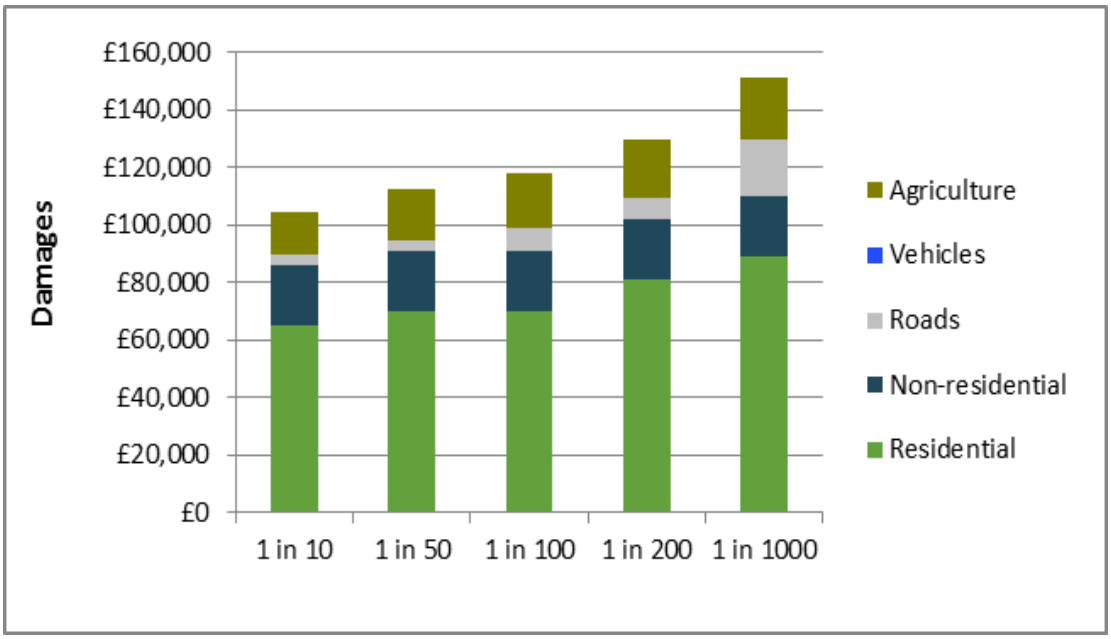


Figure 2: Damages by flood likelihood

History of flooding

There was flooding of an industrial area in Newmill and at the Isla Bank Mills by the River Isla in 2009. Surface water flooding affected Soutar's Lane, Newmill in 2005. A further surface water flood occurred in 2009, prompting Moray Council to instigate improvement works in the area.

[1] Some receptors are counted more than once if flooded from multiple sources

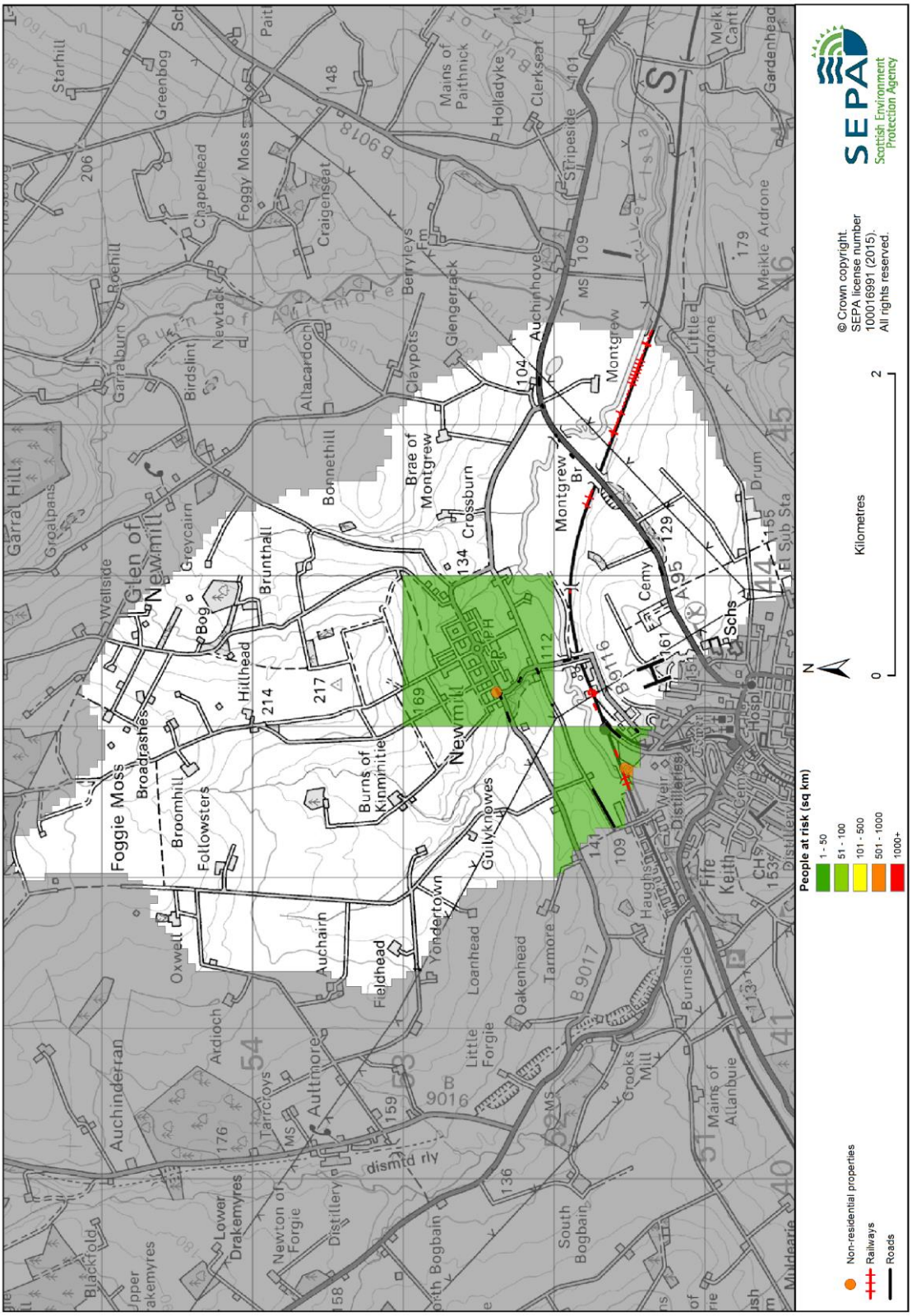


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 06/06

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 Newmill Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Newmill	Reduce risk from surface water flooding in Keith (Newmill)	600601	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 10 residential properties • £24,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 10 residential properties • £24,000 Annual Average Damages
Applies across North East 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 06/06 there are <10 residential properties at risk and Annual Average Damages of £12,000.

Actions to manage flooding in Potentially Vulnerable Area 06/06

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 Newmill 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** (6006010006)		
Objective (ID):	Reduce risk from surface water flooding in Keith (Newmill) (600601)		
Delivery lead:	The Moray Council		
Priority:	National:	Within local authority:	
	38 of 42	**1 of 1**	
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	A flood protection scheme has been confirmed and is being progressed to construction on site. The scheme includes a network of ditches to the north of Newmill, a cascade, flood walls and a replacement bridge. It has been designed to a 1 in 200 year standard of protection including an allowance for climate change.		
Potential impacts			
Economic:	The flood protection scheme will reduce flood risk to 13 residential and five non-residential properties. Damages of £1.9 million are avoided, with a benefit cost ratio of 1.32.		
Social:	The flood protection scheme will reduce risk to an estimated 29 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.		
Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. There are no designated habitat sites close to the area.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (6006010018)		
Objective (ID):	Reduce risk from surface water flooding in Keith (Newmill) (600601)		
Delivery lead:	The Moray Council		
Status:	**Ongoing**	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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020017)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	The Moray Council		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the Newmill Flood Protection Scheme, including phase 2, once completed.		

Action (ID):	**MAINTAIN FLOOD WARNING** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Keith' flood warning area which is on the River Isla and forms part of the Deveron river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**COMMUNITY FLOOD ACTION GROUPS** (6000020012)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Community		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Newmill Flood Action Group has worked with The Moray Council, landowners and tenants to reduce the impact of surface water flooding.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	The Moray 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.		

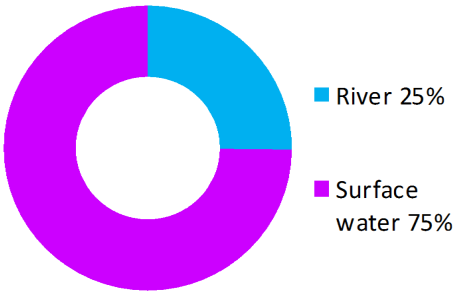
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Turriff (Potentially Vulnerable Area 06/07)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Deveron

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- 20 non-residential properties
- £24,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

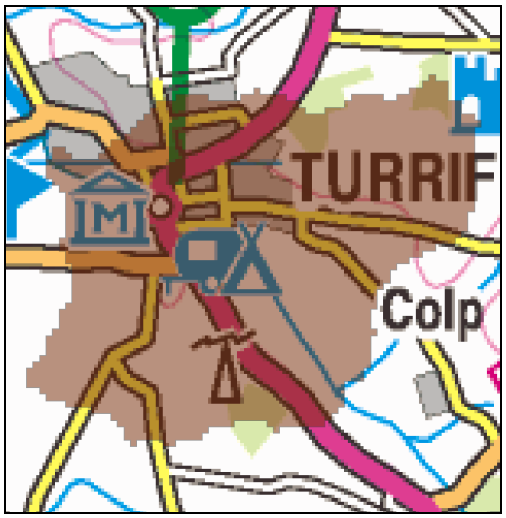
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	Maintain flood warning	Awareness raising	*Surface water plan/study*	Emergency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

Turriff (Potentially Vulnerable Area 06/07)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Deveron

Background

This Potentially Vulnerable Area includes the south and west of Turriff and surrounding rural areas. It is approximately 7km^2. The A947 passes through the middle of the area.



The main river is the Burn of Turriff which flows into the Deveron just to the north west of the area.

There are approximately 20 non-residential and fewer than 10 residential properties at risk of flooding.

The Annual Average Damages are approximately £24,000 with the majority caused by surface water flooding.

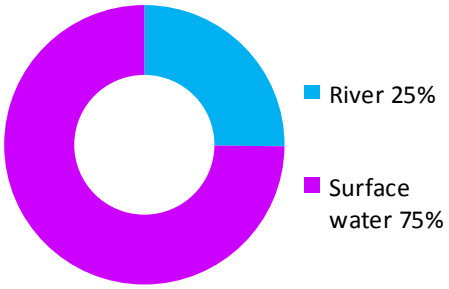


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk in Turriff is associated with the Burn of Turriff, the flood plain of which extends along the south west edge of the town towards its confluence with the River Deveron. Surface water flood risk occurs in localised areas across the town often associated with smaller watercourses.

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

Roads at risk of flooding include sections of the A947 and B9024. Flooding also affects the area that hosts the annual Turriff Show which is an important economic event for the local community. This has, however, been mitigated through improvements to the drainage upstream of the bridge on the A947.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,900)	<10	<10	20
Non-residential properties (total 330)	10	20	20
People	<10	20	40
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.4	0.5	0.5

Table 1: Summary of flooding impacts[1]

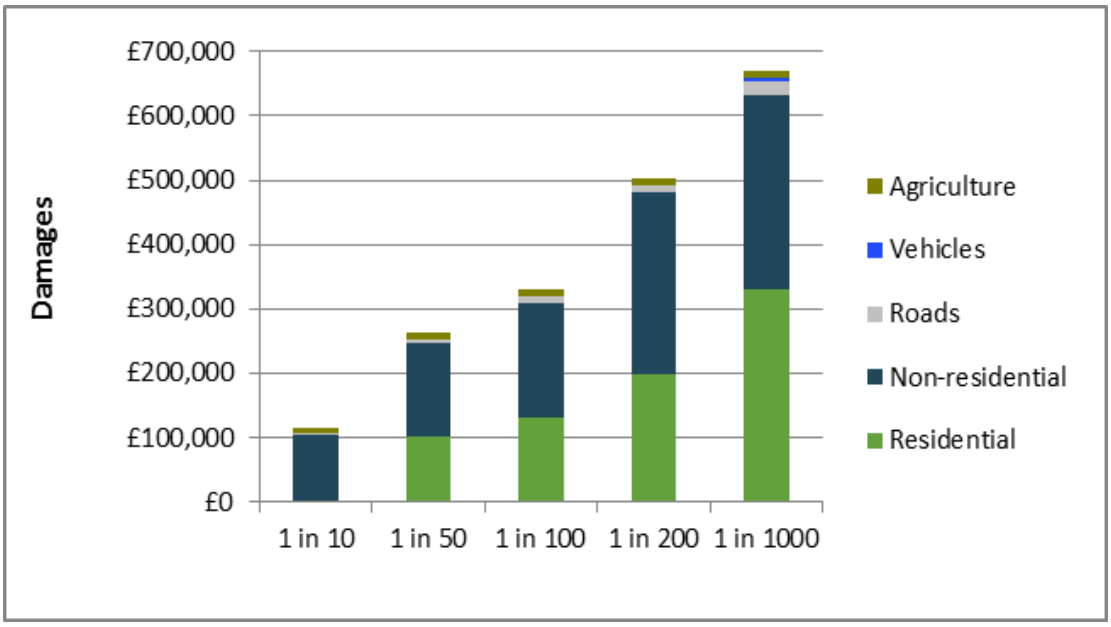


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

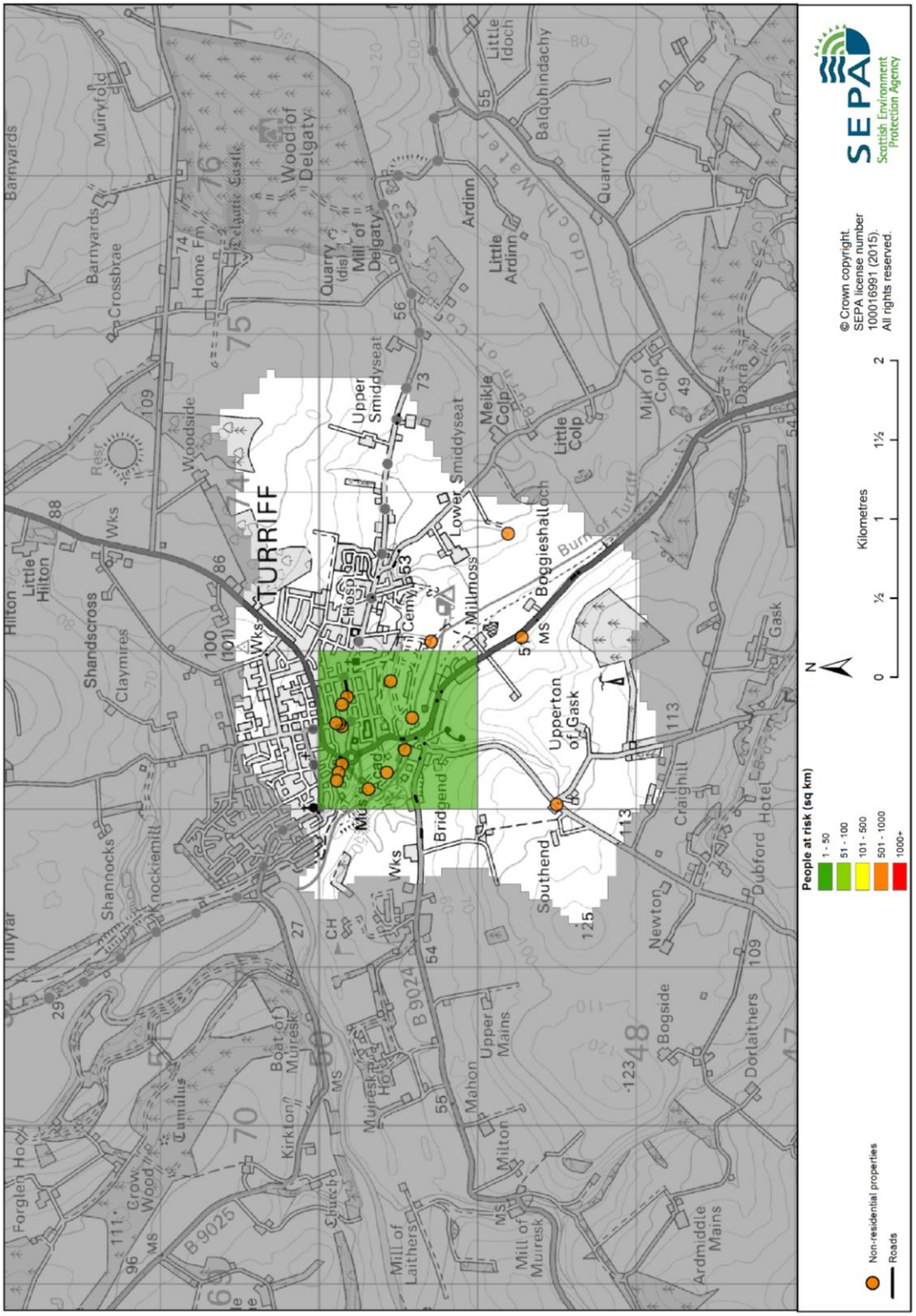


Figure 3: Impacts of flooding

History of flooding

The Burn of Turriff flooded in 1829 and 1859; the latter destroying several bridges including a railway bridge. In 1999, heavy rainfall overwhelmed the sewer causing flooding in Crooked Lane, Turriff.

Turriff United football ground has flooded on a number of occasions from the Burn of Turriff and Gassie Burn including in 2000 and 2002. Surface water flooding also occurred in Turriff in 2004, 2005, and 2008 due to the drainage infrastructure being unable to cope with runoff from heavy rainfall. This resulted in the flooding of properties and roads.

Objectives to manage flooding in Potentially Vulnerable Area 06/07

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 Turriff Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• <10 residential properties • £24,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• <10 residential properties • £24,000 Annual Average Damages
Applies across North East 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 06/07

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 Turriff 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):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Turriff' flood warning area which is part of the Deveron river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

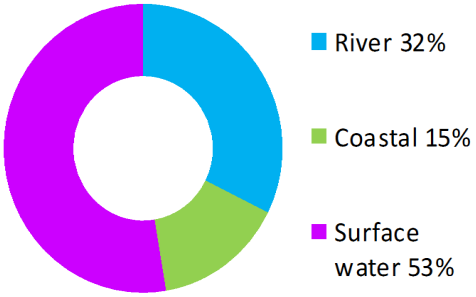
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Peterhead (Potentially Vulnerable Area 06/08)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Buchan coastal

Summary of flooding impacts



At risk of flooding

- 40 residential properties
- 80 non-residential properties
- £580,000 Annual Average Damages

(damages by flood source shown left)

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.

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

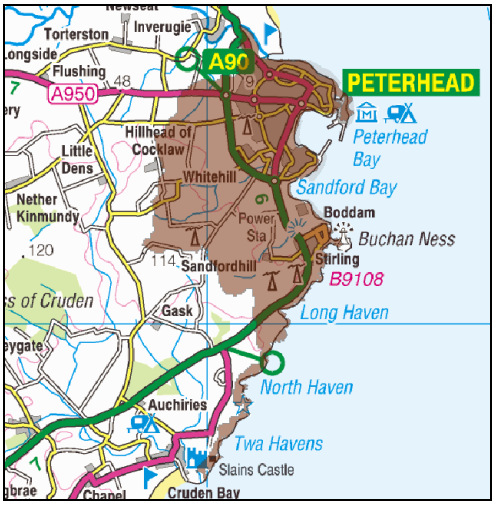
Peterhead (Potentially Vulnerable Area 06/08)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Buchan coastal

Background

This Potentially Vulnerable Area includes Peterhead, Stirling and Boddam. It is approximately 28km^2.

The A90, A950, and A982 pass through the area.



The main river in the area is the River Ugie.

There are approximately 40 residential and 80 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £580,000 with the majority attributed to surface water flooding.

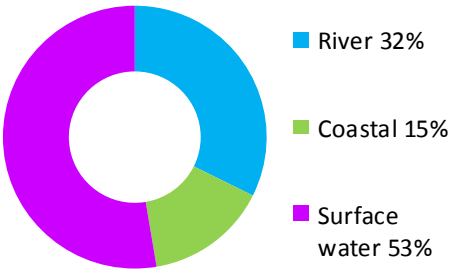


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Parts of the area, for example Roanheads, are vulnerable to coastal flooding from wave overtopping. Flooding from wave action is not fully represented in the general assessment of flood risk in this area and both the number of properties at risk and the damages from coastal flooding are likely to be underestimated. Wave overtopping has been taken into account in the setting of objectives and actions.

River flooding is associated with the Ugie and its tributary, the Collie Burn, as well as from the Millbank Burn. There are widespread areas of surface water flood risk notably affecting the A90 at Stirling village and Boddam.

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

Transport links at risk of flooding include significant lengths of the A90, the A980 and A950. One designated cultural heritage site and small areas of designated environmental sites are also at risk.

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.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 9,200)	<10	40	50
Non-residential properties (total 1,500)	30	80	90
People	10	80	120
Community facilities	0	<10 Emergency services	<10 Emergency services
Utilities assets	<10	10	20
Transport links (excluding minor roads)	Roads at 70 locations	Roads at 120 locations	Roads at 130 locations
Environmental designated areas (km^2)	0.4	0.4	0.4
Designated cultural heritage sites	1	1	2
Agricultural land (km^2)	0.2	0.2	0.3

Table 1: Summary of flooding impacts[1]

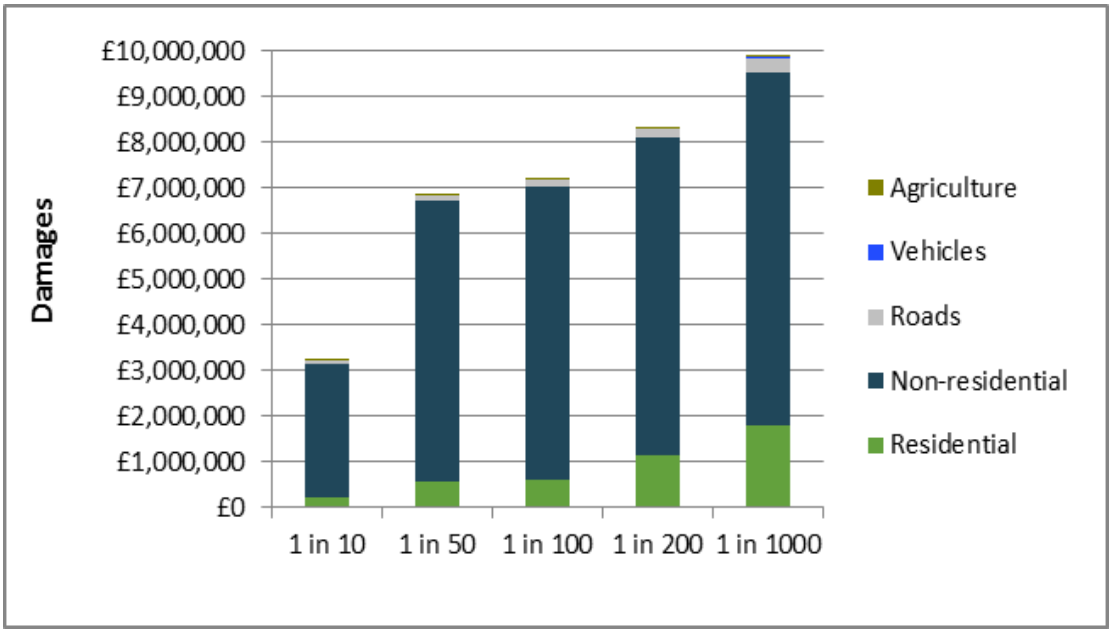


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

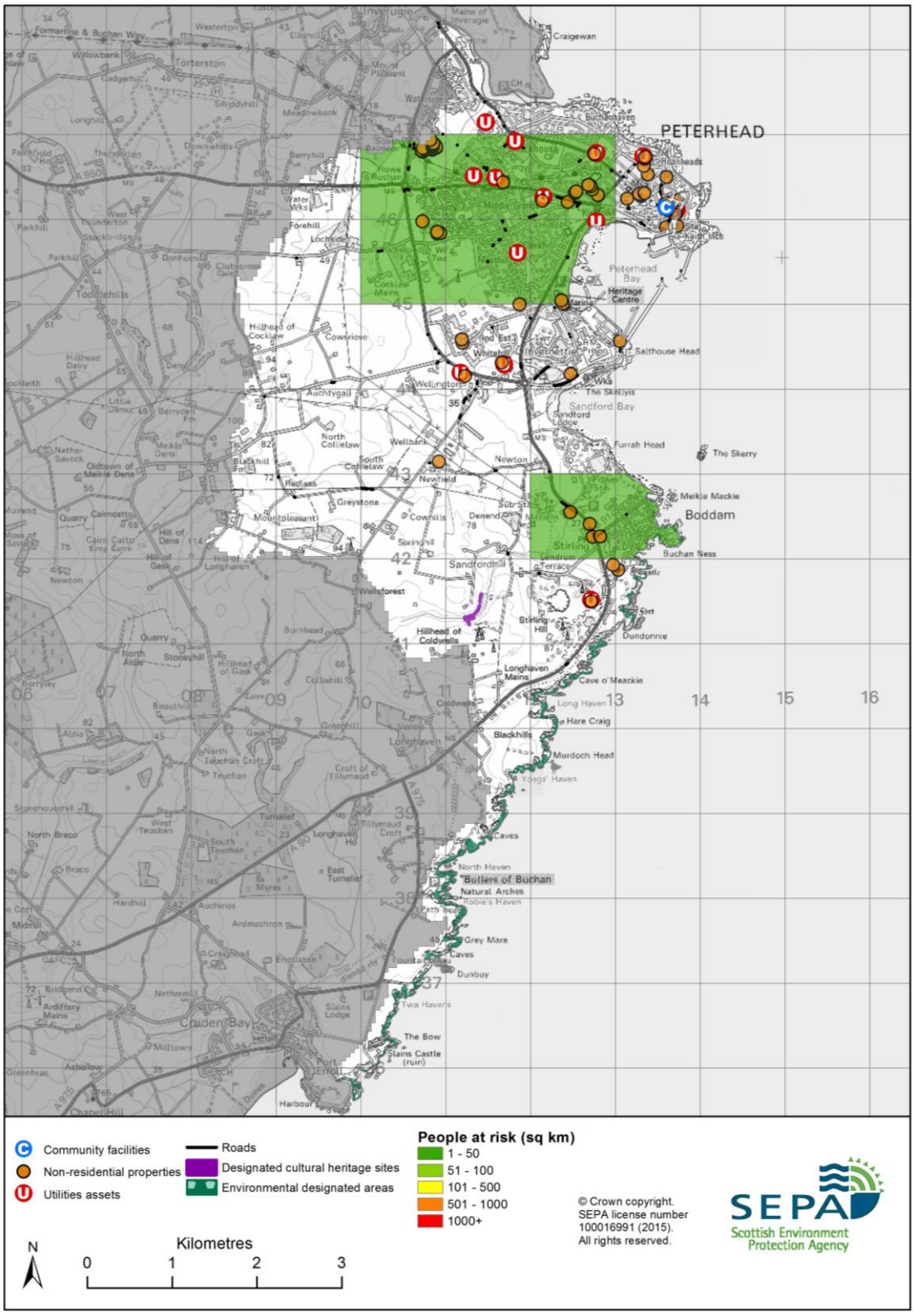


Figure 3: Impacts of flooding

History of flooding

Peterhead was flooded in 1881 and 1882 by the River Ugie. There have been 15 floods since 2002, with the majority being related to surface water. The areas affected include Wood End House, Upperton Industrial Estate, Howe of Buchan, Lendrum Terrace, Station Road/A90 junction, Queen Street, Mallard Drive, central Peterhead, Braehead Crescent, Balmoor Terrace, Springbank, River View, A90 bypass, A950, Forman Drive, Schivas Road, Petergrange Road, Hawthorn Road, Geary Place and Crossfolds Crescent.

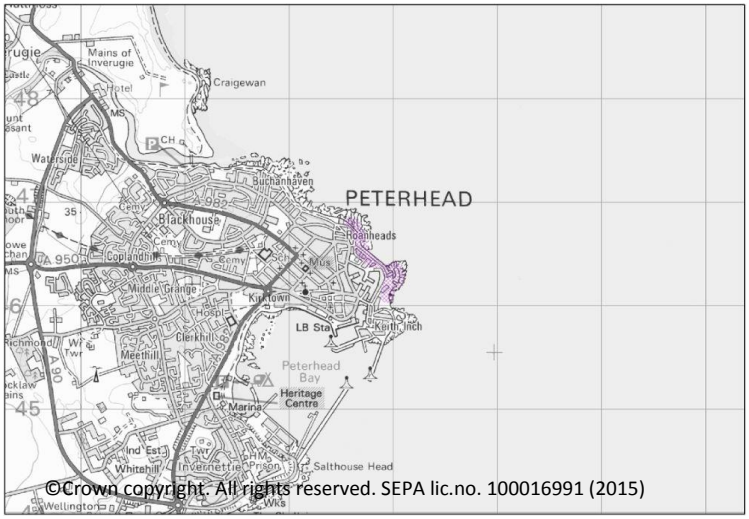
Properties on Catto Drive, Collieburn Crescent, Golf Road, Riverside Drive and York Street experienced surface water flooding in August 2012; several properties were evacuated during this event.

In the 1953 North Sea flood, Peterhead was badly affected with many cottages being washed away. More recently, in December 2012, around 30 people were evacuated from the Roanheads area of the town due to coastal flooding, which was exacerbated by wave overtopping.

Objectives to manage flooding in Potentially Vulnerable Area 06/08

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 Peterhead Potentially Vulnerable Area.

Reduce risk in Peterhead from coastal flooding

Indicators:	Target area:
• 10 people • £2,800 Annual Average Damages from residential properties	
Objective ID: 600801	

Target area	Objective	ID	Indicators within PVA
Peterhead	Reduce risk from surface water flooding in Peterhead	600804	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 40 residential properties • £580,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 40 residential properties • £580,000 Annual Average Damages
Applies across North East 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 06/08 there are 40 residential properties at risk and Annual Average Damages of £300,000.

Actions to manage flooding in Potentially Vulnerable Area 06/08

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 Peterhead 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):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Flood warning is required for communities at risk of coastal flooding along the Aberdeenshire coast from Peterhead to Montrose. A flood forecasting system will be required before the flood warning scheme can be developed.		

Action (ID):	**FLOOD PROTECTION STUDY** (6008010005)		
Objective (ID):	Reduce risk in Peterhead from coastal flooding (600801)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	162 of 168	**10 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood protection study should be developed to consider the impact from wave overtopping in Peterhead. It should primarily focus on coastal management actions, direct defences, relocation and property level protection, but other actions may also be considered in order to develop the most sustainable range of options. This study is in addition to works in Peterhead harbour area to raise a section of seawall by approximately 0.5 metres planned for late 2015 / early		

	2016.
Potential impacts	
Economic:	The flood protection study should confirm the economic impacts and number of properties at risk. Currently it is estimated that six residential and one non-residential properties are at risk. This estimate is based on local knowledge as the properties are at risk from wave overtopping which could not be assessed in SEPA flood maps. Potential damages avoided of up to £100,000 could be achieved. With further information on the impact of wave overtopping and flood depths, these benefits could change.
Social:	The development of flood protection works following the study would potentially reduce risk to 13 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. The Esplanade would also benefit from reduced risk, improving access to the properties in the Roanheads area. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should ensure the actions avoid or minimise the potential loss of natural habitat and do not interfere with coastal processes. It should also ensure the actions have no negative impact on the Roanheads conservation area. The physical condition of the Ugie Estuary to Buchan Ness coastline (water body ID 200131) is identified by river basin management planning to be at less than good status. Future works could improve the condition of the coastline or degrade it. Opportunities to improve the condition of the coastline should be considered by coordinating with river basin management planning.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6008040018)		
Objective (ID):	Reduce risk from surface water flooding in Peterhead (600804)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

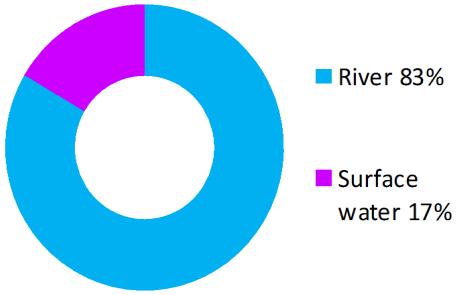
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Methlick (Potentially Vulnerable Area 06/09)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Ythan

Summary of flooding impacts



At risk of flooding

- <10 residential properties
- 20 non-residential properties
- £71,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

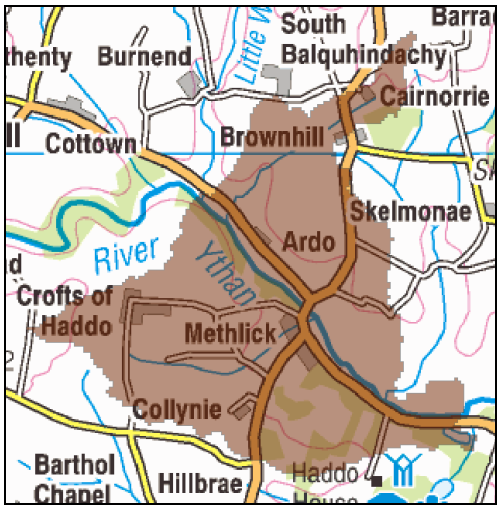
Flood protection scheme/works	*Natural flood management works*	New flood warning	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	*Maintain flood warning*	Awareness raising	*Surface water plan/study*	Emergency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

Methlick (Potentially Vulnerable Area 06/09)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Ythan

Background

This Potentially Vulnerable Area is located northeast of Inverurie and covers Methlick and the surrounding rural area. It is approximately 21km^2. The B9005 and B9170 roads run through the area.



The main water course is the River Ythan.

There are approximately 20 non-residential and fewer than 10 residential properties at risk of flooding.

The Annual Average Damages are approximately £71,000. The majority of these are attributed to river flooding.

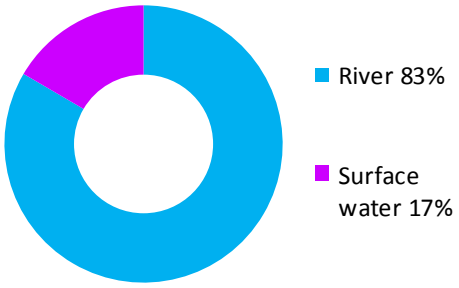


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk in this area is attributed to the River Ythan and its tributary the Burn of Sauchentree although this is mainly limited to the largely undeveloped floodplain of the Ythan itself.

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

Roads affected by flooding include the B9005. One designated cultural heritage site is also at risk.

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

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 360)	<10	<10	10
Non-residential properties (total 100)	10	20	20
People	<10	10	20
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	2	2	2
Agricultural land (km^2)	0.6	0.7	0.8

Table 1: Summary of flooding impacts[1]

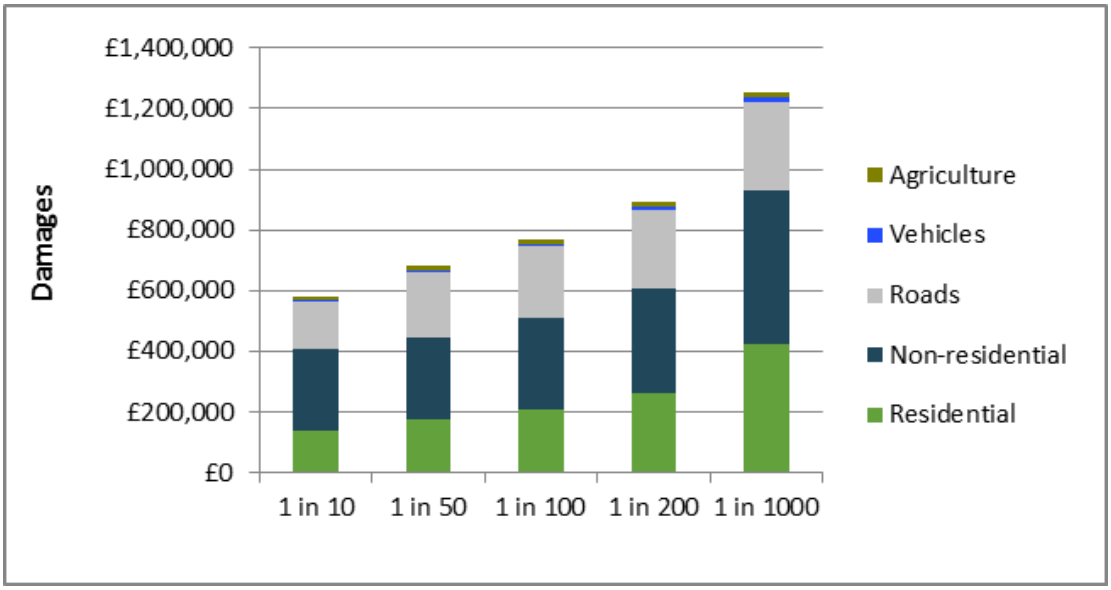


Figure 2: Damages by flood likelihood

History of flooding

There was a flood on the River Ythan in January 2003 affecting Woodhead Road in Methlick; seven properties were flooded. Flooding of the River Ythan was reported again in 2012.

[1] Some receptors are counted more than once if flooded from multiple sources

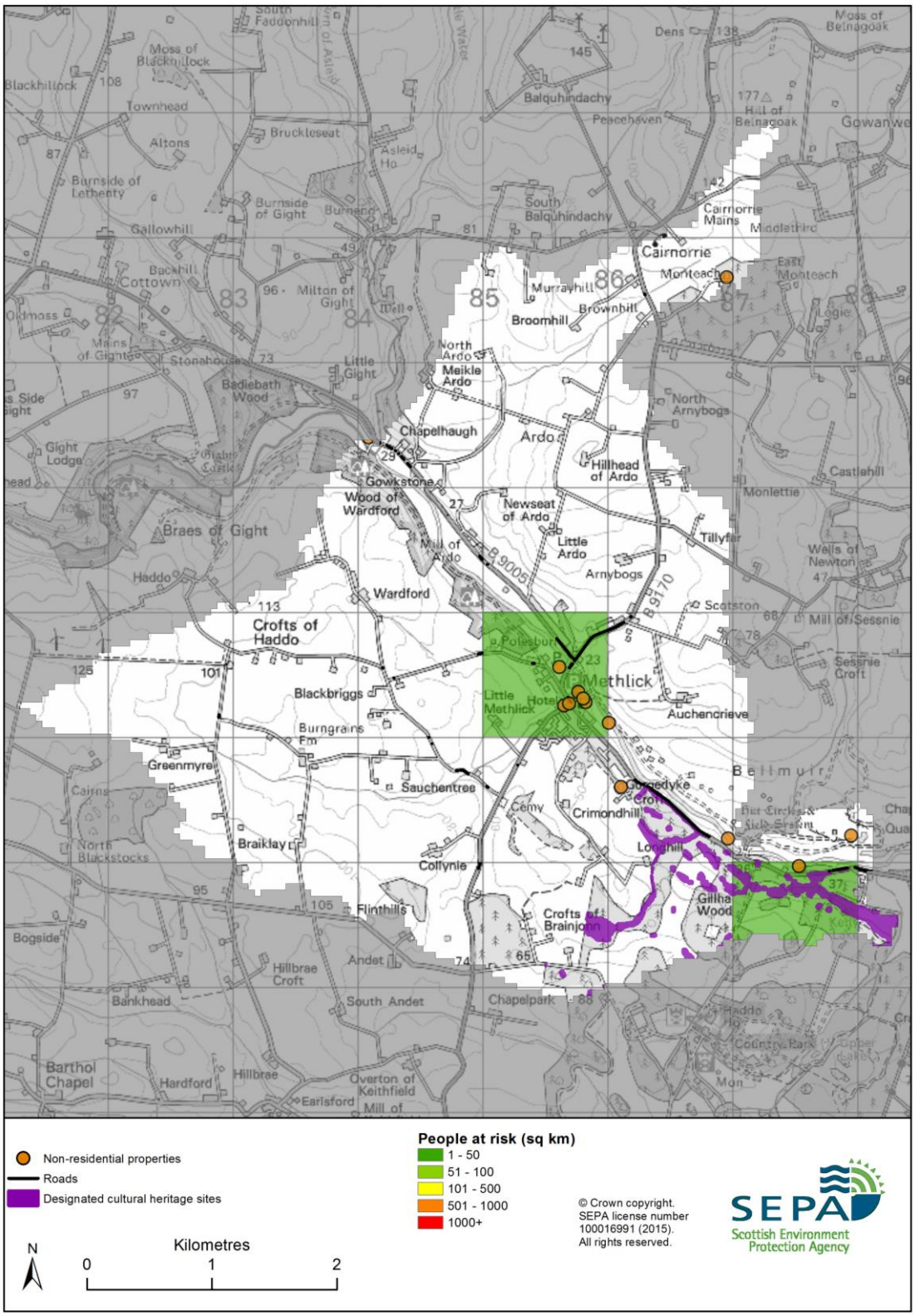


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 06/09

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 Methlick Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• <10 residential properties • £71,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• <10 residential properties • £71,000 Annual Average Damages
Applies across North East 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 06/09

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 Methlick 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):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**post 2021**
Description:	The area under consideration includes properties affected by flooding from the River Ythan. Full scoping will be required before a flood warning service can be developed and implemented in this area and further assessment will help to determine appropriate timescales for delivery.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

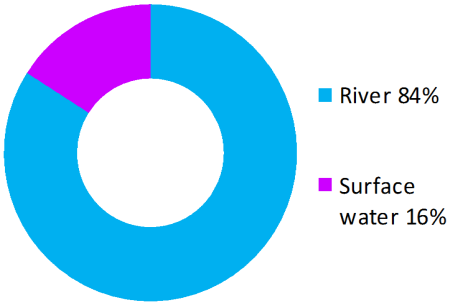
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Huntly (Potentially Vulnerable Area 06/10)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Deveron

Summary of flooding impacts



At risk of flooding

- 110 residential properties
- 50 non-residential properties
- £450,000 Annual Average Damages

(damages by flood source shown left)

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.

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

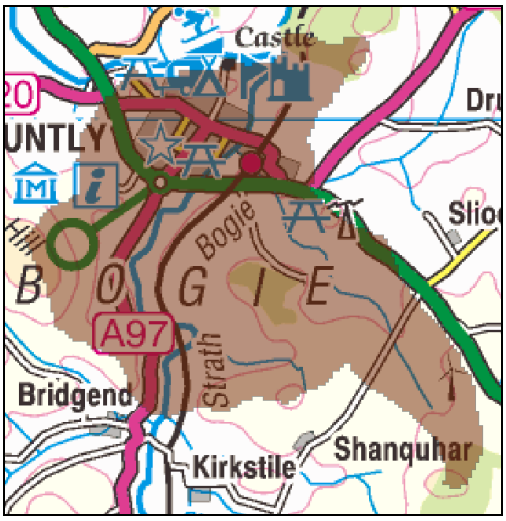
Huntly (Potentially Vulnerable Area 06/10)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Deveron

Background

This Potentially Vulnerable Area includes Huntly and the rural area to the south. It is approximately 20km².

The A96, A97 and A920 pass through the area.



The River Deveron and the River Bogie are the main rivers in this area.

There are approximately 110 residential and 50 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £450,000 with the majority due to river flooding.

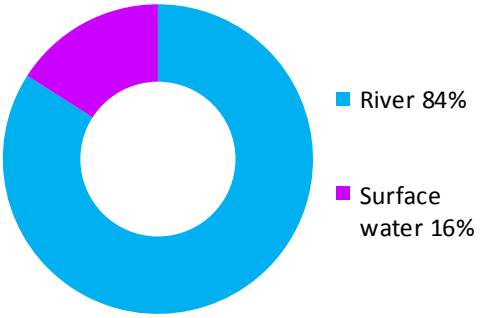


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk is primarily focused on the Meadows area in the north of Huntly. This coincides with the floodplain of the Deveron and the Meadow Burn. There are localised areas of surface water flood risk throughout Huntly.

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

A nursing home, roads including the A96 A97 and A920, and the Aberdeen to Inverness railway line are at risk of flooding. Four designated cultural heritage sites are also at risk within this area.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,400)	50	110	150
Non-residential properties (total 360)	30	50	50
People	120	250	330
Community facilities	0	<10 Healthcare facilities	<10 Healthcare facilities
Utilities assets	0	<10	<10
Transport links (excluding minor roads)	Roads at 40 locations Rail at 10 locations	Roads at 50 locations Rail at 20 locations	Roads at 50 locations Rail at 20 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	2	4	4
Agricultural land (km^2)	0.9	1.2	1.3

Table 1: Summary of flooding impacts[1]

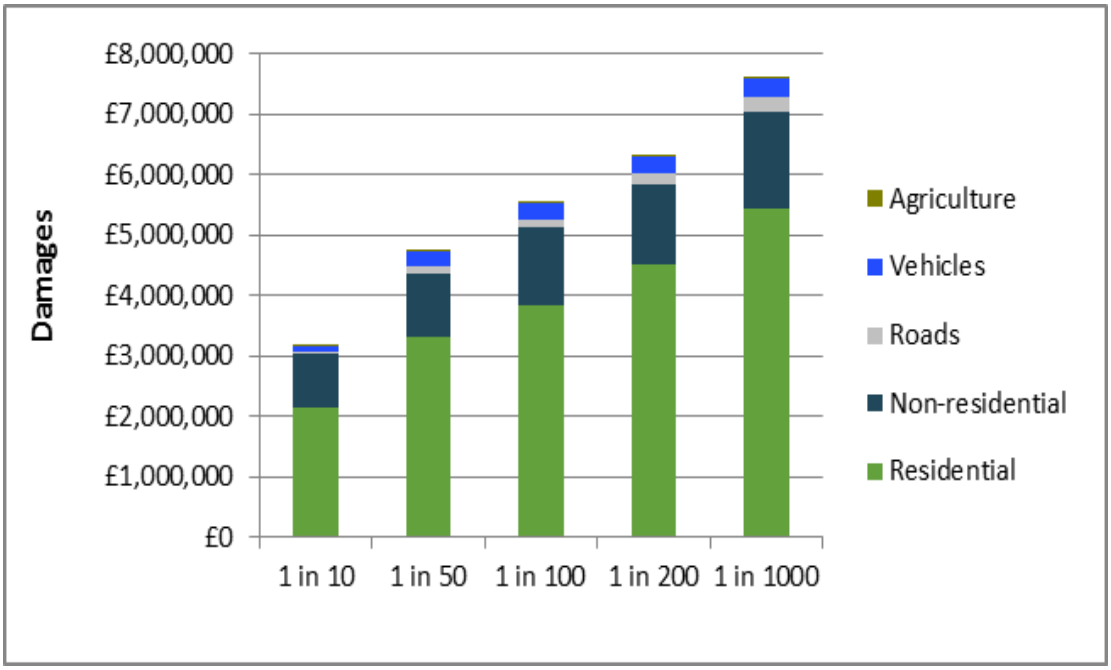


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

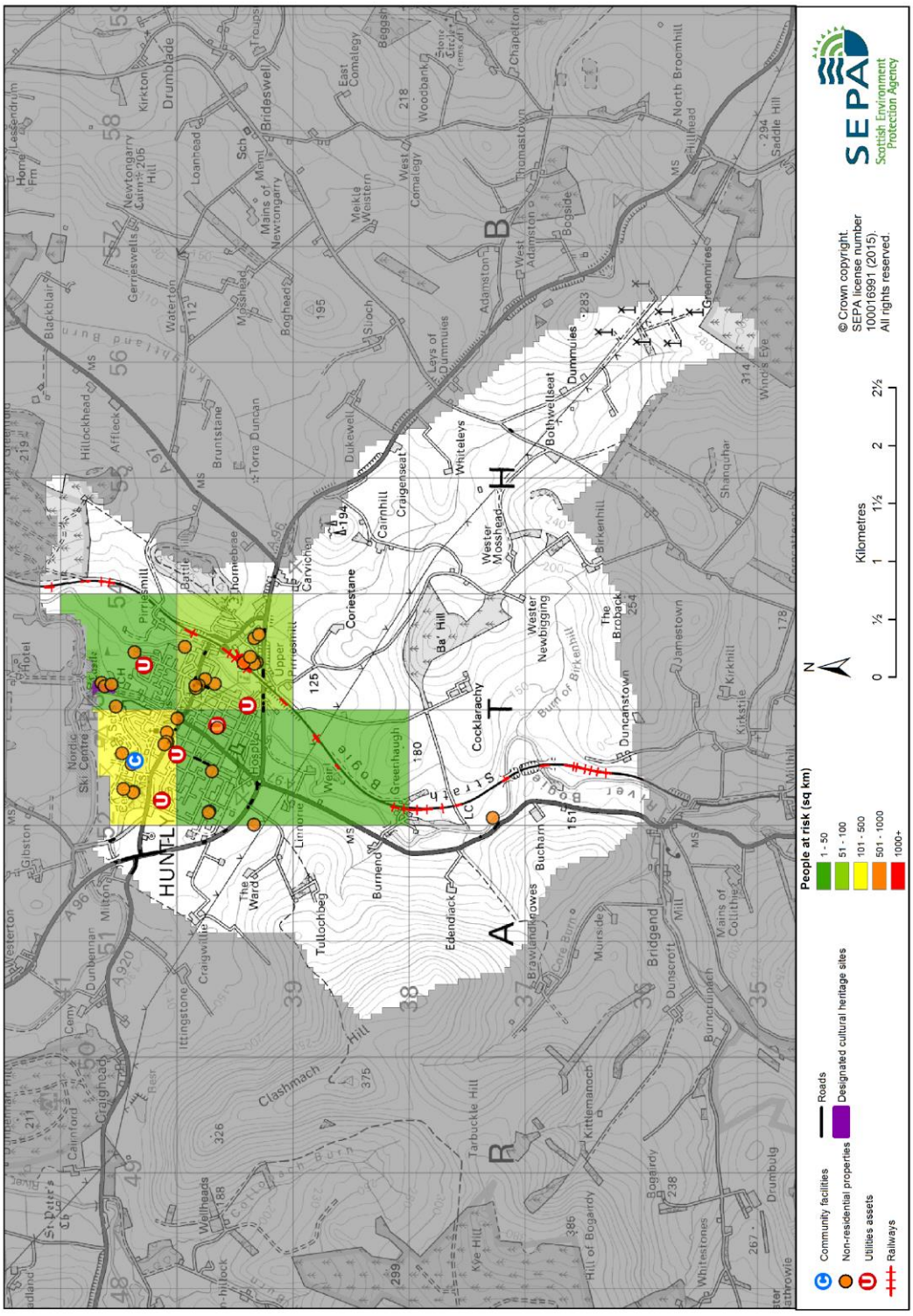


Figure 3: Impacts of flooding

History of flooding

Huntly has flooded from the River Deveron, River Bogie and Meadow Burn. Residents in the Meadows area have been evacuated on several occasions in recent years.

The earliest recorded flood was in 1829 when the town was surrounded by water and bridges destroyed by the Bogie and Deveron. There are also floods recorded from the Bogie in 1865, 1872, 1878 and 1881. The Deveron caused flooding in 1839, 1865, 1869, 1874 and 1881.

More recently, there was flooding of the Meadows area in 1995 and a further 12 floods have been recorded since 1997 from various sources including the Ittingstone Burn, Meadows Burn (2009), the Bogie (2002, 2003, 2005, and 2006) and the Deveron (2009). The highest impact flood on record occurred in November 2009 when over 100 people had to be evacuated from the Meadows area, including from a nursing home, due to flooding from the Meadows Burn.

Flooding from surface water runoff has also been recorded at various locations in Huntly. These floods have affected properties, roads, caravan parks, car parks and a care home. The areas of Huntly which have been affected include central, south east, and east Huntly, including Bleachfield Street, Burnside Road, Green Road and Glamourhaugh, George Street, and the Meadows area.

Objectives to manage flooding in Potentially Vulnerable Area 06/10

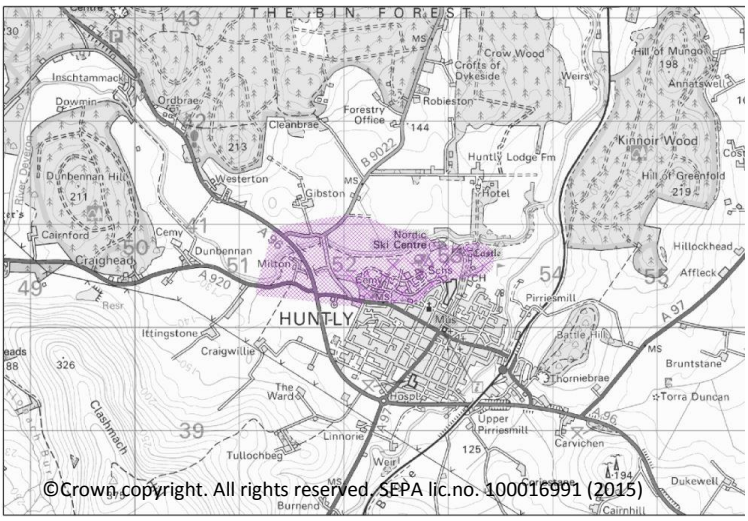
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target 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 Huntly Potentially Vulnerable Area.

Reduce flood risk in the Meadows area of Huntly (including A96 and A920, Ski Centre and caravan park) from the River Deveron and Meadows Burn

Indicators:

- 110 people
- £180,000 Annual Average Damages
- 1 nursing home
- A96
- A920

Target area:



Objective ID: 601001

Target area	Objective	ID	Indicators within PVA
Huntly	Reduce the physical risk, or disruption risk, related to areas of the A96 at risk of flooding	6300	• 10 locations on the A96 with a total length of 220m
Huntly	Reduce risk from surface water flooding in Huntly	601004	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 110 residential properties • £450,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 110 residential properties • £450,000 Annual Average Damages
Applies across North East 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 06/10 there are 60 residential properties at risk and Annual Average Damages of £72,000.

Actions to manage flooding in Potentially Vulnerable Area 06/10

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 Huntly 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** (6010010006)		
Objective (ID):	Reduce flood risk in the Meadows area of Huntly (including A96 and A920, Ski Centre and caravan park) from the River Deveron and Meadows Burn (601001)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	33 of 42	**2 of 2**	
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	A flood protection scheme has been confirmed and is being progressed to construction on site to reduce flood risk from the River Deveron and the Meadows Burn. The scheme includes a combination of improved conveyance using replacement culverts, construction of embankments and temporary flood water storage and has been designed to a 1 in 200 year standard of protection including an allowance for climate change.		
Potential impacts			
Economic:	The flood protection scheme will reduce flood risk to 50 residential properties and 13 non-residential properties, with estimated damages avoided of £3.4 million. The benefit cost ratio of the proposed works is 1.1.		
Social:	The flood protection scheme will reduce risk to an estimated 110 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. There are a higher than average number of vulnerable people in the area who will benefit from the works. The nursing home, A96 and A920, ski centre and caravan park would also benefit from reduced flood risk.		

Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. In Huntly, the embankments are set back from the river and are likely to improve the ecological quality. One scheduled monument would benefit from reduced risk of flooding. Actions taken to minimise the impacts to the environment include use of shallow sloping defences to reduce the visual impacts. There are no designated habitat sites close to the area.

Action (ID):	**FLOOD PROTECTION SCHEME/WORKS** (6300021)		
Objective (ID):	Reduce the physical risk, or disruption risk, related to areas of the A96 at risk of flooding (6300)		
Delivery lead:	Transport Scotland		
Status:	**Not started**	Indicative delivery:	**2028-2033**
Description:	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the A96.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (6010040018)		
Objective (ID):	Reduce risk from surface water flooding in Huntly (601004)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Huntly (Bogie)' flood warning area which is on the River Bogie and the 'Milton and The Meadows' flood warning area. Both form part of the Deveron river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 and promote Floodline. This will be achieved through property level protection events delivered by the Scottish Flood Forum and SEPA led education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

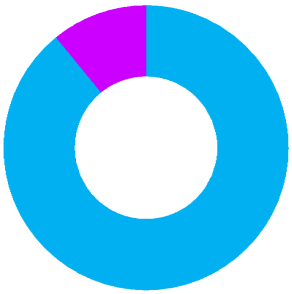
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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. There are two containers of sand bags, which can be accessed by members of the community for deployment in the event of a flood warning, within the Meadows area in Huntly. Aberdeenshire Council also operates a flood monitor on the Meadows Burn to provide early warning of potential flooding.		

Action (ID):	**PLANNING POLICIES** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Insch (Potentially Vulnerable Area 06/11)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Summary of flooding impacts



At risk of flooding

- 80 residential properties
- 30 non-residential properties
- £250,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

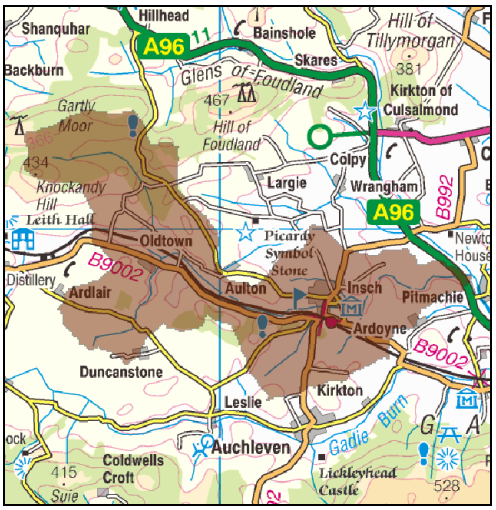
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	*Maintain flood warning*	Awareness raising	*Surface water plan/study*	Emergency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

Insch (Potentially Vulnerable Area 06/11)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Background

This Potentially Vulnerable Area is based around Insch and Oldtown. It is approximately 40km^2. The B9002 and B992 and the Aberdeen to Inverness railway line pass through the area.



The main watercourse is The Shevock which is a tributary of the River Urie.

There are approximately 80 residential and 30 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £250,000 with the majority caused by river flooding.

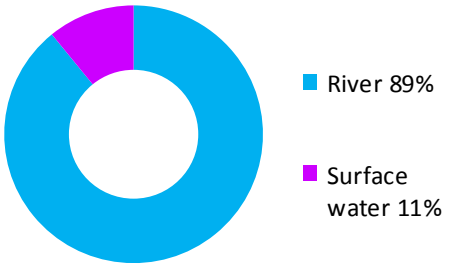


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk in this area is mainly associated with the Shevock Burn where it flows through the southern part of town of Insch.

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

A hospital, one nursing home, sections of road and railway are all identified as being at risk of flooding.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,200)	50	80	80
Non-residential properties (total 230)	20	30	30
People	100	170	170
Community facilities	0	<10 Healthcare facilities	<10 Healthcare facilities
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations Rail at 10 locations	Roads at 30 locations Rail at 20 locations	Roads at 30 locations Rail at 20 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.7	0.9	0.9

Table 1: Summary of flooding impacts[1]

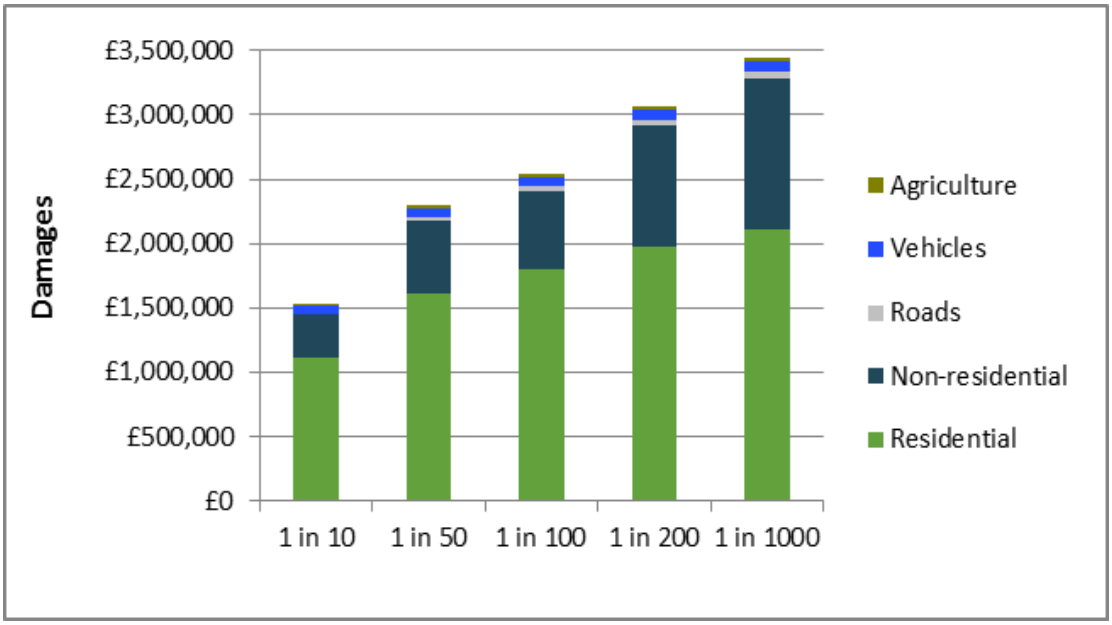


Figure 2: Damages flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

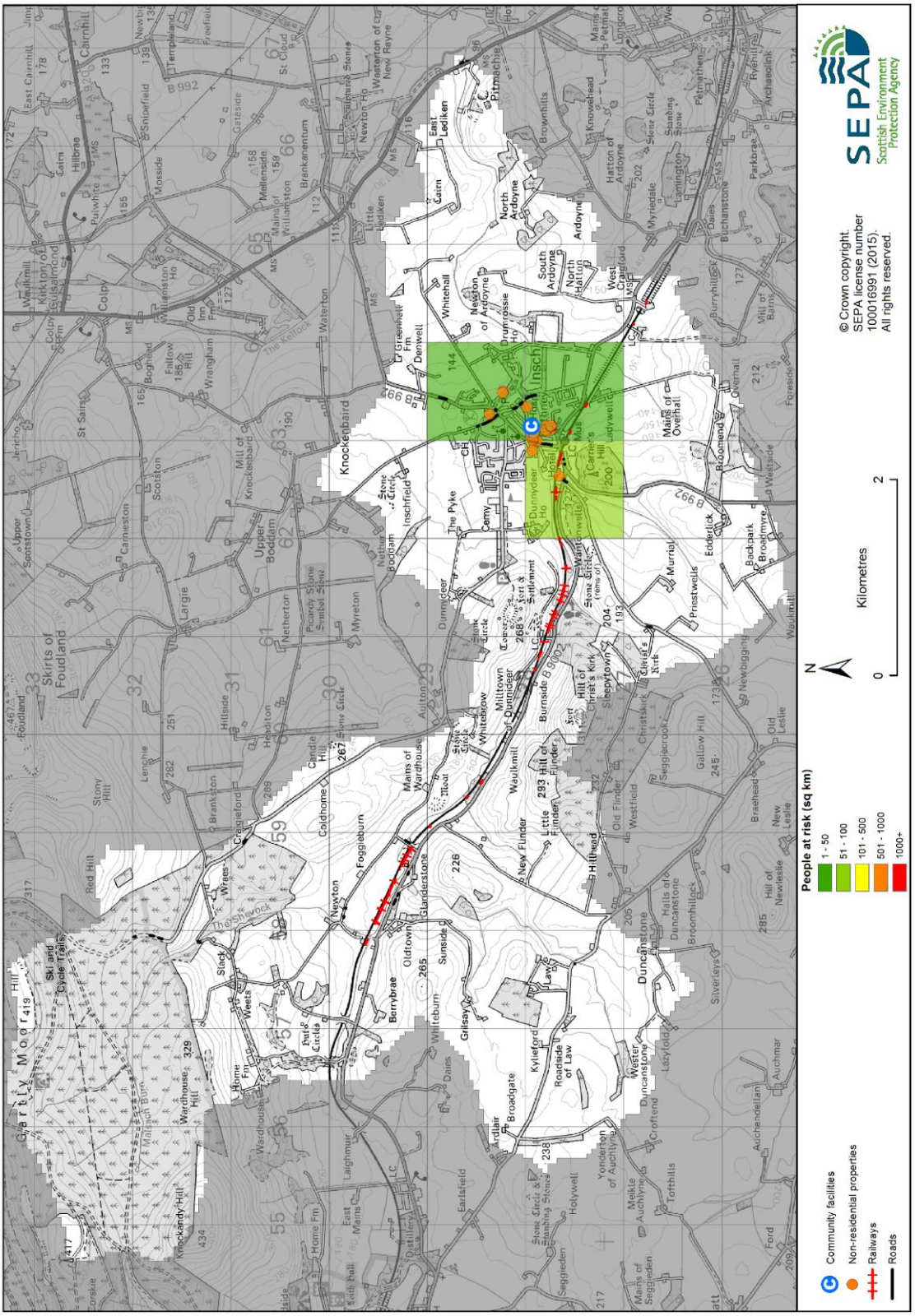


Figure 3: Impacts of flooding

History of flooding

The earliest recorded floods occurred in 1864 from The Shevock and in 1879, when the railway flooded from a burn in Insch. There were floods in 1903 and 1930 from The Shevock, resulting in minor damage.

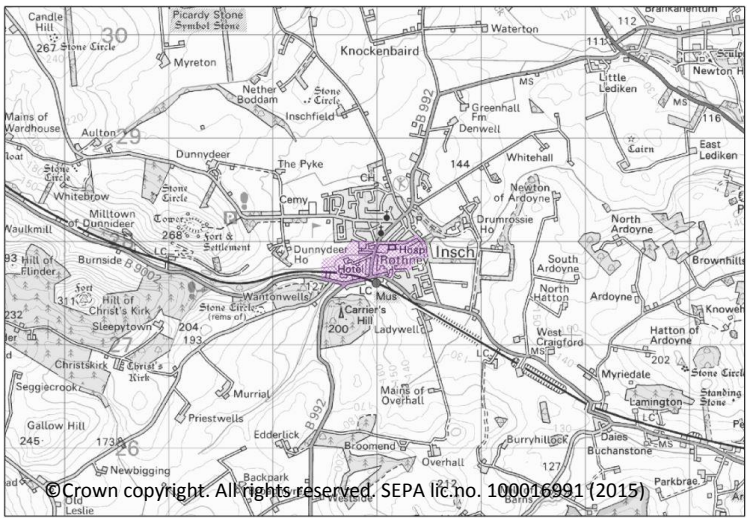
The highest impact flood on record within this Potentially Vulnerable Area occurred in November 2002, when a nursing home had to be evacuated due to flooding by The Shevock; residential properties were also affected. Local knowledge also refers to the nursing home being affected by flooding in 1995, however SEPA has no records to confirm this event or its impacts.

There have been six floods since 2002 coming variously from the Valentine Burn, The Shevock and surface water runoff. There were two floods in 2004; one in June from The Shevock, which affected properties in south west Insch, and the other from the Valentine Burn in August which affected property in north west Insch. Both floods were exacerbated by drainage systems being unable to cope with the heavy rainfall. Roads are often affected by surface water flooding, for example in 2008 the B9002 was flooded.

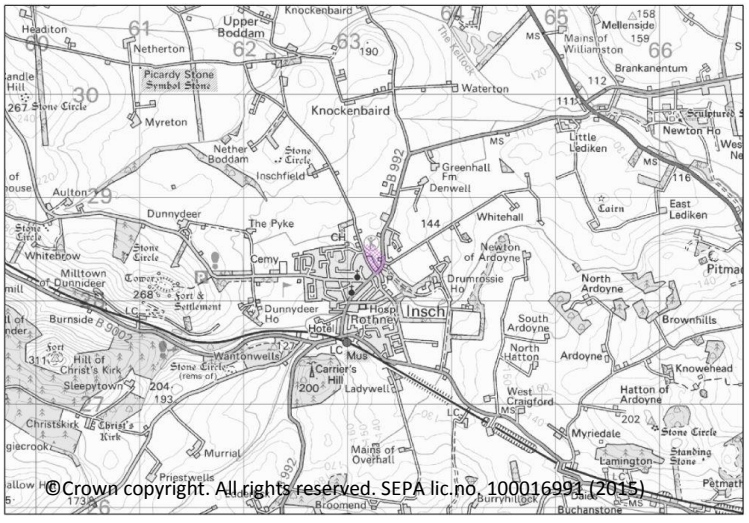
Objectives to manage flooding in Potentially Vulnerable Area 06/11

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 Insch Potentially Vulnerable Area.

Reduce flood risk in Insch from The Shevock

Indicators:	Target area:
• 100 people • £110,000 Annual Average Damages from residential properties • £54,000 Annual Average Damages from non-residential properties • 1 hospital	 ©Crown copyright. All rights reserved. SEPA lic.no. 100016991 (2015)
Objective ID: 601101	

Reduce flood risk in Insch from the Valentine Burn

Indicators:	Target area:
• 40 people • £30,000 Annual Average Damages from residential properties • £160 Annual Average Damages from non-residential properties	 ©Crown copyright. All rights reserved. SEPA lic.no. 100016991 (2015)
Objective ID: 601102	

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 80 residential properties • £250,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 80 residential properties • £250,000 Annual Average Damages
Applies across North East 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 06/11

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 Insch 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 STUDY** (6011010005)		
Objective (ID):	Reduce flood risk in Insch from the Valentine Burn (601102) Reduce flood risk in Insch from The Shevock (601101)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	61 of 168	**3 of 12**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of flooding in Insch from The Shevock and Valentine Burn. The flood protection study should focus on modifications to the bridges to improve conveyance, the construction of direct defences, natural flood management (river or floodplain restoration), relocation of properties and property level protection to reduce the likelihood of flooding. Other actions may also be considered to develop the most sustainable range of options.		
Potential impacts			
Economic:	The study could benefit 52 residential and 20 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.3 million.		
Social:	The development of flood protection works following the study would potentially reduce risk to 141 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. One healthcare facility would benefit from reduced likelihood of flooding if flood protection works provided protection to risk floods. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. Negative impacts through disturbance to		

Social:	the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment.

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to incorporate additional surface water hazard mapping information into the flood maps to improve understanding of flood risk. Approximately 1,700km² of improved data is currently available within this Local Plan District.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

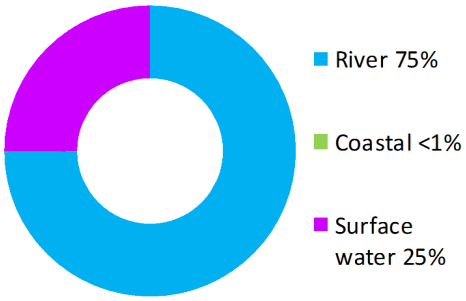
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Ellon (Potentially Vulnerable Area 06/12)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Ythan, Buchan coastal

Summary of flooding impacts



At risk of flooding

- 110 residential properties
- 40 non-residential properties
- £300,000 Annual Average Damages

(damages by flood source shown left)

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.

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

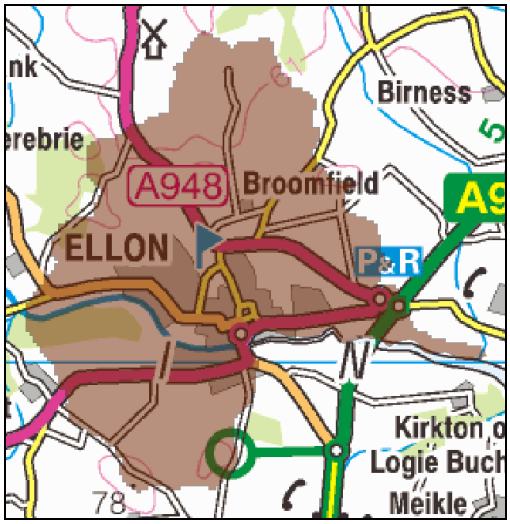
Ellon (Potentially Vulnerable Area 06/12)

Local Plan District	Local authority	Main catchments
North East	Aberdeenshire Council	River Ythan Buchan coastal

Background

This Potentially Vulnerable Area is centred on Ellon. It is approximately 19km^2.

The A920, A948, B9005 and a short section of the A90 pass through the area.



The main river in the area is the Ythan, which is tidally influenced downstream of Ellon.

There are approximately 110 residential and 40 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £300,000 with the majority due to river flooding.

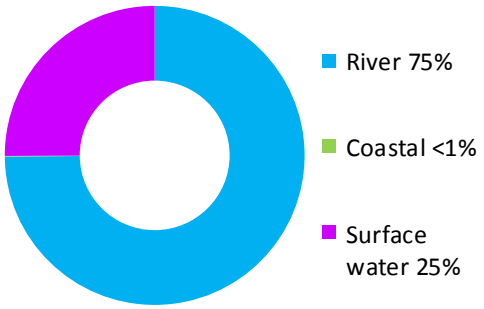


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The river flood risk comes from the River Ythan and its smaller tributaries, including Modley Burn and Broomies Burn.

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

Roads at risk of flooding include the A920, A948 and A90. One school is at risk of flooding. Three designated cultural heritage sites and small areas of designated environmental sites are shown to be at risk.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 4,400)	40	110	160
Non-residential properties (total 4,200)	20	40	50
People	90	230	350
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 40 locations	Roads at 60 locations	Roads at 70 locations
Environmental designated areas (km^2)	<0.1	<0.1	<0.1
Designated cultural heritage sites	2	3	3
Agricultural land (km^2)	0.6	0.6	0.7

Table 1: Summary of flooding impacts[1]

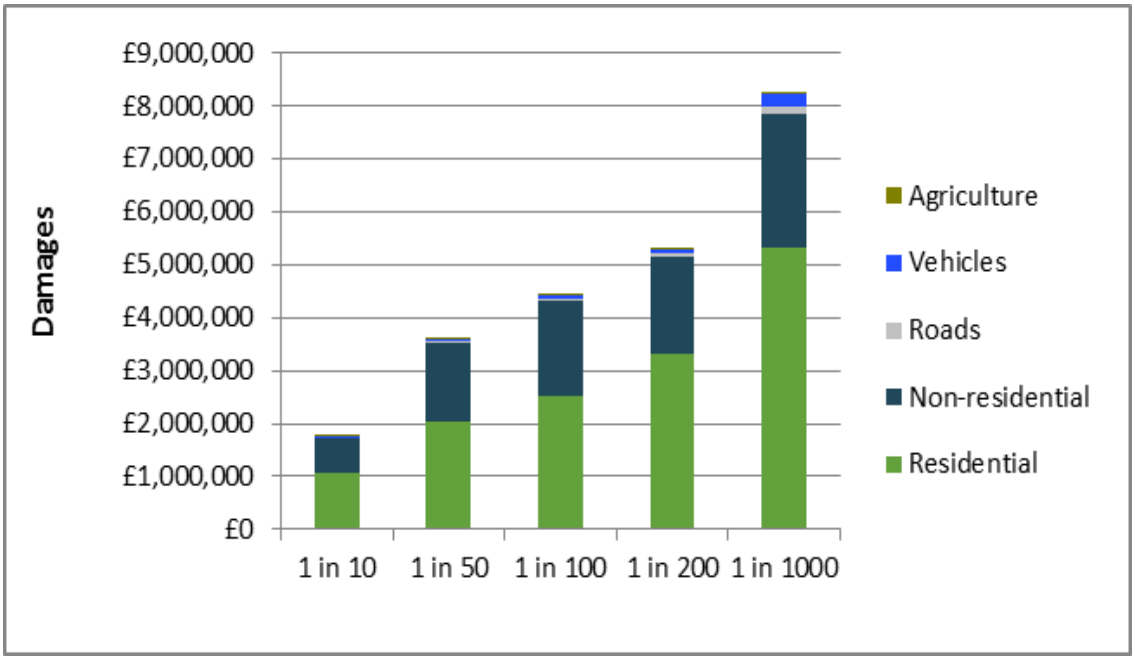


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

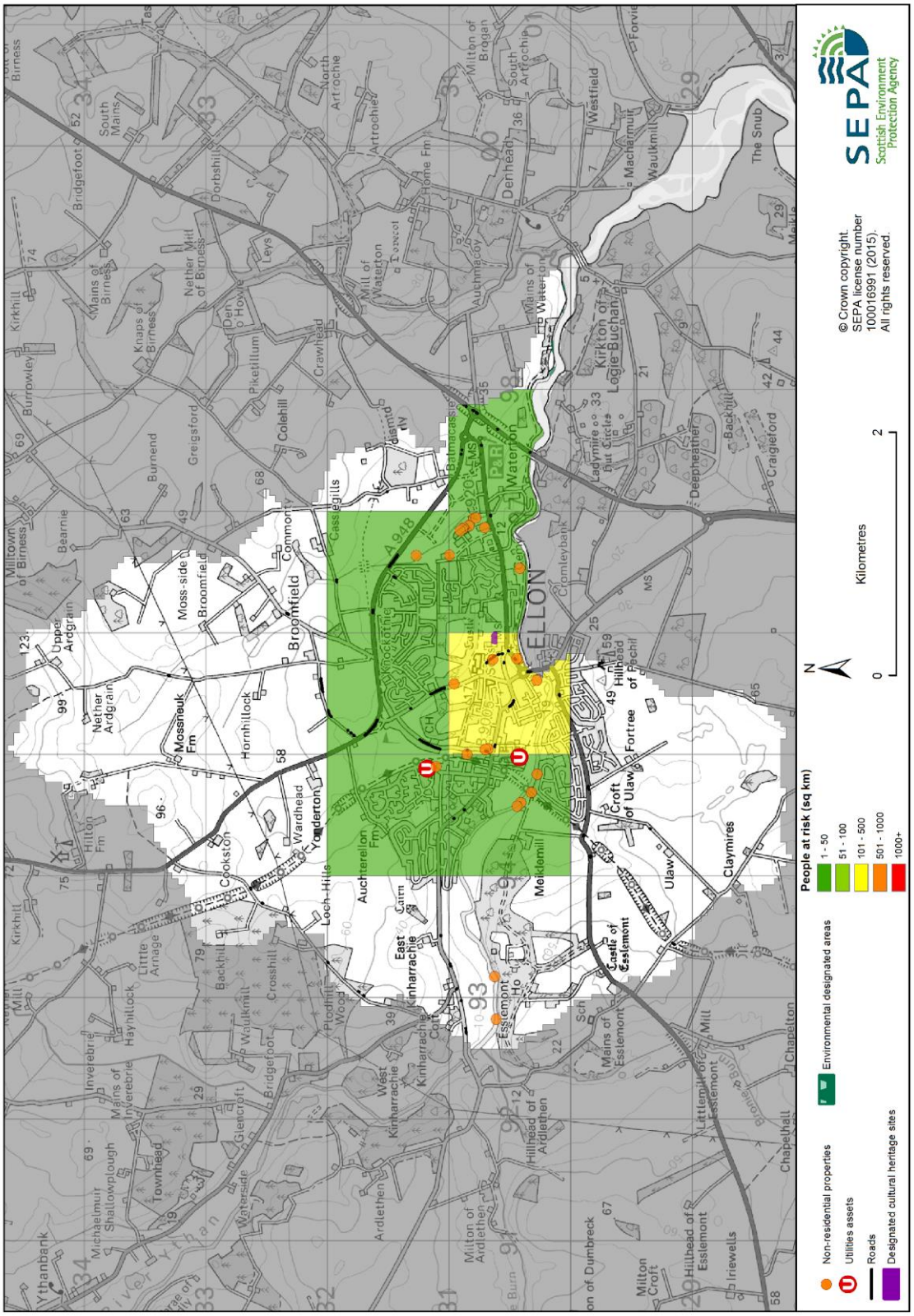


Figure 3: Impacts of flooding

History of flooding

There are two recorded floods from the Modley Burn in Ellon. In 2000 a wall collapsed, causing flooding. In 2002 the basements of property located on the culverted section of the burn flooded due to water backing up.

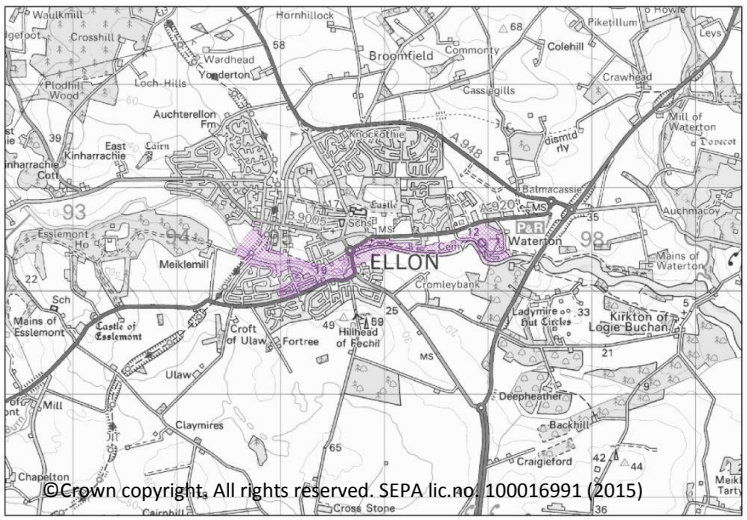
In 2004, two properties in Findhorn Gardens flooded due to runoff from the adjacent housing development.

In 2009 there was a flood from Broomies Burn, which affected Castle Way Industrial Estate, Ellon and damaged two bridges. Two industrial units and a school were affected.

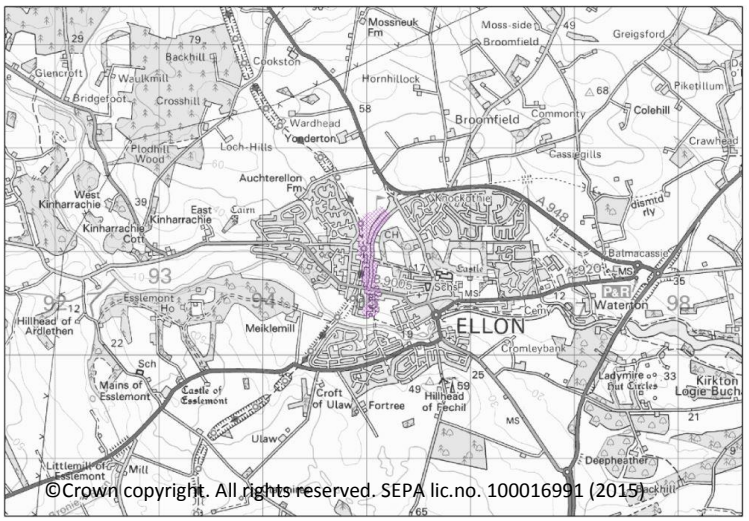
Objectives to manage flooding in Potentially Vulnerable Area 06/12

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 Ellon Potentially Vulnerable Area.

Reduce flood risk in Ellon from the River Ythan

Indicators:	Target area:
• 80 people • £58,000 Annual Average Damages from residential properties • £6,200 Annual Average Damages from non-residential properties	
Objective ID: 601201	

Reduce flood risk in Ellon from the Modley Burn

Indicators:	Target area:
• 80 people • £80,000 Annual Average Damages from residential properties • £20,000 Annual Average Damages from non-residential properties	
Objective ID: 601202	

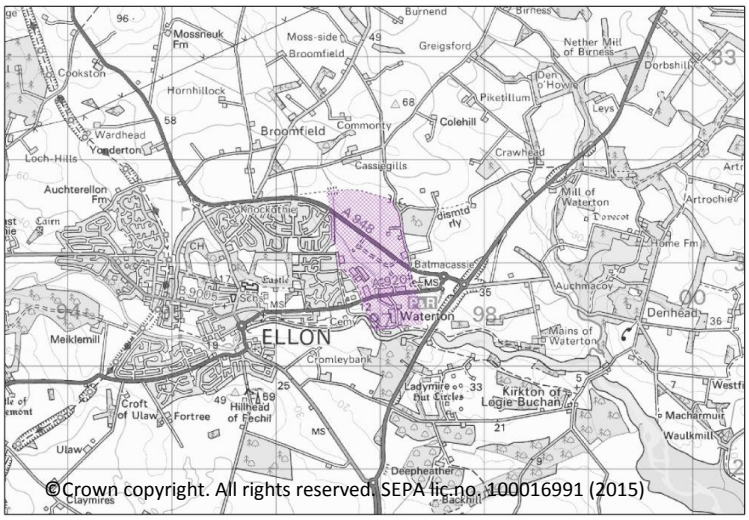
Reduce flood risk in Ellon from the Broomies / Bronie Burn

Indicators:

- £4,100 Annual Average Damages from residential properties
- £37,000 Annual Average Damages from non-residential properties

Objective ID: 601203

Target area:



Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 110 residential properties • £300,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 110 residential properties • £300,000 Annual Average Damages
Applies across North East 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 06/12

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 Ellon 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):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**post 2021**
Description:	The area under consideration includes properties affected by flooding from the River Ythan. Full scoping will be required before a flood warning service can be developed and implemented in this area and further assessment will help to determine appropriate timescales for delivery.		

Action (ID):	**FLOOD PROTECTION STUDY** (6012010005)		
Objective (ID):	Reduce flood risk in Ellon from the Broomies / Bronie Burn (601203) Reduce flood risk in Ellon from the Modley Burn (601202) Reduce flood risk in Ellon from the River Ythan (601201)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	55 of 168	**1 of 12**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of flooding in Ellon from the River Ythan, Modley Burn and Broomies / Bronie Burn. The flood protection study should focus on direct defences, online/offline storage, natural flood		

	management (sediment management - especially on Modley Burn and Broomies Burn), modification of conveyance on the Broomies Burn, relocation of properties and property level protection to reduce the risk of flooding. Any other actions may also be considered to develop the most sustainable range of options.
Potential impacts	
Economic:	The study could benefit 77 residential and 18 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.1 million.
Social:	The development of flood protection works following the study would potentially reduce risk to 169 people . A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. One school may benefit from any works. Three utility sites (energy/electricity) could also benefit from the flood protection works identified in the study depending on the location and extent of works. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. 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 Ythan Estuary, Sands of Forvie and Meikle Loch Special Protection Area. The study should ensure the actions do not impact the downstream Sands of Forvie and Ythan Estuary Site of Special Scientific Interest.

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

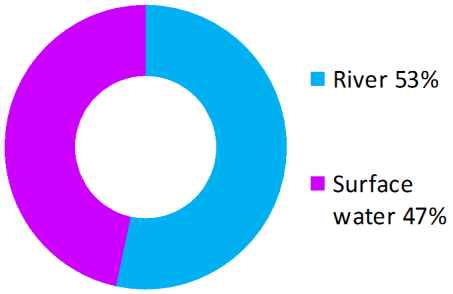
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Inverurie and Kintore (Potentially Vulnerable Area 06/13)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Summary of flooding impacts



At risk of flooding

- 230 residential properties
- 190 non-residential properties
- £510,000 Annual Average Damages

(damages by flood source shown left)

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.

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

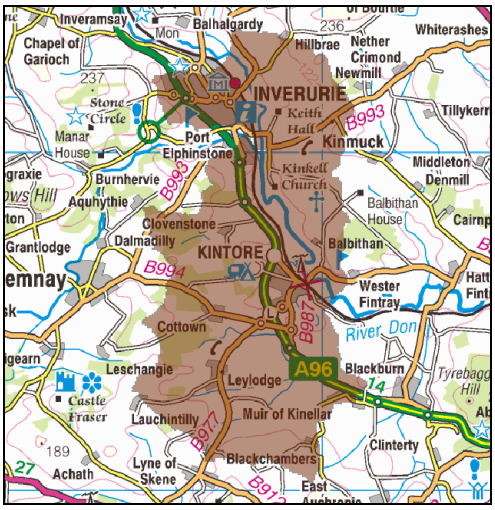
Inverurie and Kintore (Potentially Vulnerable Area 06/13)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Background

This Potentially Vulnerable Area includes Inverurie and Kintore. It is approximately 60km^2.

The A96 and the Aberdeen to Inverness railway pass through the area.



The main watercourses are the River Don and the River Urie. There are several smaller watercourses including the Strath Burn which is mainly culverted through Inverurie.

There are approximately 230 residential and 190 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £510,000 with the majority caused by river flooding.

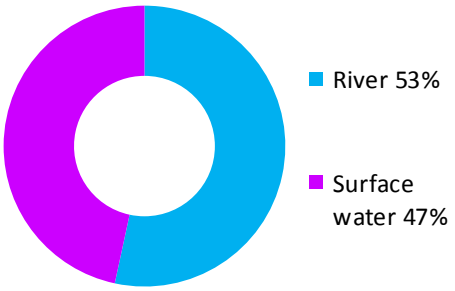


Figure 1: Annual Average Damages by flood source

Summary of impacts from all sources of flooding

River flood risk in Inverurie is concentrated at the southern end of the town at the confluence of the River Don and River Urie, with an additional flood risk area around the confluence of the Over Burn with the River Urie. The flood risk in Kintore is concentrated around the Loch Burn and the Tuach Burn.

Surface water flood risk in Inverurie is mainly associated with the culverted sections of the Strath Burn / Over Burn and is concentrated along the B9170.

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

Several road locations, including the A96 and parts of the Aberdeen to Inverness railway line are at risk of flooding. Thirteen designated cultural heritage sites and an extensive area of agricultural land are also at risk of flooding.

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 and roads.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 6,800)	40	230	280
Non-residential properties (total 1,200)	100	190	240
People	80	500	610
Community facilities	0	0	<10 Emergency services
Utilities assets	<10	10	10
Transport links (excluding minor roads)	Roads at 120 locations Rail at 20 locations	Roads at 190 location Rail at 30 locations	Roads at 210 locations Rail at 30 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	10	13	13
Agricultural land (km^2)	4	4	5

Table 1: Summary of flooding impacts[1]

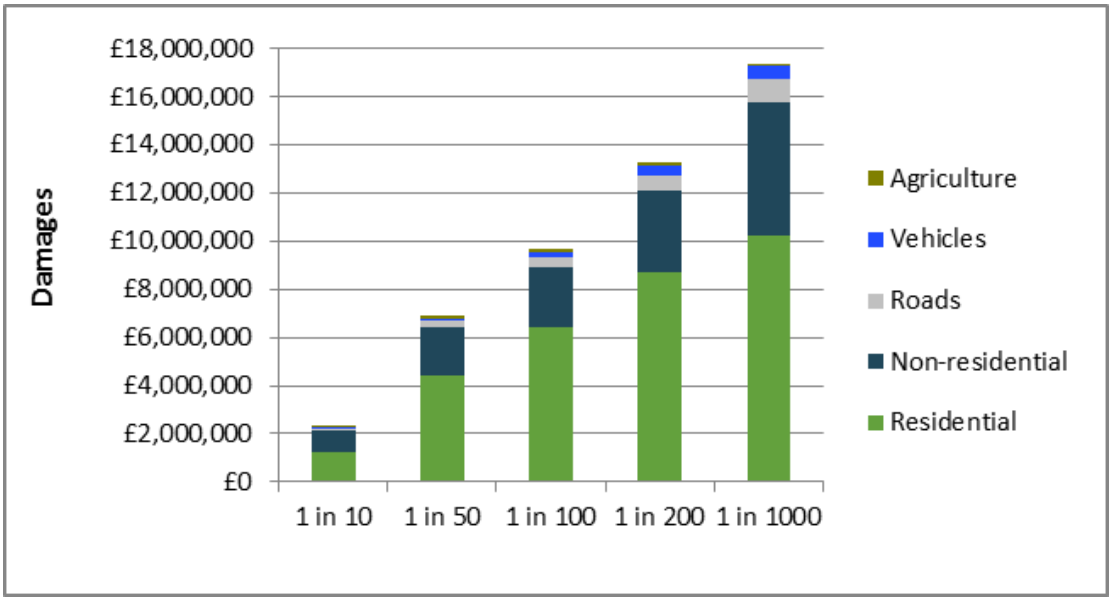


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

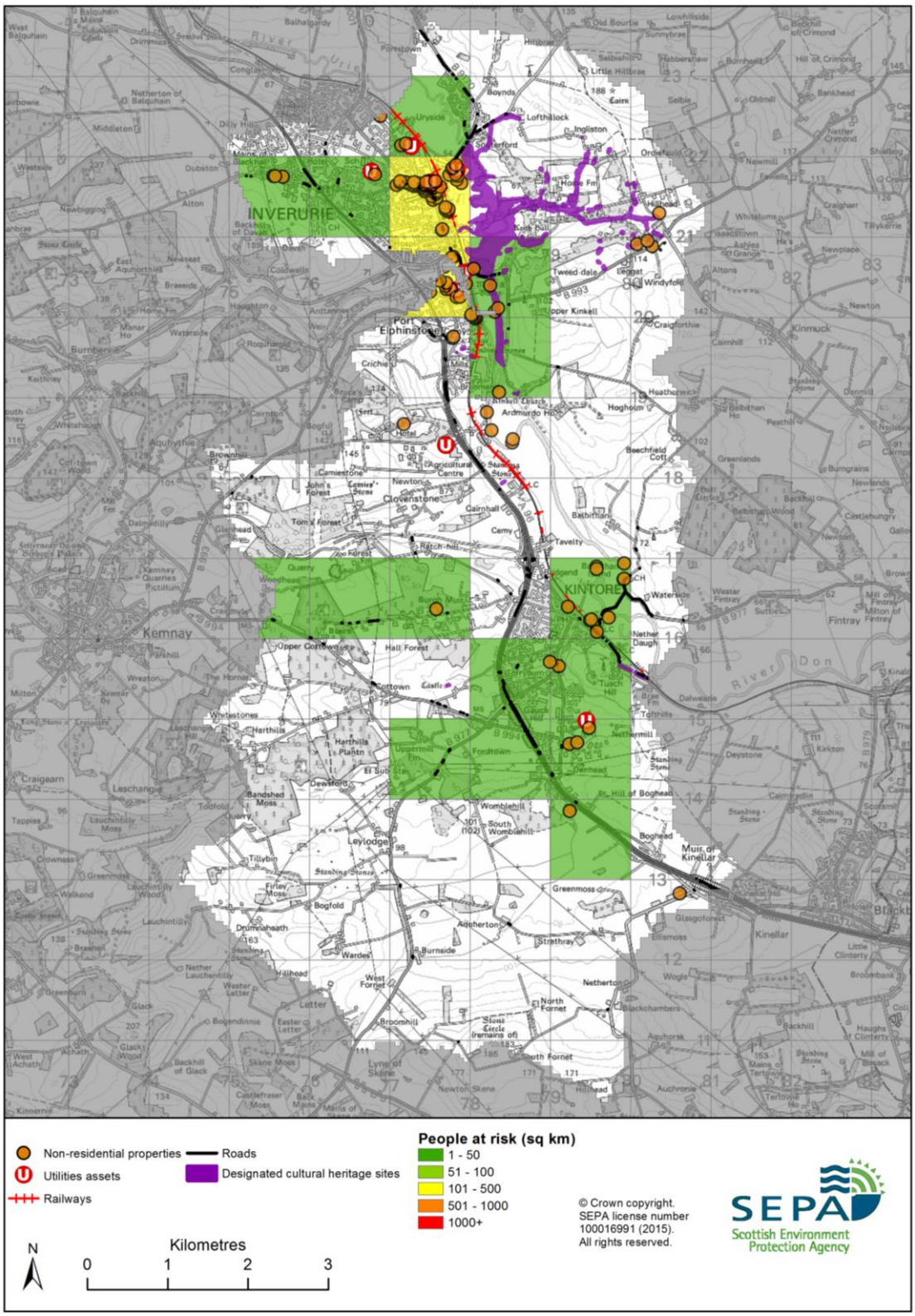


Figure 3: Impacts of flooding

History of flooding

The earliest recorded flood was in 1768 when flooding on the Don destroyed most of the agricultural crops in affected areas. Similar floods were recorded on the Don in 1828, 1838, 1872, 1903, 1905, 1928, 1948, and 1951. The River Don also caused flooding in 1995, 2002, 2003, 2004, and 2009.

The 2002 flood had the highest water level recorded at the Bridge of Don and flooding from the canal affected Canal Road. In 2003, the flood barrier at Keithhall Road, Inverurie was breached and residential properties were flooded.

The Gas Burn flooded Blackall Road in Inverurie in 1924. The Strath Burn caused flooding to properties in central Inverurie in 2002, 2005, 2006, 2008, 2009, and 2010 due to the culvert backing up and blockage of the trash screen.

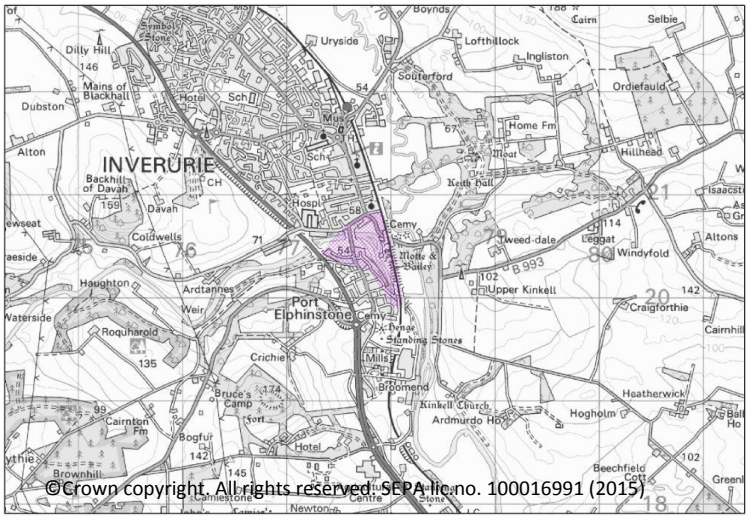
In 2009 Oldmeldrum Road and Souterford Road flooded due to overtopping of the River Urie. Other floods in this location were recorded in 1995 and 2002.

There was flooding in Kintore from the Tuach Burn in 2002, 2003, 2006, and 2009, when water backed up the burn from the River Don. Properties in south east Kintore, including Kingsfield Road, were flooded. Water levels backing up from the River Don caused flooding on the Loch Burn in the eastern areas of Kintore in 2002, 2005, and 2009 affecting commercial property in the area between the two railway culverts and properties on Northern Road.

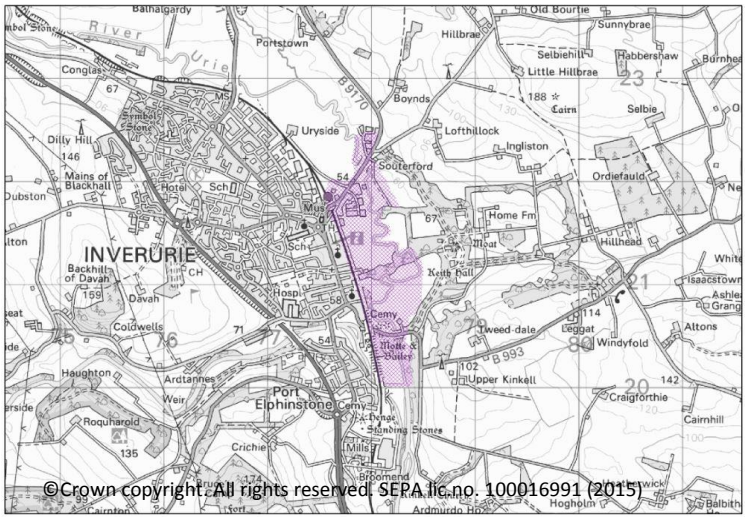
Objectives to manage flooding in Potentially Vulnerable Area 06/13

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 Inverurie and Kintore Potentially Vulnerable Area.

Reduce flood risk in Inverurie and Port Elphinstone from the River Don

Indicators:	Target area:
• 240 people • £120,000 Annual Average Damages from residential properties • £84,000 Annual Average Damages from non-residential properties	
Objective ID: 601301	

Reduce flood risk in Inverurie and Port Elphinstone from the River Urie

Indicators:	Target area:
• 30 people • £18,000 Annual Average Damages from residential properties • £21,000 Annual Average Damages from non-residential properties	
Objective ID: 601302	

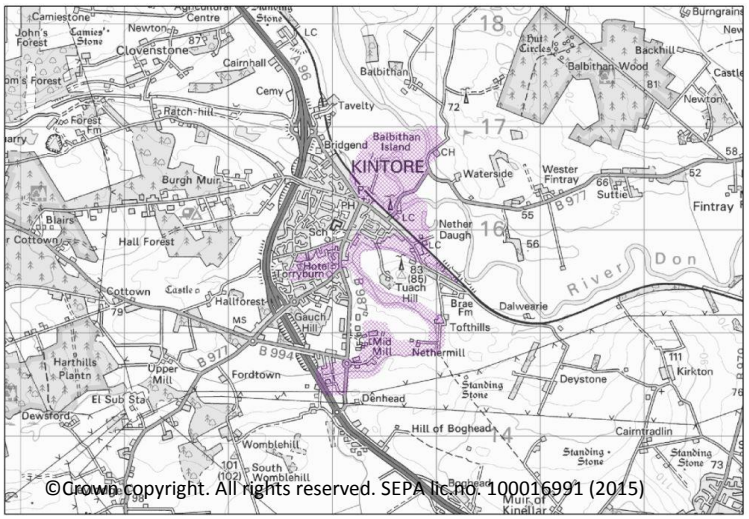
Reduce flood risk in Kintore from all watercourses (River Don, Torry Burn, Tuach Burn and Loch Burn)

Indicators:

- 60 people
- £51,000 Annual Average Damages from residential properties
- £19,000 Annual Average Damages from non-residential properties
- B977

Objective ID: 601303

Target area:



Target area	Objective	ID	Indicators within PVA
Inverurie and Kintore	Reduce the physical risk, or disruption risk, related to areas of the A96 at risk of flooding	6301	• 23 locations on the A96 with a total length of 820m
Inverurie and Kintore	Reduce risk from surface water flooding in Inverurie and Kintore	601307	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 230 residential properties • £510,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 230 residential properties • £510,000 Annual Average Damages
Applies across North East 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 06/13 there are 90 residential properties at risk and Annual Average Damages of £240,000.

Actions to manage flooding in Potentially Vulnerable Area 06/13

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 Inverurie and Kintore 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** (6301021)		
Objective (ID):	Reduce the physical risk, or disruption risk, related to areas of the A96 at risk of flooding (6301)		
Delivery lead:	Transport Scotland		
Status:	**Not started**	Indicative delivery:	**2028-2033**
Description:	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the A96.		

Action (ID):	**FLOOD PROTECTION STUDY** (6013010005)		
Objective (ID):	Reduce flood risk in Inverurie and Port Elphinstone from the River Urie (601302) Reduce flood risk in Inverurie and Port Elphinstone from the River Don (601301)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	57 of 168	**2 of 12**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A flood protection study is required to further develop previous work to consider flood protection works to reduce the risk of flooding in Inverurie and the Port Elphinstone from the River Don and River Urie. The study should cover flood risk from all watercourses in Inverurie and Port Elphinstone. The flood protection study should focus on		

	modifications to the bridges to improve conveyance, the construction of direct defences, online/offline storage, relocation of properties and property level protection to reduce the risk of flooding. Other actions may also be considered to develop the most sustainable range of options.
Potential impacts	
Economic:	The study could benefit 120 residential and 35 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.8 million.
Social:	The development of flood protection works following the study would potentially reduce risk to 264 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Three utility sites (energy/electricity sites), roads (including the B9170) and the railway line could benefit from flood protection works. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. Six cultural heritage sites could benefit from the flood protection works identified in the study, however this will depend on the final location and extent of the works.

Action (ID):	**FLOOD PROTECTION STUDY** (6013030005)		
Objective (ID):	Reduce flood risk in Kintore from all watercourses (River Don, Torry Burn, Tuach Burn and Loch Burn) (601303)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	122 of 168	**8 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A hydraulic study should be taken forward to assess the culverted sections of watercourses and the alignment of the watercourses. This will allow locations of risk to be confirmed within the modelling and against historic flood locations. The improved understanding of risk will increase the understanding of flood mechanisms and focus the area of further study, confirming the risk from all four watercourses; the River Don, Torry Burn, Tuach Burn and Loch Burn. The study should then progress to identify the most sustainable actions to manage flood risk.		
Potential impacts			
Economic:	The study could benefit 25 residential and 13 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £2.2 million. This value is likely to change during the initial stages of the study, as more information is gathered.		

Social:	There are currently an estimated 55 people at risk from floods, however this could change with further understanding of the existing flood risk. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The environmental impacts of potential actions will be considered when there is improved understanding of the current flood risk.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6013070018)		
Objective (ID):	Reduce risk from surface water flooding in Inverurie and Kintore (601307)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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** (6000020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the Upper Don area (from Pitcaple to Kintore) to improve understanding of the flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Inverurie' and 'Kintore' flood warning areas which are part of the Don river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 communities and promote Floodline using most the appropriate mix of methods for the area. These could include direct mailings, education activities, participation in local events and relevant flooding messages in the media. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

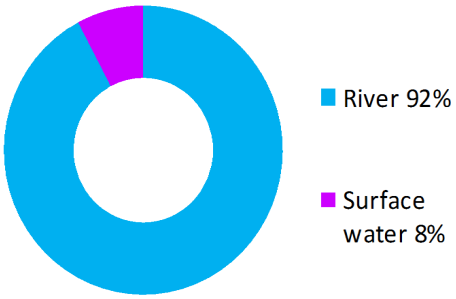
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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. Aberdeenshire Council operates a water level sensor on the Strath Burn to provide early warning of potential flooding. Additional debris clearance on the trash screen is undertaken when water levels are high or weather forecasts suggest heightened risk of flooding.		

Action (ID):	**PLANNING POLICIES** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Heugh-head (Potentially Vulnerable Area 06/14)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Summary of flooding impacts



At risk of flooding

- 10 residential properties
- 10 non-residential properties
- £95,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

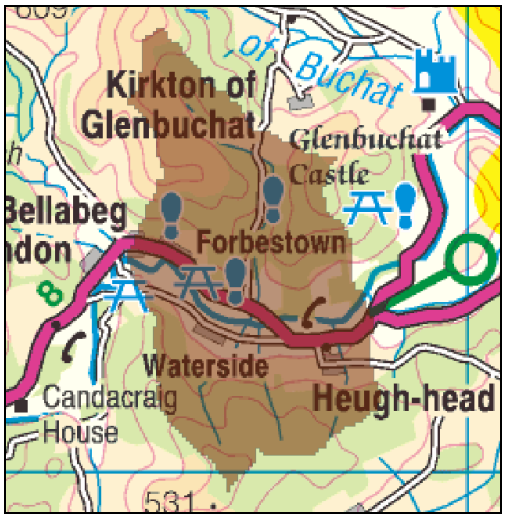
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	Site protection plans
Flood protection study	*Natural flood management study*	*Maintain flood warning*	Awareness raising	*Surface water plan/study*	Emergency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

Heugh-head (Potentially Vulnerable Area 06/14)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Don

Background

This Potentially Vulnerable Area includes the villages of Heugh-head, Forbestown, Bellabeg and Waterside. It is approximately 13km^2 and located within the Cairngorms National Park.



The main water course is the River Don.

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

The Annual Average Damages are approximately £95,000 with the majority of these from river flooding.

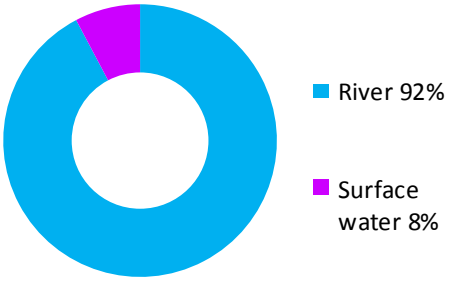


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk is mainly limited to the River Don around Bellabeg and Heugh-head.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. Roads at risk of flooding include the A944 in several locations. The fire station at Bellabeg is also at risk.

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 and roads.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 80)	<10	10	10
Non-residential properties (total 30)	10	10	10
People	20	30	30
Community facilities	<10 Emergency services	<10 Emergency services	<10 Includes: emergency services and healthcare facilities
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 20 locations	Roads at 20 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.5	0.6	0.7

Table 1: Summary of flooding impacts[1]

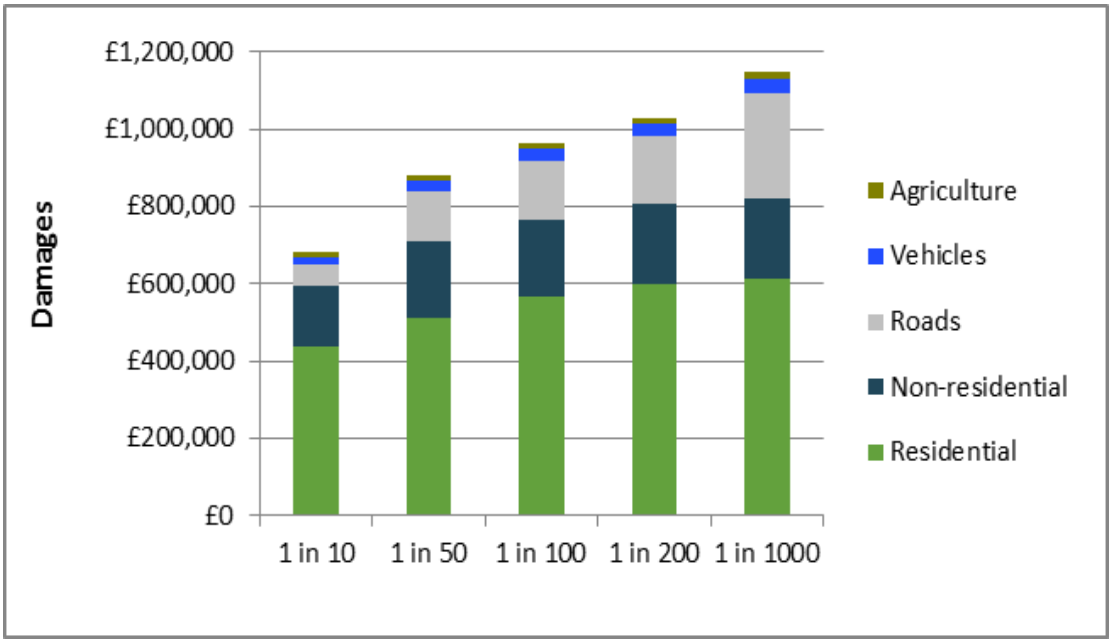


Figure 2: Damages by flood likelihood

History of flooding

There was a surface water flood in August 2006 affecting Strathdon, Waterside and Bellabeg when water ponded in low points of the road. Heavy rainfall falling on steep sloping fields to the south resulted in significant amounts of flood water on the road.

[1] Some receptors are counted more than once if flooded from multiple sources

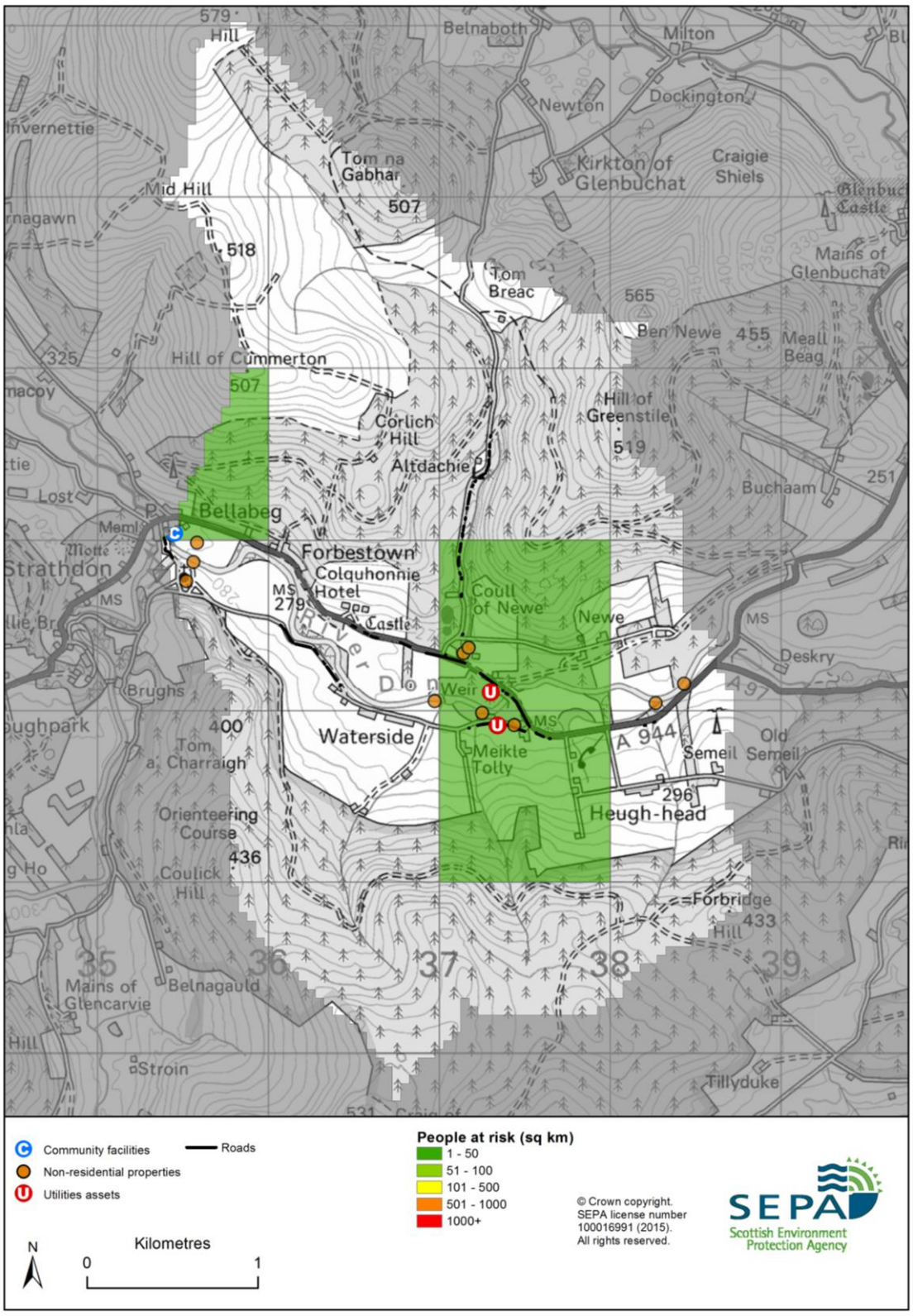


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 06/14

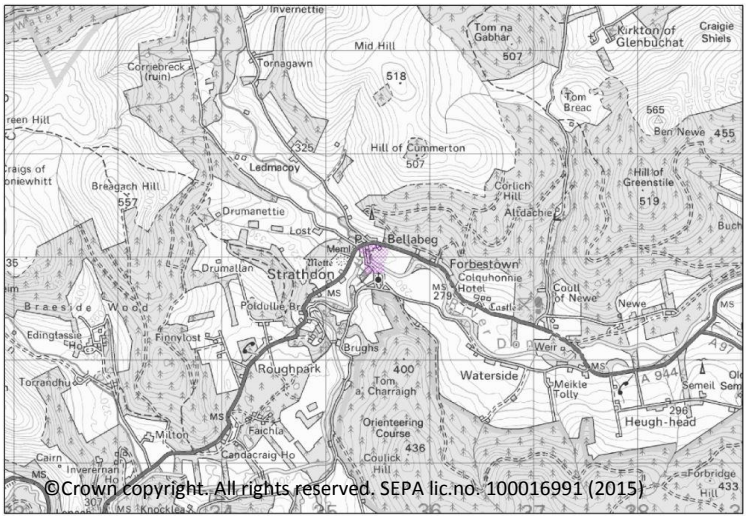
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target 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 Heugh-head Potentially Vulnerable Area.

Reduce flood risk in Strathdon from the River Don

Indicators:

- 1 emergency service
- 1 healthcare facility

Target area:



Objective ID: 601401

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 10 residential properties • £95,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 10 residential properties • £95,000 Annual Average Damages
Applies across North East 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 06/14

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 Heugh-head 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 FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 communities and promote Floodline using most the appropriate mix of methods for the area. These could include direct mailings, education activities, participation in local events and relevant flooding messages in the media. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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):	**SITE PROTECTION PLANS** (6014010015)		
Objective (ID):	Reduce flood risk in Strathdon from the River Don (601401)		
Delivery lead:	Asset managers		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	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. A site protection plan should be developed for the fire station and a doctor's surgery.		

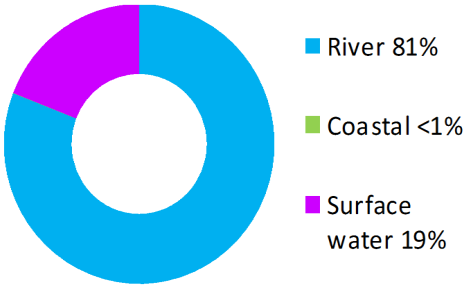
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Aberdeen City - Bridge of Don (Potentially Vulnerable Area 06/15)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council, Aberdeenshire Council	River Don, Aberdeen North coastal

Summary of flooding impacts



At risk of flooding

- 2,200 residential properties
- 470 non-residential properties
- £4.5 million Annual Average Damages

(damages by flood source shown left)

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.

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

Aberdeen City – Bridge of Don (Potentially Vulnerable Area 06/15)

Local Plan District	Local authority	Main catchments
North East	Aberdeen City Council	River Don, Aberdeen North Coastal

Background

This Potentially Vulnerable Area covers the northern areas of the City of Aberdeen, extending along the River Don from Bridge of Don to Dyce. It is approximately 46km^2 and includes the airport and Aberdeen to Inverness railway line.

The main river is the River Don and there are also a number of small watercourses, most of which are culverted for all or part of their route through the city.

There are approximately 2,200 residential properties and 470 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £4.5 million with the majority caused by river flooding.

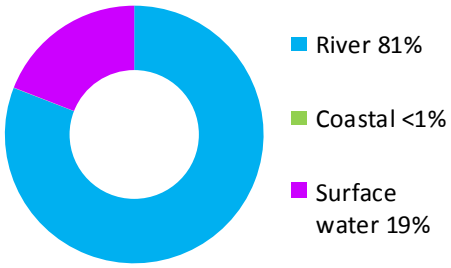


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flood risk in Aberdeen City is complex due to the interaction between the main rivers, small often culverted watercourses, sewerage systems, patterns of surface water runoff and tide levels. In order to better understand these complex interactions, a more detailed flood model has been developed which has helped to inform the assessment of flood risk reported below.

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

A number of schools, healthcare facilities and an emergency services site are at risk of flooding. Transport links affected by flooding include the A956, A90, A947 and A96 roads and the Aberdeen to Inverness railway line. Flooding also affects a small number of designated cultural heritage sites, utilities and buildings at the University of Aberdeen.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 32,000)	450	2,200	3,600
Non-residential properties (total 2,900)	180	470	610
People	980	4,800	8,000
Community facilities	<10 Educational buildings	30 Includes: educational buildings, healthcare facilities and emergency services	40 Includes: educational buildings, healthcare facilities and emergency services
Utilities assets	10	40	60
Transport links (excluding minor roads)	Roads at 180 locations Rail at 20 locations Aberdeen airport	Roads at 320 locations Rail at 40 locations Aberdeen airport	Roads at 380 locations Rail at 40 locations Aberdeen airport
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	2	3	3
Agricultural land (km^2)	0.5	0.9	1.2

Table 1: Summary of flooding impacts[1]

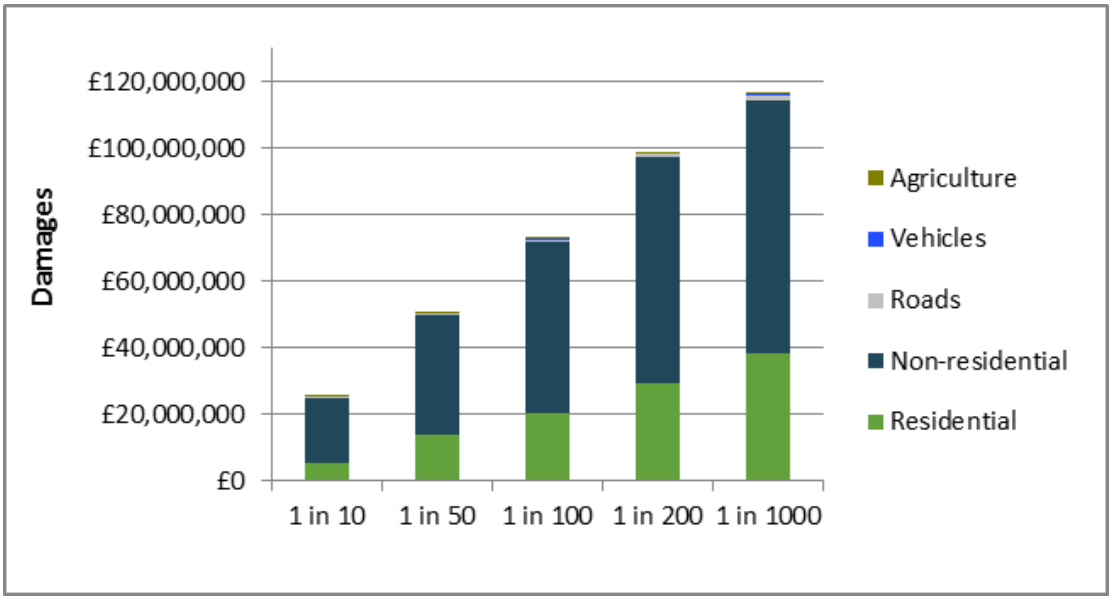


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

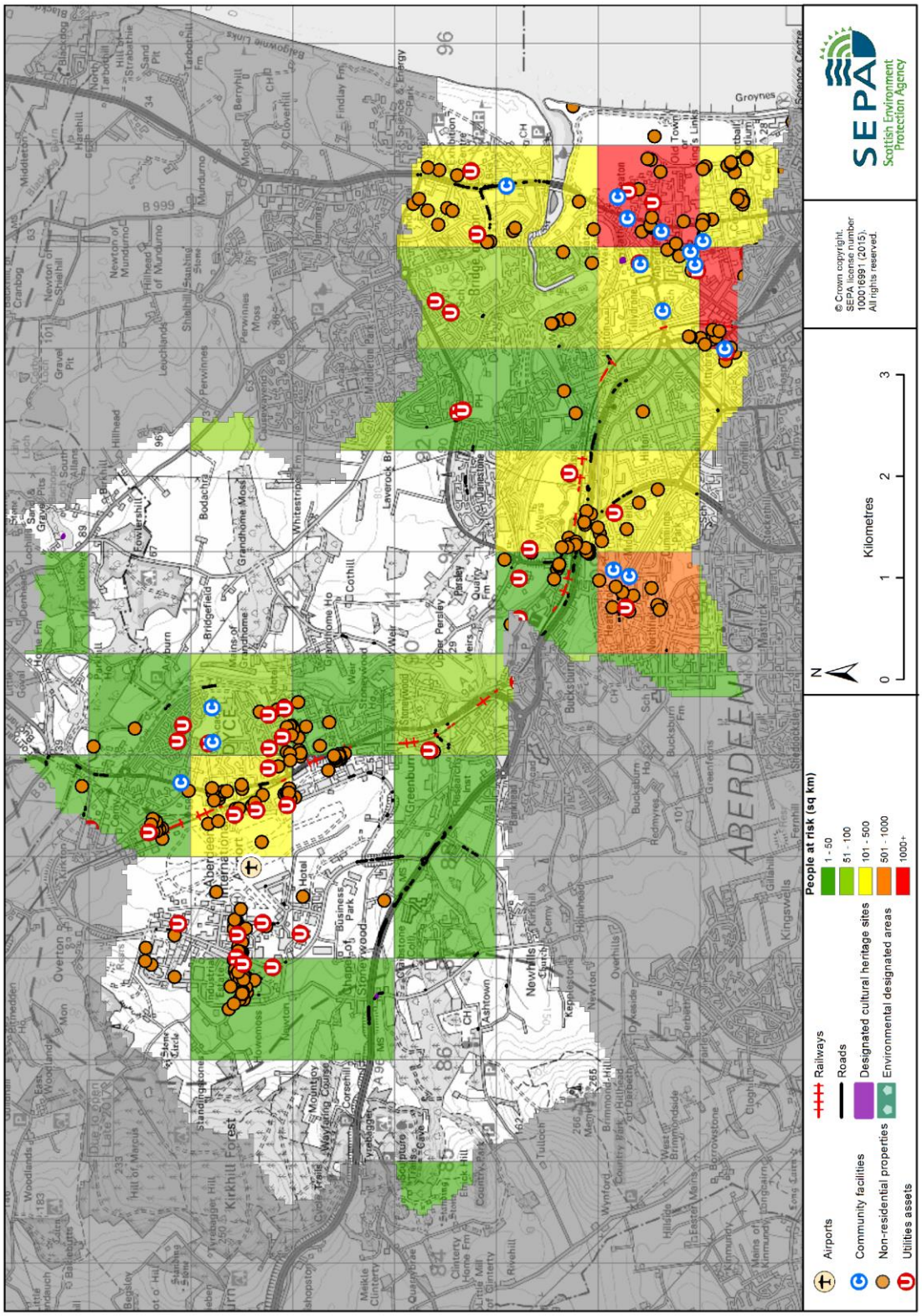


Figure 3: Impacts of flooding

History of flooding

The earliest recorded flood was in 1916 when the River Don submerged land in the Dyce area.

There was groundwater flooding in 2001, when the high water table flooded basements in Hilton Avenue, Hilton. Heavy rain resulted in surface water on the A947 Parkhill Bridge in February 2009, which caused a road traffic accident at the Newmarcher to Parkhill Crossroads.

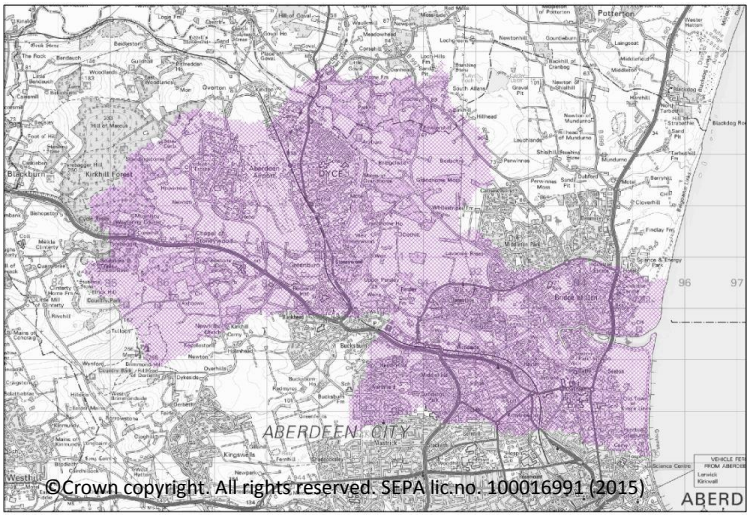
Flooding from the Silverburn due to a blockage of the watercourse was reported at Burnside Drive, Kingswell Park and Ride facility, Broadfold Drive and Cloverhill Road. Incidents have been reported due to inadequate culvert capacity, affecting Farburn Terrace and industrial units on Airport Commerce. There are reports of blockages causing flooding in the University grounds, Hilton Avenue and Cummings Park Circle. Flood incidents have also been reported at Kettock's Mill, Polo Gardens in Stoneywood and Laurel Place, Whitestripes Road, Muggiemoss Road, A96 Inverurie Road, Lade Crescent, Union Road, North Kirkhill, and Manor Drive.
The only coastal flood on record was in 1921, when there was a particularly high tide.

Large parts of Aberdeen were affected by surface water flooding in July 2015. Many manhole covers became dislodged, roads were submerged and Aberdeen Airport's terminal building was flooded.

Objectives to manage flooding in Potentially Vulnerable Area 06/15

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 Aberdeen City - Bridge of Don Potentially Vulnerable Area.

Reduce flood risk in Aberdeen (Bridge of Don) from the River Don and small watercourses including open and culverted lengths

Indicators:	Target area:
• 4,500 people • £1.1 million Annual Average Damages from residential properties • £2.3 million Annual Average Damages from non-residential properties	
Objective ID: 601502	

Target area	Objective	ID	Indicators within PVA
Aberdeen	Reduce risk from surface water flooding in Aberdeen	601507	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 2,200 residential properties • £4.5 million Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 2,200 residential properties • £4.5 million Annual Average Damages
Applies across North East 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 06/15 there are 130 residential properties at risk and Annual Average Damages of £870,000.

Actions to manage flooding in Potentially Vulnerable Area 06/15

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 Aberdeen City - Bridge of Don 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):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Flood warning is required for communities at risk of coastal flooding along the Aberdeenshire coast from Peterhead to Montrose. A flood forecasting system will be required before the flood warning scheme can be developed.		

Action (ID):	**FLOOD PROTECTION STUDY** (6015020005)		
Objective (ID):	Reduce risk from surface water flooding in Aberdeen (601507) Reduce flood risk in Aberdeen (Bridge of Don) from the River Don and small watercourses including open and culverted lengths (601502)		
Delivery lead:	Aberdeen City Council		
Priority:	National:	Within local authority:	
	1 and 5 of 168	**1 and 2 of 4**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Three separate flood protection studies apply to this area and together they should address flood risk from the River Don, small watercourses and surface water flooding in this area. The studies should identify the most sustainable range of options. For small watercourses and surface water flooding, the studies should be		

	based on the outputs from the Aberdeen Integrated Catchment Study and coordinated with the surface water management plan to take a comprehensive approach to flood risk management in Aberdeen.
Potential impacts	
Economic:	Considering all three study areas in Aberdeen City, a total of 10,500 residential and 1,800 non-residential properties could benefit, with potential damages avoided of up to £520 million. In reality the studies should look to identify flooding hotspots, where actions should be targeted. Further study will identify the true benefits of these actions.
Social:	Thirteen educational buildings, 14 health care facilities, 33 utilities, and one emergency service could benefit from any actions taken. Around 23,000 people could benefit from flood protection works. However, this will depend on locations identified for actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.
Environmental:	To be in accord with the FRM Strategy, the responsible authority should seek to ensure, as part of the studies, that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. Cultural heritage sites, including one garden and designed landscape site, could benefit from flood protection works identified in the studies. However, this will depend on the final location and extent of the works. The flood protection studies should consider how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. The physical condition of the River Don, River Dee and Bucks Burn (water body IDs 23265, 23315 and 23266) are identified by river basin management planning to be at less than good status. Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6015070018)		
Objective (ID):	Reduce risk from surface water flooding in Aberdeen (601507)		
Delivery lead:	Aberdeen City Council		
Status:	**Ongoing**	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. An integrated catchment study has been 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** (6000020016)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the Green Burn (right hand tributary at Dyce) and in the Middle Don (from Kintore to Dyce) areas to improve understanding of the flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Aberdeen (Don)' flood warning area which is part of the Don river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 and promote Floodline. This will be achieved through SEPA led education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeen City Council and 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.		

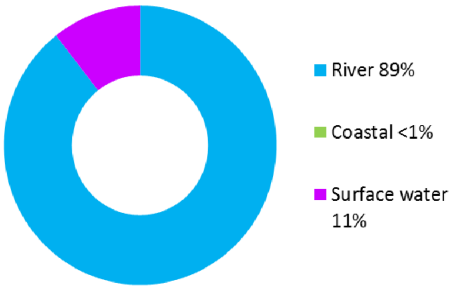
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Aberdeen City - Denmore (Potentially Vulnerable Area 06/16)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council	Buchan coastal

Summary of flooding impacts



At risk of flooding

- 140 residential properties
- 40 non-residential properties
- £570,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

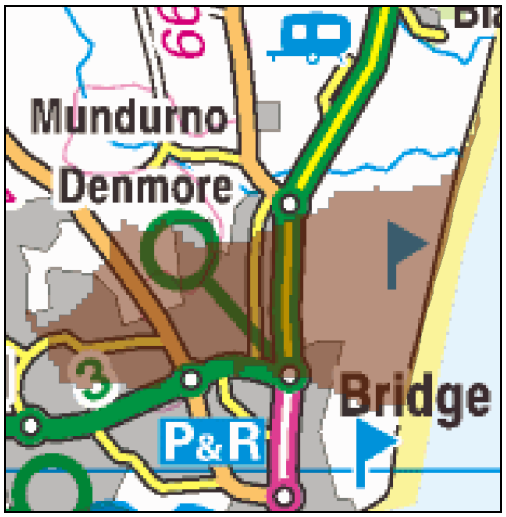
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	*Maintain flood warning*	Awareness raising	Surface water plan/study	Emergency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

Aberdeen City – Denmore (Potentially Vulnerable Area 06/16)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City council	Buchan coastal

Background

This Potentially Vulnerable Area is located on the northern edge of Aberdeen City. It includes the Denmore and Middleton Park areas of Aberdeen City and covers an area of approximately 5km^2.



There are no major rivers, however the Glashieburn and Silverburn both pass through culverts in the urban areas.

There are approximately 140 residential and 40 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £570,000 with the majority caused by river flooding.

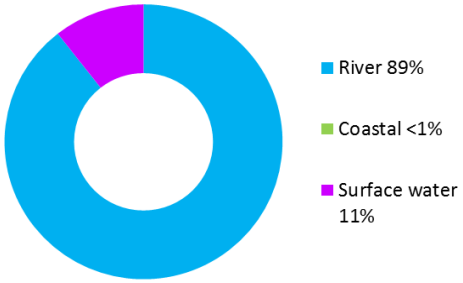


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flood risk in Aberdeen City is complex due to the interaction between the main rivers, small often culverted watercourses, sewerage systems, patterns of surface water runoff and tide levels. In order to better understand these complex interactions, a more detailed flood model has been developed which has helped to inform the assessment of flood risk reported below.

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

A number of schools and an emergency services facility are at risk of flooding. Transport links affected by flooding in several locations include the A90 and B997.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,500)	50	140	220
Non-residential properties (total 230)	10	40	60
People	110	300	470
Community facilities	<10 Educational buildings	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 10 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km^2)	0.1	0.1	0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.1	0.1	0.2

Table 1: Summary of flooding impacts[1]

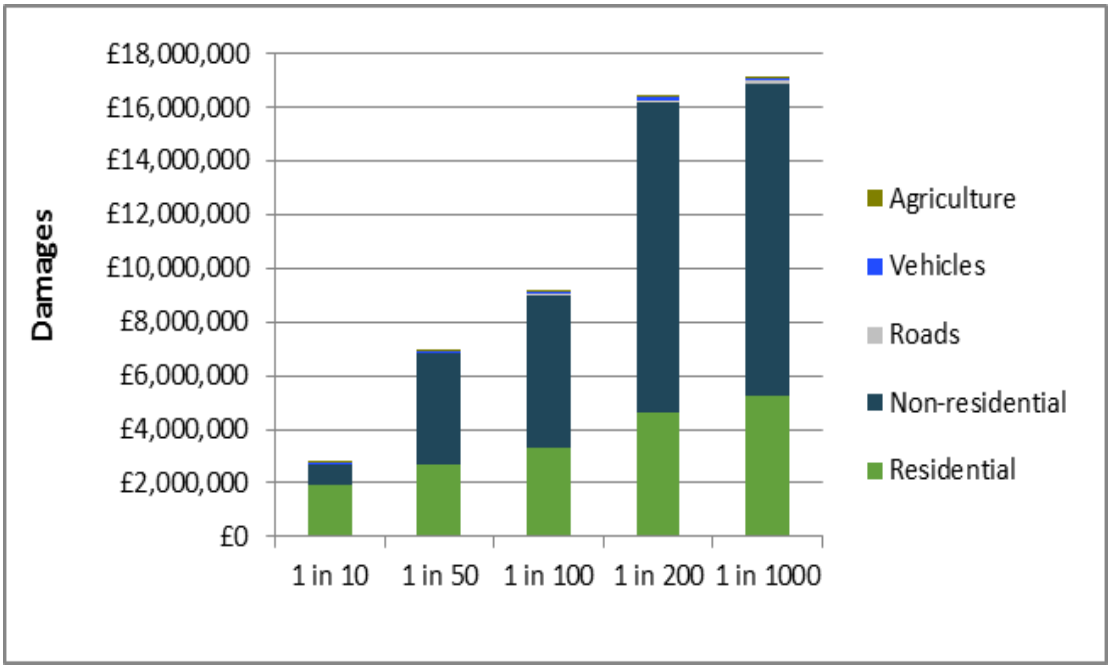


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

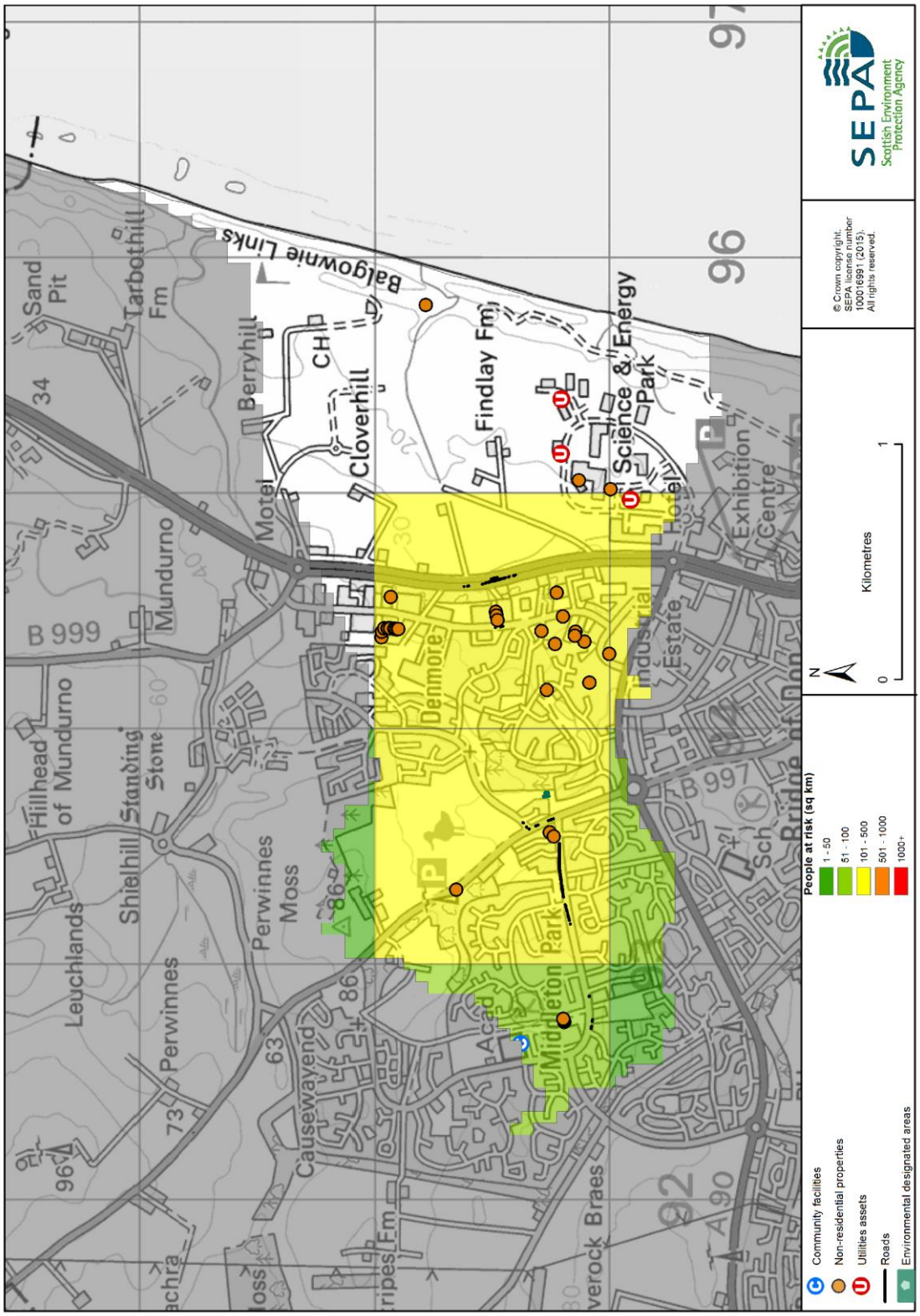


Figure 3: Impacts of flooding

History of flooding

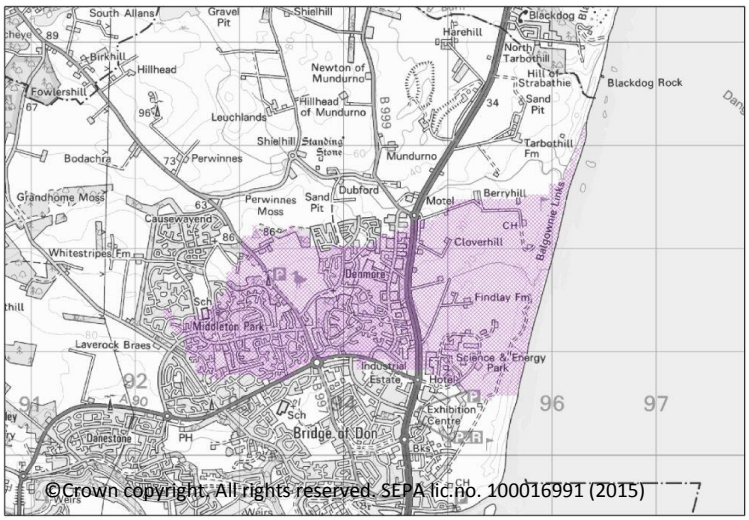
The Bridge of Don area experienced flooding in 2000 and 2001, when problems with the drainage system resulted in ponding. This was exacerbated by gullies unable to function due to the high water level in the Glashieburn. Properties in Lochside Drive, Jesmond Drive and Brook Crescent were affected. Regular flooding of the combined sewer in Jesmond Drive has been reported. Flooding has also been reported at Ellon Road due to debris building up and blocking the watercourse.

Large parts of Aberdeen were affected by surface water flooding in July 2015. Manhole covers were dislodged by the force of the water. Many roads were affected by flooding, including Ellon Road.

Objectives to manage flooding in Potentially Vulnerable Area 06/16

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 Aberdeen City - Denmore Potentially Vulnerable Area.

Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore)

Indicators:	Target area:
• 300 people • £250,000 Annual Average Damages from residential properties • £280,000 Annual Average Damages from non-residential properties	
Objective ID: 601601	

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 140 residential properties • £570,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 140 residential properties • £570,000 Annual Average Damages
Applies across North East 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 06/16

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 Aberdeen City - Denmore 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 STUDY** (6016010005)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City Council		
Priority:	National:	Within local authority:	
	5 of 168	**2 of 4**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The Bridge of Don flood protection study should address flood risk from small watercourses and surface water in this area. The study should identify the most sustainable range of options. It should be based on the outputs from the Aberdeen Integrated Catchment Study and coordinated with the surface water management plan to take a comprehensive approach to flood risk management in Aberdeen.		
Potential impacts			
Economic:	Considering all three study areas in Aberdeen City, a total of 10,500 residential and 1,800 non-residential properties could benefit, with potential damages avoided of up to £520 million. In reality the studies should look to identify flooding hotspots, where actions should be targeted. Further study will identify the true benefits of these actions.		
Social:	Thirteen educational buildings, 14 health care facilities, 33 utilities, and one emergency service could benefit from any actions taken. However, this will depend on locations identified for actions. Around 23,000 people could benefit from flood protection works. However, this will depend on locations identified for actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.		

Environmental:	To be in accord with the FRM Strategy, the responsible authority should seek to ensure, as part of the studies, that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. Cultural heritage sites, including one garden and designed landscape site, could benefit from flood protection works identified in the studies. However, this will depend on the final location and extent of the works. The flood protection studies should consider how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. The following rivers are identified by river basin management planning to be at less than good status for their physical condition: River Don, River Dee and Bucks Burn (water body IDs 23265, 23315 and 23266). Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6016010018)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City Council		
Status:	**Ongoing**	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. An integrated catchment study has been 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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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 PROTECTION SCHEME** (6016010017)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City Council		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the Glashie Burn Flood Protection Scheme (attenuation pond and culverts) which reduce the risk of flooding to Lochside Drive from the Glashie Burn.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeen City 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** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Westhill (Potentially Vulnerable Area 06/17)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council, Aberdeen City Council	River Dee (Grampian)

Summary of flooding impacts

At risk of flooding

- 90 residential properties
- 10 non-residential properties
- £77,000 Annual Average Damages

(damages by flood source shown left)

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.

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

Westhill (Potentially Vulnerable Area 06/17)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council, Aberdeen City Council	River Dee (Grampian)

Background

This Potentially Vulnerable Area is based around Westhill. It is approximately 20km^2. The A944, B119, and the B979 pass through the area.

The main watercourse is the Ord Burn, which is a tributary of the River Dee.

There are approximately 90 residential and 10 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £77,000 with the majority caused by surface water flooding.

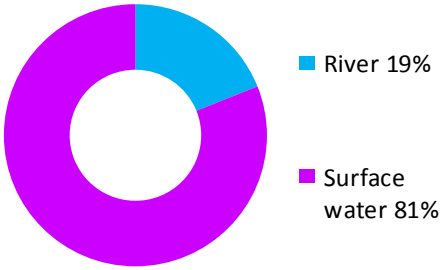


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Surface water flood risk affects properties in the centre of Westhill, primarily to the north of the A944 with further areas of surface water flood risk scattered around the area.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. Roads potentially affected by flooding include the A944, B9119 and minor roads.

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.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,900)	<10	90	120
Non-residential properties (total 330)	<10	10	20
People	20	190	260
Community facilities	0	0	0
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 40 locations	Roads at 70 locations	Roads at 70 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.4	0.5	0.6

Table 1: Summary of flooding impacts[1]

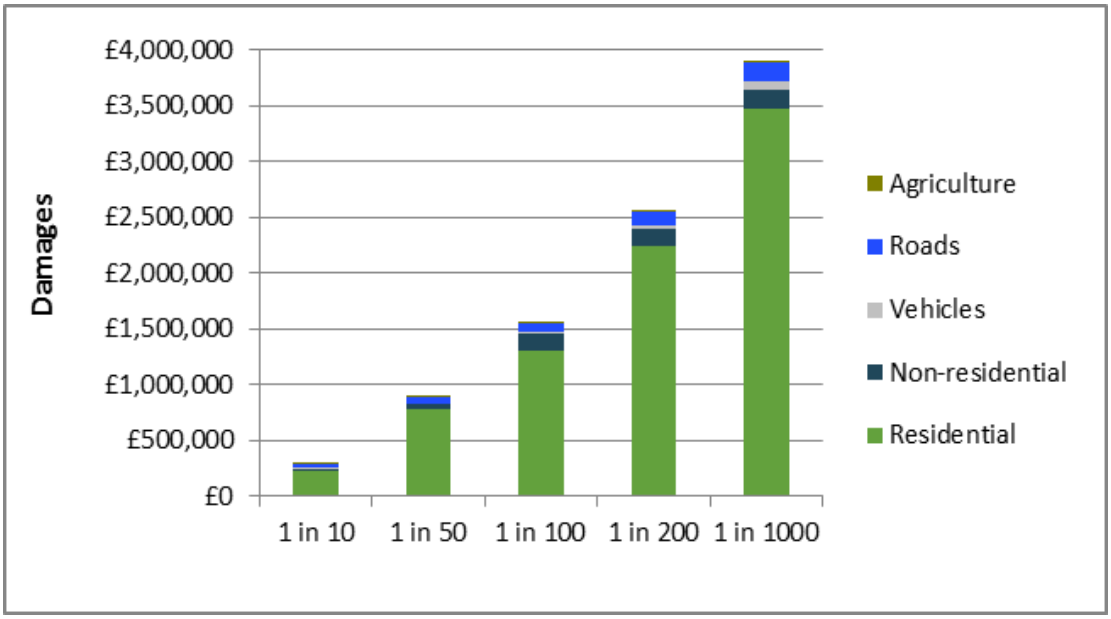


Figure 2: Damages by flood likelihood

History of flooding

Surface water runoff has caused flooding in parts of Westhill in the past. Flooding has also been reported at Brodiach Road near Cairdhillock and at Rotten of Gairn due to blocked gully outlets. Locally, issues with ground water flooding have also been reported.

[1] Some receptors are counted more than once if flooded from multiple sources

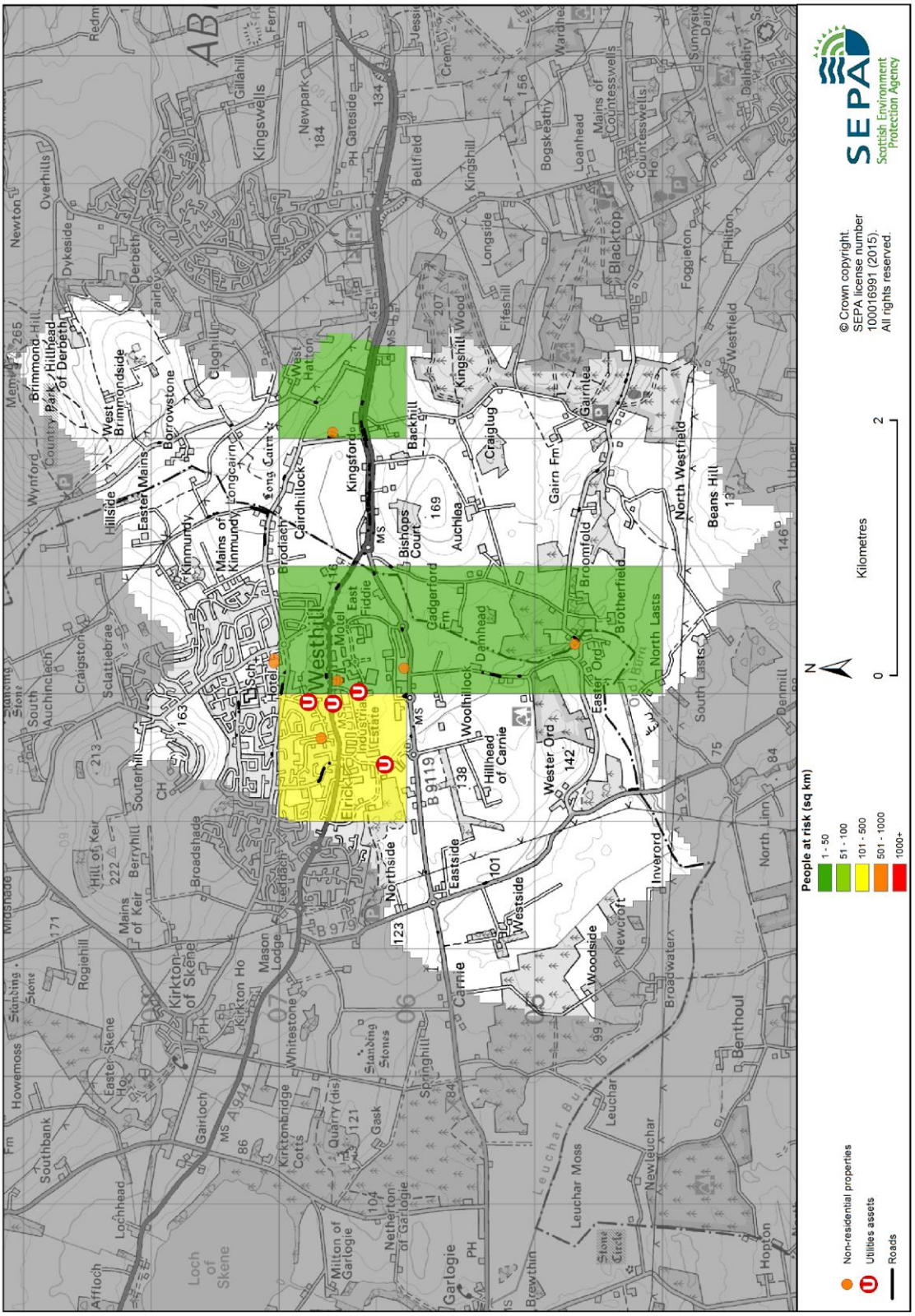


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 06/17

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 Westhill Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Westhill	Reduce risk from surface water flooding in Westhill	601701	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 90 residential properties • £77,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 90 residential properties • £77,000 Annual Average Damages
Applies across North East 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 06/17 there are 80 residential properties at risk and Annual Average Damages of £63,000.

Actions to manage flooding in Potentially Vulnerable Area 06/17

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 Westhill 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):	**SURFACE WATER PLAN/STUDY** (6017010018)		
Objective (ID):	Reduce risk from surface water flooding in Westhill (601701)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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. An integrated catchment study has been 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 and watercourses.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire. Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire and Aberdeen City Councils, 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.		

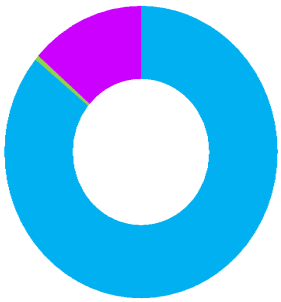
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Aberdeen City - Deeside (Potentially Vulnerable Area 06/18)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council	River Dee (Grampian), Aberdeen South coastal

Summary of flooding impacts



At risk of flooding

- 8,100 residential properties
- 2,000 non-residential properties
- £12 million Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

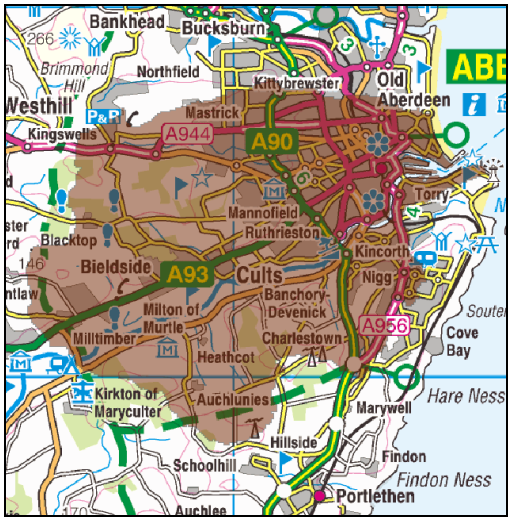
Flood protection scheme/works	*Natural flood management works*	New flood warning	Community flood action groups	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency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

Aberdeen City - Deeside (Potentially Vulnerable Area 06/18)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council	River Dee (Grampian), Aberdeen South coastal

Background

This Potentially Vulnerable Area includes the centre and west of the city of Aberdeen. It is approximately 75km^2, includes the centre of Aberdeen City and several vital transport routes pass through it.



The main river is the River Dee and there are also a number of small watercourses, most of which are culverted for all or part of their route through the city.

There are approximately 8,100 residential and 2,000 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £12 million with the majority caused by river flooding.

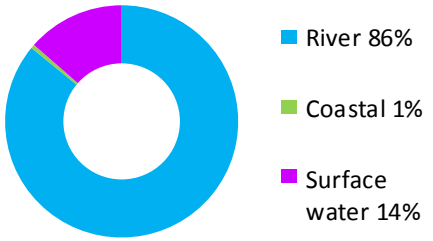


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flood risk in Aberdeen City is complex due to the interaction between the main rivers, small often culverted watercourses, sewerage systems, patterns of surface water runoff and tide levels. In order to better understand these complex interactions, a more detailed flood model has been developed which has helped to inform the assessment of flood risk reported below.

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

A number of schools and healthcare facilities are at risk of flooding. Transport links affected by flooding include the A90, A93, A96, A944, A956, A978 and the Aberdeen to Dundee / Aberdeen to Inverness railway lines. The River Dee Special Area of Conservation and one cultural heritage site are also at risk.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 65,000)	860	8,100	11,000
Non-residential properties (total 7,200)	520	2,000	2,400
People	1,900	18,000	25,000
Community facilities	<10 Educational buildings	10 Includes; educational buildings and healthcare facilities	30 Includes; educational buildings, healthcare facilities and emergency services
Utilities assets	20	60	80
Transport links (excluding minor roads)	Roads at 250 locations Rail at 30 locations	Roads at 580 locations Rail at 60 locations	Roads at 700 locations Rail at 70 locations
Environmental designated areas (km^2)	1.3	1.5	1.5
Designated cultural heritage sites	2	3	3
Agricultural land (km^2)	1.8	2.5	2.6

Table 1: Summary of flooding impacts[1]

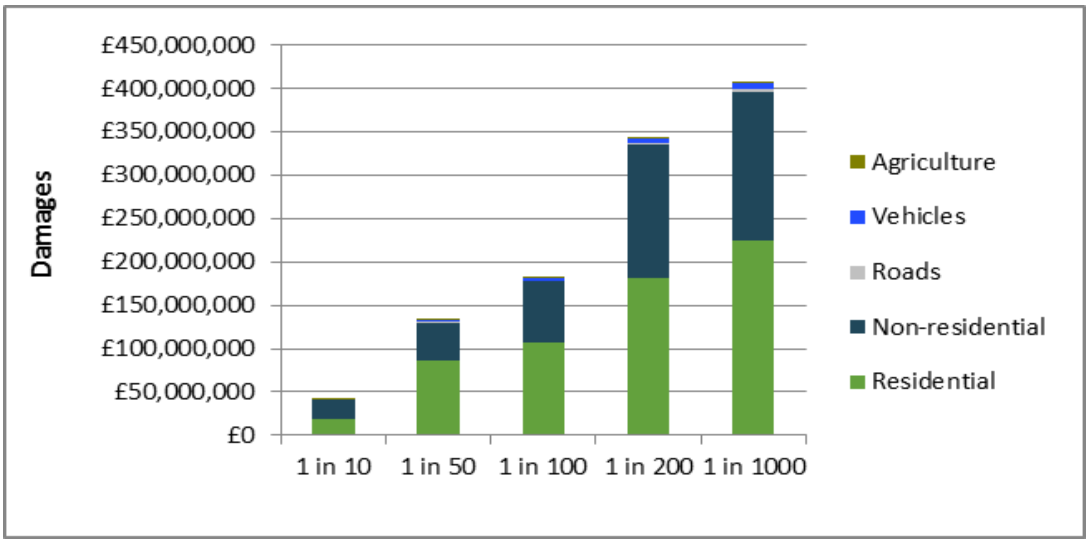


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

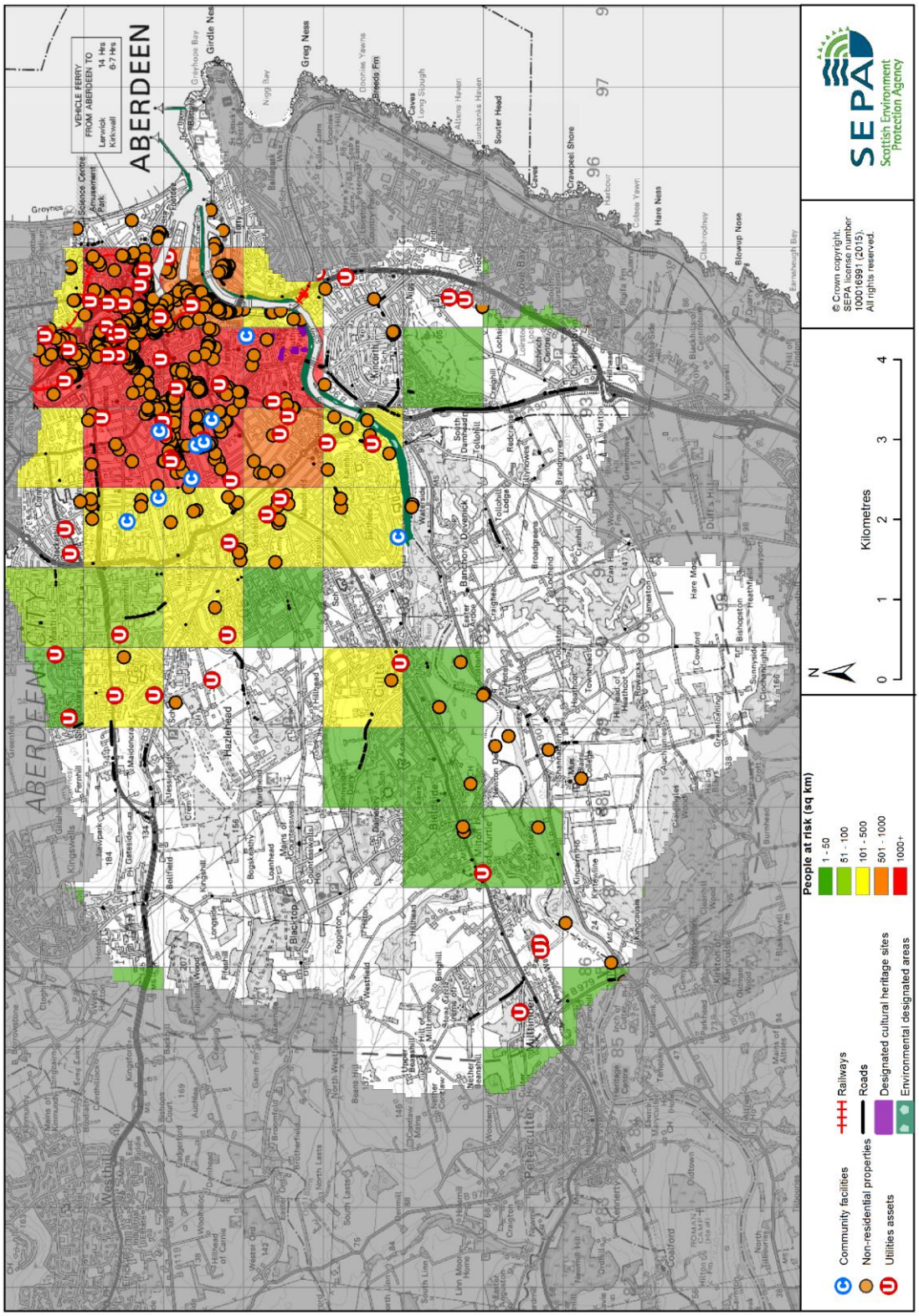


Figure 3: Impacts of flooding

History of flooding

Floods on the River Dee are reported in 1768, 1789, 1790, 1829, 1873, 1876, 1881, 1882, 1892, 1894, 1909, 1920, 1922, 1926, 1927, 1928, 1929, 1938 and 1946. The Denburn is reported to have flooded in 1869, 1872, and 1874. In 1873 the Broadford Burn flooded and surface water floods were reported in 1869, 1873, 1882, 1896, 1897, and 1940. These historic floods affected property, agriculture, railway lines, roads, and a golf course. Fatalities occurred in 1876, when a ferry sank during a high spate on the River Dee.

In October 2001 there was a surface water flood, which exceeded the capacity of the drainage systems and subsequently affected properties at Berryden Road in Ashgrove, Culter House Road in Milltimer, Hazeldene Road in Hazelhead, and Broomhill Avenue. The high water table during this flood also led to groundwater flooding at Craigbuckler Church in Springfield Road.

Further areas within Aberdeen City that have been affected from flooding include Links Road, Frederick Street, Culter House Road, Bellenden Walk, Inchgarth Road, Boyd Orr Avenue, Cranford Terrace, Craigton Road, Craigieburn Park, Springfield Place, Albyn School playing fields, Countesswells Road, Hazelhead Policies, Kirk Brae, Baird's Brae, Manse Road, West Cults Farm, Deeside Gardens, Contlaw Brae, Baillieswells Road, Abbotshall Road, Burnieboozle Crescent, Riverside Drive, and Polmuir Road. The causes of the reported flooding include blocked or inadequate drainage systems, blockages and overtopping of watercourses including the West Burn of Rubuslaw and the Cults Burn, and choked drainage ditches.

Flooding has been reported from the North Burn of Rubislaw and the Gilcomstoun Burn, as well as surface water incidents due to blocked or inadequate drainage. The areas reported as being affected include Carden Place, Jack's Brae, Fraser Street, Blenheim Lane, Trinity Quay, Forest Road, Angusfield Avenue, Cornhill Gardens, Berryden Road, Westburn Road and Springhall Road. The Polmuir Burn is reported to have caused flooding to basements due to blockages at Brighton Place.

The Cults Burn is reported to have caused flooding at Inchgarth Road due to backing up from the River Dee and blockages. Flooding has been reported at Milltimber Farm and North Deeside Road in the Guttrie catchment and at Wellington Circle in the Tullos catchment. There were three flood events at Fountain Hall, Albert Lane from the Denburn and two sewer flood events in the Merchant Quarter in 2012.

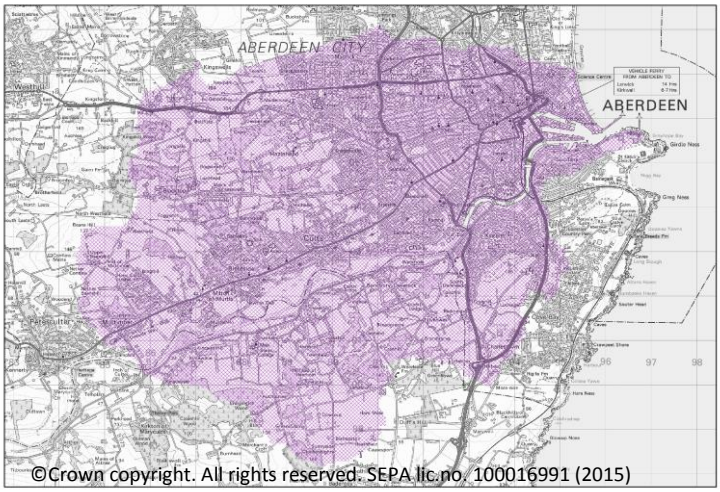
Large parts of Aberdeen were affected by flooding in July 2015, when heavy rainfall caused the drainage system to overflow, dislodging manhole covers. Many roads were affected by flooding, including Market Street, Guild Street and Holburn Street. Cars on Polmuir Road started to float due to the depth of the water. A nursery had to be evacuated due to flooding in its basement.

The largest coastal event reported was a large storm surge event in 1949. Fittie / Footdee has also been affected by overtopping of the sea wall.

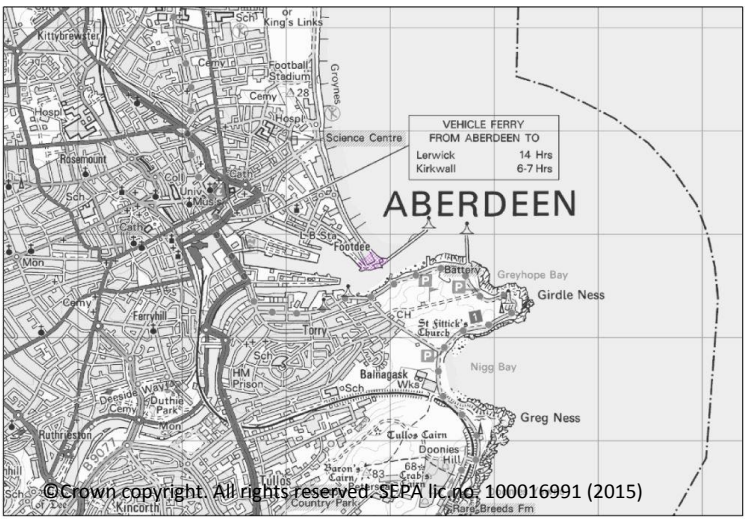
Objectives to manage flooding in Potentially Vulnerable Area 06/18

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 Aberdeen City - Deeside Potentially Vulnerable Area.

Reduce flood risk in Aberdeen (Deeside) from the River Dee and from small watercourses including open and culverted lengths

Indicators:	Target area:
• 15,000 people • £6.0 million Annual Average Damages from residential properties • £3.8 million Annual Average Damages from non-residential properties	
Objective ID: 601801	

Reduce risk from coastal flooding in the Footdee area of Aberdeen

Indicators:	Target area:
• 210 people • £45,000 Annual Average Damages from residential properties • £11,000 Annual Average Damages from non-residential properties	
Objective ID: 601802	

Target area	Objective	ID	Indicators within PVA
Aberdeen	Reduce risk from surface water flooding in Aberdeen (Deeside)	601810	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 8,100 residential properties • £12 million Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 8,100 residential properties • £12 million Annual Average Damages
Applies across North East 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 06/18 there are 1,200 residential properties at risk and Annual Average Damages of £1.7 million.

Actions to manage flooding in Potentially Vulnerable Area 06/18

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 Aberdeen City - Deeside 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):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Flood warning is required for communities at risk of coastal flooding along the Aberdeenshire coast from Peterhead to Montrose. A flood forecasting system will be required before the flood warning scheme can be developed.		

Action (ID):	**FLOOD PROTECTION STUDY** (6018010005)		
Objective (ID):	Reduce flood risk in Aberdeen (Deeside) from the River Dee and from small watercourses including open and culverted lengths (601801)		
Delivery lead:	Aberdeen City Council		
Priority:	National:	Within local authority:	
	5 of 168	**2 of 4**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The Aberdeen City Flood Study should address flood risk from the River Dee, small watercourses and surface water flooding in this area. The study should identify the most sustainable range of options. For small watercourses and surface water flooding, it should be based on the outputs from the Aberdeen Integrated Catchment Study and coordinated with the surface water management plan to		

	take a comprehensive approach to flood risk management in Aberdeen.
Potential impacts	
Economic:	Considering all three study areas in Aberdeen City, a total of 10,500 residential and 1,800 non-residential properties could benefit, with potential damages avoided of up to £520 million. In reality the studies should look to identify flooding hotspots, where actions should be targeted. Further study will identify the true benefits of these actions.
Social:	Thirteen educational buildings, 14 health care facilities, 33 utilities, and one emergency service could benefit from any actions taken. Around 23,000 people could benefit from flood protections works. However, this will depend on locations identified for actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.
Environmental:	To be in accord with the FRM Strategy, the responsible authority should seek to ensure, as part of the studies, that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. Cultural heritage sites, including one garden and designed landscape site, could benefit from flood protection works identified in the studies. However, this will depend on the final location and extent of the works. The flood protection studies should consider how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. The physical conditions of the River Don and River Dee (water body IDs 23265 and 23315) are identified by river basin management planning to be at less than good status. Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.

Action (ID):	**FLOOD PROTECTION STUDY** (6018020005)		
Objective (ID):	Reduce risk from coastal flooding in the Footdee area of Aberdeen (601802)		
Delivery lead:	Aberdeen City Council		
Priority:	National:	Within local authority:	
	131 of 168	**4 of 4**	
Status:	Not started	Indicative delivery:	2016-2021
Description:	The current SEPA national coastal flood maps do not identify properties to be at flood risk. However, there is a history of flooding due to wave overtopping. Therefore a hydraulic study should be undertaken to establish the risk of coastal flooding including wave overtopping. Once the flood risk has been defined, the study should progress to find the most sustainable combination of actions to manage the risk.		
Potential impacts			
Economic:	The study should confirm the number of properties at risk of coastal flooding and the potential damages avoided, which are currently		

Economic:	estimated at up to £1.7 million.
Social:	The social impacts of potential actions will be considered when there is improved understanding of the current flood risk. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. 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 Dee Special Area of Conservation (SAC) or the Moray Firth SAC. The physical condition of the Dee (Aberdeen) Estuary (water body ID 200103) is identified by river basin management planning to be at less than good status. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary should be considered by coordinating with river basin management planning.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6018100018)		
Objective (ID):	Reduce risk from surface water flooding in Aberdeen (Deeside) (601810)		
Delivery lead:	Aberdeen City Council		
Status:	Ongoing	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. An integrated catchment study has been 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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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 PROTECTION SCHEME** (6018030017)		
Objective (ID):	Reduce flood risk in Aberdeen (Deeside) from the River Dee and from small watercourses including open and culverted lengths (601801)		
Delivery lead:	Aberdeen City Council		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the Fraser Road Flood Protection Scheme which reduces the risk of flooding from the Gilcomston Burn.		

Action (ID):	**MAINTAIN FLOOD WARNING** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Aberdeen (Dee)' and 'Maryculter' flood warning areas which are part of the Dee river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**COMMUNITY FLOOD ACTION GROUPS** (6000020012)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Community		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Flood action groups are active in the Merchant Quarter and in the Queens Cross / Fountainhall area of Aberdeen.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 community and promote Floodline using targeted direct mailings. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeen City 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.		

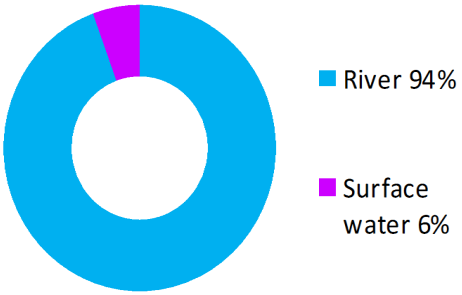
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Peterculter (Potentially Vulnerable Area 06/19)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council, Aberdeenshire Council	River Dee (Grampian)

Summary of flooding impacts



At risk of flooding

- 380 residential properties
- 20 non-residential properties
- £300,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

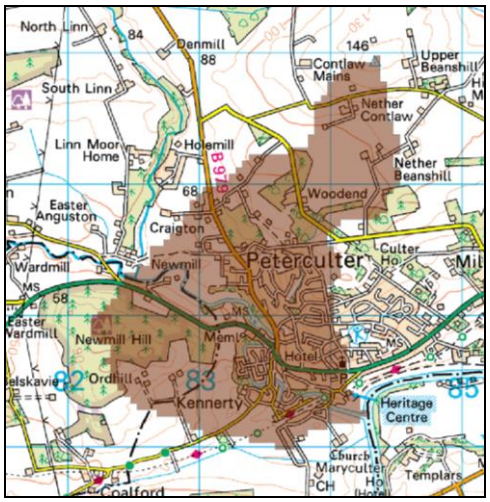
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	Natural flood management study	*Maintain flood warning*	Awareness raising	Surface water plan/study	Emergency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

Peterculter (Potentially Vulnerable Area 06/19)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council	River Dee (Grampian)

Background

This Potentially Vulnerable Area covers the west of Peterculter and is approximately 4km^2. The A93, North Deeside road, passes through the area.



The main river is the Culter Burn which flows through the south west of Peterculter before discharging into the River Dee.

There are approximately 380 residential and 20 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £300,000 with the majority caused by river flooding.

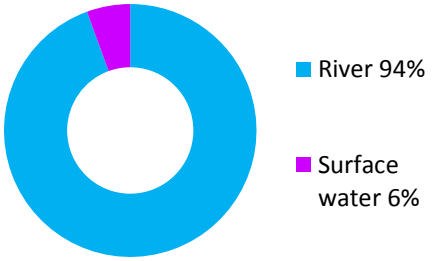


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The main source of flood risk in the area is from the Culter Burn. This affects properties in the west and south west of Peterculter.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. Roads affected by flooding include the A93.

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.

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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,600)	80	380	530
Non-residential properties (total 70)	<10	20	20
People	170	830	1,200
Community facilities	0	0	0
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at <10 locations	Roads at 10 locations	Roads at 10 locations
Environmental designated areas (km^2)	<0.1	<0.1	<0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.1	0.1	0.9

Table 1: Summary of flooding impacts[1]

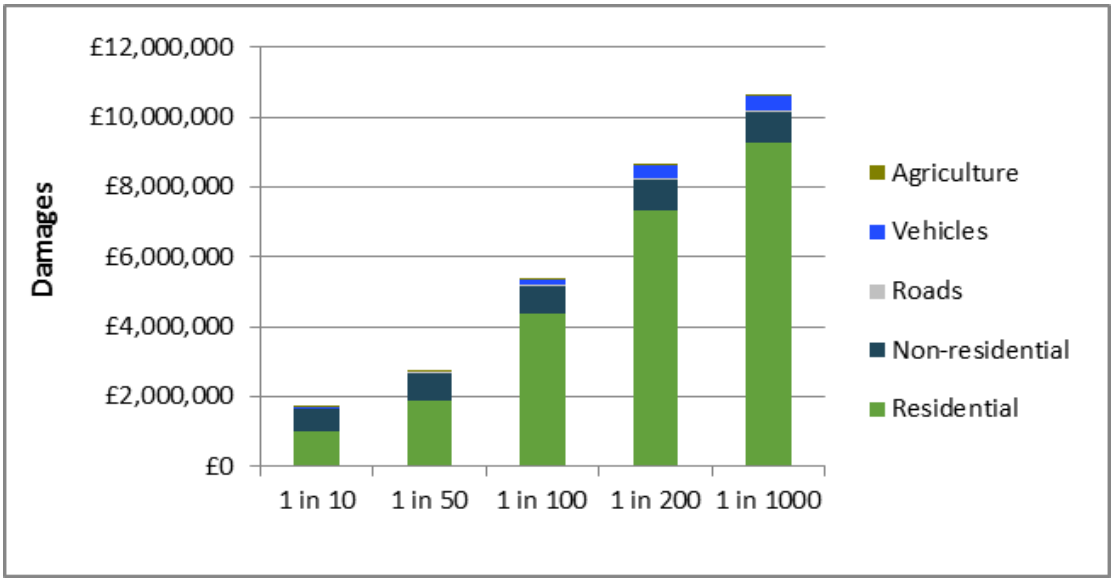


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

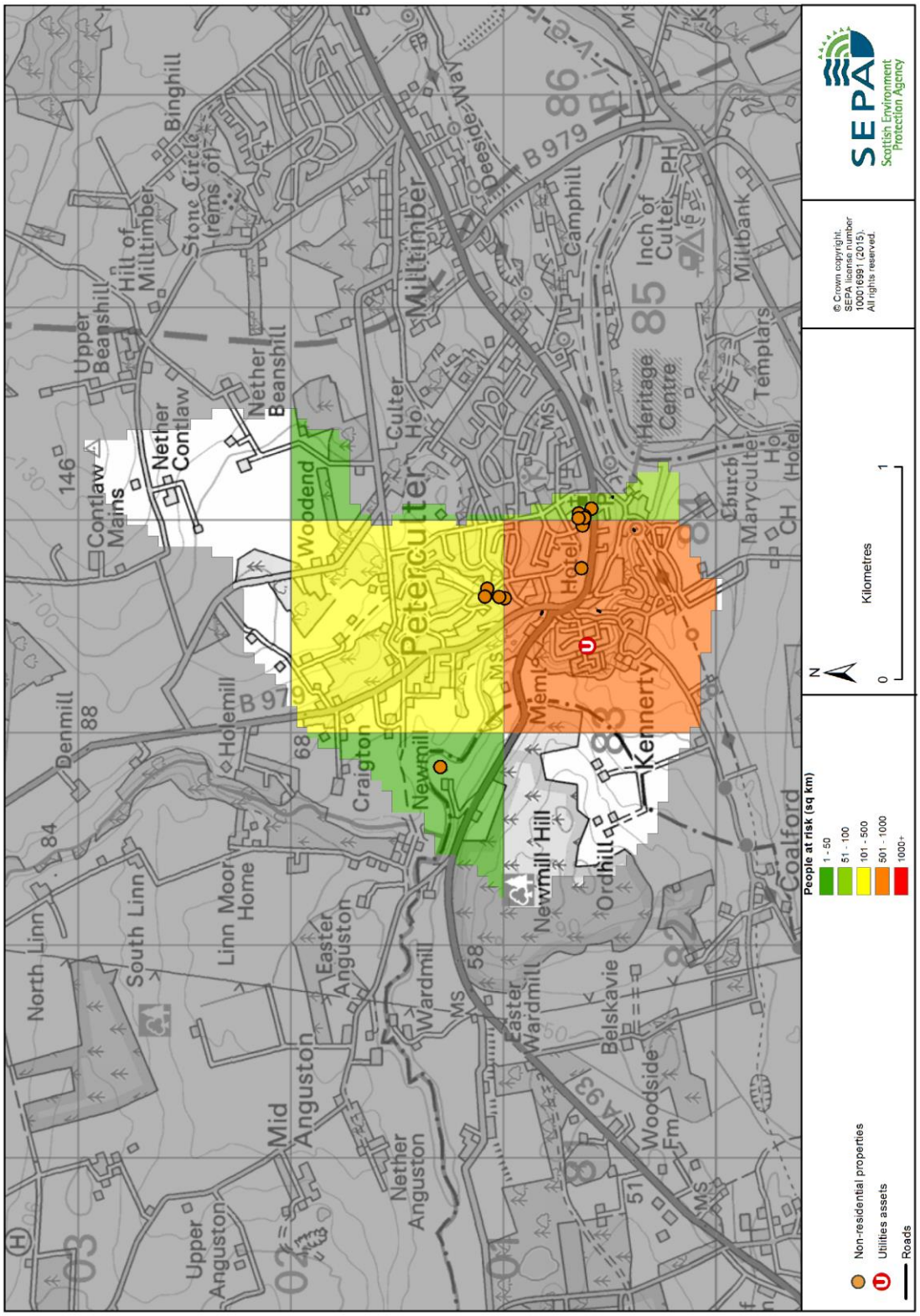


Figure 3: Impacts of flooding

History of flooding

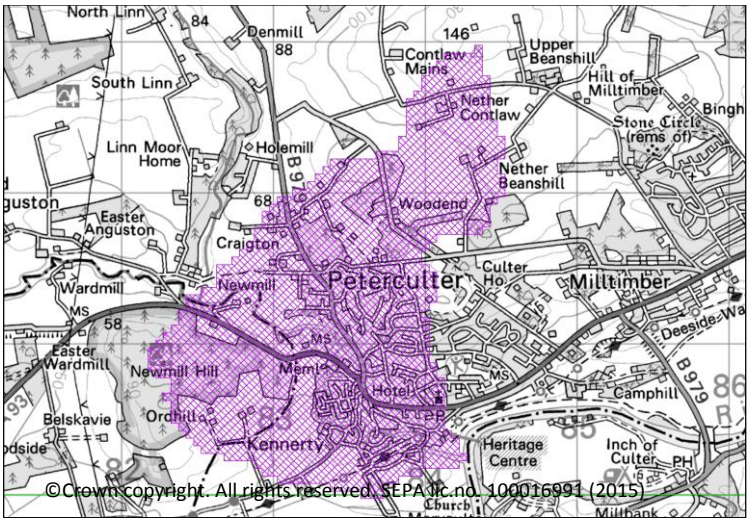
In 1827, heavy rainfall caused the failure of several small dams associated with paper milling on the Burn of Culter. This caused extensive damage to agricultural crops and the paper mill.

More recently, flooding occurred at North Deeside Road, Craigton Crescent and Buckleburn Place. These incidents were caused by blocked and inadequate drainage systems. On 23 December 2012 around 50 properties were affected by flooding from the Culter Burn.

Objectives to manage flooding in Potentially Vulnerable Area 06/19

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 Peterculter Potentially Vulnerable Area.

Reduce flood risk in Peterculter from the Culter Burn

Indicators:	Target area:
• 720 people • £180,000 Annual Average Damages from residential properties • £71,000 Annual Average Damages from non-residential properties	
Objective ID: 601901	

Target area	Objective	ID	Indicators within PVA
Aberdeen	Reduce risk from surface water flooding in Peterculter	601906	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 380 residential properties • £300,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 380 residential properties • £300,000 Annual Average Damages
Applies across North East 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 06/19 there are 50 residential properties at risk and Annual Average Damages of £17,000.

Actions to manage flooding in Potentially Vulnerable Area 06/19

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 Peterculter 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** (6019010005)		
Objective (ID):	Reduce flood risk in Peterculter from the Culter Burn (601901)		
Delivery lead:	Aberdeen City Council		
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	Flood protection works are currently under development for the Culter Burn. The works are likely to be designed to a 1 in 200 year standard of protection, including an allowance for climate change and are likely to include direct defences to retain flood flows in the channel together with improvements to conveyance at points of restriction. The scheme will be complemented by further investigations into the potential for natural flood management on the burn and its tributaries upstream of Peterculter.		
Potential impacts			
Economic:	Flood protection works could benefit 330 residential properties at risk of flooding in this location, with estimated damages avoided of £8.6 million could be achieved.		
Social:	The development of flood protection works could potentially reduce risk to an estimated 730 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Two energy production/electricity utility sites could benefit from flood protection works. However, this will depend on the final location and extent of the works.		
Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. To be in accord with the FRM Strategy, the responsible authority (and where applicable, the licensing authority) should seek		

Environmental:	to ensure as part of the scheme that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. This should include considering how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment.

Action (ID):	**NATURAL FLOOD MANAGEMENT STUDY** (6019010003)		
Objective (ID):	Reduce flood risk in Peterculter from the Culter Burn (601901)		
Delivery lead:	Various		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The natural flood management actions should primarily focus on river/floodplain restoration and sediment management, but other actions may also be considered in order to develop the most sustainable range of options.		
Potential impacts			
Economic:	Natural flood management actions could reduce risk to properties at risk from the Culter Burn. The benefits provided by the actions should be defined in the study. Any natural flood management works identified by the study will complement the proposed flood protection scheme on the Culter Burn in Peterculter		
Social:	Natural flood management actions have the potential to reduce flood risk from the Culter Burn to people during a high likelihood flood. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.		
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. 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 Dee Special Area of Conservation.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (6019060018)
Objective (ID):	Reduce risk from surface water flooding in Peterculter (601906)
Delivery lead:	Aberdeen City Council

Status:	**Ongoing**	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. An integrated catchment study has been 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, small watercourses and the River Dee.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeen City Council and 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.		

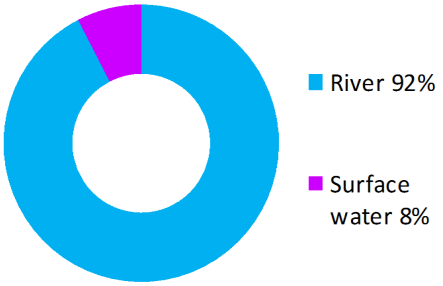
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Aboyne (Potentially Vulnerable Area 06/20)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Summary of flooding impacts



At risk of flooding

- 60 residential properties
- 20 non-residential properties
- £240,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

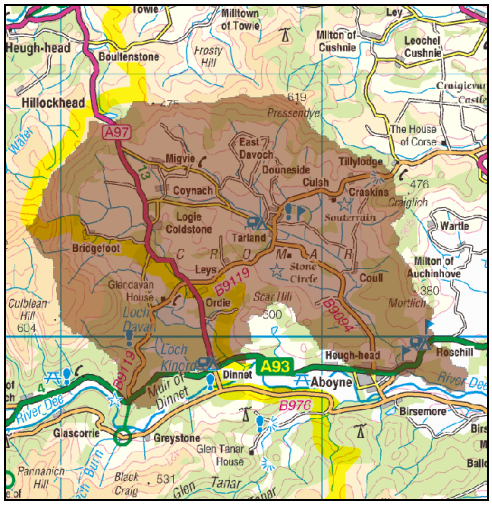
Flood protection scheme/works	*Natural flood management works*	*New flood warning*	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	*Natural flood management study*	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency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

Aboyne (Potentially Vulnerable Area 06/20)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Background

This Potentially Vulnerable Area includes Tarland and Logie Coldstone, as well as the northern part of the town of Aboyne. It is approximately 125km^2 and located on the eastern edge of the Cairngorms National Park. The A93 and the A97 pass through the area.



The River Dee flows just to the south of the Potentially Vulnerable Area. Several tributaries of the Dee including the Tarland Burn flow through the area.

There are approximately 60 residential and 20 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £240,000 with the majority from river flooding.

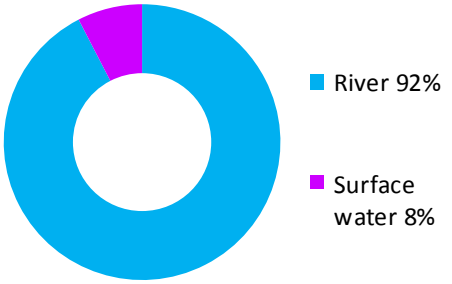


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The main areas at risk of river flooding are along the Tarland Burn. This floods mainly agricultural land south east of Tarland village and north east of Coull. Tarland Burn also floods property in eastern Aboyne including Low Road and the A93 close to where it where it joins the River Dee.

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

Logie Coldstone Primary School, several roads and 10 designated cultural heritage sites are also at risk of flooding.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,400)	40	60	140
Non-residential properties (total 270)	<10	20	30
People	90	140	310
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 60 locations	Roads at 80 locations	Roads at 80 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	9	10	10
Agricultural land (km^2)	4	5	5

Table 1: Summary of flooding impacts[1]

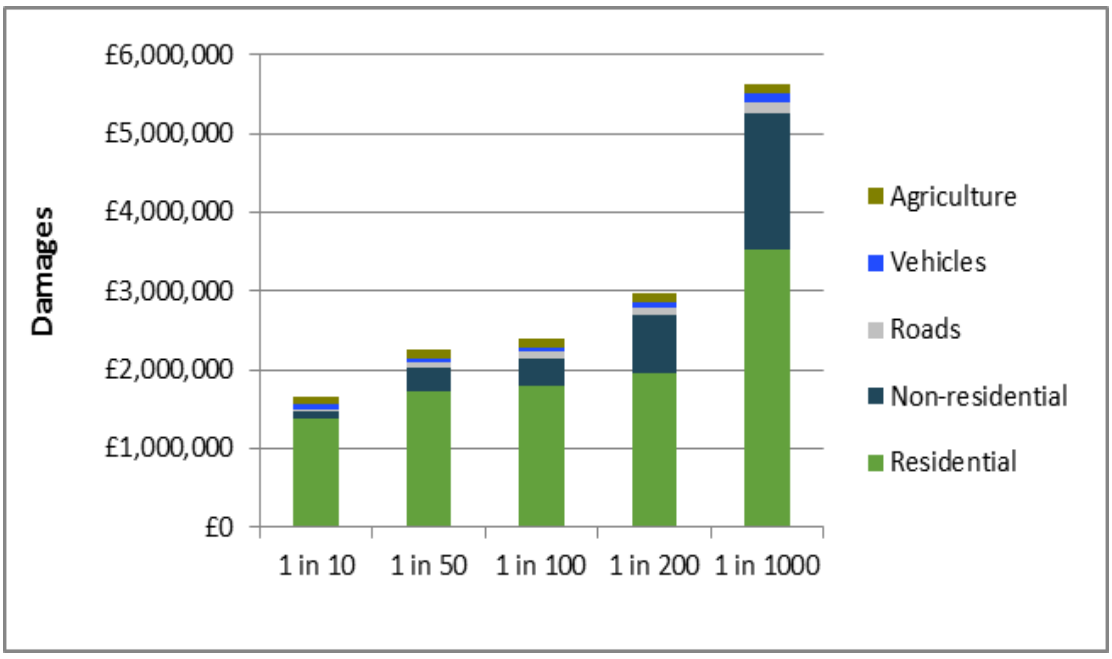


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

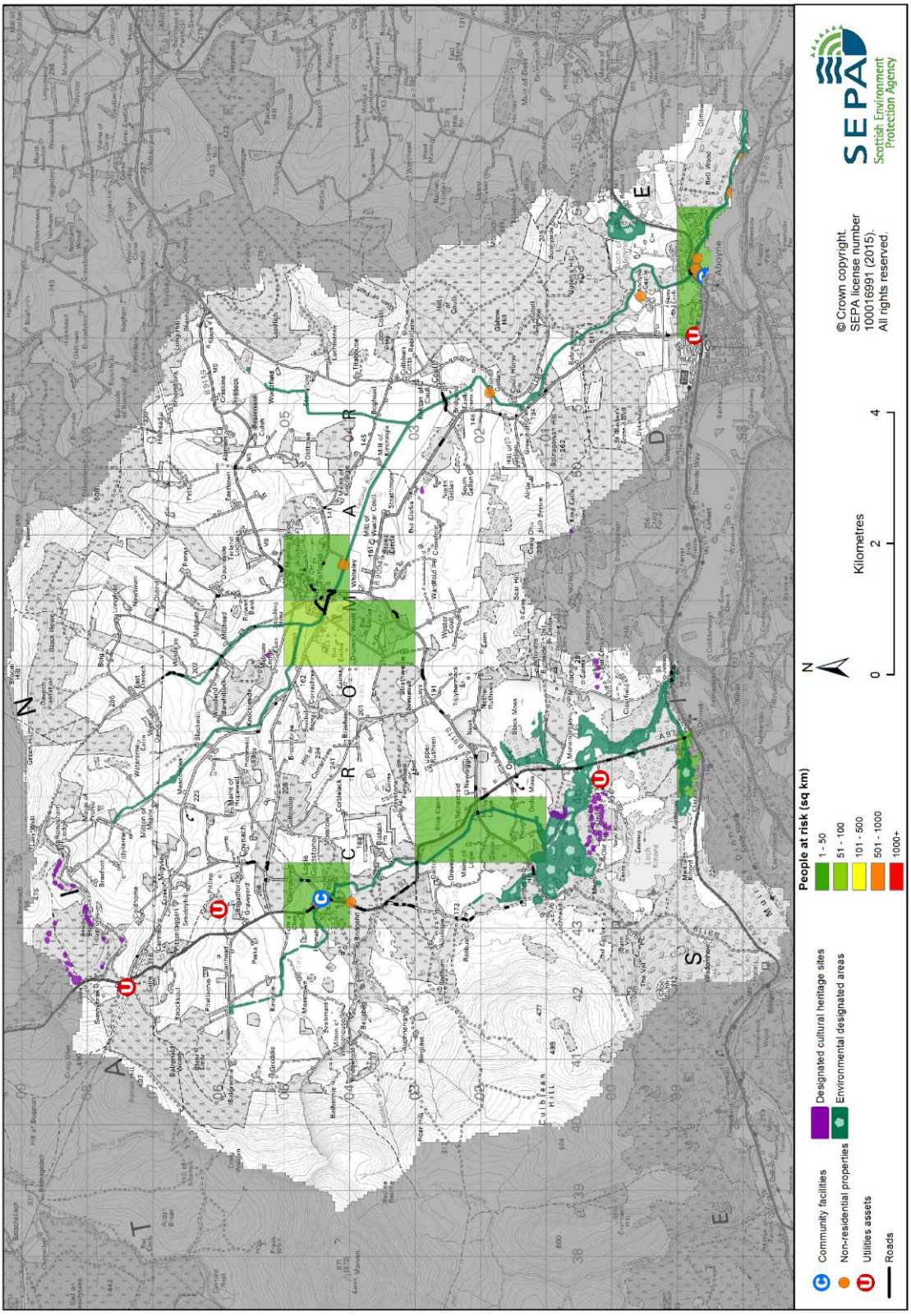


Figure 3: Impacts of flooding

History of flooding

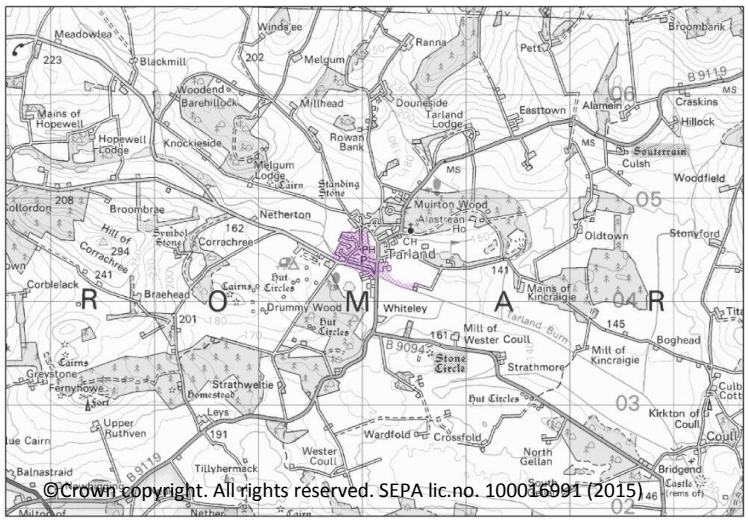
In 2000 and 2002 the Tarland Burn caused flooding in Aboyne and Tarland when it overtopped its banks, flooding properties and roads. Flooding has occurred at Burnside Road, Tarland, due to the Tarland Burn in March 2006 and again in February and November 2009. In December 2005 and July 2009, surface water flooding impacted residential properties in Tarland.

In June 2005 the Logie Burn overtopped its banks causing localised flooding. Surface water flooding has also affected parts of Aboyne, south of the A93 which is just outside the southern boundary of the Potentially Vulnerable Area.

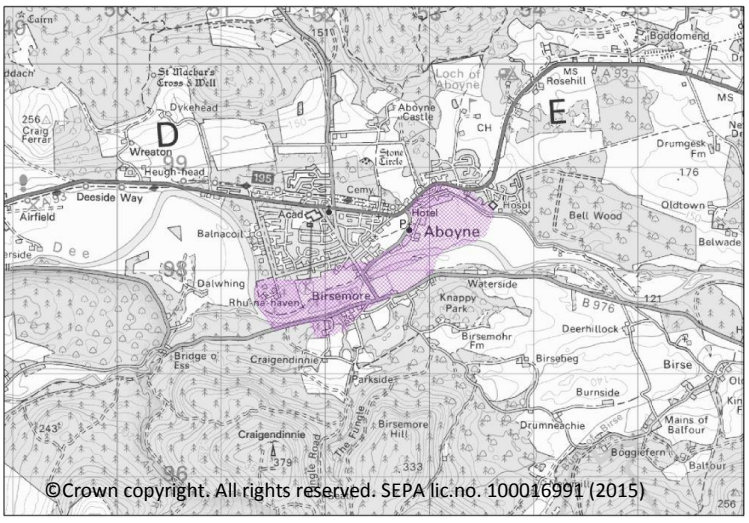
Objectives to manage flooding in Potentially Vulnerable Area 06/20

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 Aboyne Potentially Vulnerable Area.

Reduce flood risk in Tarland from the Tarland Burn

Indicators:	Target area:
• 70 people • £27,000 Annual Average Damages from residential properties	
Objective ID: 602001	

Reduce flood risk in Aboyne from Tarland Burn and River Dee

Indicators:	Target area:
• 220 people • £114,000 Annual Average Damages • 1 educational building	
Objective ID: 602002	

Target area	Objective	ID	Indicators within PVA
Aboyne	Reduce risk from surface water flooding in Aboyne	602005	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 60 residential properties • £240,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 60 residential properties • £240,000 Annual Average Damages
Applies across North East 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 06/20 there are 10 residential properties at risk and Annual Average Damages of £18,000.

Actions to manage flooding in Potentially Vulnerable Area 06/20

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 Aboyne 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 STUDY** (6020020005)		
Objective (ID):	Reduce flood risk in Aboyne from Tarland Burn and River Dee (602002)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	104 of 168	**7 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood study should be carried out to address flooding from the Tarland Burn and River Dee in Aboyne. To reduce flood risk from the Tarland Burn it is recommended that previous work carried out by Aberdeenshire Council is developed further. The flood protection study should primarily focus on direct defences, relocation of properties, runoff reduction, river or floodplain restoration, sediment management and property level protection. Other actions may also be considered to develop the most sustainable range of options.		
Potential impacts			
Economic:	The study could benefit 140 properties at risk of flooding in this location, with potential damages avoided of up to £3.3 million.		
Social:	The development of flood protection works following the study would potentially reduce risk to 290 people. A school would also benefit from flood protection works. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.		
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the		

Environmental:	environment. Opportunities to mitigate any environmental impacts may include design and timing of works. 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 Dee Special Area of Conservation. The physical condition of the Tarland Burn (water body ID 23338) is identified by river basin management planning to be at less than good status. Future works could improve the condition of the river or degrade it. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.

Action (ID):	**FLOOD PROTECTION STUDY** (6020010005)		
Objective (ID):	Reduce flood risk in Tarland from the Tarland Burn (602001)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:		Within local authority:
	136 of 168		**9 of 12**
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood protection study is required to develop the previous work carried out by Aberdeenshire Council to consider flood protection works to reduce flood risk in Tarland from the Tarland Burn. Development of the previous work should consider a combination of actions including modification of conveyance, construction of direct defences, relocation of properties and property level protection to compare against the previously identified online storage options. Other actions may also be considered in order to develop the most sustainable solution.		
Potential impacts			
Economic:	The study could benefit 22 properties at risk of flooding in this location, with potential damages avoided of up to £760,000.		
Social:	The development of flood protection works following the study would potentially reduce risk to 48 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. The roads through Tarland would also benefit from flood protection works. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. Negative impacts through disturbance to the local community during the construction phase should be considered.		
Environmental:	To be in accord with the FRM Strategy, the responsible authority should seek to ensure, as part of the studies, that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. Cultural heritage sites, including one garden and designed landscape site, could benefit from flood protection works identified in the study. However, this will depend on the final location and extent of the works. The flood protection study should consider how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. The following rivers are		

Environmental:	identified by river basin management planning to be at less than good status for their physical condition: River Don, River Dee and Bucks Burn (water body IDs 23265, 23315 and 23266). Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6020050018)		
Objective (ID):	Reduce risk from surface water flooding in Aboyne (602005)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Aboyne' flood warning area which is part of the Dee river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 and promote Floodline. This will be achieved through SEPA led education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

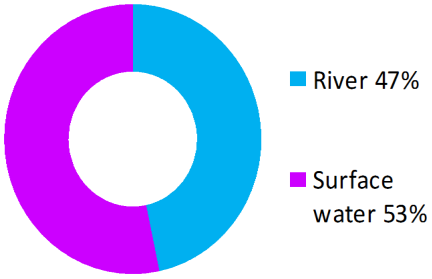
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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. Aberdeenshire Council and the James Hutton Institute operate river level gauges on the Tarland Burn to assist with emergency response.		

Action (ID):	**PLANNING POLICIES** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Banchory and Torphins (Potentially Vulnerable Area 06/21)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Summary of flooding impacts



At risk of flooding

- 30 residential properties
- 50 non-residential properties
- £200,000 Annual Average Damages

(damages by flood source shown left)

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.

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

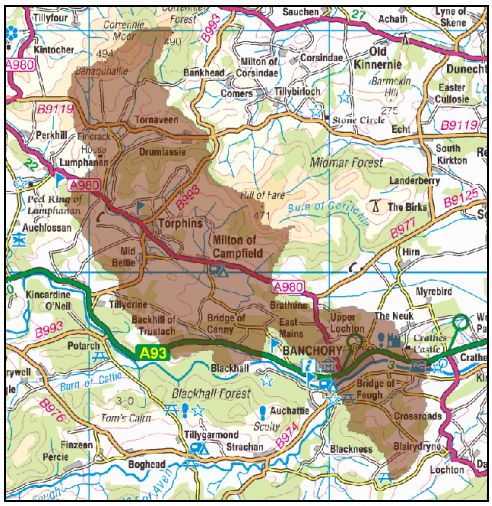
Banchory and Torphins (Potentially Vulnerable Area 06/21)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Background

This Potentially Vulnerable Area is based around Banchory and Torphins. It is approximately 97km^2.

The A93 and A980 pass through the area.



The main rivers are the River Dee and its tributaries, the Burn of Canny and the Beltie Burn.

There are approximately 30 residential and 50 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £200,000 with the majority due to surface water flooding.

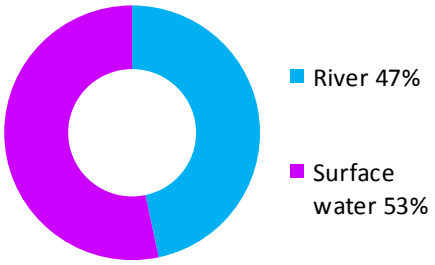


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk is associated with the River Dee in Banchory and the Beltie Burn around Torphins.

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

Five designated cultural heritage sites are at risk of flooding within this area. Roads potentially affected by flooding include sections of the A980, A93, B9119 and B993.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 3,500)	10	30	40
Non-residential properties (total 430)	30	50	60
People	20	60	90
Community facilities	0	0	0
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 120 locations	Roads at 140 locations	Roads at 150 locations
Environmental designated areas (km^2)	0	0	0
Designated cultural heritage sites	5	5	6
Agricultural land (km^2)	2	3	3

Table 1: Summary of flooding impacts[1]

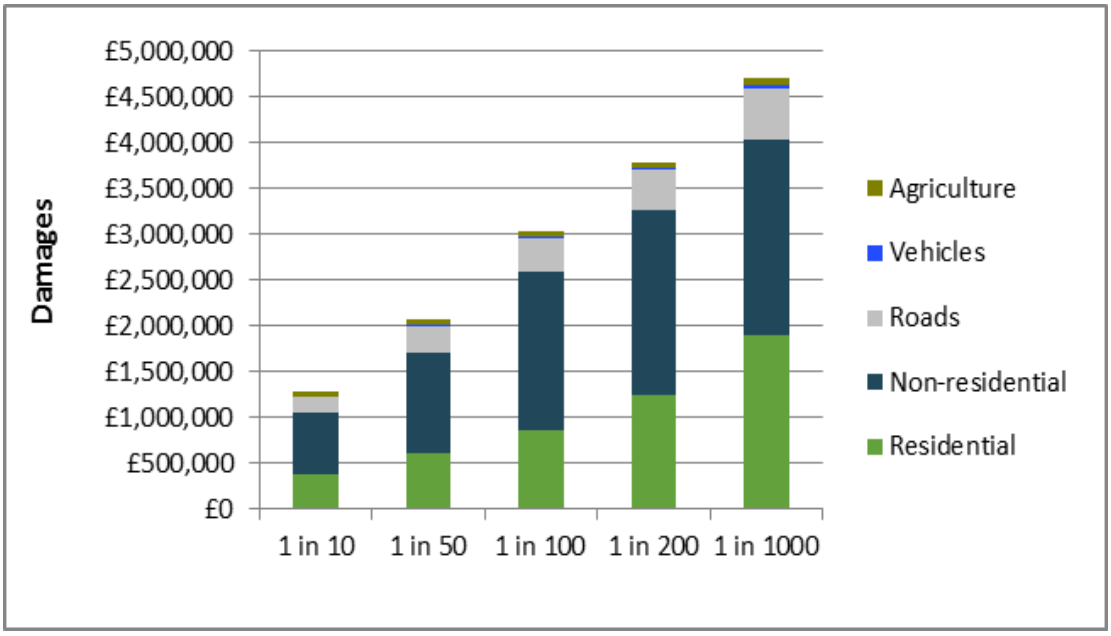


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

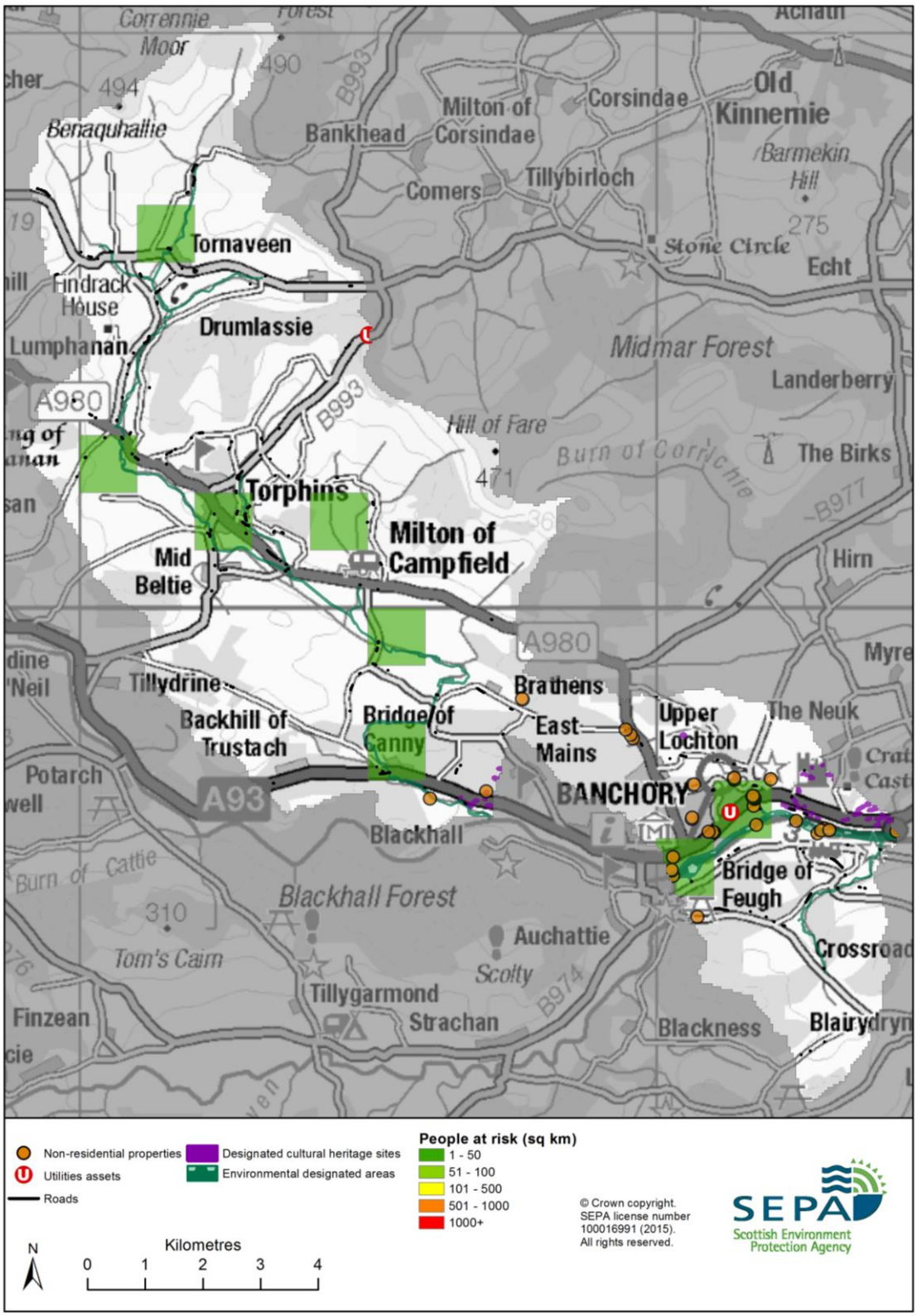


Figure 3: Impacts of flooding

History of flooding

The Beltie Burn flooded in 1799, 1829, 1872, and 1876 affecting the railway (now abandoned) and damaging bridges. Flooding on the River Dee occurred in 1876 and 1902, which affected the railway at Glassel and Banchory. In 1998 and 2000 the Burn of Canny overtopped its banks in several places causing flooding to properties at Millbank and Inchmarlo.

More recently, there was flooding in Torphins at Craigour Avenue in 2000, Craigmyle Road in 2002 from a small spring, Waulkmill Farm in 2002 from the Beltie Burn, Grove Cottage in 2002 from ground water, Grove Terrace in 2003 and Kincardine Road in 2009. There was surface water flooding reported at Briarwood, Upper Lochton at Banchory in 2002. Flooding due to the Burn of Canny overtopping and surface water runoff occurred in Brathens in 2003. Following this flood, the river was realigned and rock armour used to improve flows.

Objectives to manage flooding in Potentially Vulnerable Area 06/21

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 Banchory and Torphins Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 30 residential properties • £200,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 30 residential properties • £200,000 Annual Average Damages
Applies across North East 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 06/21

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 Banchory and Torphins 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):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Banchory' flood warning area which is part of the Dee river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

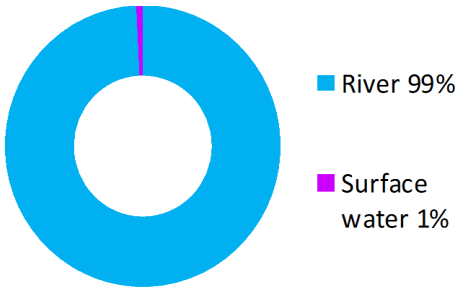
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Ballater (Potentially Vulnerable Area 06/22)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Summary of flooding impacts



At risk of flooding

- 200 residential properties
- 40 non-residential properties
- £230,000 Annual Average Damages

(damages by flood source shown left)

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.

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

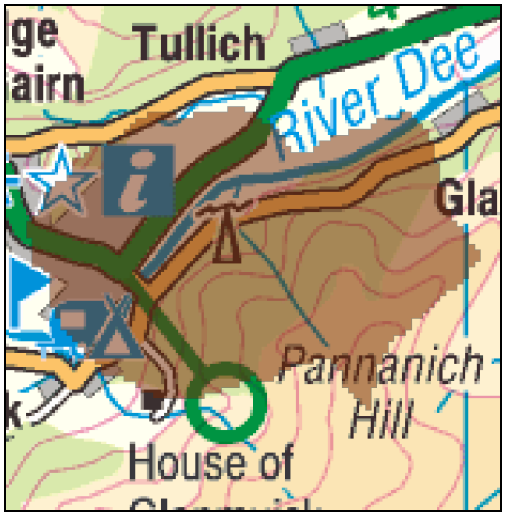
Ballater (Potentially Vulnerable Area 06/22)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	River Dee (Grampian)

Background

This Potentially Vulnerable Area is based around Ballater and is approximately 7km^2.

The area is located within the Cairngorms National Park and the A93 passes through it.



The main river is the River Dee, which is a Special Area of Conservation for salmon, otters and freshwater pearl mussels.

There are approximately 200 residential and 40 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £230,000. Almost all the damages are caused by river flooding.

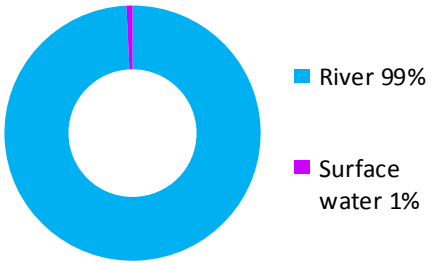


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The main areas at risk of river flooding are along the River Dee in south and east Ballater around Salisbury Road, Braichlie Road and Dee Street. Further areas of risk include Tullich Road and Craigview Road.

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

The caravan site and the fire station are at risk of flooding as are a number of roads, notably the A93, B972 and B976. Small areas of designated environmental sites are also at risk of flooding including the River Dee Special Area of Conservation.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 960)	<10	200	540
Non-residential properties (total 190)	<10	40	100
People	<10	430	1,200
Community facilities	0	<10 Emergency services	<10 Emergency services
Utilities assets	0	<10	<10
Transport links (excluding minor roads)	Roads at <10 locations	Roads at <10 locations	Roads at 10 locations
Environmental designated areas (km^2)	0.3	0.4	0.4
Designated cultural heritage sites	0	0	0
Agricultural land (km^2)	0.1	0.6	0.8

Table 1: Summary of flooding impacts[1]

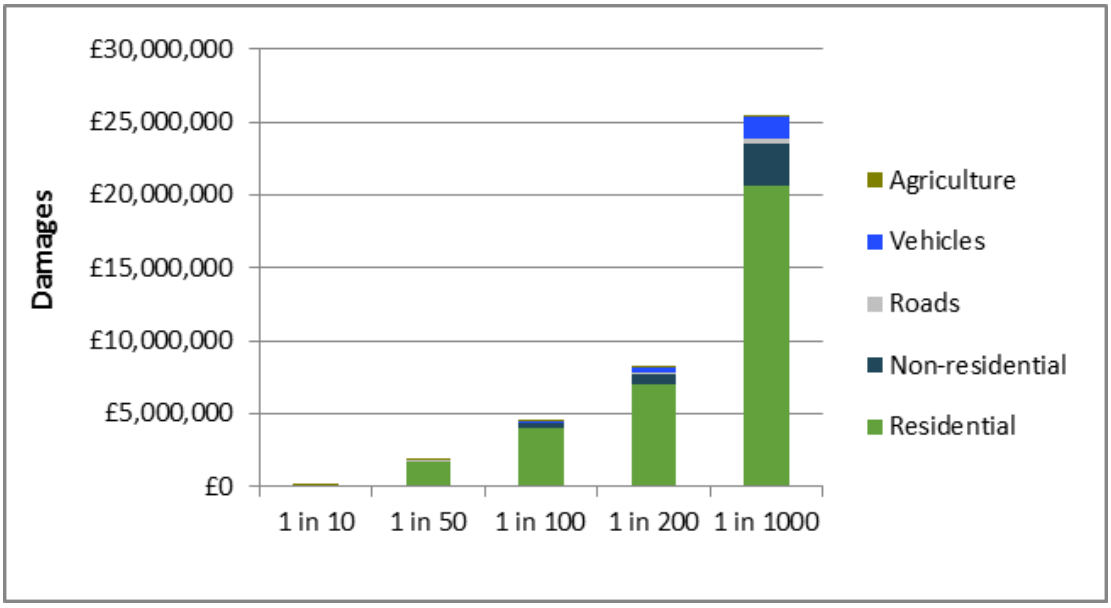


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

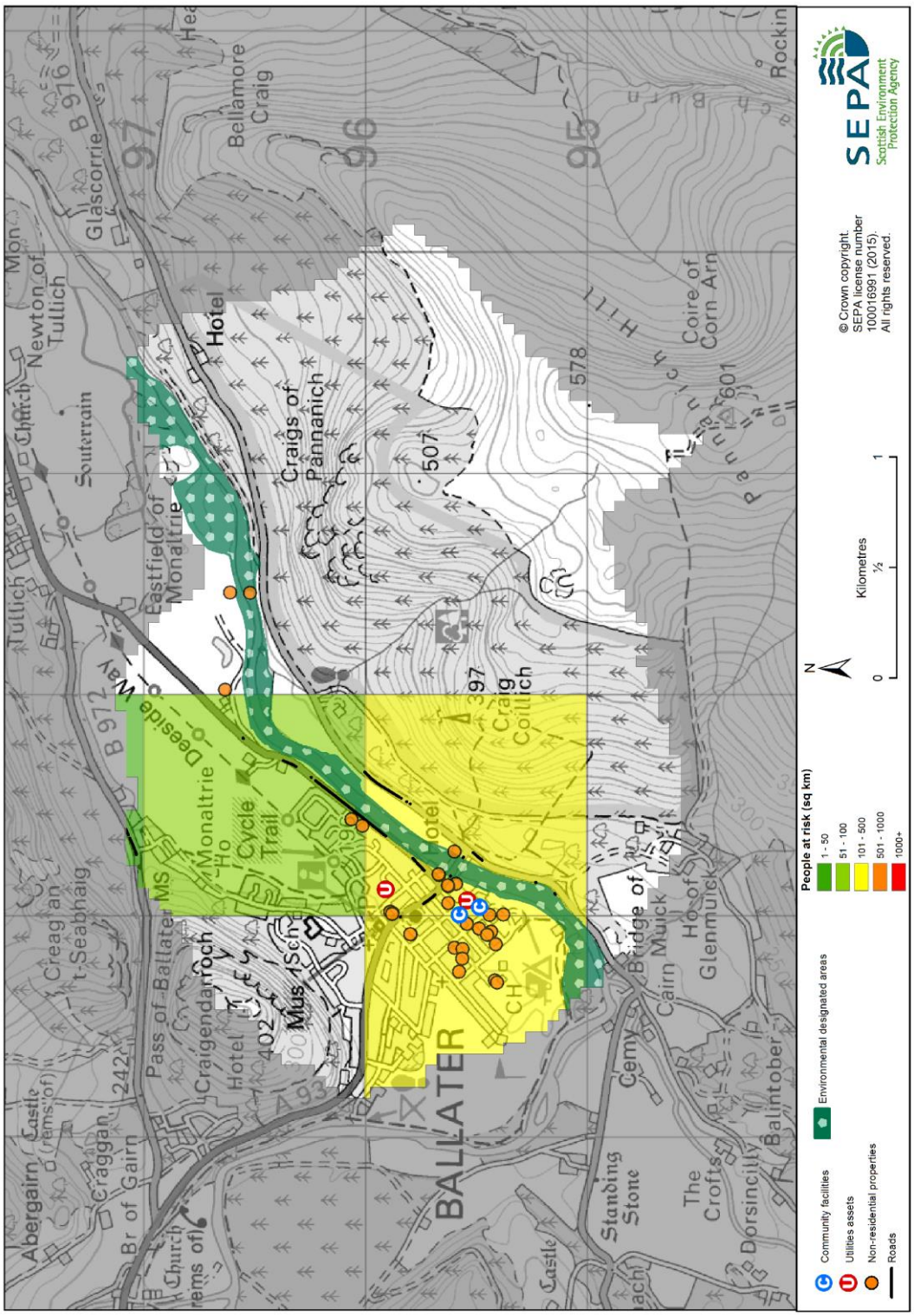


Figure 3: Impacts of flooding

History of flooding

Flooding occurred on the River Dee in 1829, destroying the Ballater Bridge and in 1839, the bridge at Tullich was damaged. In 1877, cellars in the lower part of Ballater were flooded, and in 1920 and 1929 the town and roads were flooded.

Local reports are that in the late 1980s the bottom part of the village was badly flooded with water coming up through the drains. Deebank Road, Bridge Street Richmond Place, Braichlie Road were all affected. In 2008, surface runoff entered the Netherley Guest House at Netherley Place.

In August 2014, the caravan park and a number of roads were closed due to flooding from the River Dee. As a result, 150 people were evacuated from the caravan site.

Objectives to manage flooding in Potentially Vulnerable Area 06/22

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 Ballater Potentially Vulnerable Area.

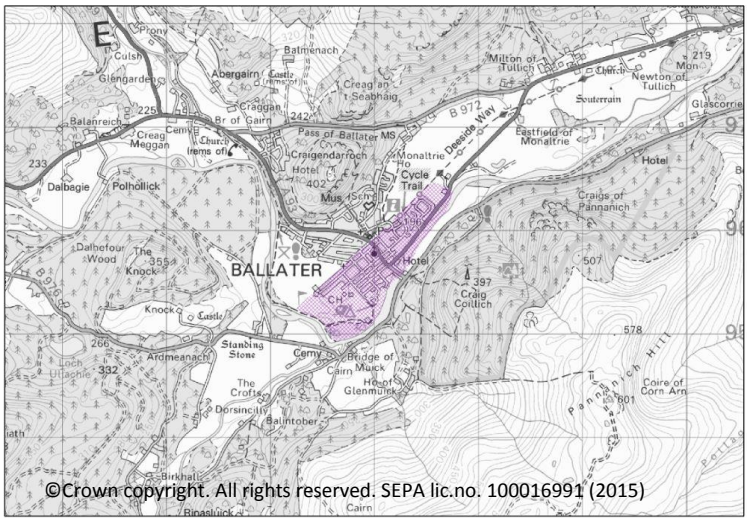
Reduce flood risk in Ballater from the River Dee

Indicators:

- 420 people
- £170,000 Annual Average Damages from residential properties
- £16,000 Annual Average Damages from non-residential properties
- 2 emergency services

Objective ID: 602201

Target area:



Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 200 residential properties • £230,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 200 residential properties • £230,000 Annual Average Damages
Applies across North East 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 06/22

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 Ballater 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 STUDY** (6022010005)		
Objective (ID):	Reduce flood risk in Ballater from the River Dee (602201)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	90 of 168	**5 of 12**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of flooding in Ballater from the River Dee. The flood protection study should primarily focus on direct defences, relocation of properties and property level protection, but other actions may also be considered in order to develop the most sustainable range of options.		
Potential impacts			
Economic:	The study could benefit 192 residential and 32 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £3.8 million.		
Social:	The development of flood protection works following the study would potentially reduce risk to 422 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. The caravan park, two emergency services and two utility sites (one energy/electricity site and one telecommunications site) could benefit from future flood protection works depending on the location and extent of works confirmed in the study. Negative impacts through disturbance to the local community during the construction phase should be considered.		

Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. The flood protection study should consider how to avoid or minimise potential impacts on the Ballater conservation area and Cairngorms National Park. 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 Dee Special Area of Conservation.

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Ballater' flood warning area which is part of the Dee river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**COMMUNITY FLOOD ACTION GROUPS** (6000020012)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Community		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	There is a flood action group in Ballater.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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.		

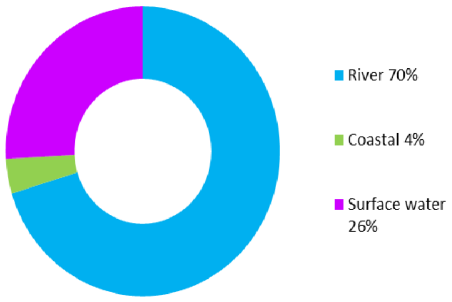
Action (ID):	**EMERGENCY PLANS/RESPONSE** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, 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** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		

Stonehaven (Potentially Vulnerable Area 06/23)

Local Plan District	Local authority	Main catchment
North East	Aberdeenshire Council	Kincardine and Angus coastal

Summary of flooding impacts



At risk of flooding

- 860 residential properties
- 240 non-residential properties
- £890,000 Annual Average Damages

(damages by flood source shown left)

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.

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

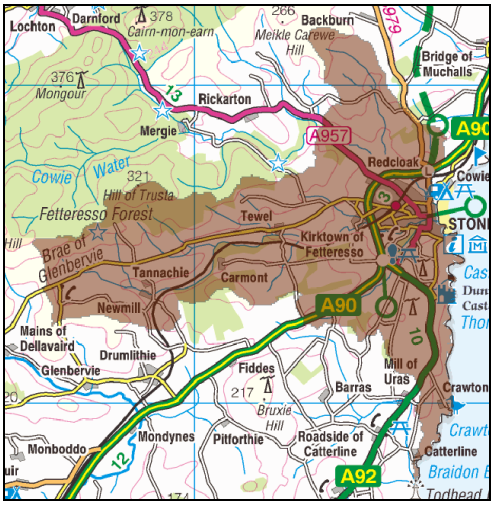
Stonehaven (Potentially Vulnerable Area 06/23)

Local Plan District	Local authority	Main catchments
North East	Aberdeenshire Council	Kincardine and Angus coastal

Background

This Potentially Vulnerable Area covers Stonehaven and the surrounding rural area. It is approximately 68km².

The Aberdeen to Dundee railway line, and the A90, A957 and A92 pass through the area.



The main rivers in the area are Carron and the Cowie. Stonehaven has suffered from major flooding in recent years from the River Carron and from the sea.

There are approximately 860 residential and 240 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £890,000, with the majority due to river flooding.

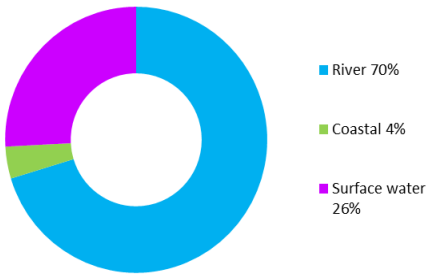


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flood risk is mainly from the River Carron and the Glaslaw Burn. Floods from the Carron can extend along Low Wood Road and Dunnottar Avenue in the south, and throughout the low-lying parts of town along Barclay Street in the north. Flooding also extends to the south east along High Street and Arbuthnott Court into the Old Town. Surface water flooding also impacts on the town, particularly around the leisure centre and in the Old Town. Flooding from wave overtopping is not fully represented in the general assessment of flood risk and the number of properties at risk and the damages from coastal flooding are known to currently be underestimated. Flooding from wave overtopping has been included in the setting of objectives and selection of actions.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. Dunnottar School, the police station and the main supermarket are at risk of flooding. Transport routes affected by flooding include the A90, A92, A957 and the Aberdeen to Dundee railway in several locations. Six designated cultural heritage sites and a small area of designated environmental sites are at risk.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 5,200)	140	860	950
Non-residential properties (total 590)	60	240	260
People	300	1,900	2,100
Community facilities	<10 Emergency services	<10 Includes; educational buildings and emergency services	<10 Includes; educational buildings and emergency services
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 100 locations Rail at 30 locations	Roads at 160 locations Rail at 40 locations	Roads at 170 locations Rail at 40 locations
Environmental designated areas (km^2)	0.1	0.1	0.1
Designated cultural heritage sites	4	6	7
Agricultural land (km^2)	0.5	0.6	0.7

Table 1: Summary of flooding impacts[1]

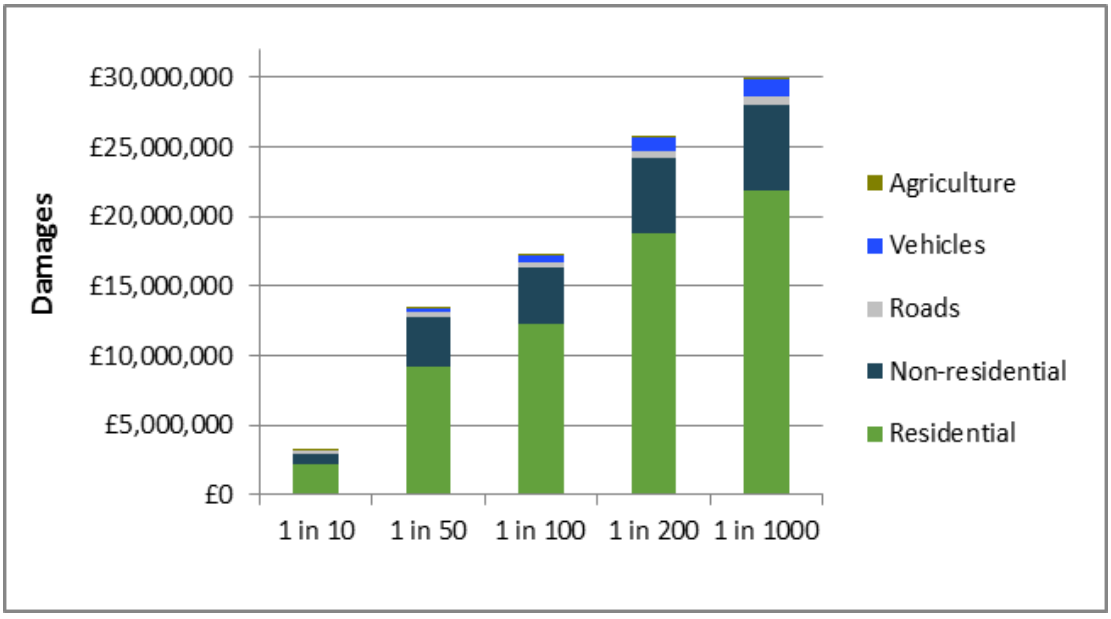


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

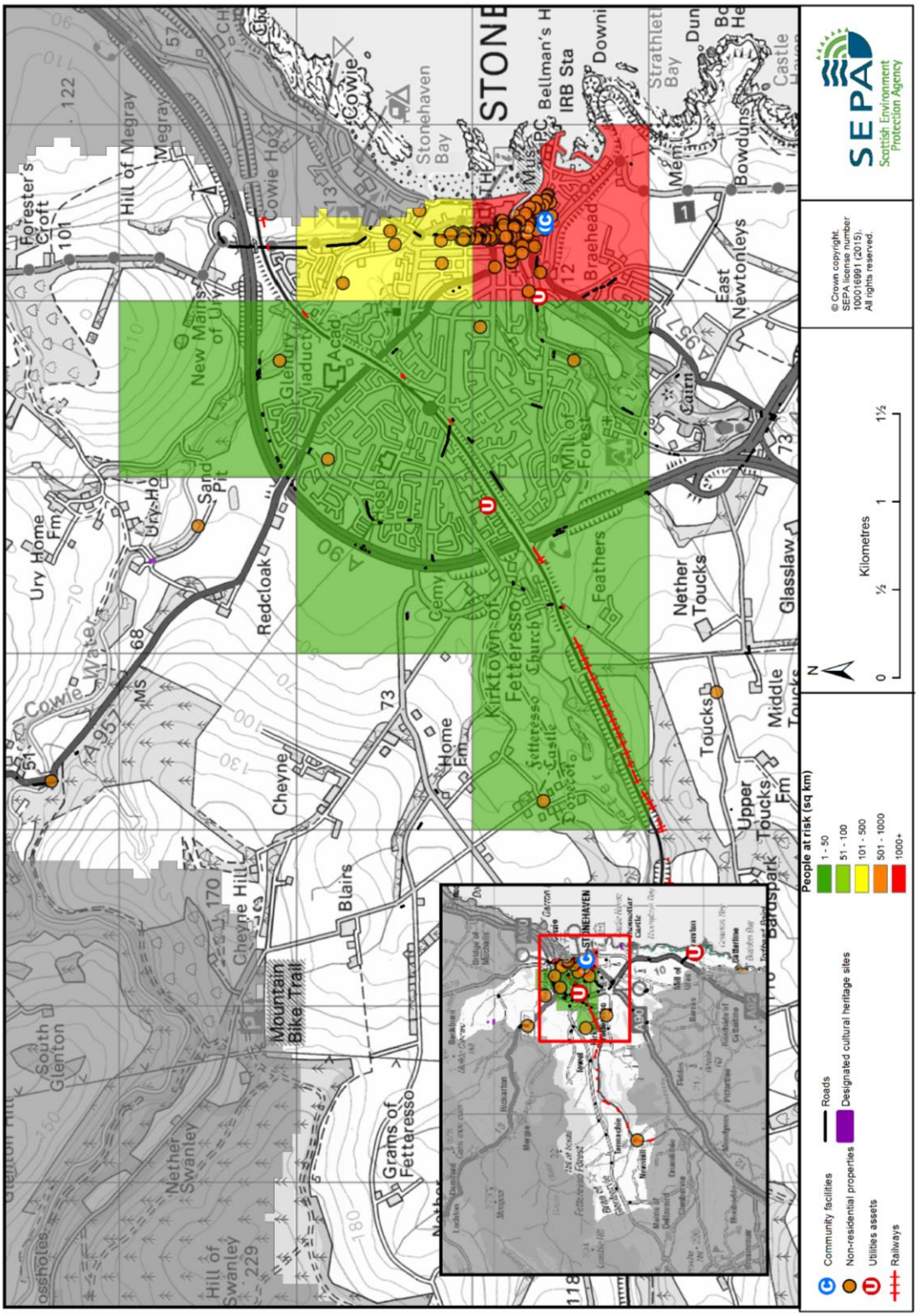


Figure 3: Impacts of flooding

History of flooding

There is a long record of flooding in Stonehaven dating back to the early 1800s, with flooding affecting property, agriculture, bridges and roads. A number of these floods resulted in several feet of water in the town.

There is extensive and valuable local knowledge of historic flooding and further work is required to fully reconcile this knowledge with existing recorded events listed below.

The earliest recorded flood on Carron Water was in 1829, with additional floods recorded in 1835 (when large areas of the town were submerged by several feet of water) 1836, 1878 (when one fatality occurred), 1881, and 1895. There are floods recorded on Cowie in 1878, 1881, 1882, 1884, 1895, 1896 and 1949. In December 1985 there was a flood on both the Carron and Cowie rivers, which affected Arduthie Street, Carron Terrace, and Cameron Street. In 2002, the Carron flooded Low Wood Road.

In November 2009, the Carron burst its banks at the green bridge and flooded 97 properties in Stonehaven with 50 people needing to be evacuated. The River Carron and its tributary, the Glaslaw Burn, flooded again in December 2012 when 40 properties were evacuated and suffered significant damage. Surface water also contributed significantly to this flood.

In 1998, the Farrochie Burn flooded Arduthie Gardens in Stonehaven affecting three properties; it flooded again in 2002. In 2006, a trash screen became blocked with debris and caused Farrochie Burn to flood a public park and road. In 2006, Victoria Street was flooded from an unnamed watercourse, with a culvert blockage causing the water to back up. In 2008 the gardens of Touck Cottages were affected by surface runoff from agricultural land.

On 15 December 2012, a coastal storm overtopped the sea defences and around 20 properties were flooded internally. Around 25 vulnerable residents had to be evacuated and there was significant structural damage to further seafront properties from wave action. Seafront properties were again affected in October 2014 by wave overtopping and many vulnerable people were evacuated from their homes.

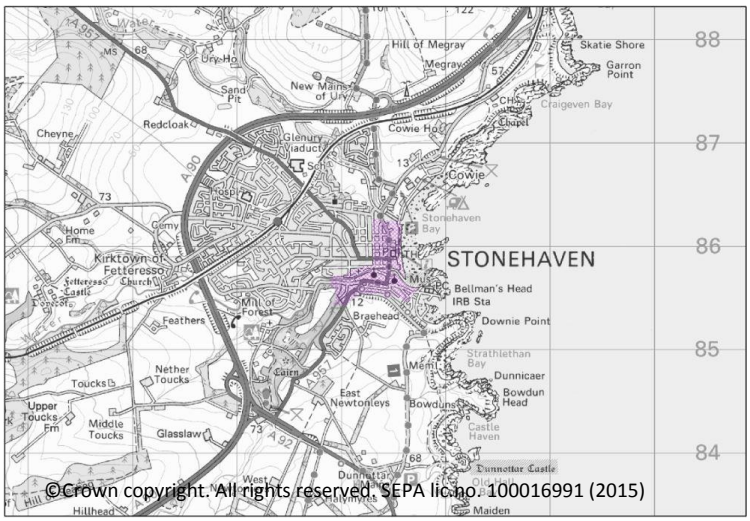
Wave overtopping frequently impacts seafront businesses to the north of the River Cowie. Residential properties in Cowie village are also affected during periods of high water levels and wave activity.

The village of Catterline is affected by surface water flooding. Erosion of the toe of the coastal slopes by wave action, combined with the impact of surface water and springs on slope stability, have contributed to coastal landslips in the village. This erosion threatens a significant proportion of the property in the village and the access road to the harbour. The neighbouring village of Crawton has also suffered from flooding.

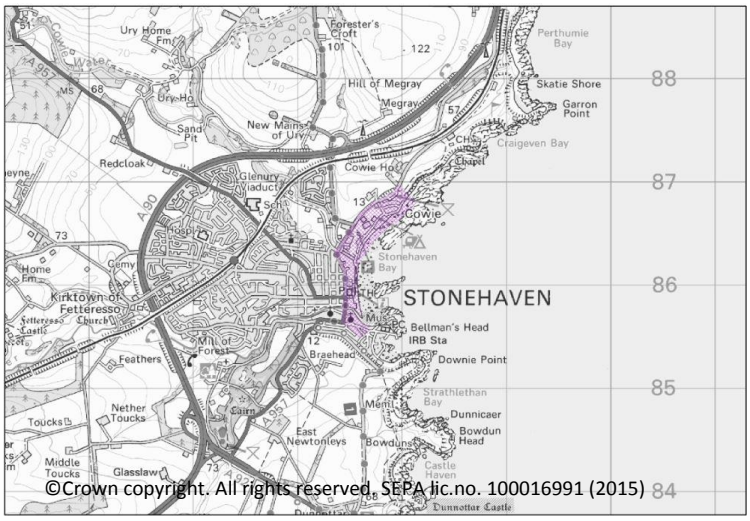
Objectives to manage flooding in Potentially Vulnerable Area 06/23

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 Stonehaven Potentially Vulnerable Area.

Reduce flood risk in Stonehaven from the River Carron and Glaslaw Burn

Indicators:	Target area:
• 820 people • £450,000 Annual Average Damages from residential properties • 1 educational building • 1 emergency service	
Objective ID: 602301	

Reduce risk in Stonehaven from coastal flooding

Indicators:	Target area:
• 110 people • £27,000 Annual Average Damages from residential properties • £3,100 Annual Average Damages from non-residential properties	
Objective ID: 602302	

Target area	Objective	ID	Indicators within PVA
Stonehaven	Reduce risk from surface water flooding in Stonehaven	602307	* See note below
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	• 860 residential properties • £890,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	• 860 residential properties • £890,000 Annual Average Damages
Applies across North East 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 06/23 there are 180 residential properties at risk and Annual Average Damages of £230,000.

Actions to manage flooding in Potentially Vulnerable Area 06/23

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 Stonehaven 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** (6023010006)		
Objective (ID):	Reduce flood risk in Stonehaven from the River Carron and Glaslaw Burn (602301)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	32 of 42	**1 of 2**	
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	A Flood Order was published in July 2015 with a flood protection scheme undergoing detailed design to reduce flood risk to Stonehaven from the River Carron and Glaslaw Burn. The scheme will include a combination of new culverts and alterations to bridges, removal of weirs and installing trash screens and the construction of direct defences. It is being designed to a 1 in 200 year standard of protection including an allowance for climate change.		
Potential impacts			
Economic:	A flood protection scheme could reduce flood risk to 372 residential properties at risk of flooding in this location, with estimated damages avoided of £20 million. The benefit-cost ratio of the proposed works is 1.23.		
Social:	A flood protection scheme could reduce risk to an estimated 818 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Two utility sites (energy production/electricity), a school, an emergency service site and the A957 could benefit from flood protection works.		
Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they		

Environmental:	are designed. Direct defences will be set back from the river where possible to reduce potential negative impacts on the ecological quality of the rivers and minimise tree loss. The removal of the weir will improve fish passage along the river which is important for salmon, trout and otter. The development of the design should look to maintain and enhance the attractive build environment along the riverside where possible, incorporating finishes, materials and details that complement this.

Action (ID):	**NEW FLOOD WARNING** (6000020010)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Flood warning is required for communities at risk of coastal flooding along the Aberdeenshire coast from Peterhead to Montrose. A flood forecasting system will be required before the flood warning scheme can be developed.		

Action (ID):	**FLOOD PROTECTION STUDY** (6023020005)		
Objective (ID):	Reduce risk in Stonehaven from coastal flooding (602302)		
Delivery lead:	Aberdeenshire Council		
Priority:	National:	Within local authority:	
	86 of 168	**4 of 12**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A flood protection study is required to consider flood protection works to reduce the risk of coastal flooding in Stonehaven. The flood protection study should consider wave attenuation (beach management / recharge), coastal management actions (revetments), the construction of direct defences, relocation of properties and property level protection. Other actions may also be considered to develop the most sustainable range of options. The number of properties at risk of flooding from wave overtopping will be confirmed as part of the study. The estuary of the River Cowie up to the A957 road bridge will be included in this study.		
Potential impacts			
Economic:	The study could benefit 47 residential and seven non-residential properties at risk of flooding in this location, with potential damages avoided of up to £4 million. Flood protection works would have additional benefits of reducing structural damage from direct wave action to property along the seafront.		
Social:	The development of flood protection works following the study would potentially reduce risk to 106 people. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Natural flood management actions can restore and enhance natural environments and create		

Social:	opportunities for recreation and tourism. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. Beach recharge will very often involve proposals to obtain the donor sediment from the low intertidal or shallow sub tidal zone in the vicinity. There are potential adverse effects on biodiversity, active coastal processes, and even coastal flood risk if sediment extraction allows greater wave attack inshore. The flood protection study should ensure the actions avoid or minimise the potential loss of natural habitat and do not interfere with coastal processes. The flood protection study should consider how to avoid or minimise potential negative effects on the Garron Point Site of Special Scientific Interest to the north.

Action (ID):	**SURFACE WATER PLAN/STUDY** (6023070018)		
Objective (ID):	Reduce risk from surface water flooding in Stonehaven (602307)		
Delivery lead:	Aberdeenshire Council		
Status:	**Ongoing**	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. An integrated catchment study has been 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. Flood risk from the Farrochie Burn in Stonehaven will be covered by the surface water management plan		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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** (6000020030)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the 'Stonehaven' flood warning area which is on the Carron Water and is part of the Stonehaven river flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
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. The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.		

Action (ID):	**COMMUNITY FLOOD ACTION GROUPS** (6000020012)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Community		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Stonehaven Flood Action Group vigorously represent the local community on flood risk issues and have been actively involved in working with Aberdeenshire Council and SEPA in seeking and implementing solutions to flood risk in Stonehaven. The group have raised and distributed over £12,000 to assist residents to improve property level protection both individually and collectively. The group also share alerts and help raise awareness of flood risk in the town. There is also a flood warden scheme, supported by Aberdeenshire Council, to warn and inform of potential floods from the River Carron and Glaslaw Burn.		

Action (ID):	**SELF HELP** (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provide a small range of flood protection products for individual property protection, which are available for all types of flooding, at cost price with free delivery across Aberdeenshire.		

Action (ID):	**AWARENESS RAISING** (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
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 the community and promote Floodline through education events undertaken jointly with the Stonehaven Flood Action Group. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeenshire 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** (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
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. Aberdeenshire Council provides sandbags at pre-arranged locations in the town when forecast conditions indicate that the likelihood of need is very high. Aberdeenshire Council also deploys flood barriers in these conditions to help divert flood water away from properties and back into the river channel where possible. Aberdeenshire Council operates a water level monitor on the River Carron.		

Action (ID):	**PLANNING POLICIES** (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001)		
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.		

Flood Risk Management Strategy

North East 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

3.1 Introduction

In the North East Local Plan District, river flooding is reported across four distinct river catchments. Coastal flooding is reported over three distinct coastal areas and surface water flooding is reported across the whole Local Plan District.

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

	Total number of properties at risk[1]	Annual Average Damages	Local authorities
River catchments			
Deveron catchment group	360	£1.3 million	Aberdeenshire Council The Moray Council
Ythan catchment group	330	£2.9 million	Aberdeenshire Council Aberdeen City Council
Don catchment group	3,100	£5.9 million	Aberdeenshire Council Aberdeen City Council
Dee catchment group	10,000	£13.5 million	Aberdeenshire Council Aberdeen City Council
Coastal flooding			
Inverbervie to Girdle Ness coastal area	70	£40,000	Aberdeenshire Council Aberdeen City Council
Girdle Ness to Cairnbulg Point coastal area	20	£160,000	Aberdeenshire Council Aberdeen City Council
Cairnbulg Point to Portgordon coastal area	30	£66,000	Aberdeenshire Council The Moray Council
Surface water flooding			
North East Local Plan District	4,100	£5.2 million	Aberdeenshire Council Aberdeen City Council The Moray Council

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

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

3.2 River flooding

North East Local Plan District

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.

In the North East Local Plan District, river flooding is reported across four river catchment groups (Figure 1).

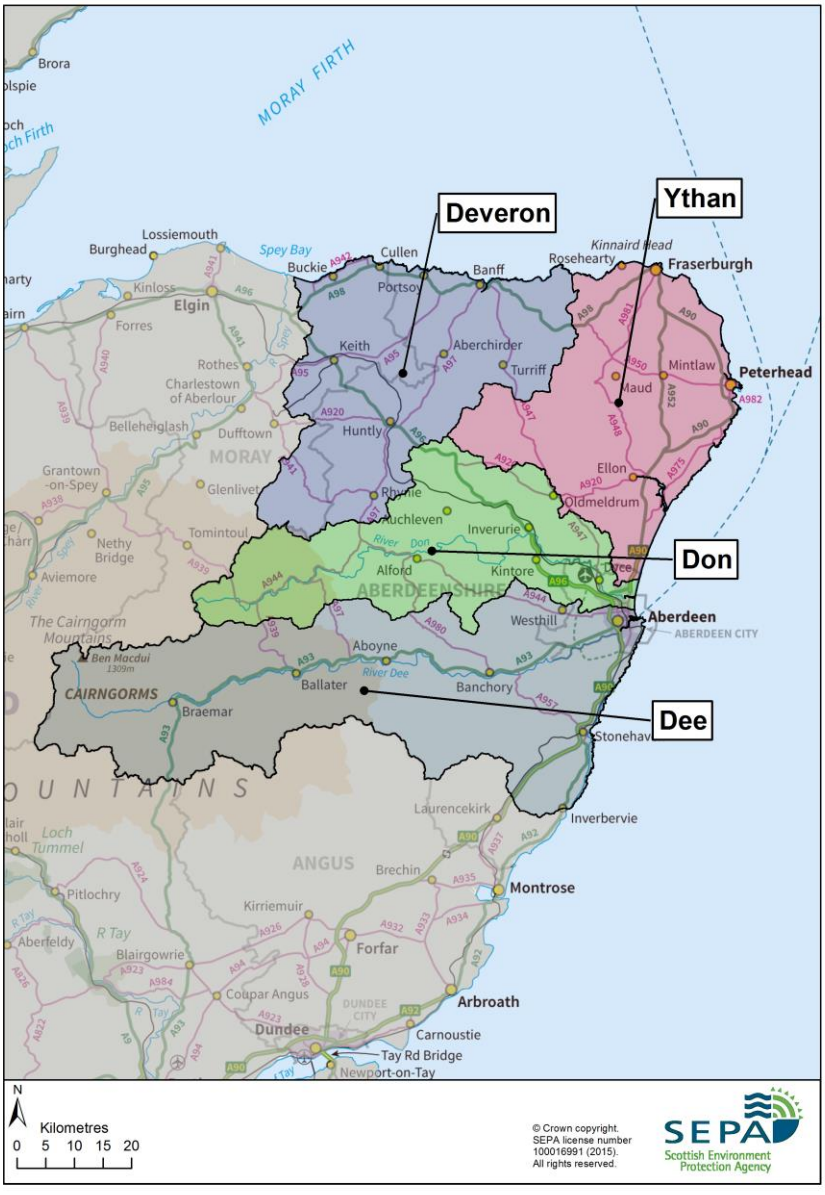


Figure 1: River catchment groups in the North East Local Plan District

River flooding
Deveron catchment group

Catchment overview

The Deveron river catchment group covers an area in the north west of the Local Plan District from Buckie along the coast to Pennan, and south to Rhynie. It has an area of approximately 1,600km^2 (Figure 1). The largest river is the River Deveron. Tributaries of the Deveron include the Burn of Turriff, River Isla and River Bogie with their confluences close to the towns of Turriff, Keith, and Huntly respectively. In the north and west of the area, smaller watercourses including Burn of Boyne, Burn of Buckie and Burn of Durn flow north straight out to the coast.

The predominant land covers are arable, horticulture and improved grassland, which together cover 55% of the area. Heather and heather grassland in the south west of the catchment and coniferous woodland are also important. The area has a highly variable annual rainfall of between 400mm and1200mm with the wettest areas being inland.

The catchment contains seven Potentially Vulnerable Areas:

- Portgordon (06/01)
- Portsoy (06/02)
- Banff (06/03)
- Macduff (06/04)
- Newmill (06/06)
- Turriff (06/07)
- Huntly (06/10).

Flood risk in the catchment

There are approximately 220 residential properties and 140 non-residential properties at risk of river flooding. Around 46% of the residential and 32% of the non-residential properties at risk are located within the Potentially Vulnerable Areas.

Main areas at risk

The main areas that have greater than 20 residential properties at risk of river flooding are shown in Table 1.

	Residential and non-residential properties at risk of river flooding	Annual Average Damages
Huntly	80	£370,000
Banff and Macduff	60	£220,000

Table 1: Main areas at risk of river flooding

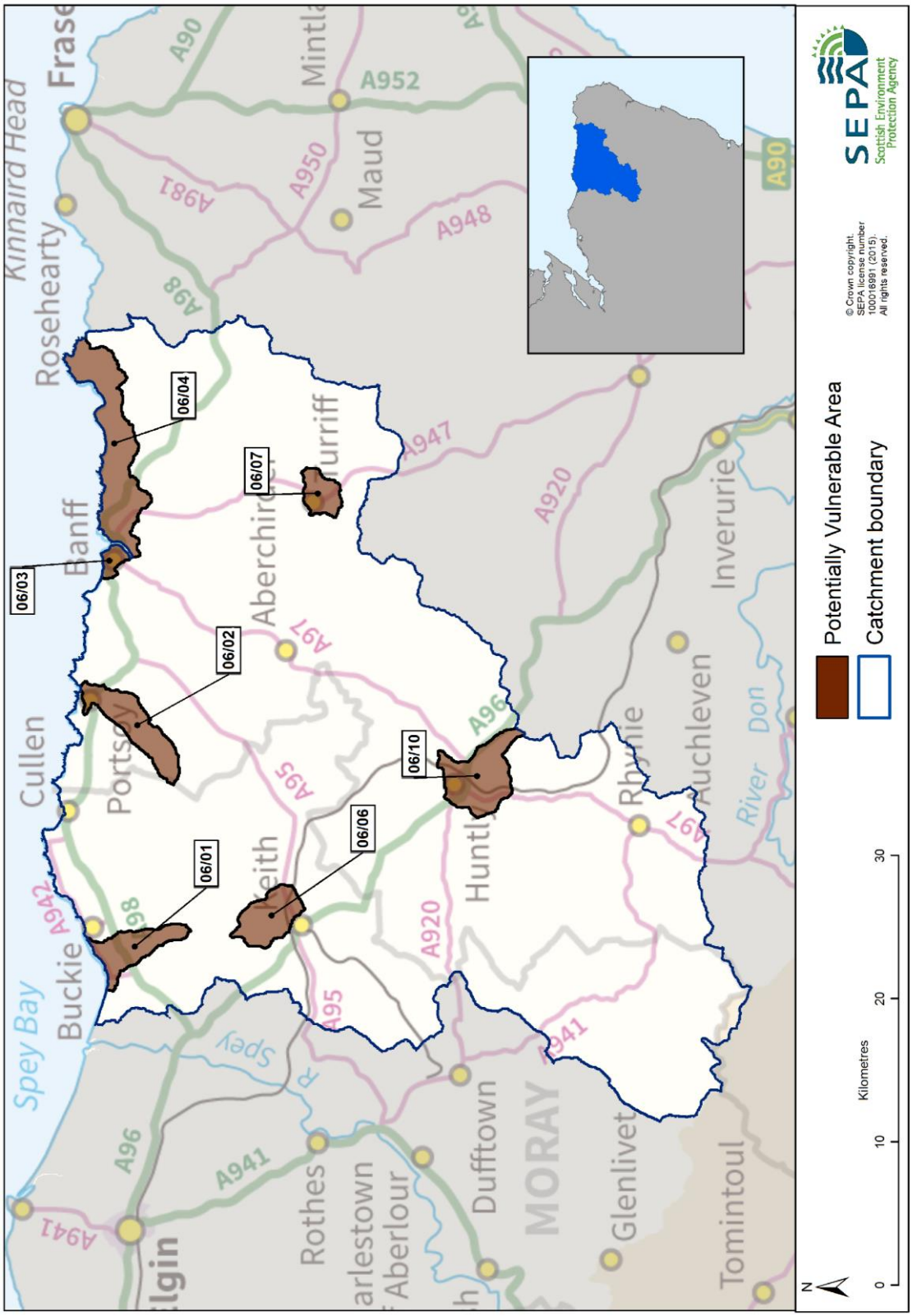


Figure 1: Deveron river catchment group and Potentially Vulnerable Areas

Economic activity and infrastructure at risk

The Annual Average Damages from river flooding in the Deveron catchment area are estimated to be £1.3 million. This accounts for around 5% of the total Annual Average Damages for the North East Local Plan District. The damages are distributed as follows:

- 49% non-residential properties (£660,000)
- 28% residential properties (£380,000)
- 7% emergency services (£90,000)
- 7% roads (£89,000)
- 6% agriculture (£84,000)
- 3% vehicles (£35,000).

Figure 2 shows the location of Annual Average Damages from river flooding across the area. The areas of highest damage are in Banff and Huntly.

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	Healthcare facilities.
Utility assets	<10	Fuel extraction sites.
Roads (excluding minor roads)	390 locations	Notably the A96, A97 and A98
Railway routes	50 locations	Inverness to Aberdeen
Agricultural land (km^2)	38	n/a

Table 2: Infrastructure at risk of river flooding

Designated environmental and cultural heritage sites at risk

There are approximately 30 designated cultural heritage sites at risk of river flooding. These sites include scheduled monuments, gardens and designed landscapes and listed buildings.

Less than 1km^2 of designated environmental area is at risk of river flooding, including Special Areas of Conservation and Sites of Special Scientific Interest.

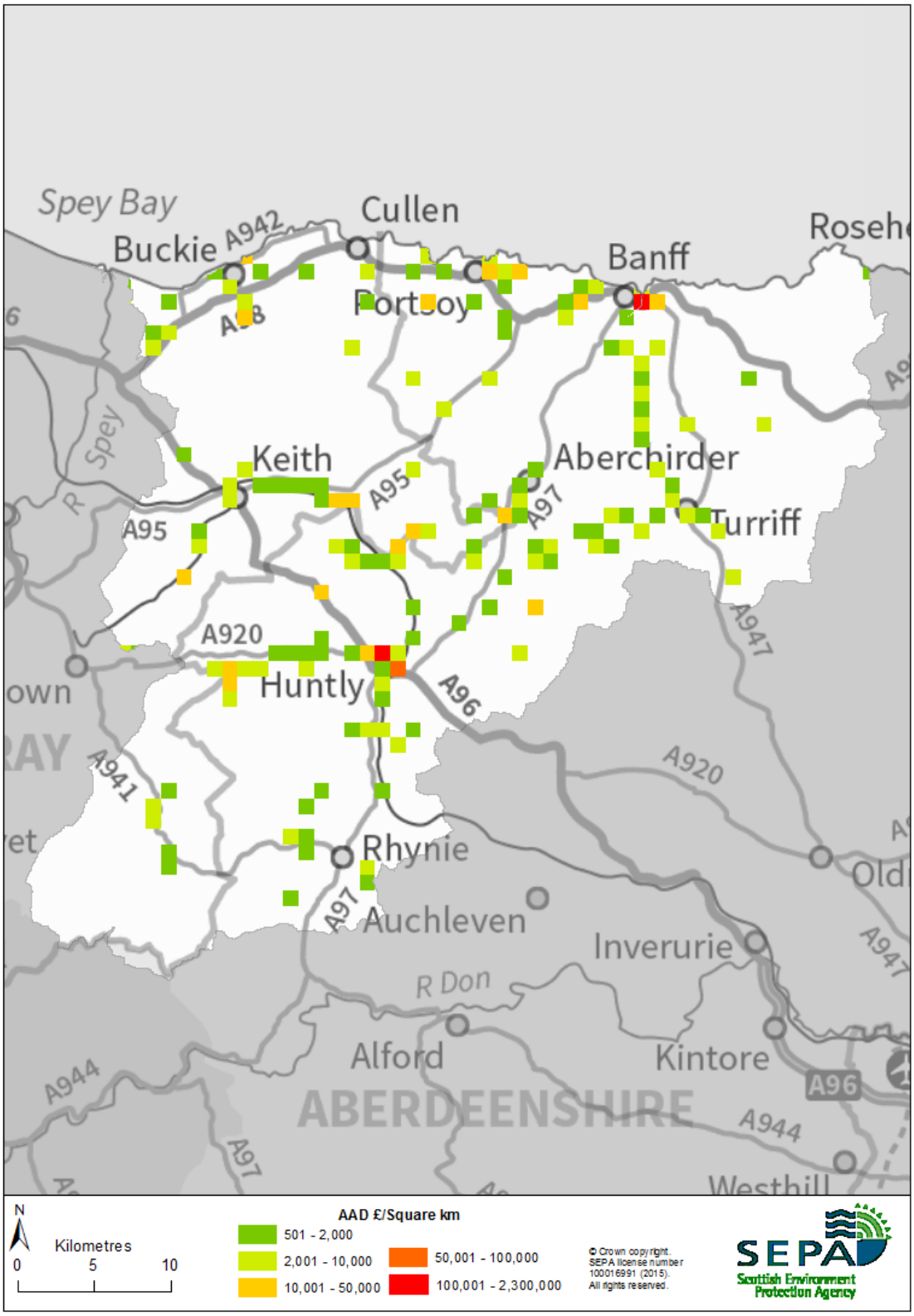


Figure 2: Annual Average Damages from river flooding

History of flooding

During 2009 there was a significant river flood from the Meadow Burn in Huntly that caused a nursing home to be evacuated. Floods have also been recorded from the River Deveron, River Bogie, Turriff Burn and the Soy Burn in Portsoy.

There have been no recent river flooding issues within Banff out with the golf course area. This is believed to be due to the road embankment acting as a flood defence, holding water away from the town. This would significantly reduce the likelihood of river flooding to Banff and the estimated number of properties reported above to be at risk of 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.

Existing actions that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

River flood warning schemes

There are five flood warning areas for river flooding in the Deveron group river catchment, which are listed in Table 2. These are the areas where SEPA has detailed models set up to predict flooding on specific rivers. There are flood warning areas on the River Deveron and Burn of Turriff at Turriff, the River Deveron and River Bogie at Huntly, the River Isla at Keith, and the River Deveron at Banff (Figure 3).

Flood warning area	Residential properties within flood warning area	% of properties registered (January 2014)
Banff	329	15%
Huntly (Bogie)	13	38%
Keith	34	32%
Millton and The Meadows	68	100%
Turriff	11	27%

Table 2: Flood warning areas

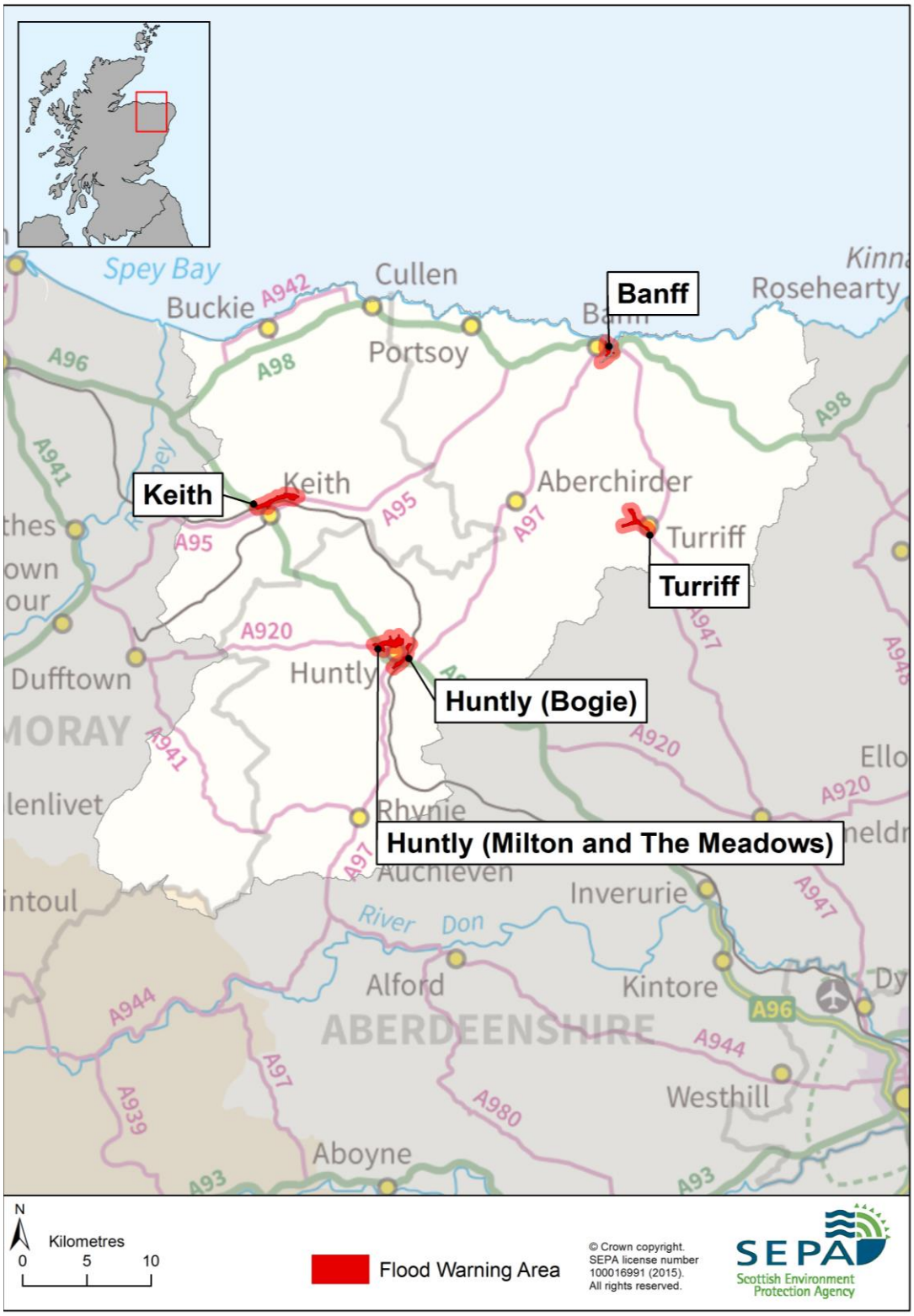


Figure 3: Flood warning areas

Property level protection

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

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- The Moray Council does not provide flood guards to private property owners. However, the flood team provides advice on how property owners can protect their own property.

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 Deveron catchment catchment may increase by 24%[1]. This would potentially increase in the number of residential properties at risk of river flooding from approximately 220 to 310 and the number of non-residential properties from 140 to 170.

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.

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.

Runoff reduction

The areas of potential for runoff reduction in the Deveron catchment group tend to be small and scattered, with the only significant continuous area of potential in the south west of the catchment. There is very little potential of runoff reduction either within or immediately upstream of any of the Potentially Vulnerable Areas within the catchment, with the exception of Portsoy (06/02). Therefore, it is unlikely that runoff reduction measures would have any significant impact on flood risk within the majority of the Potentially Vulnerable Areas.

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

Floodplain storage

The most significant continuous areas of potential for floodplain storage are along the valleys of the River Deveron, River Bogie and River Isla. All of the Potentially Vulnerable Areas in the North East Local Plan District show potential for floodplain storage, particularly Banff (06/03), Keith (06/06), Turriff (06/07), and Huntly (06/10).

Sediment management

The majority of the river systems have substantial reaches that are either in approximate balance or moderately eroding. However, there are also significant lengths of river that are predominantly highly eroding or depositing, which can contribute to flood risk. The Potentially Vulnerable Areas showing the largest amount of erosion or deposition are Portsoy (06/02), Keith (06/06), and Huntly (06/10).

River flooding
Ythan catchment group

Catchment overview

The Ythan river catchment group (Figure 1) covers the north eastern corner of the Local Plan District, from north of Aberdeen to west of Rosehearty. It has an area of approximately 1,400km^2. The largest rivers are the River Ugie and the River Ythan, which flow south-eastwards to the coast at Peterhead and Newburgh respectively. The River Ugie drains the central area, whilst the River Ythan drains the southern area to the west of Ellon. There are also numerous smaller watercourses that drain the area and flow straight out to the coast.

The predominant land covers are arable and horticulture, and improved grassland, which together cover 78% of the area. Annual rainfall is between 400-900mm with the wettest areas being inland.

The catchment contains four Potentially Vulnerable Areas as follows:

- Fraserburgh and Rosehearty (06/05)
- Peterhead (06/08)
- Methlick (06/09)
- Ellon (06/12).

Flood risk in the catchment

There are an estimated 230 residential properties and 100 non-residential properties at risk of river flooding. Approximately 36% of residential and non-residential properties at risk are located within the Potentially Vulnerable Areas

Main areas at risk

The only urban area that has greater than 20 residential properties at risk of river flooding is Ellon (Table 1).

Location	Residential and non-residential properties at risk of flooding	Annual Average Damages
Ellon	80	£220,000

Table 1: Main areas at risk of river flooding

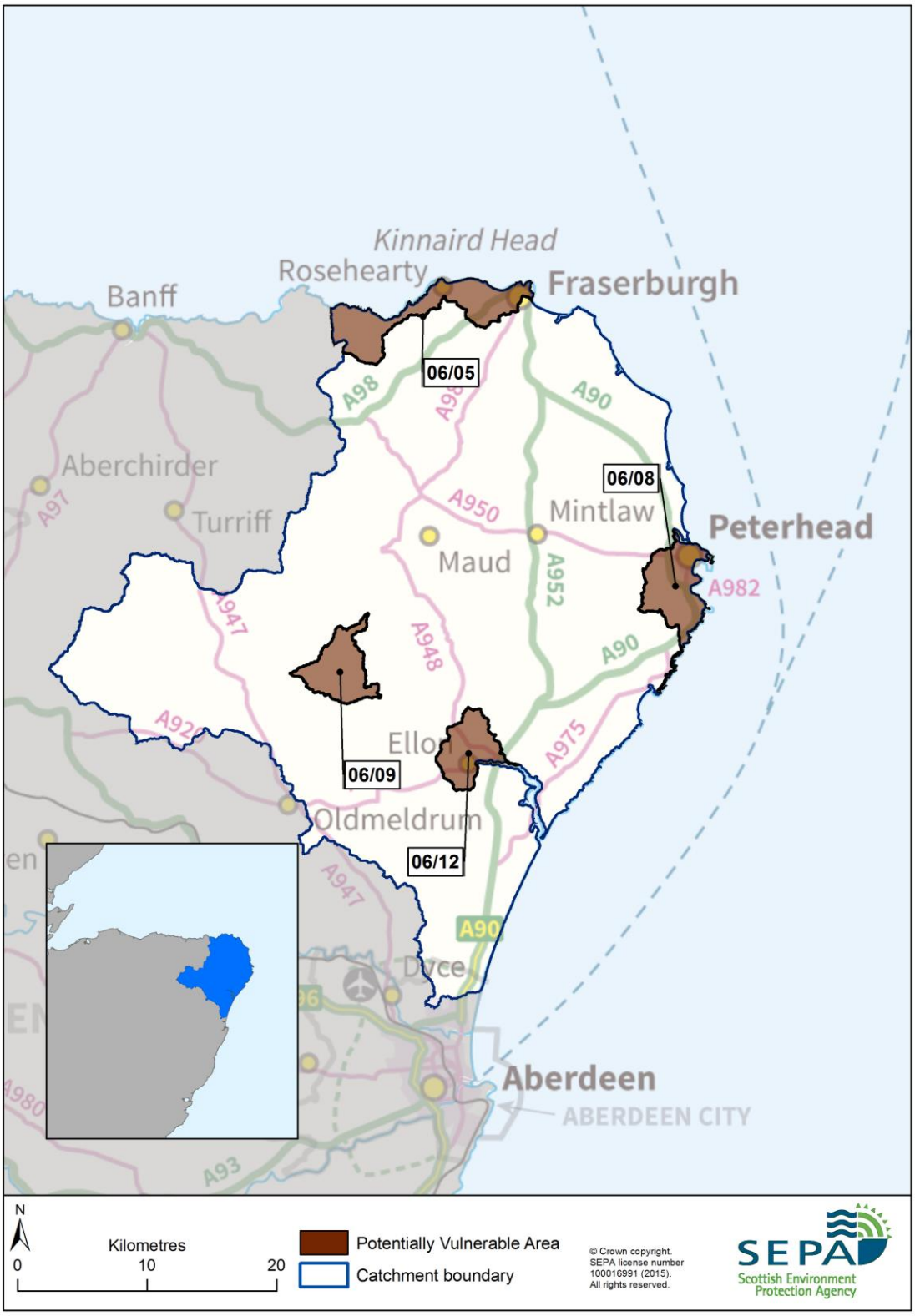


Figure 1: Ythan river catchment group and Potentially Vulnerable Areas

Economic activity and infrastructure at risk

The Annual Average Damages from river flooding in the River Ythan catchment area are estimated to be £2.9 million. This accounts for 10% of the total for the Local Plan District. The damages are distributed as follows:

- 65% non-residential properties (£1.9 million)
- 23% residential properties (£670,000)
- 6% emergency services (£180,000)
- 3% agriculture (£93,000)
- 2% roads (£62,000)
- 1% vehicles (£25,000).

Figure 2 shows the location of Annual Average Damages from river flooding. The areas of highest damage are in Ellon and Peterhead.

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

	Number at risk	Further detail
Community facilities	0	n/a
Utility assets	10	Includes; electricity substations and fuel/mineral extraction sites
Roads (excluding minor roads)	400 locations	Notably the A90 and A920
Railway routes	n/a	n/a
Agricultural land (km^2)	37	n/a

Table 2: Infrastructure at risk of river flooding

Designated environmental and cultural heritage sites at risk

There are 20 cultural heritage sites, including scheduled monuments, listed buildings and gardens and designed landscapes, at risk of river flooding.

Approximately 10km^2 of designated environmental area is at risk of river flooding. These include Special Areas of Conservation, Special Protection Areas, and Sites of Special Scientific Interest.

History of flooding

There have been several localised floods from the River Ythan and from the River Ugie. Smaller watercourses have also caused localised flooding.

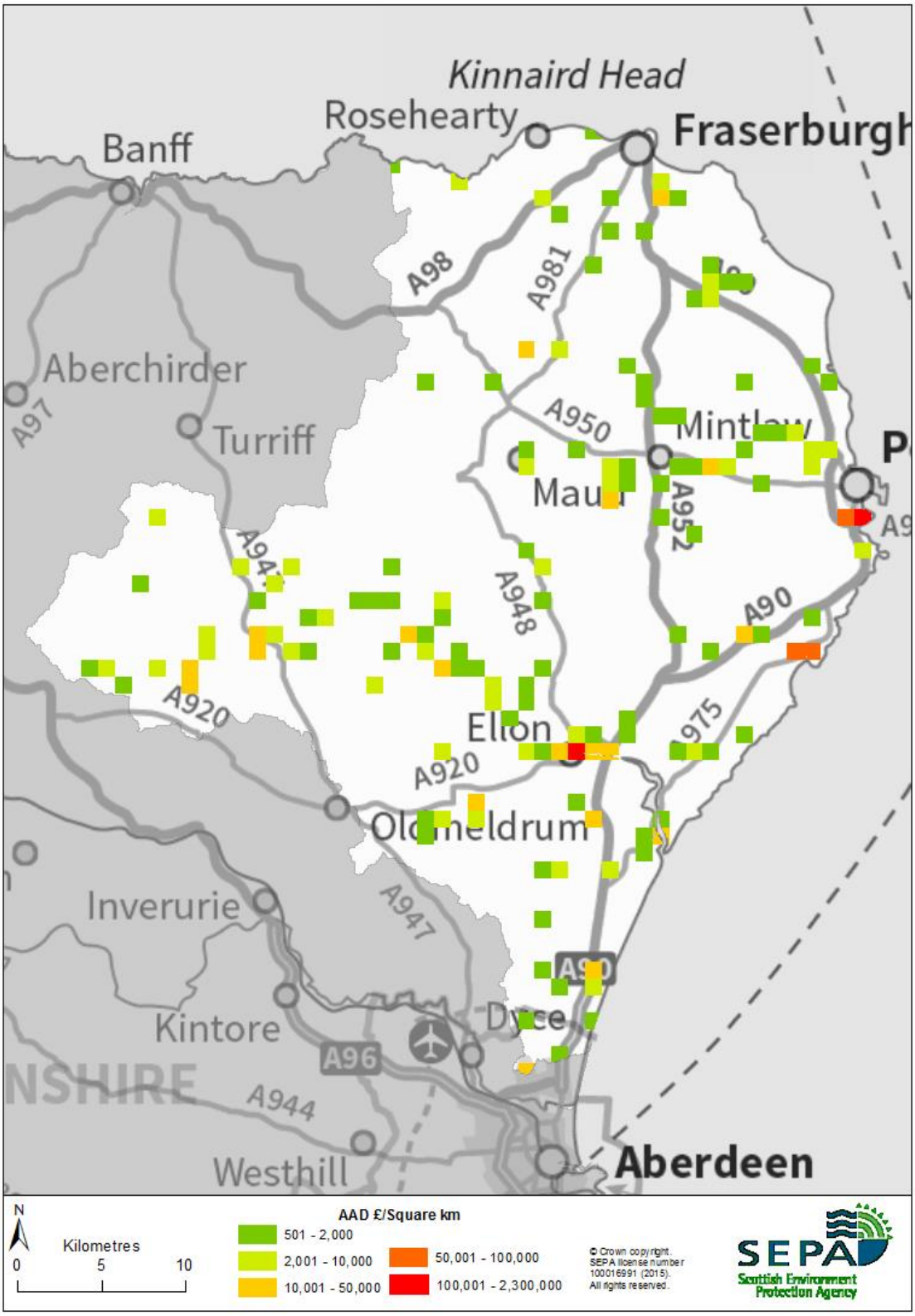


Figure 2: Annual Average Damages from river flooding

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.

Existing actions that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

Property level protection

Aberdeenshire Council offers a small range of flood protection products to residents, which are suitable for all types of flooding. These are sold to residents at cost price with free delivery across Aberdeenshire.

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 Ythan catchment may increase by 24%[1]. This would potentially increase in the number of residential properties at risk of river flooding from approximately 230 to 280, while the number of non-residential properties at risk does not change.

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.

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.

Runoff reduction

There is limited potential for runoff reduction in the Ythan catchment group and what does exist tends to be small scattered areas. None of the Potentially Vulnerable Areas show any significant potential of runoff reduction either within or immediately

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

upstream. Runoff reduction measures would not have any significant impact on flood risk in the Ythan catchment group, however may provide local benefits.

Floodplain storage

There are significant areas of high potential for floodplain storage within the Ythan catchment group. The most significant continuous areas of high potential are along the valleys of the major rivers, including the River Ugie and its tributaries, and the River Ythan. The Potentially Vulnerable Areas covering Peterhead (06/08), Methlick (06/09), and Ellon (06/12) all show potential for floodplain storage. It is likely that floodplain storage could reduce flood risk and may be considered further for these areas. The Potentially Vulnerable Area covering Fraserburgh (06/05) shows less potential though and floodplain storage may not provide as great an impact on flood risk here.

Sediment management

The River Ugie system is predominantly in balance, therefore measures to manage sediment is unlikely to reduce flood risk in the Peterhead (06/08). The River Ythan system is more varied and has significant lengths of predominantly eroding or depositing reaches, in particular through Methlick (06/09). The reaches through Ellon (06/12) include areas of moderate erosion and deposition. Therefore, measures to manage sediment in these Potentially Vulnerable Areas could potentially reduce flood risk.

River flooding
Don catchment group

Catchment overview

The River Don flows eastwards from the Cairngorm Mountains towards Aberdeen where it flows into the North Sea. It has a catchment area of approximately 1,300km^2 (Figure 1).

The predominant land covers are arable, horticulture, and improved grassland, which together cover approximately half of the catchment, predominantly in the east. Coniferous woodland is also significant in the east, with heather and montane habitats dominant in the west. The catchment has an annual rainfall of between 400-900mm with the wettest areas being in the west.

There are five Potentially Vulnerable Areas:

- Insch (06/11)
- Inverurie and Kintore (06/13)
- Heugh-head (06/14)
- Aberdeen City – Bridge of Don (06/15)
- Aberdeen City – Denmore (06/16).

Flood risk in the catchment

Note: The assessment of river flood risk in Aberdeen City is based on more detailed modelling derived from the Aberdeen integrated catchment study.

There are approximately 2,600 residential properties and 530 non-residential properties at risk of river flooding in the River Don catchment area. Approximately 96% of residential properties and 82% of non-residential properties at risk of river flooding are located within the Potentially Vulnerable Areas.

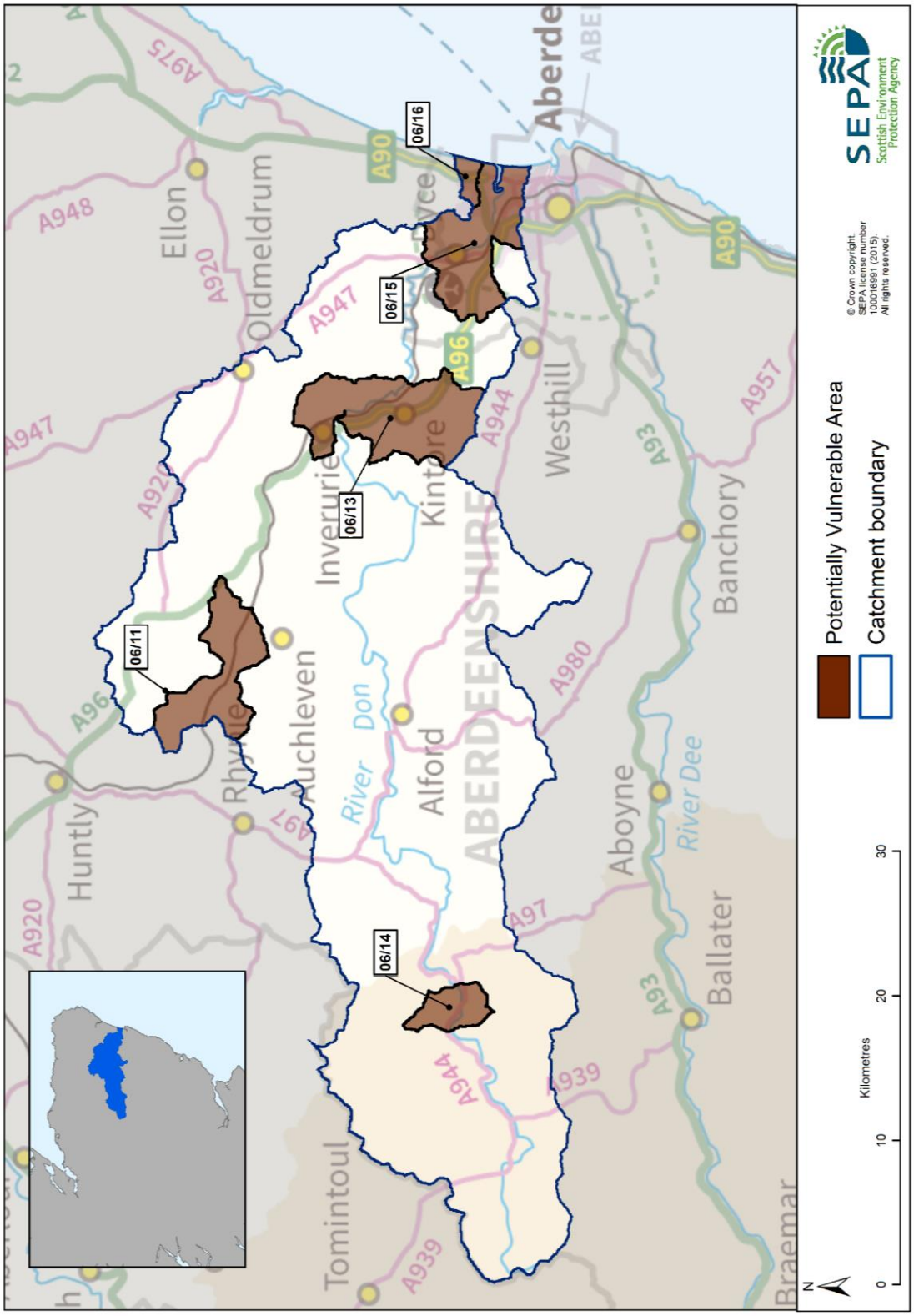


Figure 1: Don river catchment group and Potentially Vulnerable Areas

Main areas at risk

The main urban areas that have greater than 20 residential properties at risk of river flooding are shown in Table 1. Aberdeen City (North) is the area with the greatest number of properties at risk in the River Don catchment group. It includes properties at risk of flooding from smaller, often culverted, watercourses in the north of the city.

	Residential and non-residential properties at risk of river flooding	Annual Average Damages
Aberdeen City North	2,200	£2.1 million
Dyce	270	£2.0 million
Insch	80	£220,000
Inverurie and Port Elphinstone	160	£270,000
Kintore	30	£87,000

Table 1: Main urban areas at risk of river flooding

Economic activity and infrastructure at risk

The Annual Average Damages from river flooding for this catchment area are estimated to be approximately £5.9 million. This accounts for around 21% of the Annual Average Damages for the North East Local Plan District. The damages are distributed as follows:

- 53% non-residential properties (£3.2 million)
- 36% residential properties (£2.1 million)
- 5% emergency services (£330,000)
- 2% roads (£130,000)
- 2% agriculture (£120,000)
- 1% vehicles (£48,000).

Figure 2 shows the location of Annual Average Damages from river flooding across the area. The areas of highest damage are in Aberdeen City (North) and Dyce.

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	30	Includes; healthcare facilities, educational buildings and emergency services.
Utility assets	60	Includes; electricity sub-stations, telecommunications and fuel extraction sites.
Roads (excluding minor roads)	390 locations	Notably the A96, A947 and A944
Railway routes	50 locations	Inverness to Aberdeen
Agricultural land (km^2)	$45km^2$	n/a

Table 2: Infrastructure and agricultural land at risk of river flooding

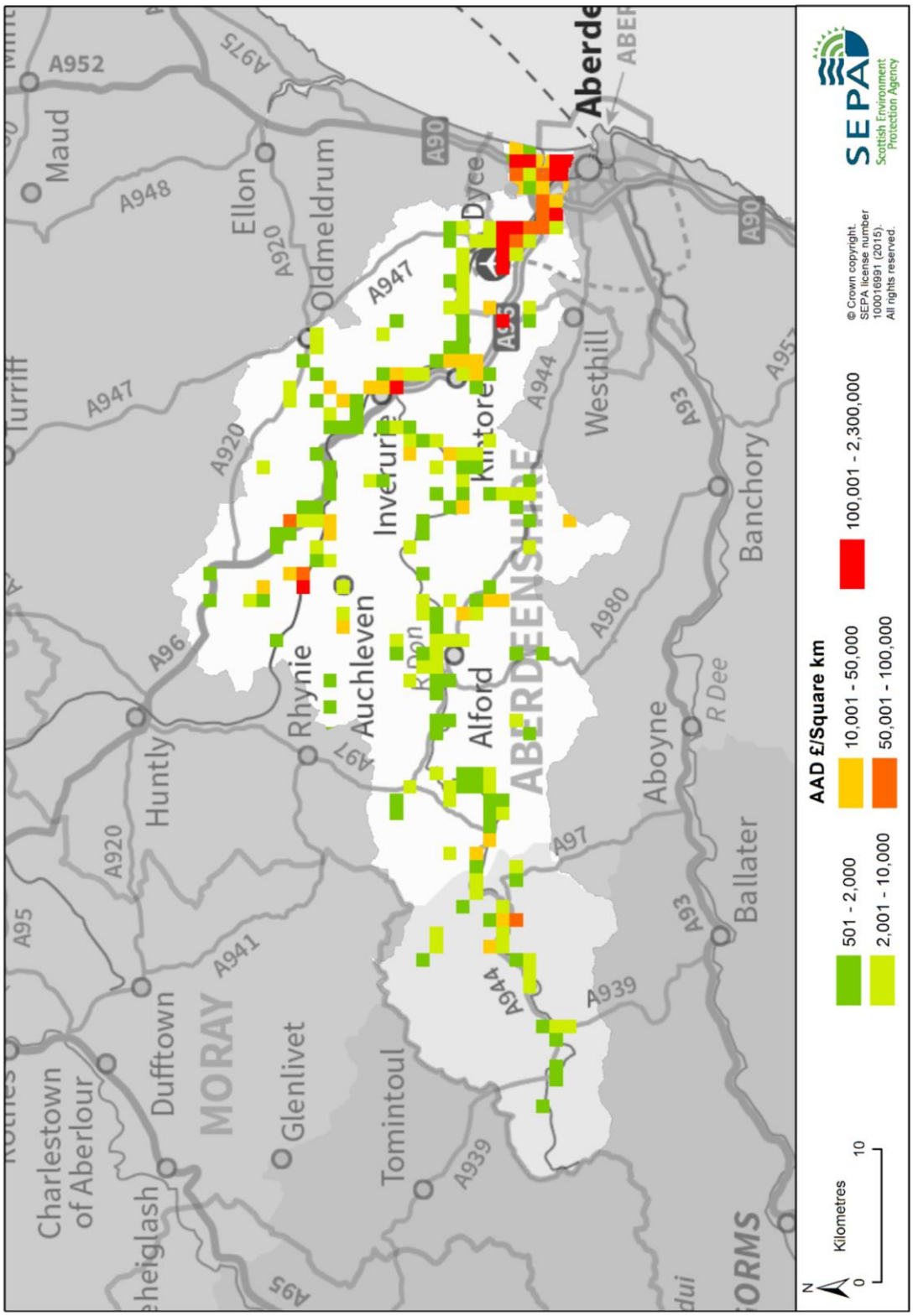


Figure 2: Annual Average Damages from river flooding

Designated environmental and cultural heritage sites at risk

There are approximately 40 cultural heritage sites at risk of river flooding in this catchment, including A-listed buildings, scheduled monuments, gardens and designed landscapes. Less than 1km^2 of designated environmental area is at risk of river flooding.

History of river flooding

The Bridge of Don area experienced flooding in 2000 and 2001, when problems with the drainage system resulted in ponding. This was exacerbated by gullies surcharging due to the high water level in the Glashieburn and properties in Lochside Drive, Jesmond Drive and Brook Crescent were affected. Regular surcharging of the combined sewer in Jesmond Drive has been reported as has flooding at Ellon Road due to debris accumulation blocking the watercourse.

There was significant river flooding in 2002 from the Tuach Burn and Valentine Burn, which resulted in the inundation and evacuation of a nursing home. There have also been localised floods recorded caused by flooding from the River Don, Strath Burn, Loch Burn and Gas Burn. Many of these floods caused localised flooding to properties.

Large parts of north east Scotland were affected by flooding due to Hurricane Bertha in August 2014. The railway line at Huntly was submerged and the road network was affected.

Large parts of Aberdeen were affected by surface water flooding in July 2015. Many manhole covers became dislodged, roads were submerged and Aberdeen airport's terminal building was flooded.

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 that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

River flood warning schemes

There are four flood warning areas for river flooding on the River Don catchment, which are listed in Table 3. These are the areas where SEPA has detailed models set up to predict flooding on specific rivers. The majority of the flood warning areas are associated with the River Don. The locations of the flood warning areas are shown in Figure 3.

Flood warning area	Number of properties within flood warning area	% of properties registered (January 2014)
Aberdeen City (Don)	442	18%
Inverurie	213	29%
Kemnay	48	46%
Kintore	64	33%

Table 3: Flood warning areas

Property level protection

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

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.

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 Don catchment may increase by 24%[1]. This would potentially increase in the number of residential properties at risk of river flooding from approximately 2,600 to 4,200 and the number of non-residential properties from 530 to 680.

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.

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

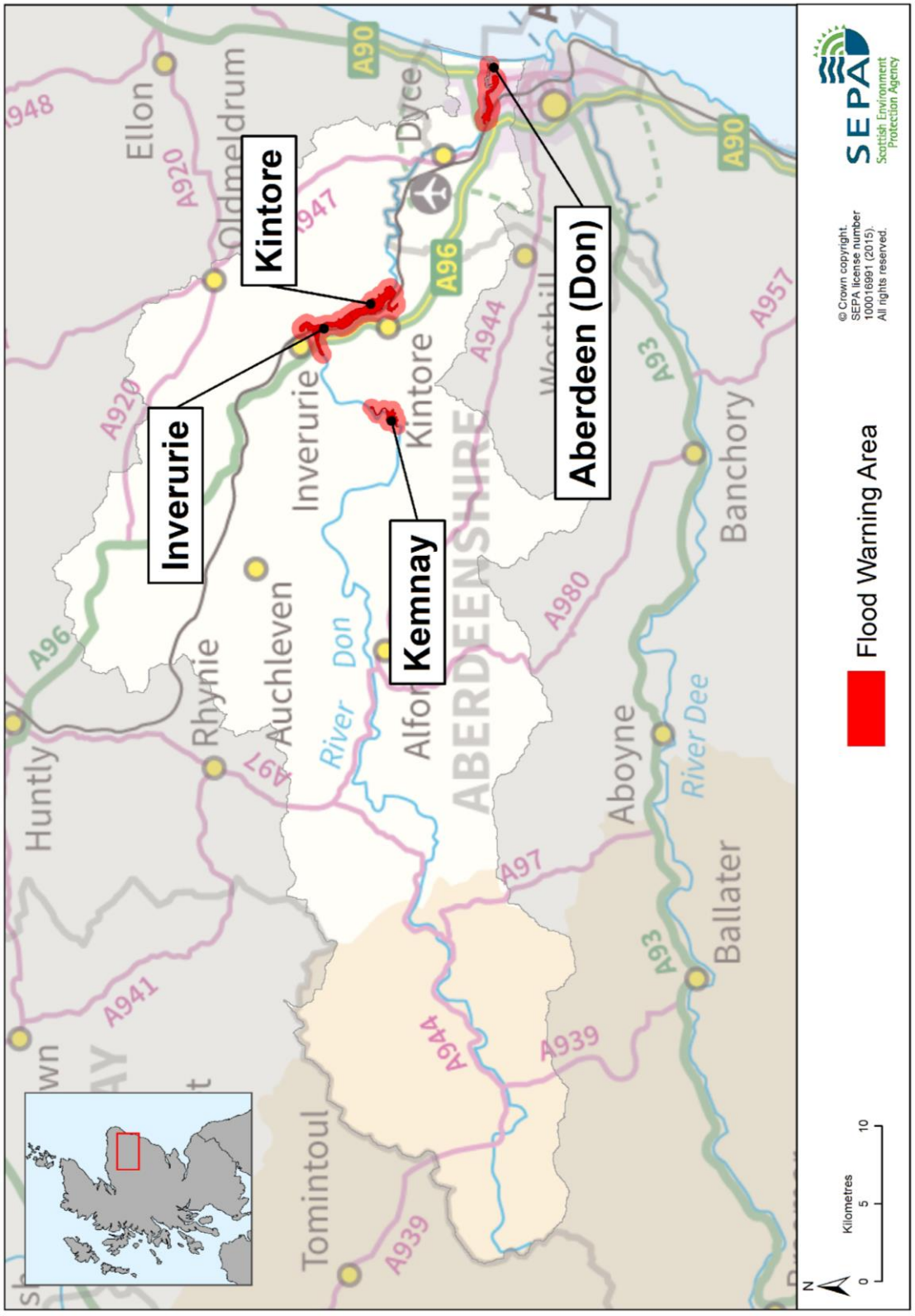


Figure 3: Flood warning areas

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.

Runoff reduction

The main area with potential for runoff reduction in the River Don catchment group is located in the west. Other areas of potential tend to be small and scattered. None of the Potentially Vulnerable Areas show any significant areas of runoff reduction potential either within or immediately upstream. Therefore, it is unlikely that runoff reduction measures would have any significant impact on flood risk on the River Don although runoff reduction may be effective on the smaller tributaries.

Floodplain storage

There are significant areas of potential for floodplain storage within the River Don catchment. All of the Potentially Vulnerable Areas show some areas of high potential for floodplain storage. In particular Inverurie and Kintore (06/13) and Aberdeen City Bridge of Don (06/15) show significant potential and this is more evident when considered in conjunction with Aberdeen City Denmore (06-16). It is likely that floodplain storage could improve flood risk and should be considered further for these Potentially Vulnerable Areas.

Sediment management

The majority of the catchment is either in approximate balance or undergoing moderate erosion. The reaches through Heugh-head (06/14) include areas of deposition and high erosion. There are also long reaches of depositional areas through Inverurie and Kintore (06/13). Therefore, measures to manage sediment in these Potentially Vulnerable Areas could potentially reduce flood risk. Through Insch (06/11) and Aberdeen City Bridge of Don (06/15) the rivers are either in approximate balance or undergoing moderate erosion and consequently there is not as much opportunity to reduce flood risk through sediment management measures in these Potentially Vulnerable Areas.

River flooding
Dee catchment group

Catchment overview

The Dee river catchment group covers the southern part of the North East Local Plan District (Figure 1) and has an area of approximately 2,200km^2. The largest river in the catchment is the River Dee, which flows in a generally eastwards direction to the coast at Aberdeen where it discharges to the sea. The catchment area also includes coastal rivers to the south, including the River Carron and River Cowie in Stonehaven.

The predominant land cover in the upland areas in the west is montane habitat, which covers 23% of the catchment. Coniferous woodland, heather and improved grassland each cover around 15% of the area. Improved grassland, arable and horticulture dominate the east of the catchment. The bulk of the catchment area has an annual rainfall of between 400-900mm with the more mountainous areas in the west receiving between 900mm-1,200mm per annum.

The catchment includes seven Potentially Vulnerable Areas as follows:

- Aberdeen – Westhill (06/17)
- Aberdeen City – Deeside (06/18)
- Peterculter (06/19)
- Aboyne (06/20)
- Banchory and Torphins (06/21)
- Ballater (06/22)
- Stonehaven (06/23).

Flood risk in the catchment

Note: The assessment of river flood risk in Aberdeen City and Peterculter is based on more detailed modelling derived from the Aberdeen integrated catchment study.

There are approximately 8,400 residential properties and 1,800 non-residential properties at risk of river flooding in the River Dee catchment area. Approximately 97% of residential and 91% of non-residential properties at risk of flooding are located within Potentially Vulnerable Areas, with the majority in Aberdeen City Deeside (06/18).

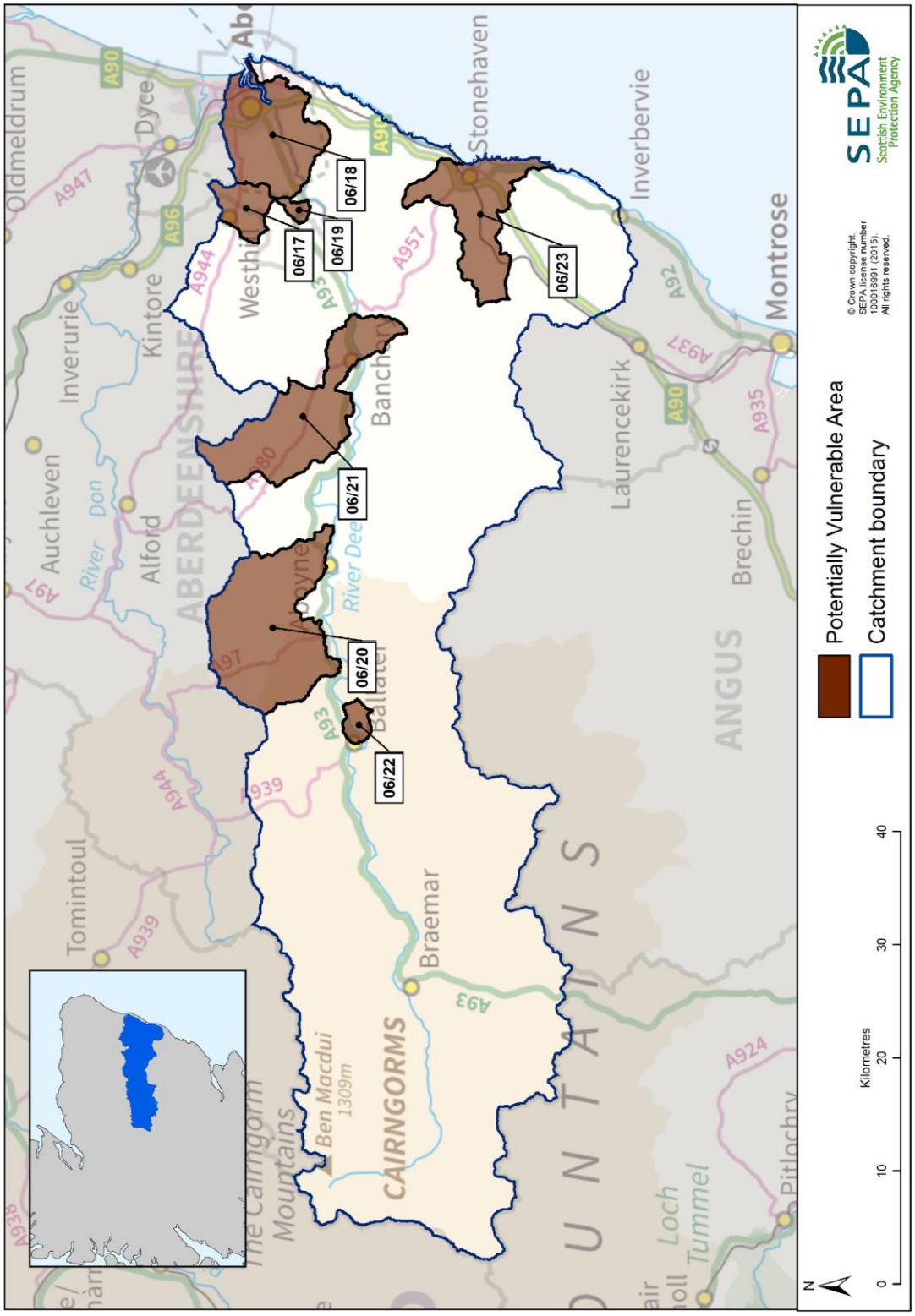


Figure 1: Dee river catchment group and Potentially Vulnerable Areas

Main areas at risk

The main areas that have greater than 20 residential properties at risk of river flooding are shown in Table 1.

	Residential and non-residential properties at risk of river flooding	Annual Average Damages
Aberdeen City - South	8,300	£10.5 million
Stonehaven	630	£620,000
Peterculter	200	£310,000
Ballater	190	£220,000
Aboyne and Tarland	90	£240,000
Banchory and Torphins	20	£60,000

Table 1: Main areas at risk of river flooding

Economic activity and infrastructure at risk

The Annual Average Damages from river flooding in this catchment area are approximately £13.5 million. This accounts for 46% of the Annual Average Damages for the North East Local Plan District. The damages are distributed as follows:

- 57% residential properties (£7.7 million)
- 33% non-residential properties (£4.5 million)
- 5% emergency services (£670,000)
- 2% agriculture (£330,000)
- 2% vehicles (£210,000)
- 1% roads (£110,000).

Figure 2 shows the location of Annual Average Damages from river flooding. The areas of highest damage are in Aberdeen City.

There are also significant damages shown in Stonehaven, Peterculter, Ballater, Aboyne and Tarland.

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

	Number at risk	Further detail
Community facilities	10	Includes; healthcare facilities, educational buildings and emergency services.
Utility assets	40	Includes; electricity sub-stations, telecommunications and fuel extraction sites.
Roads (excluding minor roads)	550 locations	Notably the A93
Railway routes	30 locations	Inverness to Aberdeen Aberdeen to Dundee
Agricultural land (km^2)	$71km^2$	n/a

Table 2: Infrastructure and agricultural land at risk of river flooding

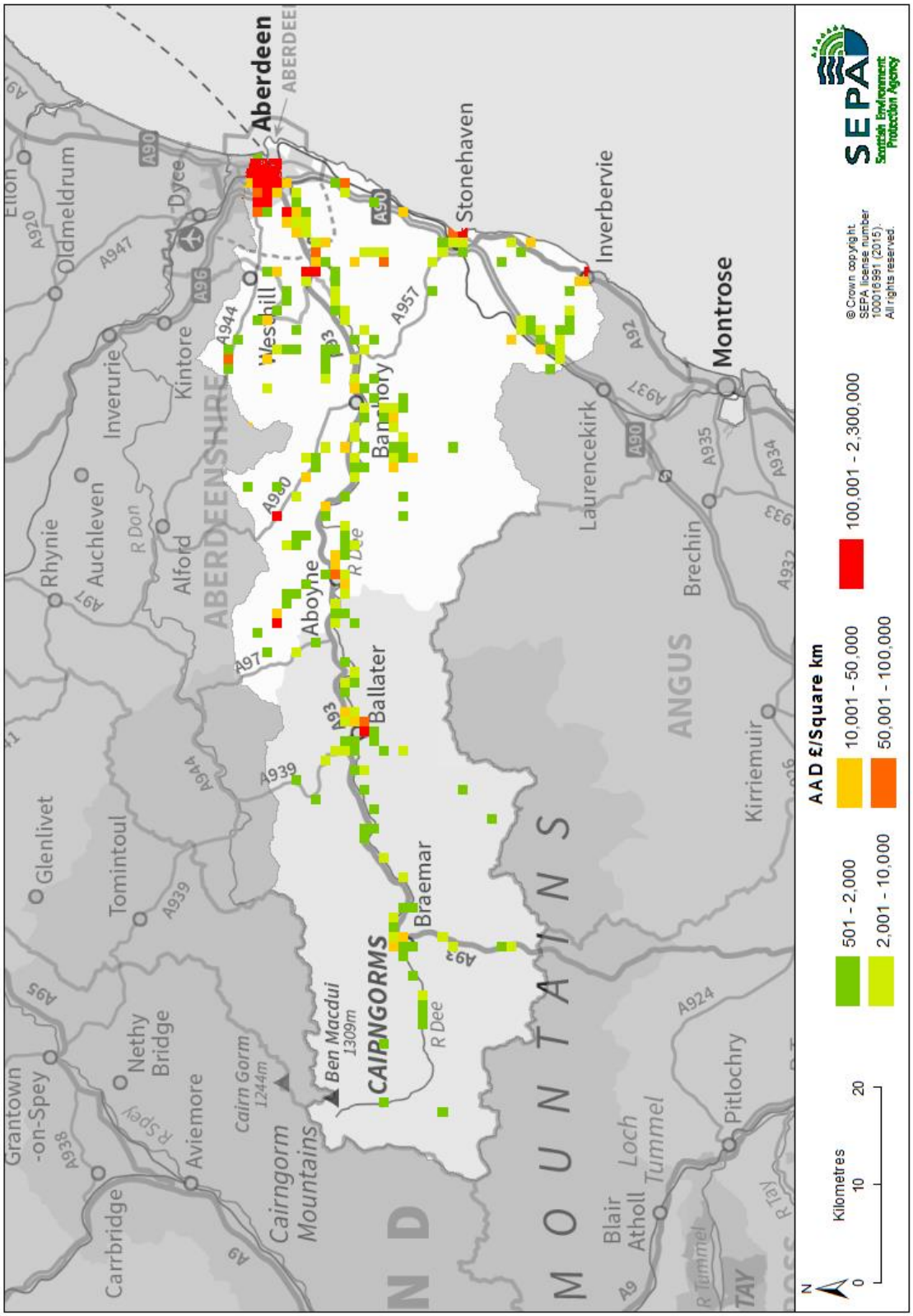


Figure 2: Annual Average Damages from river flooding

Designated environmental and cultural heritage sites at risk

There are 63 cultural heritage sites at risk of river flooding, including A-listed buildings, scheduled monuments, gardens and designed landscapes.

There are 63km^2 of designated environmental sites at risk of flooding. These include Sites of Special Scientific Interest, Special Protection Areas and Special Areas of Conservation, including the River Dee Special Area of Conservation (SAC).

History of flooding

Flooding in Aberdeen City is a complex issue due to the interactions between culverted watercourses, sewers, rivers and heavy rainfall. Floods are often due to the interaction of different sources of flooding, for example surface water flooding due to high river levels preventing the sewers and drainage systems discharging.

Historic flood events on the River Dee have been reported in 1789, 1790, 1829, 1873, 1876, 1881, 1882, 1892, 1894, 1909, 1920, 1922, 1926, 1927, 1928, 1929, 1938 and 1946. The Den Burn is reported to have flooded in 1869, 1872, and 1874.

The Cults Burn has caused flooding at Inchgarth Road due to blockages on the watercourse backing it up from the River Dee.

Floods in 2009 and December 2012 from the River Carron resulted in many properties in Stonehaven being evacuated. Extensive damage was caused to residential and non-residential properties.

The Tarland Burn has caused flooding in Tarland and Aboyne, most notably in 2002.

The River Dee flooded in August 2014, destroying a bridge at Mar Lodge Estate. The A93 between Braemar and Ballater was closed and several smaller roads were also affected in Aberdeenshire. The caravan park in Ballater was evacuated after the River Dee burst its banks.

Large parts of Aberdeen were affected by flooding in July 2015, when heavy rainfall caused the drainage system to overflow, dislodging manhole covers. Many roads were affected by flooding, including Market Street, Guild Street and Holburn Street. Cars on Polmuir Road started to float due to the depth of the water. A nursery had to be evacuated due to flooding in its basement.

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 that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

River flood warning schemes

There are six flood warning areas for river flooding in the Dee (Aberdeenshire) river catchment, listed in Table 3. These are the areas where SEPA has detailed models set up to predict flooding on specific rivers. The locations of the flood warning areas are shown in Figure 3.

Flood warning area	Number of properties within flood warning area	% of properties registered (January 2014)
Aberdeen (Dee)	45	13%
Aboyne	92	22%
Ballater	218	35%
Banchory	49	29%
Maryculter	10	100%
Stonehaven	878	36%

Table 3: Flood warning areas

Property level protection

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

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.

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 Dee catchment by 2080 may increase by 24%[1]. This would potentially increase in the number of residential properties at risk of river flooding from approximately 8,400 to 11,000 and the number of non-residential properties from 1,800 to 2,100.

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.

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

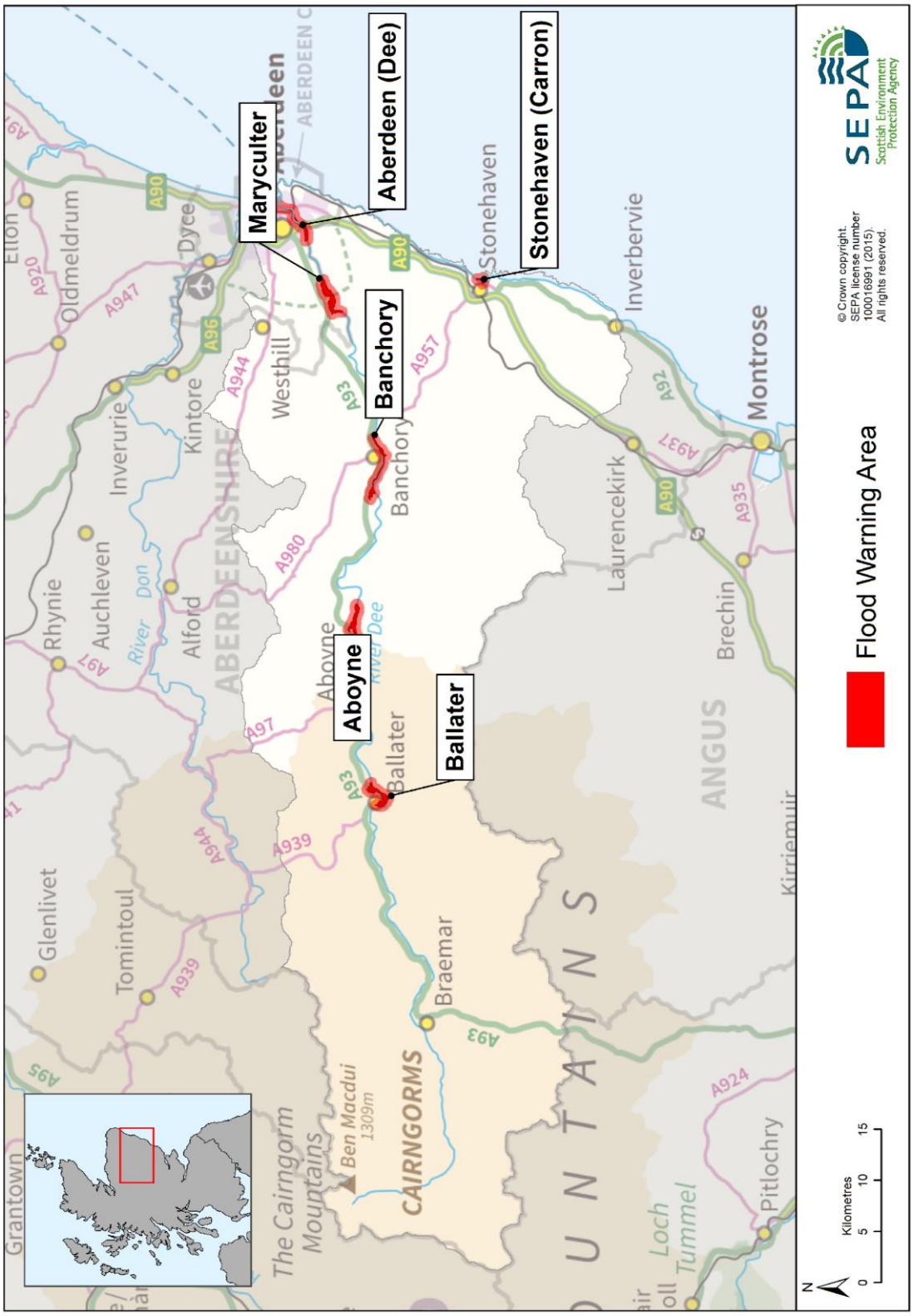


Figure 3: Flood warning areas

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.

Runoff reduction

There are significant areas of potential for runoff reduction in the south and west of the Dee catchment. However, these are a significant distance from the Potentially Vulnerable Areas. None of the Potentially Vulnerable Areas themselves show any significant areas of runoff reduction potential either within or immediately upstream of their boundaries. Therefore, it is unlikely that runoff reduction measures would have any significant impact on flood risk in the Dee catchment area. Runoff reduction may however be effective in the case of localised flooding.

Floodplain storage

There are significant areas of high potential for floodplain storage within the Dee catchment area. All of the Potentially Vulnerable Areas show some areas of high potential for floodplain storage.

Sediment management

The majority of the river systems in the Dee catchment area have substantial reaches that are either in approximate balance or moderately eroding. However, there are also significant lengths of river that are predominantly highly eroding or depositing, which can contribute to flood risk. The Potentially Vulnerable Areas showing the largest amount of erosion or deposition are Aberdeen – Westhill (06/17), Aberdeen City - Deeside (06/18), Aboyne (06/20), and Banchory and Torphins (06/21).

3.3 Coastal flooding

North East Local Plan District

This chapter provides supplementary information on coastal flooding at a coastal area level. It provides an overview of the natural characteristics of the coast, a summary of flood risk within the coastal area and a brief history of flooding. It further explains the potential climate change effects on future flood risk and summarises the potential for natural flood management.

Information about the objectives and actions to manage flood risk are provided in the relevant Potentially Vulnerable Area chapters in Section 2.

In the North East Local Plan District, coastal flooding is reported in three coastal areas (Figure 1).

Figure 1: Coastal areas within the North East Local Plan District

Coastal flooding
Inverbervie to Girdle Ness

Coastal overview

The Inverbervie to Girdle Ness coastal area covers approximately 55km of coastline from Inverbervie in the south, to Girdle Ness, Aberdeen in the north (Figure 1). There are several towns and villages located close to the coastline including the southern areas of Aberdeen and the towns of Portlethen, Newtonhill, Stonehaven and Inverbervie. The coastal area contains two local authorities; Aberdeen City Council and Aberdeenshire Council.

The coastal area is characterised by cliffs with numerous headlands enclosing small bays. There are few beaches along this section of coast and these tend to be pocket or bay head type beaches bounded by headlands or rock abrasion platforms. The nearshore bathymetry is variable and the coastline indented, therefore the wave conditions at the coastline are highly variable.

The Bervie Water in Inverbervie and the Carron and Cowie rivers in Stonehaven are the main rivers which outfall to the sea along this stretch of coastline.

There is one Potentially Vulnerable Area in this coastal area; Stonehaven (06/23).

Flood risk in the coastal area

Main areas at risk

Within the Inverbervie to Girdle Ness coastal area, there are approximately 50 residential properties and 20 non-residential properties at risk of coastal flooding. All of the residential properties and an estimated 91% of the non-residential properties at risk of coastal flooding are located within the Stonehaven Potentially Vulnerable Area.

Economic activity and infrastructure at risk

The Annual Average Damages from coastal flooding in the Inverbervie to Girdle Ness coastal area are approximately £40,000. The Annual Average Damages are distributed as follows:

- 70% residential properties (£28,000)
- 16% non-residential properties (£6,300)
- 8% roads (£3,200)
- 4% emergency services (£1,600)
- 1% vehicles (£400)
- <1% agriculture (£120).

Flooding from wave overtopping is not fully represented in the general assessment of flood risk and the Annual Average Damages from coastal flooding are known to be significantly underestimated. The number of properties at risk of flooding may also be underestimated. In addition some properties have suffered from structural damage due to wave overtopping even if the properties themselves have not been flooded internally.

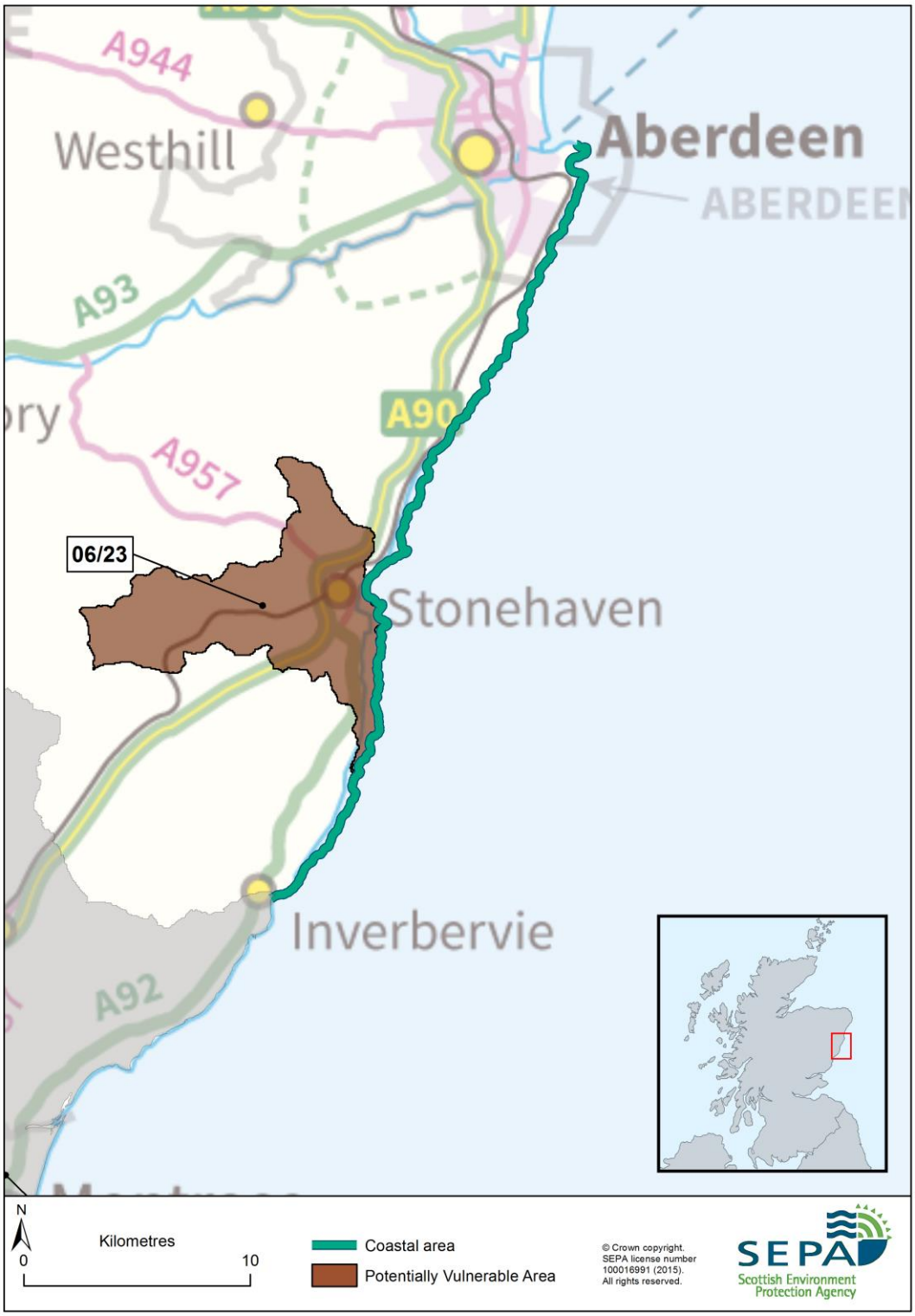


Figure 1: Inverbervie to Girdle Ness coastal area and Potentially Vulnerable Areas

Figure 2 shows the location of Annual Average Damages from coastal flooding across the area. Most of the economic damages from coastal flooding are attributed to flooding in Stonehaven. The main road affected by coastal flooding is the A957, but a number of minor roads are also impacted.

Table 1 shows further information about infrastructure and agricultural land at risk of coastal flooding.

	Number at risk	Further detail
Community facilities	0	n/a
Utility assets	0	n/a
Roads (excluding minor roads)	3	Including A957
Railway routes	0	n/a
Airports	0	n/a
Agricultural land (km²)	0.04	n/a

Table 1: Infrastructure and agricultural land at risk of coastal flooding

Designated environmental and cultural heritage sites at risk

There are five designated cultural heritage sites at risk of coastal flooding in this area. Two are scheduled monuments and three are listed buildings.

Less than 1km^2 of environmental designated area is at risk of coastal flooding including Special Protection Areas and Sites of Special Scientific Interest.

History of coastal flooding

In December 2012 Stonehaven was affected by significant coastal flooding. This was caused by high tide levels combined with strong onshore easterly winds which generated large waves. There was extensive damage to properties, local amenities, vehicles and seafront businesses. Two sheltered housing complexes on David Street had to be evacuated and some businesses were closed down as a result of the damages incurred. The town's only supermarket was also affected. Wave overtopping is a regular occurrence which causes flooding to seafront businesses at Cowie. Less severe flooding and damage to structures occurred in October 2014 as a direct result of wave overtopping.

Further detail about the history of flooding in this area is available in the relevant Potentially Vulnerable Area chapter in section 2 of this document.

Figure 2: Annual Average Damages from coastal 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.

Existing actions that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

Property level protection

Each local authority has its own incentives or subsidies to help property owners with property level protection. In this coastal area:

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.

Climate change and future flood risk

UK Climate Projections (UKCP09) predicts that climate change may increase sea levels. The magnitude of sea level rise varies around the coastline.

For the UKCP09 high emissions scenario, the predicted average sea level increase for the Inverbervie to Girdle Ness coastline is 0.5m by 2080. This may increase the number of residential properties at risk of coastal flooding from approximately 50 to 130 and for non-residential properties from 20 to 60. Coastal flood modelling by SEPA has not taken into account the impacts of a future climate on wave overtopping or storminess, which could increase the number of properties affected by coastal flooding.

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.

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 wave attenuation and estuarine surge attenuation. 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.

Estuarine surge

The assessment shows that there are no opportunities for estuarine surge attenuation in the Inverbervie to Girdle Ness coastal area.

Wave energy

There are several areas in this coastal area which have potential for wave energy dissipation. The main area of potential is around Stonehaven. There are also smaller areas of potential at Nigg Bay near Aberdeen, Braidon Bay and Bervie Bay, Crawton, Doonie Point, and Cove Bay.

Coastal flooding
Girdle Ness to Cairnbulg Point

Coastal overview

The Girdle Ness to Cairnbulg Point coastal area covers approximately 80km of coastline from Girdle Ness, Aberdeen in the south to the eastern end of the Moray Firth in the north (Figure 1). There are several towns and villages located close to the coastline including Aberdeen, Balmedie, Cruden Bay, Boddam, Peterhead and Inverallochy. The coastal area contains two local authorities; Aberdeen City Council and Aberdeenshire Council.

The coastal area is characterised by wide sandy bays such as at Balmedie and Cruden Bay and rocky cliffs with small bays enclosed by headlands. The nearshore bathymetry is variable and the coastline indented, therefore the wave conditions at the coastline are highly variable.

There are several large rivers which outfall along this stretch of coastline including the River Dee and River Don in Aberdeen, the River Ythan at Newburgh and the River Ugie at Peterhead.

There are five Potentially Vulnerable Areas:

- Peterhead (06/08)
- Ellon (06/12)
- Aberdeen City – Bridge of Don (06/15)
- Aberdeen City – Denmore (06/16)
- Aberdeen City – Deeside (06/18).

Flood risk in the coastal area

Main areas at risk

Within the Girdle Ness to Cairnbulg Point coastal area there are fewer than ten residential properties and approximately 20 non-residential properties at risk of coastal flooding. None of the residential properties and an estimated 83% of the non-residential properties are located within Potentially Vulnerable Areas.

The majority of non-residential properties at risk are in Peterhead and Aberdeen City. The residential properties at risk are all located in the Newburgh area where the River Ythan flows into the sea. Although no residential properties were identified as being at risk of coastal flooding in any of the Potentially Vulnerable Areas it is evident from historical events that a number of residential properties in Potentially Vulnerable Areas are affected by overtopping waves including in Peterhead and at Footdee in Aberdeen.

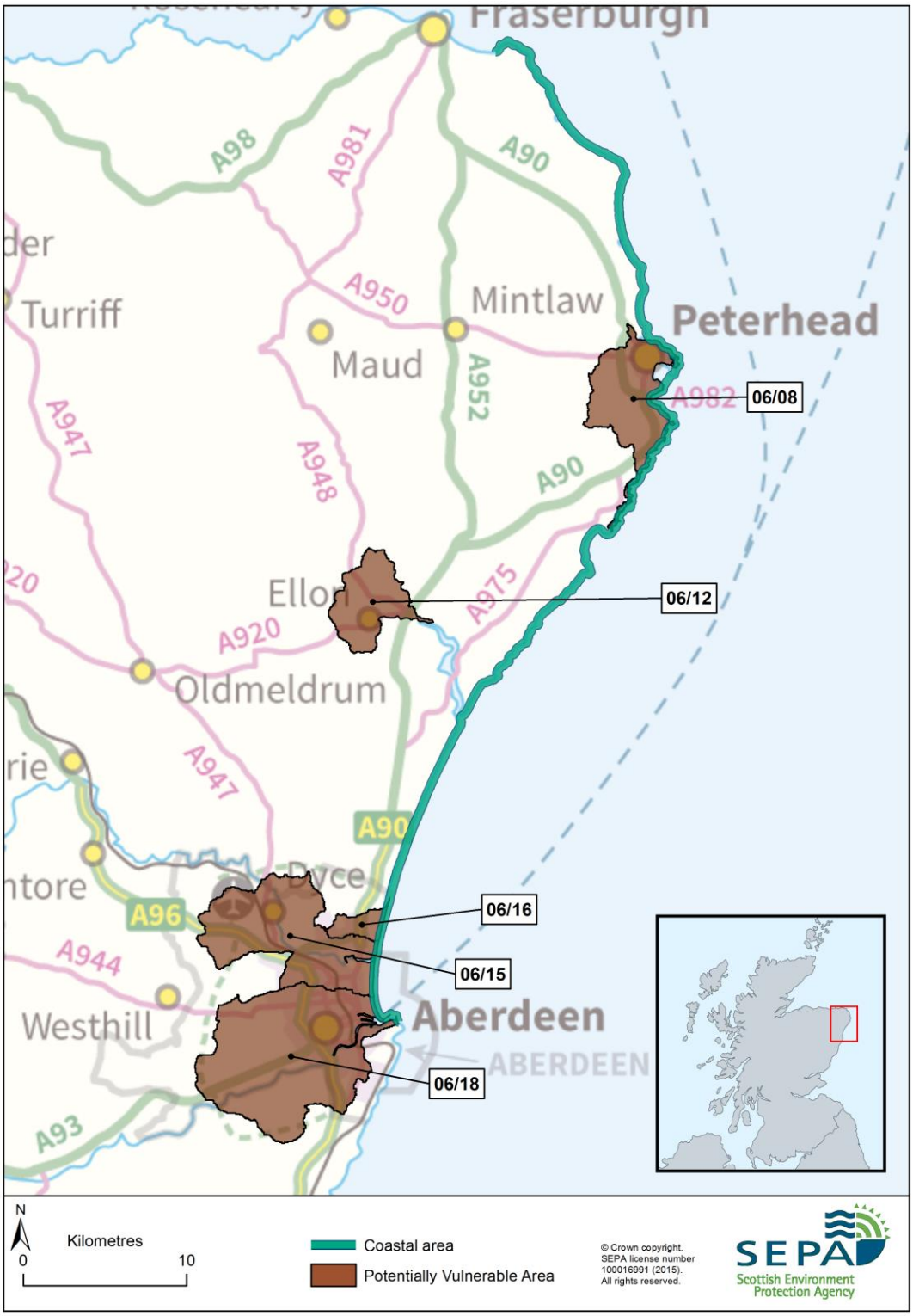


Figure 1: Girdle Ness to Cairnbulg Point coastal area and Potentially Vulnerable Areas

Economic activity and infrastructure at risk

The Annual Average Damages from coastal flooding in the Girdle Ness to Cairnbulg Point coastal area are estimated to be £160,000. The Annual Average Damages are distributed as follows:

- 79% non-residential properties (£130,000)
- 13% roads (£22,000)
- 5% emergency services (£7,700)
- 1% residential properties (£2,600)
- 1% agriculture (£2,000).

Figure 2 shows the location of Annual Average Damages from coastal flooding across the area.

Table 1 shows further information about infrastructure and agricultural land at risk of coastal flooding.

	Number at risk	Further detail
Community facilities	0	n/a
Utility assets	<10	Electricity sub-stations
Roads (excluding minor roads)	30 sections	Including A90, A920, A948, A975 and A982
Railway routes	5 locations	Aberdeen to Inverness
Agricultural land (km^2)	1.2	n/a

Table 1: Infrastructure and agricultural land at risk of coastal flooding

Designated environmental and cultural heritage sites at risk

There are four cultural heritage sites at risk of coastal flooding in this area including garden and designed landscapes, scheduled monuments and listed buildings.

Approximately 10km^2 of environmentally designated area is at risk of coastal flooding including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Sites of Special Scientific Interest (SSSI). The sites affected include the River Dee, Bullers of Buchan Coast and Buchan Ness to Collieston Coast.

History of flooding

The North Sea flood of 1953 resulted in flooding along the east coast, notably in Peterhead where cottages were destroyed. There have also been a number of localised floods, including storm surges in 1921 and 1949, which affected Aberdeen City. In December 2012 there were a number of houses evacuated and some were flooded in Peterhead with significant damage to the harbour-side businesses from wave overtopping during a coastal storm.

Further detail about the history of flooding in this area is available in the relevant Potentially Vulnerable Area chapter in section 2 of this document.

Figure 2: Annual Average Damages from coastal 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.

Existing actions that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

Flood protection schemes

A coastal protection scheme was completed in Aberdeen in 2006. This scheme comprises beach recharge and rock groynes to reduce the risk of failure of the existing seawalls, which provide erosion and flood protection to Aberdeen City.

Property level protection

Each local authority has its own incentives or subsidies to help property owners with property level protection. In this coastal area:

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.

Climate change and future flood risk

UK Climate Projections (UKCP09) predicts that climate change may increase sea levels. The magnitude of sea level rise varies around the coastline.

For the UKCP09 high emissions scenario, the predicted average increase for the Girdle Ness to Cairnbulg Point coastline is 0.5m by 2080. This may increase the number of residential properties at risk of coastal flooding from fewer than 10 to 60 and the number of non-residential from approximately 20 to 30. Coastal flood modelling by SEPA has not taken into account the impacts of a future climate on wave overtopping or storminess, which could increase the number of properties affected by coastal flooding.

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.

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 wave attenuation and estuarine surge attenuation. 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.

Estuarine surge

The assessment shows there is limited opportunity for estuarine surge attenuation in the Girdle Ness to Cairnbulg Point coastal area. The areas of potential are relatively small and not continuous.

Along the River Don in Aberdeen there is a limited amount of potential for estuarine surge attenuation located between the A956 and Seaton Park. There are also some small areas of potential on the River Ythan, mainly in the vicinity of Newburgh downstream of the A975 road crossing and small isolated sections of potential for estuarine surge attenuation close to Loch of Strathbeg and South Inch (south of St Combs).

Wave energy

There is potential for wave energy dissipation along most of the coastline between Girdle Ness and Cairnbulg Point. There are areas of potential along the Aberdeen City frontage (where wave energy dissipation work in the form of beach replenishment has been carried out previously), in the centre of Newburgh Bay, in the Bay of Cruden, along the Peterhead frontage and between Rattray Head and Inverallochy.

Coastal flooding
Cairnbulg Point to Portgordon

Coastal overview

The Cairnbulg Point to Portgordon coastal area covers approximately 88km of mainly north facing coastline along the outer Moray Firth (Figure 1). There are several towns and villages close to the coastline including Fraserburgh, Rosehearty, Macduff, Banff, Portsoy, Portknockie, Findochty, and Buckie. The coastal area contains two local authorities; Moray Council and Aberdeenshire Council.

The coastal area is characterised by a sequence of small bays between rocky headlands and cliffs. There are a few relatively short sections of sand and shingle beaches along the coastline for example to the east of Fraserburgh. The nearshore bathymetry is variable and the coastline indented, therefore the wave conditions at the coastline are highly variable.

The River Deveron, which outfalls at Banff Bay, is the only major river which discharges to the sea along this section of coast. However there are several smaller rivers and burns which outfall to the Moray Firth.

There are five Potentially Vulnerable Areas:

- Portgordon (06/01)
- Portsoy (06/02)
- Banff (06/03)
- Macduff (06/04)
- Fraserburgh and Rosehearty (06/05).

Flood risk in the coastal area

Main areas at risk

Within the Cairnbulg Point to Portgordon coastal area there are approximately 30 non-residential properties at risk of coastal flooding. An estimated 56% of these are located within Potentially Vulnerable Areas, with the majority located in Fraserburgh and Rosehearty (06/05). Although there are no residential properties identified to be at risk of flooding, historically properties have been subject to flooding due to wave overtopping.

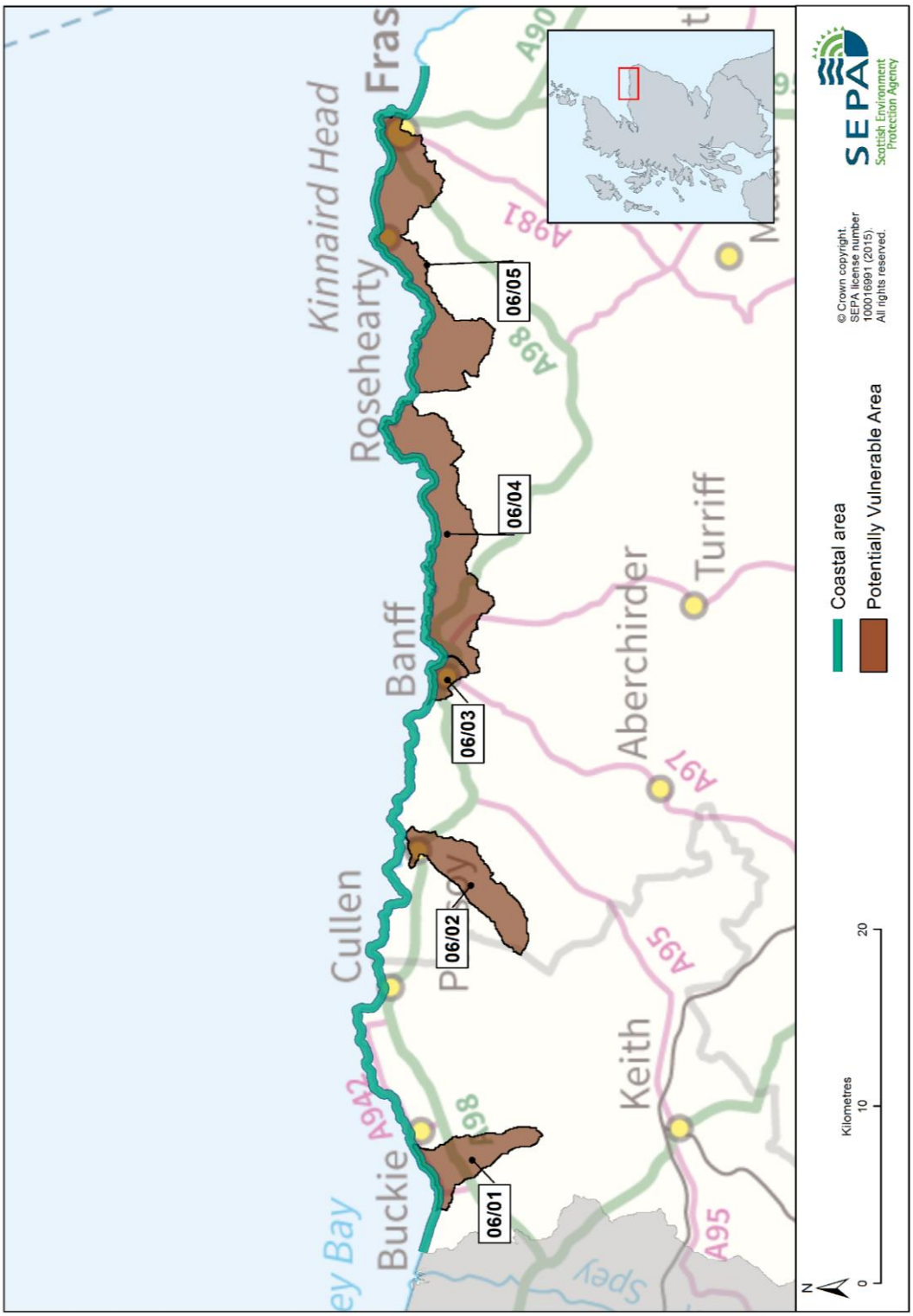


Figure 1: Cairnbulg Point to Portgordon coastal area and Potentially Vulnerable Areas

Economic activity and infrastructure at risk

The Annual Average Damages from coastal flooding in the Cairnbulg to Portgordon coastal area are estimated to be approximately £66,000. The Annual Average Damages are distributed as follows:

- 74% non-residential properties (£49,000)
- 10% residential properties (£6,400)
- 7% emergency services (£4,800)
- 7% roads (£4,700)
- 1% vehicles (£690)
- 1% agriculture (£560).

Flooding from wave overtopping is not fully represented in the general assessment of flood risk. The number of properties at risk of flooding and the Annual Average Damages from coastal flooding may be underestimated.

Figure 2 shows the location of Annual Average Damages from coastal flooding across the area.

Table 1 shows further information about infrastructure and agricultural land at risk of coastal flooding.

	Number at risk	Further detail
Community facilities	0	n/a
Utility assets	0	n/a
Roads (excluding minor roads)	10 sections	Including A98 and the B9033
Railway routes	0	n/a
Agricultural land (km^2)	0.4	n/a

Table 1: Infrastructure and agricultural land at risk of coastal flooding

Designated environmental and cultural heritage sites at risk

There are 14 cultural heritage sites at risk of coastal flooding in this area including garden and designed landscapes, scheduled monuments and listed buildings.

Approximately 2km^2 of environmental designated area is at risk of coastal flooding including Special Protection Areas and Sites of Special Scientific Interest. The sites affected include Troup Head, Pennan Head, and Lion's Head, Gamrie, together with Pennan Coast, Whitehills to Melrose Coast, Rosehearty to Fraserburgh Coast, Spey Bay and Cullen to Stake Ness Coast.

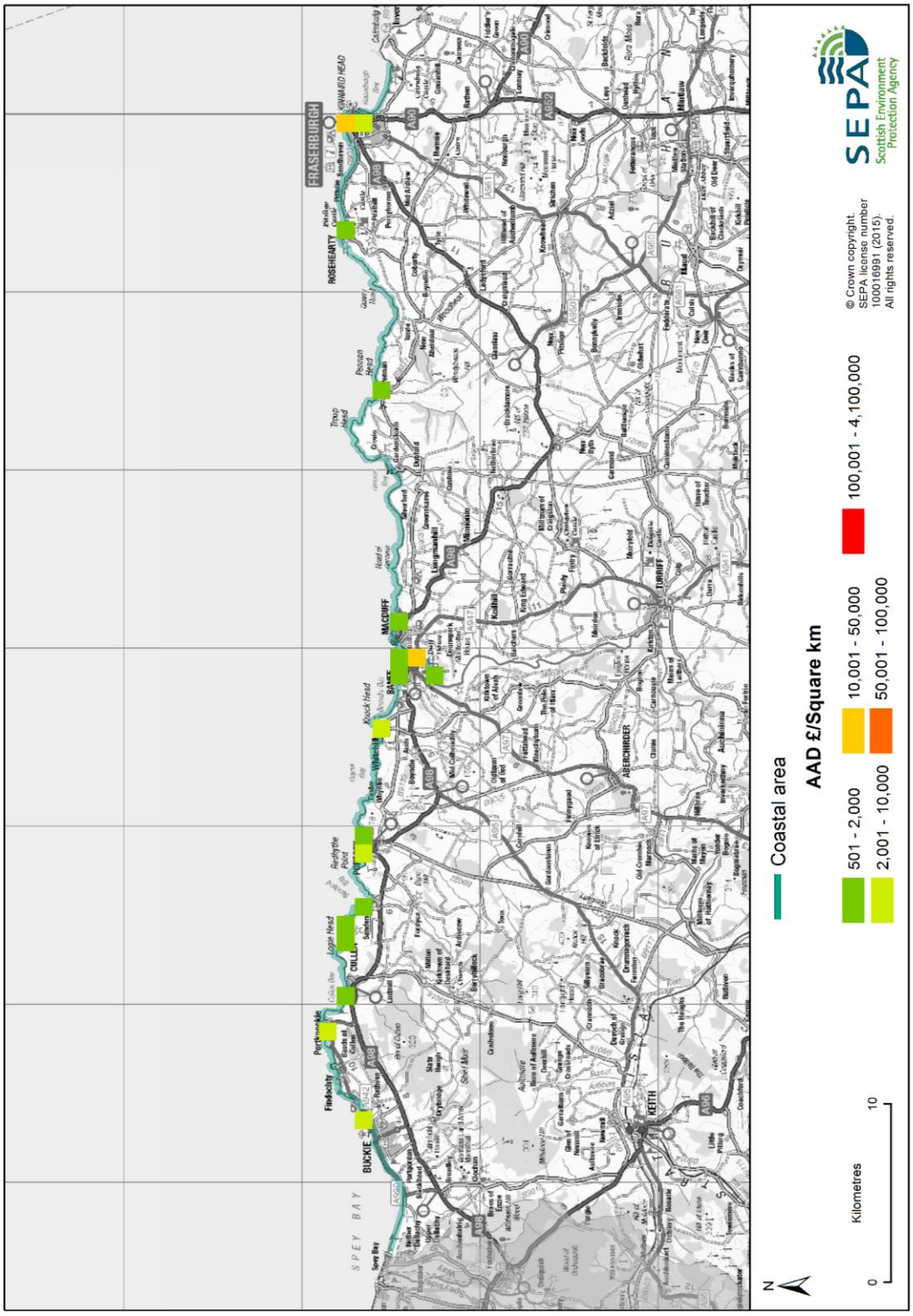


Figure 2: Annual Average Damages from coastal flooding

History of flooding

The North Sea flood of 1953 had a significant impact on this stretch of coastline, with properties and seawalls destroyed in Buckie, Portsoy, Crovie, Banff and Rosehearty. The village of Crovie was effectively abandoned after the event. In Macduff, properties were damaged and the cliff road destroyed in 1957.

There have been numerous smaller coastal floods recorded right across this coastal area impacting locally on property and infrastructure, for example in Portgordon where properties are flooded on a frequent basis.

Further detail about the history of flooding in this area is available in the relevant Potentially Vulnerable Area chapter in section 2 of this document.

Managing coastal 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 that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

Coastal flood warning schemes

This coastal area benefits from the Moray Firth Coastal Flood Warning Scheme. There are four coastal flood warning areas, namely Portgordon to Cullen, Portsoy to Macduff, Gardenstown to Pennan and Roseharty to Fraserburgh (Figure 3).

Property level protection

Each local authority has its own incentives or subsidies to help property owners with property level protection. In this coastal area:

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- The Moray Council does not provide flood guards to private property owners. However, the flood team provides advice on how property owners can protect their own property.

Figure 3: Flood warning areas

Climate change and future flood risk

UK Climate Projections (UKCP09) predicts that climate change may increase sea levels. The magnitude of sea level rise varies around the coastline.

For the UKCP09 high emissions scenario, the predicted average sea level increase for the Cairnbulg Point to Portgordon coastline is 0.5m by 2080. This may increase the number of residential properties at risk of coastal flooding to approximately 390 and the number of non-residential from 30 to approximately 280. Coastal flood modelling by SEPA has not taken into account the impacts of a future climate on wave overtopping or storminess, which could increase the number of people affected by coastal flooding.

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.

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 wave attenuation and estuarine surge attenuation. 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.

Estuarine surge

There is limited opportunity for estuarine surge attenuation in the Cairnbulg Point to Portgordon Coastal Area. The only area which has any potential is in Banff Bay where potential attenuation occurs between Macduff and Banff around the perimeter of Banff Bay extending up the River Deveron to Banff Bridge.

Wave energy

There are several areas along this section of coastline which have potential for wave energy dissipation. There are significant areas of potential for dissipation around the urban areas of Fraserburgh, Banff and Buckie with several of the bays also showing potential including Cullen Bay, Sandend Bay, Gamrie Bay and Fraserburgh Bay.

3.4 Surface water flooding

North East 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 North East Local Plan District, there are approximately 2,400 residential properties and 1,700 non-residential properties at risk of surface water flooding. 80% of the residential properties at risk of surface water flooding in the Local Plan District are located within Potentially Vulnerable Areas.

Main areas at risk

The areas which have greater than 50 properties at risk of surface water flooding are shown in Table 1. Table 1 also shows the estimated economic impact of surface water flooding in each area expressed as Annual Average Damages.

	Residential and non-residential properties at risk of surface water flooding	Annual Average Damages
Aberdeen City	1,900	£2.2 million
Stonehaven	260	£320,000
Inverurie and Kintore	210	£200,000
Fraserburgh and Rosehearty	130	£49,000
Dyce	120	£570,000
Westhill	100	£89,000
Peterhead	80	£280,000
Huntly	80	£73,000

Table 1: Main areas at risk of surface water flooding

Economic activity and infrastructure at risk

The Annual Average Damages in the North East Local Plan District from surface water flooding are estimated to be £5.2 million. This accounts for 18% of the total flood damages for the Local Plan District. The damages are distributed as follows:

- 54% non-residential properties (£2.8 million)
- 36% residential properties (£1.9 million)
- 5% emergency services (£270,000)
- 4% roads (£220,000)
- 1% vehicles (£46,000).

Figure 1 shows the location of Annual Average Damages from surface water flooding across the Local Plan District. The area with the largest Annual Average Damages is Aberdeen City.

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	20	Includes; educational buildings, healthcare facilities and emergency services.
Utility assets	190	Includes; electricity substations, fuel extraction sites and telephone exchanges.
Roads (excluding minor roads)	3,800 locations	Notably parts of the A9
Railway routes	300 locations	Aberdeen to Inverness, Aberdeen to Dundee.
Airports	1	Aberdeen (Dyce) airport.

Table 2: Infrastructure at risk of surface water flooding

Designated environmental and cultural heritage sites at risk

Within the North East Local Plan District it is estimated that approximately 180 cultural heritage sites are at risk of surface water flooding. The sites at risk include scheduled monuments, designed gardens and landscapes, battlefields and listed buildings.

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

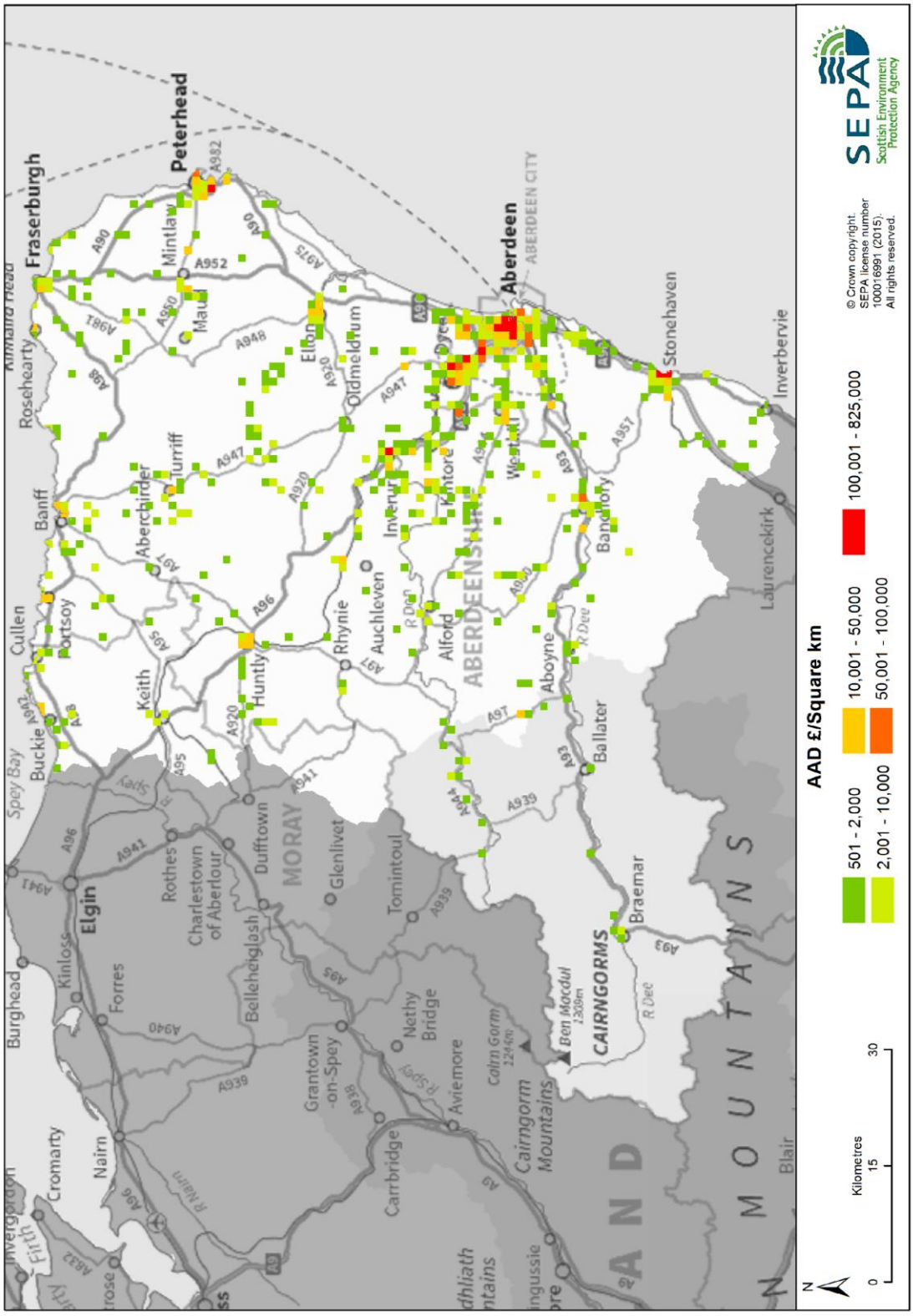


Figure 1: Annual Average Damages from surface water flooding

History of surface water flooding

In 1940 flooding occurred across low lying areas of Aberdeen, resulting in the flooding of around 50 properties. In 2012 there were several floods, including sewer flooding in the Merchant Quarter, Aberdeen and Fountainhall / Queens Cross area. The Middleton Park area of Aberdeen suffers from a high water table, which regularly causes basements there to flood. More recently in July 2015 there was extensive flooding across Aberdeen including in the Merchant Quarter. The airport terminal was also affected.

Outwith Aberdeen City, examples of localised events include flooding of residential properties in 2004 and in 2009 affecting properties in Fordyce and Aboyne. Historically, properties in Boddam, Rosehearty and Peterhead have also been affected by 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.

Existing actions that are in place to manage flood risk and that are in addition to the information presented in Section 2 are described below.

Property level protection

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

- Aberdeenshire Council provides a small range of flood protection products for individual property protection which are available for all types of flooding at cost price, with free delivery across Aberdeenshire.
- Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.
- The Moray Council does not provide flood guards to private property owners. However, the flood team provides advice on how property owners can protect their own property.

Integrated catchment studies

A major study (the Aberdeen Integrated Catchment Study) is currently underway to develop a better understanding of the interaction between flooding from surface water, sewers, culverted watercourses, rivers and the sea in the Aberdeen area. The outcomes of this study will help to develop a better understanding of flood mechanisms and how flooding can be better addressed in the future. The study covers a wide geographical area including Aberdeen City, Westhill, Dyce, Peterculter, Portlethen and Stonehaven.

Surface water management priority areas

The areas at highest risk from surface water flooding have been identified as priority areas. These priority areas were identified using SEPA flood models, supplemented with evidence from historic surface water floods and, where available, more detailed modelling carried out by local authorities. These priority areas require surface water management plans to be prepared, the details of which can be found within the Potentially Vulnerable Area chapters in Section 2.

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 2,400 to 3,600 and the number of non-residential properties from approximately 1,700 to 2,000.

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
	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. See also 'Annual Average Damages'
Demountable defences	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]
Deposition	A natural process leading to an accumulation of sediment on a river bed, floodplain or coastline.
Economic impact	An assessment of the economic value of the positive and negative effects of flooding and / or the actions taken to manage floods.
Embankment	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.
Emergency plans / response	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.
Environmental impact	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.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment (EIA) is a process which identifies the potential environmental impacts, both negative and positive, of a proposal.
Environmental sites / environmental designated areas/ environmentally designated sites	Areas formally designated for environmental importance, such as Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) or Special Areas of Conservation (SAC).
Episodic erosion	Erosion induced by a single event, such as a storm.
Erosion	A natural process leading to the removal of sediment from a river bed, bank or floodplain or coastline.
Estuarine surge attenuation	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.
Estuary	A coastal body of water usually found where a river meets the sea; the part of the river that is affected by tides.
Fault (fault line)	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.
Flash flood	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.
Flashy watercourse	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

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 fror 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	The chance of flooding occurring. **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. **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. **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.
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

[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/sssis/ 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
AVOID DEVELOPMENT IN MEDIUM TO HIGH RISK AREAS 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. b) **Planning authorities and SEPA** require the submission of flood risk assessments that accord with SEPA's *Technical Flood Risk Guidance for Stakeholders*, 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. 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. 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.
REDUCE IMPACTS TO EXISTING BUILDINGS 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.
PROTECT AND ENHANCE NATURAL FEATURES THAT HAVE A POSITIVE IMPACT ON REDUCING OVERALL FLOOD RISK 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.
NEW DEVELOPMENTS ARE DESIGNED TO ENSURE THAT SURFACE WATER DRAINAGE DOES NOT INCREASE FLOOD RISK ON OR OFF SITE a) **SEPA** prepares guidance for planning authorities and developers on the use of surface water hazard maps for land use planning purposes. 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. 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.
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.

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:

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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.

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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.