

Flood Risk Management (Scotland) Act 2009:

DRAFT Local Flood Risk Management Plan

Ayrshire Local Plan District



Published by: North Ayrshire Council



Delivering sustainable flood risk management is important for Scotland's continued economic success and well-being. It is essential that we avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities.

This is first local flood risk management plan for the No 12 Ayrshire Local Plan District, describing the actions which will make a real difference to managing the risk of flooding and recovering from any future flood events.

The task now for us – local authorities, Scottish Water, the Scottish Environment Protection Agency (SEPA), the Scottish Government and all other responsible authorities and public bodies – is to turn our plan into action.

Foreword

The impacts of flooding experienced by individuals, communities and businesses can be devastating and long lasting. It is vital that we continue to reduce the risk of any such future events and improve Scotland's ability to manage and recover from any events which do occur.

The publication of this Local Flood Risk Management Plan (FRM Plan) is an important milestone in implementing the Flood Risk Management (Scotland) Act 2009 and improving how we cope with and manage floods in the Ayrshire Local Plan district. The FRM Plan details how and when the actions to deliver the goals set in the Flood Risk Management Strategy are to be delivered in the first six-year planning cycle, from 2016 to 2022. They therefore describe the short-term direction of flood risk management in the Ayrshire Local Plan District. The actions in the FRM Plan are based on agreed objectives for tackling floods in high risk areas. They rely on the best evidence available on the causes and consequences of flooding and make clear the practical ambition of responsible authorities, including local authorities and Scottish Water.

The Ayrshire LFRMP is published by North Ayrshire Council on behalf of a partnership comprising three local authorities: North Ayrshire Council, East Ayrshire Council and South Ayrshire Council, Scottish Water SEPA and SNH. North Ayrshire are the lead local authority for this district.

In summary, there are 18 areas and one candidate area that have been identified as being potentially vulnerable to flood risk across the Ayrshire Local Plan district. These include 7,800 residential and 2,700 non-residential properties. The estimated annual average damages from the identified flood risks is £16.4 million.

This plan presents actions to avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities within these potentially vulnerable areas and across the local plan district. These actions include 3 prioritised flood protection schemes or works; 15 flood protection studies; as well as flood warning schemes, surface water management plans, and natural flood management studies and works. The delivery of many of these actions may be dependent on the availability of funding, however, we can all play our part in managing flood risk.

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. The publication of this plan shows that the coordinated and collaborative efforts of public bodies can be brought together to deliver sustainable outcomes. However, the actions in this plan can only be delivered with the support of all the public bodies, The Scottish Government, and most importantly you and your communities.

This plan therefore provides the blueprint upon which SEPA, local authorities and Scottish Water and any other responsible authorities will deliver their flood risk management responsibilities in a sustainable manner.

We would like to thank all those who contributed to the development of this Plan which will help shape the way in which floods and their impacts are managed across the Ayrshire Local Plan district.

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1. Flood Risk Management in Ayrshire Local Plan District

1.1.1 What is a Local Flood Risk Management Plan?

The Local Flood Risk Management Plan has been developed to detail the actions adopted to reduce the devastating and costly impact of flooding in the Ayrshire Local Plan District. This plan supplements the Flood Risk Management Strategy (FRM Strategy) as published by the Scottish Environment Protection Agency on the 22 December 2015. This Strategy coordinates the efforts of all organisations involved in flood risk management actions. The Strategy identifies where the risk of flooding and benefits of investment are greatest. The Plan details the prioritised actions that will be delivered within this investment period. There are 13 other Strategies and Plans for the other Local Plan Districts in Scotland.

By publishing this plan, individuals and communities have the information to better manage their own responsibilities. Everyone can take action with the confidence of what others are doing and with the clear knowledge when they are doing it.

This plan details how and when the actions to deliver the goals set in the FRM Strategy are to be delivered in the first six-year planning cycle, from 2016 to 2022. They describe the short-term direction of flood risk management in the Ayrshire Local Plan District, which is expanded upon in the FRM Strategy. The actions in this plan are based on agreed objectives for managing flood in high risk areas. They rely on the best evidence available on the causes and consequences of flooding and make clear the priorities of responsible authorities, including local authorities and Scottish Water.

It is through this risk-based and plan-led approach that that management of flood risk will improve for all in the Ayrshire Local Plan District.

The contents of the Plan have been agreed with the lead authority and every other responsible authority which has flood risk related functions.

The Plan is published by North Ayrshire Council, lead authority for the Ayrshire Local Plan District. The Plan has been prepared in close collaboration with East Ayrshire Council, South Ayrshire Council and any other organisations with a responsibility or interest in managing flooding. This plan is a requirement under the Flood Risk Management (Scotland) Act 2009 and fulfils requirements within the European Commission's Floods Directive.

1.1.2 How to read this plan

The Local Flood Risk Management Plan has three sections:

Section 1 contains background information on the approach taken in Scotland to manage flood risk. It explains the duties and aims of relevant organisations, including

how they work together and how flood risk management planning is linked to other government policies and initiatives. Most importantly, how flood risk management planning is delivered locally to each Local Plan District through a Local Flood Risk Management Plan.

Section 2 is the most important section for those individuals and communities seeking to understand their flood risk and its management. For priority communities (called Potentially Vulnerable Areas) there is a short description of the causes and consequences of flooding. The agreed goals or objectives are clearly defined. Actions that will deliver progress against these goals are explained in more in detail, focusing on responsibility, coordination, timing and funding.

Annexes to the Plan provide supporting documents and references, and present more detailed information in various formats. A glossary of terms is also available.

The Plan should be read alongside the FRM Strategy for the Ayrshire Local Plan District. The FRM Strategy has been developed in parallel and provides additional background information and national context. The publication date of the FRM Strategy was December 2015. Both the FRM Plan and the FRM Strategy will be updated every six years – see chapter 1.5.

1.3 *How we have developed the FRM Plan?*

1.3.1 *Coordination, collaboration and partnership working*

Many organisations and individuals are involved in helping to improve flood management in Scotland. A coordinated approach to manage flood risk is essential because flooding disregards local authority boundaries and similarly cuts across the responsibilities of organisations such as SEPA, Scottish Water and emergency responders.

The Ayrshire Local Flood Risk Management Plan has been developed in partnership. It has provided the evidence through data sharing and improved understanding of each organisations objectives to allow informed joint decisions.

The FRM Plan has been developed by:
North Ayrshire Council (lead authority);
East Ayrshire Council,
South Ayrshire Council,
Scottish Water;
SEPA; and
Any other responsible authority

1.3.2 *Roles and responsibilities for flood risk management planning*

Individuals have responsibilities to protect themselves and their property from flooding. Being prepared by knowing what to do and who to contact in relation to flooding can help you reduce the damage and disruption flooding can have on your life.

Local Authorities work together for flood risk management planning purposes through a single lead authority which has the responsibility to produce a Local Flood Risk Management Plan. It is the responsibility of your local authority to implement any identified actions within the FRM Plan. During severe flooding, local authorities will work with the emergency services and coordinate action.

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. SEPA has a statutory duty to produce Scotland's Flood Risk Management Strategies. They 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.

In running Floodline, SEPA provides 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 forecast for flooding SEPA works 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. SEPA works 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.

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.

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 Government has also approved this Flood Risk Management Strategy.

Scottish Natural Heritage has provided general and local advice in the development of this Flood Risk Management Strategies. Flooding is seen as natural process that can

maintain the features of interest at many designated sites, so Scottish Natural Heritage helps to ensure that any changes to patterns of flooding do not adversely affect the environment. Scottish Natural Heritage also provides advice on the impact 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 first 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 forecasts and weather warnings. SEPA and the Met Office work together through the Scottish Flood Forecasting Service.

The emergency services provide emergency relief 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 Scotland considers flooding as part of their regular site assessments. As such, flooding is considered as one of the many factors which inform the development and delivery of its management and maintenance programmes.

1.3.3 Consultation, engagement and advice

Local authorities and SEPA have 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 appropriately. Two statutory public consultations were held during the development of the FRM Strategies and FRM Plans. The first, by SEPA, was on the general approach to flood risk management planning and the identification of priority areas (2011); the second, held jointly with SEPA and local authorities, was on the understanding of flooding in these priority areas and on the objectives and actions to manage flooding (2015). The views and representations of the respondents to the second consultation were taken account of in developing and finalising the FRM Plan. Details of further consultations and other communication and engagement activities for this plan are described below.

Further advice has been sought from relevant organisations at key stages. The FRM Strategies (and FRM Plans) have benefitted from input from the Clyde Loch Lomond and Ayrshire Local Advisory Group, providing important local knowledge on both the causes and consequences of flooding and on the appropriate actions for future management. Advice was also taken from a National Flood Management Advisory Group consisting of over 50 member organisations, reflecting the national importance and impact of flooding on our communities, economy, environment and cultural heritage.

Some of the work carried out has been complex and technical in nature for which professional advice was sought from across Scotland and beyond. Working together, SEPA, The Scottish Government, Local Authorities, Scottish Water and other key interested organisations have assisted each other and developed industry best practice guidance for flood risk management planning.

1.3.4 Identification of objectives, appraisal and prioritisation of actions

The identification of objectives and appraisal of actions to reduce flood risk has been led by SEPA with significant local input from Local Authorities and Scottish Water. The setting of objectives and selecting the most sustainable actions to reduce flood risk in each Local Plan District will provide the long-term vision for Flood Risk Management in Scotland. Objectives set focus on the main sources and impacts of flooding identified for each Potentially Vulnerable Area in every Local Plan District. A wide range of actions were appraised, including flood protection works and schemes, flood protection studies, flood warning schemes, surface water management plans, and natural flood management studies and works.

To prioritise future actions across Scotland as required in flood risk management planning, SEPA separated the technical, risk-based assessment of priorities from aspects of local, practical deliverability. In this way the data on the costs and impacts of actions is used alongside information from delivery and funding bodies to jointly agree priorities and identify indicative delivery dates for actions. A National Prioritisation Advisory Group 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. This group was made up of representatives from SEPA, Local Authorities, CoSLA and Scottish Water.

The FRM Strategy provides the list of prioritised actions for the first six-year flood risk management planning cycle, 2016 to 2022. The FRM Plan identifies who will be responsible for the action, a timetable of when it will be undertaken and the funding arrangements – see Section 2.

The lists of prioritised actions to meet agreed goals and objectives in the first six-year cycle considered what would be achievable assuming a similar level of funding for flood risk management activities from The Scottish Government. However, given the timing of spending reviews and annualised financial settlements for local

government, the actual ability to deliver all the actions set in the Strategies in December 2015 and detailed in this Plan will be dependent on the availability of the necessary funding in each year of the six year Plan.

1.3.5 Strategic Environmental Assessment and Habitats Regulations Appraisal

North, East and South Ayrshire Councils jointly undertook a strategic environmental assessment to assess the significant environmental effects of the Plan. Our assessment was published in a screening report and we consulted through SEA Gateway with the statutory bodies SEPA, SNH and Historic Scotland. **Appendix X** shows the screening decision and scoping report and 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 Plan.

North, East and South Ayrshire Councils also undertook a Habitats Regulations Appraisal to ensure that the FRM Plan will not adversely affect the integrity of Special Areas of Conservation and Special Protection Areas. Scottish Natural Heritage was consulted on our appraisal and their views have been taken into account. Mitigation has been applied where required to ensure that the Plan will not adversely affect the integrity of Special Areas of Conservation and Special Protection Areas.

1.3.6 Post-consultation communication and engagement

The FRM Plan does not stand in isolation. As far as is practicable, an integrated approach to land and water management has been pursued. When developing the FRM Strategy and FRM Plan, early links were made with other relevant aspects of water and land management including local development plans, river basin management plans and emergency plans. In turn, the responsible authorities will work proactively to ensure the findings from these flood risk management plans and strategies will influence other planning initiatives in an interactive and iterative cycle. Making these links has helped identify opportunities to deliver multiple benefits from flood risk management goals, objectives and actions.

River basin management planning

Reducing flood risk in Scotland through the development of Flood Risk Management Strategies has provided 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 local authorities for Local Flood Risk Management Plans, and they have 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 FRM Plans and FRM Strategies.

Scottish Water Business Plan 2015-2021

Scottish Water's investment programme is set out in their business plan 2015-2021, which can be found in their website [<https://www.scottishwater.co.uk/about-us/publications/strategic-projections>].

Scottish Waters customers have told them that reducing internal property flooding from sewers is a high priority and this is reflected in Scottish Waters Business Plan commitments for the period 2015-21. Addressing sewer flooding is of the highest importance to Scottish Water, as highlighted by our customers who have helped shape the investment plans for 2015-21.

In recognition of this high priority, within the period 2015-2021, Scottish Water will invest approximately £115m to improve the hydraulic capability of the sewer network so that they can remove all customers from the high risk internal sewer flooding register (greater than 10% chance per annum) as quickly as possible, typically within four years of their problem being confirmed. However Scottish Water has made a commitment to those customers on the register on 31 March 2015 that they will no longer be on the register by 31 March 2021.

Scottish Water customers have also highlighted external flooding is an important issue. As a result, within the period 2015-2021, Scottish Water are investing approximately £40m to develop and to begin to implement solutions to reduce the flood risk for 400 high priority external sewer flooding areas suffering from frequent repeat flooding events.

As a responsible authority under the Flood Risk Management (Scotland) Act 2009, Scottish Water is also working collaboratively with third parties such as SEPA and Local Authorities through the Flood Risk Management Planning process which will assess the risk of flooding into the future.

As part of that work, Scottish Water has allocated investment to undertake further modelling and assessment in sewer catchments within PVA's to improve knowledge and understanding of flood risk from the sewers in these areas, as required under Section 16 of the Flood Risk Management (Scotland) Act 2009. Scottish Water is also working in partnership with SEPA and Local Authorities, to lead on the production of Integrated Catchment Studies across key catchments. Work carried out under these Flood Risk Management (Scotland) Act 2009 duties will continue to inform future investment requirements for Scottish Water.

Surface Water Management Planning

Surface water flooding is any flooding which is not originated from a river or the sea. This can include any overland flow which can come from rainfall, ground water, sewer and drain overflow.

Surface water flooding is a key component of this plan. Areas requiring a Surface water management plan are identified in the Ayrshire Local Flood Risk Management Strategy. The initial assessment for the needs for a surface water management plan was based on historic flooding data, the identification of significant surface water flood risk from the SEPA maps and consultation with the Local Plan District group.

The development of the surface water management plans will be as described in Section 2. The complexity, severity and source of flooding has determined the requirement of a Surface Water Management Plan.

Integrated Catchment Studies

Integrated Catchment Studies (ICS) are led by Scottish Water in partnership with local authorities and SEPA. These studies will improve knowledge and understanding of the interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where appropriate) the sea. This will improve the understanding of contributions these drainage networks play in local surface water flood risk.

Currently there are two ICS being developed within the Ayrshire Local Plan District.

The Meadowhead Catchment ICS was undertaken during SR10 (2010-2015), to Modelling and flood risk assessment stage. This study includes Irvine, Kilmarnock, Troon, Prestwick and Ayr towns. This has provided a fuller understanding of the sources and mechanisms of flooding across this catchment. The study is expected to undertake an Optioneering phase between 2015-2021. This stage will identify the actions to reduce flood risk across the catchments, with the outputs feeding into the Local Authority led Surface Water Management Planning process.

The Stevenston Point ICS began in the autumn of 2015 and is now in the Scoping Stage. This study will cover Ardrossan, Stevenston, Saltcoats, Kilwinning, Kilbirnie, Glenarnock, West Kilbride and Beith. This study will go through the Scoping and Modelling phases, which culminates in defining the sources and mechanisms of flooding in the catchment, and provides an understanding of the impacts of that flooding. It is expected that the ICS partnership will remain and it is anticipated that the Optioneering phase for this study will be initiated directly after the preceding phases.

1.4 *Next steps and monitoring progress*

The Plan runs for six years from June 2016. Over this period the Ayrshire Local Plan District partnership will continue to meet periodically to monitor progress towards implementing the actions detailed in Section 2 and **Annex 1 of the Plan**.

Between years 2 and 3 of the FRM cycle (i.e. before June 2019), North Ayrshire Council, as lead authority will publish a report on the conclusions of a review of the Plan, including information on the progress that has been made towards implementing the measures identified in the implementation part of the Plan.

Between years 5 and 6 of the FRM cycle (i.e. before June 2021), North Ayrshire Council, as lead authority will publish a report on the Plan containing an assessment of the progress made towards implementing the current measures, a summary of the current measures which were not implemented, with reasons for their non-implementation, and a description of any other measures implemented since the plan was finalised which the lead authority considers have contributed to the achievement of the objectives summarised in the Plan.

The lead authority will make these reports available for public inspection.

1.5 *Licensing acknowledgements*

Full licensing acknowledgements can be found in **Annex X** of this Plan.

2. Managing Flood Risk in Ayrshire Local Plan District

2.1 *Understanding of flooding within the Ayrshire Local Plan District*

This chapter presents the summaries of flooding for the Ayrshire Local Plan District and for the 18 Potentially Vulnerable Areas (PVAs) and one candidate PVA. Planned actions to manage flooding that have been prioritised for delivery between 2016 and 2021 across the whole of the LPD area and in each PVA are detailed. It identifies who will be responsible for the delivery and implementation of the actions, along with a timetable of when the actions will be undertaken and the funding arrangements.

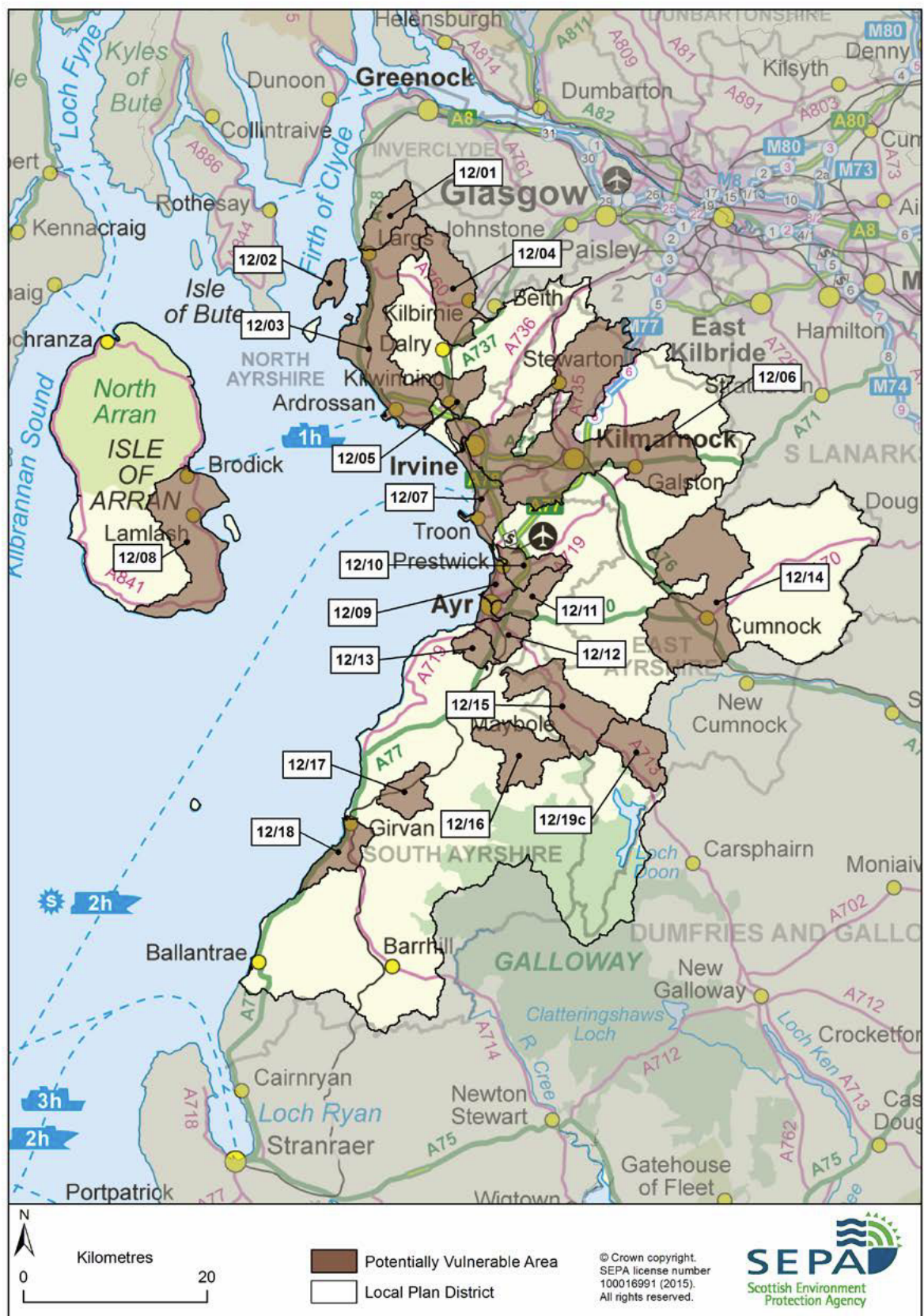
This chapter summarises the characteristics and impacts of flooding from river, coastal and surface water sources on the Ayrshire Local Plan District and how flooding from these mechanisms are to be managed, which are described in more detail in the Strategy.

Section 2.2 presents a summary for the LPD. Section 2.3 presents the Local Plan Overview and 2.4 presents the actions for each PVA.

2.2 *Local Plan District summary*

There are 18 PVAs and 1 Candidate PVAs across the Ayrshire Local Plan District – see Figure 1.

12/01 Noddsdale Water
12/02 Great Cumbrae Island
12/03 Largs to Stevenston
12/04 Upper Garnock Catchment
12/05 Kilwinning
12/06 River Irvine and Annick Water
12/07 Irvine to Troon
12/08 Isle of Arran
12/09 Prestwick to Ayr
12/10 Pow Burn Catchment
12/11 River Ayr
12/12 Ayr east
12/13 Ayr south
12/14 Cumnock and Catrine
12/15 Dalrymple and Patna
12/16 Straiton
12/17 Dailly
12/18 Girvan
12/19c Dalmellington*



There are approximately 7,800 residential properties and approximately 2,700 non-residential properties with a risk of flooding in the Ayrshire Local Plan District. This is approximately 5% of the residential properties and over 16% of non-residential properties in the area. It is estimated that 90% of residential and non-residential properties at risk are located within Potentially Vulnerable Areas. The Annual Average Damages from flooding are approximately £17 million.

River flooding is the main source of flooding in the Local Plan District, closely followed by surface water flooding (Figure 2 to 4). The Annual Average Damages caused by river flooding are £12 million, those caused by surface water flooding are £3.1 million and those caused by coastal flooding are £1.3 million.

Table 1 summarises the headline actions to manage flood risk over the six-year plan period.

Area	Actions					
	NFM Studies	NFM Works	Flood Protection Study	Flood Protection Schemes/ Works	SWMP	Flood Warning Schemes
SCOTLAND						
LPD*						
North Ayrshire Council	1	0	6+1 additional	3	2	4
East Ayrshire Council	0	0	4	0	1	0
South Ayrshire Council	0	2	4	0	1	2

* Councils and responsible authorities may have other actions in other LPD.

Table 1: Summary of actions by LPD and Council Areas

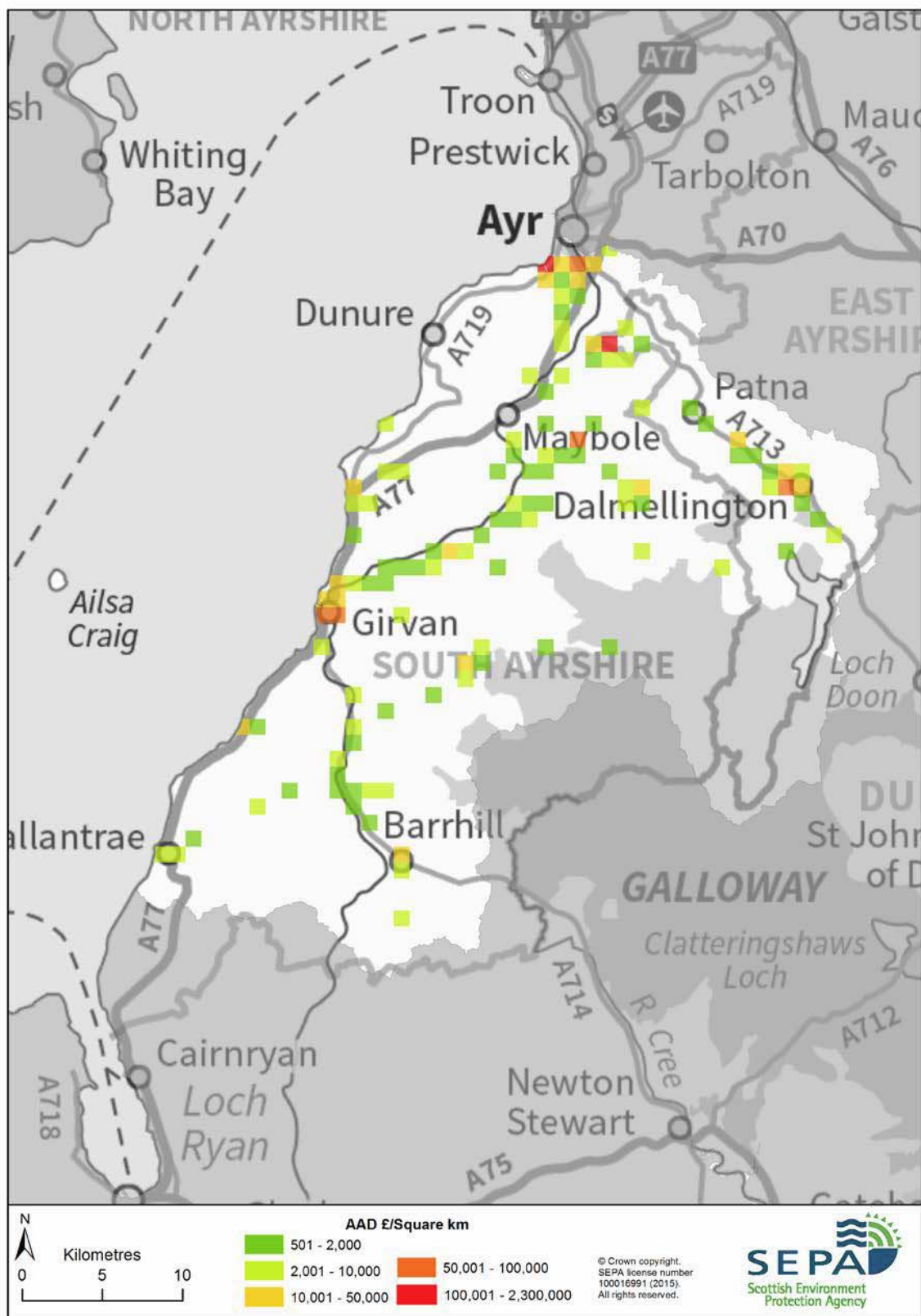


Figure 2.1: Doon Group River Catchment Annual Average Damages from river flooding for Ayrshire LPD

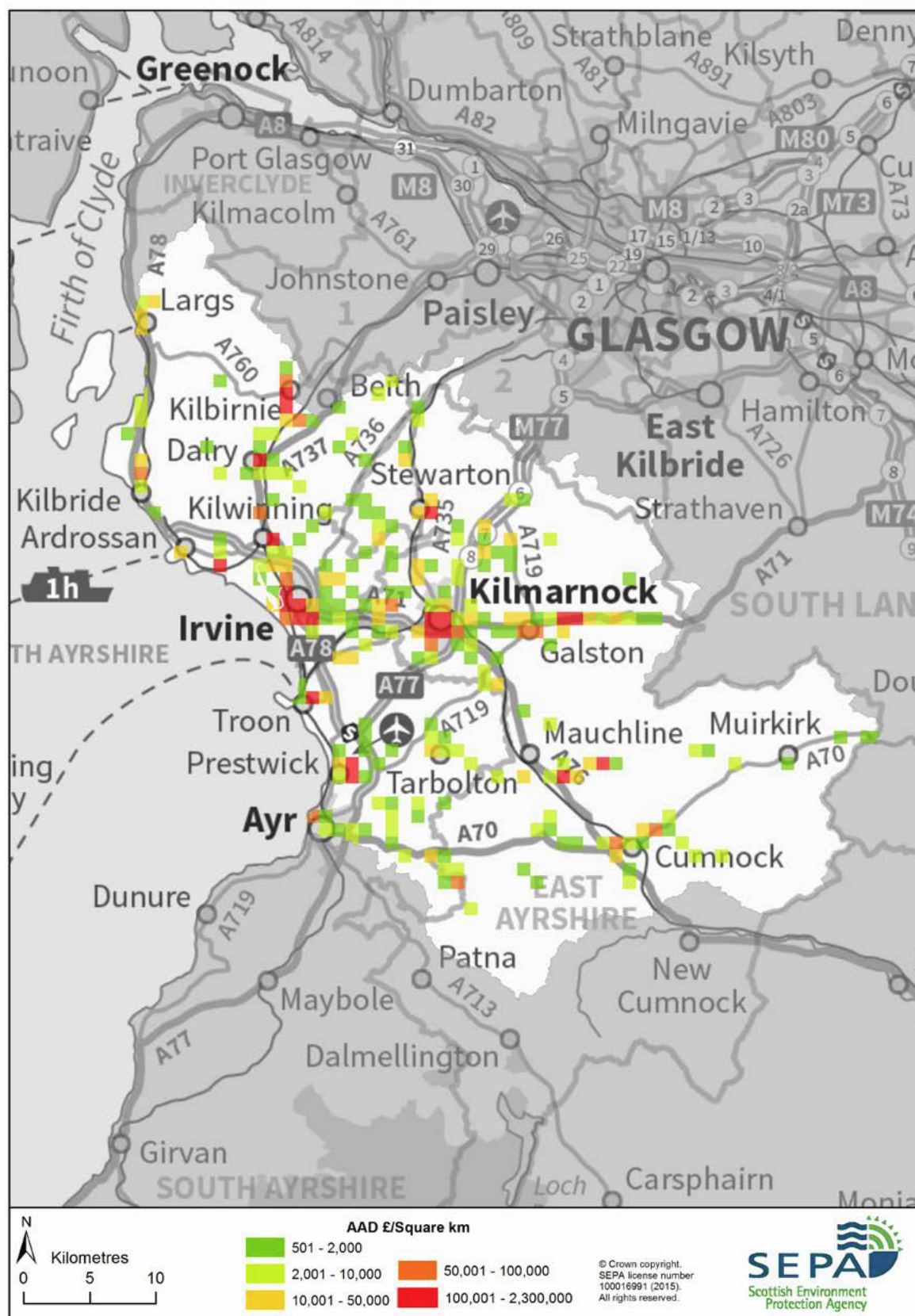


Figure 2.2 River Irvine and Ayr Catchment Group Annual Average Damage from river flooding for Ayrshire LPD

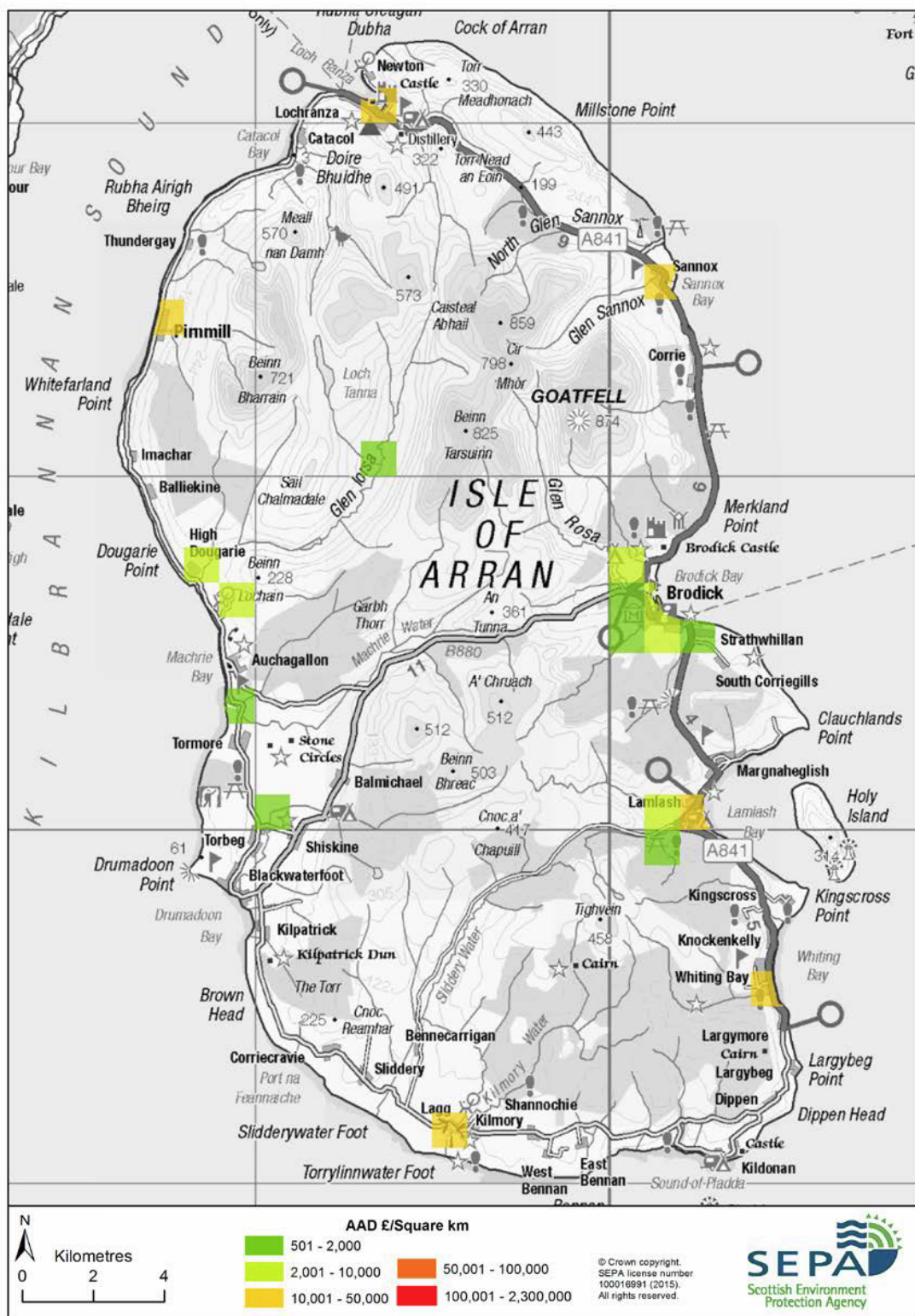


Figure 2.3 Isle of Arran river catchment Group Annual Average Damage from river flooding
Group Annual Average Damage from river flooding for Ayrshire LPD

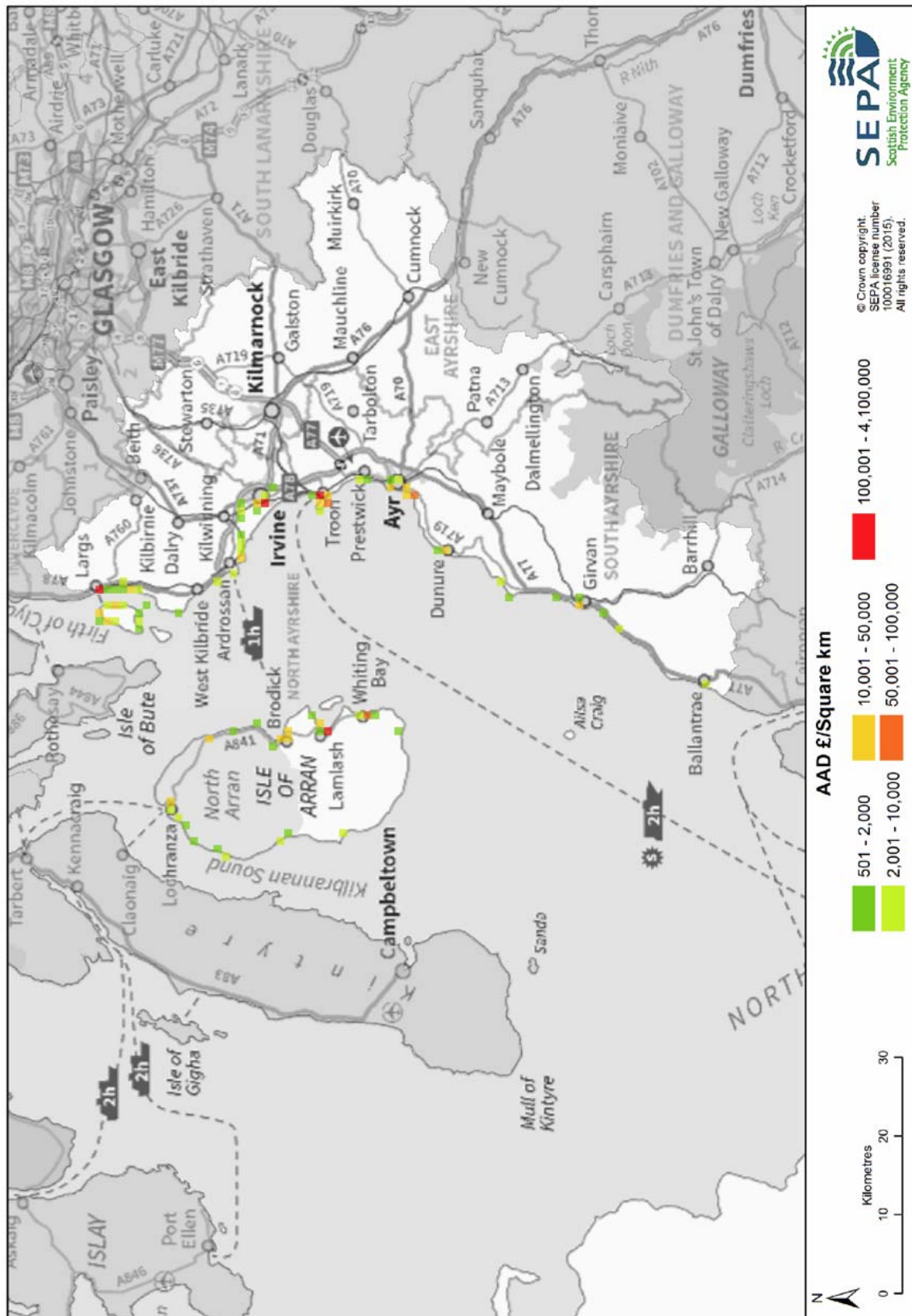


Figure 3: Annual Average Damages from coastal flooding for Ayrshire LPD

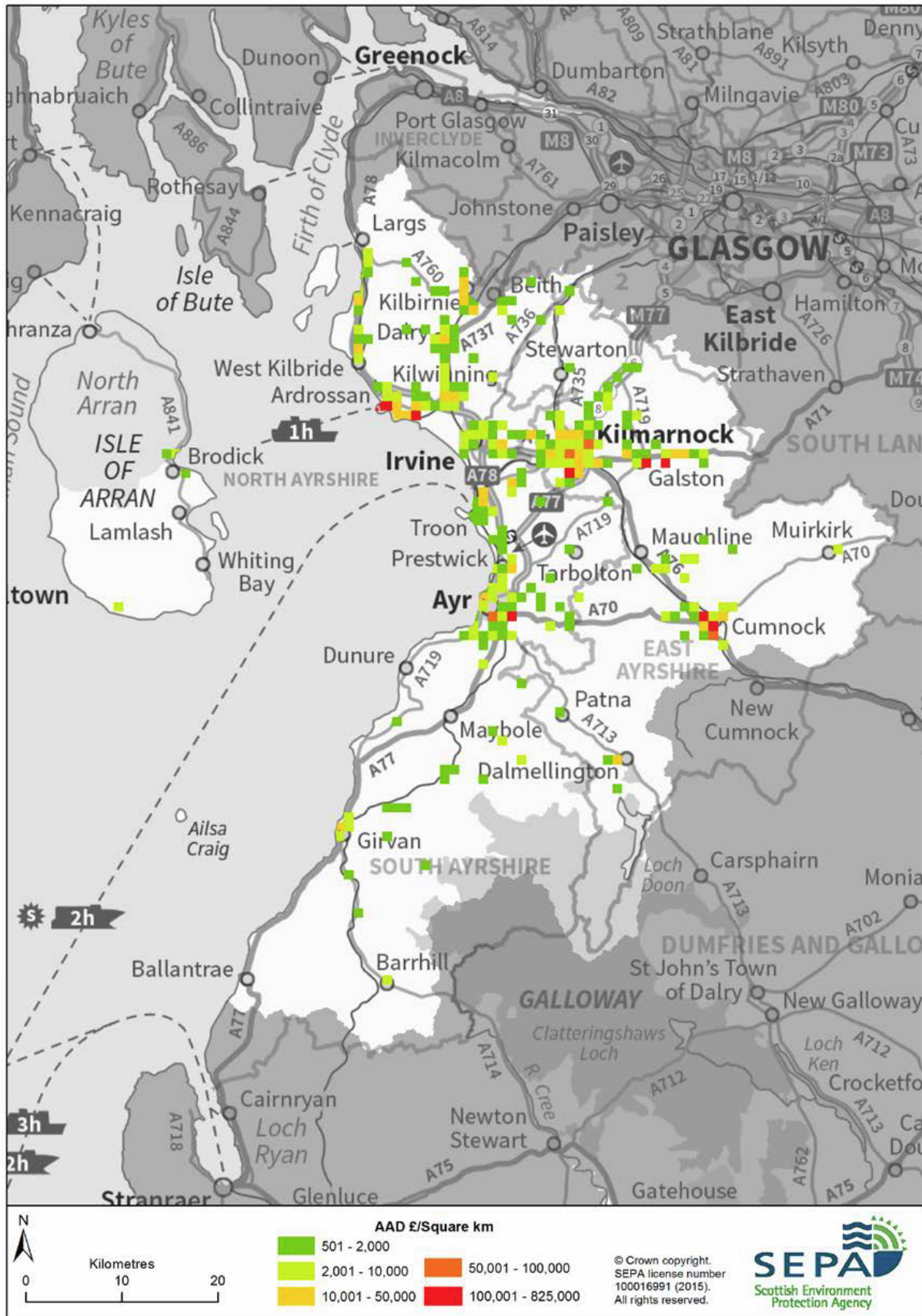


Figure 4: Annual Average Damages from surface water flooding for Ayrshire LPD

2.3 Local Plan District Overview

The following section takes the information detailed in the Strategy and summarises the flood risk, objectives, actions and prioritisation for the whole of No 12 Local Plan District. In addition, as required by the Plan, it identifies who will be responsible for the delivery and implementation of the actions, along with a timetable of when the actions will be undertaken and the funding arrangements.

Flood Risk in Ayrshire

Table 1 shows the main areas, number of properties at risk and the Annual Average Damages caused by flooding. This includes damages to residential properties, non-residential properties, transport and agriculture. Please note that economic damages to airports and rail infrastructure were not assessed as strategic information on damages at this scale is not available.

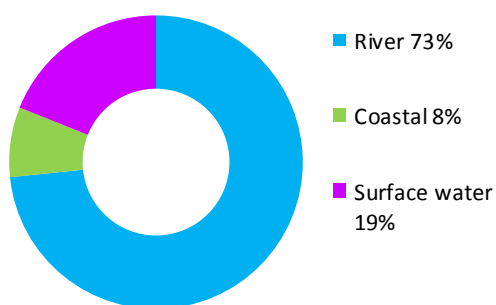


Figure 1: Annual Average Damages by flood source

Table 1: Main areas at risk of flooding

	Residential and non-residential properties at risk of flooding	Annual Average Damages
Irvine (including Dreghorn)	2,000	£4.7 million
Kilmarnock (including Hurlford)	1,300	£1.2 million
Prestwick/Ayr	1,100	£1.7 million
Troon	930	£430,000
Kilbirnie	850	£1.3 million
Saltcoats/Ardrossan	610	£450,000
Newmilns/Greenholm	420	£550,000
Galston	400	£620,000
Largs	290	£200,000
Stevenston	250	£490,000

Background Information on the Ayrshire Local Plan District

The Ayrshire Local Plan District extends from Largs in the north to Ballantrae in the south and includes the Isle of Arran and Great Cumbrae. The district has a total area of 3,100km² and a population of approximately 370,000 people. The main urban areas within the district are Kilmarnock, Irvine and Ayr.

The area spans seven local authorities and 18 Potentially Vulnerable Areas and one candidate PVA. Subsequently, a further review of flood risk identified one further candidate Potentially Vulnerable Area for further analysis. The location of these areas is shown in **Figure 2**.

The largest river catchment is the River Ayr, which flows through the centre of the district. Other watercourses include: the River Doon, the River Garnock, the River Girvan and the River Irvine. The area is predominantly rural with large areas of agricultural grazing in the lower catchments. The upper catchments have large sections of woodland and heather grassland, especially in the east of the district and on the Isle of Arran. The urban areas are largely concentrated along the mainland coast, with further concentration of urban areas along the River Irvine valley.

The coastal area of the Ayrshire Local Plan District covers approximately 300km of coastline including the Firth of Clyde, Great Cumbrae and the Isle of Arran.

Further details of flood risk from distinct sources can be found in the river, coastal and surface water sections of this report.

Flood Risk, Objectives, actions and prioritisation for the Ayrshire Local Plan District

Target area	Objective(s)	ID	Indicators
Applies across Ayrshire Local Plan District	Avoid an overall increase in flood risk	12039	<ul style="list-style-type: none"> • 7,800 residential properties • 2,700 non-residential properties • 17,160 people
Applies across Ayrshire Local Plan District	Reduce overall flood risk	12082	<ul style="list-style-type: none"> • 7,800 residential properties • 2,700 non-residential properties • 17,160 people

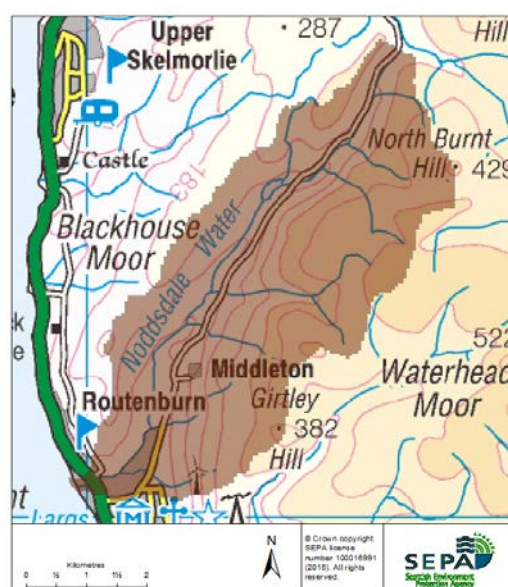
2.4 Local Plan District Actions by PVAs

Noddsdale Water (Potentially Vulnerable Area 12/01)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Noddsdale Water

Background

This Potentially Vulnerable Area is located in the north of the Ayrshire Local Plan District and is approximately 20km², from North Burnt Hill to the north of Largs Bay (shown below).



There are approximately 30 residential properties at risk of flooding. The Annual Average Damages are approximately £68,000.

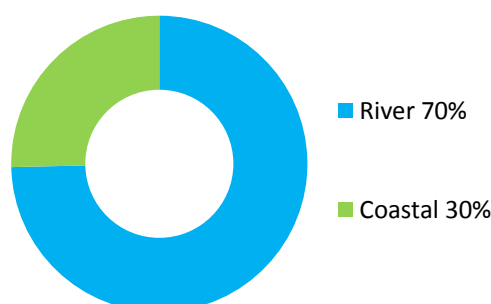


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in this area comes from several small tributaries of the Noddsdale Water. These small watercourses present a potential impact to residential properties and roads. However, due to the small catchment size, they have not been modelled in the national assessment and are not included within the tables and figures presented below. This flooding source has however been considered within the objectives and actions to manage flooding.

The national assessment attributes river flooding primarily to the Noddsdale Water, with the majority of impacts in the north of Largs. A flood risk assessment for the Noddsdale Water identified areas between Noddleburn Road and the A78 at risk from river flooding, and a local depression downstream of the A78 at risk from high tides and storm surges. The study also identified erosion problems to the banks of the Noddsdale Water within Largs. Green bank protection work was completed at the back of Glen Avenue to reduce further erosion of the public path.

There is potential for a restriction in capacity along the Noddsdale Water at the A78, Greenock Road, which may cause flooding to the road network, there have also been cases of blockages to the bridge connecting Noddleburn Meadow and Noddleburn Road.

On the lower reaches of the Noddsdale Water there is potential for interaction between coastal and river flooding where low lying properties are at risk. North Ayrshire Council has coastal defences which provide both flood and erosion protection. There are revetments, seawalls and embankments in Netherhall, north of the Noddsdale Water.

Surface water mapping indicates a number of localised areas within the north of Largs that may be at risk of flooding. Historical records support this assessment. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 30 to 70.

Residential properties affected by river and coastal flooding experience the highest economic impact at approximately 98% of the damages. Most of the impacts are within Largs with flooding to people and utilities.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Noddsdale Water Potentially Vulnerable Area 12/01.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_01_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/01

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. The objectives below have been set for Noddsdale Water Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Noddsdale Water Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood Protection Study					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/01

Action (ID):	FLOOD PROTECTION STUDY (120010005)
Objective (ID):	Reduce the risk of river flooding to residential properties in the north east of Largs (12001)
Delivery lead:	North Ayrshire Council
Action Description:	<p>A study was completed in early 2016 which investigated the feasibility of a flood protection scheme focussing on modification of conveyance by upgrading culverts in the Brisbane Glen Road area and property level protection.</p> <p>This study also considered the potential for natural flood management to reduce runoff to the small burns in the area, and other actions to select the most sustainable combination of actions. A number of options with high level cost estimates were identified by the study, and North Ayrshire Council will assess these options in order to determine the outline design work.</p>
Timing and status:	The Feasibility Study completed early in 2016, the design of actions is due for completion in 2016.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will coordinate with SEPA, Scottish Water, local residents, landowners and other stakeholders identified through the development of the scheme.
Potential Environmental Impacts:	<p>Flood protection studies will 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. To be in accord with the flood risk management 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 Renfrewshire Heights Special Protection Area. There is the potential for runoff control actions to have an impact on the Renfrewshire Heights Site of Special Scientific Interest. Downstream of this culvert there may be negative impacts on water quality through increased erosion and sedimentation on the Noddsdale Water; however, there is the potential for improvements to fish passage from upgrading of the culverts.</p>

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water

Action Description:	Scottish Water will undertake further investigation and modelling in the Largs sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2018 and will be completed in 2020.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	All
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April/May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Largs, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme. Through the continued development of flood schemes and studies at higher risk locations, officers from the Council's Flood Risk Management Team attend community council events to discuss elements of flood risk management.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish

Funding:	<p>Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.</p> <p>Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-

Coordination:	ordination.
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Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate</p>

locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

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 SEPA's Strategy.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website <http://www.sepa.org.uk/environment/land/planning/>.

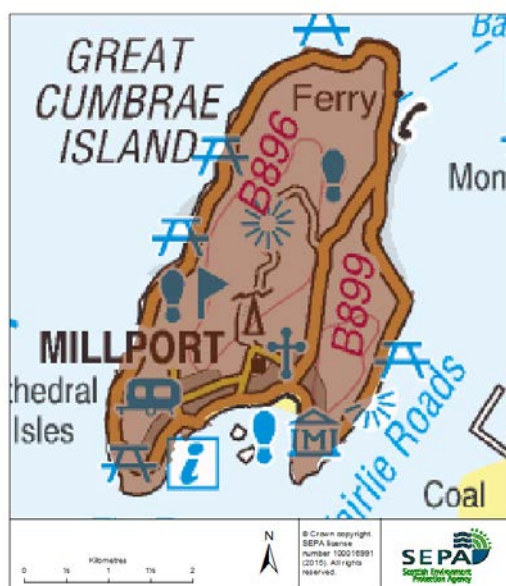
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Great Cumbrae Island (Potentially Vulnerable Area 12/02)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Great Cumbrae coastal

Background

This Potentially Vulnerable Area is approximately 10km². It encompasses all of Great Cumbrae Island located in the Firth of Clyde, to the west of Largs (shown below).



Local studies have shown approximately 800 properties to be at risk. The Annual Average Damages are approximately £2.2 million.

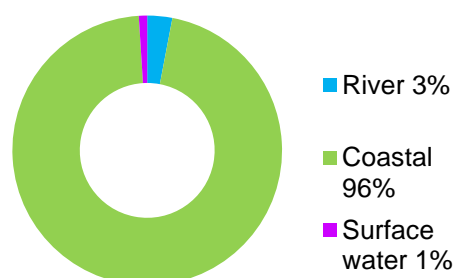


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The national assessment shows that flooding within the area is primarily from coastal sources with a limited impact from surface water; however, there have also been reports of river flooding from the Mill Burn. The catchment size threshold used for the river study however, means that no watercourses on the island were modelled.

The vast majority of the damages arise from coastal flooding. It should be noted there may be an additional level of risk to residential and non-residential properties due to wave overtopping, which was not taken into account at the modelling stage of this assessment. Coastal flooding is likely to impact on sections of road infrastructure with the main road link at risk being the B896.

Due to the limitations of the national modelling approach the risk identified by the national assessment underestimated the risk in the area. North Ayrshire Council has undertaken further studies which identified a risk to over 700 properties from coastal flooding, including wave overtopping and erosion. A further 30 properties were identified at risk of river flooding from the Mill Burn.

Due to the discrepancy between the values from the national assessment and the local study no tables or figures from the national assessment have been provided. The information from areas studied by North Ayrshire Council will be reviewed for use when

updating the national mapping. Objectives and actions have been identified to reduce the identified flood risk.

There are only a small number of areas at risk of surface water flooding. These areas tend to coincide with the locations of small reservoirs and lochs. There is one location, to the north of Kames Bay, which indicates that surface water flooding may impact residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Great Cumbrae Potentially Vulnerable Area 12/02.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_02_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/02

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. The objectives below have been set for Great Cumbrae Island Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Great Cumbrae Island Potentially Vulnerable Area.

Selected actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Millport Coastal Flood Protection Scheme					
			Mill Burn Flood Mitigation Works		
Shoreline Management Plan					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/02

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120020006)
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
Delivery lead:	North Ayrshire Council
Action Description:	In 2015 North Ayrshire Council completed a Coastal Flood Risk Assessment Study for Millport Town. This was followed by the Option Appraisal Study, which outlined the feasibility of developing flood mitigation strategies and measures along with a high level cost benefit assessment. The studies identified a number of financially feasible options to reduce the risk of flooding. Future investigations will look to identify the most sustainable flood mitigation option to manage flooding. The need for the Coastal Flood Scheme development in Millport town is recognised by SEPA Flood Risk Management Strategy. The scheme has a national priority rating of 10 out of the 42 schemes and the estimated cost of the scheme is £12.1 million.
Timing and status:	The outline design with option optimisation will take place in 2016-17, the detailed design will take place in 2017-18 and construction will take place in 2019-20.
Funding:	The project will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. Schemes confirmed by the Scottish Government qualify for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
Coordination:	North Ayrshire Council will coordinate with Marine Scotland, Clyde Marine Planning Partnership Forum, SEPA, Scottish Water, local residents, landowners and other stakeholders identified through the development of the scheme.
Potential Environmental Impacts:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Further impacts will be assessed by the local authority.

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120030006)
Objective (ID):	Reduce the risk of river flooding to residential properties in Millport along the Mill Burn (12003)
Delivery lead:	North Ayrshire Council
Action Description:	In 2015 North Ayrshire Council completed a Flood Risk Assessment Study for Mill Burn and followed by the Option Appraisal Study which outlined the feasibility of developing flood mitigation strategies and measures along with a high level cost benefit assessment. The studies identified initial remedial work that could be carried out, this has helped to reduce the level of risk in the area. Future investigations will establish the remaining level of risk and the most sustainable combination of actions to manage this risk. The need for the Flood Scheme development for the Mill Burn is recognised by

	SEPA Flood Risk Management Strategy. The scheme has a national priority rating of 30 out of the 42 schemes and the estimated cost of the scheme is £1.1 million.
Timing and status:	2019-2021
Funding:	The project will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. Schemes confirmed by the Scottish Government qualify for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
Coordination:	North Ayrshire Council will coordinate with Marine Scotland, local businesses, SEPA, Scottish Natural Heritage, residents and other key stakeholders identified through the development of the scheme.
Potential Environmental Impacts:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Further impacts will be assessed by the local authority.

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
Delivery lead:	North Ayrshire Council and South Ayrshire Council
Action Description:	<p>The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab</p>

	analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.
Timing and status:	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the coastline. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km ² of improved surface water data is currently available within this Local Plan District.
Timing and status:	The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year 2016.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120020017)
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
Delivery lead:	North Ayrshire Council
Action Description:	The proposed Millport Coastal Flood Protection Scheme will look at altering the current defences including seawalls, revetments and breakwaters along Millport Bay. It is proposed that a new break water will be constructed and the seawall will be extended in order to enhance the protection of Millport Town. Until this time North Ayrshire Council will continue to inspect and maintain the Millport Coastal Flood defences, which will continue to manage flooding according to the design standard at the time of construction. The Millport Flood defences have an annual inspection regime along with

	a principal inspection every 6 years, to ensure integrity and peak efficiency. The sea defences will be maintained as part of the Council's coastal asset management programme. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the the Millport Seafront flood warning area, which is part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection scheme for Millport and a shoreline management plan are proposed in this PVA. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme and any new information about flood risk resulting from the proposed flood protection study are fully considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April/May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Millport, the

	<p>opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme. North Ayrshire Council support local Flood Action Groups at Millport. Through the continued development of flood schemes and studies at higher risk locations, officers from the Council's Flood Risk Management Team attend community council events to discuss elements of flood risk management.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). For the new Millport flood protection schemes, SEPA will support the local authority's communications and engagement activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	A new coastal along with a river flood protection scheme are proposed for Millport. North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council, asset / land managers

Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p>

	<ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk</p>

	<p>management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Largs to Stevenston (Potentially Vulnerable Area 12/03)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Saltcoats to Largs coastal

Background

This Potentially Vulnerable Area is approximately 100km². It is located in the north of the Ayrshire Local Plan District and extends from Stevenston, Saltcoats and Ardrossan in the south, to Waterhead Moor in the north (shown below). It incorporates the towns of Largs and West Kilbride.



The area has a risk of river, coastal and surface water flooding. The majority of damages are caused by surface water flooding.

There are approximately 960 residential properties at risk of flooding. The Annual Average Damages are approximately £1.2 million.

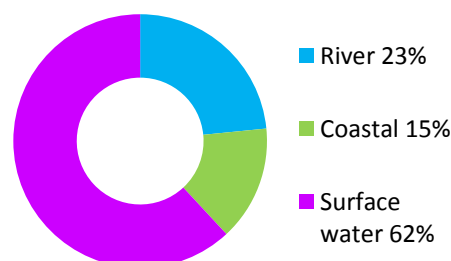


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Surface water flooding is likely to impact the Ardrossan, Saltcoats and West Kilbride areas where a large number of residential properties are at risk. There is also potential for flooding of agricultural land in the north west of the area. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

River flooding occurs throughout the area but is primarily attributed to the Gogo Water. Largs has the potential to be affected by river flooding, which is most likely to occur to the west of the A78 Irvine Road and to the main rail link south of Largs station. West Kilbride is another area where there is a notable risk of river flooding. The Kilbride Burn, which flows south towards West Kilbride, passes beneath the B781 and the main rail link north of West Kilbride rail station. There are a number of constrictions within this area that are likely to cause the water within the Kilbride Burn to overflow. A study on the Kilbride Burn, West Kilbride was undertaken to assess the local impact of river flooding. The study identified Cubrieshaw Bridge as a constraint to river flows. Areas at risk are primarily agricultural land, although residential areas are also at risk. River flooding to land and properties is also likely to occur within Ardrossan from the Master Gott Burn, which is largely culverted.

Coastal flooding is not widespread in this area however there are a number of residential and non-residential properties at risk, particularly near Saltcoats. Three other areas at risk include the north side of West Kilbride, the vicinity of Ardrossan Harbour and a residential area adjacent to Auchenhavie Golf Course.

It should be noted that along the coastline there may be an additional level of risk due to wave overtopping which was not taken into account at the modelling stage of this assessment. As a consequence areas at risk of flooding may not have been identified.

There is the potential for interaction between sources of flooding within the area which may affect the A78 and land adjacent to the RSPB reserve.

Residential properties affected by surface water flooding experience the highest economic impact at approximately 40% of the damages. Non-residential properties also provide a substantial portion of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 960 to 2,000 and the number of non-residential properties from approximately 380 to 710.

Most of the impacts are within Largs, Ardrossan, Saltcoats and Stevenston with a number of different receptors impacted. The A78 is at risk of flooding at various locations including Fairlie and Ardrossan.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Largs to Stevenston Potentially Vulnerable Area 12/03.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_03_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/03

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. The objectives below have been set for Largs to Stevenston Potentially Vulnerable Area:

- Reduce the physical or disruption risk related to the transport network for rail (ID 12300)
- Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (ID 12041)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Largs to Stevenston Potentially Vulnerable Area.

Selected actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Fairlie Keppen Burn Flood Protection Works					
Gogo Flood Protection Study					
Shoreline Management Plan					
Surface Water Management Plan					
Integrated Catchment Study					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/03

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120060006)
Objective (ID):	Reduce the risk of river flooding to residential properties and non-residential properties in Fairlie (12006)
Delivery lead:	Transport Scotland and Network Rail
Action Description:	North Ayrshire Council, Transport Scotland and Network Rail are all working in partnership on the Keppen Burn culvert upgrade. All three organisations have an approved prioritises worklist for the next 3-5 years based on the organisations own objectives and funding availability. The Keppen Burn Culvert upgrade will be assessed by all three organisations separately and will fit into the already prioritised worklist. The sequence of construction also depends on technical principles therefore close coordination of the three organisations and sufficient commitment for the construction by all parties are essential to progress on site.
Timing and status:	Detailed design is in the final stage, depends on the three organisations funding availability, construction will commence between 2016-2021
Funding:	The project will be funded through each organisations capital and/or revenue budgets provided by Scottish Government.
Coordination:	North Ayrshire Council will coordinate with Network Rail and Transport Scotland, SEPA, Scottish Water, local residents, utility providers and other stakeholders identified through the development of the scheme.
Potential Environmental Impacts:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Further impacts will be assessed by the local authority.

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (12300021)
Objective (ID):	Reduce the physical or disruption risk related to the transport network for rail. (12300)
Delivery lead:	Network Rail
Action Description:	Network Rail will carry out civil engineering work which will reduce flood risk to identified sections of the rail network within this area.
Timing and status:	2016-2021
Funding:	
Coordination:	

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Largs (12004)
Delivery lead:	North Ayrshire Council
Action Description:	The Ayrshire Shoreline Management Plan is currently under development by North and South Ayrshire Councils who are working in partnership to complete this study by 2021. The objective of this study is to provide North and South Ayrshire Council with a document to outline the long term 100 years management of the Ayrshire Coastline and inform Planning and policy makers on the coastal change processes. It will be used when setting priorities for coastal defence management. It will take into account the issues of public safety, the preservation of property and infrastructure, the preservation (and where possible the enhancement) of the environment and the likely costs of defence management along a coastline. This report will provide an understanding of the processes shaping the coast, based on a mixture of geomorphological analysis, interpretation of available data in waves, tides, movements of beach sediment and past shoreline changes. This study is not limited to Potentially Vulnerable Areas but should cover the whole of the Ayrshire coastline and any areas beyond this which may be influenced by changes in coastal processes.
Timing and status:	The Ayrshire Shoreline Management Plan is started in the of 2015 and expected to be developed by mid 2018. As part of the Ayrshire SMP, which is currently underway, a gap study for the North Ayrshire Mainland is currently progressing, which will assess the Coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the coastline. Irvine Bay (water body ID 200021), within this study area, is identified by river basin management planning to be at less than good status. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning.

Action (ID):	FLOOD PROTECTION STUDY (120040005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Largs (12004)
Delivery lead:	North Ayrshire Council

Action Description:	<p>A study is planned to further investigate the river and coastal flood risk in Largs and if there is significant interaction between the two. The study will look at updating the existing modelling on the Gogo Water, and further investigate enhancing and extending the existing coastal defences.</p> <p>The Ayrshire Shoreline Management Plan (SMP) (action 12103005) will also cover Largs and will be used to provide background information for this study. As part of the Gogo Water Flood Risk Assessment, the opportunities to explore the natural flood management aspect will be looked at. As part of the Ayrshire SMP, which is currently underway, a gap analysis for the North Ayrshire Mainland is currently progressing which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study.</p>
Timing and status:	The Gogo Water hydraulic model update is underway. Information from the Shoreline Management Plan will feed into this study, which will not be expected to commence before 2017.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will coordinate with SEPA, Scottish Water, Scottish Natural Heritage, landowners and other stakeholders will be identified through the development of the various studies related to this area.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. There are no international, national or local level environmental designations that are likely to be impacted by this action. There is likely to be a loss of natural and semi-natural habitat in the footprint and vicinity of the defences. There is the potential for negative impacts on local water quality and disturbance to flora and fauna in Largs Bay and at the downstream end of the Gogo Water during the construction period. There is the potential for negative impacts to the numerous listed buildings in the area, and their setting, in particular the public fountain, the War Memorial and the harbour.

Action (ID):	SURFACE WATER PLAN/STUDY (120411018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (12041)
Delivery lead:	North Ayrshire Council
Action Description:	<p>North Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment to establish the highest risk areas is being undertaken using data provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the councils focus within an Integrated Catchment Study for the Stevenston Point. The integrated catchment study will improve</p>

	<p>knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network.</p> <p>Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120411019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (12041)
Delivery lead:	Scottish Water in partnership with North Ayrshire Council
Action Description:	An integrated catchment study covering the Stevenston Point catchment will be carried out to support the surface water management planning process in Kilwinning, Saltcoats, Ardrossan and Stevenston . The study will improve knowledge and understanding of the interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. To date, all timescale, agreements and funding between Scottish Water and the Local Authorities will take the studies through the Scoping and Modelling phases which culminates in defining the flooding issues in the catchment. It is expected that the integrated catchment study partnerships will remain and anticipated that the Optioneering phase will be initiated directly after the preceding phases.
Timing and status:	Scoping for the Stevenston Point integrated catchment study began in 2016 and the report of the modelling phase will be completed by 2019.
Funding:	This project is being funded by Scottish Water in partnership with North Ayrshire Council. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. North Ayrshire Council is funding this project from their revenue budget provided by Scottish Government.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to develop flood mapping in the Ayr to Ardrossan area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied. The coastal mapping and modelling process will start in 2016, with early work focussing on methodology development and data collection. Once this stage has been completed a thorough review will be carried out to identify the final mapping improvements that can be made in the area.
Timing and status:	The coastal strategic mapping and modelling will begin in 2016 and will be completed by 2019.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Largs and Stevenston Point sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2018 and will be completed in 2020.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120040017)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Largs (12004)
Delivery lead:	North Ayrshire Council
Action Description:	Largs Flood Protection Scheme was constructed in 2002 and consists of a concrete seawall from Old Fish Quay to Gogo Water. This scheme provides protection to the area up to a 200 year flood. The Gogo Street Flood Protection Scheme was completed in 2013 to mitigate flooding from the Gogo Water to a standard of protection of a 1 in 75 year flood. North Ayrshire Council will continue to inspect and maintain these schemes, which will continue to manage flooding according to the design standard at the time of construction. The Largs Flood Protection Scheme has an annual inspection regime and in every 6 years a principal inspection will be carried out to ensure integrity and peak efficiency. The sea defences will be maintained as part of the Council's coastal asset management programme. The inspection works for the Gogo Street Flood Protection scheme will be scheduled as part of the Council's duties in accordance with Sections 18 of the Flood Risk Management (Scotland) Act 2009. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120090017)
Objective (ID):	Reduce the risk of coastal flooding to residential properties in Ardrossan, Saltcoats and Stevenston (12009)
Delivery lead:	North Ayrshire Council
Action Description:	Saltcoats Flood Protection Scheme was constructed in 2006 and consists of breakwaters, seawalls and flood banks at Outer Nebbock. This scheme provides protection to the area up to a 200 year flood. North Ayrshire Council will continue to inspect and maintain the Saltcoats coastal flood defences, which will continue to manage flooding according to the design standard at the time of construction. The Saltcoats Flood Protection Scheme has an annual inspection regime and in every 6 years a principal inspection will be carried out to ensure integrity and peak efficiency. The sea defences will be maintained as part of the Council's coastal asset management programme. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.

Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Largs Fort Street, Largs Seafront and Saltcoats Harbour flood warning areas, which are part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection scheme for Fairlie and a flood protection study for Largs are proposed in this PVA. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme and any new information about flood risk resulting from the proposed flood protection study are fully considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.

Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Saltcoats, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.

	<p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). For the new flood protection scheme, SEPA will support the local authority's communications and engagement activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	A flood protection scheme is proposed for Fairlie. North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which</p>

	<p>are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.

Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p>

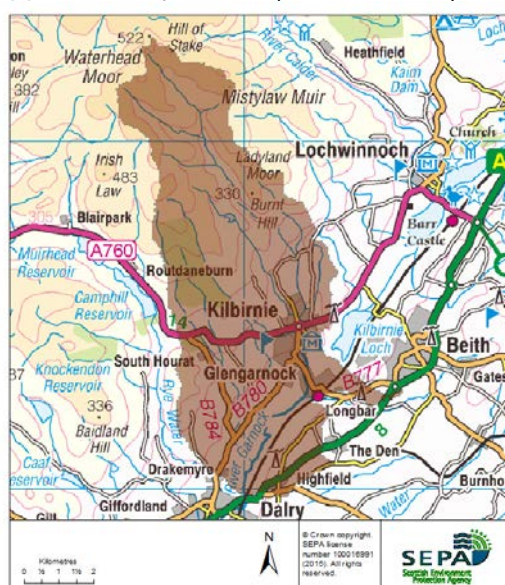
	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of thre Council`s Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Upper Garnock catchment (Potentially Vulnerable Area 12/04)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council, Renfrewshire Council	River Garnock

Background

This Potentially Vulnerable Area is located in the north of the Ayrshire Local Plan District, between Dalry and Clyde Muirshiel Regional Park and it is approximately 50km² (shown below).



There are approximately 810 residential properties at risk of flooding. The Annual Average Damages are approximately £790,000.

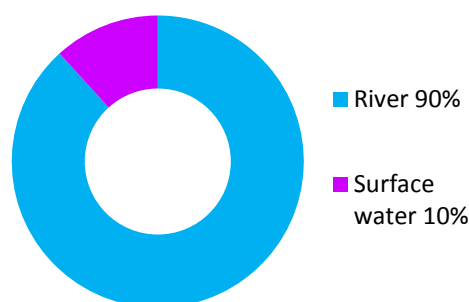


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in the area is primarily attributed to the River Garnock which flows from north to south through the town of Kilbirnie and towards Dalry. A large number of residential and non-residential properties are at risk in the town. Flooding may occur to transport routes (notably the A737 and A760) and within the town. A number of areas of river erosion have also been noted in Kilbirnie. To the north of Kilbirnie the floodplain is restricted as it flows through a steep sided valley; however, there are substantial areas of flooding to the south, which would predominantly impact agricultural land. These southern floodplains are located upstream of the town of Dalry. The Rye Water flows into Dalry from the north-west with a risk of flooding to an industrial area which may be attributed to the downstream confluence of the Rye Water and the Garnock Water.

Surface water flooding within the area occurs predominantly in rural locations, or is potentially combined with flooding to smaller watercourses. Areas in the north of Dalry are at risk of combined surface water and river flooding.

Residential properties affected by river flooding experience the highest economic impact at approximately 80% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 810 to 1040 and the number of non-residential properties from approximately 100 to 120.

Most of the impacts from flooding are south of the A760 at Kilbirnie, these include flooding risk to people, non-residential properties, community facilities, utilities, roads and railways. The A760 itself is at risk of flooding at Kilbirnie.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Upper Garnock catchment Potentially Vulnerable Area 12/04.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_04_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/04

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. The objectives below have been set for Upper Garnock catchment Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Upper Garnock catchment Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Upper Garnock Flood Protection Scheme					
New Flood Warning					
Natural Flood Management Study					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/04

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120100006)
Objective (ID):	Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Kilbirnie, Glengarnock and Longbar (12010)
Delivery lead:	North Ayrshire Council
Action Description:	The Council are progressing work on the proposed flood protection scheme on the upper River Garnock. The Outline design of the Upper Garnock Flood Protection Scheme and notification period completed in October 2015. A Total of five objections were received during this period and the Council is currently trying to resolve these objections with the individuals before making a decision to confirm the scheme either with or without an unresolved objection. If an unresolved objection is maintained, then the scheme will be submitted to the Scottish Government for determination. The Council's aim is to continue with the detailed design process in 2016. The construction costs of the scheme are currently estimated at £14.5m, with a further £1m for studies and design fees.
Timing and status:	Detailed design proposed to start in mid 2016, and expected to be completed within 9 months. Construction would follow soon after that.
Funding:	The Flood Scheme will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. The Upper Garnock Flood Protection scheme was confirmed by the Scottish Government as qualifying for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
Coordination:	North Ayrshire Council will coordinate with SEPA, Scottish Water, local residents, landowners and other stakeholders identified through the development of the scheme.
Potential Environmental Impacts:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. River Garnock (water body ID 10381), within this study area, is identified by river basin management planning to be at less than good status. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning. There are no international, national or local level environmental designations that are likely to be impacted by this action. There is likely to be a loss of natural and semi-natural habitat in the direct footprint of the engineered storage and defences. Downstream of the storage action there may be negative impacts on water quality through increased erosion and sedimentation. Implementation of the storage action will have permanent negative impacts on the water body morphology. There is the potential for negative impacts on local water quality downstream of works during the construction period.

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (121020006)
Objective (ID):	Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Dalry (12102)
Delivery lead:	North Ayrshire Council
Action Description:	The Council are progressing work on the proposed flood protection scheme on the upper River Garnock. The Outline design of the Upper Garnock Flood Protection Scheme and notification period completed in October 2015. The proposed scheme includes flood storage and flood walls and will reduce the risk of flooding to Dalry and Kilbirnie. The new flood warning scheme being developed along the River Garnock will also enable property level protections actions to be further investigated. A Total of five objections were received during this period and the Council is currently trying to resolve these objections with the individuals before making a decision to confirm the scheme either with or without an unresolved objection. If an unresolved objection is maintained, then the scheme will be submitted to the Scottish Government for determination. The Council's aim is to continue with the detailed design process in 2016. The construction costs of the scheme are currently estimated at £14.5m, with a further £1m for studies and design fees.
Timing and status:	Detailed design proposed to start in mid 2016 and expected to be completed within 9-12 months. Construction would follow soon after that.
Funding:	The Flood Scheme will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. The Upper Garnock Flood Protection scheme was confirmed by the Scottish Government as qualifying for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
Coordination:	North Ayrshire Council will coordinate with SEPA, Scottish Water, local residents, landowners and other stakeholders identified through the development of the scheme. Coordination with SEPA's River Basin Management Planning Team to examine potential improvements to the river environment including an improvement to river morphology.
Potential Environmental Impacts:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. This flood protection scheme is proposed for a number of rivers. The physical condition of the River Garnock (water body ID 10381) 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 river will be considered by coordinating with river basin management planning. There are no international, national or local level environmental designations that are likely to be impacted by this action. There is likely to be a loss of natural and semi-natural habitats and displacement of species in the footprint and vicinity of the defences. There is the potential for negative impacts on local water quality downstream of works during the construction period.

Action (ID):	NEW FLOOD WARNING (120820010)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	<p>SEPA will continue with the development and implementation of a flood warning scheme on the River Garnock. Detail of communities that will benefit from the warnings will be determined during scheme development.</p> <p>Once implemented SEPA will continue to maintain the flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.</p>
Timing and status:	The River Garnock flood warning scheme will be delivered by December 2016.
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, the Government provide grant funding to enable SEPA to implement new flood warning schemes.
Coordination:	A flood protection scheme is proposed for the Upper Garnock. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme are fully considered in the new flood warning system.

Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (120100003)
Objective (ID):	Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Kilbirnie, Glengarnock and Longbar (12010)
Delivery lead:	North Ayrshire Council
Action Description:	<p>A previous assessment of the potential benefit of these actions on the upper River Garnock has been carried out during the work on the upper River Garnock flood protection scheme. A further study focussing on the potential benefits of natural flood management actions to the tributaries of the River Garnock will be carried out. These actions may have multiple benefits including enhancing the protection that will be offered by the Upper Garnock flood protection scheme.</p>
Timing and status:	2016-2021 this work is proposed to run parallel to the Upper Garnock FPS
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with SEPA, landowners and all appropriate stakeholders identified through the study.

<p>Potential Environmental Impacts:</p>	<p>Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. This study is proposed for the River Garnock (water body ID 10381). The physical condition of this river is identified by river basin management planning to be at less than good status. Natural flood management actions are likely to improve the condition of rivers. Proposed actions will be coordinated with river basin management planning. Proposed runoff control in the upper catchment area north west of Murchan Hill has the potential to impact upon the Renfrewshire Heights Special Area of Conservation and Site of Special Scientific Interest. To be in accord with the flood risk management strategy, the responsible authority will seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Renfrewshire Heights Special Protection Area. Runoff control in the lower catchment area, to the north west of Kilbirnie, is unlikely to impact these designated sites. There is the potential for the existing ecosystems in the area to be impacted through a change of land use if woodland planting is undertaken. In areas of grazing grassland this could improve biodiversity; however, in the bog areas from Blacks Law to High Blaeberry Craigs this would have significant negative impacts. Depending on the status of the bog there may, however, be potential for some land management activities, such as drain blocking. There are likely to be improvements in water quality through reduced agricultural chemical and sediment runoff, which will have positive impacts on the terrestrial and freshwater habitats and species in the area. There are likely to be local improvements in water quality through reduced sedimentation; however, increased flows may have localised erosion impacts downstream. Sediment management works and bank restoration may cause the short term loss of some habitats and displacement of species, which should recolonise and return to the area following sediment management activities. There is the potential for improved water quality, reduced sediment and reduced scour in the River Garnock. There is also the potential for a slight increase in carbon storage with this action, provided the upland bogs are not negatively impacted upon. There is the potential for woodland planting to impact upon the setting of Glengarnock Castle. Bank restoration and sediment management activities on the River Garnock have the potential to temporarily impact upon the heritage features of Glengarnock Castle and the Kilbirnie heritage conservation area.</p>
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Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water

Action Description:	Scottish Water will undertake further investigation and modelling in the Stevenson Point sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2018 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. North Ayrshire Council support local Flood Action Group in the Upper Garnock Valley. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Kilbirnie, the opportunity to meet and discuss the Strategy and raise awareness of the developing SEPA Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>For the new flood protection scheme, SEPA will support the local authority's communications and engagement activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.</p> <p>To support the delivery of the new SEPA flood warning scheme on the River Garnock, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.</p> <p>Scottish Water will provide targeted flooding communications for</p>

	<p>Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	<p>A flood protection scheme is proposed for Upper Garnock Valley and a new flood warning scheme is under development for River Garnock. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.</p> <p>North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.</p>

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council and Renfrewshire Council, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection</p>

	works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk. Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p>

	<p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of thre Council`s Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Kilwinning (Potentially Vulnerable Area 12/05)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	River Garnock

Background

This Potentially Vulnerable Area is located to the north of Irvine and includes a large proportion of Kilwinning. It is approximately 30km² (shown below).



The area has a risk of river, surface water and coastal flooding. The majority of damages are caused by river flooding predominately from the River Garnock, River Irvine and the Bannoch Burn.

There are approximately 170 residential properties at risk of flooding. The Annual Average Damages is approximately £400,000.

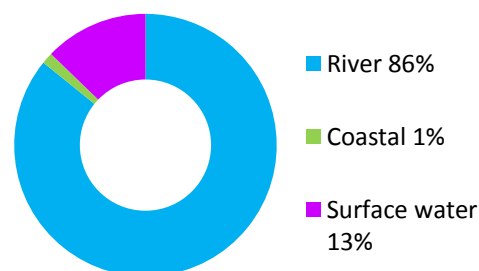


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding from the River Garnock, River Irvine and the Bannoch Burn present risk to residential and non-residential properties within Kilwinning and to the area south of the A78, where the Irvine Golf Club and former industrial area are deemed at risk. There are also transport routes at risk, notably railway lines and the A737 and A78. A flood study for the Bannoch Burn completed in February 2014 identified that the culverted section of the Bannoch Burn is lacking capacity and can contribute to flooding.

Surface water flooding is predicted to impact the residential area of Kilwinning with considerable potential disruption along the A737. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

There is a small risk from coastal flooding over the lower reaches of the River Garnock where there is a tidal influence but no residential or non-residential properties are predicted to be affected.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 170 to 220 and the number of non-residential properties from approximately 50 to 60.

Most of the impacts from are within Kilwinning and Irvine. These include flooding risk to people, non-residential properties, utilities, roads and railways. The A78 is at risk of flooding between Kilwinning and Irvine. Three designated cultural heritage sites are at risk of flooding, and small areas of environmentally designated sites (approximately 1.5km²) are also at risk.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Kilwinning Potentially Vulnerable Area 12/05.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_05_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/05

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. The objectives below have been set for Kilwinning Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (ID 12041)
- Reduce the economic damages and risk to people from surface water flooding in Irvine (ID 12042)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Kilwinning Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
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Delivery of selected actions

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
New Flood Warning					
Surface Water Management Plan					
Integrated Catchment Study					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/05

Action (ID):	NEW FLOOD WARNING (120820010)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	<p>SEPA will continue with the development and implementation of a flood warning scheme on the River Garnock. Detail of communities that will benefit from the warnings will be determined during scheme development.</p> <p>Once implemented SEPA will continue to maintain the flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.</p>
Timing and status:	The River Garnock flood warning scheme will be delivered by December 2016.
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, the Government provide grant funding to enable SEPA to implement new flood warning schemes.
Coordination:	A flood protection study is proposed for Kilwinning. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

Action (ID):	FLOOD PROTECTION STUDY (120130005)
Objective (ID):	Reduce the risk of river flooding to residential properties and non-residential properties in Kilwinning (12013)
Delivery lead:	North Ayrshire Council
Action Description:	<p>The Stevenston Point integrated catchment study will further develop an understanding of flood risk and water quality along the Wood Burn. This study will look at mitigation options including upgrading of culverts and sustainable drainage systems.</p> <p>The Council will review the outcomes from the Integrated study and potential mitigation options to develop the feasibility of a flood protection scheme.</p> <p>Along the River Garnock the Council will examine control structures focussing on the influence on river levels in Kilwinning.</p>
Timing and status:	The ownership of the Kilwinning Weir needs to be confirmed prior to further work in this section of the River Garnock. Further study is proposed to be started in 2018/19. This may allow for any appropriate information from the Stevenston Point ICS to be utilised as this is due to be completed by 2019.

Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	<p>Scottish Water will work with North Ayrshire council to ensure that best available knowledge and data is used to inform this study.</p> <p>Opportunities to remove obstruction to fish passage will be explored with SEPA's River Basin management Plan Unit.</p>
Potential Environmental Impacts:	<p>Flood protection studies will 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. This study is proposed for a number of rivers. Part of the River Garnock (water body ID 10379) is identified by river basin management planning to be at less than good status for its physical condition. Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers will be considered by coordinating with river basin management planning. There are no international, national or local level environmental designations that are likely to be significantly impacted by this action. Downstream of these culverts there may be negative impacts on water quality through increased erosion and sedimentation on the River Garnock. There is the potential for improvements to fish passage from upgrading of the culverts and weir removal. Increased flows from removal of this weir may cause increased erosion and sedimentation on the River Garnock. There is likely to be a direct loss of natural and semi-natural habitat and displacement of species in the footprint and vicinity of the direct defences. There is the potential for negative impacts on local water quality downstream of works during the construction period. However, there is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area. There is also the potential for negative impacts on the Kilwinning Bridge listed heritage structure.</p>

Action (ID):	SURFACE WATER PLAN/STUDY (120410018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (12041)
Delivery lead:	North Ayrshire Council
Action Description:	<p>North Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment to establish the highest risk areas is being undertaking using data provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the councils focus within an Integrated Catchment Study for Stevenston Point. The integrated catchment study will improve knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network.</p> <p>Outcomes from the Integrated catchment study will be used to help</p>

	inform the surface water management plan.
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120410019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilwinning, Saltcoats, Ardrossan and Stevenston (12041)
Delivery lead:	Scottish Water in partnership with North Ayrshire Council
Action Description:	An integrated catchment study covering the Stevenston Point catchment will be carried out to support the surface water management planning process in Kilwinning, Saltcoats, Ardrossan and Stevenston . The study will improve knowledge and understanding of the interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. To date, all timescale, agreements and funding between Scottish Water and the Local Authorities will take the studies through the Scoping and Modelling phases which culminates in defining the flooding issues in the catchment. It is expected that the integrated catchment study partnerships will remain and anticipated that the Optioneering phase will be initiated directly after the preceding phases.
Timing and status:	Scoping for the Stevenston Point integrated catchment study began in 2016 and the report of the modelling phase will be completed by 2019.
Funding:	This project is being funded by Scottish Water in partnership with North Ayrshire Council. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. North Ayrshire Council is funding this project from their revenue budget provided by Scottish Government.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120420018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042)
Delivery lead:	North Ayrshire Council

Action Description:	<p>North Ayrshire Council will develop a surface water management plan to cover Irvine which set objectives for the management of surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment to establish the highest risk areas is being undertaken using data provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the council's focus within an Integrated Catchment Study for Stevenston Point. The integrated catchment study will improve knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network.</p> <p>Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120420019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042)
Delivery lead:	Scottish Water in partnership North Ayrshire Council
Action Description:	<p>An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).</p>
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.

Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.
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Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead and Stevenston Point sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Kilwinning, the opportunity to meet and discuss the Strategy.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). To support the delivery of the new SEPA flood warning scheme on the River Garnock, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.</p>

	<p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	<p>A new flood warning scheme is under development for River Garnock. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.</p> <p>North Ayrshire Council SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.</p>

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Local authorities, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the</p>

	<p>public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate</p>

Coordination:	category 1 and 2 responders in severe flood events.
Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	Reduce overall flood risk (12082) Avoid an overall increase in flood risk (12039)
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see</p>

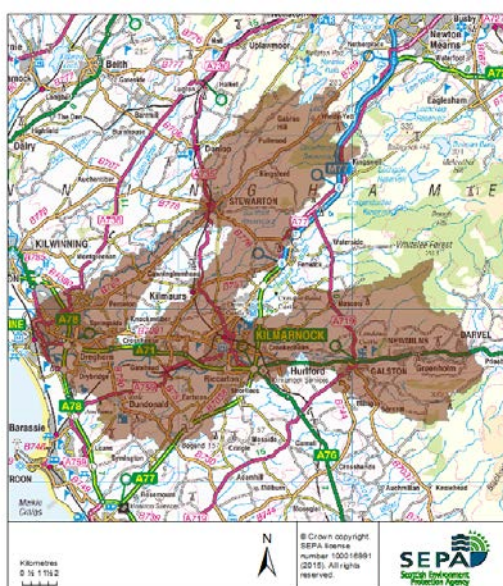
	<p>SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of thre Council`s Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

River Irvine and Annick Water catchments (Potentially Vulnerable Area 12/06)

Local Plan District	Local authority	Main catchment
Ayrshire	East Ayrshire Council, East Renfrewshire Council, North Ayrshire Council, South Ayrshire Council, South Lanarkshire Council	River Irvine

Background

This Potentially Vulnerable Area is in the centre of the Ayrshire Local Plan District and covers an extensive section of the River Irvine catchment, including the towns of Kilmarnock and Irvine (shown below). The area is centred on Kilmarnock, extending west to the Irvine coast and north encompassing Stewarton with an area of approximately 220km².



The area has a risk of river, surface water and coastal flooding. The majority of damages are caused by river flooding predominately from the River Irvine and Annick Water.

There are approximately 2,900 residential properties at risk of flooding. The Annual Average Damages are approximately £7.1 million.

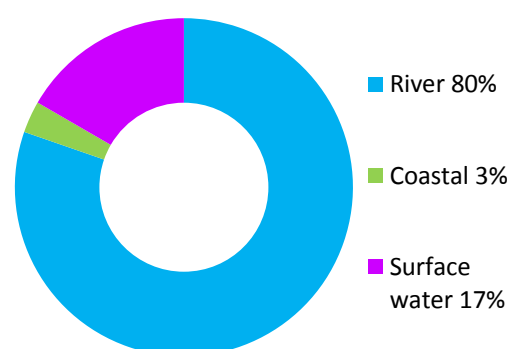


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding within the area is primarily from the River Irvine, which flows west towards the Firth of Clyde. There are also a number of tributaries of the River Irvine including the Annick Water, Carmel Water, Fenwick Water and Kilmarnock Water, which all present a risk to people and properties. There are also a number of structures on the Annick Water within the Stewarton area which could possibly impede the flow of flood water. This may contribute towards a heightened risk of flooding to local properties, particularly in the area where the B778 crosses the Annick Water.

There are sections of road and rail infrastructure at risk of flooding, notably; the M77, A71, A76, A77 and A78, which could affect access to Irvine and other main access routes.

There are approximately 620 residential properties at risk of surface water flooding around Irvine, Kilmarnock and Galston. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

The tidal weir downstream of the Marress Bridge in Irvine limits the impact from coastal flooding in the area, with no residential properties at identified at risk.

Residential properties affected by river flooding experience the highest economic impact at approximately 50% of the damages. Non-residential properties also contribute a notable portion of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 2,900 to 4,000 and the number of non-residential properties from approximately 1,200 to 1,500.

Most of the impacts are within Kilmarnock, Irvine, Galston and Newmilns and include flooding to people, non-residential properties, community facilities, utilities, roads and railways. The A71 is at risk of flooding at various locations including Kilmarnock and Irvine. Thirteen designated cultural heritage sites are at risk of flooding, along with small areas of environmentally designated sites.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, River Irvine and Annick Water Potentially Vulnerable Area 12/05.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_06_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/06

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. The objectives below have been set for River Irvine and Annick Water Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Kilmarnock and Greenholm (ID 12040)
- Reduce the economic damages and risk to people from surface water flooding in Irvine (ID 12042)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Kilwinning Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Kilmarnock Flood Protection Study					
	Irvine Town Flood Protection Study				
New Flood Warning					
Surface Water Management Plan					
Integrated Catchment Study					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Supporting Community Action Groups, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/06

Action (ID):	NEW FLOOD WARNING (120820010)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	<p>The scope of a new flood warning for the River Irvine is currently being examined. The area under consideration for a new flood warning includes properties in Newmilns affected by flooding from the River Irvine. The risk to Galston will be reviewed using the councils new flood study for the River Irvine. This could impact on the potential for provision of warnings at Galston. For areas where the risk is from the Irvine an update to the flood forecasting system will be required.</p> <p>Another area under consideration includes properties in Kilmarnock affected by flooding from the Kilmarnock Water and River Irvine. An update to the existing flood forecasting system will be required to deliver flood warning in this location. Flood warning is also required for properties mainly in Irvine and Stewarton affected by flooding from the Annick Water. Full scoping, infrastructure and a flood forecasting system will be required to develop a new flood warning scheme in this area.</p>
Timing and status:	<p>Further flood risk management studies will be carried out to determine whether the River Irvine flood warning scheme should be delivered in cycle 1.</p> <p>Annick Water flood warning scheme: the hydrometry development begins in spring 2016, the flood forecasting system update will begin in autumn 2019 and the launch will take place in spring 2020.</p>
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, the Government provide grant funding to enable SEPA to implement new flood warning schemes.
Coordination:	A flood protection study is proposed for along the River Irvine and Kilmarnock Water which will cover Kilmarnock and Galston. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

Action (ID):	FLOOD PROTECTION STUDY (120150005)
Objective (ID):	<p>Reduce the risk of flooding from the River Irvine in Galston (12019)</p> <p>Reduce the risk of flooding from the River Irvine and the Kilmarnock Water in Kilmarnock (12015)</p>
Delivery lead:	East Ayrshire Council

Action Description:	A study is underway to further investigate the flood risk from the River Irvine and Kilmarnock Water. The study will look at the actions that have previously been implemented in the area to assess the level of protection that is offered within Kilmarnock and in other areas along the River Irvine valley including Galston. Depending on the findings from the study there may be the requirement to look at enhancing the current defences or complimentary actions which could help to improve the level of protection offered. One of the actions that should be investigated is a property level protection scheme. East Ayrshire Council appointed RPS to undertake this study which commenced at the end of 2015.
Timing and status:	This flood protection study is ongoing and will be completed in 2016.
Funding:	This study will be funded through East Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The scope of this study was agreed with SEPA/SW, and SEPA are Vetting the report as it is produced.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Further impacts will be assessed by the local authority.

Action (ID):	SURFACE WATER PLAN/STUDY (120400018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilmarnock and Greenholm (12040)
Delivery lead:	East Ayrshire Council
Action Description:	<p>East Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through East Ayrshire Council's revenue budget provided by Scottish Government.

Coordination:	East Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.
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Action (ID):	SURFACE WATER PLAN/STUDY (120400019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kilmarnock and Greenholm (12040)
Delivery lead:	Scottish Water in partnership with East Ayrshire Council
Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network and watercourses. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120421018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042) Reduce the risk of flooding from the River Irvine and the Annick Water combined with surface water, to residential properties and non-residential properties in Irvine (12017)
Delivery lead:	North Ayrshire Council
Action Description:	North Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.

	Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	North Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120421019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042) Reduce the risk of flooding from the River Irvine and the Annick Water combined with surface water, to residential properties and non-residential properties in Irvine (12017)
Delivery lead:	Scottish Water in partnership with North Ayrshire Council
Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network and watercourses. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.

Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.
Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	<p>SEPA will work with East Ayrshire Council to improve the understanding of flood risk along the River Irvine. The Council are leading on the production of the River Irvine modelling with SEPA providing advice and reviewing information during the process.</p> <p>SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km² of improved surface water data is currently available within this Local Plan District. The inclusion of additional surface water hazard data resulting from the completion of local authority surface water management plans will be considered as these projects are completed.</p>
Timing and status:	<p>The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year.</p> <p>The River Irvine strategic mapping and modelling will begin in 2017 and will be completed by 2021.</p> <p>As improvements for the River Irvine catchment are largely third party led studies and works, there is currently considerable uncertainty over delivery timescales. SFR will seek to better understand these during 2016 in order to refine timescales and inform resource planning.</p>
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	<p>A flood protection study is proposed for the Upper Irvine Valley. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.</p> <p>A surface water management plan and integrated catchment study are proposed for Irvine, Kilmarnock and Greenholm. SEPA will work with the responsible authorities to ensure that new information about flood risk resulting from the proposed surface water study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.</p> <p>A new flood warning scheme is under consideration for Newmilns, Kilmarnock and Galston. SEPA will ensure that any new information about flood risk resulting from the proposed flood warning developments is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.</p>

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead and Stevenston Point sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2020.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120150017)
Objective (ID):	Reduce the risk of flooding from the River Irvine and the Kilmarnock Water in Kilmarnock (12015)
Delivery lead:	East Ayrshire Council
Action Description:	<p>The Kilmarnock Flood Protection Scheme was designed to mitigate flooding from the River Irvine in the Riccarton and Crookedholm areas of Kilmarnock. The scheme has a standard of protection of 100 years. The schemes currently constructed form two main types:</p> <ul style="list-style-type: none"> • Walled structures maintained under the Annual Flap valve and Penstock Maintenance Contract. • Earth Embankments maintained by Panel engineers and supported by the annual grass cutting contract (to allow inspection). <p>In addition the effectiveness of these schemes is under review. See objective 12015 River Irvine Flood Study. These defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.</p>
Timing and status:	Ongoing. Known problem areas have been identified and are being inspected on a weekly basis.
Funding:	The maintenance of flood protection scheme will be funded through East Ayrshire Council's Revenue Budget provided by Scottish

Funding:	Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120170017)
Objective (ID):	Reduce the risk of flooding from the River Irvine and the Annick Water combined with surface water, to residential properties and non-residential properties in Irvine (12017)
Delivery lead:	North Ayrshire Council
Action Description:	Defences along the banks of the Irvine River protect properties in the Waterside up to a 20 year flood. North Ayrshire Council will continue to inspect and maintain the River Irvine flood defences at Waterside, which will continue to manage flooding according to the design standard at the time of construction. Given the relatively minor nature of the structures, the inspection works will be scheduled as part of the Council's duties in accordance with Sections 18 of the Flood Risk Management (Scotland) Act 2009. In 2014 the River embankment stabilisation was carried out, and recently the surface water outfall vales were inspected and proposed to be lowered/replaced as part of the surface water flood mitigation effort for the area. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing. Known problem areas have been identified and are being inspected on a regular basis.
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Irvine Waterside/Low Green flood warning area in Irvine and the Queen's Drive, New Mill Road and Samson Avenue flood warning areas in Kilmarnock which are part of the Irvine river flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Kilmarnock. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	COMMUNITY FLOOD ACTION GROUPS (120820012)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Community
Action Description:	Although not part of a community flood action group the public take an active interest in flooding issues within Galston and inform the council about debris in the watercourse. East Ayrshire Council will liaise with the group through Community Council meetings and directly to the public.
Timing and status:	Ongoing
Funding:	This project will be funded through East Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders,

Coordination:	including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.
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Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>The Council's, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, North Ayrshire Council, East Ayrshire Council and SEPA gave residents in 7 towns, including Irvine, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support</p>

	<p>and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, East Ayrshire, South Ayrshire, SEPA and Scottish Water and the Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>East Ayrshire, North Ayrshire and South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	<p>A new flood warning scheme is proposed for the River Irvine and Kilmarnock Water. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.</p> <p>East Ayrshire, North Ayrshire and South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.</p>

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Local authorities, asset / land managers
Action Description:	<p>North Ayrshire, South Ayrshire and East Ayrshire Councils in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect. High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual</p>

	<p>inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>The Councils review the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. The Councils work with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.

Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>
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Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of</p>

	<p>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 SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing CDG
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Irvine to Troon (Potentially Vulnerable Area 12/07)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council, South Ayrshire Council	Monkton to Irvine coastal

Background

This Potentially Vulnerable Area is located on the west coast of the Ayrshire Local Plan District between Monkton and Irvine. It is approximately 30km² (shown below).



There are approximately 1,000 residential properties at risk of flooding. The Annual Average Damages are approximately £1.3 million.

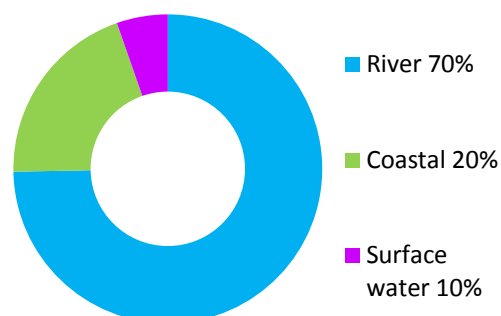


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding is predicted in Irvine from a number of small burns. One area shown to be at risk is Muirhead, with flooding attributed to the Darley Burn. This burn is culverted beneath the A759 which may cause flood water to collect upstream, affecting a number of residential properties. Sections of road and rail routes are also predicted to be impacted by flooding (notably the A78).

The area has frontage onto the Firth of Clyde, with a number of areas at risk. The area with the highest projected risk is Troon Harbour between Port Ranald Drive and South Beach Esplanade, where a number of residential properties could experience coastal flooding. Historically at this location waves have overtopped seawalls and flood water has become trapped. Past reports indicate that the shorefront to the north of Troon has exhibited periods of accumulation and erosion of sand dunes.

Interaction between sources of coastal and river flooding is expected to occur in the lower reaches of the River Irvine and Gables Burn. There is also a possibility of interaction between river and surface water flooding around Muirhead. It is locally understood that flooding generally occurs during heavy rainfall and is accentuated by high tidal conditions.

Surface water flooding is predicted to affect properties and transport routes in the area, with a potential interaction between river and surface water flooding. The areas at highest risk from surface water flooding require the preparation of surface water management plans.

Residential properties affected by river flooding experience the highest economic impact at approximately 65% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 1,000 to 1,600 and the number of non-residential properties from approximately 520 to 690.

Most of the impacts are within Irvine and Troon with flooding to people, non-residential properties, community facilities, utilities, roads and railways.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Irvine to Troon Potentially Vulnerable Area 12/07.

[7http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_07_Full.pdf](http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_07_Full.pdf)

Objectives to reduce flooding in the Potentially Vulnerable Area 12/07

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. The objectives below have been set for Irvine to Troon Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Irvine (ID 12042)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Irvine to Troon Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural Flood Management Works					
Shoreline Management Plan					
Surface Water Management Plan					
Integrated Catchment Study					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/07

Action (ID):	NATURAL FLOOD MANAGEMENT WORKS (120200004)
Objective (ID):	Reduce the risk of coastal and surface water flooding to non-residential properties in Troon (12020)
Delivery lead:	South Ayrshire Council
Action Description:	South Ayrshire Council is undertaking work to restore sand dunes using natural waste in Troon, and some of the benefits of this action are to help reduce the risk of coastal erosion and flooding. This restoration project commenced in 2013 and is ongoing. The success of the project has resulted in it being nominated for the COSLA Excellence Awards 2016. The sand dune restoration project and use of natural waste for this purpose was agreed with SEPA.
Timing and status:	Ongoing
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with SEPA, Scottish Natural Heritage, landowners and all appropriate stakeholders identified through the study.
Potential Environmental Impacts:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. These natural flood management works are proposed for Irvine Bay (water body ID 200021). The physical condition of this coastline is identified by river basin management planning to be at less than good status. Natural flood management works are likely to improve the condition of the coastline. Proposed actions will be coordinated with river basin management planning. Sand dune restoration on the north and south sands has the potential to impact upon the coastal processes and sediment supply to the Troon Golf Links and Foreshore Site of Special Scientific Interest and the Western Gables Site of Special Scientific Interest. These impacts could be positive or negative and would require further study. Dune restoration in the area could provide greater areas of habitat for flora and fauna to colonise.

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of coastal and surface water flooding to non-residential properties in Troon (12020)
Delivery lead:	North Ayrshire Council and South Ayrshire Council
Action Description:	The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals

	<p>and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , developed by North and South Ayrshire Councils.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the coastline. Ayr Estuary (water body ID 200018), within this study area, is identified by river basin management planning to be at less than good status. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning.

Action (ID):	FLOOD PROTECTION STUDY (120200005)
Objective (ID):	Reduce the risk of coastal and surface water flooding to non-residential properties in Troon (12020)
Delivery lead:	South Ayrshire Council
Action Description:	The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed

	<p>high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , developed by North and South Ayrshire Councils.
Potential Environmental Impacts:	<p>Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for Irvine Bay (water body ID 200021). The physical condition of this coastline 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 will be considered by coordinating with river basin management planning.</p> <p>The Troon Golf Links and Foreshore Site of Special Scientific Interest and the Western Gailes Site of Special Scientific Interest have the potential to be affected by any alteration in sediment movement or erosion patterns caused by the structures. Direct defences can lead to erosion of the sand dunes and beach within and along the coast from where the actions are proposed due to effects on coastal processes. This results in the loss of natural habitat and could increase flood risk to other areas currently protected by the sand dunes. This is particularly true in this area as there is long-shore drift. Changes to coastal processes could benefit the Troon Golf Links and Foreshore and the Western Gailes Sites of Special Scientific Interest</p>

Potential Environmental Impacts:	by reducing erosion and increasing sediment supply, or result in an adverse effect through increased erosion and a reduction in sediment supply. There may be the permanent loss of habitat from the footprint of new defences. There is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area. There is potential for negative impacts on the visual setting of the war memorial heritage structure on South Beach Esplanade and the setting of the Troon Heritage Conservation Area.
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Action (ID):	SURFACE WATER PLAN/STUDY (120422018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042)
Delivery lead:	North Ayrshire Council
Action Description:	<p>South Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	South Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120422019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Irvine (12042)
Delivery lead:	Scottish Water in partnership with North Ayrshire Council

Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to develop flood mapping in the Ayr to Ardrossan area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. The coastal mapping and modelling process will start in 2016, with early work focussing on methodology development and data collection. Once this stage has been completed a thorough review will be carried out to identify the final mapping improvements that can be made in the area. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.
Timing and status:	The coastal strategic mapping and modelling will begin in 2016 and will be completed by 2019.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Troon. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120200017)
Objective (ID):	Reduce the risk of coastal and surface water flooding to non-residential properties in Troon (12020)
Delivery lead:	South Ayrshire Council
Action Description:	In Troon there are sections of seawalls, rock armour and gabion mattresses running from the golf club to the harbour and north of the harbour to Beach Road. These defences offer some level of protection to the properties in this area. These defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. Annual inspections are carried out on all coastal protection structures in South Ayrshire Council with maintenance works carried out on a priority basis within available resources. Additional inspections are carried out in response to external defect reports or following severe storm events. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North and South Ayrshire Councils will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Troon Coastal, Troon Central and Prestwick Links Road flood warning areas which are part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Troon. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, North Ayrshire Council and SEPA gave residents in 7 towns, including Irvine, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, South Ayrshire Council, SEPA and Scottish Water website's.</p>

Timing and status:	Ongoing
Funding:	<p>North Ayrshire and South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	North Ayrshire and South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Local authorities, asset / land managers
Action Description:	<p>North and South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. The Councils review the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. The Councils also work with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk. Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>

Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North and South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>

Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site</p>

	<p>allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	<p>The development and review of the Council's Planning Policies and Guidance notes will be funded through North and South Ayrshire Council's revenue budgets provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>
Coordination:	<p>North and South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.</p>

Isle of Arran (Potentially Vulnerable Area 12/08)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Brodict to Kilmory – Arran coastal

Background

This Potentially Vulnerable Area is located on the Isle of Arran in the Firth of Clyde (shown below). The area stretches from Brodict Bay to Torrylinnwater Foot in the south of the island. It is approximately 90km².

River flooding is predominantly from the Strathwhillan Burn and the Glen Cloy Burn in the north of the area, as well as the Benlister Burn and the Monamore Burn. The majority of damages are caused by coastal flooding.



There are approximately 120 residential properties at risk of flooding. The Annual Average Damages are approximately £390,000.

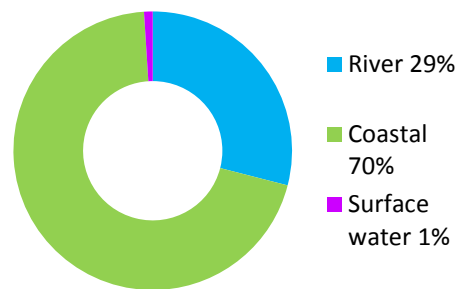


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The Glen Cloy Burn and the Strathwhillan Burn affect areas in Brodict with risk to residential and non-residential properties. In Margnaheglis, the Blairmore Burn presents a risk of flooding to a number of residential properties. Flooding from the Benlister Burn is also predicted to affect residential and non-residential properties in Lamlash.

Coastal flooding is not widespread throughout the area, however, there a number of residential and non-residential areas at risk. The national assessment of coastal flood risk does not include flooding from wave overtopping. There is potential for an increased risk from coastal sources as wave overtopping is considered to be a risk in this area. In Brodict, coastal flooding is predicted to cause flooding of the A841 and nearby properties. Properties along the A841 within Lamlash and south toward the Benlister Burn are at risk of coastal flooding. Coastal erosion is known to occur in the area of Brodict beach and particularly at Brodict golf course.

Interaction between sources of coastal and river flooding is predicted to occur in the lower reaches of the four watercourses, the Glen Cloy Burn, Strathwhillan Burn, Blairmore Burn and Benlister Burn, where they enter the Firth of Clyde.

Residential properties affected by river flooding experience the highest economic impact at approximately 60% of the damages.

Most impacts are within Brodick, Lamlash and Whiting Bay with flooding to people, non-residential properties and roads and to three designated cultural heritage sites along with small areas of environmentally designated sites.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Isle of Arran Potentially Vulnerable Area 12/08.

[7http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_08_Full.pdf](http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_08_Full.pdf)

Objectives to reduce flooding in the Potentially Vulnerable Area 12/08

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. The objectives below have been set for Isle of Arran Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Isle of Arran Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Brodict and Lamdash Flood Protection Studies			
Shoreline Management Plan					

The Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2022.

Actions to manage flooding in Potentially Vulnerable Area 12/08

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	The Ayrshire Shoreline Management Plan is currently under development by North and South Ayrshire Councils who are working in partnership to complete this study by 2021. The objective of this study is to provide North and South Ayrshire Council with a document to outline the long term 100 years management of the Ayrshire Coastline and inform Planning and policy makers on the coastal change processes. It will be used when setting priorities for coastal defence management. It will take into account the issues of public safety, the preservation of property and infrastructure, the preservation (and where possible the enhancement) of the environment and the likely costs of defence management along a coastline. This report will provide an understanding of the processes shaping the coast, based on a mixture of geomorphological analysis, interpretation of available data in waves, tides, movements of beach sediment and past shoreline changes. This study is not limited to Potentially Vulnerable Areas but should cover the whole of the Ayrshire coastline and any areas beyond this which may be influenced by changes in coastal processes.
Timing and status:	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018. As part of the Ayrshire SMP, which is currently underway, a gap study for the Isle of Arran is currently progressing, which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Further impacts will be assessed by the local authority.

Action (ID):	FLOOD PROTECTION STUDY (120230005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and

	<p>coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	As part of the Ayrshire SMP, which is currently underway, a gap study for the Isle of Arran is currently progressing, which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study. Flood risk assessment studies on the Monamore , Benlister and Glen Cloy Burn is proposed to be progressed in 2018 onwards.
Funding:	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. To be in accord with the flood risk management strategy, the responsible authority will seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Arran Moors Special Protection Area. Sand dune restoration at Brodick and Lamlash has the potential to impact upon the coastal processes and sediment supply in the area, with the potential for impacts on Claughlands Point Site of Special Scientific Interest. The impacts could be positive or negative and would require further study. Dune restoration in the area could provide greater areas of habitat for flora and fauna to colonise. There are no international level environmental designations that are likely to be directly impacted by this conveyance action. There is the potential for this action to have

Potential Environmental Impacts:	<p>short term temporary impacts through disturbance to species and reduced water quality during construction. Increasing conveyance in these watercourses may increase erosion downstream of the action. There is likely to be a direct loss of natural and semi-natural habitat in the footprint and vicinity of the defences. There is the potential for temporary negative impacts on the connectivity to the Arran Moors Special Protection Area and Site of Special Scientific Interest along the Benlister Burn and Glen Cloy Burn during construction works. There is the potential for negative impacts on WFD status from this action. There are no local level environmental designations that are likely to be impacted by these actions. Improved design of the culverts may enable better fish passage. There may be temporary negative impacts to water quality during construction. There are unlikely to be significant impacts on heritage features from this action, however sensitive construction may be required in the vicinity of the Brodick Parish Church listed buildings.</p>
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Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120230017)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties in Brodick and Lamlash (12023)
Delivery lead:	North Ayrshire Council
Action Description:	There are a range of formal and informal coastal defences in Brodick and Lamlash. These defences offer some level of protection to the properties in this area. North Ayrshire Council will continue to inspect and maintain the Brodick and Lamlash coastal flood defences, which will continue to manage flooding according to the design standard at the time of construction. The Largs Flood Protection Scheme has an annual general inspection regime to ensure integrity and peak efficiency. The sea defences will be maintained as part of the Council's coastal asset management programme. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA

Action Description:	SEPA will continue to maintain the Arran Lamlash Cordon and the Arran Seafront and Montrose Terrace flood warning areas which are part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Brodich and Lamlash. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. North Ayrshire Council support local Flood Action Groups at Brodick. Most recently in April /May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Brodick, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish</p>

Funding:	Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.
Coordination:	North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	North Ayrshire Council, asset / land managers
Action Description:	<p>North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy PI8: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new</p>

development in areas of significant flood risk unless the stringent criteria in Policy PI8 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding & Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy PI8 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

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 SEPA's Strategy.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website <http://www.sepa.org.uk/environment/land/planning/>.

Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Prestwick/Ayr (Potentially Vulnerable Area 12/09)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	Doonfoot to Monkton coastal

Background

This Potentially Vulnerable Area is located on the west coast of the Ayrshire Local Plan District along the Prestwick and Ayr coastline. It is approximately 10km² (shown below).



There are approximately 300 residential properties at risk of flooding. The Annual Average Damages are approximately £240,000.

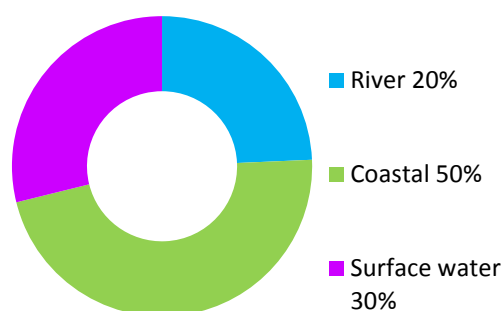


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

This area fronts onto the Firth of Clyde and has tidally influenced rivers, including the River Ayr which flows through the centre as far as the Nethermills weir at Victoria Bridge. The most notable area at risk of coastal flooding is Prestwick. This assessment does not include the impact of wave overtopping which is known to occur in Prestwick and Newton Shore, therefore the reported risk from coastal flooding may be underestimated. Cunning Park in Ayr is also predicted to flood, putting a large number of properties at risk.

River flooding is mainly attributed to the River Ayr, with properties along the course of the river impacted. River flooding is also attributed to a lesser extent to the Slaphouse Burn, which is located just outside the area and is predicted to impact properties in Cunning Park in Ayr.

In this area there are a large number of culverts and structures, plus the potential for interaction between river and surface water flooding. This complexity means that the strategic modelling used for this area carries more uncertainty than some other areas. A more detailed study of flooding and the interaction between different sources of flooding is currently underway, to improve the understanding of flooding in the area.

Interaction between coastal and river flooding is predicted to occur in the lower reaches of the River Ayr where it discharges to the Firth of Clyde.

Surface water flooding is shown to impact residential properties within the area of Whitletts, Heathfield, Lockside and Belmont, along with sections of main rail and road routes (notably the A77). The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

Residential properties affected by coastal flooding experience the highest economic impact at approximately 40% of the damages. Non-residential properties also provide a notable proportion of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 300 to 1,200 and the number of non-residential properties from approximately 160 to 340.

Most of the impacts are within Prestwick and Ayr and flooding to people, non-residential properties, utilities, roads and railways.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Prestwick/Ayr Potentially Vulnerable Area 12/09.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_09_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/09

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. The objectives below have been set for Prestwick/Ayr Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (ID 12043)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Prestwick/Ayr Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural Flood Management Works					
Shoreline Management Plan					
Surface Water Management Plan					
Integrated Catchment Study					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/09

Action (ID):	NATURAL FLOOD MANAGEMENT WORKS (120240004)
Objective (ID):	Reduce the risk of coastal and surface water flooding to residential properties and non-residential properties in Ayr (12024)
Delivery lead:	South Ayrshire Council
Action Description:	South Ayrshire Council manage the beach in Ayr to promote the natural development of sand dunes by restricting the beach areas where the use of mechanical beach cleaning equipment is permitted. This beach management policy is ongoing and some of the benefits of this action are to help reduce the risk of coastal erosion and flooding.
Timing and status:	Ongoing, monitoring
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with SEPA, Scottish Natural Heritage, landowners and all appropriate stakeholders identified through the study.
Potential Environmental Impacts:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. Sand dune restoration offshore of Seafield in Ayr has the potential to impact upon the coastal processes and sediment supply to the Maidens to Doonfoot Site of Special Scientific Interest and the Troon Golf Links and Foreshore Site of Special Scientific Interest. The impacts could be positive or negative and would require further study. Dune restoration in the area could provide greater areas of habitat for flora and fauna to colonise.

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of coastal and surface water flooding to residential properties and non-residential properties in Ayr (12024)
Delivery lead:	South Ayrshire Council
Action Description:	<p>The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP</p>

	<p>Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	As part of the Ayrshire SMP, which is currently underway, a gap study for the North & South Ayrshire Mainland is currently progressing, which will assess the coastal processes and sediment movement along the shore. The recommendation of the report will be considered in the wider SMP study.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by South Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Ayr Estuary (water body ID 200018), within this study area, is identified by river basin management planning to be at less than good status. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning.

Action (ID):	FLOOD PROTECTION STUDY (120240005)
Objective (ID):	Reduce the risk of coastal and surface water flooding to residential properties and non-residential properties in Ayr (12024)
Delivery lead:	South Ayrshire Council
Action Description:	Not required in LFRMP
Timing and status:	2022-2027
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.

Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , led by North Ayrshire Council.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. A flood protection study is proposed for Ayr Estuary (water body ID 200018). The physical condition of this estuary 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 will be considered by coordinating with river basin management planning. The Maidens to Doonfoot Site of Special Scientific Interest and the Troon Golf Links and Foreshore Site of Special Scientific Interest have the potential to be affected by any alteration in sediment movement or erosion patterns caused by the seawalls. Direct defences can lead to erosion of the sand dunes and beach within and along the coast from where the actions are proposed due to effects on coastal processes. There may also be the permanent loss of habitat from the footprint of new structures. This could increase flood risk to other areas currently protected by the sand dunes. There is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area. There is the potential for negative impacts on heritage structures on the Esplanade, at the harbour, and at the protected bridges along the Ayr Estuary. There is potential for negative impacts on the visual setting of the war heritage structures on the Esplanade and the setting of the Ayr Central Heritage Conservation Area.

Action (ID):	SURFACE WATER PLAN/STUDY (120431018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	South Ayrshire Council
Action Description:	<p>South Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>

Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	South Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120431019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	Scottish Water in partnership with South Ayrshire Council
Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. The Optioneering phase of this study will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA

Action Description:	SEPA will seek to develop flood mapping in the Ayr to Ardrossan area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied. The coastal mapping and modelling process will start in 2016, with early work focussing on methodology development and data collection. Once this stage has been completed a thorough review will be carried out to identify the final mapping improvements that can be made in the area.
Timing and status:	The coastal strategic mapping and modelling will begin in 2016 and will be completed by 2019.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Ayr. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120240017)
Objective (ID):	Reduce the risk of coastal and surface water flooding to residential properties and non-residential properties in Ayr (12024)
Delivery lead:	South Ayrshire Council

Action Description:	The South Pier protects the entrance of Ayr Harbour from the action of waves while also reducing siltation in the channel. An existing seawall runs from the South Pier to the mouth of the River Doon, the purpose of which is to protect coastal erosion however it also provides a limited level of flood protection to the area. These defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. An annual inspection is carried out on all coastal protection structures in South Ayrshire Council with maintenance works carried out on a priority basis within available resources. Additional inspections are carried out in response to external defect reports or following severe storm events.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Ayr Seafield the Prestwick Links Road flood warning areas which are part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Ayr. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA

Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities

Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. In May of 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in Prestwick and Ayr the opportunity to meet and discuss the Draft Ayrshire Flood Risk Management Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water website's.</p>
Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other</p>

	<p>water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.

Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our</p>

	<p>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 SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's land use planning will be co-ordinated with the activities of other responsible authorities as required.

Pow Burn catchment (Potentially Vulnerable Area 12/10)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	Pow Burn

Background

This Potentially Vulnerable Area is located on the west coast of the Ayrshire Local Plan District, east of Prestwick and is approximately 10km². It includes Prestwick Airport (shown below).



The area has a risk of river and surface water flooding. The majority of damages are caused by river flooding, predominately from the Ladykirk Burn and the Pow Burn.

There are approximately 410 residential properties at risk of flooding. The Annual Average Damages are approximately £940,000.

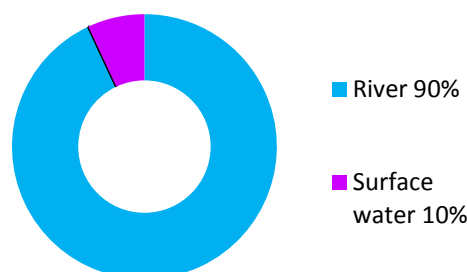


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flooding from the Ladykirk Burn is predicted at Shields and Prestwick, where it discharges to the Pow Burn. Flooding from the Pow Burn is predicted to impact Prestwick Airport and residential properties around Newdykes. The Ladykirk and Pow Burns are culverted at Prestwick Airport and through Prestwick, which may contribute to flooding.

Surface water flooding is predicted to directly impact residential properties in the area south of Newdykes, Prestwick St Cuthbert Golf Course and at the eastern boundary of the airport where the Ladykirk Burn is culverted. Interaction between river and surface water flooding is likely to occur in the residential area south of Newdykes. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

Residential properties affected by river flooding experience the highest economic impact at approximately 90% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 410 to 490.

Most of the impact is located near Prestwick International Airport with flooding to properties and infrastructure.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Pow Burn catchment Potentially Vulnerable Area 12/10.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_10_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/10

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. The objectives below have been set for Pow Burn catchment Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (ID 12043)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Pow Burn catchment Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
New Flood Warning will be assessed					
Surface Water Management Plan					
Integrated Catchment Study					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/10

Action (ID):	NEW FLOOD WARNING (120820010)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	The potential benefits and feasibility of a new flood warning scheme for the Pow Burn in Prestwick will be assessed in 2016.
Timing and status:	Further catchment studies will be carried out to determine the feasibility of the Pow Burn flood warning scheme in Prestwick. SEPA will put a date against this scheme once further scoping has been completed.
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, the Government provide grant funding to enable SEPA to implement new flood warning schemes.
Coordination:	SEPA will work with the local authority and local asset owners to review recent local studies and flood risk management works.

Action (ID):	SURFACE WATER PLAN/STUDY (120432018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	South Ayrshire Council
Action Description:	South Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk. Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish

Funding:	Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	South Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

Action (ID):	SURFACE WATER PLAN/STUDY (120432019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	Scottish Water in partnership with South Ayrshire Council
Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. The Optioneering phase of this study will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km ² of improved surface water data is currently available within this Local Plan District. The inclusion of additional surface water

	hazard data resulting from the completion of local authority surface water management plans will be considered as these projects are completed.
Timing and status:	The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year 2016.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A surface water management plan and associated integrated catchment study are proposed for Prestwick and Ayr. SEPA will work with the responsible authorities to ensure that new information about flood risk resulting from the proposed surface water study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.

Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. In May of 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in Prestwick and Ayr the opportunity to meet and discuss the Draft Ayrshire Flood Risk Management Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.

	<p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on South Ayrshire Council, SEPA and Scottish Water and Ayrshire Road Alliance website's</p>
Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	<p>A new flood warning scheme is proposed for Prestwick. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.</p> <p>South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.</p>

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller</p>

	<p>culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment

	<ul style="list-style-type: none"> • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning</p>

	<p>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 SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

River Ayr (Potentially Vulnerable Area 12/11)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	River Ayr

Background

This Potentially Vulnerable Area spans Ayr and Mossblown (shown below). It is approximately 20km².



The area has a risk of river surface water and coastal flooding. The majority of damages are caused by surface water flooding.

There are approximately 90 residential properties at risk of flooding. The Annual Average Damages are approximately £72,000.

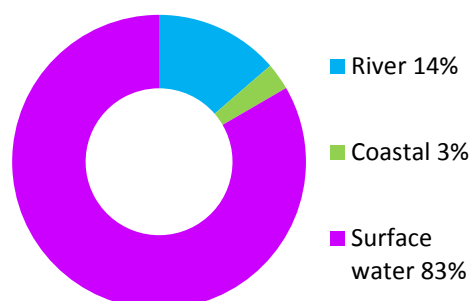


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Surface water flooding presents the greatest risk in the area, with residential areas in Forehill and Craigue at risk along with risk to main road and rail routes. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

The River Ayr meanders through the area from the east and is the main source of river flooding. The Water of Coyle merges with the River Ayr at Barclaugh where flooding would mostly affect surrounding agricultural land. The floodplain of the River Ayr is relatively narrow but residential and non-residential properties, and a small number of utilities, are at risk as it flows through Ayr.

Residential properties affected by surface water flooding experience the highest economic impact at approximately 50% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 90 to 110.

Most of impacts are within Ayr and Annbank. This includes flooding to people, non-residential properties, utilities and roads. Railways are at risk at Mossblown and two designated cultural heritage sites are also at risk.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, River Ayr Potentially Vulnerable Area 12/11.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_11_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/11

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. The objectives below have been set for River Ayr Potentially Vulnerable Area:

- Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (ID 12043)
- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 River Ayr Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
	New Flood Warning will be assessed				
Surface Water Management Plan					
Integrated Catchment Study					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/11

Action (ID):	NEW FLOOD WARNING (120820010)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	The area under consideration for a new flood warning includes properties affected by flooding from the River Ayr. Full scoping, infrastructure and a flood forecasting system will be required before a flood warning service can be delivered in this area. Communities that will benefit from a warning will be identified during development of the scheme.
Timing and status:	The scheme is due to be completed by October 2018.
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, the Government provide grant funding to enable SEPA to implement new flood warning schemes.
Coordination:	SEPA will work with the local authority and local asset owners to review recent local studies and flood risk management works.

Action (ID):	SURFACE WATER PLAN/STUDY (120430018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	South Ayrshire Council
Action Description:	<p>South Ayrshire Council will develop a surface water management plan for the area, which will establish a long term action plan to manage surface water flood risk. This plan will use the best available information to establish an understanding of the surface water flood risk and the most sustainable actions to manage this risk.</p> <p>Preliminary assessment for the highest risk areas was undertaken using strategic information provided by Scottish Water and SEPA along with the Councils records of flooding. This information was used to define the Councils focus within an Integrated Catchment Study for the Meadowhead catchment. The study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to improve understanding of flood risk in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge on interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. Outcomes from the Integrated catchment study will be used to help inform the surface water management plan.</p>
Timing and status:	A surface water management plan for these areas will be developed between 2016 and 2021.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.

Coordination:	South Ayrshire Council will co-ordinate the preparation of a surface water management plan in partnership with other responsible authorities. Scottish Water will work with local authorities and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.
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Action (ID):	SURFACE WATER PLAN/STUDY (120430019)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Prestwick and Ayr (12043)
Delivery lead:	Scottish Water in partnership with South Ayrshire Council
Action Description:	An integrated catchment study covering the Meadowhead catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Kilmarnock, Greenholm, Irvine, Prestwick and Ayr. The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and the sea. The Optioneering phase of this study will be carried out in SR15 (2015-2021).
Timing and status:	Characterisation of flood risk from the Integrated Catchment Study was completed in 2015. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).
Funding:	The Integrated Catchment Study is being funded by Scottish Water in partnership with North, East and South Ayrshire Councils. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. The Councils are funding both the Integrated Catchment project and the Surface Water Management Plan from their revenue budget.
Coordination:	Scottish Water will work collaboratively with project partners throughout the studies. Scottish Water will provide project partners with the outputs of the integrated catchment study which, where relevant, may be used to inform surface water management plans.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water

Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. In May of 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in Prestwick and Ayr the opportunity to meet and discuss the Draft Ayrshire Flood Risk Management Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on South Ayrshire Council, SEPA and Scottish Water and Ayrshire Road Alliance website's</p>

Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	<p>A new flood warning scheme is proposed for the River Ayr. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.</p> <p>South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.</p>

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p>

	Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	Reduce overall flood risk (12082) Avoid an overall increase in flood risk (12039)
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of</p>

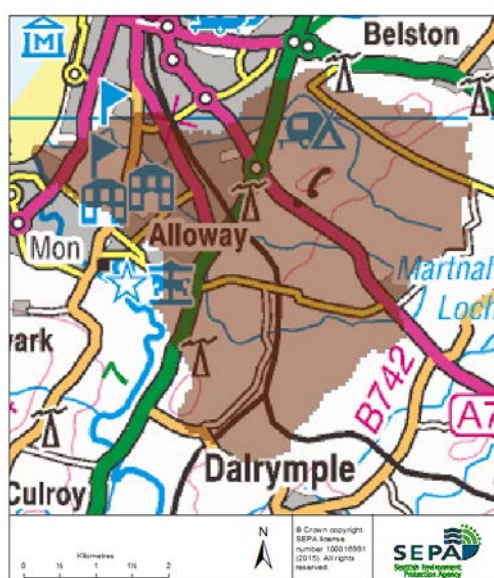
	<p>flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	<p>The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>
Coordination:	<p>South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.</p>

Ayr East (Potentiall Vulnerable Area 12/12)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	River Ayr

Background

This Potentially Vulnerable Area is located to the south of Ayr and has an area of approximately 20km² (shown below). It incorporates the Alloway, Mountcharles and Rozelle areas of Ayr and the rural catchments of the Slaphouse and Annfield Burns.



There are approximately 290 residential properties at risk of flooding. The Annual Average Damages are approximately £720,000.

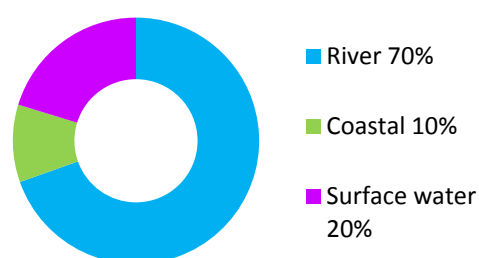


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding from the Slaphouse Burn is predicted to impact, the residential area to the south of Cunning Park and the area around Belleisle Park. At the confluence of the Annfield Burn and the Slaphouse Burn, in Rozelle, residential properties and cultural heritage sites are predicted to be at risk of flooding. Just to the south of the Potentially Vulnerable Area, the River Doon is predicted to affect the Mountcharles and Alloway areas of Ayr.

There are approximately 70 residential properties at risk from surface water flooding, notably to the south of Cunning Park. Flooding may also affect sections of the road and rail network (notably the A77). The areas at highest risk from surface water flooding have been prioritised. These priority areas were identified using SEPA flood models, supplemented with historical flood information and, where available, more detailed modelling from local authorities.

This area has a very short frontage onto the Firth of Clyde where there is potentially a risk to the residential area south of Cunning Park from coastal flooding.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 290 to 390.

Residential properties affected by river flooding experience the highest economic impact at approximately 70% of the damages.

Most of impacts are within Rozelle and Kincaidston with flooding to people, non-residential properties, utilities and roads. Railways are at risk of flooding at Broomberry and Pleasantfield. Two designated cultural heritage sites are also at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Ayr East Potentially Vulnerable Area 12/12.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_12_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/12

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. The objectives below have been set for Ayr East Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Ayr East Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/12

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to develop flood mapping in the Ayr to Ardrossan area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied. The coastal mapping and modelling process will start in 2016, with early work focussing on methodology development and data collection. Once this stage has been completed a thorough review will be carried out to identify the final mapping improvements that can be made in the area.
Timing and status:	The coastal strategic mapping and modelling will begin in 2016 and will be completed by 2019.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Ayr Seafield flood warning area which is part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Ayr. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. In May of 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in Prestwick and Ayr the opportunity to meet and discuss the Draft Ayrshire Flood Risk Management Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p>

	Further Information is provided on South Ayrshire Council, SEPA and Scottish Water and Ayrshire Road Alliance website's
Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>

Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role..
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>

Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website</p>

	http://www.sepa.org.uk/environment/land/planning/ .
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Ayr South (Potentially Vulnerable Area 12/13)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	River Doon

Background

This Potentially Vulnerable Area is located to the south of Ayr (shown below). It is approximately 10km² which includes Newark, Mountcharles, Alloway and Carcluie.



There are approximately 20 residential properties at risk of flooding. The Annual Average Damages are approximately £40,000.

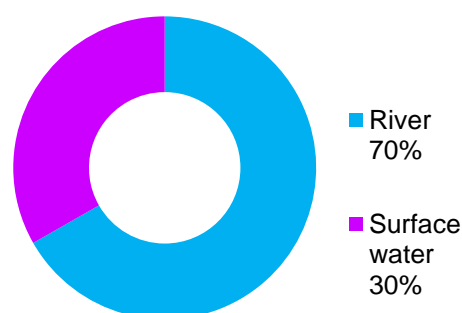


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding is primarily from the River Doon which flows in a northerly direction towards Ayr before discharging to the Firth of Clyde. Flooding from the River Doon is predicted to affect residential areas of Mountcharles and Alloway, and agricultural land from Doonholm to Monkwood. The main road link at risk is the A77.

Surface water flooding is likely to occur on agricultural and de-forested areas of land, particularly those low lying areas adjacent to the River Doon. There is potential for interaction with river flooding in this location.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 20 to 30.

Residential properties affected by river flooding experience the highest economic impact at approximately 50% of the damages. Non-residential properties also provide a notable portion of the damages.

Most of the impacts are within Alloway, Brae of Auchendrane and Nether Auchendrane. The railway line is at risk of flooding at Carcluie.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Ayr South Potentially Vulnerable Area 12/13.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_13_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/13

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. The objectives below have been set for Ayr South Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Ayr South Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/13

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Meadowhead sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. In May of 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in Prestwick and Ayr the opportunity to meet and discuss the Draft Ayrshire Flood Risk Management Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p>

	Further Information is provided on South Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.
Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and</p>

	repair on the public sewer network.
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of</p>

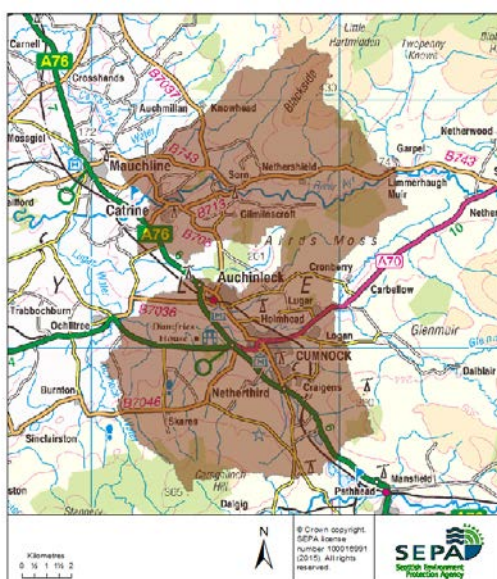
	<p>flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	<p>The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.</p>
Coordination:	<p>South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.</p>

Cumnock and Catrine (Potentially Vulnerable area 12/14)

Local Plan District	Local authority	Main catchment
Ayrshire	East Ayrshire	River Ayr

Background

This Potentially Vulnerable Area is located in the east of the Ayrshire Local Plan District and is approximately 130km². This area includes much of Catrine and Sorn in the north as well as Auchinlock, Cumnock and Netherthird in the south (shown below).



There are approximately 330 residential properties and 240 non-residential properties at risk of flooding. The Annual Average Damages are approximately £970,000.

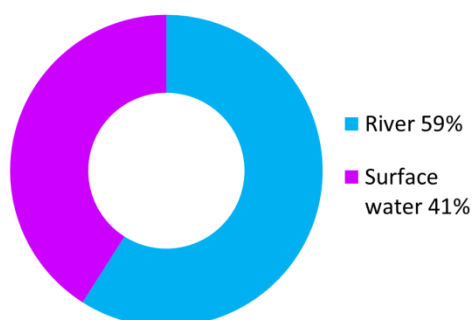


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in this area is attributed to the River Ayr and its tributaries. The River Ayr flows in a westerly direction in the north of the area, impacting upon a number of residential and non-residential properties, community facilities and utilities within Catrine and Sorn. In the south the Lugar Water (a tributary of the River Ayr) flows in a westerly direction through Lugar and Cumnock, affecting a number of residential and non-residential properties. In addition to the Lugar Water, Cumnock is also affected by river flooding from the Glaisnock Burn, a tributary of the Lugar Water which flows in a northerly direction through the centre of the town. The Auchinleck Burn is a further tributary of the Lugar Water and is predicted to impact upon residential properties and non-residential properties in the village of Auchinleck. Sections of railway line and the road network are also at risk of flooding (notably the A70 and A76).

Surface water flooding is generally located in low lying areas adjacent to the various watercourses which flow through the area. Cumnock also has isolated pockets of predicted surface water flooding in areas throughout the town. There is an existing surface water flood attenuation area upstream of Cumnock which can be further utilised if there is to be more development in the town.

Two historic opencast mines, Dalfad and Powharnal, are situated upstream of Potentially Vulnerable Area in proximity to the River Ayr and the Glenmuir Water. There is a potential flood risk relating to water overflowing from these mines should the necessary levels of maintenance and pumping not be provided.

Residential properties affected by river flooding experience the highest economic impact at approximately 45% of the damages. Non-residential properties also provide a substantial share of the damages.

Most of the impacts are within Catrine, Sorn and Cumnock with flooding to properties and infrastructure.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Cumnock and Catrine Potentially Vulnerable Area 12/14.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_14_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/14

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. The objectives below have been set for Cumnock and Catrine Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Cumnock and Catrine Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Catrine Flood Protection Study					
Property Level Protection Scheme					

The Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/14

Action (ID):	FLOOD PROTECTION STUDY (120300005)
Objective (ID):	Reduce the risk of flooding from the River Ayr to residential properties and non-residential properties in Catrine (12030)
Delivery lead:	East Ayrshire Council
Action Description:	A study will investigate the feasibility of a flood protection scheme along the River Ayr. East Ayrshire Council is currently procuring suitable flow and level monitoring installations on appropriate watercourses identified for studies, with the intention of informing those studies in areas known to have little or no information currently available. Information gaps and proposed locations are being identified in co-operation with SEPA. Once this information is available the study will look to refine understanding of the current and future flood risk in the area and investigate the feasibility of actions to reduce flooding, as prioritised in the Ayrshire Flood Risk Management Strategy.
Timing and status:	2018-2019 flood monitoring to be installed prior to study to allow information gathering
Funding:	This study will be funded through East Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	East Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. There may be negative impacts on the Catrine Voes and Woodland Local Nature Reserve through the direct footprint of defences. There is likely to be a loss of natural and semi-natural habitats and displacement of species in the footprint and vicinity of the defences. There is the potential for negative impacts on local water quality downstream of works during the construction period, which have the potential for temporary negative impacts on the Howford Bridge Site of Special Scientific Interest which is downstream on the River Ayr. However, there is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area. With direct defences there is the potential for impacts upon the setting of the Catrine Heritage Conservation Area, the Catrine Mill Water Works Scheduled Monument, the many listed buildings in the area and views of the river in the town.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA

Action Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km ² of improved surface water data is currently available within this Local Plan District.
Timing and status:	The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year 2016.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Catrineholme (Catrine) and Underwood Cumnock sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2016 and will be completed in 2019.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.

Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	PROPERTY LEVEL PROTECTION SCHEME (120290008)
Objective (ID):	Reduce the risk of the River Ayr flooding to residential properties in Sorn (12029)
Delivery lead:	East Ayrshire Council
Action Description:	<p>East Ayrshire Council is currently procuring suitable flow and level monitoring installations on appropriate watercourses identified for studies, with the intention of informing those studies in areas known to have little or no information currently available. Information gaps and proposed locations are being identified in co-operation with SEPA.</p> <ul style="list-style-type: none"> • Once this in place the Flood Study for the River Ayr will inform any property level protection requirements for the area and the monitors will form the basis for a Flood Warning scheme to support the placement.
Timing and status:	2016-2021
Funding:	These works will be funded through East Ayrshire Council's revenue budget provided by the Scottish Government.
Coordination:	East Ayrshire will co-ordinate with SEPA after the study on the River Ayr on the need/effectiveness.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action Description:	<p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the</p>

	Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>East Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on East Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>East Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	East Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	East Ayrshire Council, asset / land managers
Action Description:	<p>East Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>East Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. East Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through East Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the

	<p>Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current East Ayrshire Council Local Plan (LP) was adopted in 26th October 2010 and will be replaced in November 2016 (by the Local Development Plan) and run for a further 5 years.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site</p>

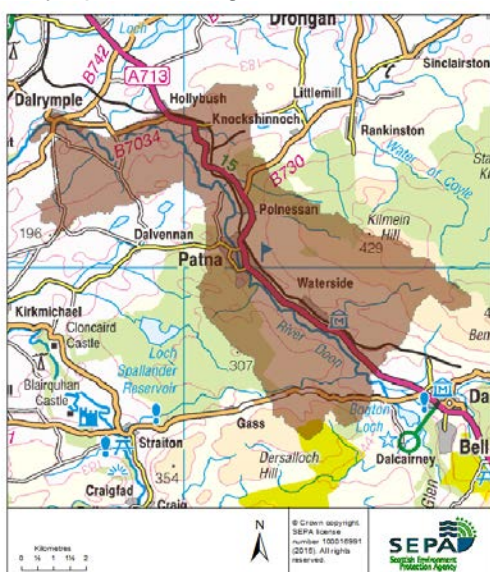
	<p>allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through East Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	East Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Dalrymple to Patna (Potentially Vulnerable Area 12/15)

Local Plan District	Local authority	Main catchment
Ayrshire	East Ayrshire Council, South Ayrshire Council	River Doon

Background

This Potentially Vulnerable Area is located to the south east of the Ayrshire Local Plan District is approximately 50km² (shown below). It encompasses an area along the River Doon between the village of Dalrymple and Bogton Loch.



There are approximately 90 residential properties at risk of flooding. The Annual Average Damages are approximately £120,000.

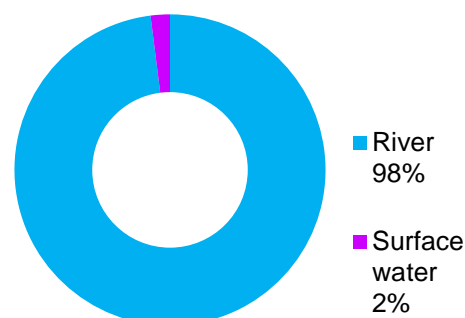


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

This area is situated within the River Doon catchment where land use is primarily hill pasture and forestry. The River Doon affects a number of residential and non-residential properties in the villages of Dalrymple, Patna and Waterside. Areas of agricultural land to the south of Waterside are also predicted to be affected by river flooding. Doon Dam on Loch Doon straddles the boundary between Ayrshire and Solway. During most conditions Loch Doon helps to reduce the force of flows however if left open during extreme conditions this dam can contribute to flooding downstream.

Surface water flooding is predicted within the natural floodplain of the River Doon on land used for agricultural purposes. There are fewer than 10 residential properties at risk however, sections of road and rail infrastructure are at risk of surface water flooding (notably the A713).

A now closed opencast mine, Dunstonhill, is situated to the east of Polnessan. There is a potential flood risk relating to water overflowing from this mine should the necessary levels of maintenance and pumping not be provided.

Residential properties affected by river flooding experience the highest economic impact at approximately 75% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 90 to 110.

Most of impacts are within Dalrymple and Patna with flooding to people, non-residential properties and roads.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Dalrymple to Patna Potentially Vulnerable Area 12/15.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_15_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/15

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. The objectives below have been set for Dalrymple to Patna Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Dalrymple to Patna Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Dalrymple Flood Protection Study					

The Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/15

Action (ID):	FLOOD PROTECTION STUDY (120310005)
Objective (ID):	Reduce the risk of flooding from the River Doon and the Primpton Burn, to residential properties in Dalrymple (12031)
Delivery lead:	East Ayrshire Council
Action Description:	A study will investigate the feasibility of a flood protection scheme, including modification of conveyance through a historic bridge and construction of direct defences. The study will also examine the current operating procedure of Loch Doon to increase the level of storage, this will be carried out in coordination with Scottish Power. Other actions may also be considered to select the most sustainable combination of actions.
Timing and status:	2020-2021 flood monitoring to be installed prior to study to allow information gathering
Funding:	This study will be funded through East Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The scope of this study was agreed with SEPA/SW, and SEPA are Vetting the report as it is produced.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. There is the potential for impacts on the Loch Doon and Ness Glen Sites of Special Scientific Interest with the storage action. There is the potential for loss of existing natural terrestrial habitats due to increased water levels; however, there could be an increase in wetland habitats. Incorporation of hydro power dams to the scheme could have negative impacts on fish passage. Downstream of these actions there may be negative impacts on water quality through increased erosion and sedimentation, which has the potential to impact upon Bogton Loch Site of Special Scientific Interest. Implementation of the storage action will have permanent negative impacts on the water body morphology. There is likely to be a loss of habitat and displacement of species in the short term during modification works which are likely to re-establish and return in the medium to long term. However, this is likely to be permanent in the footprint and vicinity of the direct defences. There is the potential for negative impacts on local water quality downstream of works during the construction period. There is the potential for impacts on the protected monuments, properties in care and listed buildings in and around Loch Doon from the storage action. With direct defences there is the potential for impacts on the setting of the Dalrymple Heritage Conservation Area, Dalrymple Bridge listed structure, the Skeldon House garden and designed landscape conservation area and views of the river in the town.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km ² of improved surface water data is currently available within this Local Plan District.
Timing and status:	The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year 2016.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120310017)
Objective (ID):	Reduce the risk of flooding from the River Doon and the Primpton Burn, to residential properties in Dalrymple (12031)
Delivery lead:	East Ayrshire Council
Action Description:	<p>An existing overflow channel on the Primpton Burn reduces the flood risk from the watercourse. The Council should investigate the current benefit which is offered by the scheme. This channel will be maintained, and will continue to manage flooding according to the design standard at the time of construction. Levels of flood risk are likely to increase over time as a consequence of climate change.</p> <p>The Primpton Burn is particularly prone to high water levels in the River Doon. East Ayrshire Council/ACCT have held meetings with Scottish Power to liaison on the operating protocols of the Doon Dam. Scottish Power have agreed to release more water earlier to mitigate against the need to open the gates only in an emergency. This earlier release is intended to lessen the impact during heavy rainfall events. This section of the Doon is an area that has been identified for a future study (2016-2021) to establish any further works required here.</p>
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through East Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Including Scottish Water with regards to the operation of the Doon Dam

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>East Ayrshire Council, South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on East Ayrshire Council, South Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>East Ayrshire and South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	East Ayrshire Council, South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Local authorities, asset / land managers

Action Description:	<p>East Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled".</p> <p>The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>East Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location.</p> <p>East Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p>

	<ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current East Ayrshire Council Local Plan (LP) was adopted in 26th October 2010 and will be replaced in November 2016 (by the Local Development Plan) and run for a further 5 years.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website</p>

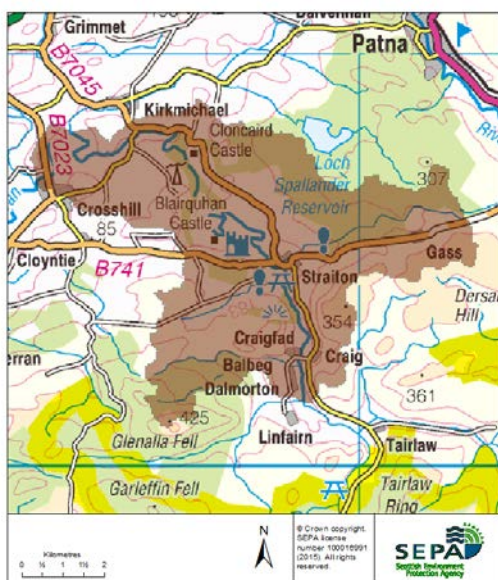
	http://www.sepa.org.uk/environment/land/planning/ .
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through East Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	East Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Straiton (Potentially Vulnerable Area 12/16)

Local Plan District	Local authority	Main catchment
Ayrshire	East Ayrshire Council, South Ayrshire Council	Water of Girvan

Background

This Potentially Vulnerable Area is located to the south east of the Ayrshire Local Plan District and is centred around the village of Straiton and Blairquhan Castle (shown below). It is approximately 40km².



The area has a risk of river and surface water flooding. The majority of damages are caused by river flooding.

There are approximately 20 residential properties at risk of flooding. The Annual Average Damages are approximately £45,000.

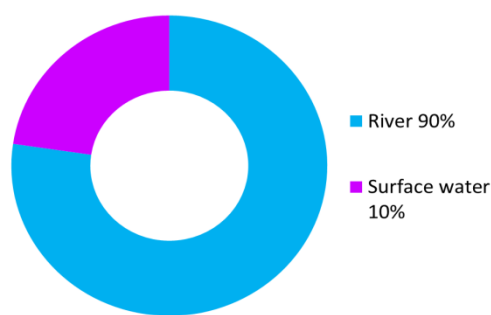


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in this area is primarily attributed to the Water of Girvan. It flows in a north westerly direction through the village of Straiton where there is a predicted risk to residential properties and road infrastructure. Additionally, there are historical reports of the bridge at Fowlers Croft silting and causing a blockage problem.

Surface water flooding is likely to occur on low lying agricultural land adjacent to the Water of Girvan.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 20 to 30.

Residential properties affected by river flooding experience the highest economic impact at approximately 40% of the damages. Roads infrastructure also provides a notable portion of the damages.

Most of the impacts are within Straiton with flooding to people, non-residential properties, utilities and roads.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Straiton Potentially Vulnerable Area 12/16.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_16_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/16

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. The objectives below have been set for Straiton Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Straiton Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

The Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/16

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including

Coordination:	community groups and the public to raise awareness of flood risk and how those affected can be better prepared.
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Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, East Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on South Ayrshire Council, East Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>East Ayrshire and South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	East Ayrshire Council, South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Local authorities, asset / land managers

Action Description:	<p>East Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled".</p> <p>The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>East Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location.</p> <p>East Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through East Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p>

	<ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p>

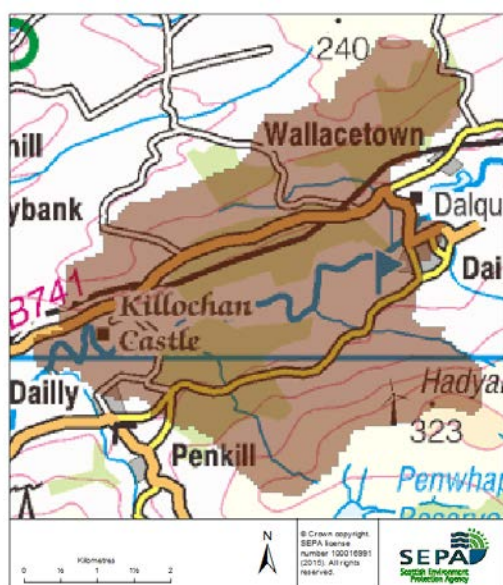
	<p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Dailly (Potentially Vulnerable Area 12/17)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	Water of Girvan

Background

This Potentially Vulnerable Area is located in the south east of the Ayrshire Local Plan District and is approximately 20km² (shown below).



The area is within the Water of Girvan catchment and incorporates the village of Dailly and forest areas such as Drummuck, Blawearry and Blackpark Wood.

There are fewer than ten residential properties at risk of flooding. The Annual Average Damages are approximately £38,000.

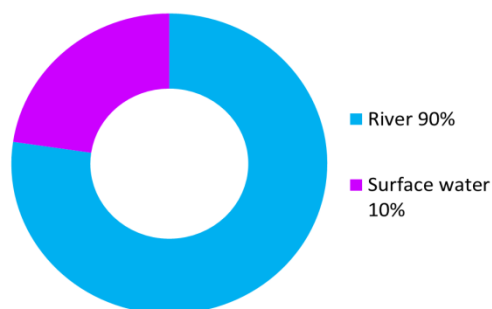


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in this area is primarily attributed to the Water of Girvan. There is a risk of river flooding to a small number of properties situated within Dailly, downstream of the Water of Girvan confluence with the Dobbingsstone Burn.

Surface water flooding is predicted to primarily affect small areas of low lying agricultural land adjacent to the Water of Girvan with very limited risk to residential properties

Residential properties affected by river flooding experience the highest economic impact at approximately 60% of the damages.

Most of the impacts are within Dailly with flooding to people, non-residential properties and roads. The railway is at risk of flooding at various locations including Dalquharran Mains.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Dailly Potentially Vulnerable Area 12/17.

[57http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_17_Full.pdf](http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_17_Full.pdf)

Objectives to reduce flooding in the Potentially Vulnerable Area 12/17

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. The objectives below have been set for Dailly Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Dailly Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

The Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/17

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including

Coordination:	community groups and the public to raise awareness of flood risk and how those affected can be better prepared.
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Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on South Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers

Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland)</p>

	<p>Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p>

	<p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Girvan (Potentially Vulnerable Area 12/18)

Local Plan District	Local authority	Main catchment
Ayrshire	South Ayrshire Council	Girvan to Lendalfoot coastal

Background

This Potentially Vulnerable Area is located in the south of the Ayrshire Local Plan District on the west coast between Girvan and Lendalfoot (shown below). It incorporates the towns of Girvan and Pinminnoch and is approximately 20km².



There are approximately 110 residential properties at risk of flooding. The Annual Average Damages are approximately £220,000.

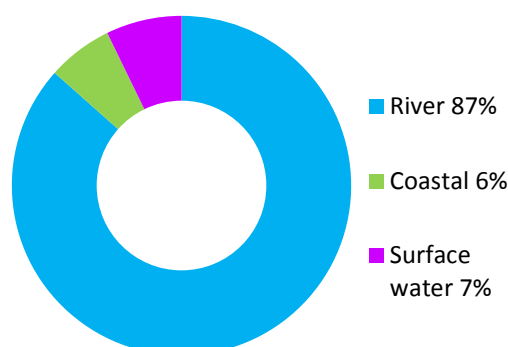


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding within this area is primarily attributed to the Mill Burn which flows in a north westerly direction through Girvan before joining the Water of Girvan immediately downstream of the A77. This is expected to impact a number of residential and non-residential properties, along with sections of the road and rail network (notably the A77). The Water of Girvan is outwith the Potentially Vulnerable Area boundary to the north but as the larger watercourse, it is likely to contribute to flooding on the lower reaches of the Mill Burn. The Mill Burn primarily flows as an open channel through a largely residential area with culverts beneath a number of roads in the area. The Myoch Burn, which flows in a westerly direction approximately 500m to the south of Girvan, is another source of river flooding which predominately affects agricultural land but also presents a risk to a caravan park.

The only urban areas at risk of surface water flooding are in the vicinity of the Mill Burn in Girvan.

There is limited risk from coastal flooding which is concentrated around the mouth of the Water of Girvan. At this location a number of residential and non-residential properties and sections of road are predicted to experience flooding.

Interaction between the various flooding sources is likely to occur on the lower reaches of watercourses as they enter the sea. High river flows in the Mill Burn and tidal surges have the potential to produce the highest impacts. Other watercourses which are likely to produce a combined effect of river and coastal flooding are the Water of Girvan and Myoch Burn. The Doune Burn and Mill Burn catchment have been studied by South Ayrshire Council to understand the flooding from these watercourses and the tidal effects of the Water of Girvan.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 110 to 130 and the number of non-residential properties from 30 to 40.

Residential properties affected by river flooding experience the highest economic impact at approximately 80% of the damages.

Most of the impacts are within Girvan with flooding to people, non-residential properties, utilities and roads.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Girvan Potentially Vulnerable Area 12/18.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_18_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/18

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. The objectives below have been set for Girvan Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- 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.

Summary of flooding 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 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 Girvan Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Girvan Flood Protection Study			
Shoreline Management Plan					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/18

Action (ID):	FLOOD PROTECTION STUDY (121030005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties and non-residential properties in Girvan (12032)
Delivery lead:	South Ayrshire Council
Action Description:	<p>The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	The Ayrshire Shoreline Management Plan is started in the of 2015 and expected to be developed by mid 2018.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , led by South Ayrshire Council.

Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment.
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Action (ID):	FLOOD PROTECTION STUDY (120320005)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties and non-residential properties in Girvan (12032)
Delivery lead:	South Ayrshire Council
Action Description:	<p>The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG).</p> <p>These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.</p>
Timing and status:	The Ayrshire Shoreline Management Plan is started in the of 2015 and expected to be developed by mid 2018.
Funding:	This study will be funded through South Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group , led by South Ayrshire Council.

Potential Environmental Impacts:	<p>Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the Girvan Estuary (water body ID 200014). The physical condition of this estuary 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.</p> <p>There are no international, national or local level environmental designations that are likely to be impacted by this action. There is likely to be a loss of semi-natural habitats in the footprint of the storage. Downstream of the new structures there may be slight negative impacts on water quality through increased erosion and sedimentation on the Mill Burn. Introduction of a control structure may cause a build up of sediment in the Mill Burn, and potentially increased localised erosion on the Girvan Estuary. There is the potential for introduction of wetland habitats to the storage area, which would provide increased biodiversity to this suburban parkland area. There is likely to be a the loss of habitat and displacement of species in the short term during culvert modification works; however, these are likely to re-establish and return in the medium to long term. There is the potential for short term water quality impacts on the Girvan Estuary during works. There is the potential for impediment to fish passage from the introduction of a control structure. There is the potential for impacts on the local townscape in the area of Victory Park.</p>
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Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will seek to develop flood mapping in the Ayr to Ardrossan area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied. The coastal mapping and modelling process will start in 2016, with early work focussing on methodology development and data collection. Once this stage has been completed a thorough review will be carried out to identify the final mapping improvements that can be made in the area.
Timing and status:	The coastal strategic mapping and modelling will begin in 2016 and will be completed by 2019.
Funding:	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Girvan. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820019)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Scottish Water
Action Description:	Scottish Water will undertake further investigation and modelling in the Girvan sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.
Timing and status:	This project will commence in 2018 and will be completed in 2020.
Funding:	Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.
Coordination:	Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120320017)
Objective (ID):	Reduce the risk of river and coastal flooding to residential properties and non-residential properties in Girvan (12032)
Delivery lead:	South Ayrshire Council
Action Description:	There are a number of sections of coastal defences in Girvan which provide some protection to the area. These defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. An annual inspection are carried out on all coastal protection structures in South Ayrshire Council with maintenance works carried out on a priority basis within available resources. Additional inspections are carried out in response to external defect reports or following severe storm events. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
Timing and status:	Ongoing
Funding:	The maintenance of flood protection scheme will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

Action (ID):	MAINTAIN FLOOD WARNING (120820030)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action Description:	SEPA will continue to maintain the Girvan Esplanade flood warning area which is part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
Timing and status:	Ongoing
Funding:	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	A flood protection study is proposed for Girvan. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection study is considered in the existing flood warning system.

Action (ID):	FLOOD FORECASTING (120820009)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	SEPA
Action 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.
Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (120820011)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (120820013)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Responsible authorities
Action Description:	<p>South Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on South Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>

Timing and status:	Ongoing
Funding:	<p>South Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	South Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (120820007)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	South Ayrshire Council, asset / land managers
Action Description:	<p>South Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>Furthermore, South Ayrshire Council inspects the coastal defences in this area on an annual basis and undertakes additional inspections as and when required. There is an annual prioritised maintenance programme for coastal defences in the South Ayrshire Council area. South Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. South Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>

Timing and status:	Ongoing
Funding:	The maintenance work will be funded through South Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	South Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (120820014)
Objective (ID):	Reduce overall flood risk (12082)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>

Delivery lead:	Planning authority
Action Description:	<p>The current South Ayrshire Local Development Plan (LDP) was adopted on 23 September 2014. It sets out how the Council envisages South Ayrshire will be developed over the 10 year period from its adoption. It will be replaced in 2019, though the town centre and retail policies element of the Plan are likely to be replaced in 2016/17. A Land Assessment Framework was used to assess the merits of submitted development sites for inclusion in the LDP. This Framework comprised a range of environmental criteria, including flood risk. The LDP contains a specific policy on flooding and development, which identifies a flood risk framework against which development proposals will be assessed. The policy indicates that development should avoid areas likely to be affected by flooding or increasing the likelihood of flooding elsewhere. It also requires impermeable surfaces to be minimised in all new developments, which must include Sustainable Urban Drainage Systems. Individual planning applications are assessed against the LDP, including LDP policy: flooding and development, and other material considerations, such as SPP. If flood risk is perceived as a possible concern, further information, such as a flood risk assessment, may be sought from the applicant. In addition, the Council maintains an interactive mapping facility, which identifies environmental constraints, including coastal and fluvial flooding. At an individual scale all planning applications received by the Council are reviewed on a variety of criteria and if flooding may be a concern the further information is sought.</p> <p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website</p>

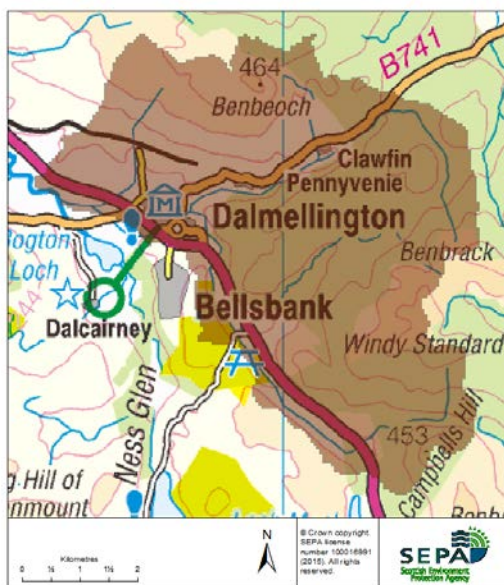
	http://www.sepa.org.uk/environment/land/planning/ .
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through South Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	South Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Dalmellington (Candidate Potentially Vulnerable Area 12/19c)

Local Plan District	Local authorities	Main catchment
Ayrshire	East Ayrshire Council	Muck Water

Background

This candidate Potentially Vulnerable Area is located to the south of the Ayrshire Local Plan District around Dalmellington and is approximately 35km² (shown below).



There are approximately 50 residential properties at risk of flooding. The total Annual Average Damages are approximately £140,000.

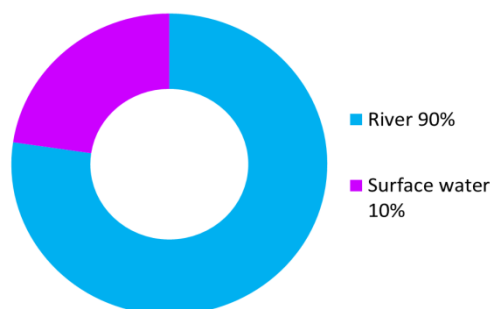


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

This area was not originally identified as a Potentially Vulnerable Area in 2011. However, updated information on flood risk from the new hazard maps identified that this area should be regarded as a candidate Potentially Vulnerable Area due to the risk to people and properties.

River flooding poses the largest flood risk to the area, with the majority being to residential properties within Dalmellington. The Muck Water flows from the south of through a steep forest area parallel to the A713 before flowing through Dalmellington after which it joins the River Doon. The Linn Water originates in forests to the north and flows around Dalmellington. The Linn Water joins the Muck Water to the south west of the town before joining the River Doon. The River Doon flows to the south of the candidate Potentially Vulnerable Area boundary where there is a wide floodplain at Bogton Loch. The largest area of flood risk is to the south west of Dalmellington near the confluence of the three watercourses. There are sections of road and rail infrastructure at risk of flooding (notably the A713 and B741).

There are a small number of isolated areas at risk of surface water flooding and these are predominantly in rural locations.

Damages to residential properties experience the highest economic impact at approximately 60% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 50 to 60.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Dalmellington Potentially Vulnerable Area 12/19c.

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_19_Full.pdf

Objectives to reduce flooding in the Potentially Vulnerable Area 12/19c

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. The objectives below have been set for Dalmellington Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12101)
- 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.

Summary of flooding 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 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 Dalmellington Potentially Vulnerable Area.

Summary of flooding actions

Flood protection scheme/work	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 management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Dalmellington Flood Protection Study					

The Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

Actions to manage flooding in Potentially Vulnerable Area 12/19c

Action (ID):	FLOOD PROTECTION STUDY (120330005)
Objective (ID):	Reduce the risk of flooding from the Muck Water, to residential properties in Dalmellington (12033)
Delivery lead:	East Ayrshire Council
Action Description:	A study will investigate the feasibility of a flood protection scheme along the Muck Water. East Ayrshire Council is currently procuring suitable flow and level monitoring installations on appropriate watercourses identified for studies, with the intention of informing those studies in areas known to have little or no information currently available. Information gaps and proposed locations are being identified in co-operation with SEPA. Once this information is available the study will look to refine understanding of the current and future flood risk in the area and investigate the feasibility of actions to reduce flooding, as prioritised in the Ayrshire Flood Risk Management Strategy.
Timing and status:	2019-2020 flood monitoring to be installed prior to study to allow information gathering
Funding:	This study will be funded through East Ayrshire Council's revenue budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders.
Potential Environmental Impacts:	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. There is likely to be a loss of semi-natural habitats and displacement of species in the footprint and vicinity of the defences. There is the potential for negative impacts on local water quality downstream of works during the construction period, which has the potential for slight temporary impacts on the Dalmellington Moss Site of Special Scientific Interest. There is the potential for impacts on the setting of the Dalmellington Heritage Conservation Area and the Doon Tavern and Dalmellington Inn listed buildings.

Action (ID):	FLOOD FORECASTING (121010009)
Objective (ID):	Reduce overall flood risk (12101)
Delivery lead:	SEPA
Action 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.

Timing and status:	Ongoing
Funding:	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
Coordination:	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Action (ID):	SELF HELP (121010011)
Objective (ID):	Reduce overall flood risk (12101)
Delivery lead:	—
Action 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. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
Timing and status:	Ongoing
Funding:	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
Coordination:	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	AWARENESS RAISING (121010013)
Objective (ID):	Reduce overall flood risk (12101)
Delivery lead:	Responsible authorities
Action Description:	<p>East Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing</p>

	<p>activity and promotion of SEPA's flood forecasting and warning services (Floodline).</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on East Ayrshire Council, SEPA, Scottish Water and Ayrshire Road Alliance website's.</p>
Timing and status:	Ongoing
Funding:	<p>East Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
Coordination:	East Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

Action (ID):	MAINTENANCE (121010007)
Objective (ID):	Reduce overall flood risk (12101)
Delivery lead:	East Ayrshire Council, asset / land managers
Action Description:	<p>East Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled".</p> <p>The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>East Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location.</p> <p>East Ayrshire Council also works with riparian landowners to ensure</p>

	that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk. Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.
Timing and status:	Ongoing
Funding:	The maintenance work will be funded through East Ayrshire Council's Revenue Budget provided by Scottish Government.
Coordination:	East Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Action (ID):	EMERGENCY PLANS/RESPONSE (121010014)
Objective (ID):	Reduce overall flood risk (12101)
Delivery lead:	Category 1 and 2 Responders
Action Description:	<p>The Civil Contingencies team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <ul style="list-style-type: none"> • mitigate the harmful effects of the emergency on the environment • bring about a swift return to normal life in the communities and environment affected • encourage all agencies and organisations to prepare for their role.
Timing and status:	Ongoing
Funding:	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
Coordination:	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

Action (ID):	PLANNING POLICIES (120390001)
Objective (ID):	Reduce overall flood risk (12101) Avoid an overall increase in flood risk (12039)
Delivery lead:	Planning authority
Action Description:	<p>The current East Ayrshire Council Local Plan (LP) was adopted in 26th October 2010 and will be replaced in November 2016 (by the Local Development Plan) and run for a further 5 years.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website http://www.sepa.org.uk/environment/land/planning/.</p>
Timing and status:	Ongoing
Funding:	The development and review of the Council's Planning Policies and Guidance notes will be funded through East Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
Coordination:	East Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.

Annex x: Supporting information

1. Sources of flooding described in this strategy

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

There can be interactions between these sources of flooding, but for the purposes of this strategy they are dealt with independently.

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

- **Groundwater** is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.
- **Reservoir breaches** have been assessed under separate legislation. Further information and maps can be found on SEPA's website.
- The Flood Risk Management Act (Scotland) 2009 does not include powers for SEPA or responsible authorities to assess or manage **coastal erosion**. SEPA have included consideration of erosion in the Flood Risk Management Strategies by identifying areas that are likely to be vulnerable to erosion and therefore 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 how coastal actions interact with coastal erosion.
- **Wave overtopping.** The information on coastal flooding in this strategy is based on SEPA modelling using still water level predictions. The method used simplifies the 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 they may underestimate of coastal flood risk in some areas. In locations with wide and flat floodplains, the modelling may overestimate flood risk because the volumes of water able to inundate an area over a tidal cycle are not taken into account. 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 selection of appropriate actions to address coastal flood risk.

2. Understanding commonly used terms in flood risk management

Below are explanatory notes for the approach taken in this strategy and commonly used terms in flood risk management. 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.

Likelihood of flooding	Return period
High	10 year
Medium	200 year
Low	1000 year

- **Annual Average Damages** have been used to assess the potential economic impact of flooding within an area. These are the average economic damages per year when assessed over a very long period of time. They are derived from the estimated economic damages from all sources of flooding to the following receptors: agriculture, residential properties (direct and indirect), non-residential properties, vehicles, emergency services and roads within the area.

3. Flood Risk Management Strategy

The following is extracted from the 'Managing flooding in Scotland' section of the Flood Risk Management Strategy.

National Flood Risk Assessment

SEPA published a National Flood Risk Assessment 2011. It significantly improved our understanding of the causes and consequences of flooding, and identified areas most vulnerable to floods. It was the first step to delivering a risk-based, sustainable and plan-led approach to flood risk management.

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. This combined understanding of where flooding is likely to occur, and the impact when it does, helped target the efforts of organisations managing flood risk to people, the economy and the environment.

Potentially Vulnerable Areas and Local Plan Districts

Based on the National Flood Risk Assessment, SEPA identified where the estimated impact of 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 within Scotland.

For flood risk management purposes, Scotland was divided into 14 Local Plan Districts. Each Local Plan District will have a Flood Risk Management Strategy and a Local Flood Risk Management Plan.

Lead local authority

The FRM Act requires a lead local authority to be identified for each Local Plan District. The lead local authority is crucial to the successful implementation of the FRM Act and, as such, must perform several important functions over and above the general duties and powers given to local authorities elsewhere in the FRM Act.

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 of co-ordinated actions to reduce flood risk within the Local Plan District. Although the lead local authority is responsible for the production of the plan, its content will be drawn from and agreed by all local authorities, other responsible authorities and SEPA within the Local Plan District.

Natural flood management assessment and mapping of artificial and natural features

The new approach to Flood Risk Management requires SEPA to consider whether techniques that restore, enhance or alter natural features and characteristics can contribute to managing flood risk. This means looking at the potential to work with natural hydrological and morphological processes.

Because the National Flood Risk Assessment provides only a strategic assessment of flood risk, further refined assessments may be required in Potentially Vulnerable Areas, including the mapping of artificial and natural features whose removal could increase flood risk.

The development of catchment characteristics and methodologies, to assess the potential for natural flood management, will take place throughout 2012. The work to identify natural flood management actions, that could contribute to the management of flood risk, will be carried out in 2012 as part of the appraisal process. The information will then be collated and published in 2013. The assessment of natural flood management will be a consideration in the setting of objectives and actions in the Flood Risk Management Strategies.

Flood hazard and flood risk maps

The production of flood hazard and flood risk maps will improve our understanding of flooding and help inform the selection of actions required to manage flood risk in Potentially Vulnerable Areas. Work on production of these maps will begin in January 2012. These maps will show details of flood events for a range of probabilities and will cover flooding from rivers, the sea, sewers, surface water run-off and groundwater.

A flood hazard map will show information that describes the nature of a flood, such as the extent of flooding, water level, depth and velocity where appropriate.

A flood risk map provides detail on the impacts on people, the economy, cultural heritage and the environment.

List of Acronyms and Abbreviations

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

Term	Definition
	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.
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.

Term	Definition
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	<p>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.</p> <p>The potential damages avoided by implementation of a flood risk management action are commonly referred to as the benefits of that action. When comparing the effectiveness of different actions, it is useful to consider estimated damages and damages avoided across the lifespan of the action. Within the FRM Strategies, a 100 year appraisal period has been used as standard. This allows costs, damages and benefits across this time frame to be compared in present value terms.</p> <p>See also 'Annual Average Damages'</p>
Demountable defences	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.

Term	Definition
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 can be prone to flooding and leave a short time for warning or actions.
Flood	In the terms of the FRM Act, 'flood' means a temporary covering by water, from any source, of land not normally covered by water. This does not include a flood solely from a sewerage system, as a result of normal weather or infrastructure drainage. A flood can cause significant adverse impacts on people, property and the environment. drainage.
Flood bund	A constructed retaining wall, embankment or dyke designed to protect against flooding to a specified standard of protection.
Flood defence	Infrastructure, such as flood walls, embankments or flood storage intended to protect an area against flooding to a specified standard of protection.
Flood extent	The area that has been affected by flooding, or is at risk of flooding from one or more sources for a particular likelihood.
Flood forecasting	SEPA operates a network of over 250 rainfall, river and coastal monitoring stations throughout Scotland that generate data 24 hours a day. This hydrological information is combined with meteorological information from the Met Office. A team of experts then predict the likelihood and timing of river, coastal and surface water flooding. This joint initiative between SEPA and the Met Office forms the Scottish Flood Forecasting Service.
Flood frequency	The probability that a particular size/severity of flood will occur in a given year (see likelihood).
Flood gate	An adjustable, sometimes temporary, barrier used as a flood defence to control the flow of water within a water system or during a flood. Flood gates can also be part of operational flood defences or protect individual buildings or sites.
Flood guard	Flood guards cover a variety of types of door and window barriers that can be fitted to individual properties and operated by the owners / occupiers prior to a flood event. They act as a physical barrier to water entering the property and can provide protection against frequent and relatively shallow flooding.
Flood hazard	In terms of the FRM Act, hazard refers to the characteristics (extent, depth, velocity) of a flood.
Flood hazard map	Flood hazard maps are required by the FRM Act to show information that describes the nature of a flood in terms of the source, extent, water level or depth and, where appropriate, velocity of water. Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website.
Flood Prevention Scheme / Flood Protection Scheme (FPS)	A flood protection scheme, as defined by the FRM Act, is a scheme by a local authority for the management of flood risk within the authority area. This includes defence measures (flood prevention schemes) formerly promoted under the Flood Prevention (Scotland) Act 1961.
Flood protection study	Flood protection studies aim to refine understanding of the hazard and risk associated with flooding in a particular area, catchment or coastline. They will involve detailed assessment of flood hazard and /

Term	Definition
	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.
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.

Term	Definition
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}
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.

Term	Definition
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.
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

Term	Definition
	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, 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

Term	Definition
	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.
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.

Term	Definition
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.

Glossary

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- 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/lmr/> 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=ufmfs#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