

Flood Risk Management (Scotland) Act 2009:

Clyde and Loch Lomond Local Plan District

Local Flood Risk Management Plan

June 2016



Published by: Glasgow City 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 Clyde and Loch Lomond 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 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 Clyde and Loch Lomond Local Plan District. The Plan translates this legislation into actions to reduce the damage and distress caused by flooding over the first planning cycle from 2016 to 2022. This Plan should be read in conjunction with the Flood Risk Management Strategy that was published for the Clyde and Loch Lomond area by the Scottish Environment Protection Agency in December 2015.

The Clyde and Loch Lomond Local Plan District Local Flood Risk Management Plan is published by Glasgow City Council on behalf of a partnership comprising 10 local authorities - Argyll and Bute Council, East Dunbartonshire Council, East Renfrewshire Council, Glasgow City Council, Inverclyde Council, North Lanarkshire Council, Renfrewshire Council, South Lanarkshire Council, Stirling Council and West Dunbartonshire Council – SEPA and a number of responsible authorities - Scottish Water; Forestry Commission Scotland; and Loch Lomond and the Trossachs National Park Authority.

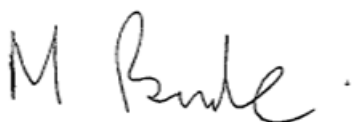
In summary, there are 22 catchments that have been designated as being Potentially Vulnerable Areas within the Clyde and Loch Lomond Local Plan District. These are areas within which clusters of properties are at significant risk of flooding. Across the Local Plan District there are 21,000 residential and 8,600 non-residential properties at risk of flooding. The estimated annual average damage of these flood risks is approximately £67 million per annum.

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 19 flood protection schemes or works; 24 flood protection studies; as well as flood warning schemes, surface water management plans, and natural flood management studies and works.

Reducing flood risk is a shared responsibility as everyone is responsible for protecting themselves and their property 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.

This Plan therefore provides the blueprint upon which local authorities, SEPA, Scottish Water and other responsible authorities will deliver their flood risk management responsibilities in a sustainable manner. However, the actions in this Plan can only be delivered with the continued support of all the public bodies, The Scottish Government and, most importantly, you and your communities.

I would like to thank all those who contributed to the development of this Plan which will help shape the way in which flood risk and the impacts of flooding are reduced across the Clyde and Loch Lomond Local Plan District.



Councillor Maureen Burke
Convenor, Clyde and Loch Lomond Local Plan District Joint Committee





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List of Acronyms and Abbreviations

AAD	Average Annual Damages
BCR	Benefit Cost Ratio
CaLL	Clyde and Loch Lomond
CoSLA	Convention of Scottish Local Authorities
CSO	Combined Sewer Overflow
EIA	Environmental Impact Assessment
FPS	Flood Prevention / Protection Scheme
FRA	Flood Risk Assessment
FRM	Flood Risk Management
FRM Act	Flood Risk Management (Scotland) Act 2009
FRMP	Flood Risk Management Plan
FRMS	Flood Risk Management Strategies (prepared by SEPA)
HRA	Habitats Regulations Appraisal
ICS	Integrated Catchment Study
LA	Local Authority
LFRMP	Local Flood Risk Management Plan
LLA	Lead Local Authority
LNR	Local Nature Reserve
LDP	Local Development Plan
LPD	Local Plan District
MGSDP	Metropolitan Glasgow Strategic Drainage Partnership
NFM	Natural Flood Management
NFRA	National Flood Risk Assessment
PVA	Potentially Vulnerable Area
PLP	Property Level Protection
Q&S	Quality and Standards
RA	Responsible Authority
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SAIFF	Scottish Advisory and Implementation Forum for Flooding
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SG	Supplementary Guidance
SNH	Scottish Natural Heritage
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
SWMP	Surface Water Management Plan
UID	Unsatisfactory Intermittent Discharge

1 Flood Risk Management in the Clyde and Loch Lomond Local Plan District

1.1 What is a Local Flood Risk Management Plan?

This Local Flood Risk Management Plan (the 'Plan') has been developed to detail the actions adopted to reduce the devastating and costly impact of flooding in the Clyde and Loch Lomond Local Plan District. The Plan supplements the Flood Risk Management Strategy (the 'Strategy'), which sets out the actions to tackle flooding, be it in our cities or rural areas and be it from rivers, the sea or from surface water. The Strategy identifies where the risk of flooding and benefits of investment are greatest: the Plan details the prioritised actions that will be delivered with this investment. There are 13 other Strategies and Plans for the other Local Plan Districts in Scotland.

The Flood Risk Management Strategy for the Clyde and Loch Lomond Local Plan District is available on the SEPA website here – <http://apps.sepa.org.uk/FRMStrategies/>

By publishing the Strategy and 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.

The Plan details how and when the actions to deliver the goals set in the Strategy are to be delivered in the first six-year planning cycle, from 2016 to 2022 (Cycle 1). They therefore describe the short-term direction of flood risk management in the Clyde and Loch Lomond Local Plan District, which is expanded upon in the Strategy. The actions in this Plan are based on agreed objectives for tackling floods in higher 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.

It is through this risk-based and plan-led approach that flood management will improve for the individuals, communities and businesses at risk in the Clyde and Loch Lomond Local Plan District.

The Plan is published by Glasgow City Council, Lead Authority for the Clyde and Loch Lomond Local Plan District. The Plan has been prepared in collaboration with and agreed by Argyll and Bute Council, East Dunbartonshire Council, East Renfrewshire Council, Inverclyde Council, North Lanarkshire Council, Renfrewshire Council, South Lanarkshire Council, Stirling Council and West Dunbartonshire Council, SEPA, Scottish Water, Forestry Commission Scotland and Loch Lomond and the Trossachs National Park Authority. The Plan is a requirement under the Flood Risk Management (Scotland) Act 2009 and fulfils requirements within the European Commission's Floods Directive.

1.2 How to read this plan

The Local Flood Risk Management Plan has three sections:

Chapter 1 contains background information on the approach taken in Scotland to manage flooding. 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. And, most importantly, how flood risk management planning is delivered locally to each Local Plan District through a Local Flood Risk Management Plan.

Chapter 2 provides background information on the Clyde and Loch Lomond Local Plan District, an overview of flood risk and additional information on river, coastal and surface water flooding. The chapter also provides a summary of the Potentially Vulnerable Area specific actions and sets out the Local Plan District wide actions together with other flood risk management activities. Finally the chapter provides information on the funding and co-ordination arrangements for the delivery of actions set out in the Plan and confirms the commitment to use natural features to manage flood risk where beneficial.

Chapter 3 is the most important section for those individuals and communities seeking to understand their flood risk and its management. Information is provided for each Potentially Vulnerable Area, a catchment within which a significant number of receptors are at risk of flooding. For each Potentially Vulnerable Area there is a short description of the causes and consequences of flooding, with area specific agreed goals or objectives clearly set out. And, most importantly, the actions that will deliver progress against these goals over the first six-year planning cycle from 2016 and 2022 are described, including when they will be implemented and which organisation is responsible.

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

1.3 How we have developed the Plan?

Coordination, collaboration and partnership working

Many organisations and individuals are involved in helping to improve flood management in Scotland. A piecemeal approach to tackle flooding does not work. Flooding is too complex, and the causes and impacts too complicated for any single organisation to address alone. Flooding disregards local authority boundaries and similarly cuts across the responsibilities of organisations such as SEPA, Scottish Water and emergency responders. Flood management requires the coordination set out in this Plan (and parallel Strategy) to be successful. A willingness to collaborate by those responsible for flood management is essential.

The Plan has been developed in partnership. Those organisations responsible are working more closely together than ever before. In local partnerships, here and throughout Scotland, SEPA has provided the technical analysis and ensured a consistent national approach is taken. It has provided the evidence upon which to make sensible, informed decisions. Local authorities and Scottish Water have made sure that local knowledge and expertise has informed the decision-making. The National Park Authority and Forestry Commission Scotland have also contributed. The Plan has been developed by:

Glasgow City Council (Lead Authority);

Argyll and Bute Council;

East Dunbartonshire Council;

East Renfrewshire Council;

Inverclyde Council;

North Lanarkshire Council;

Renfrewshire Council;

South Lanarkshire Council;

Stirling Council;

West Dunbartonshire Council;

Scottish Water;

SEPA;

Forestry Commission Scotland; and

Loch Lomond and The Trossachs National Park Authority.

Roles and responsibilities for flood risk management planning

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life.

However, the responsibility for planning flood risk management falls in the main to SEPA, local authorities and Scottish Water.

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.

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. Local authorities have been working collaboratively to develop these. It is the responsibility of your local authority to implement its flood protection actions agreed within the Plan from new engineering projects to clearance and repair of watercourses. During severe flooding, local authorities will work with the emergency services and coordinate shelter for people evacuated from their homes.

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 within 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.

Loch Lomond and The Trossachs National Park Authority and Forestry Commission

Scotland are responsible authorities for the Clyde and Loch Lomond Local Plan District. Both organisations have a big role in developing natural flood management actions.

Further details on some of the key roles are outlined in Annex 2.

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 where most can be achieved. Two statutory public consultations were held during the development of the Strategies and 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 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 Strategies (and Plans) have benefitted from input from Local Advisory Groups, providing important area-based 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, Forestry Commission Scotland, the National Park Authorities and other key interested organisations have assisted each other and developed industry best practice guidance for flood risk management planning.

In February 2016 a non-statutory consultation was undertaken by the Clyde and Loch Lomond local authorities to raise awareness of flood risk, the Flood Risk Management Strategy document and the development of the Local Flood Risk Management Plan.

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, the Scottish Government, local authorities, CoSLA and Scottish Water.

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

Strategic Environmental Assessment and Habitats Regulations Appraisal

Glasgow City Council undertook screening to determine whether a Strategic Environmental Assessment (SEA) was required to support the development of the Plan. A screening report was submitted to the SEA Gateway to seek the views of the Consultation Authorities (SEPA, SNH and Historic Environment Scotland). The screening report documented that an SEA had been undertaken by SEPA for the Clyde and Loch Lomond Flood Risk Management Strategy and that the actions set out in the Plan mirrored the actions assessed under the Strategy. On this basis, the screening report concluded that an SEA would not be required as the Plan would not have any significant environmental effects over and above those assessed for the Strategy. The views expressed by the Consultation Authorities supported the conclusion that an SEA was not required, whereupon Glasgow City Council determined that an SEA was not required.

Glasgow City Council also undertook a Habitats Regulations Appraisal (HRA). The scope of our appraisal was a review of the HRA prepared by SEPA to support the development of the Clyde and Loch Lomond Flood Risk Management Strategy, whereupon we adopted the SEPA appraisal outputs. This platform has been built upon to further develop the Appropriate Assessment, including identifying mitigation actions, for the Cycle 1 actions identified as having the potential to adversely affect a European site. This has allowed Glasgow City Council, as the plan-making body, to ascertain that implementation of the Plan will not adversely affect the integrity of any European site. Scottish Natural Heritage was consulted on our appraisal and has confirmed that they are content with the Appraisal produced.

1.4 Links with other plans, policies, strategies and legislative requirements

The 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 Strategy and 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 Plans and Strategies.

Local Development Plans

Planning plays a vital role in flood risk management. Scottish Planning Policy requires that Local Development Plans take account of Flood Risk Management Strategies and Plans. Local Development Plan strategies and policies, together with associated Supplementary Guidance, should set the direction of travel for making space for water and sustainable management of flood risk. Local Authorities may develop Area Specific Guidance to manage areas such as those where Surface Water Management Plans are programmed, and Local Development Plan policies and associated Supplementary Guidance may require that this is taken into consideration when making decisions on planning proposals. Relevant Authorities will perform their statutory duties with a view to reducing overall flood risk. Integrating Flood Risk Management and Planning will be iterative and will develop through the Local Development Plan Cycle and Flood Risk Management Planning Cycle. Scottish Planning Policy presumes against building on floodplains unless in exceptional circumstances.

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 Water's customers have told them that reducing internal property flooding from sewers is a high priority and this is reflected in Scottish Water's Business Plan commitments for the period 2015-2021. Addressing sewer flooding is of the highest importance to Scottish

Water, as highlighted by their customers who have helped shape the investment plans for 2015-2021.

In recognition of this high priority, within the period 2015-2021, Scottish Water will invest circa £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 is investing circa £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 Potentially Vulnerable Areas 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.

1.5 Supplementary and Implementation Parts

This Plan consists of both Supplementary and Implementation parts, as required by Clause 34 of the Flood Risk Management Act.

1.6 Next steps and monitoring progress

The Plan runs for six years from June 2016. Over this period the Clyde and Loch Lomond Local Plan District partnership will continue to meet periodically to monitor progress towards implementing the actions detailed in Chapters 2 and 3.

Between years 2 and 3 of the Flood Risk Management cycle (i.e. before June 2019), Glasgow City 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 Actions.

Between years 5 and 6 of the Flood Risk Management cycle (i.e. before June 2022), Glasgow City Council, as lead authority will publish a report on the Plan containing an assessment of the progress made towards implementing the current Actions, a summary of the current Actions which were not implemented, with reasons for their non-implementation, and a description of any other Actions implemented since the plan was finalised which have contributed to the achievement of the objectives summarised in the Plan.

The Lead Authority will make these reports available for public inspection.

1.7 Licensing acknowledgements

Full licensing acknowledgements can be found in Annex 6 of this Plan.

2 Managing Flood Risk in the Clyde and Loch Lomond Local Plan District

This chapter provides background information on the Clyde and Loch Lomond Local Plan District, an overview of flood risk and additional information on river, coastal and surface water flooding. The chapter also provides a summary of the Potentially Vulnerable Area specific actions and sets out the Local Plan District wide actions together with other flood risk management activities. Finally the chapter provides information on the funding and co-ordination arrangements for the delivery of actions set out in the Plan and confirms the commitment to use natural features to manage flood risk where beneficial.

More detailed information on the Local Plan District and the causes of flooding is provided in the Clyde and Loch Lomond Flood Risk Management Strategy, available on the SEPA website here - <http://apps.sepa.org.uk/FRMStrategies/>

2.1 Local Plan District background

The Clyde and Loch Lomond Local Plan District extends from Loch Lomond in the north to Leadhills in the south, and includes part of the Loch Lomond and The Trossachs National Park (see Figure 1). This district has a total area of approximately 4,800km² and is primarily served by 10 local authorities. The vast majority of properties at risk of flooding within the Local Plan District are located within the 22 Potentially Vulnerable Areas and the one candidate Potentially Vulnerable Area.

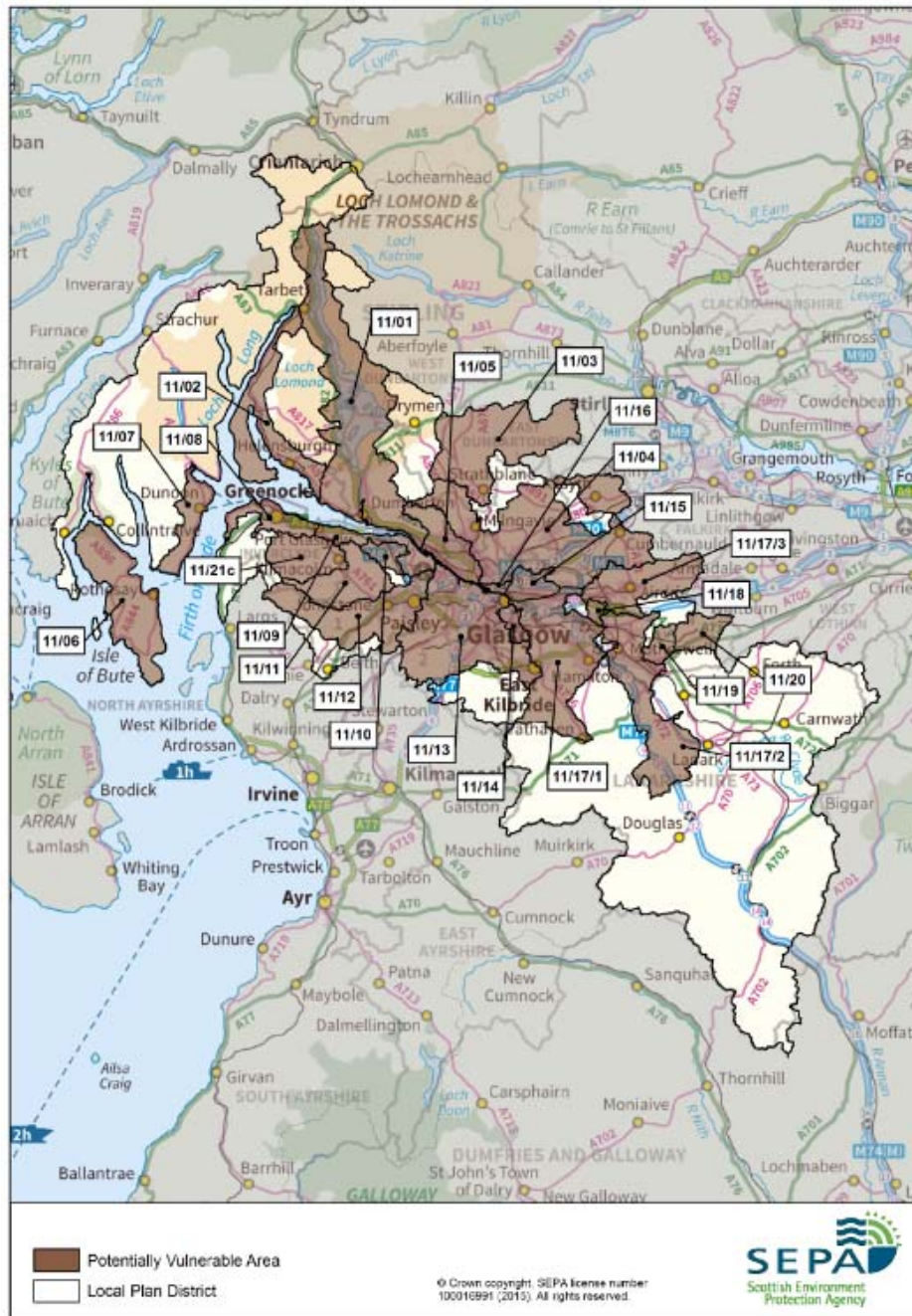


Figure 1: Clyde and Loch Lomond Local Plan District with Potentially Vulnerable Areas identified

An interactive map of the Clyde and Loch Lomond Local Plan District is available on the SEPA website here - <http://apps.sepa.org.uk/FRMStrategies/clyde-loch-lomond.html>

2.2 Flood Risk in the Clyde and Loch Lomond Local Plan District

SEPA has produced national flood maps for Scotland. The maps, first published online in January 2014, are designed to help you understand how you could be affected by flooding from river, coastal and surface water. Further information regarding the development of the flood maps and providing a link to the maps, is available online on the SEPA website here – <http://www.sepa.org.uk/environment/water/flooding/flood-maps/>

There are approximately 21,000 residential properties and 8,600 non-residential properties at risk of flooding within the Local Plan District. This equates to 27% of all properties at risk of flooding nationally. Within the Local Plan District, approximately 3% of the residential properties and 8% of non-residential properties are at risk and it is estimated that 97% of these properties are located within Potentially Vulnerable Areas. The Annual Average Damages from flooding are approximately £67 million per annum.

River flooding is the main source of flooding in the Local Plan District. In the Clyde and Loch Lomond Local Plan District, river flooding is reported across three distinct river catchments – the River Clyde catchment group, the River Leven (Dunbartonshire) catchment group and the Firth of Clyde catchment group. Coastal flooding and surface water flooding are reported across the whole Local Plan District.

The Annual Average Damages caused by river flooding are £28 million, with £19 million Average Annual Damages caused by coastal flooding and £20 million Average Annual Damages associated with surface water flooding. The relative proportion of flooding from each source is shown below in Figure 2.

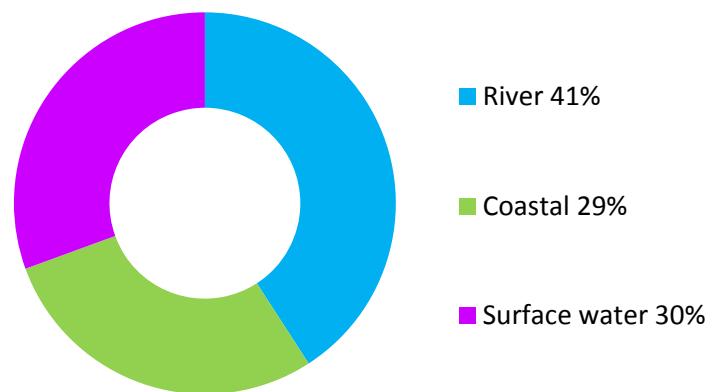


Figure 2: Annual Average Damages by flood source

Figure 3 and Table 1 show the main areas at flood risk, number of properties at risk and the associated Annual Average Damages caused by flooding. This includes physical damage to residential properties, non-residential properties, transport and agriculture, but excludes the cost of economic disruption caused by flooding. Please note that economic damages to airports and rail infrastructure were not assessed as strategic information on damages at this scale was not available.

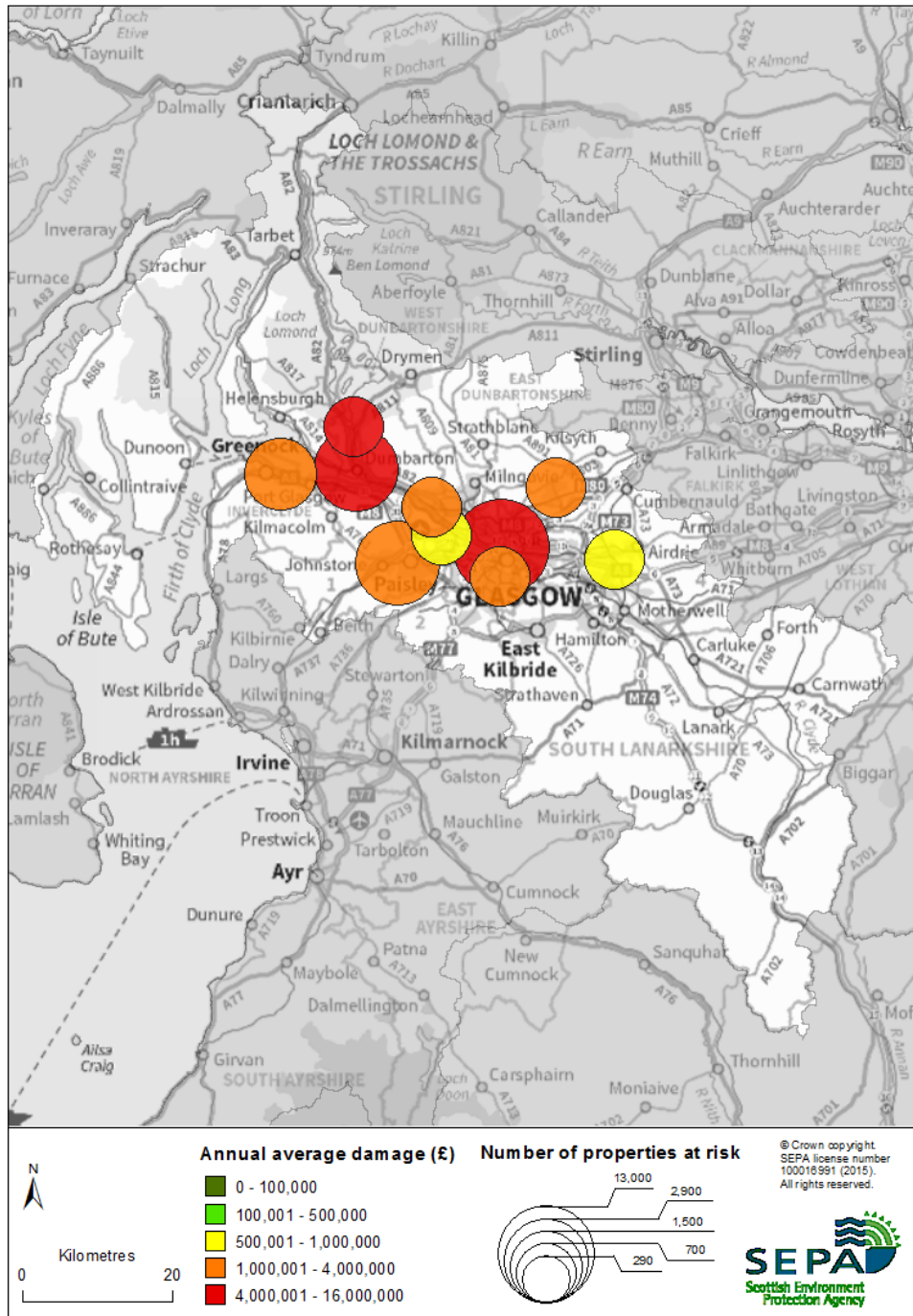


Figure 3: Clyde and Loch Lomond Local Plan District showing areas with most properties at risk of flooding and associated damages

Population Centre	Residential + non-residential properties at risk of flooding	Annual Average Damages
Glasgow City	13,000	£10,000,000
Paisley and Johnstone	2,900	£3,400,000
Dumbarton	2,000	£12,000,000
Gourock/Greenock/Port Glasgow	1,300	£2,100,000
Kirkintilloch	690	£1,100,000
Alexandria and Balloch	680	£4,100,000
Rutherglen	680	£1,900,000
Renfrew	630	£1,000,000
Coatbridge/Airdrie	550	£730,000
Clydebank	520	£2,400,000

Table 1: Main areas at risk of flooding

River flooding

There are estimated to be approximately 11,620 residential and non-residential properties at risk of river flooding. The Annual Average Damages caused by river flooding are approximately £28 million. The distribution of river flooding is shown in Table 2.

River Catchment	Residential + non-residential properties at risk of flooding	Annual Average Damages
River Clyde catchment group	9,600	£22,000,000
River Leven (Dunbartonshire) catchment group	1,100	£4,200,000
Firth of Clyde catchment group	920	£1,800,000
Totals	11,620	£28,000,000

Table 2: Distribution of river risks and damages flooding

Figure 4 shows the three distinct river catchments in the Clyde and Loch Lomond Local Plan District.

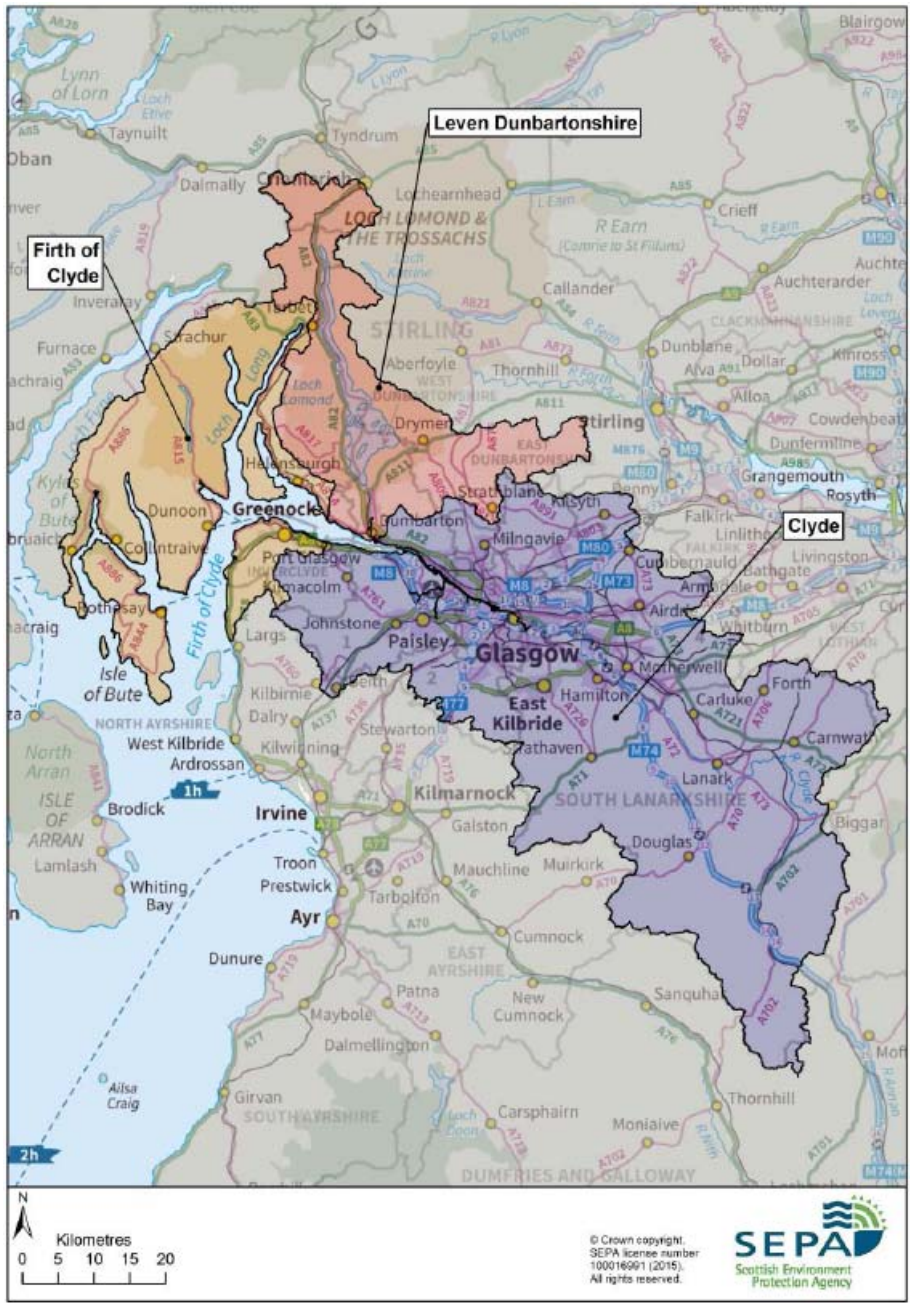


Figure 4: River catchments within the Clyde and Loch Lomond Local Plan District

The distribution of river flooding damages in the River Clyde catchment is shown in Figure 5.

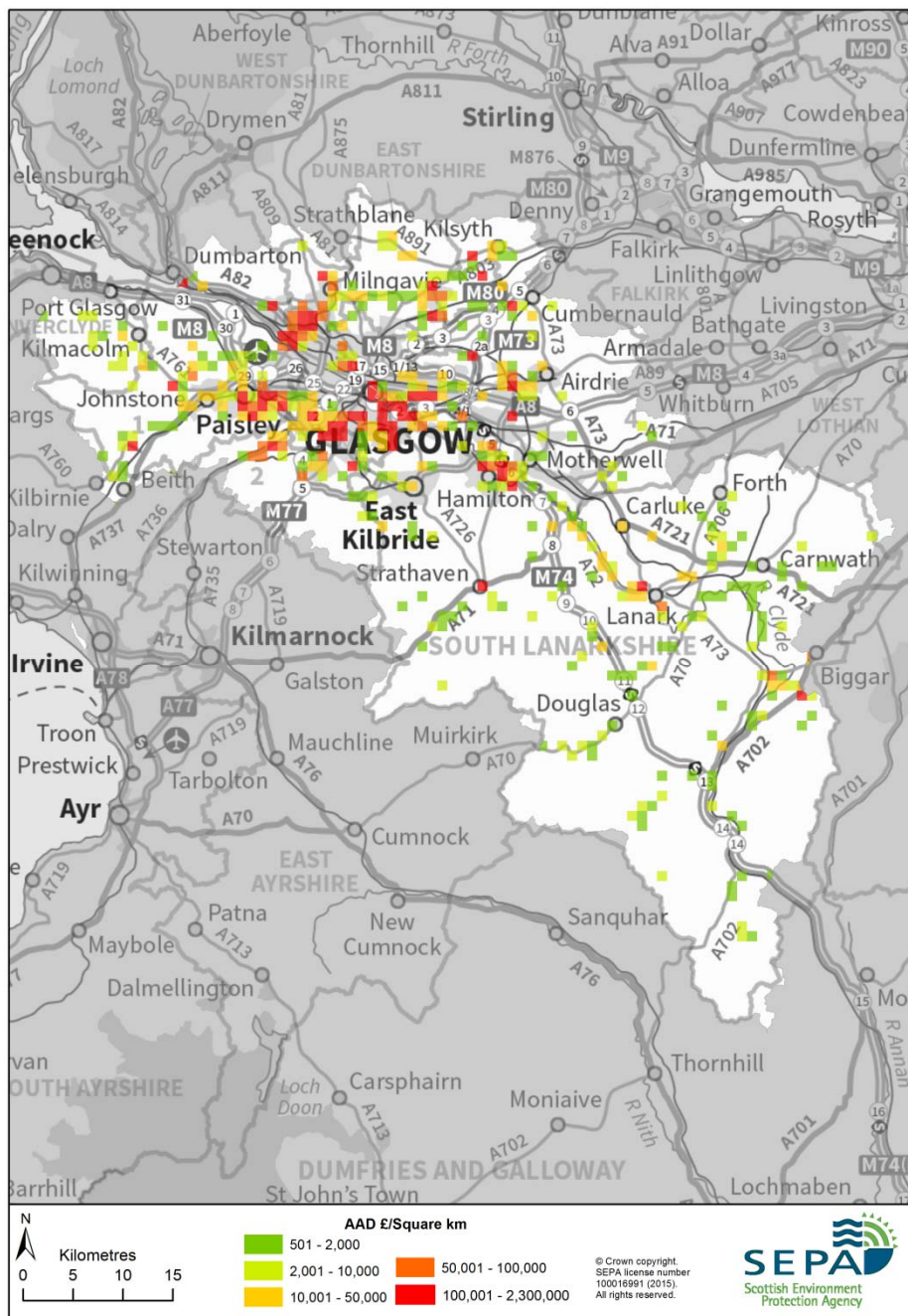


Figure 5: Annual Average Damages from river flooding in the River Clyde catchment group of the Clyde and Loch Lomond Local Plan District

The distribution of river flooding damages in the River Leven (Dunbartonshire) catchment group is shown in Figure 6.

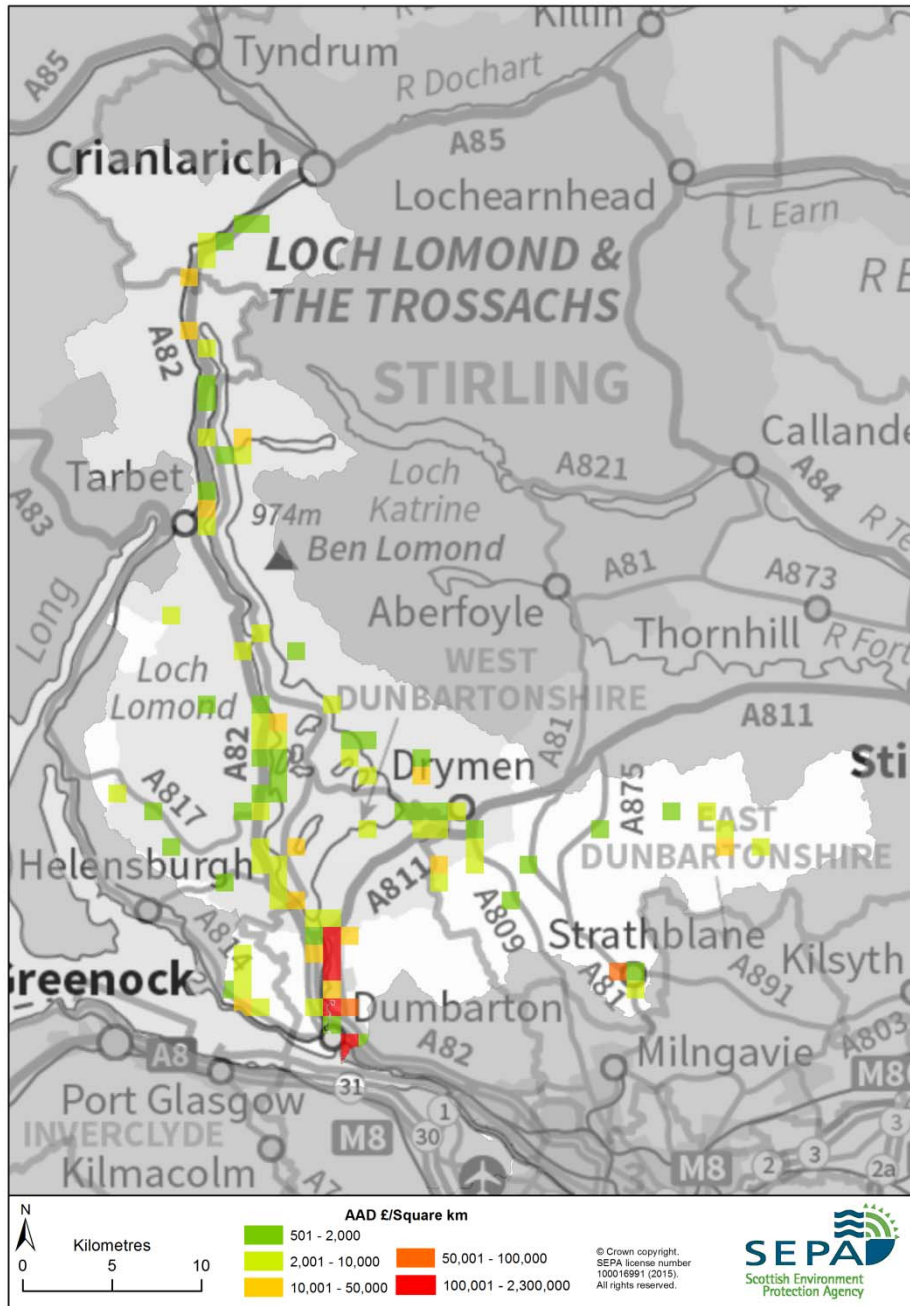


Figure 6: Annual Average Damages from river flooding in the River Leven (Dunbartonshire) catchment group of the Clyde and Loch Lomond Local Plan District

The distribution of river flooding damages in the Firth of Clyde catchment group is shown in Figure 7.

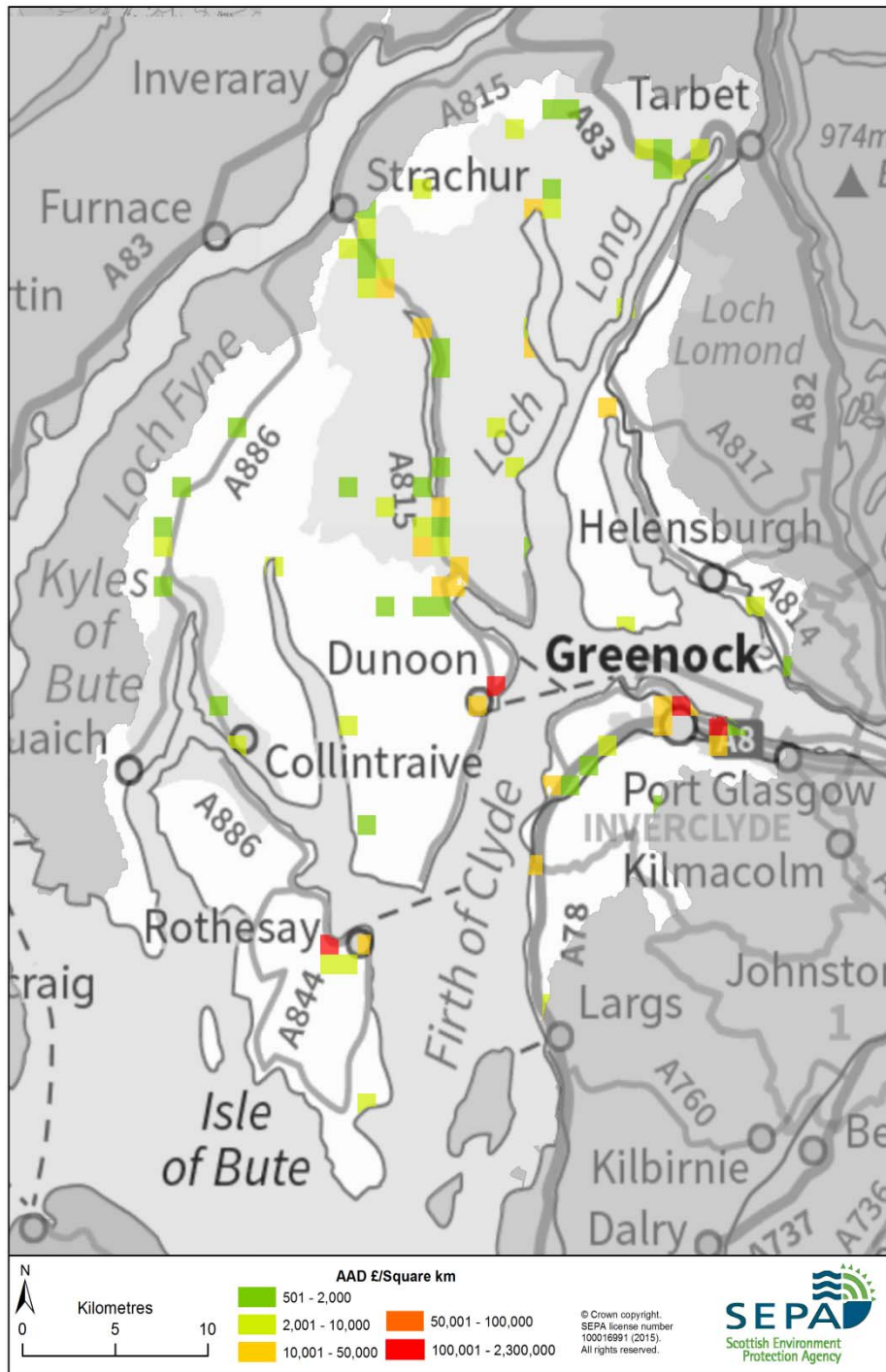


Figure 7: Annual Average Damages from river flooding in the Firth of Clyde catchment group of the Clyde and Loch Lomond Local Plan District

Coastal Flooding

There are estimated to be approximately 3,600 residential properties and approximately 1,300 non-residential properties at risk of coastal flooding. The highest damages are predicted to occur around Clydebank, Dumbarton, Renfrew and Rothesay. High damages can also be seen in Glasgow City (along the Clyde), Port Glasgow, Gourock and Renton. This is due to the density of businesses in the area and the impact on entertainment services, commercial services and industrial properties. The distribution of coastal flooding damages is shown in Figure 8.

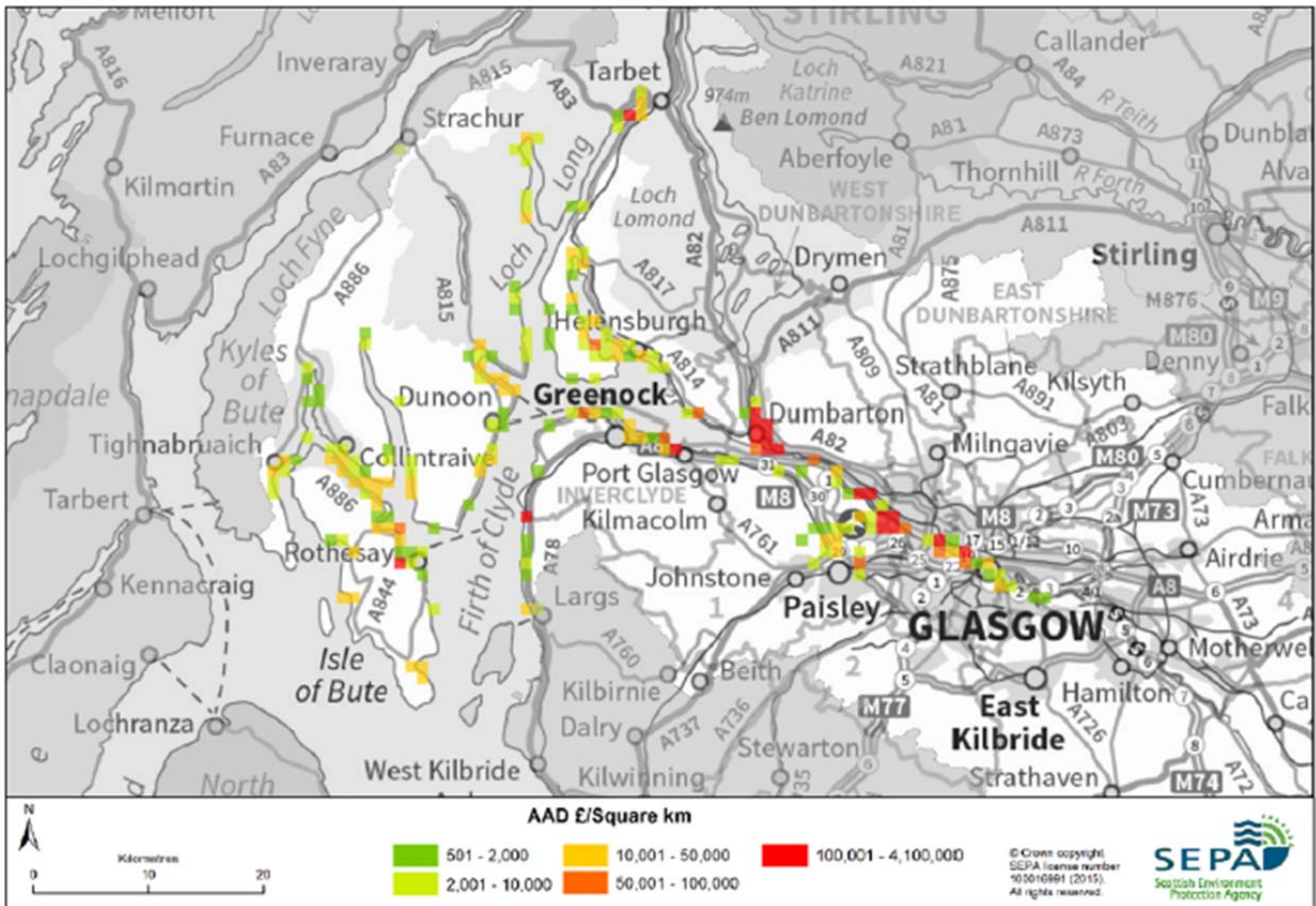


Figure 8: Annual Average Damages from coastal flooding for Clyde and Loch Lomond Local Plan District

Surface water flooding

There are estimated to be approximately 13,000 residential and 6,300 non-residential properties at risk of surface water flooding. Approximately 98% of all properties at risk from surface water flooding are located within Potentially Vulnerable Areas.

The Average Annual Damages caused by surface water flooding are approximately £20 million, with a high concentration of damages in and around Glasgow. The distribution of surface water flooding damages is shown in Figure 9.

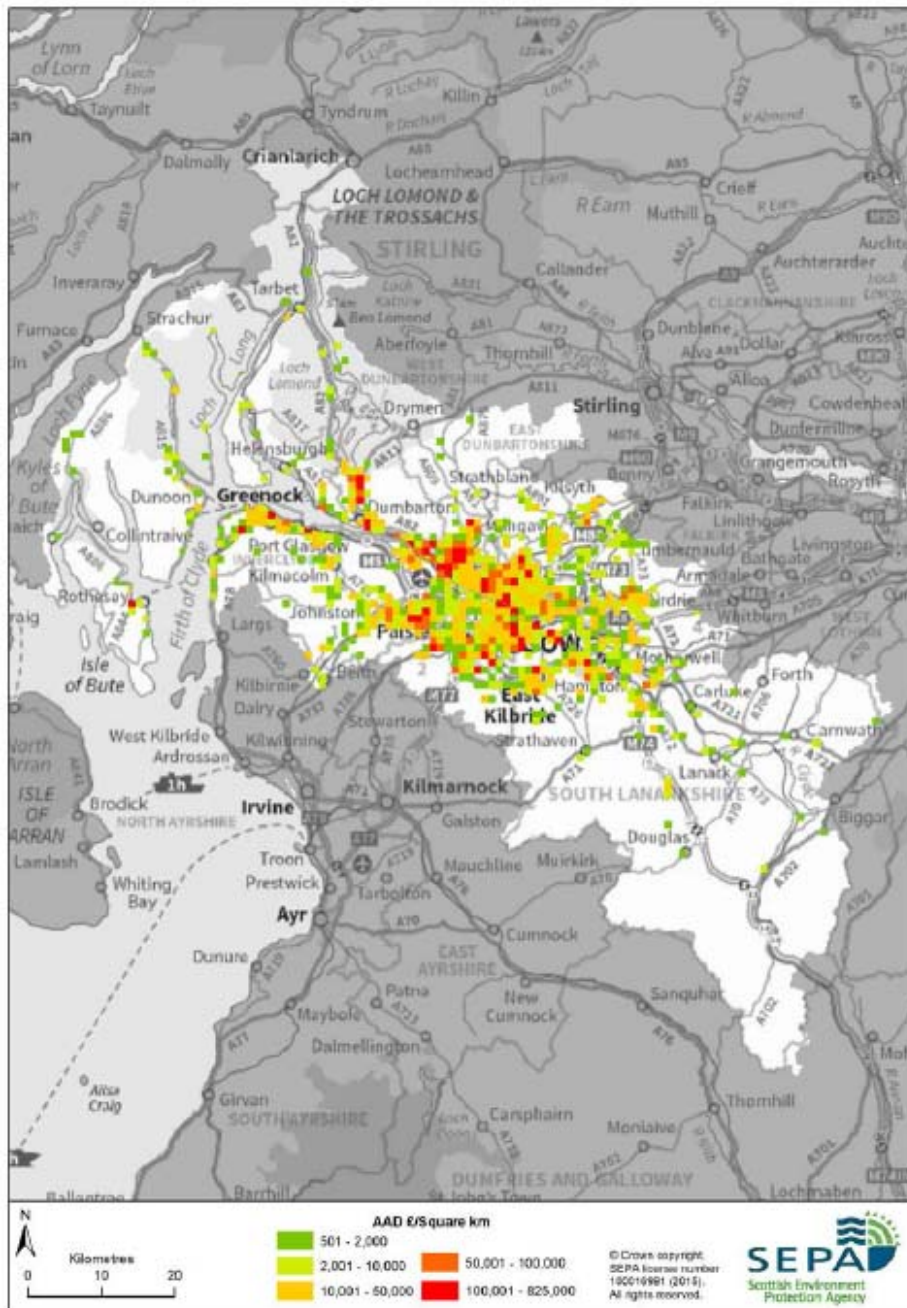


Figure 9: Annual Average Damages from surface water flooding for Clyde and Loch Lomond Local Plan District

Flood Risk Management Objectives

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

2.3 Actions within Potentially Vulnerable Areas

This Plan sets out over 100 Potentially Vulnerable Area specific actions to be progressed during Cycle 1 (2016 – 2022) to reduce and manage flood risk with the Clyde and Loch Lomond Local Plan District. These actions respond to objectives set out in the Flood Risk Management Strategy. Table 3 shows the split of these actions by type and lead organisation, together with the total number of actions being progressed across Scotland.

Area / Implementation Lead	Actions						
	NFM Studies	NFM Works	Flood Protection Studies	Flood Protection Schemes/ Works	Integrated Catchment Studies	SWMP Priority Areas	New Flood Warning Schemes
SCOTLAND	22	4	130	56	20	94	18
Clyde and Loch Lomond Local Plan District	8	1	24	19	3	37	1
Argyll and Bute Council			1	1		2	
East Dunbartonshire Council			2	1		3	
East Renfrewshire Council			1			3	
Glasgow and Clyde Valley Green Network	3						
Glasgow City Council			8	2		12	
Inverclyde Council	1			4	*	2	
Loch Lomond and The Trossachs National Park	1						
Network Rail				4			
North Lanarkshire Council			4			6	
Renfrewshire Council	2		4	1	*	2	
Scottish Water				2	3		
SEPA	1						1
South Lanarkshire Council			3		*	5	
Transport Scotland				3			
West Dunbartonshire Council		1	1	1		2	

Notes:- SEPA and responsible authorities may have other actions in other Local Plan Districts.

Flood Protection Schemes / Works – Includes proposed flood protection schemes and surface water management works.

Integrated Catchment Studies – To be delivered in partnership with local authorities indicated *.

SWMP Priority Areas – Includes surface water management priority areas as identified in FRM Strategy.

Table 3: Summary of actions by Type and Responsible Authority / SEPA

The distribution of actions by Potentially Vulnerable Area is shown in Table 4. Further detail on specific actions can be found in the relevant Potentially Vulnerable Area section within Chapter 3.

PVA	Flood Protection scheme / works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan / study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning*	Flood forecasting	Property level protection study	Community flood action groups	Self help	Awareness Raising	Maintenance	Site protection plans	Emergency plans / response	Planning policies
11/01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
11/02	✓			✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
11/03							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/04	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
11/05				✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
11/06				✓			✓	✓	✓	✓			✓	✓	✓		✓	✓
11/07				✓		✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
11/08	✓					✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓
11/09	✓					✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/10						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/11	✓					✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/12	✓			✓	✓	✓	✓	✓	N/A	✓			✓	✓	✓		✓	✓
11/13	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
11/14				✓		✓	✓	✓	N/A	✓		✓	✓	✓	✓		✓	✓
11/15						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/16	✓			✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
11/17/1	✓			✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
11/17/2	✓			✓		✓	✓	N/A	N/A	✓			✓	✓	✓	✓	✓	✓
11/17/3						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/18							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/19						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/20							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
11/21c	✓				✓		✓	N/A	N/A	✓			✓	✓	✓		✓	✓

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

Table 4: Range of Objectives and Actions identified for each Potentially Vulnerable Area.

2.4 Actions applicable across the Local Plan District

Some flood risk management objectives and actions apply to all areas, whether designated as a Potentially Vulnerable Area or not. For example, flood risk can be managed through national planning policy or as part of ongoing statutory duties discharged by local authorities.

The Local Plan District-wide objectives and the corresponding actions are set out in Table 5 below.

Table 5: Local Plan District Wide - Objectives and Actions - Ongoing Actions that are applicable across the entire Local Plan District / all PVAs

Action ID	Action Type	Objective Description	Lead Authority	Action Description
111270001	Planning Policies	Avoid an overall increase in flood risk Reduce overall flood risk	Planning 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 Annex 2 and Annex 5.
111320007	Maintenance	Reduce overall flood risk	Local authorities, asset / land managers	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. Local authority schedules of clearance and repair work are available for public inspection – see Annex 4. Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.
111320009	Flood Forecasting	Reduce overall flood risk	SEPA	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.
111320011	Self Help	Reduce overall flood risk	Everyone	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.
111320013	Awareness Raising	Reduce overall flood risk	Responsible Authorities	SEPA and responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. From 2016 SEPA will engage with the community and promote Floodline. Local authorities will be undertaking additional awareness raising activities linked to Potentially Vulnerable Area specific Actions. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.
111320014	Emergency Plans / Responses	Reduce overall flood risk	Category 1 and 2 Responders	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.

2.5 Other flood risk activities by local authorities

Other activities undertaken by local authorities to manage flood risk are summarised below:

Section 18 & 59: Works of Clearance and Repair

Based on an assessment of the condition of a body of water, local authorities must prepare a schedule of clearance and repair works that would substantially reduce the risk of flooding. This is commonly referred to as a Schedule 18, which is made available by each local authority within the Local Plan District for public inspection. Under Section 59 of the Act, the local authority must carry out the works in the Schedule 18 if it considers that this will contribute to the implementation of actions in the Plan. Details of how to access Schedule 18s for each local authority in the Local Plan District are included in Annex 4 of the Plan.

Where any material has been placed on the bank of a watercourse or fallen into the watercourse, the local authority may serve notice on the landowner to remove such material if it presents an increased risk of flooding. If the landowner fails to remove the material within the stated period of time, the local authority may remove the material and recover the cost of removal from the landowner.

Section 56: General Power to manage flood risk

Without affecting the implementation of actions in this Plan, a local authority may do anything which it considers will contribute to the implementation of actions in the Plan or is necessary to reduce the risk of a flood which is likely to occur imminently and have serious adverse consequences for human health, the environment, cultural heritage or economic activity in its area.

This may include carrying out flood protection works, which may not be identified as actions in the Plan.

2.6 Funding

Funding is anticipated to be available to progress all actions set out in this Plan. However, the completion of the Plan actions shall require sufficient funding to be made available over the 6 year cycle. Where funding becomes a constraint to progress, this will be highlighted in the monitoring reports (see Section 1.6) prepared on the implementation of the Plan. The funding streams to deliver the Plan actions are described below.

Local Authority Actions

Funding	Actions	Comments
Revenue	<ul style="list-style-type: none"> Awareness raising Emergency plans/response Clearance and repair Maintain flood protection scheme Planning policies Site protection plans 	<p>Local authorities have received a 1 year funding settlement from the Scottish Government up until March 2017.</p> <p>The Scottish Government has a duty to consider the requirements of the FRM Act in future funding for local authorities.</p>
Revenue and / or Capital	<ul style="list-style-type: none"> Flood protection study Integrated catchment study Property level protection scheme Natural flood management study Surface water plan / study 	
Capital	<ul style="list-style-type: none"> Flood protection scheme/works Natural flood management works 	

Scottish Water Actions

Funding	Actions	Comments
Q&S 4a delivery period funding	<ul style="list-style-type: none"> Integrated catchment study Flood protection scheme/works Strategic mapping and modelling 	<p>Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers. Local authority partners will contribute funding towards the integrated catchment studies.</p>
Capital or operational expenditure	<ul style="list-style-type: none"> Maintenance Awareness raising 	<p>Scottish Water is funded by customer charges as set by the economic regulator. All business activities required under these actions are accounted for in Scottish Water's capital or operational expenditure.</p>

SEPA Actions

Funding	Actions	Comments
Grant in aid allocation from Scottish Government	<ul style="list-style-type: none"> • Awareness raising • Emergency plans/response • Maintenance of flood warning service • Extension of flood warning service • Land use planning 	SEPA's activities will be co-ordinated with the activities of other responsible authorities.
	<ul style="list-style-type: none"> • Flood forecasting service 	SEPA / Met Office joint initiative, the Met Office receives funding from the UK Government.

Loch Lomond and The Trossachs National Park Actions

Funding	Actions	Comments
From local authority partners	<ul style="list-style-type: none"> • Natural flood management study 	Local authorities will contribute funding to deliver Actions.

Glasgow Clyde Valley Green Network Actions

Funding	Actions	Comments
From local authority partners	<ul style="list-style-type: none"> • Natural flood management study 	Local authorities will contribute funding to deliver Actions.

Transport Scotland Actions

Funding	Actions	Comments
Grant in aid allocation from Scottish Government	<ul style="list-style-type: none"> • Flood protection scheme/works 	The Scottish Government has a duty to consider the requirements of the FRM Act in future funding allocations. Delivery of Actions by Transport Scotland to either accept (but to monitor and take appropriate action) or to reduce the physical risk, or disruption risk, will be determined by Ministerial funding decisions, as outlined in forthcoming Spending Reviews. Local authority partners will contribute funding towards studies where applicable.

Network Rail Actions

Funding	Actions	Comments
Grant in aid allocation from Scottish Government	<ul style="list-style-type: none"><li data-bbox="360 479 794 510">• Flood protection scheme/works	The Network Rail Initial Industry Plan (IIP) is being developed for submission to The Scottish Government in September 2016. This will include a bid to carry out drainage work associated with Flood Risk Management Strategy actions for the period 2019 to 2024. Delivery of Flood Risk Management Strategy actions will be prioritised in accordance with allocated funding.

2.7 Coordination

The Flood Risk Management (Scotland) Act 2009 places a general duty on SEPA and responsible authorities to adopt an integrated approach by co-operating with each other so as to co-ordinate the delivery of the actions set out in this Plan.

This is achieved at a Local Plan District level through the Clyde and Loch Lomond Senior Officers Group meeting regularly. This group brings together senior officers from SEPA and the responsible authorities to discuss the development and implementation of actions. The work of this group is facilitated by the presence of a Programme Management Office (PMO) which supports the communication between parties and provides assistance co-ordinating related actions. The PMO also aids integrated working during the implementation of actions between SEPA, responsible authorities and third parties.

Actions are related where they occur within the same river or sewer catchment. This is because a change in the flow patterns of river or surface water may have an impact on the development of other actions within the same catchment. Related actions will be coordinated and the coordination of these related actions will be monitored by the PMO and reviewed at the Senior Officers Group. All actions specific to a Potentially Vulnerable Area are also related to the Local Plan District wide actions. In addition, the Senior Officers Group will provide a forum to share best practice and lessons learnt from similar studies.

Co-ordination between SEPA and the responsible authorities is also specific to the type of action as described below or noted within the specific Action Description in Section 3.

Flood protection studies will be led by the local authority within whose boundary the main river or watercourse flooding occurs. The development of the flood protection study will be co-ordinated with the other local authority areas that the river or watercourse flows through, together with SEPA to link into River Basin Management Plan related activities and Scottish Water where there is interaction between the sewer network and the river or watercourse. The flood protection study for the River Leven will also be developed in partnership with the National Park Authority.

Flood protection schemes / works will be led by the lead authority identified within this Plan – ie local authorities, Transport Scotland, Network Rail or Scottish Water. The development and delivery of the flood protection scheme / works will be co-ordinated with all appropriate stakeholders to ensure an integrated and collaborative approach is demonstrated.

Integrated catchment studies will be led by Scottish Water. 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.

Surface water management plans will be led by the local authority in whose area the majority of the plan is located. The development of the surface water plan will be co-ordinated with the other local authorities within whose area the plan extends and Scottish Water due to the interaction between surface water and the sewer system. Scottish Water will provide local knowledge and understanding of the sewer network. This may include outputs of Section 16 or integrated catchment studies (where available), to assist with the surface water management planning process. SEPA has provided flood hazard mapping information to inform the surface water management planning process. Where the opportunity for woodland management is identified during the development of a surface water management plan, the Forestry Commission Scotland will be consulted.

Natural flood management studies that fall within a single local authority will be led by that authority. Natural flood management studies that straddle several local authority boundaries will be led by either the National Park Authority or the Glasgow and Clyde Valley Green Network Partnership, with the local authorities collaborating in the development of the study. All studies will be co-ordinated with SEPA to link into River Basin Management Plan related activities and the Forestry Commission in relation to woodland management opportunities.

The development of **new flood warnings** will be led by SEPA who will co-ordinate with the local authorities within whose area the new warning is proposed to be available. The flood warning for the River Leven will also be developed in partnership with the National Park Authority.

Scottish Water and local authorities will use the Local Plan District Partnerships to keep each other informed of large scale capital **maintenance** works and identify opportunities for possible co-ordination of work.

Awareness raising initiatives within the Local Plan District by either SEPA or any responsible authority will continue to be co-ordinated through the Senior Officers Group.

2.8 Natural Features

The primary actions that will explore the opportunity and utilise natural features to contribute to the management of flood risk are the natural flood management studies and works set out in Section 3. The Plan sets out eight natural flood management studies and one natural flood management works spanning across six Potentially Vulnerable Areas. The co-ordination arrangements for natural flood management actions are set out in Section 2.7 above.

Over and above these nine specific natural flood management actions, elements of natural flood management will be considered and incorporated into other flood protection and surface water management actions where beneficial.

3 Managing Flood Risk in Potentially Vulnerable Areas

This chapter is focused on the actions being taken to manage flood risk in the Potentially Vulnerable Areas. For each Potentially Vulnerable Area, background information including a summary of flood impacts and the actions to manage flooding is presented. Additional information on flooding within each Potentially Vulnerable Area is available within the Clyde and Loch Lomond Flood Risk Management Strategy, available on the SEPA website here - <http://apps.sepa.org.uk/FRMStrategies/>

The background information sets the scene for the planned actions to manage flooding that have been prioritised for delivery between 2016 and 2022. The Potentially Vulnerable Area level action tables set out the flood management objective that is to be achieved, provide a description of the action, identify who will be responsible for the delivery and implementation and a timetable of when the actions will be undertaken. The Local Plan District wide actions noted in Section 2.4 apply to all Potentially Vulnerable Areas.

This information is provided for each of the 22 Potentially Vulnerable Areas and the one candidate Potentially Vulnerable Area within the Clyde and Loch Lomond Local Plan District. Each Potentially Vulnerable Area has a separate sub-section with each sub-section following the same format.

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

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

3.1 PVA 11/01 – Loch Lomond and Vale of Leven

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council, Stirling Council, West Dunbartonshire Council	Loch Lomond

Background and Summary of Flooding Impacts

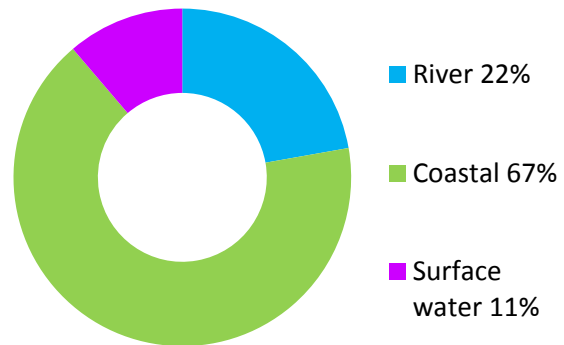
This Potentially Vulnerable Area is in the north of the Clyde and Loch Lomond Local Plan District (shown below). The area includes Loch Lomond and intersects the Loch Lomond and The Trossachs National Park. It is approximately 300km².



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

There are approximately 3,300 residential properties and 790 non-residential properties at risk of flooding. The Annual Average Damages are approximately £17 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

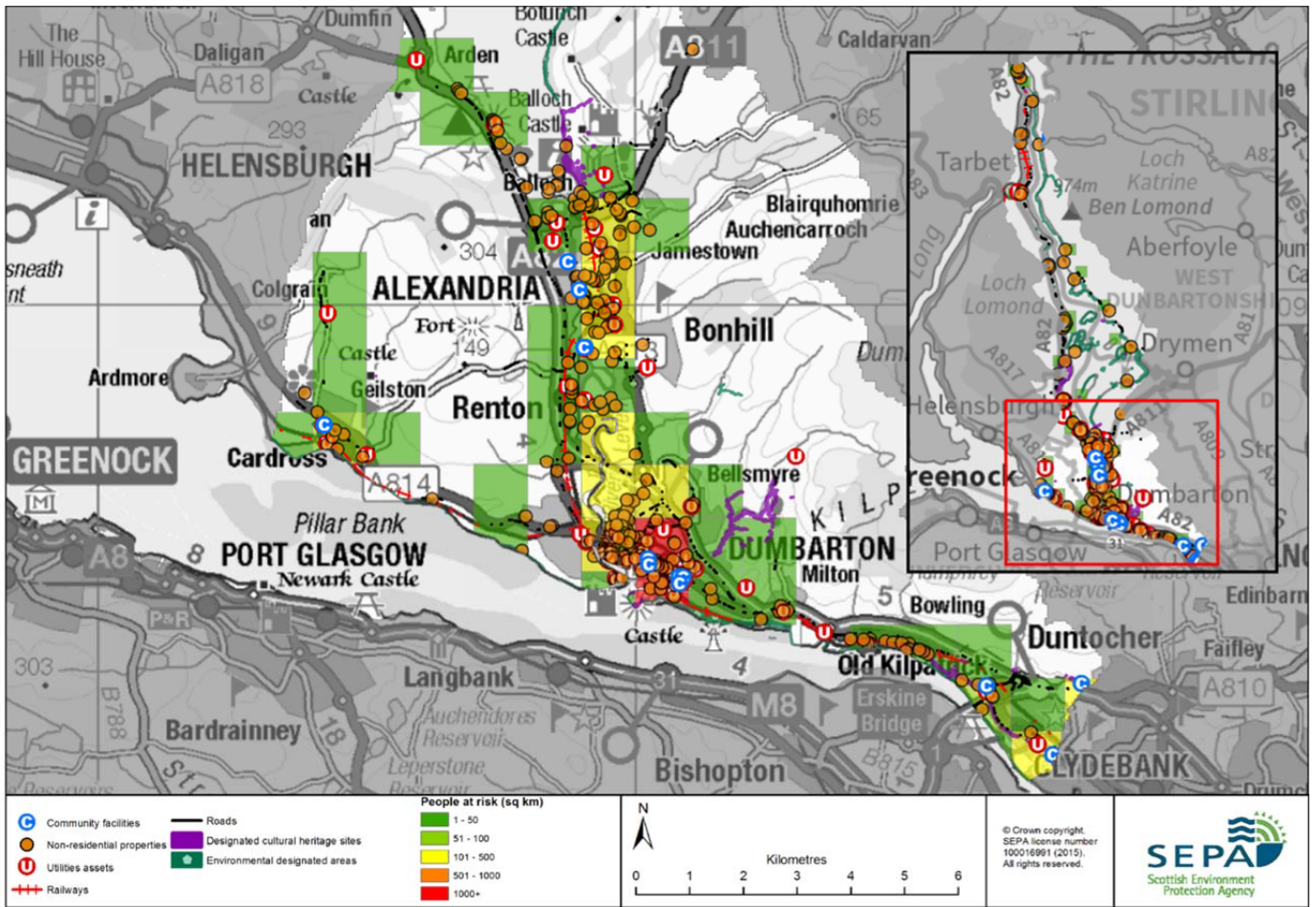


Figure 3.1: Impacts of Flooding

Table 3.1: PVA 11/01 - Loch Lomond and Vale of Leven - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
11300021	Flood protection scheme/works Reduce the risk of disruption along the A82 due to flooding	Transport Scotland	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the trunk road. The operational scheme will consider awareness raising, emergency response plans, clearance and repair and utilising the flood forecasting warning service.	2016	2021
110720004	Natural flood management work Reduce the risk of flooding to residential properties, non-residential properties and transport routes in Dumbarton from the Gruggies Burn and coast	West Dunbartonshire Council	Native woodland planting in the upper catchment has been investigated by the council. The woodland will help to slow and reduce runoff into the river which could reduce the impact from high likelihood flooding. The Council plans to undertake woodland planting and investigate other locations with the potential for runoff control which have also been identified in the strategic assessment of this area.	2013	2015
110720006	Flood protection scheme/works Reduce the risk of flooding from the River Leven and Firth of Clyde to residential properties, non-residential properties and community facilities in Vale of Leven and Dumbarton Reduce the risk of flooding to residential properties, non-residential properties and transport routes in Dumbarton from the Gruggies Burn and coast	West Dunbartonshire Council	The Council is undertaking preparation work on the proposed flood protection scheme for Gruggies Burn . Further design work is required to refine the preferred option for the scheme, which at present is to maximise upstream flood storage and construct defences from Hunter's Burn to Castle Street , and downstream of Castlegreen Street , to address coastal flooding. In addition to these actions the use of property level protection within the scheme will be investigated. The natural flood management work (Actions 110720004 and 110750003) will also help to reduce the impact of flooding in this area. SEPA will review the study outputs for possible inclusion to the Flood Maps.	2014	2019

Table 3.1: PVA 11/01 - Loch Lomond and Vale of Leven - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110740017	<p>Maintain flood protection scheme</p> <p>Accept that current significant flood risks along the Knowle Burn are being managed appropriately</p>	West Dunbartonshire Council	Continue to maintain the existing flood defences along the Knowle Burn .	Ongoing	Ongoing
110750003	<p>Natural flood management study</p> <p>Reduce the risk of flooding from the River Leven and Firth of Clyde to residential properties, non-residential properties and community facilities in Vale of Leven and Dumbarton</p>	Loch Lomond and The Trossachs National Park Authority	Loch Lomond and The Trossachs National Park Authority plans to lead a natural flood management study , in partnership with West Dunbartonshire Council, Argyll and Bute Council and Stirling Council, to further investigate the potential benefit for runoff control in areas surrounding Loch Lomond . This study will focus on reducing runoff to the small burns that feed into Loch Lomond , which can impact some communities and transport routes.	2019	2020
110750005	<p>Flood protection study</p> <p>Reduce the risk of flooding from the River Leven and Firth of Clyde to residential properties, non-residential properties and community facilities in Vale of Leven and Dumbarton</p>	West Dunbartonshire Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme to reduce river and coastal risk along the River Leven. This will build on previous studies to examine the potential benefits of a new canal, sediment management including the erosion of banks, the potential to set back existing embankments and new direct defences along the River Leven. In addition to this the potential to increase flood storage within Loch Lomond, while remaining within the current operating limits of the barrage, will be investigated. The study will initially look to establish a technical grounding to any potential benefit of additional storage within Loch Lomond. If there is an identified benefit from this action, a second stage of work will be undertaken. The second stage of work will focus on engaging with interested stakeholders to establish the feasibility and restrictions to taking forward this action.</p> <p>Due to the importance of the area, the study, while led by West Dunbartonshire Council, will be carried out in partnership with Loch Lomond and The Trossachs National Park, Argyll and Bute Council, Stirling Council, Scottish Water and SEPA.</p> <p>SEPA will review the study outputs for possible inclusion to the Flood Maps.</p>	2018	2020

Table 3.1: PVA 11/01 - Loch Lomond and Vale of Leven - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111250018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Dumbarton	West Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2021
111320010	New flood warning Reduce overall flood risk	SEPA	Continue with the development of the River Leven and Loch Lomond flood warning scheme . This will provide warnings to properties at risk between Loch Lomond and Dumbarton Common with the main centres of risk found at Balloch and Alexandria . A flood protection study is proposed for the River Leven . 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 .	2016	2017

Table 3.1: PVA 11/01 - Loch Lomond and Vale of Leven - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA-led education events.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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, 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>Argyll & Bute Council Website has a Flood Advice webpage. Other awareness raising activities will be identified during the 1st FRM Act cycle.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	2013	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	<p>Scottish Water will undertake further investigation and modelling in the Ardoch 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.</p>	2016	2020

Table 3.1: PVA 11/01 - Loch Lomond and Vale of Leven - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	<p>Continue to maintain the Dumbarton Central, Dumbarton Common and Dumbarton East End flood warning areas which are part of the Firth of Clyde coastal flood warning scheme.</p> <p>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 the flood warning service is timely and accurate.</p> <p>A flood protection study is proposed for the River Leven. 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.</p>	Ongoing	Ongoing

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.2 PVA 11/02 – Helensburgh to Loch Long

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Loch Long and Gare Loch

Background and Summary of Flooding Impacts

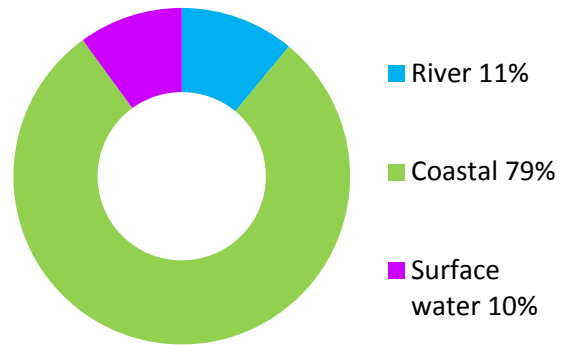
This Potentially Vulnerable Area is located to the north of the Firth of Clyde. It incorporates Helensburgh and Garelochhead and is approximately 100km² (shown below). It includes part of the Loch Lomond and Trossachs National Park.



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

There are approximately 70 residential properties and 90 non-residential properties at risk of flooding. The Annual Average Damages are approximately £390,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

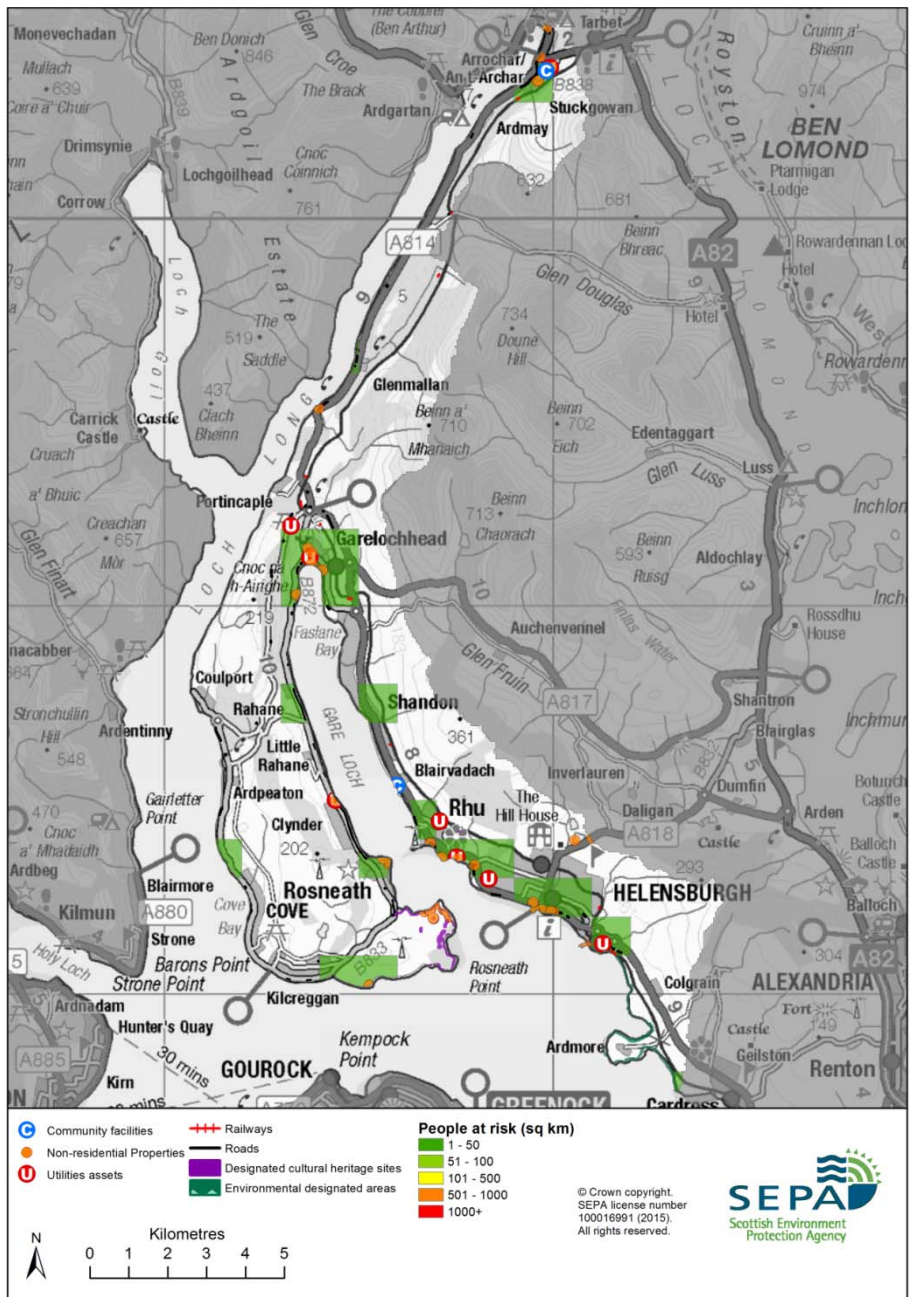


Figure 3.2: Impacts of Flooding

Table 3.2: PVA 11/02 - Helensburgh to Loch Long - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110030005	Flood protection study Reduce the risk of coastal flooding to residential properties and non-residential properties in Helensburgh	Argyll and Bute Council	The Council plans to undertake a study to further investigate the feasibility of new and or enhanced sections of defences along the seafront of Helensburgh . This study will look to complement and enhance the proposed development along the seafront including a new swimming pool and raised car park in Helensburgh . The study will also consider the potential for natural flood management actions to help reduce coastal flooding and the maintenance of defences. Other actions may also be considered to select the most sustainable combination of actions.	2016	2022
110840005	Flood protection scheme/works Reduce the economic damages and risk to people from surface water flooding in Kilcreggan	Argyll and Bute Council	Argyll and Bute Council has completed a study of surface water flooding in Kilcreggan , which identified frequent surface water flooding due to runoff from the surrounding area. The Council plans to undertake further refinement of mitigation options to produce an economic appraisal of benefits from flood protection works . The preparation work will also examine the use of property level protection as a single action and in combination with other actions and the potential benefits of natural flood management for runoff control. This work is linked to the surface water management plan. The work has not been prioritised as further investigation is required to develop the work that will be carried out and to establish the benefits of the work.	2019	2022
110840018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Kilcreggan	Argyll and Bute Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	Ongoing	2019

Table 3.2: PVA 11/02 - Helensburgh to Loch Long - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA-led education events.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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>As part of SEPA's education programme and to contribute to community resilience SEPA is sponsoring a play by Rightlines Productions called 'Rapid Departure'. This interactive play about flooding will tour locations in Scotland throughout 2016, including this Potentially Vulnerable Area. The performances aim to lead people to consider how flooding could impact their community and how they can take steps to prepare for it.</p> <p>Argyll & Bute Council Website has a Flood Advice webpage. Other awareness raising activities will be identified during the 1st FRM Act cycle.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	2013	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 2,200km 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.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Helensburgh, Garelochhead, Cove & Killcregan 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.	2016	2020

Table 3.2: PVA 11/02 - Helensburgh to Loch Long - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	<p>Continue to maintain the Helensburgh A814 flood warning area which is part of the Firth of Clyde coastal flood warning scheme.</p> <p>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 the flood warning service is timely and accurate.</p> <p>A flood protection study is proposed for Helensburgh. 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.</p>	Ongoing	Ongoing
113010021	Flood protection scheme/works Reduce the physical or disruption risk related to the transport network for rail.	Network Rail	Network Rail will carry out civil engineering work which will reduce flood risk to identified sections of the rail network within this Potentially Vulnerable Area.	2019	2024

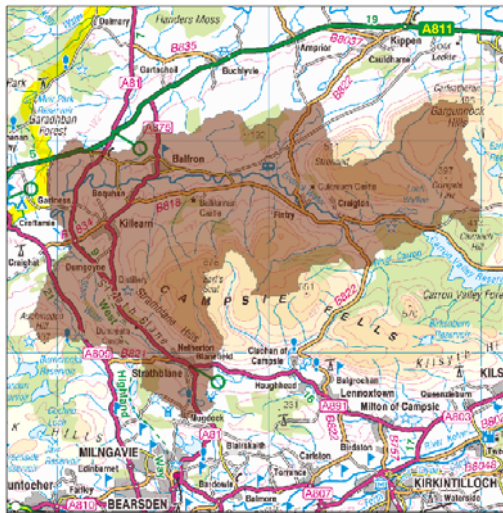
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.3 PVA 11/03 – Strathblane

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	East Dunbartonshire Council, Stirling Council	River Endrick (Loch Lomond)

Background and Summary of Flooding Impacts

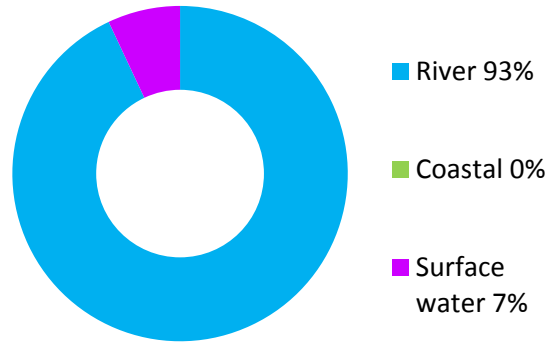
This Potentially Vulnerable Area is located to the north of Campsie Fells, between Killearn and Strathblane in the west and the Gargunnoch Hills in the east (shown below). It contains Balfron, Fintry and Craigton and is approximately 160km² (shown below).



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

There are approximately 40 residential properties at risk of flooding. The Annual Average Damages are approximately £140,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

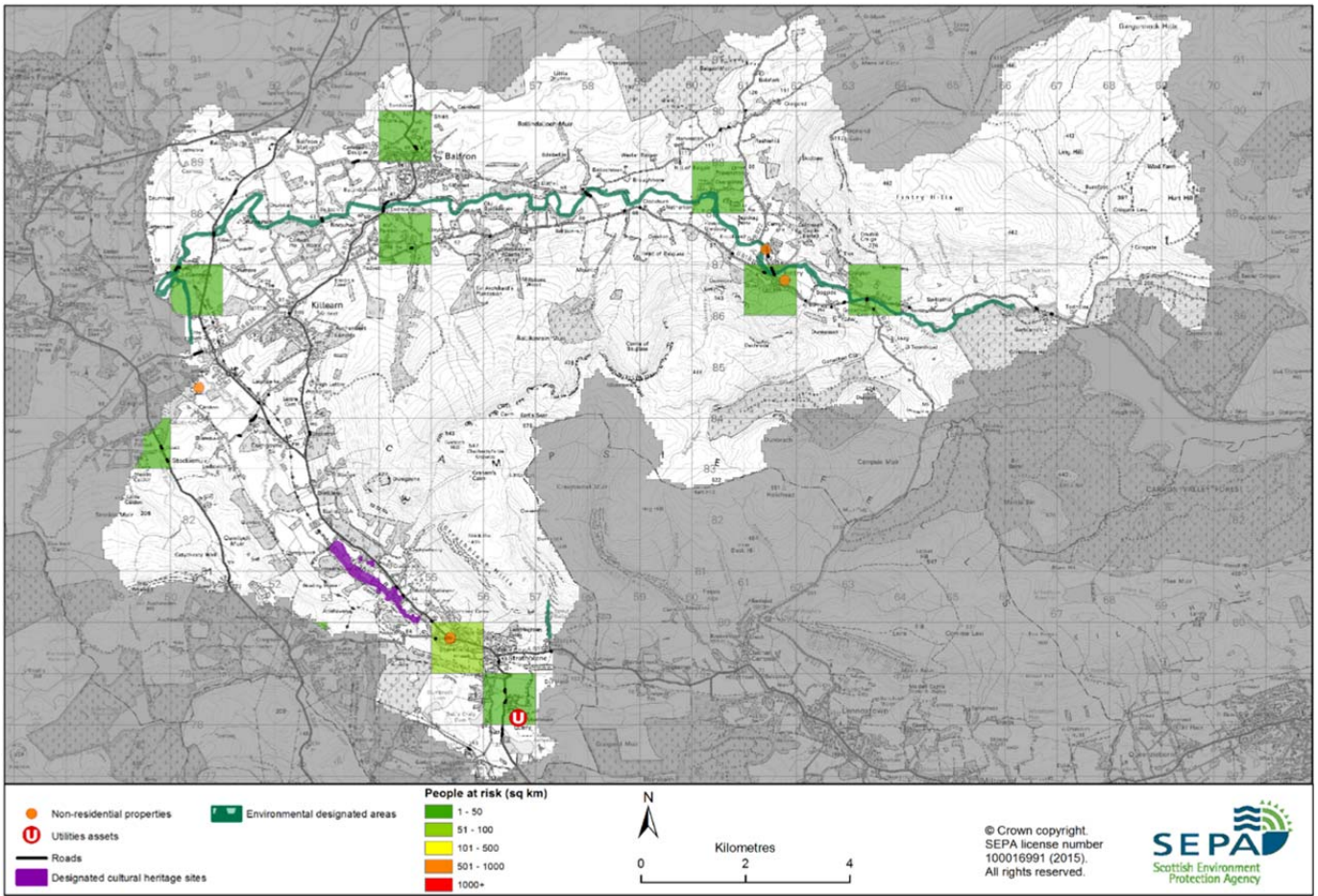


Figure 3.3: Impacts of Flooding

Table 3.3: PVA 11/03 -Strathblane - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA-led education events. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk . Approximately 2,200km 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.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Balfroon, Fintry and Strathblane 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.	2016	2020

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here

3.4 PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	East Dunbartonshire Council, Glasgow City Council, North Lanarkshire Council, Stirling Council, West Dunbartonshire Council	River Kelvin

Background and Summary of Flooding Impacts

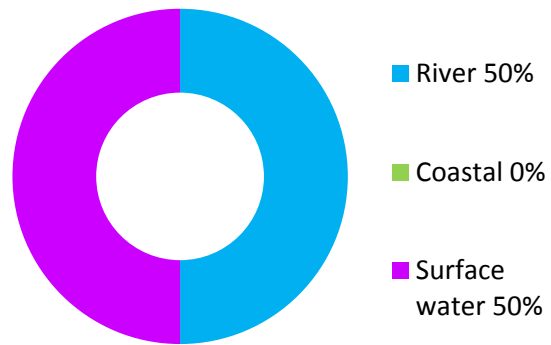
This Potentially Vulnerable Area incorporates the northern urban extent of the City of Glasgow, between Clydebank and Cumbernauld and is approximately 290km² (shown below).



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The area has a risk of river and surface water flooding. The damages are evenly split.

There are approximately 2,300 residential properties and 1,100 non-residential properties at risk of flooding. The Annual Average Damages are approximately £4.6 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

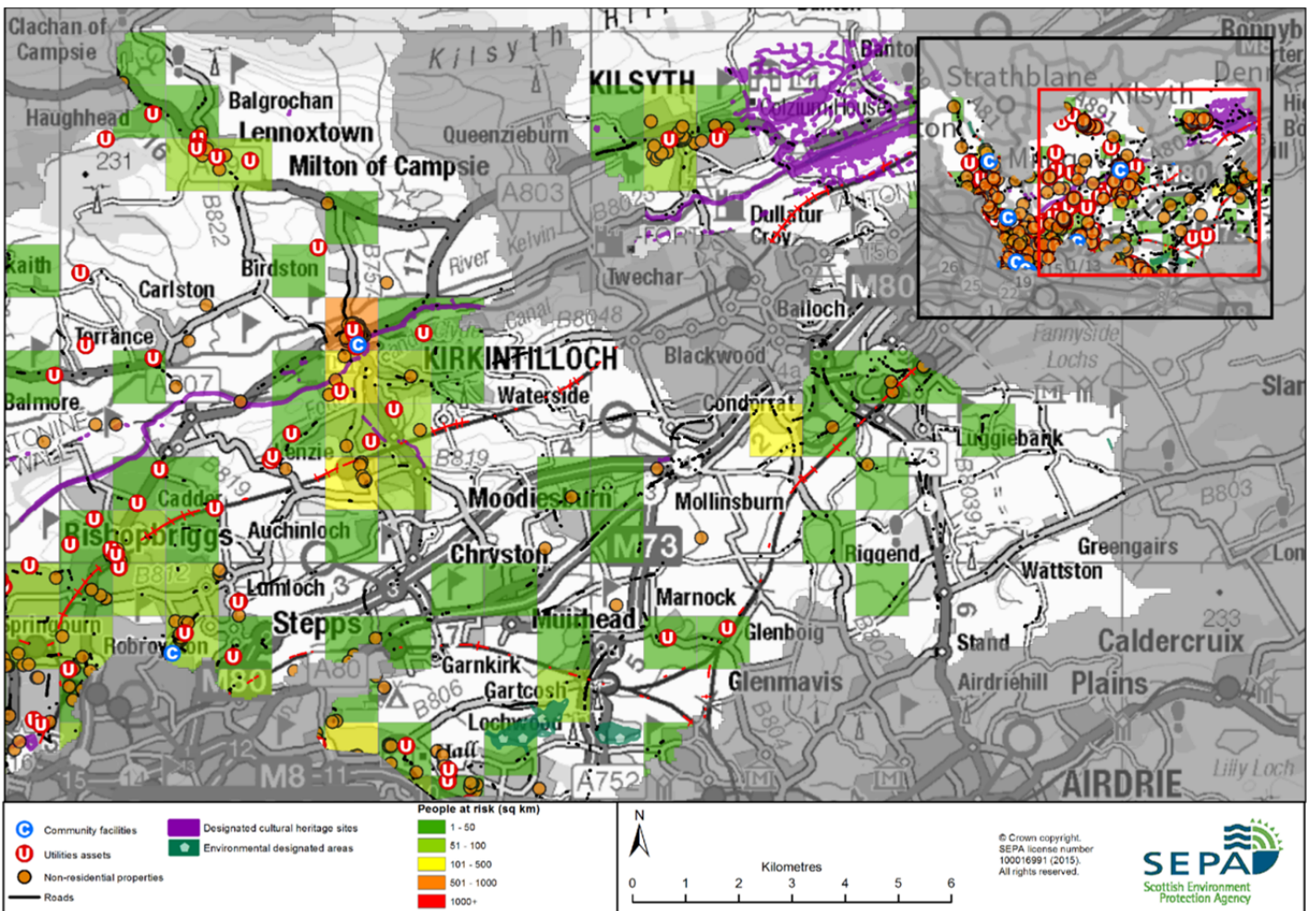
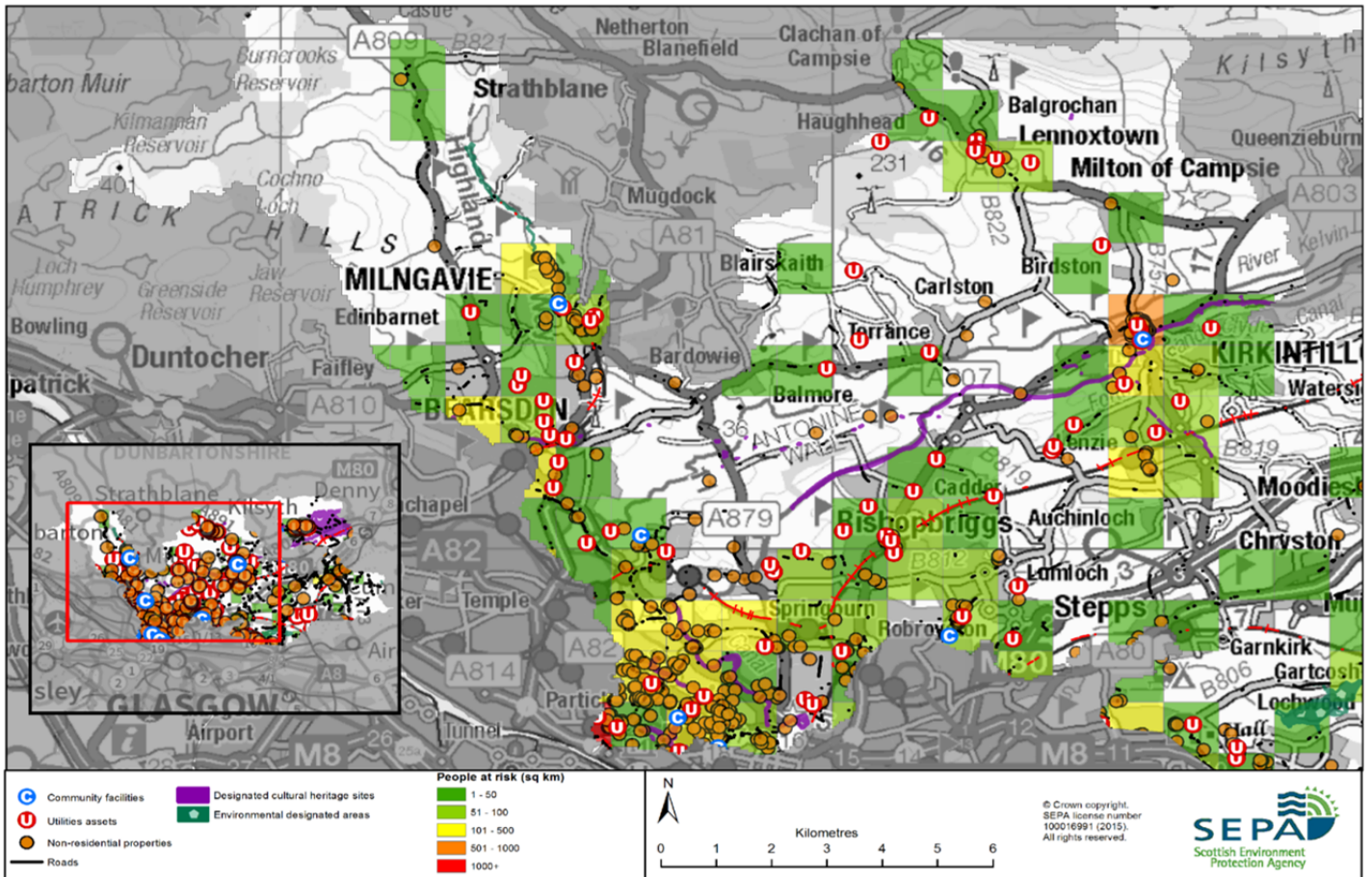


Figure 3.4a & 3.4b: Impacts of Flooding

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110080003	<p>Natural flood management study</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Kirkintilloch</p>	SEPA	<p>SEPA is currently carrying out a pilot study looking at potential options for river restoration and natural flood management in the Glazert catchment. This study will assess in detail runoff control and floodplain restoration.</p> <p>This action may also have a positive flooding impact near Kirkintilloch within the River Kelvin catchment.</p>	2016	2021
110080005	<p>Flood protection study</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Kirkintilloch</p>	East Dunbartonshire Council	<p>A study of the River Kelvin catchment is being undertaken and will assess the current level of flood risk. The study is being undertaken by East Dunbartonshire Council in conjunction with Glasgow City Council and SEPA. The study will provide revised data on flood risk in the area and assess the benefit offered by the existing flood protection scheme in Kirkintilloch.</p> <p>The Council plan to undertake a review of the outcomes of the River Kelvin study to determine the current risk in the town and the potential future risk with climate change. This will determine if / when further work is required to investigate how to reduce the flood risk from the River Kelvin to Kirkintilloch.</p> <p>SEPA will review the study outputs for possible inclusion in the Flood Maps.</p>	2015	2016
110080017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Kirkintilloch</p>	East Dunbartonshire Council	<p>The River Kelvin Flood Protection Scheme 1998 consists of embankments, retaining walls, channel improvements, culverts, floodgates and various other works. The scheme was completed in 2004 and provides protection to Kirkintilloch. The level of protection offered by the scheme is being assessed. This scheme will be maintained and will continue to mitigate flooding. The level of flood risk is likely to increase over time as a consequence of climate change.</p>	Ongoing	Ongoing

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110090006	<p>Flood protection scheme/works</p> <p>Reduce the risk of flooding from the Park Burn and surface water to residential properties in Kirkintilloch</p>	East Dunbartonshire Council	<p>The Council plans to undertake flood protection works along the Park Burn. Before the final design of the works the flood modelling in the area will be updated to improve the representation of the River Kelvin. This will help to more accurately represent the risk of flooding downstream. If there is found to be an interaction between the Park Burn and River Kelvin, joint probability analysis should also be carried out. The potential for natural flood management actions to help reduce runoff will also be investigated.</p> <p>The works will include the profiling of the channel and provide scope to improve the ecology and morphology of the river in addition to the flooding benefits. The proposed works could offer protection up to a 1 in 75 year flood; however, it is recommended that additional property level protection options be investigated to improve the overall protection of the scheme.</p> <p>The flood mapping for the Park Burn should be revised to identify the areas protected by the works and any remaining residual risk now and in the future.</p> <p>SEPA will review the study outputs for possible inclusion in the Flood Maps.</p>	2016	2019
110110005	<p>Flood protection study</p> <p>Reduce the risk of flooding from the Allander Water and surface water to residential properties and non-residential properties in Milngavie</p>	East Dunbartonshire Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme on the Allander Water in Milngavie, focusing on the construction of direct defences along with the benefits of property level protection and other actions which may enhance the level of protection offered.</p> <p>The additional benefits from natural flood management are being considered within a separate catchment study, and both studies will be considered to select the most sustainable combination of actions.</p>	2015	2019

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110110003	<p>Natural flood management study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Bearsden</p> <p>Reduce the risk of flooding from the River Kelvin and surface water to residential properties, non-residential properties and community facilities in west and north west Glasgow.</p> <p>Reduce the risk of flooding from the Allander Water and surface water to residential properties and non-residential properties in Milngavie</p> <p>Reduce the risk of flooding from the Park Burn and surface water to residential properties in Kirkintilloch</p>	Glasgow Clyde Valley Green Network and local authorities	<p>The strategic assessment identified that there are widespread areas with the potential for runoff control and floodplain restoration, therefore a catchment wide natural flood management study is planned for the River Kelvin. The study will focus on the potential benefit natural flood management actions may have on the tributaries of the River Kelvin but also if these actions combined would start to reduce flood risk on the River Kelvin.</p> <p>The delivery of Actions 110870018, 110871018, 11014005 and 11009006 will also help to reduce the risk of flooding in this area.</p>	2017	2018

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110140005	<p>Flood protection study</p> <p>Reduce the risk of flooding from the River Kelvin and surface water to residential properties, non-residential properties and community facilities in west and north west Glasgow</p>	Glasgow City Council and East Dunbartonshire Council	<p>A study of the River Kelvin catchment is being undertaken and will assess the current level of flood risk. The study is being undertaken by East Dunbartonshire Council in conjunction with Glasgow City Council and SEPA. The study will provide a revised assessment of risk within the area.</p> <p>The Council plans to undertake a review of the outcomes of the River Kelvin study to determine the current risk in the city and the potential future risk with climate change. This will determine if / when further work is required to investigate how to reduce the flood risk from the River Kelvin. The additional benefits from natural flood management are being considered within a separate catchment study, and both studies will be considered to select the most sustainable combination of actions.</p> <p>SEPA will review the study outputs for possible inclusion in the Flood Maps.</p>	2018	2020
110140015	<p>Site protection plans</p> <p>Reduce the risk of flooding from the River Kelvin and surface water to residential properties, non-residential properties and community facilities in west and north west Glasgow</p>	Glasgow City Council	<p>Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network. A Site Protection Plan is planned to be developed for the Kelvin Bridge Subway.</p>	2017	2018
110140017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of flooding from the River Kelvin and surface water to residential properties, non-residential properties and community facilities in west and north west Glasgow</p>	Glasgow City Council	<p>There a number of sections of flood defence along the River Kelvin which offer protection to properties in the area. These defences 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>	Ongoing	Ongoing

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110350005	Flood protection study Reduce the risk of flooding from the Luggie Water to residential properties in Cumbernauld	North Lanarkshire Council	The Council plans to undertake a study to further investigate the flood risk along the Luggie Water . As part of this study the feasibility of flood protection work in Cumbernauld will be examined, focusing on the potential to redesign the Badenheath Bridge to increase conveyance of the Luggie Water , and the benefit of direct defences along the Luggie Water. This study will consider property level protection and other complementary actions to determine the most sustainable combination of actions. North Lanarkshire Council and East Dunbartonshire Council may undertake this as a joint study to identify any further potential flood risk areas along the river.	2016	2019
110360005	Flood protection study Reduce the risk of river flooding to residential properties and non-residential properties in Kilsyth	North Lanarkshire Council	The Council plans to undertake a study to further investigate the feasibility of flood protection work in Kilsyth , focusing on the use of the Scottish Canals feeder as a bypass channel to divert flow from the Colzium Burn to Banton Loch for storage, and increasing the conveyance of the Ebroch Burn by altering the footbridge at Burngreen Park . This study will also investigate the use of property level protection to reduce residual risk. Other actions will also be considered to select the most sustainable combination of actions.	2016	2019
110850018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Bishopbriggs	East Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2021
110860018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Milngavie	East Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2021
110870018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Bearsden	East Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2021

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111110018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Cumbernauld	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019
111120018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Kilsyth	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019
111320012	Community flood action groups Reduce overall flood risk	Community	East Dunbartonshire Council has approached the Scottish Flood Forum for support in creating a community flood action group.	Ongoing	Ongoing

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with community resilience groups and participate in property level protection events delivered by the Scottish Flood Forum where possible.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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 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 keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	<p>Scottish Water will undertake further investigation and modelling in the Dalmuir and Dalmarnock 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.</p>	2016	2020

Table 3.4: PVA 11/04 – Kilsyth to Bearsden – north of Glasgow City - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	<p>Continue to maintain the Cleveden Park, Goyle Bridge and Kelvinbridge Underground flood warning areas which are part of the Kelvin river flood warning scheme.</p> <p>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 the flood warning service is timely and accurate.</p> <p>A flood protection study is proposed for the River Kelvin. 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.</p>	Ongoing	Ongoing

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here

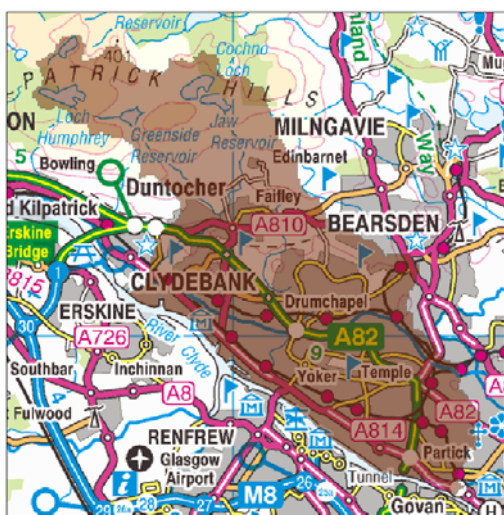
3.5 PVA 11/05 – Yoker Catchment – Clyde (Clydebank to Partick)

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	East Dunbartonshire Council, Glasgow City Council, West Dunbartonshire Council	River Clyde

Background and Summary of Flooding Impacts

This Potentially Vulnerable Area is located to the south east of Loch Lomond on the northern bank of the River Clyde (shown below).

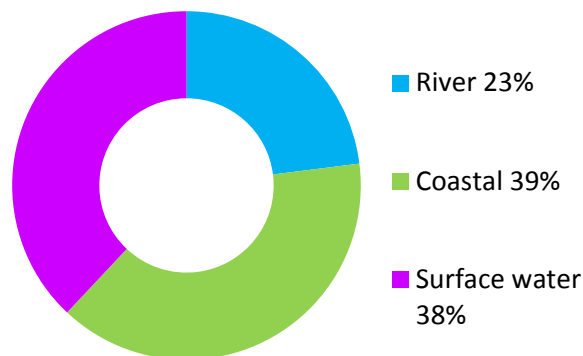
The area stretches from Clydebank in the west and extends east to incorporate parts of Bearsden, Drumchapel and the north west of Glasgow City. It is approximately 80km².



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The area has a risk of river, surface water and coastal flooding. Damages are split fairly evenly over all sources of flooding.

There are approximately 4,900 residential properties and 700 non-residential properties at risk of flooding. The Annual Average Damages are £8.1 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

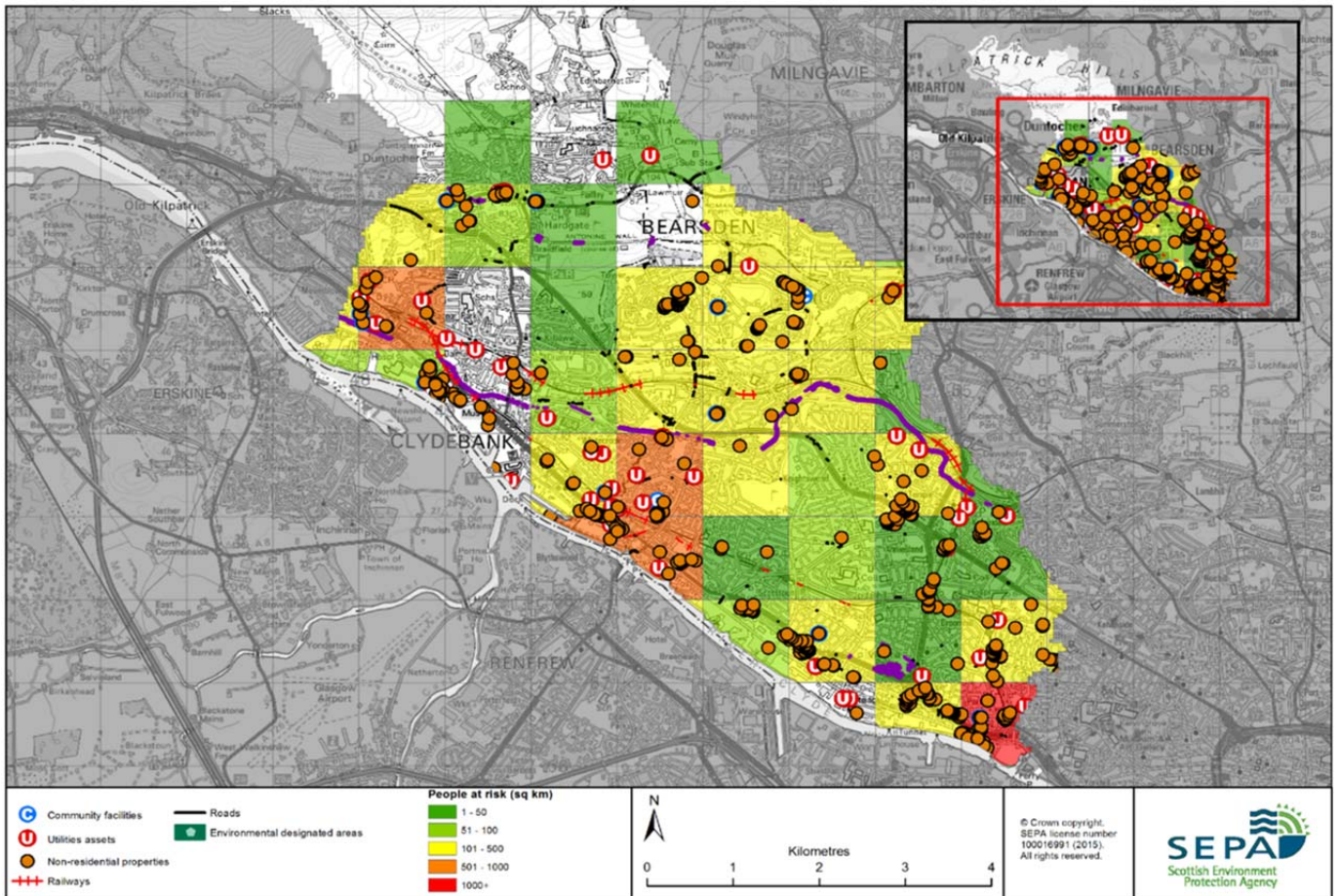


Figure 3.5: Impacts of Flooding

Table 3.5: PVA 11/05 - Yoker Catchment – Clyde (Clydebank to Partick) - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110160003	<p>Natural flood management study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Bearsden</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties and transport routes in Yoker Mains and Yoker Burn catchments</p>	Glasgow Clyde Valley Green Network and local authorities	<p>A natural flood management study will be undertaken to further investigate the potential benefit from runoff control within the catchment. The strategic screening has identified that there are areas of the upper catchment that could reduce the impact of flooding by altering land management or land cover. If there is an identified benefit of these actions the study will look at engaging with local land owners to establish the potential for future works.</p> <p>The delivery of Actions 110870018 and 110871018 will also help to reduce the risk of flooding in this area.</p>	2016	2017
110160005	<p>Flood protection study</p> <p>Reduce the economic damages and risk to people from surface water flooding in the Yokermain Burn catchment</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties and transport routes in Yoker Mains and Yoker Burn catchments</p>	Glasgow City Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme on the Yoker Burn and Garscadden Burn, focusing on the benefit of direct defences along both banks, the potential benefit for runoff control using natural flood management and the benefits of a property level protection scheme to reduce residual risk. Other actions may also be considered to select the most sustainable combination of actions.</p> <p>The Council plans to undertake a surface water management plan for the Yokermain Burn (Action 111050018), which will help identify actions to reduce flooding in the area, such as sustainable drainage systems.</p>	2018	2020

Table 3.5: PVA 11/05 - Yoker Catchment – Clyde (Clydebank to Partick) - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110160017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties and transport routes in the River Clyde catchment</p>	Glasgow City Council	There are a number of sections of flood defence along the River Clyde which offer protection to properties in the area. These defences 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.	Ongoing	Ongoing
110871018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Bearsden</p>	East Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2021
110930018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Drumchapel</p>	Glasgow City Council	The Council plans is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2015	2016
110960018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in High Knightswood, Netherton</p>	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2017
111050018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in the Yokermain Burn catchment</p>	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2018	2020

Table 3.5: PVA 11/05 - Yoker Catchment – Clyde (Clydebank to Partick) - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111260018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Old Kilpatrick, Duntocher and Mountblow	West Dunbartonshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2021
111320011	Self help Reduce overall flood risk	Everyone	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. West Dunbartonshire Council has a flood resilience subsidy scheme which permits any residential or business property at risk of flooding to apply. The scheme enables applicants to purchase selected property level protection products at cost price less a maximum subsidy.	Ongoing	Ongoing
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Ardoch and Dalmuir 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.	2016	2020

Table 3.5: PVA 11/05 - Yoker Catchment – Clyde (Clydebank to Partick) - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	Continue to maintain the Renfrew 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 the flood warning service is timely and accurate.	Ongoing	Ongoing

Note:- 1 – Actions will be funded as per the statements in Section 2.

2 – Coordination of the Actions will be carried out as per the statements in Section 2.

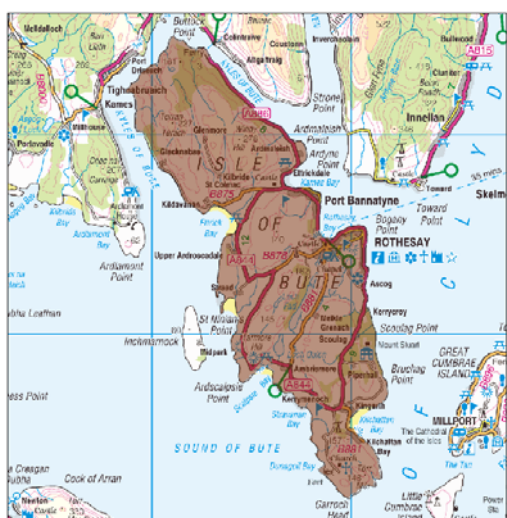
3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.6 PVA 11/06 – Isle of Bute

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Isle of Bute

Background and Summary of Flooding Impacts

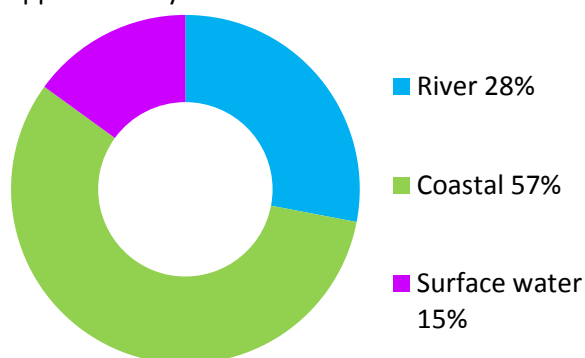
This Potentially Vulnerable Area is located in the west of the Clyde and Loch Lomond Local Plan District, on the Isle of Bute. It is approximately 120km² (shown below).



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

There are approximately 600 residential properties and 420 non-residential properties at risk of flooding. The Annual Average Damages are approximately £2.3 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

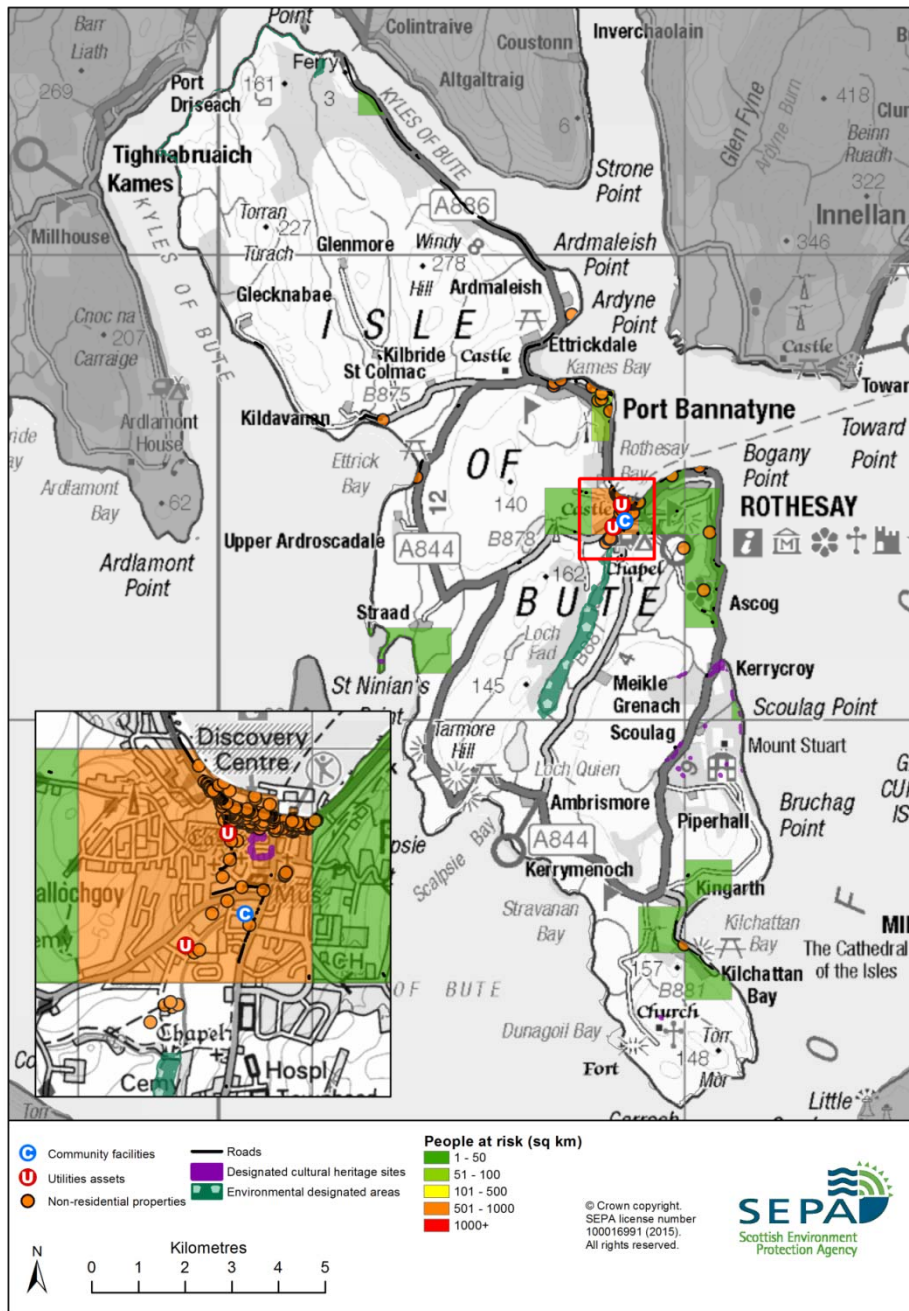


Figure 3.6: Impacts of Flooding

Table 3.6: PVA 11/06 – Isle of Bute - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110040017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of combined flooding to residential properties and non-residential properties in Rothesay</p>	Argyll and Bute Council	<p>Rothesay Flood Protection Scheme was constructed in 2004 and consists of approximately 910m of seawall from Argyle Street, along the Esplanade to East Princes Street. This scheme provides protection to the area up to a 100 year flood. These defences 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>	2004	Ongoing
111320013	<p>Awareness raising</p> <p>Reduce overall flood risk</p>	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	<p>Strategic mapping and modelling</p> <p>Reduce overall flood risk</p>	Scottish Water	<p>Scottish Water will undertake further investigation and modelling in the Rothesay 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.</p>	2016	2019
111320030	<p>Maintain flood warning</p> <p>Reduce overall flood risk</p>	SEPA	<p>Continue to maintain the Rothesay Town Centre and Kames Bay Pointhouse Crescent 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 the flood warning service is timely and accurate.</p> <p>A flood protection study is proposed for Rothesay. 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.</p>	Ongoing	Ongoing

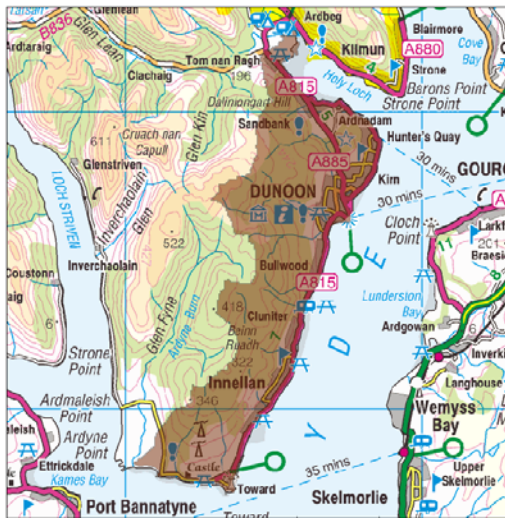
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.7 PVA 11/07 – Dunoon

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Cowal / Clyde Sealochs coastal

Background and Summary of Flooding Impacts

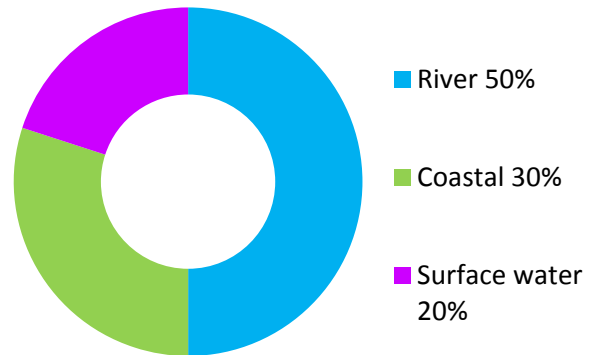
This Potentially Vulnerable Area is located in the north west of the Clyde and Loch Lomond Local Plan District, along the coast between Holy Loch and Port Bannatyne, and is approximately 40km² (shown below).



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

There are approximately 140 residential properties and 80 non-residential properties at risk of flooding. The Annual Average Damages are approximately £480,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

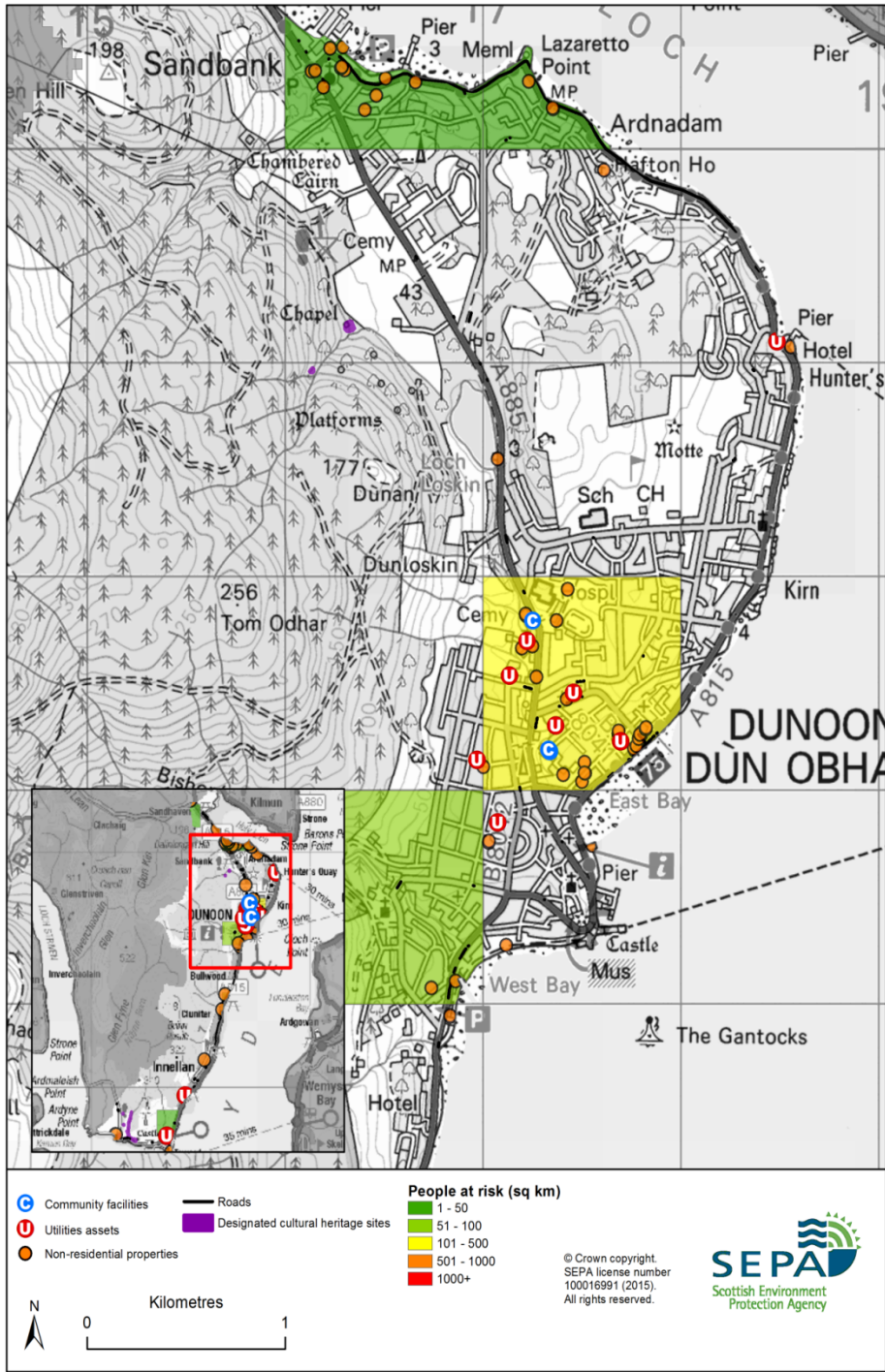


Figure 3.7: Impacts of Flooding

Table 3.7 - PVA 11/07 – Dunoon - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110050017	<p>Maintain flood protection scheme</p> <p>Accept that current and future significant flood risks in the Kilbride Road and Crochan Road area are being managed appropriately</p>	Argyll and Bute Council	Continue to maintain the existing defences in Dunoon .	2012	Ongoing
110060017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of Milton Burn flooding to residential properties in Dunoon</p>	Argyll and Bute Council	The Milton Burn Flood Protection Scheme was completed in 2012 which consists of a 1.4m bypass pipe, flood wall improvements and the raising of a pedestrian bridge. This scheme reduces the impact of flooding in Dunoon and provides a standard of protection to a 1 in 100 year flood plus climate change in the St Mun's area. These defences will be maintained , and will continue to manage flooding according to the design standard at the time of construction. Unless actions are put in place to enhance the standard of protection, levels of flood risk are likely to increase over time as a consequence of climate change.	2012	Ongoing
110830018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Dunoon</p>	Argyll and Bute Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	Ongoing	2019
111320013	<p>Awareness raising</p> <p>Reduce overall flood risk</p>	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing

Table 3.7 - PVA 11/07 – Dunoon - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Dunoon 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.	2015	2019
111320030	Maintain flood warning Reduce overall flood risk	SEPA	Continue to maintain the Dunoon Pier and Hunter's Grove 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 the flood warning service is timely and accurate.	Ongoing	Ongoing

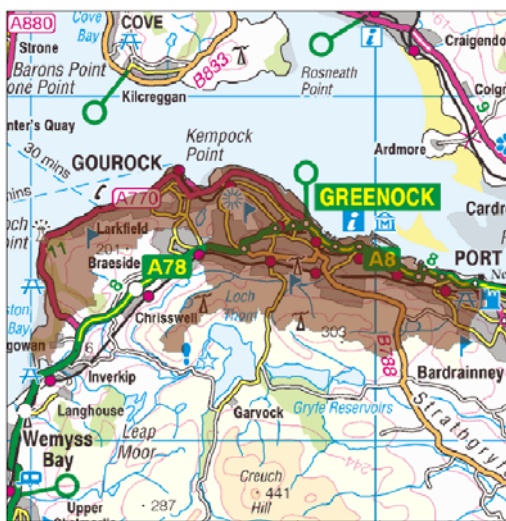
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.8 PVA 11/08 – Greenock to Gourock

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Inverclyde Council	Inverclyde coastal

Background and Summary of Flooding Impacts

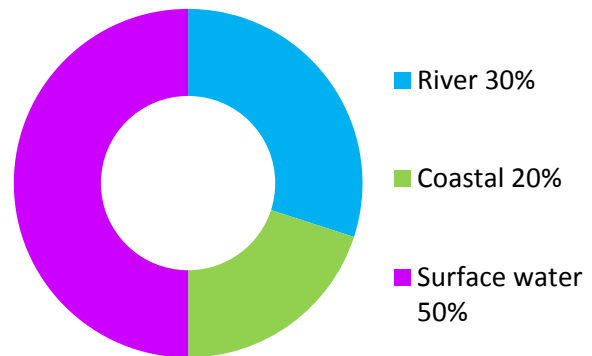
This Potentially Vulnerable Area is located in the north west of the Clyde and Loch Lomond Local Plan District and is approximately 40km² (shown below). The area covers the coastline of the Firth of Clyde from Port Glasgow to Ardgowan in the south west, and includes the settlements of Greenock, Gourock and Port Glasgow.



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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 820 residential properties and 730 non-residential properties at risk of flooding. The Annual Average Damages are approximately £1.5 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

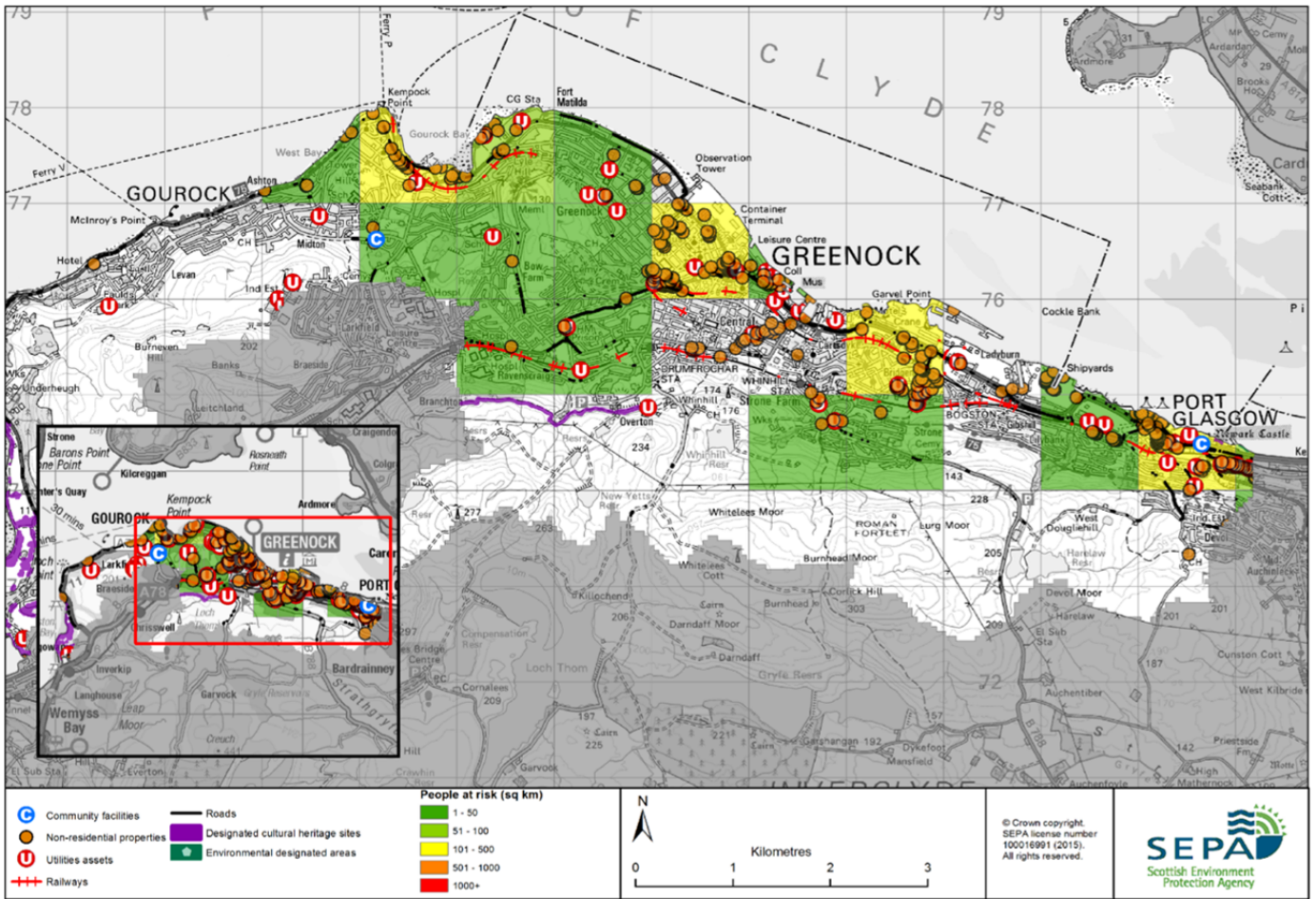


Figure 3.8: Impacts of Flooding

Table 3.8: PVA 11/08 – Greenock to Gourock - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110280006	Flood protection scheme/works Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Greenock	Inverclyde Council	The Council plans to progress the flood protection scheme proposed for the Coves Burn . The work involves a number of conveyance modification actions including: upgrading of culverts, construction of a new connection chamber and tidal valve. The Controlled Activities Regulations licence has been granted for these works.	2017	2019
110280017	Maintain flood protection scheme Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Greenock	Inverclyde Council	There are V-notches on spillways from 5 reservoirs upstream of Greenock which act as automatic attenuation. They restrict the discharge from the reservoirs and reduce peak flows in watercourses downstream during periods of heavy rain. These defences 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.	Ongoing	Ongoing
110280026	Flood protection scheme/works Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Greenock	Inverclyde Council	The Council plans to progress the Greenock Flood Protection Scheme . The work involves a number of conveyance modification actions, along the Bouverie Burn .	2017	2019
111080018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Greenock	Inverclyde Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2019
111080019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Greenock . Surface water plan / study	Scottish Water in partnership with Inverclyde Council	An integrated catchment study covering the Inverclyde catchment will be carried out to support the surface water management planning process in Greenock and Port Glasgow . 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. This will improve the understanding of local surface water flood risk.	2016	2019

Table 3.8: PVA 11/08 – Greenock to Gourock - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111090018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Port Glasgow	Inverclyde Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2019
111090019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Port Glasgow .	Scottish Water in partnership with Inverclyde Council	An integrated catchment study covering the Inverclyde catchment will be carried out to support the surface water management planning process in Greenock and Port Glasgow . 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. This will improve the understanding of local surface water flood risk.	2016	2019
111320011	Self help Reduce overall flood risk	Everyone	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. Inverclyde Council has purchased flood protection products for use throughout Inverclyde.	Ongoing	Ongoing
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will work towards raising awareness of flood risk through partnership activities with Transport Scotland. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. 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. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing

Table 3.8: PVA 11/08 – Greenock to Gourock - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Inverclyde 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.	2016	2019
111320030	Maintain flood warning Reduce overall flood risk	SEPA	Continue to maintain the Gourock Cove Road and the Greenock and Port Glasgow 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 the flood warning service is timely and accurate.	Ongoing	Ongoing

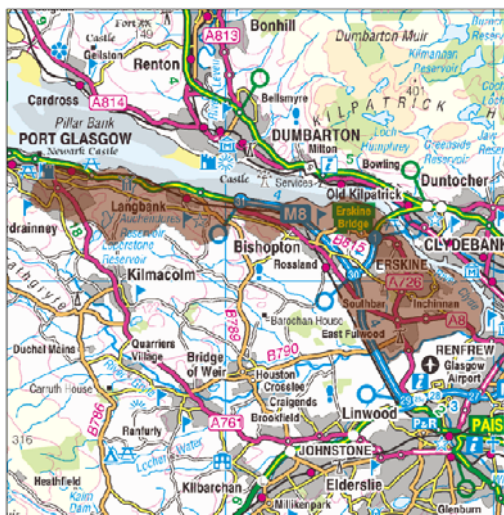
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here

3.9 PVA 11/09 – Clyde South - Port Glasgow to Inchinnan

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Inverclyde Council, Renfrewshire Council	Firth of Clyde – Renfrew to Port Glasgow

Background and Summary of Flooding Impacts

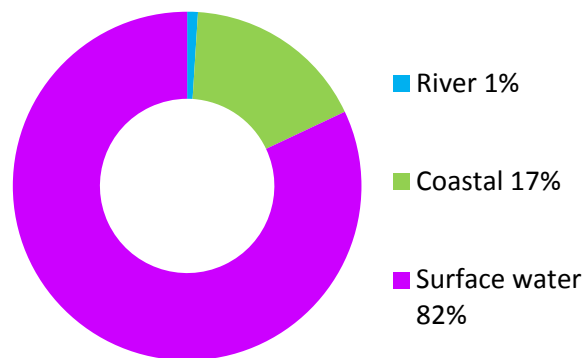
This Potentially Vulnerable Area is located to the west of Glasgow City, at the mouth of the River Clyde, spanning from Port Glasgow in the west to Erskine and Inchinnan in the east, with the southern border along the Black Cart Water (shown below). This area is approximately 40km².



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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 190 residential properties and 60 non-residential properties at risk of flooding. The Annual Average Damages are approximately £310,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

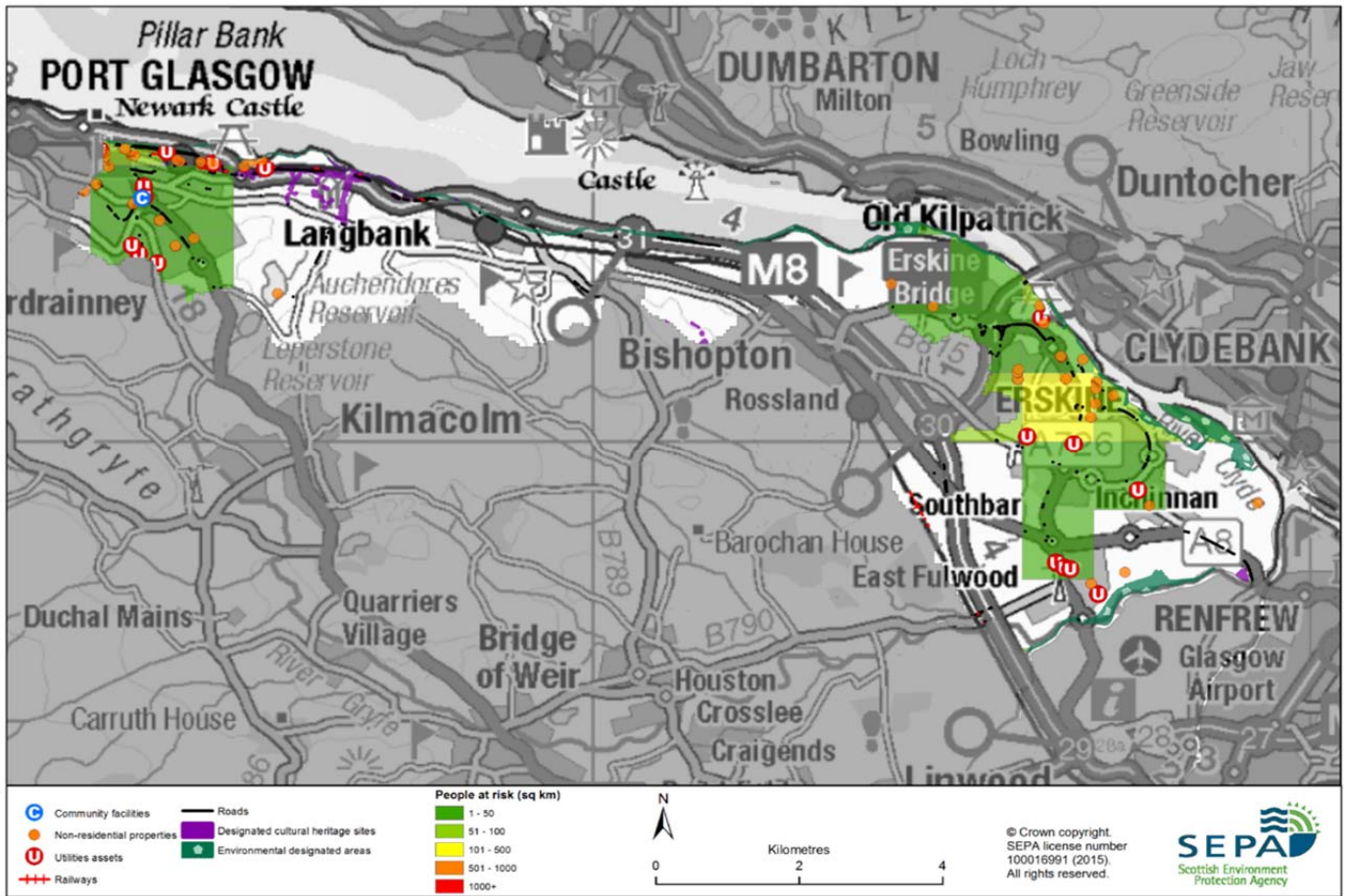


Figure 3.9: Impacts of Flooding

Table 3.9: PVA 11/09 – Port Glasgow to Inchinnan- Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
11302021	Flood protection scheme/works Reduce the physical or disruption risk related to the transport network for rail.	Network Rail	Network Rail will carry out civil engineering work which will reduce flood risk to identified sections of the rail network within this Potentially Vulnerable Area.	2019	2024
111091018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Port Glasgow	Inverclyde Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2019
111091019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Port Glasgow . Surface water plan / study	Scottish Water in partnership with Inverclyde Council	An integrated catchment study covering the Inverclyde catchment will be carried out to support the surface water management planning process in Greenock and Port Glasgow . 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. This will improve the understanding of local surface water flood risk.	2016	2019
111150019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Inchinnan .	Scottish Water in partnership with Renfrewshire Council	An integrated catchment study covering the Erskine catchment will be carried out to support the surface water management planning process in Erskine, Inchinnan, Linwood, Johnstone and Kilbarchan . 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. This will improve the understanding of local surface water flood risk.	2016	2020
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing

Table 3.9: PVA 11/09 – Port Glasgow to Inchinnan- Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Inverclyde and Erskine 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.	2016	2020

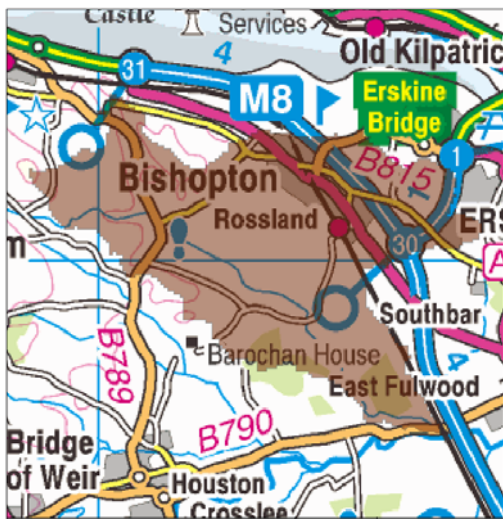
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.10 PVA 11/10 – Bishopton

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Renfrewshire Council	River Gryfe

Background and Summary of Flooding Impacts

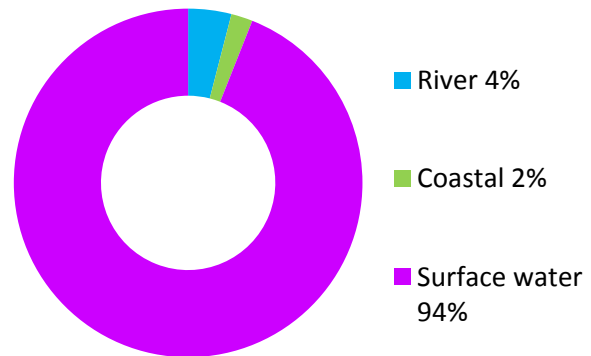
This Potentially Vulnerable Area is located to the west of Glasgow City and is approximately 20km² (shown below). The area is centred on Bishopton and incorporates a large amount of wooded areas which surround the site of the former Bishopton Royal Ordnance Factory.



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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 30 residential properties at risk of flooding. The Annual Average Damages are approximately £35,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

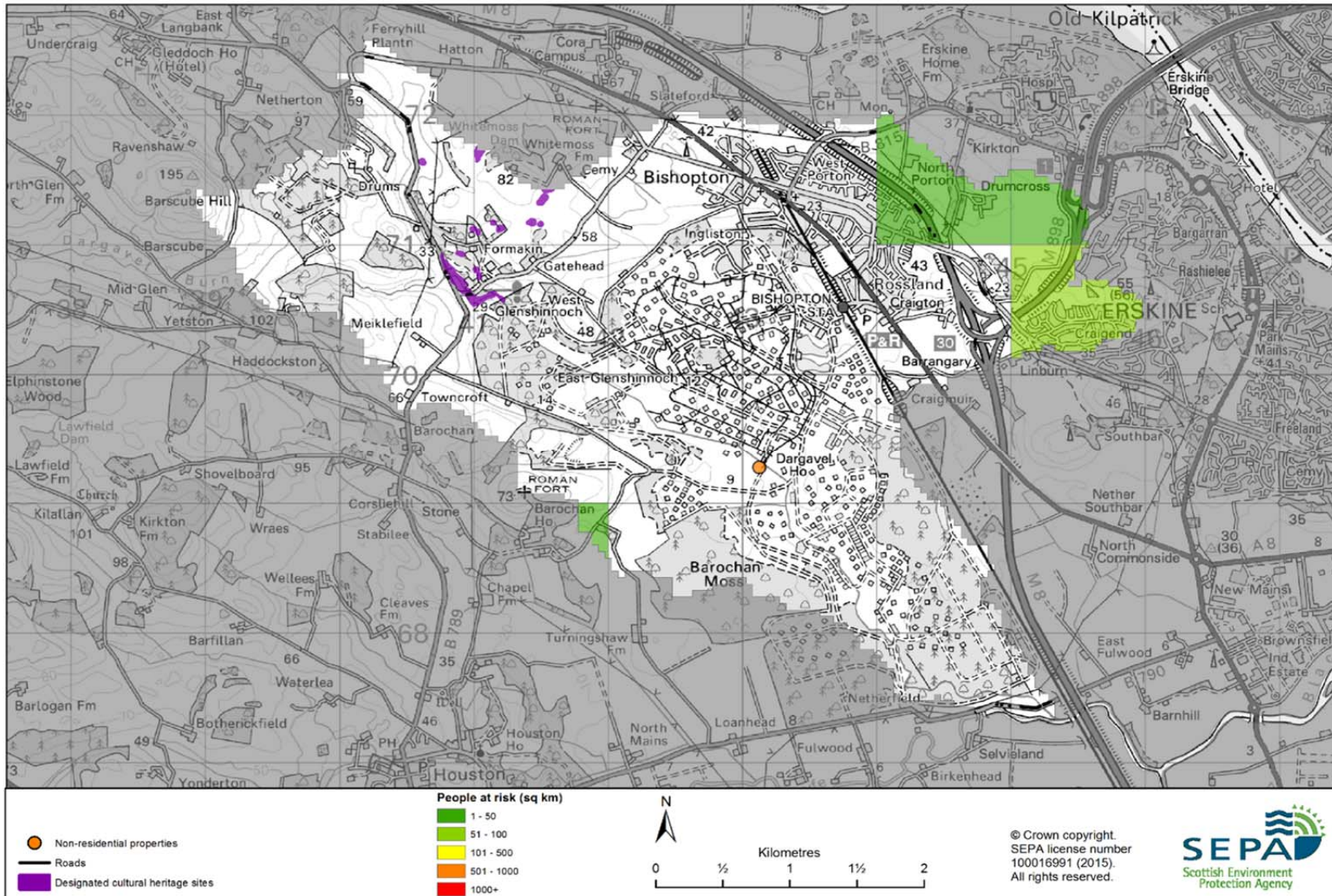


Figure 3.10: Impacts of Flooding

Table 3.10: PVA 11/10 – Bishopton - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111141019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Erskine .	Scottish Water in partnership with Renfrewshire Council	An integrated catchment study covering the Erskine catchment will be carried out to support the surface water management planning process in Erskine, Inchinnan, Linwood, Johnstone and Kilbarchan . 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. This will improve the understanding of local surface water flood risk.	2016	2020
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Erskine 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.	2017	2020

Note:- 1 – Actions will be funded as per the statements in Section 2.

2 – Coordination of the Actions will be carried out as per the statements in Section 2.

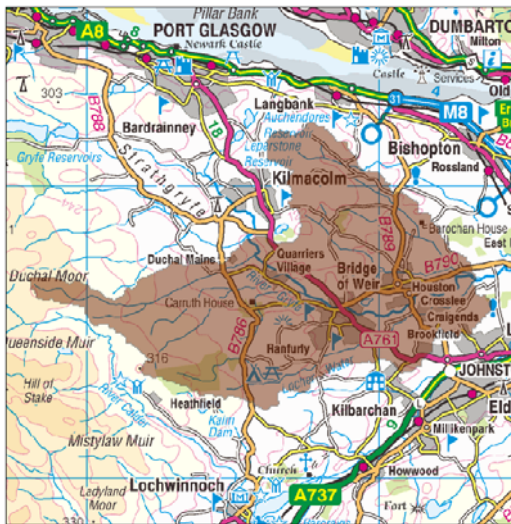
3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.11 PVA 11/11 – Gryfe catchment - Bridge of Weir to Houston

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Inverclyde Council, Renfrewshire Council	River Gryfe

Background and Summary of Flooding Impacts

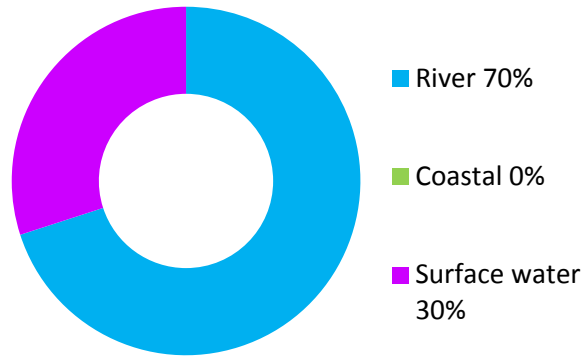
The Potentially Vulnerable Area is located to the south west of Glasgow City, situated between Langbank in the north, Johnstone to the south and the River Calder (shown below). It is approximately 70km² and incorporates the villages of Houston, Bridge of Weir and Quarriers Village.



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

There are approximately 190 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £430,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

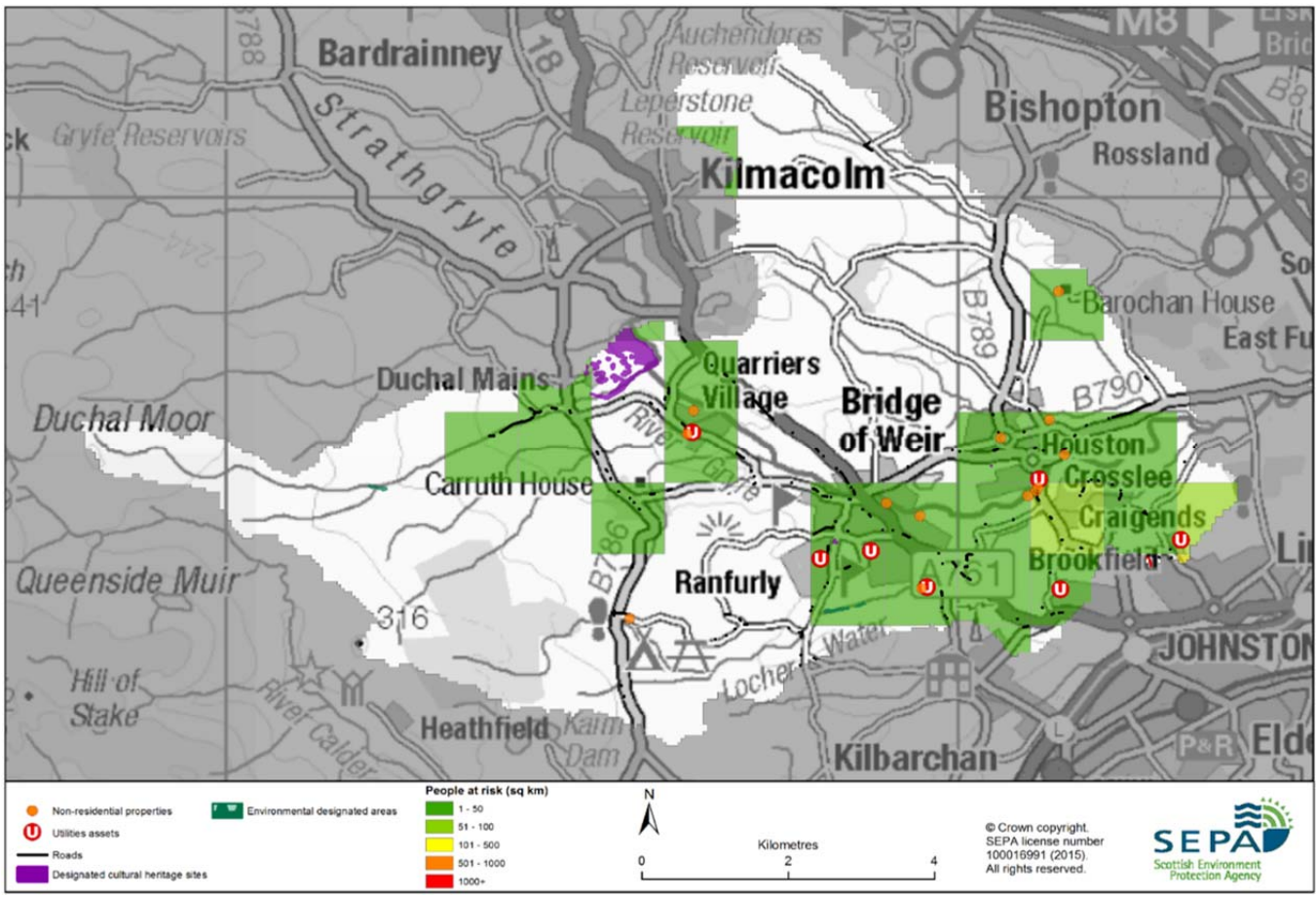


Figure 3.11: Impacts of Flooding

Table 3.11: PVA 11/11 – Gryfe Catchment-Bridge of Weir to Houston - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110330006	Flood protection scheme/works Reduce the risk of flooding from the Gotter Water and River Gryfe to residential properties in Quarriers Village	Inverclyde Council	Inverclyde Council plans to progress the flood protection scheme proposed for the Gotter Water in Quarrier's Village . Inverclyde Council have completed a study which investigated the creation of embankments on the south bank of the watercourse upstream of Quarrier's Village , with flood defence walls downstream of the embankments on both banks along the reach. The study will be progressed to develop a detailed design of the scheme. SEPA will review the output of the study for inclusion in the Flood Maps.	2017	2019
111160018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Johnstone and Kilbarchan	Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2020	2021
111170019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Linwood .	Scottish Water in partnership with Renfrewshire Council	An integrated catchment study covering the Erskine catchment will be carried out to support the surface water management planning process in Erskine, Inchinnan, Linwood, Johnstone and Kilbarchan . 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. This will improve the understanding of local surface water flood risk.	2016	2020

Table 3.11: PVA 11/11 – Gryfe Catchment-Bridge of Weir to Houston - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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, 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>As part of SEPA's education programme and to contribute to community resilience SEPA is sponsoring a play by Rightlines Productions called 'Rapid Departure'. This interactive play about flooding will tour locations in Scotland throughout 2016, including this Potentially Vulnerable Area. The performances aim to lead people to consider how flooding could impact their community and how they can take steps to prepare for it.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	<p>Scottish Water will undertake further investigation and modelling in the Erskine 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.</p>	2017	2020

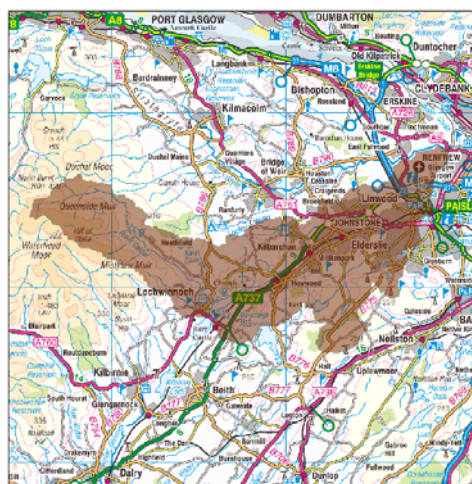
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.12 PVA 11/12 – Black Cart Water catchment - Lochwinnoch to Johnstone

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	East Renfrewshire Council, Inverclyde Council, Renfrewshire Council	Black Cart Water

Background and Summary of Flooding Impacts

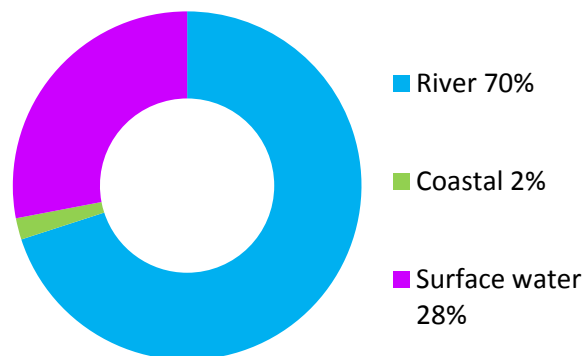
This Potential Vulnerable Area is located to the south west of Glasgow City incorporating the catchments of the Black Cart Water, River Calder and Old Patrick Water (shown below). The area spans between Glasgow Airport in the north east, the A737 as far as Barr Loch and Queenside Muir in the west, incorporating part of Paisley, Johnstone and several villages. It is approximately 120km².



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

There are approximately 1,300 residential properties and 550 non-residential properties at risk of flooding. The Annual Average Damages are approximately £2.6 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

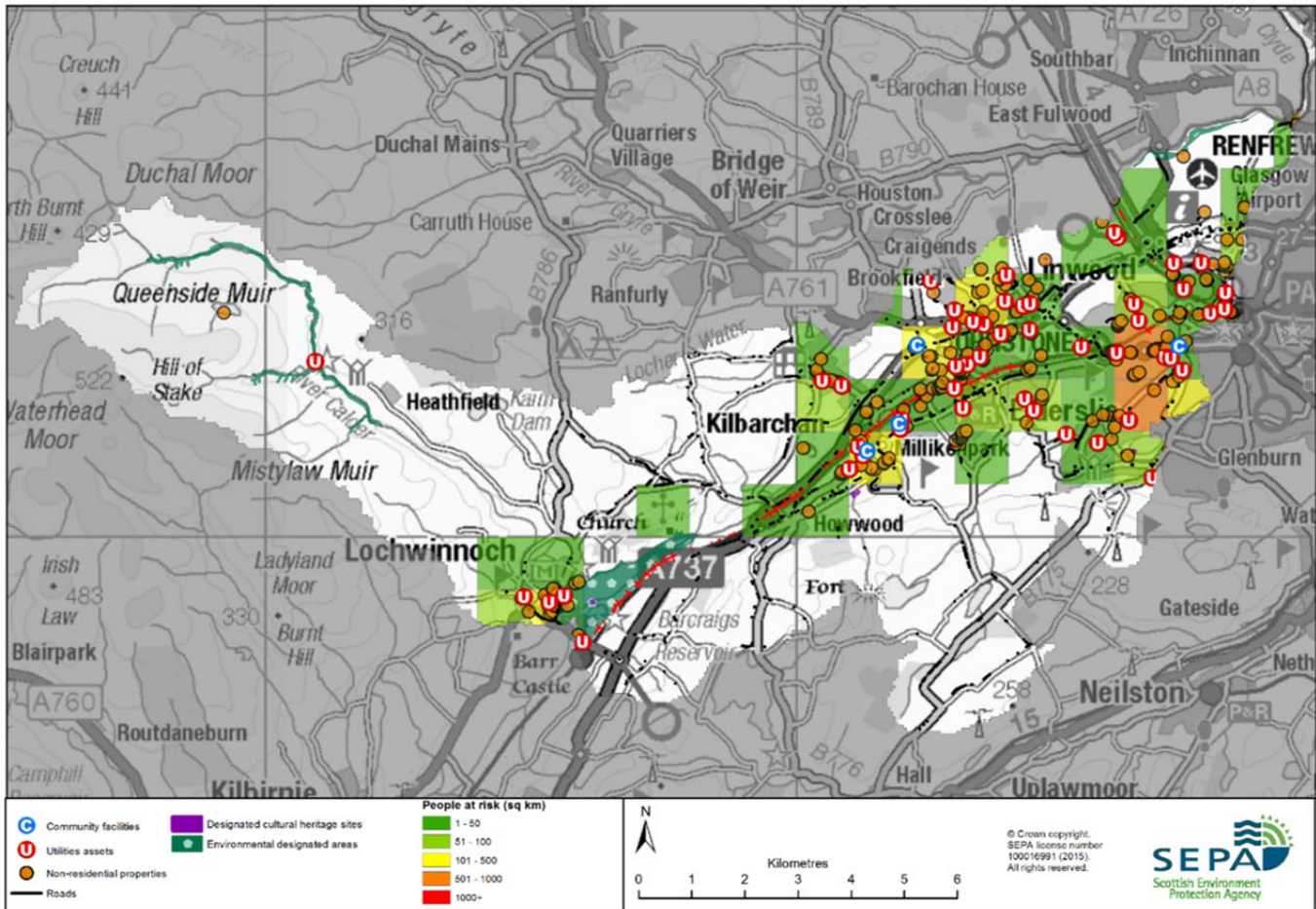


Figure 3.12: Impacts of Flooding

Table 3.12: PVA 11/12 – Black Cart Water Catchment Lochwinnoch to Johnstone - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
11303021	Flood protection scheme/works Reduce the physical or disruption risk related to the transport network for rail.	Network Rail	Network Rail will carry out civil engineering work which will reduce flood risk to identified sections of the rail network within this Potentially Vulnerable Area.	2019	2024
110440005	Flood protection study Reduce the risk of river and surface water flooding to residential properties and non-residential properties in the Candren Burn catchment	Renfrewshire Council	The Council plans a study to further investigate the feasibility of a flood protection scheme along the Candren Burn , focusing on the use of sustainable drainage systems and short sections of flood defences. The study will also examine the potential benefit of property level protection both as a single action and in combination with other actions. Other actions will also be considered to select the most sustainable combination of actions.	2021	2022
110490005	Flood protection study Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Johnstone	Renfrewshire Council	The Council plans a study to further investigate the feasibility of actions recommended in the Green Networks Integrated Urban Infrastructure report. These focused on the potential to create small areas of offline storage at a number of locations within Johnstone and the potential to improve culvert conveyance and investigate culvert daylighting. In addition to this the study will examine the potential benefit of automatic property level protection and sustainable drainage systems. Other actions will also be considered to select the most sustainable combination of actions. This may be combined into the study investigating the flood risk within Kilbarchan (action 110500005). This study is linked to the Johnstone and Kilbarchan surface water management plans which will help to identify the potential of some actions.	2020	2021
110490017	Maintain flood protection scheme Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Johnstone	Renfrewshire Council	The Collier Street / Rankine Street Flood Protection Scheme has been designed to protect properties in the area against a 200 year flood inclusive of climate change allowances. This scheme 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.	Ongoing	Ongoing

Table 3.12: PVA 11/12 – Black Cart Water Catchment Lochwinnoch to Johnstone - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110500003	<p>Natural flood management study</p> <p>Reduce the risk of flooding from the Kilbarchan Burn and surface water to residential properties, non-residential properties and transport routes in Kilbarchan</p>	Renfrewshire Council	The Council plans to undertake a natural flood management study to further investigate the potential benefit for sediment management at Kilbarchan . This may be carried out as a separate study or as part of the flood protection study within this area.	2020	2021
110500005	<p>Flood protection study</p> <p>Reduce the risk of flooding from the Kilbarchan Burn and surface water to residential properties, non-residential properties and transport routes in Kilbarchan</p>	Renfrewshire Council	<p>The Council plans a study to further investigate the feasibility of a flood protection scheme in Kilbarchan. The study will focus on storage for the Kilbarchan Burn at Bog Park and improved conveyance of the Kilbarchan Burn through Kilbarchan by upgrading of culverts and watercourse channel. A separate study (action 11050003) will also investigate managing the sediment getting into the channel using natural flood management actions.</p> <p>Other actions will also be considered to select the most sustainable combination of actions. The study may be combined into the study investigating the flood risk within Johnstone (action 110490005).</p> <p>This study is linked to the Johnstone and Kilbarchan surface water management plans which will help to identify the potential of some actions, including sustainable drainage systems.</p>	2020	2021
110520003	<p>Natural flood management study</p> <p>Reduce the risk of river flooding to residential properties, non-residential properties and transport routes in Lochwinnoch</p>	Renfrewshire Council	The Council plans to undertake a natural flood management study to further investigate the potential benefit for runoff control and sediment management in Lochwinnoch . The study will look at the land management upstream of Lochwinnoch and start engagement with local land owners to establish the potential for works. This may be carried out as a separate study or as part of the flood protection study within this area (action 110520005).	2021	2022
110520005	<p>Flood protection study</p> <p>Reduce the risk of river flooding to residential properties, non-residential properties and transport routes in Lochwinnoch</p>	Renfrewshire Council	The Council plans a study to undertake a study to further investigate the feasibility of a flood protection scheme along the River Calder within Lochwinnoch , focusing on the benefit of direct defences. Other actions may also be considered to select the most sustainable combination of actions. A separate study looking at natural flood management actions will also cover this area.	2021	2022

Table 3.12: PVA 11/12 – Black Cart Water Catchment Lochwinnoch to Johnstone - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111161018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Johnstone and Kilbarchan	Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2020	2021
111171019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Linwood, Johnstone and Kilbarchan	Scottish Water in partnership with Renfrewshire Council	An integrated catchment study covering the Erskine catchment will be carried out to support the surface water management planning process in Erskine, Inchinnan, Linwood, Johnstone and Kilbarchan . 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. This will improve the understanding of local surface water flood risk.	2016	2020
111180018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Paisley	Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.	2021	2022

Table 3.12: PVA 11/12 – Black Cart Water Catchment Lochwinnoch to Johnstone - Objectives and Actions

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with community resilience groups and participate in property level protection events delivered by the Scottish Flood Forum where possible.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>As part of SEPA's education programme and to contribute to community resilience SEPA is sponsoring a play by Rightlines Productions called 'Rapid Departure'. This interactive play about flooding will tour locations in Scotland throughout 2016, including this Potentially Vulnerable Area. The performances aim to lead people to consider how flooding could impact their community and how they can take steps to prepare for it.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk . Approximately 2,200km 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 will be considered as these projects are completed.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Erskine, Lightham, Paisley, and Lochwinnoch 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.	2016	2020

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.13 PVA 11/13 – White Cart Water catchment

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	East Renfrewshire Council, Glasgow City Council, Renfrewshire Council, South Lanarkshire Council	White Cart Water

Background and Summary of Flooding Impacts

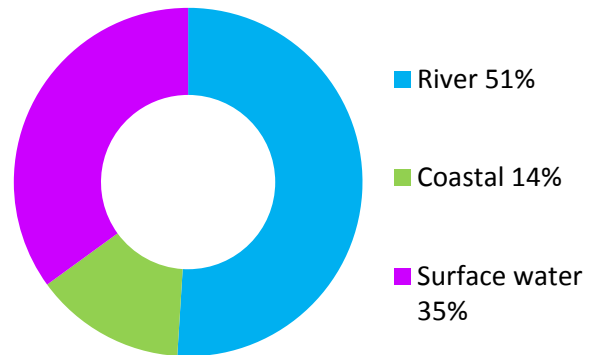
This Potentially Vulnerable Area incorporates the Paisley, Pollokshields, Barrhead, Newton Mearns and East Kilbride areas to the south west of Glasgow City centre (shown below). It is approximately 190km².



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

There are approximately 4,700 residential properties and 2,800 non-residential properties at risk of flooding. The Annual Average Damages are approximately £10 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

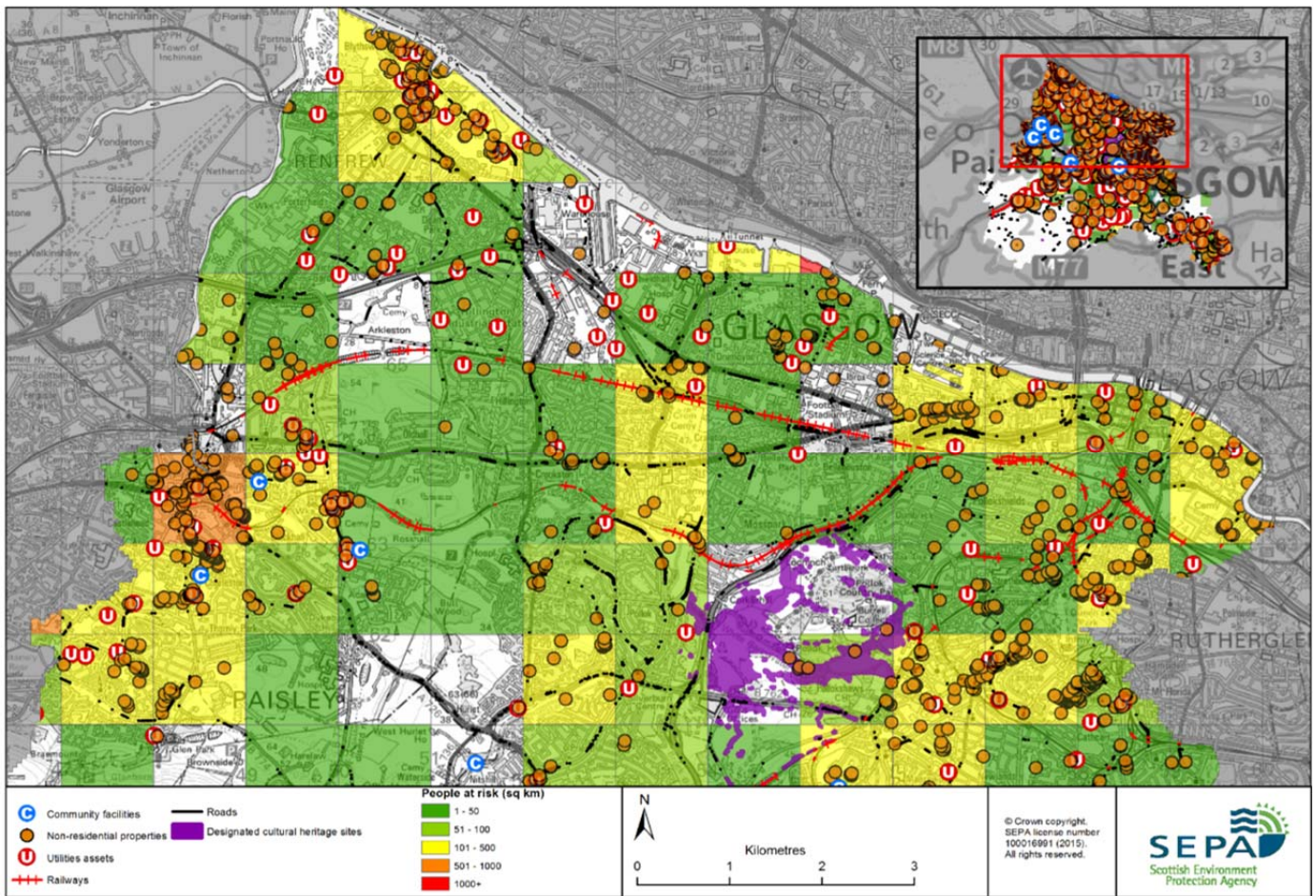


Figure 3.13: Impacts of Flooding

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110120006	<p>Flood protection scheme/works</p> <p>Reduce the risk of river and surface water flooding to residential properties in Giffnock</p>	Scottish Water	<p>The Sewer Flooding Project by Scottish Water proposes a new pumping station (at Woodfarm playing fields) which will receive storm flows from the existing combined sewer network. A new rising main will transfer storm flows from this pumping station to a new combined sewer overflow at Robslee Drive.</p> <p>As part of Scottish Water's Unsatisfactory Intermittent Discharge (UID) projects a diversion at Thornliebank is being carried out which will intercept flow and divert it to the Shieldhall Tunnel. The Scottish Water Shieldhall Tunnel Project is a proposed trunk sewer through Pollok Park which will add capacity and conveyance for the catchment flows to reach Shieldhall Wastewater Treatment Works and at times of extreme storm conditions, act as online storage for the combined flows.</p>	Ongoing	2019
110130005	<p>Flood protection study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Barrhead.</p> <p>Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Barrhead</p>	East Renfrewshire Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme to reduce the risk of river flooding in Barrhead. The study will focus on placing direct defences along the watercourses and the potential for runoff control and floodplain restoration using natural flood management. This study will also include an assessment of the potential benefit of a property level protection scheme in Barrhead. Other actions may also be considered to select the most sustainable combination of actions.</p> <p>This study is linked to a surface water management plan (Action 110880018) for the area and any recommendations will be considered.</p>	2017	2020
110170005	<p>Flood protection study</p> <p>Reduce the risk of flooding to non-residential properties and community facilities in Gorbals from the River Clyde</p>	Glasgow City Council	<p>The Council plans to progress the Gorbals Tidal Weir morphology study to further investigate the potential risk to key community facilities on the south bank of the Clyde. The outcomes of this study will be used to determine if /when further action is required to increase the level of protection to these facilities.</p>	2020	2022

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110190006	Flood protection scheme/works Reduce the risk of river flooding to residential properties and non-residential properties from the White Cart Water	Glasgow City Council	The Council plans to progress the flood protection scheme proposed for the White Cart Water . The scheme is an extension of the existing defences, and will increase the level of protection to a number of properties along parts of the Auldhouse Burn and White Cart Water . The proposed scheme includes building flood walls in locations where properties are still identified to be at risk. The flood mapping for the White Cart Water and Auldhouse Burn will be revised to include all defences to understand any remaining residual risk now and in the future.	2017	2019
110190012	Community flood action groups Reduce the risk of river flooding to residential properties and non-residential properties from the White Cart Water	Community	The local community set up the White Cart Action group, to raise awareness of flood risk in the area. Although the White Cart Water scheme has reduced flood risk, it is recommended that the group continues to carry out these functions.	Ongoing	Ongoing
110190015	Site protection plans Reduce the risk of river flooding to residential properties and non-residential properties from the White Cart Water	Glasgow City Council	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. The site protection plans that are in place for Strathclyde Police Horse and Dog Training Division and the cattle in Pollok Country Park should be maintained and periodically reviewed.	Ongoing	Ongoing
110190017	Maintain flood protection scheme Reduce the risk of river flooding to residential properties and non-residential properties from the White Cart Water	Glasgow City Council	In Langside and Shawlands there are sections of direct flood defences constructed along the White Cart Water and Auldhouse Burn as part of the White Cart Water Flood Protection Scheme upper catchment reservoirs which provide protection to the area. This scheme along with the new phase of work, 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.	Ongoing	Ongoing

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110270005	<p>Flood protection study</p> <p>Reduce economic damages and risk to people from surface water flooding in Merrylee, Thornliebank, Giffnock and Eastwood North.</p> <p>Reduce the risk of river and surface water flooding to residential properties and non-residential properties in Merrylee</p>	Glasgow City Council	<p>The Council plans to undertake a study to further investigate flood risk in Merrylee. The current strategic mapping does not have sufficient detail to represent the culverts and potentially overestimates the risk in the area. A detailed study of the burns including culverted sections will be developed to identify any potential constraints and identify the flood risk to people and properties. This study will be carried out by Glasgow City Council with the cooperation of East Renfrewshire Council. This study is linked to a surface water management plan (Action 110890018) for the area and any recommendations will be considered.</p> <p>Review of the study will establish the level of risk and if further stages are required to examine actions to manage flooding.</p> <p>The flood mapping from the study should be used to revise SEPA's strategic mapping.</p>	2020	2022
110590003	<p>Natural flood management study</p> <p>Reduce the risk of flooding to residential properties north of Thornley Reservoir.</p> <p>Reduce the risk of flooding from the Espedair Burn / Gleniffer Burn and surface water to residential properties, non-residential properties, community facilities and transport routes in Paisley</p>	Glasgow Clyde Valley Green Network on behalf of local authorities	<p>The strategic assessment identified that there are widespread areas with the potential for natural flood management, therefore a catchment wide natural flood management study is planned to be undertaken for the White Cart Water catchment. The study will focus on the potential for runoff control and sediment management within the tributaries of the White Cart Water, however it will also examine how these might combine to reduce flows to the White Cart Water itself.</p> <p>The delivery of Action 110190006 will also help to reduce the risk of flooding in this area.</p>	2018	2019

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110590017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of flooding from the Espedair Burn / Gleniffer Burn and surface water to residential properties, non-residential properties, community facilities and transport routes in Paisley</p>	Renfrewshire Council	The Moredun Flood Protection Scheme at Moredun playing fields provides offline storage from the Espedair Burn to a standard of protection of up to a 100 year flood. This scheme 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.	Ongoing	Ongoing
110630006	<p>Flood protection scheme/works</p> <p>Reduce the risk of coastal flooding to residential properties, non-residential properties and transport routes in Renfrew North</p>	Renfrewshire Council	The North Renfrew Flood Protection Scheme was completed in the first half of 2016 and consists of embankments, demountable barriers, raised ground and a new pumping station.	2014	2016
110630017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of coastal flooding to residential properties, non-residential properties and transport routes in Renfrew North</p>	Renfrewshire Council	The North Renfrew Flood Protection Scheme consists of embankments, demountable barriers, raised ground and a new pumping station. This scheme will be maintained , and will continue to manage flooding according to the design standard at the time of construction.	Ongoing	Ongoing
110880018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Barrhead</p>	East Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.	2017	2020

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110890018	Surface water plan/study Reduce economic damages and risk to people from surface water flooding in Merrylee, Thornliebank, Giffnock and Eastwood North	East Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses. Merrylee section of the plan to be completed in the first cycle with remaining areas to be completed during the second Flood Risk Management cycle.	2021	2027
110900018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Newton Mearns	East Renfrewshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2021	2027
110920018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Darnley Mains	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2018
111060018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Hillington and Cardonald	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The plan is to be carried out by Glasgow City Council and Renfrewshire Council. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.	2016	2018
111181018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Paisley	Renfrew-shire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.	2021	2022

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111190018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in East Kilbride	South Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2019
111190019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in East Kilbride	Scottish Water in partnership with South Lanarkshire Council	An integrated catchment study covering the Philipshill catchment will be carried out to support the surface water management planning process in East Kilbride . 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 and watercourses. This will improve the understanding of local surface water flood risk.	2016	2019
111320013	Awareness raising Reduce overall flood risk	Responsible authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA-led education events.</p> <p>The South Lanarkshire Council winter awareness campaign, between October and March includes information on flooding.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Shieldhall, Lighthill, Paisley, Philipshill, and Neilston 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.	2016	2019

Table 3.13: PVA 11/13 – White Cart Catchment

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	<p>Continue to maintain the Alyth Crescent, Pollok, Pollokshaws, Pollok Country Park and the Shawlands, Langside and Cathcart flood warning areas which are part of the White Cart Water flood warning scheme.</p> <p>Continue to maintain the Glasgow Quay Walls and Renfrew flood warning areas which are part of the Firth of Clyde coastal flood warning scheme.</p> <p>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 the flood warning service is timely and accurate.</p> <p>A flood protection scheme for the White Cart and Auldhouse Burn and a flood protection study for Gorbals are proposed in this Potentially Vulnerable Area. 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.</p>	Ongoing	Ongoing

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.14 PVA 11/14 – Rutherglen

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Glasgow City Council, South Lanarkshire Council	Cityford Burn

Background and Summary of Flooding Impacts

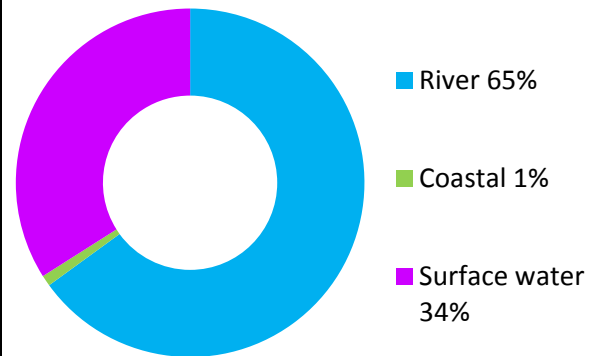
This Potentially Vulnerable Area is located to the south-east of Glasgow City centre and is approximately 10km² (shown below). It incorporates Rutherglen, spanning south to the Cathkin Braes.



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

There are approximately 1,800 residential properties and 280 non-residential properties at risk of flooding. The Annual Average Damages are approximately £3.2 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

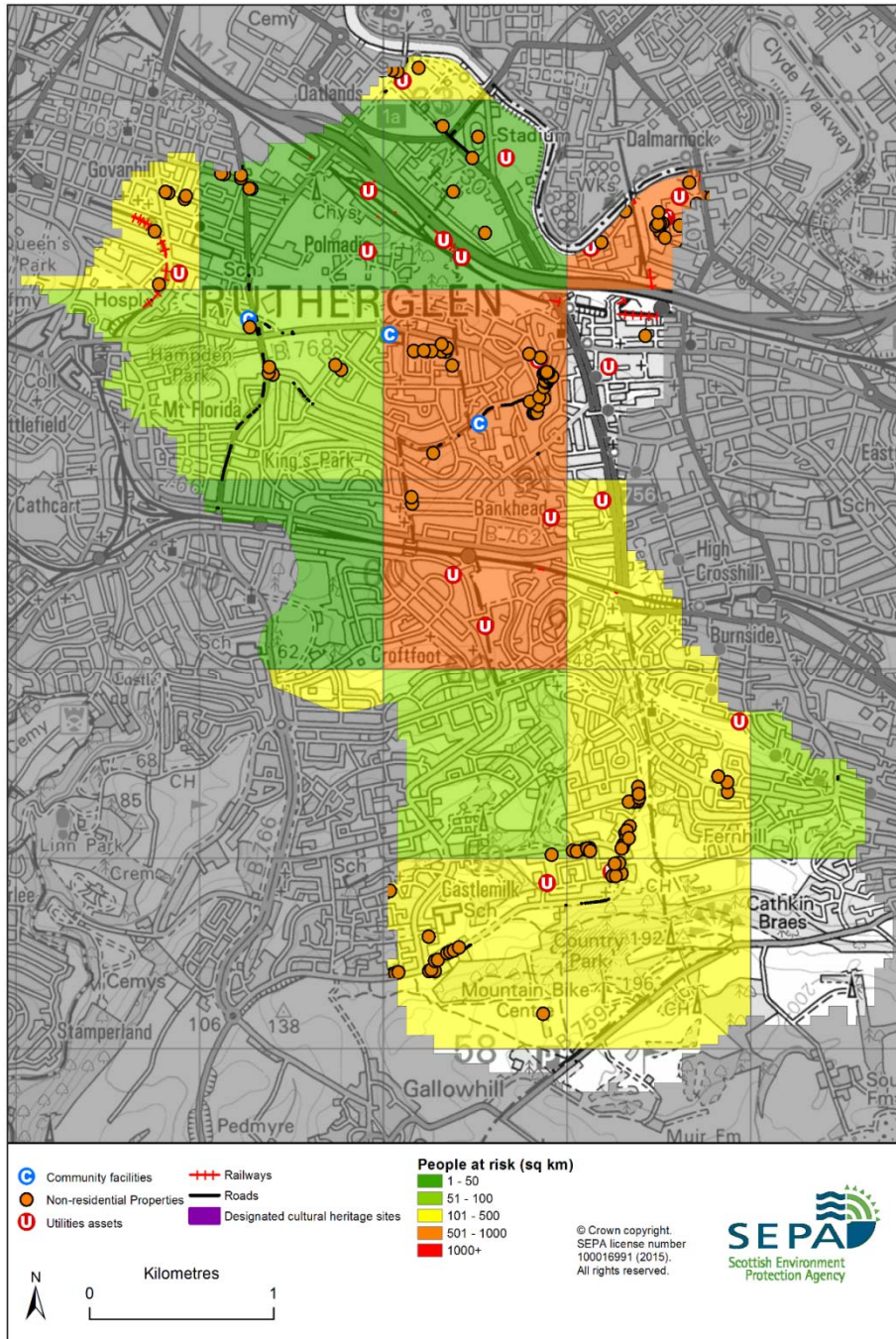


Figure 3.14: Impacts of Flooding

Table 3.14: PVA 11/14 – Rutherglen

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110200005	<p>Flood protection study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Castlemilk</p> <p>Reduce the risk of flooding from the Spittal Burn and surface water to residential properties in Castlemilk</p>	Glasgow City Council and South Lanarkshire Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme on the Cityford / Spittal Burn. The study will focus on identifying the most sustainable combination of actions for managing flooding in the area including, upstream storage, modification of conveyance by upgrading culverts and construction of an embankment along sections of the Cityford Burn / Spittal Burn.</p> <p>This study is linked to the Castlemilk (Action 111290018) and Croftfoot (Action 111070018) surface water management plans which will help to identify the potential of some of these actions, including sustainable drainage systems and the benefit of property level protection.</p>	2018	2020
110210005	<p>Flood protection study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Croftfoot</p> <p>Reduce the risk of river and surface water flooding to residential properties in Croftfoot</p>	Glasgow City Council	<p>The Council plans to undertake a flood protection study to further investigate the following actions in detail, separately and in combination: construction of storage, modification of conveyance by upgrading a culverts and construction of an embankment along sections of the Cityford Burn / Spittal Burn.</p> <p>This study is linked to the Croftfoot surface water management plan (Action 111070018) which will help to identify the potential of actions, including sustainable drainage systems and property level protection. It is proposed that Glasgow City Council will carry out hydraulic studies in the Croftfoot and Spittal areas. The study will also consider links to the Cathkin Road bypass project, which lies outwith the Target Area, which involves attenuation and storage.</p>	2017	2019
110210012	<p>Community flood action groups</p> <p>Reduce the risk of river and surface water flooding to residential properties in Croftfoot</p>	Community	<p>The local community set up the Croftfoot Action group, to raise awareness of flood risk in the area. It is recommended that this group continues its activities.</p>	Ongoing	Ongoing
110210017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of river and surface water flooding to residential properties in Croftfoot</p>	Glasgow City Council	<p>The Cityford Burn Culvert Flood Protection Scheme was completed in 2006 and entailed extending a culvert and creating an over ground storage channel. The scheme was designed to protect properties in Landemer Drive from fluvial flooding up to a 200 year flood. This scheme 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>	Ongoing	Ongoing

Table 3.14: PVA 11/14 – Rutherglen

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110220005	Flood protection study Reduce the risk of flooding to residential properties and non-residential properties in Shawfield	Glasgow City Council	The Council plans to undertake a review of the Clyde Gateway masterplan at Shawfield to assess if further work is required to assess the level of flood risk . The plan is for this review to be coordinated between Glasgow City Council and South Lanarkshire Council for the Rutherglen / Shawfield areas. If the review identifies further investigation of actions may be required, sustainable drainage systems and property level protection will be considered.	2018	2020
110970018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Kings Park	Glasgow City Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2015	2016
111070018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Croftfoot	Glasgow City Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2015	2016
111230018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Muirbank	South Lanarkshire Council	The Council is undertaking a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2015	2017
111290018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Castlemilk	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2019	2021

Table 3.14: PVA 11/14 – Rutherglen

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with the Safer Rutherglen group and Neighbourhood Watch Scotland.</p> <p>The South Lanarkshire Council winter awareness campaign, between October and March includes information on flooding.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Shieldhall 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.	2016	2019

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here

3.15 PVA 11/15 – Glasgow City north

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Glasgow City Council, North Lanarkshire Council	East Glasgow

Background and Summary of Flooding Impacts

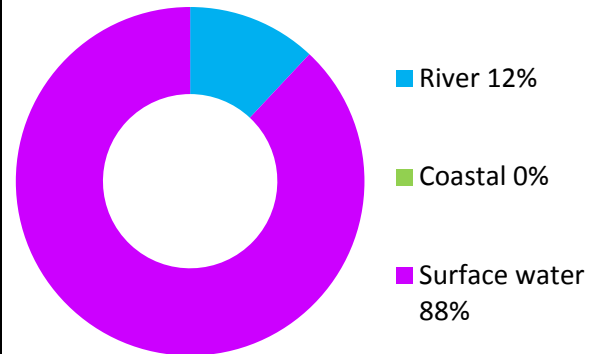
This Potentially Vulnerable Area is located in Glasgow and is approximately 30km² (shown below). The area incorporates the Old Balornock, Millerston, Queenslie, Greenfield, Bridgeton, Calton and Dennistoun sections of the city.



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

There are approximately 710 residential properties and 410 non-residential properties at risk of flooding. The Annual Average Damages are approximately £750,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

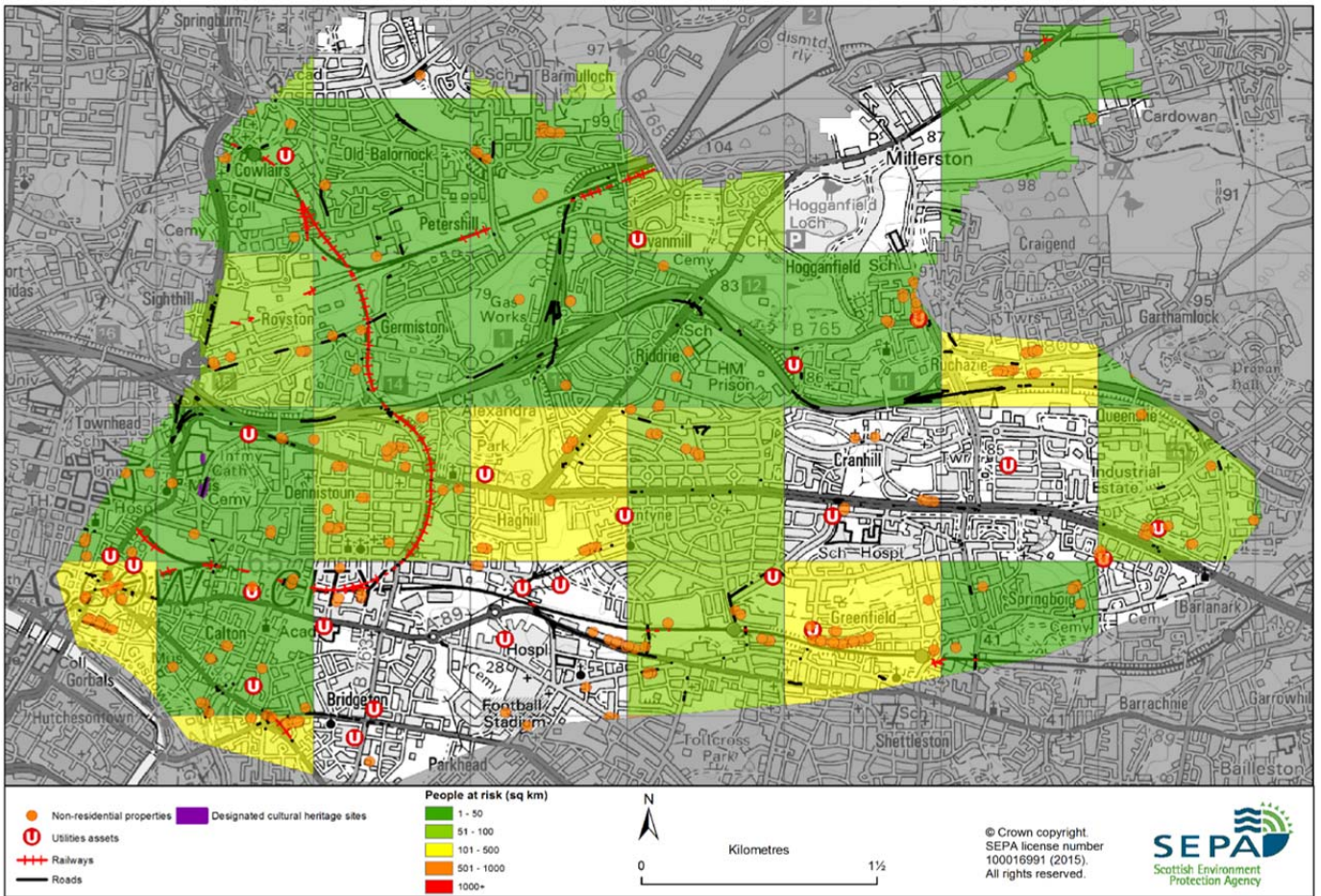


Figure 3.15: Impacts of Flooding

Table 3.15: PVA 11/15 – Glasgow City North

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110910018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Cockenzie Street	Glasgow City Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2014	2016
110940018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in East Springburn	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2018
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Dalmarnock 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.	2016	2019

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.16 PVA 11/16 – Glasgow City centre

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Glasgow City Council	River Clyde

Background and Summary of Flooding Impacts

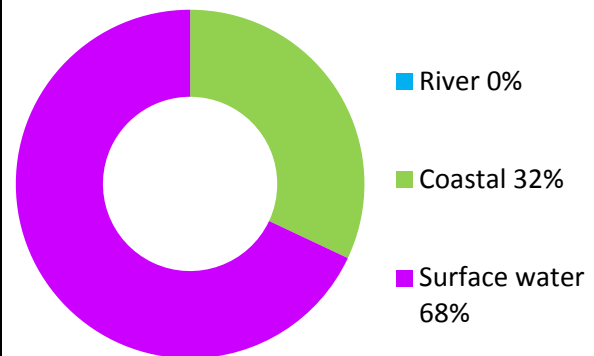
This Potentially Vulnerable Area is located in Glasgow City centre along the north of the River Clyde between Glasgow Bridge in the east and the riverside museum to the west (shown below). The area incorporates Yorkhill, Glasgow Central railway station, Townhead and is approximately 4km².



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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 420 residential properties and 460 non-residential properties at risk of flooding. The Annual Average Damages are approximately £550,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

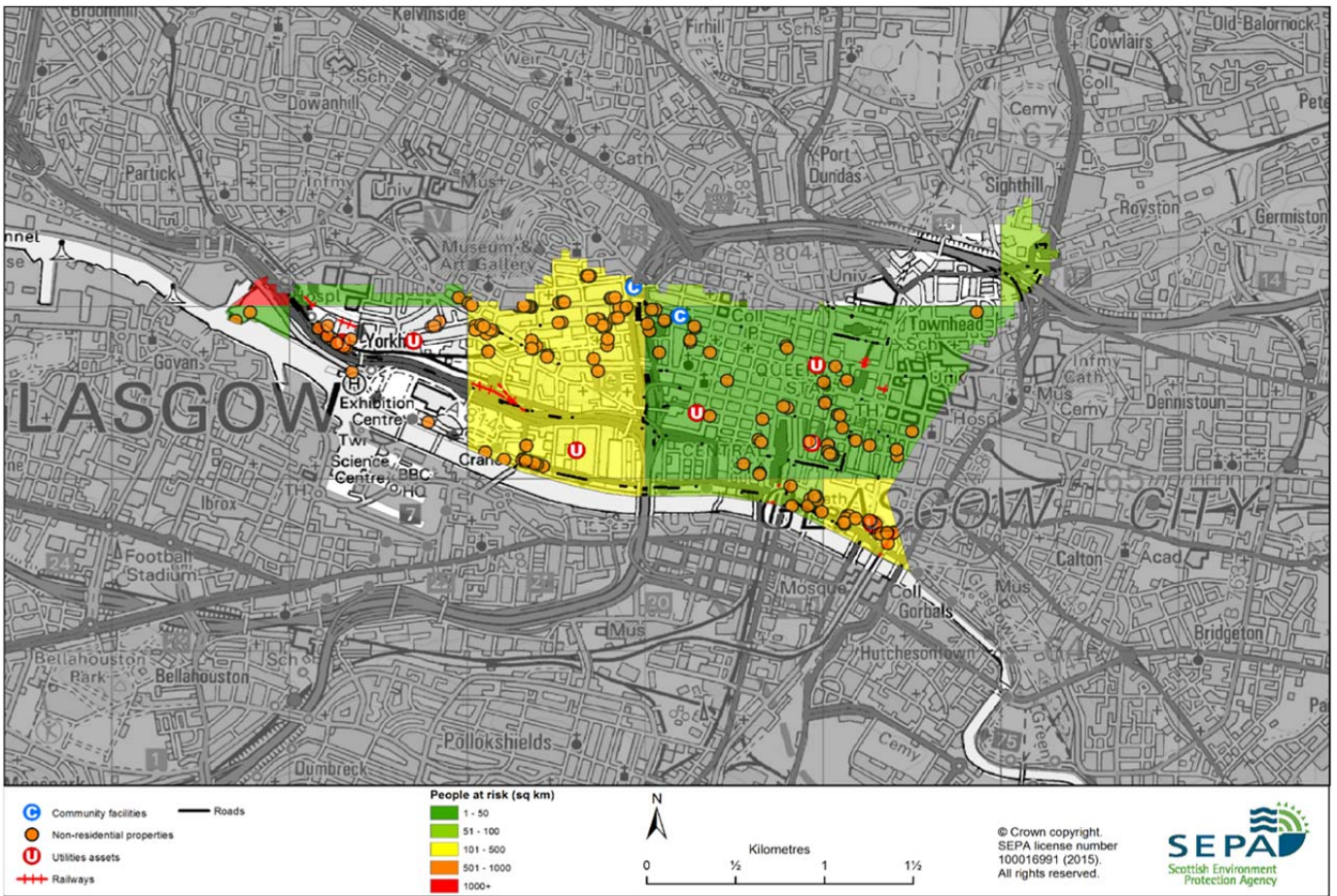


Figure 3.16: Impacts of Flooding

Table 3.16: PVA 11/16 – Glasgow City Centre

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110230006	Flood protection scheme/works Reduce the economic damages and number of people at risk of surface water flooding in Glasgow City	Scottish Water	Scottish Water has proposed a large combined sewer overflow interceptor for Yorkhill adjacent to the Heliport which will remove combined sewer spills from the River Kelvin . This will not reduce the risk of coastal flooding to the Exhibition Quarter .	Ongoing	2019
110230015	Site protection plans Reduce the risk of coastal flooding to non-residential properties in the Exhibition Centre Quarter	Glasgow City Council	Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network. A site protection plan for the Exhibition Centre should be developed; the multiple operators in the Centre should be involved in the process.	2017	2018
110230017	Maintain flood protection scheme Reduce the risk of coastal flooding to non-residential properties in the Exhibition Centre Quarter	Glasgow City Council	There are a number of sections of flood defence along the River Clyde which offer protection to properties in the area. These defences will be maintained, with the responsibility for this task split between the council and riparian lanowners, 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.	Ongoing	Ongoing
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing

Table 3.16: PVA 11/16 – Glasgow City Centre

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Dalmuir 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.	2016	2020
111320030	Maintain flood warning Reduce overall flood risk	SEPA	Continue to maintain the Glasgow Quay Walls 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 the flood warning service is timely and accurate.	Ongoing	Ongoing

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.17 PVA 11/17/1 – East of Glasgow

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Glasgow City Council, North Lanarkshire Council, South Lanarkshire Council	River Clyde

Background and Summary of Flooding Impacts

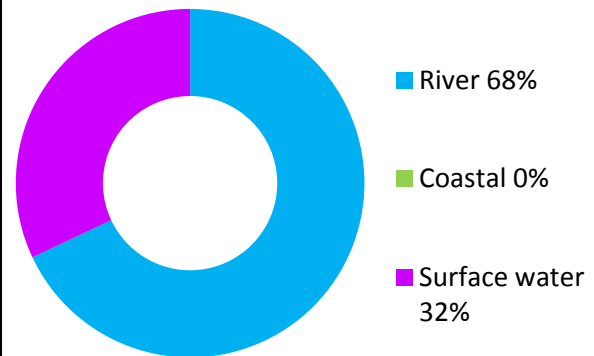
This Potentially Vulnerable Area covers the area south of Glasgow City centre down through Hamilton and Strathaven (shown below). It is approximately 160km².



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

There are approximately 2,500 residential properties and 650 non-residential properties at risk of flooding. The Annual Average Damages are approximately £6.7 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

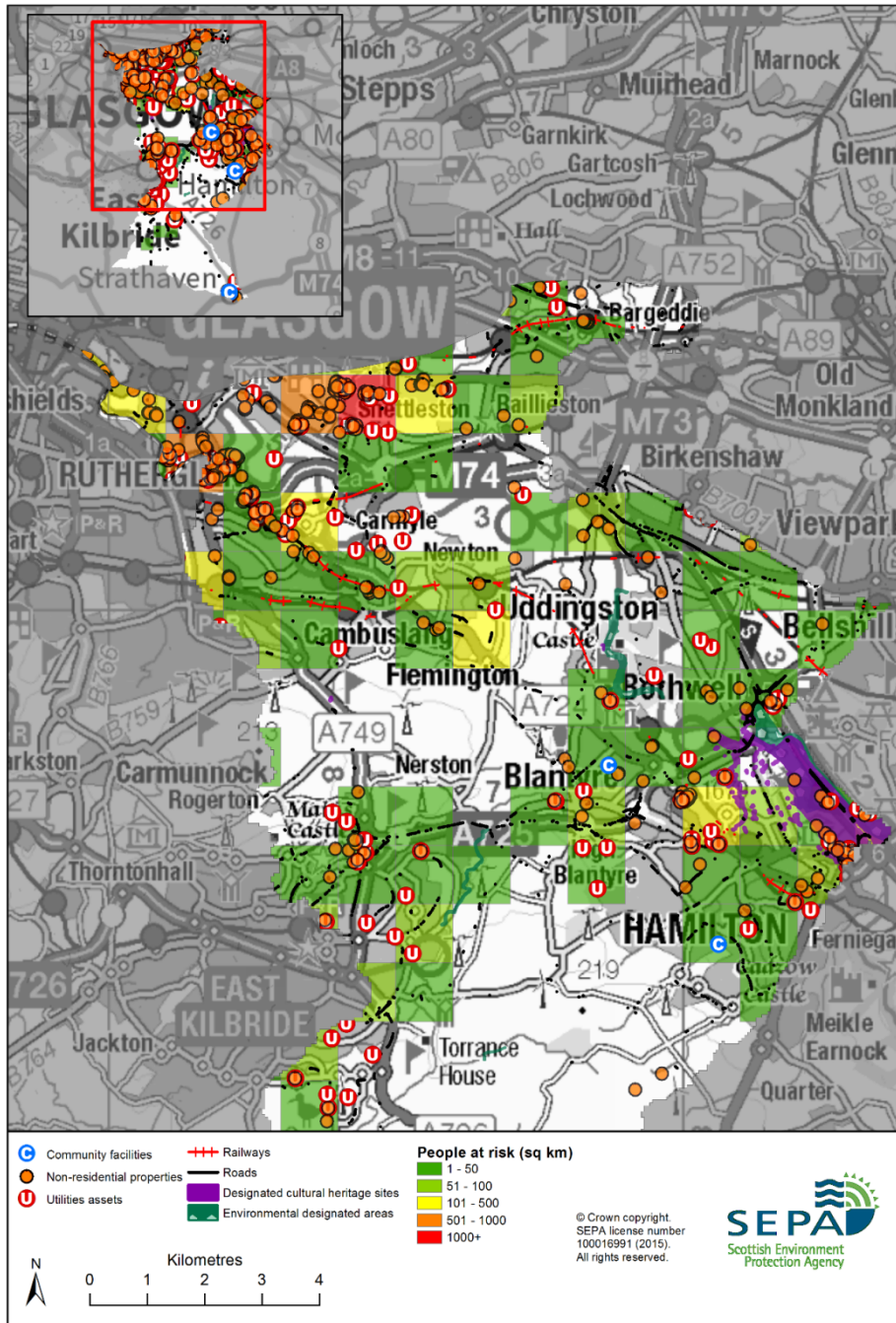


Figure 3.17: Impacts of Flooding

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
11304021	Flood protection scheme/works Reduce the physical or disruption risk related to the transport network for rail.	Network Rail	Network Rail will carry out civil engineering work which will reduce flood risk to identified sections of the rail network within this Potentially Vulnerable Area.	2019	2024
11305021	Flood protection scheme/works Reduce the physical risk, or disruption risk, related to areas of the M8, M73, M74 at risk of flooding	Transport Scotland	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the trunk road. The operational scheme will consider awareness raising, emergency response plans, clearance and repair, and utilising the flood forecasting warning service.	2016	2021
110240012	Community flood action groups Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Dalmarnock	Community	The local community set up the Clyde River Users group, to raise awareness of flood risk in the area. The group should continue its activities.	Ongoing	Ongoing
110240017	Maintain flood protection scheme Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Dalmarnock	Glasgow City Council	The Dalmarnock Flood Bund Flood Protection Scheme consists of a flood embankment adjacent to the River Clyde at Downiebrae Road . It protects properties in the area against a 200 year flood. This scheme 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.	Ongoing	Ongoing

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110260005	<p>Flood protection study Reduce the risk of flooding from the Tollcross Burn and Camlachie Burn to residential properties and non-residential properties in Shettleston</p>	Glasgow City Council	<p>The Council plans to progress work to deculvert sections of the Tollcross Burn in Sandyhills Park. The work is being carried out in coordination with river basin management planning and should help to improve the condition of the river.</p> <p>The Council plans to undertake a study to further investigate the flood benefit of the deculverting work and feasibility of a flood protection scheme on the Tollcross Burn focusing on, upstream storage, modification of conveyance by upgrading a culverts, sustainable drainage systems, modification of fluvial control structures by replacing existing trash screens and construction of a river wall. Other actions will also be considered to select the most sustainable combination of actions.</p>	2016 (Ongoing)	2018
110260006	<p>Flood protection scheme/works Reduce the risk of flooding from the Tollcross Burn and Camlachie Burn to residential properties and non-residential properties in Shettleston</p>	Glasgow City Council	<p>The Council plans to progress the flood protection scheme proposed for the Camlachie Burn. The proposed work includes two elements of improvement works linked to the overall strategy to address existing network constraints in the area, which has the potential to contribute to substantial flooding within the wider catchment if not addressed.</p> <p>The work includes diversion of extreme flows and watercourse restoration to remove substantial network constraints close to Biggar Street and Shettleston Road. The flood mapping for the Camlachie Burn will be revised to include all elements of the scheme to understand any remaining residual risk now and in the future.</p>	2016	2018
110650005	<p>Flood protection study Reduce the risk of flooding to residential properties, non-residential properties and transport routes along the River Clyde from Strathclyde Park to Shawfield</p>	South Lanarkshire Council	<p>The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme along the lower River Clyde. The Clyde Gateway Masterplan will initially be reviewed and built upon for this study. The study will focus on establishing the most sustainable combination of actions including; improving the conveyance through a number of structures, the construction of a control structure on the Powburn with a pumping station to force water into the River Clyde, and the benefit of flood defences. The study will also assess the benefit of sustainable drainage systems and property level protection.</p> <p>A separate study of the upper River Clyde is also being carried out (ID 110680005) and will be considered when identifying actions.</p> <p>SEPA will review the output from this study for inclusion in the Flood Maps.</p>	2017	2019

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110650017	<p>Maintain flood protection scheme</p> <p>Reduce the risk of flooding to residential properties, non-residential properties and transport routes along the River Clyde from Strathclyde Park to Shawfield</p>	South Lanarkshire Council	The Dalmarnock Flood Bund Flood Protection Scheme consists of a flood embankment adjacent to the River Clyde at Downiebrae Road . It protects properties in the area against a 200 year flood. These defences 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.	Ongoing	Ongoing
110710005	<p>Flood protection study</p> <p>Reduce the risk of river and surface water flooding to residential properties, non-residential properties, community facilities and transport routes in Strathaven</p>	South Lanarkshire Council	The Council plans to undertake a study to further investigate the feasibility of a flood protection scheme in Strathaven focusing on the benefit from storage from the Powmillon Burn , improving the conveyance through existing structures on the Powmillon Burn , modification of the existing weirs at Strathaven Park and the Old Mill and construction of flood defences along the Powmillon Burn within Strathaven . Sustainable drainage systems will be assessed in any future flood study undertaken in the area. This study may also consider natural flood management, property level protection actions and other complementary actions.	2015	2017
110950018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in Garrowhill and Baillieston</p>	Glasgow City Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2015	2016
111040018	<p>Surface water plan/study</p> <p>Reduce the economic damages and risk to people from surface water flooding in the Tollcross Burn catchment</p>	Glasgow City Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2020	2022

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111130018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Motherwell and Wishaw	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019
111191018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in East Kilbride	South Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2019
111191019	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in East Kilbride	Scottish Water in partnership with South Lanarkshire Council	An integrated catchment study covering the Allers catchment will be carried out to support the surface water management planning process in East Kilbride . 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 and watercourses. This will improve the understanding of local surface water flood risk.	2016	2019
111200018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Eastfield	South Lanarkshire Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2015	2019
111210018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Halfway	South Lanarkshire Council	The Council is undertaking a surface water management plan to set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2015	2017
111220018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Hamilton	South Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.	2016	2018

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA led education events.</p> <p>The South Lanarkshire Council winter awareness campaign, between October and March includes information on flooding.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include digital materials, awareness campaigns and promotion of our flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk . Approximately 2,200km 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.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Allers, Bothwellbank, Hamilton, Shieldhall, and Strathaven 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.	2016	2021

Table 3.17: PVA 11/17/1 – East of Glasgow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320030	Maintain flood warning Reduce overall flood risk	SEPA	<p>Continue to maintain the Cambuslang Road and Morrison Park, Carmyle, Dalbeth, Dalmarnock Bridge, Hamilton Services and the Watersports Centre at Strathclyde Loch flood warning areas which are part of the River Clyde flood warning scheme.</p> <p>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 the flood warning service is timely and accurate.</p> <p>A flood protection study is proposed for the lower River Clyde. 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.</p>	Ongoing	Ongoing

Note:- 1 – Actions will be funded as per the statements in Section 2.

2 – Coordination of the Actions will be carried out as per the statements in Section 2.

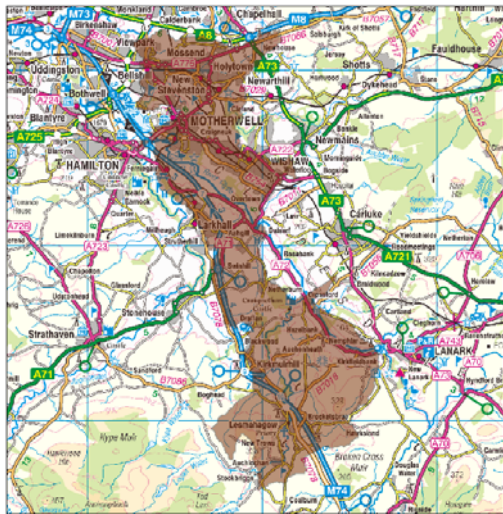
3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.18 PVA 11/17/2 – Clyde catchment - Motherwell to Lesmahagow

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	North Lanarkshire Council, South Lanarkshire Council	River Clyde

Background and Summary of Flooding Impacts

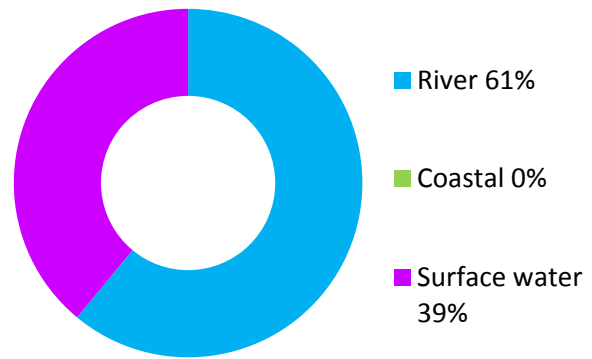
This Potentially Vulnerable Area extends from Mossend and Holytown in the north towards Kirkmuirhill and Lesmahagow. It is approximately 140km² (shown below).



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

There are approximately 420 residential properties and 210 non-residential properties at risk of flooding. The Annual Average Damages are approximately £1.1 million.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

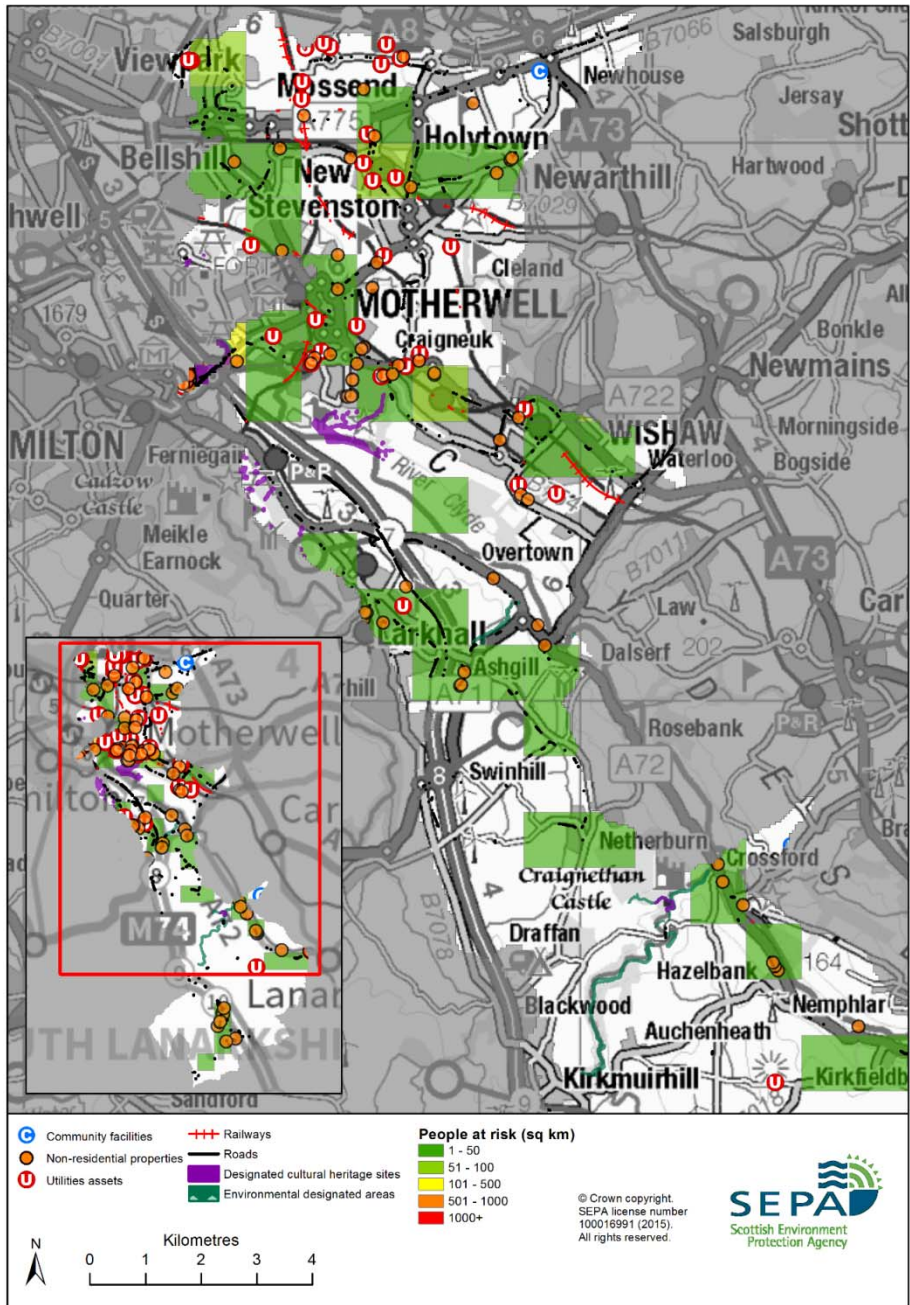


Figure 3.18: Impacts of Flooding

Table 3.18: PVA 11/17/2 – Clyde catchment - Motherwell to Lesmahagow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
11306021	Flood protection scheme/works Reduce the physical risk, or disruption risk, related to areas of the M74 at risk of flooding	Transport Scotland	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the trunk road. The operational scheme will consider awareness raising, emergency response plans, clearance and repair, and utilising the flood forecasting warning service.	2016	2021
110370005	Flood protection study Reduce the risk of river flooding to residential properties in Greenacres	North Lanarkshire Council	The Council will undertake a study to further investigate the feasibility of flood protection work in Greenacres , focusing on direct defences and sustainable drainage systems. Property level protection should also be considered to reduce residual risk. Other actions will also be considered to select the most sustainable combination of actions.	2016	2019
110380005	Flood protection study Reduce the risk of flooding to residential properties in Holytown	North Lanarkshire Council	The Council will undertake a study to further investigate surface water flood risk in Holytown . The identified risk from strategic mapping does not correspond with the flooding history in this area. Therefore a detailed study will be carried out to assess the flow paths and potential flood risk. Review of the study will establish the level of risk and if further stages are required to examine actions to manage flooding. The flood mapping from the study should be used to revise SEPA's strategic mapping.	2016	2019
110680005	Flood protection study Reduce the risk of flooding to residential properties, non-residential properties and transport routes along the River Clyde , upstream of Strathclyde Park	South Lanarkshire Council	The Council will undertake a study to further investigate the feasibility of a flood protection scheme on the upper River Clyde (upstream of Strathclyde Park) focusing on, improving the conveyance of a number of existing structures and the benefit of flood defences at various locations along the upper River Clyde . This should also assess the benefit of sustainable drainage systems and property level protection. A separate study of the lower River Clyde is also being carried out (action 110650005) and should be considered when selecting the most sustainable combination of actions. SEPA will review the output from this study for inclusion in the Flood Maps.	2016	2019
111131018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Motherwell and Wishaw	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019

Table 3.18: PVA 11/17/2 – Clyde catchment - Motherwell to Lesmahagow

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. The South Lanarkshire Council winter awareness campaign, between October and March includes information on flooding. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Ashgill New, Blackwood, Crossford, Carbarns, Coursington, Daldowie, Lesmahagow, and Skellyton 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.	2015	2021
112030015	Site protection plans Reduce the risk of river flooding to non-residential properties in Bothwellhaugh	North Lanarkshire Council	Site protection plans are developed to identify whether normal operation of a facility can be maintained during a flood. This may be due to existing protection or resilience of the facility or the network. A site protection plan will be developed for the Caravan Park and hotels in Bothwellhaugh adjacent to M&D's theme park.	2016	2021

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.19 PVA 11/17/3 – Coatbridge and Airdrie

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	North Lanarkshire Council	North Calder Water

Background and Summary of Flooding Impacts

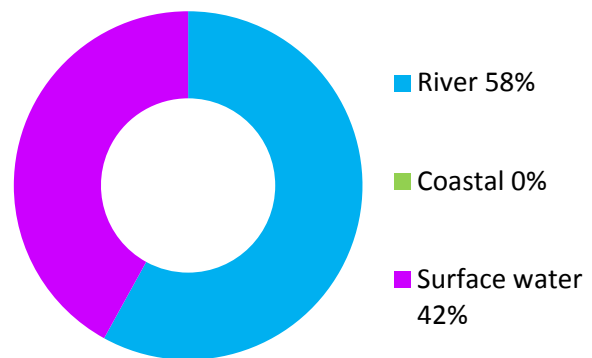
This Potentially Vulnerable Area is situated in North Lanarkshire around Coatbridge and Airdrie (shown below). It is approximately 80km².



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

There are approximately 470 residential properties and 150 non-residential properties at risk of flooding. The Annual Average Damages are approximately £900,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

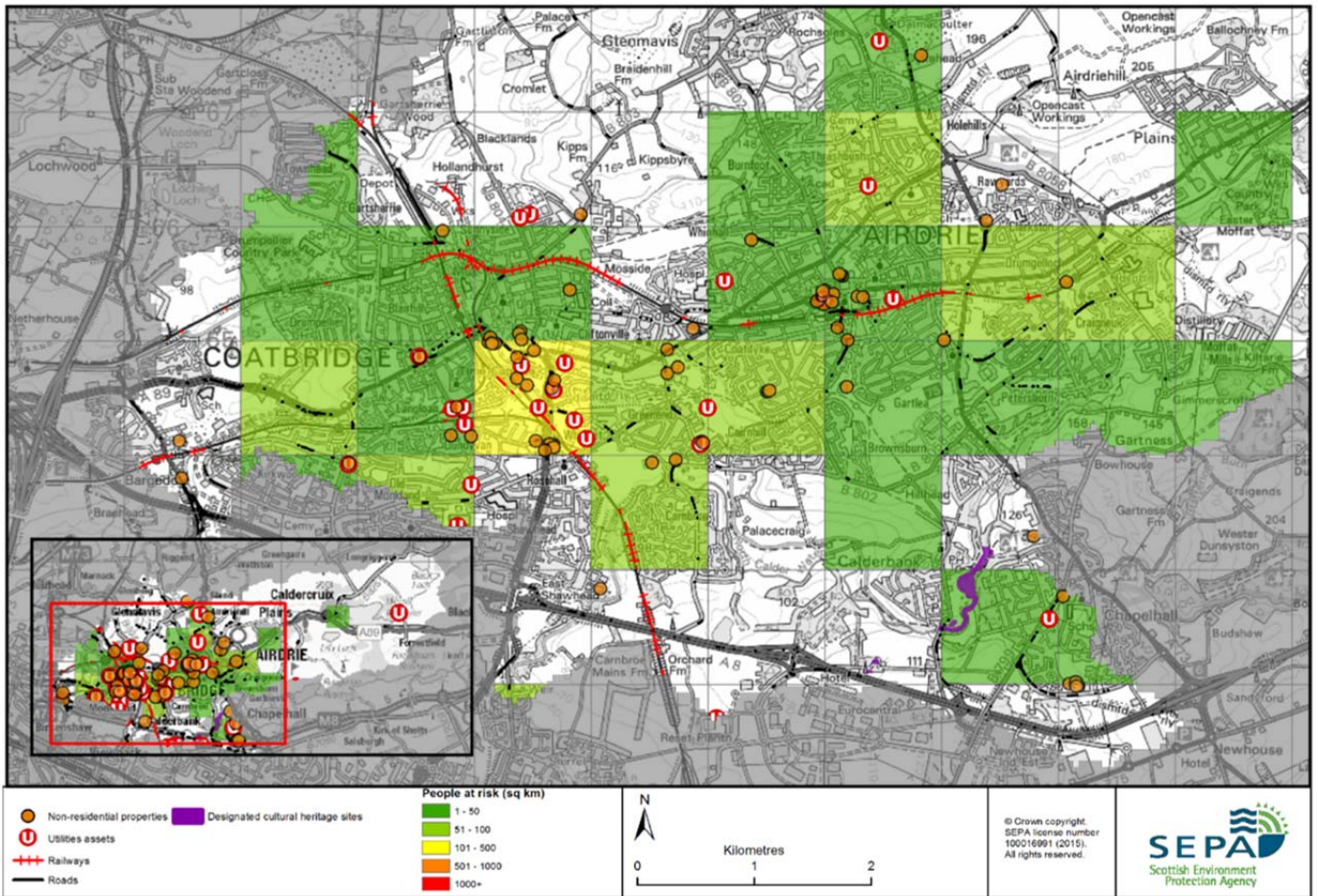


Figure 3.19: Impacts of Flooding

Table 3.19: PVA 11/17/3 – Coatbridge and Airdrie

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111101018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Coatbridge and Airdrie	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Daldowie and Plains 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.	2016	2020

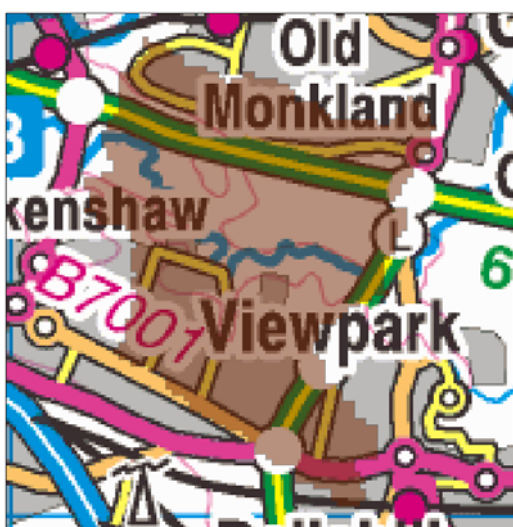
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.20 PVA 11/18 – Coatbridge/Viewpark

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	North Lanarkshire Council	North Calder Water

Background and Summary of Flooding Impacts

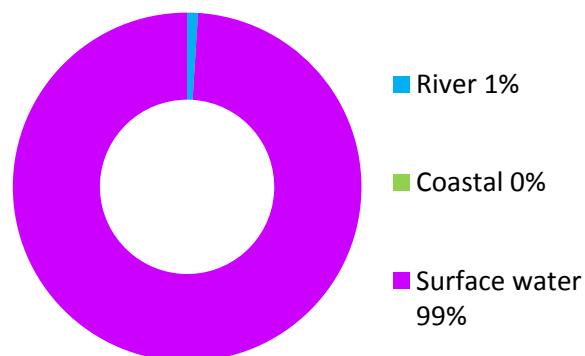
This Potentially Vulnerable Area is located to the east of Glasgow, within the North Calder Water catchment and is 7km² (shown below). Kirkwood and Kirkshaw residential areas are in the north of the area, while Viewpark and Righead Industrial Estate is in the south.



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

There are approximately 50 residential properties at risk of flooding. The Annual Average Damages are approximately £43,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

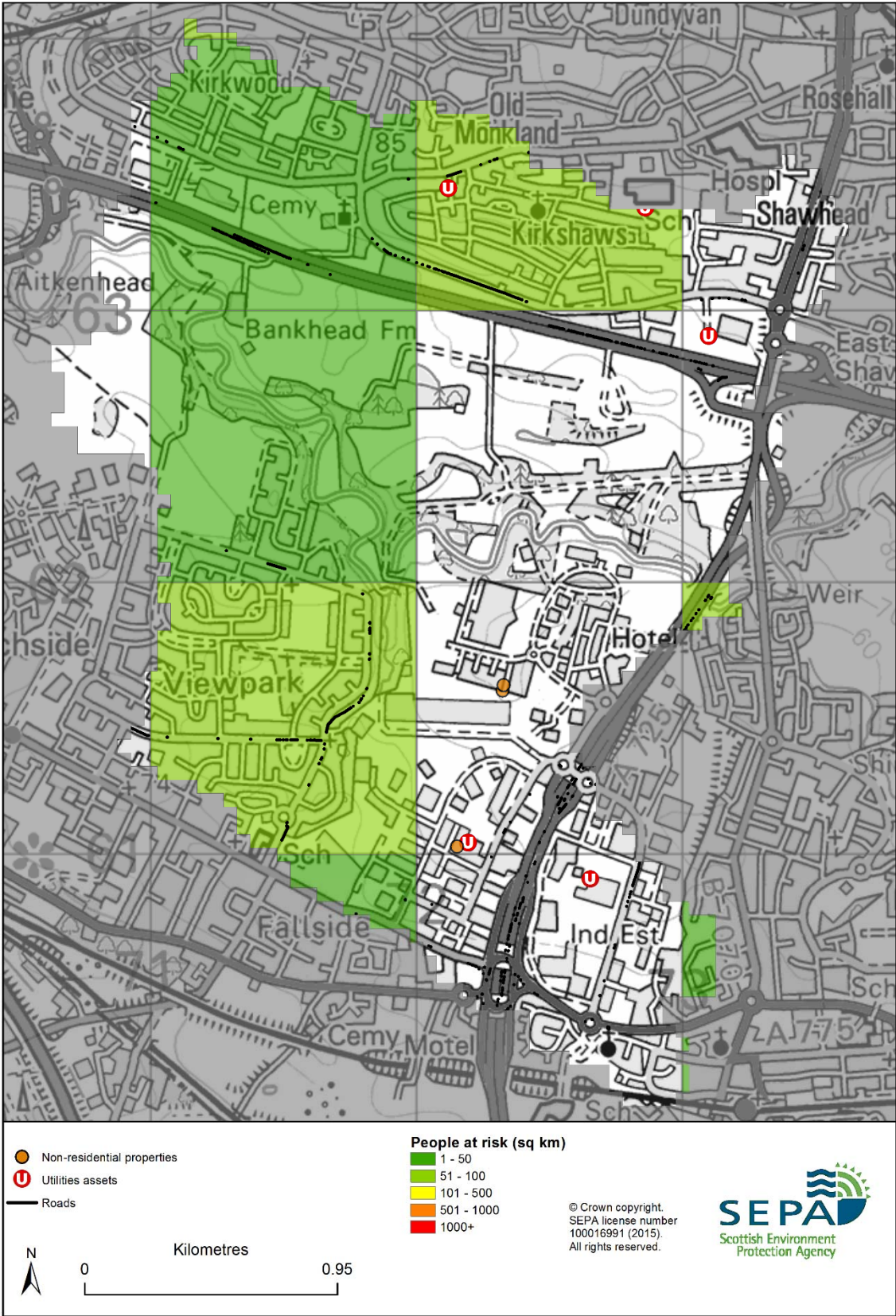


Figure 3.20: Impacts of Flooding

Table 3.20: PVA 11/18 – Coatbridge/Viewpark

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Daldowie 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.	2016	2020

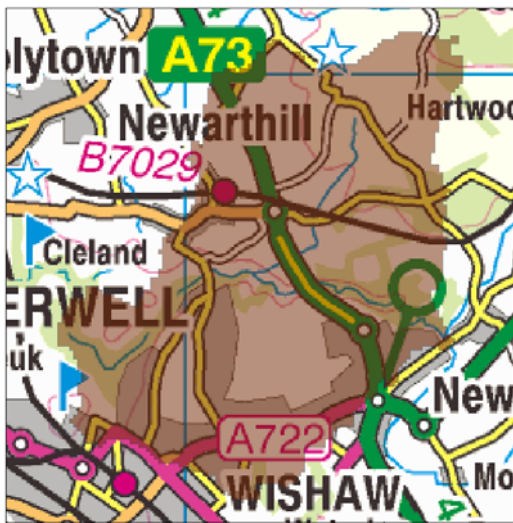
- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.21 PVA 11/19 – North of Wishaw

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	North Lanarkshire Council	South Calder Water

Background and Summary of Flooding Impacts

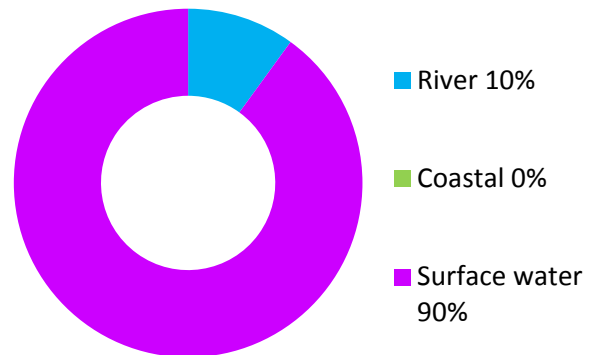
This Potentially Vulnerable Area is located to the south east of Glasgow within the South Calder Water catchment and is approximately 20km² (shown below). The town of Wishaw is in the south west.



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

There are approximately 30 residential properties at risk of flooding. The Annual Average Damages are approximately £50,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

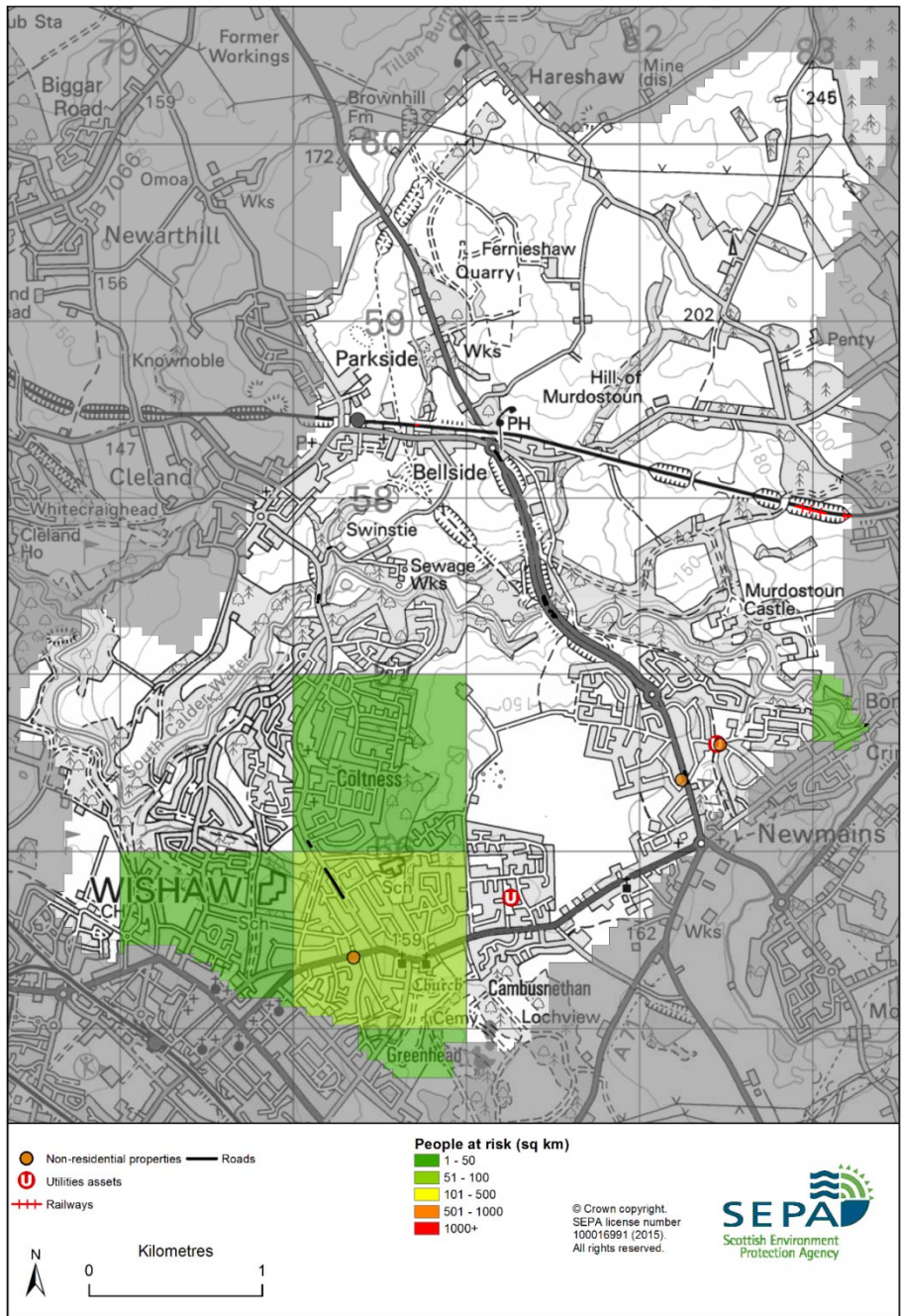


Figure 3.21: Impacts of Flooding

Table 3.21: PVA 11/19 – North of Wishaw

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111132018	Surface water plan/study Reduce the economic damages and risk to people from surface water flooding in Motherwell and Wishaw	North Lanarkshire Council	The Council plans to undertake a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. The Metropolitan Glasgow Strategic Drainage Partnership will support the process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network and watercourses.	2016	2019
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk . Approximately 2,200km 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.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Carbarns and Swinstie 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.	2016	2021

Note:- 1 – Actions will be funded as per the statements in Section 2.

2 – Coordination of the Actions will be carried out as per the statements in Section 2.

3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.22 PVA 11/20 – Shotts

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	North Lanarkshire Council	South Calder Water

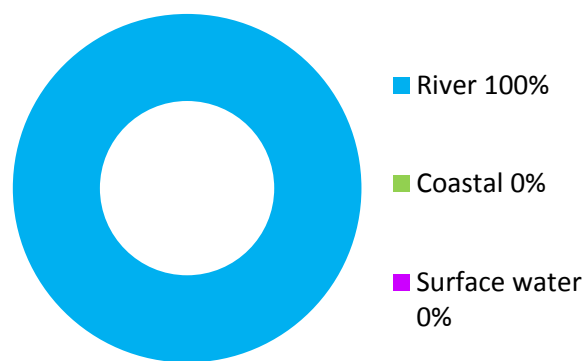
Background and Summary of Flooding Impacts

The Potentially Vulnerable Area is located to the east of Glasgow, is approximately 30km² and incorporates the urban areas of Dykehead and Shotts (shown below).



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There are less than 10 residential and non-residential properties at risk of flooding. The Annual Average Damages are approximately £7,200. All damages in this Potentially Vulnerable Area are caused by river flooding.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

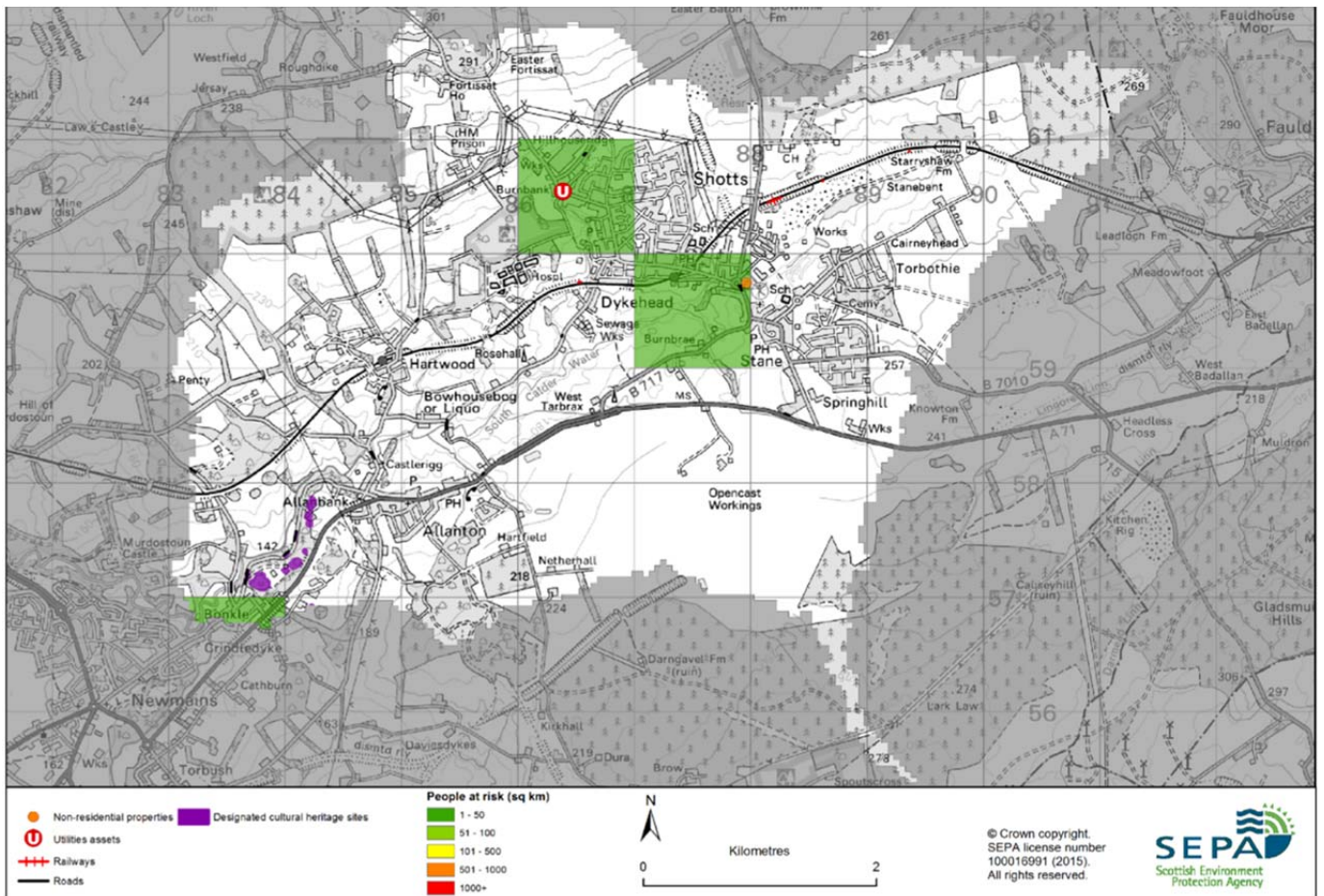


Figure 3.22: Impacts of Flooding

Table 3.22: PVA 11/20 – Shotts

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. 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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships. Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.	Ongoing	Ongoing
111320016	Strategic mapping and modelling Reduce overall flood risk	SEPA	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk . Approximately 2,200km 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.	2016	2016
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	Scottish Water will undertake further investigation and modelling in the Shotts and Swinstie 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.	2016	2021

Note:- 1 – Actions will be funded as per the statements in Section 2.

2 – Coordination of the Actions will be carried out as per the statements in Section 2.

3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

3.23 PVA 11/21C – Kilmacolm

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Inverclyde Council, Renfrewshire Council	Gryfe Water

Background and Summary of Flooding Impacts

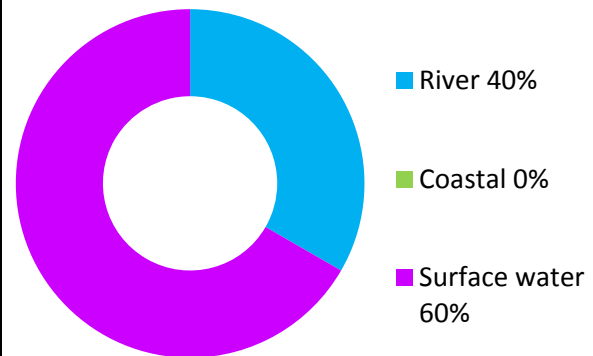
This candidate Potentially Vulnerable Area covers Kilmacolm and the land to the west (shown below). The Gryfe Water and the Green Water flow through this area. It is approximately 60km².



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

There are approximately 30 residential properties and 40 non-residential properties at risk of flooding. The Annual Average Damages are approximately £96,000.



Annual Average Damages by flood source

Summary of Actions to Manage Flooding

The actions below have been selected to manage flood risk.

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

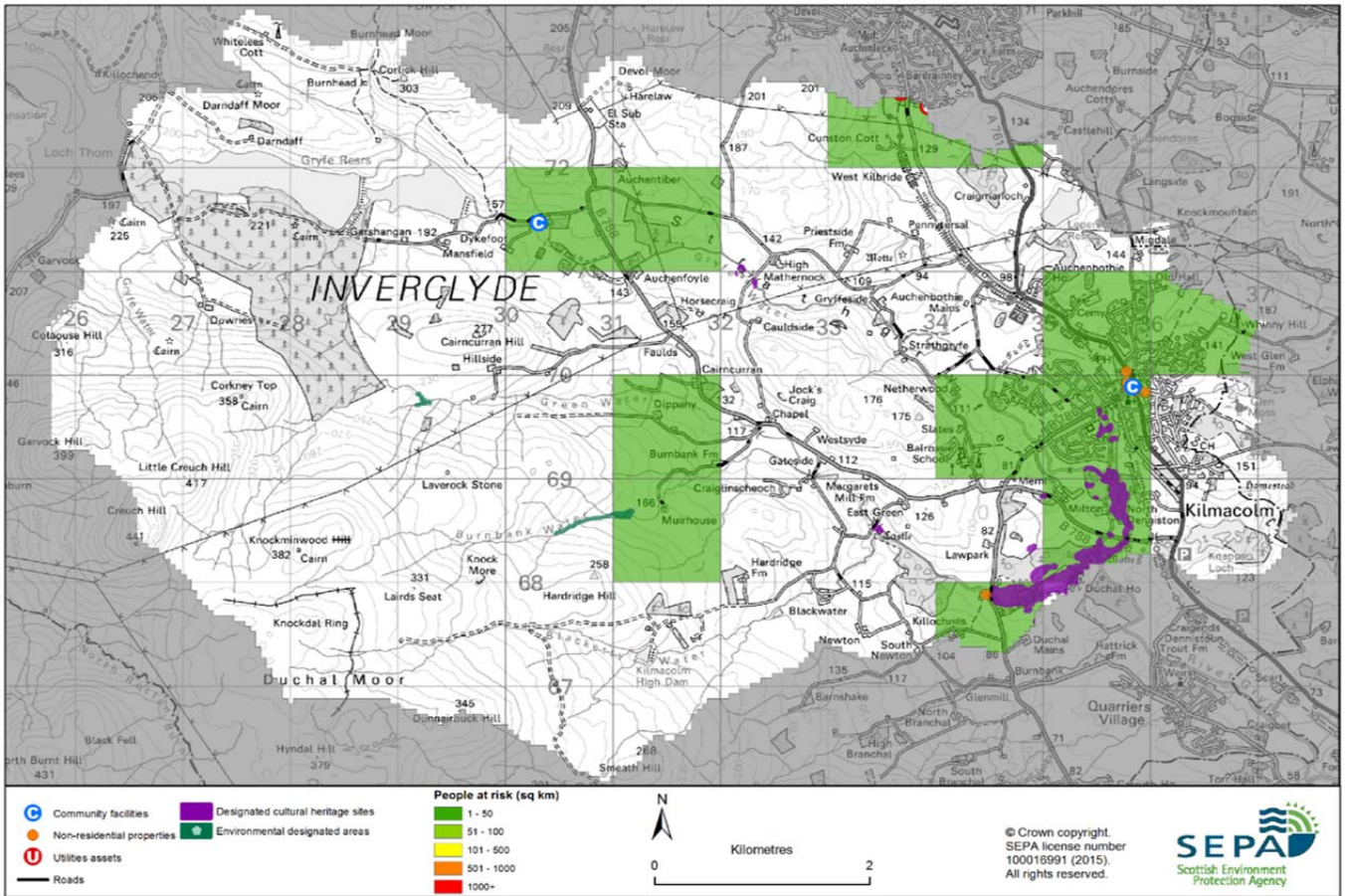


Figure 3.23: Impacts of Flooding

Table 3.23: PVA 11/21C – Kilmacolm

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
110340003	<p>Natural flood management study</p> <p>Reduce the risk of flooding from the Glenmosston Burn to residential properties and non-residential properties in Kilmacolm</p>	Inverclyde Council	<p>The Council plans to undertake a natural flood management study to further investigate the potential benefit for floodplain restoration at Glen Moss in Kilmacolm. These actions will help complement the protection that will be offered by the Glenmosston Burn works, by holding more water in the upper catchment. A scoping study is to be carried out by Inverclyde Council to inform future direction of the natural flood management study. The council will look to engage with land owners early in the process to establish the potential for any works.</p>	2016	2019
110340006	<p>Flood protection scheme/works</p> <p>Reduce the risk of flooding from the Glenmosston Burn to residential properties and non-residential properties in Kilmacolm</p>	Inverclyde Council	<p>The Council plans to progress the flood protection scheme proposed for the Glenmosston Burn. The works include upgrading a culvert at Market Place and a new overflow pipe at Gowkhuse Road.</p> <p>A separate natural flood management study is being carried out in the area which may identify additional actions that could be included within the flood protection scheme.</p>	2017	2019

Table 3.23: PVA 11/21C – Kilmacolm

Action ID	Action Type & Objective Description	Lead Authority	Action Description	Start Date	Finish Date
111320013	Awareness raising Reduce overall flood risk	Responsible Authorities	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk.</p> <p>From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.</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). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.</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, 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>As part of SEPA's education programme and to contribute to community resilience SEPA is sponsoring a play by Rightlines Productions called 'Rapid Departure'. This interactive play about flooding will tour locations in Scotland throughout 2016, including this Potentially Vulnerable Area. The performances aim to lead people to consider how flooding could impact their community and how they can take steps to prepare for it.</p> <p>Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.</p>	Ongoing	Ongoing
111320019	Strategic mapping and modelling Reduce overall flood risk	Scottish Water	<p>Scottish Water will undertake further investigation and modelling in the Erskine 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.</p>	2017	2020

- Note:-
- 1 – Actions will be funded as per the statements in Section 2.
 - 2 – Coordination of the Actions will be carried out as per the statements in Section 2.
 - 3 – Flood Risk Management Strategy Actions from Cycle 2 and Cycle 3 are not included here.

Annex 1: Actions

Annex 1 provides a full list of Clyde and Loch Lomond Local Plan District Actions for all ongoing and Cycle 1 Actions, and is available for download from the GCC website here – www.glasgow.gov.uk/clydeandlochlomond

Annex 2: Roles and Responsibilities

Individuals are the first line of defence against flooding. However, public bodies have responsibilities too and are working together to reduce the impacts of flooding in Scotland. Responsibility for flood risk management planning falls in the main to SEPA, local authorities and Scottish Water. However, individuals have a personal responsibility to protect themselves and their property.

Some of the key roles are outlined below and more information is available from the SEPA website.

Your responsibilities

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

The first step to being prepared is to sign up to Floodline - www.floodlinescotland.org.uk - to receive messages to let you know where and when flooding is likely to happen. Other useful tools and advice on how to be prepared are available on the [Floodline](#) website including a quick guide to who to contact in the event of a flood. You can also check how your area could be affected by flooding by looking at SEPA's [flood maps](#) - www.sepa.org.uk/environment/water/flooding/flood-maps

SEPA

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. SEPA works closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted.

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

In running Floodline, SEPA provides 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 closely with the Met Office.

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 resources and help to promote preparedness and understanding of how flood risk is managed.

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

www.sepa.org.uk/environment/land/planning

Local authorities

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. Local authorities have been working collaboratively in the manner described above to develop these.

It is the responsibility of your local authority to implement its flood protection actions agreed within the Local Flood Risk Management Plan. You can help your local authority to manage flooding by not dumping material on the banks of a watercourse and by letting them know if flood defences are tampered with.

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

The Lead Local Authority for the Clyde and Loch Lomond Local Plan District is:

Glasgow City Council

Other local authorities who are responsible authorities for the Clyde and Loch Lomond Local Plan District are:

Argyll and Bute District Council;

East Dunbartonshire Council;

East Renfrewshire Council;

Inverclyde Council;

North Lanarkshire Council;

Renfrewshire Council;

South Lanarkshire Council;

Stirling Council; and

West Dunbartonshire Council.

Scottish Water

Scottish Water is a responsible authority for flood risk management and is working closely with SEPA, local authorities and other responsible authorities 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 surfaces from the boundary of properties. Additionally, Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. Scottish Water is not responsible for private pipework or guttering within the property boundary.

National Park

The two National Park Authorities, Loch Lomond and the Trossachs National Park Authority and Cairngorms National Park, were designated as responsible authorities for flood risk management purposes in 2013. Both have worked with SEPA, local authorities and Scottish Water to help develop Flood Risk Management Strategies and Local Flood Risk Management Plans. They also fulfil an important role in land use planning, carrying out or granting permission for activities that can play a key role in managing and reducing flood risk. Loch Lomond and the Trossachs National Park Authority is a responsible authority for the Clyde and Loch Lomond Local Plan District.

Forestry Commission Scotland

Forestry Commission Scotland was designated in 2013 as a responsible authority for flood risk management planning purposes and has engaged in the development of the Local Flood Risk Management Plan. This reflects the widely held view that forestry can play a significant role in managing flooding.

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 Natural Heritage** has provided general and local advice in the development of this Flood Risk Management Strategies. Flooding is seen as a 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.
- During the preparation of the first flood risk management plans **Network Rail** and **Transport Scotland** have identified 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 Environment 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.
- The **Scottish Flood Forum** is a Scottish charitable organisation that provides support for those who are affected by, or are at risk of, flooding. It provides flood advice, information, awareness, education and training to individuals and communities to help reduce the risk of flooding; in partnership with the local authority, provides support during the recovery process following a flood incident and aims to support the development of resilient communities.

Annex 3: Consultation and engagement

From 22 December 2014 a national consultation on the current state of knowledge of flood risk across Scotland and what the potential solutions might be, was undertaken with the public on the work carried out to develop draft Flood Risk Management Strategies and Local Flood Risk Management Plans.

The consultation was run jointly between SEPA and local authorities and involved the publication of draft information that is contained in the strategies and local plans. The consultation was carried out in 2 phases:

- Phase 1 commenced on 22 December 2014 and initially provided a summary of the main sources and impacts of flooding.
- Phase 2 commenced on 2 March 2015 when the proposed initial objectives to manage the identified flood risk were made available alongside a short list of potential measures, as well as information on the draft local flood risk management plans.

There was an opportunity to comment on the all the information provided between 2 March and 2 June 2015. The responses helped to form the final Strategies and Plans.

The final Flood Risk Management Strategies for 14 Local Plan Districts were approved by the Scottish Government and published by SEPA in December 2015. Further information is available on the SEPA website here - <http://apps.sepa.org.uk/FRMStrategies/>

Following publication of the Flood Risk Management Strategies by SEPA, the Clyde and Loch Lomond local authorities undertook a range of engagement activities through February and early March 2016 to raise awareness of the Clyde and Loch Lomond Flood Risk Management Strategy, flood risk within the local authority area, as identified in the SEPA Flood Maps available here - <http://map.sepa.org.uk/floodmap/map.htm> - and inform the development of the Clyde and Loch Lomond Local Flood Risk Management Plan. The objective of this activity was to ensure a greater awareness of these key documents, particularly for those communities identified as at risk of flooding. Further details of the activities being undertaken are available from each Clyde and Loch Lomond Local Authority. No changes were made to the Clyde and Loch Lomond Local Flood Risk Management Plan in light of the views and representations received.

There will be ongoing engagement both with raising public awareness of the Plan and its approaches to managing or reducing flood risk, and as part of the process of delivering Actions.

Annex 4: Links to other plans, policies, strategies and legislative requirements

S18 Schedule of Clearance and Repair

The table below provides details of how to access schedules of clearance and repair for each local authority under Section 18 of the Flood Risk Management (Scotland) Act 2009:

Local Authority	Method of public access to the S18 Schedule
Argyll and Bute District Council	Information available on request. Details available here http://www.argyll-bute.gov.uk/transport-and-streets/flood-advice or for further information contact floodingenquiries@argyll-bute.gov.uk
East Dunbartonshire Council	Information available on request. Details available here http://www.eastdunbarton.gov.uk/residents/flooding or for further information contact customerservices@eastdunbarton.gov.uk
East Renfrewshire Council	Information available on request. Details available here http://www.eastrenfrewshire.gov.uk/flooding or for further information contact roads@eastrenfrewshire.gov.uk
Glasgow City Council	Information available on request. Details available here https://www.glasgow.gov.uk/index.aspx?articleid=17739 or for further information contact FloodRiskManagement@drs.glasgow.gov.uk
Inverclyde Council	Information available on request. Details available here https://www.inverclyde.gov.uk/environment/roads-lighting/flood-prevention or for further information contact customerservice@inverclyde.gov.uk
North Lanarkshire Council	Information available on request. Details available here http://www.northlanarkshire.gov.uk/index.aspx?articleid=13610 or for further information complete the online request form also at this address.
Renfrewshire Council	Information available on request. Details available here http://www.renfrewshire.gov.uk/webcontent/Home/Services/Environment/Flooding/ or for further information contact pt@renfrewshire.gov.uk
South Lanarkshire Council	Information available on request. Details available here http://www.southlanarkshire.gov.uk/info/200163/home_safety_and_planning_for_emergencies/404/flooding_advice_and_support or for further information call 0800 24 20 24
Stirling Council	Information available on request. Details available here http://my.stirling.gov.uk/services/planning-and-the-environment/emergencies-and-emergency-services/emergencies-flooding or for further information call 0845 277 7000
West Dunbartonshire Council	Information available on request. Details available here http://www.west-dunbarton.gov.uk/emergencies-safety-crime/flooding-information-and-advice/ or for further information contact roads@west-dunbarton.gov.uk

Annex 5: Supporting information

Sources of flooding described in this Plan

The Local Flood Risk Management Plan 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, and the Actions set out in this Plan take this into account.

The following aspects of flooding have not been incorporated into this Plan:

- **Groundwater** is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.
- **Reservoir breaches** have been assessed under separate legislation (Reservoirs (Scotland) Act 2011). Further information and maps can be found on SEPA's website.
- The Flood Risk Management Act (Scotland) 2009 does not require SEPA or responsible authorities to assess or manage **coastal erosion**. However, SEPA has included consideration of erosion in the Flood Risk Management Strategies by identifying areas that are likely to be susceptible to erosion and where erosion can exacerbate flood risk. As part of considering where actions might deliver multiple benefits, SEPA has 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 erosion in these areas.
- **Coastal flood modelling.** The information on coastal flooding used to set objectives and identify actions is based on SEPA modelling using simplified coastal processes and flooding mechanisms at work during a storm. Wave overtopping cannot be accurately modelled at a national scale due to the importance of local factors such as prevailing wind conditions, the depth and profile of the near-shore sea bed or the influence of any existing defences or management structures. As a result, coastal flood risk may be underestimated in some areas. Conversely, in locations with wide and flat floodplains, the modelling may overestimate flood risk. To address this, in a number of locations where more detailed local models were available they have been incorporated into the development of the Flood Risk Management Strategies. Where wave overtopping has been specifically identified as a concern – but where no further detailed modelling is available – particular compensation has been made in the selection of appropriate actions to address coastal flood risk.

Commonly used terms

Below are explanatory notes for commonly used terms in flood risk management. A glossary of terms is also available.

- **Reference to flood risk.** During the development of the Strategy and Plan, flood risk has been assessed over a range of likelihoods. For consistency in reporting information, 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	Annual Exceedance Probability (chance of event occurring in any one year)
High	10 year	10%
Medium	200 year	0.5%
Low	1000 year	0.1%

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

Flood risk management planning process

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

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

- ***Identifying priority areas at significant flood risk***

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

- ***Potentially Vulnerable Areas and Local Plan Districts***

Based on the National Flood Risk Assessment, SEPA identified areas where flooding was considered to be nationally significant. These areas are based on catchment units as it is within the context of the wider catchment that flooding can be best understood and managed. These nationally significant catchments are referred to as **Potentially Vulnerable Areas**.

In Scotland, 243 Potentially Vulnerable Areas were identified. They are estimated to contain 92% of the total number of properties at risk.

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

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.

- ***Improving the understanding of flooding***

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

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

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

- ***Identifying objectives and selecting actions***

The objectives and actions to manage flooding will provide the long-term vision and practical steps for delivering flood risk management in Scotland.

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

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

- ***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.

- ***Surface Water Management Plans***

A Surface Water Management Plan (SWMP) is a best practice plan which outlines the preferred surface water management strategy in a given location. In this context surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small water courses and ditches that occurs as a result of heavy rainfall.

A SWMP study is undertaken in consultation with key local partners who are responsible for surface water management and drainage in their area. Partners work together to

understand the causes and effects of surface water flooding and agree the most cost effective way of managing surface water flood risk for the long term. The process of working together as a partnership is designed to encourage the development of innovative solutions and practices.

A SWMP should establish a long-term action plan to manage surface water in an area and should influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning and future developments.

The UK Government SWMP guidance seeks to provide a simplified overarching framework, which allows different organisations to work together and develop a shared understanding of the most suitable solutions to surface water flooding problems. The SWMP guidance has been written for local authorities to assist them as they co-ordinate and lead local flood risk management activities.

- ***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.

Five ICS's were undertaken in Scotland during SR10 (2010-2015), to Modelling and Flood Risk Assessment stage, which have provided a fuller understanding of the sources and mechanisms of flooding across these catchments. These studies are expected to undertake an Optioneering phase between 2015-2021. This 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.

Fifteen ICS's will begin in Scotland during SR15 (2015-2021). These studies will go through the Scoping and Modelling phases, which culminates in defining the sources and mechanisms of flooding in the catchment, and an understanding of the impacts of that flooding. It is expected that the ICS partnerships will remain and it is anticipated that the Optioneering phase for these studies will be initiated directly after the preceding phases.

Within this Local Plan District, ICS's are being carried out in the following areas; Inverclyde (including Greenock and Port Glasgow), Erskine (including Inchinnan and Linwood) and East Kilbride.

- ***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, commenced in 2012 alongside work to identify natural flood management actions, that could contribute to the management of flood risk. The information was published in 2013. The assessment of natural flood management was a consideration in the setting of objectives and actions in the Flood Risk Management Strategies. In January 2016 SEPA published the Natural Flood Management Handbook to provide practitioners with information on how best to implement natural flood management measures.

- ***Flood hazard and flood risk maps***

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

A flood hazard map shows 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.

Further information regarding the development of the flood maps and providing a link to the maps, is available online on the SEPA website here –

<http://www.sepa.org.uk/environment/water/flooding/flood-maps/>

Annex 6: Acknowledgments

The information described in this Annex relates to the Figures and Maps that have been generated by SEPA as part of the Flood Risk Management Strategy and have been reproduced in this Local Flood Risk Management Plan. The Clyde and Loch Lomond Local Plan District Partners gratefully acknowledge the cooperation and input that various parties have provided, including inter alia, the following organisations:

SEPA

Local authorities acknowledge the inclusion of Figures, Maps and text generated by SEPA in preparation of the Clyde and Loch Lomond Flood Risk Management Strategy. Figures and Maps produced by SEPA for the Clyde and Loch Lomond Flood Risk Management Strategy have been reproduced in the Clyde and Loch Lomond Local Flood Risk Management Plan with authorisation from SEPA under SEPA Licence number 100016991 (2015).

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Local authorities

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

Scottish Water

Local authorities acknowledge the inclusion of surface water flooding data generated by Scottish Water in preparation of flood risk information.

Glossary

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. The FRM Act uses the term 'measures' rather than 'actions'.

Annual Average Damages (AAD) - Depending on its size or severity, each flood will cause a different amount of damage to a flood prone area and we can calculate the cost of this damage. Annual Average Damages for an area are the average costs per year that would occur from flooding over a very long period of time. Scottish figures have been calculated based on the method set out in the Flood Hazard Research Centre's 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.

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.

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 of a number of techniques used in appraisal.

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

Catchment – The area of land drained by a drainage system – either natural or piped.

Category (CAT) 1 and 2 Responders – As defined by the Civil Contingencies Act 2004. 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.

Coastal Flooding – Flooding that results from sea level rise from a combination of high tides 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 foul 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 - 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.

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 - Sites of particular cultural significance may be designated. The highest level of designation is a World Heritage Site. Historic Environment Scotland maintains lists of buildings of special architectural or historic interest; these buildings are referred to as 'listed buildings'.

Culvert - A pipe, channel or tunnel used for the conveyance of a watercourse or surface drainage water under a road, railway, canal or other obstacle.

Damages - Flood damages are categorised as direct or indirect i.e. as a result of the flood water itself, or subsequent knock on effects. Damage to buildings and contents caused by flood water are an example of direct damages, whilst loss of industrial production, travel disruption or stress and anxiety are indirect. Some damages can be quantified in monetary terms, and others can only be described. The potential damages avoided by implementation of a flood risk management action are commonly referred to as the benefits of that action. When comparing the effectiveness of different actions, it is useful to consider estimated damages and damages avoided across the lifespan of the action. Within the FRM Strategies, a 100 year appraisal period has been used as standard. This allows costs, damages and benefits across this time frame to be compared in present value terms. See also 'Annual Average Damages'.

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 – A flood embankment is an engineered earthfill structure 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) - A process which identifies the potential environmental impacts, both negative and positive, of a proposal.

Estuary - A coastal body of water usually found where a river meets the sea; the part of the river that is affected by tides.

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.

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 Frequency - The probability that a particular size/severity of flood will occur in a given year (see likelihood).

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 / Protection Scheme - A flood protection scheme, as defined by the FRM Act, is a scheme by a local authority for the management of flood risk within the authority area. This includes defence measures (flood prevention schemes) formerly promoted under the Flood Prevention (Scotland) Act 1961.

Flood Protection Study - Flood protection studies aim to refine understanding of the hazard and risk associated with flooding in a particular area, catchment or coastline. They will involve detailed assessment of flood hazard and / or risk and may develop options for managing flood risk.

Flood Protection Works - Flood protection works can include the same flood defence measures that would make up a formal Flood Protection Scheme but without the legal process, protections and requirements that would come by delivering the works as a scheme.

Flood Risk - A measure of the combination of the likelihood of flooding occurring and the associated impacts on people, the economy and the environment.

Flood Risk Assessment - 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 Strategy - Sets out a long-term vision for the overall reduction of flood risk. Contains 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 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 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.

Floodplain - Area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would naturally flow but for the presence of flood defences and other structures where they exist.

Floodplain Storage - Floodplains naturally store water during high flows. Storage can be increased through natural or man-made features to increase flood depth or slow flows in order to reduce flooding elsewhere.

Green (Blue-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.”

Historic Environment Scotland - The new lead public body for the country’s historic environment. It brings together Historic Scotland and the Royal Commission on the Ancient and Historic Monuments of Scotland.

Habitats Regulations Appraisal - The Habitats Regulations require competent authorities to assess certain plans or projects which affect Natura sites. Any development proposal, which requires planning permission or other consent, is a 'project' which may require consideration under the Habitats Regulations.

Land Use Planning – 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.

Local Development Plan – A Local Development Plan (LDP) provides the vision for how communities will grow and develop in the future. The intention is that they provide certainty for communities and investors alike about where development should take place and where it should not and the supporting infrastructure required for growth. A LDP is required for each council area across Scotland.

Local Flood Risk Management Plan - Produced by lead local authorities, these 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 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 Local Plan District 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.

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 - 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.

Potentially Vulnerable Area - 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 Potentially Vulnerable Areas identified by SEPA in the National Flood Risk Assessment and these will be 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.

Q&S - Quality and Standards (Q&S) is the process, governing costs and outputs, through which the planning and delivery of improvements by Scottish Water to the public drinking water and sewerage services in Scotland is carried out.

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.

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.

Scottish Flood Forecasting Service - SEPA operates a network of over 250 rainfall, river and coastal monitoring stations throughout Scotland that generate data 24 hours a day. 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

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.

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.

Site of Special Scientific Interest - Sites protected by law under the Nature Conservation (Scotland) Act 2004 to conserve their plants, animals and habitats, rocks and landforms.

Special Area of Conservation (SAC) - Strictly protected site 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.

Strategic Environmental Assessment - 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.

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.

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 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.

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.

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.

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 and the ability to recover following a flood (resilience).