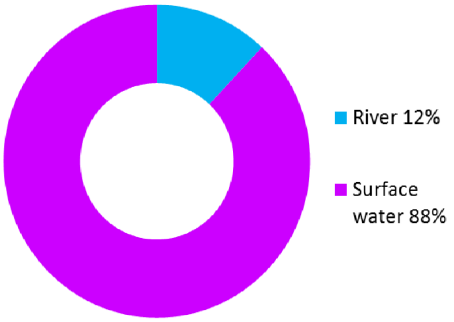
Glasgow City north (Potentially Vulnerable Area 11/15)

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

Summary of flooding impacts



At risk of flooding

- 710 residential properties
- 410 non-residential properties
- £750,000 Annual Average Damages

(damages by flood source shown left)

Summary of objectives to manage flooding

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

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

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

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

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Local Plan District	Local authority	Main catchment
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Background

This Potentially Vulnerable Area is located in Glasgow City centre and is approximately 30km^2 (shown below). The area incorporates the Old Balornock, Millerston, Queenslie, Greenfield, Bridgeton, Calton and Dennistoun sections of the city.

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.

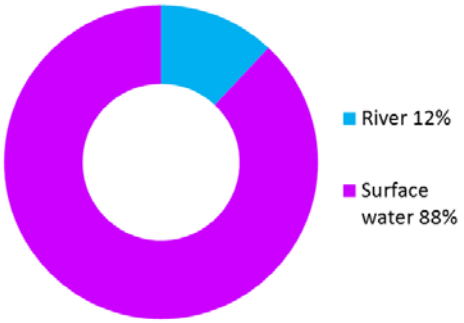

Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Surface water flooding affects residential properties and main transport routes (notably; railway lines, M8, M80 and A74). The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

River flooding is limited to small pockets of flooding to the west of Greenfield and in Glasgow Green. River flooding is most likely to occur in the areas where watercourses are restricted by a culvert or another structure.

Scottish Water and local authorities have completed a number of studies, including strategic and detailed assessments of the risk from surface water flooding and its interaction with river flooding, as well as considering mitigation actions. Many of these studies have been helped by the partnership working developed within the Metropolitan Glasgow Strategic Drainage Partnership. This has led to the implementation of schemes and works to protect properties from river and surface water flooding.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. The damages associated with floods of different likelihood are shown in Figure 2.

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

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 710 to 1,000 and the number of non-residential properties from approximately 410 to 550.

The location of the impacts of flooding is shown in Figure 3. There are impacts throughout the area with the greatest concentrations in the city centre and north of the M8. The M8 itself is at risk of flooding within this area.

History of flooding

Between the 10-12 December 1994 major flooding occurred in rivers and urban watercourses across the Glasgow and its surrounding areas. A slow-moving weather system delivered persistent rain over a 48 hour period across a wide geographical area. Previously recorded peak river flows were exceeded in all major catchments in the region.

In July and August 2002 flash floods affected the areas of Greenfield and Shettleston, which is just outside this Potentially Vulnerable Area. A total of 200 people were evacuated and a number of roads were badly affected by flooding in Sighthill, Springburn, as well as the main A82 and A8 roads and the M8 motorway. Flash floods were again reported on the 25 July 2013.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 49,000)	140	710	990
Non-residential properties (total 12,000)	120	410	540
People	320	1,600	2,200
Community facilities	0	0	0
Utilities assets	<10	20	30
Transport links-roads (km)	4.5 (of which 1.3 is motorway and <0.1 is A road)	10.2 (of which 3.2 is motorway and 0.3 is A road)	12.3 (of which 3.7 is motorway and 0.6 is A road)
Transport links-rail (km)	1.4	5.5	6.5
Transport links-airports	0	0	0
Environmental designated areas (km²)	0	0	0
Designated cultural heritage sites	6	6	7
Agricultural land (km²)	0	<0.1	<0.1

Table 1: Summary of flooding impacts[1]

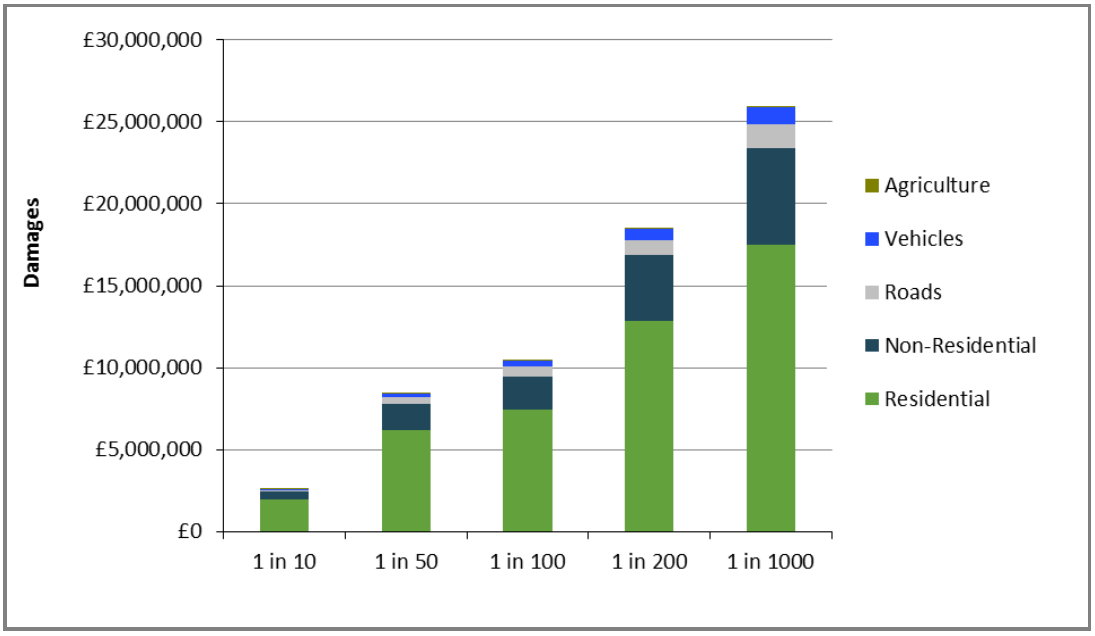

Figure 2: Damages by flood likelihood

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

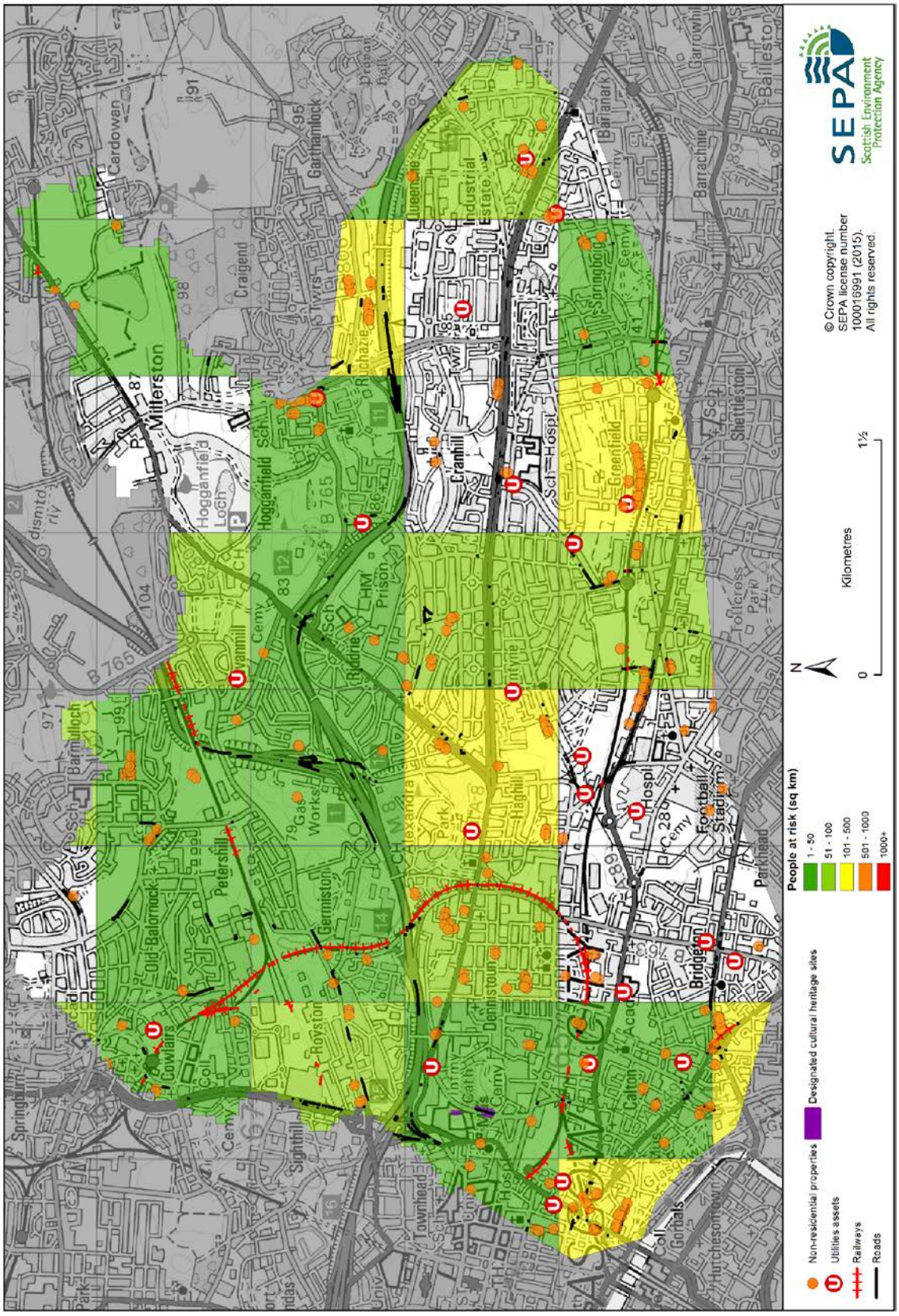

Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 11/15

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

Target area	Objective	ID	Indicators within PVA
Glasgow	Reduce the economic damages and number of people at risk of surface water flooding in Glasgow City	11007	* See note below
Cockenzie Street, Glasgow	Reduce the economic damages and risk to people from surface water flooding in Cockenzie Street	11091	* See note below
East Springburn, Glasgow	Reduce the economic damages and risk to people from surface water flooding in East Springburn	11094	* See note below
Light Burn, Glasgow	Reduce the economic damages and risk to people from surface water flooding in Light Burn	11098	* See note below
Riddrie and Carntyne, Glasgow	Reduce the economic damages and risk to people from surface water flooding in Riddrie / Carntyne	11101	* See note below
Applies across Clyde and Loch Lomond Local Plan District	Avoid an overall increase in flood risk	11127	• 710 residential properties • £750,000 Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Reduce overall flood risk	11132	• 710 residential properties • £750,000 Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 11/15 there are 660 residential properties at risk and Annual Average Damages of £660,000.

Actions to manage flooding in Potentially Vulnerable Area 11/15

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

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

Action (ID):	**SURFACE WATER PLAN/STUDY** (110070018)		
Objective (ID):	Reduce the economic damages and number of people at risk of surface water flooding in Glasgow City (11007)		
Delivery lead:	Glasgow City Council		
Status:	**Not started**	Indicative delivery:	**2028-2033**
Description:	The area must be covered by a strategy to manage and reduce surface water flood risk and identify the most sustainable actions to achieve the objectives. This strategy has been developed by the Metropolitan Glasgow Strategic Drainage Partnership. The detailed objectives and actions to manage and reduce surface water flood risk will be set out in the area specific surface water management plans described below.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (110910018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Cockenzie Street (11091)		
Delivery lead:	Glasgow City Council		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (110940018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in East Springburn (11094)		
Delivery lead:	Glasgow City Council		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (110980018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Light Burn (11098)		
Delivery lead:	Glasgow City Council		
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (111010018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Riddrie / Carntyne (11101)		
Delivery lead:	Glasgow City Council		
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (111320019)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	Scottish Water		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	**FLOOD FORECASTING** (111320009)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	**SELF HELP** (111320011)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	—		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.		

Action (ID):	**AWARENESS RAISING** (111320013)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	Responsible authorities		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (111320007)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	Local authorities, asset / land managers		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

Action (ID):	**EMERGENCY PLANS/RESPONSE** (111320014)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.		

Action (ID):	**PLANNING POLICIES** (111270001)		
Objective (ID):	Avoid an overall increase in flood risk (11127) Reduce overall flood risk (11132)		
Delivery lead:	Planning authority		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		