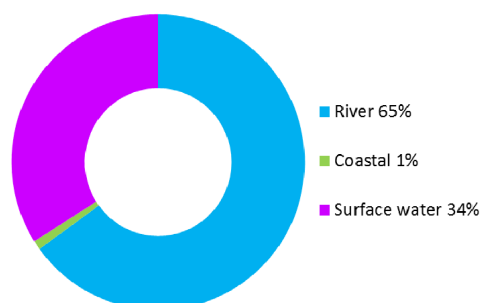


Rutherglen (Potentially Vulnerable Area 11/14)

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

Summary of flooding impacts



At risk of flooding

- 1,800 residential properties
- 280 non-residential properties
- £3.2 million Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

Summary of objectives to manage flooding

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

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

Objectives

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

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

Actions

Rutherglen (Potentially Vulnerable Area 11/14)

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

Background

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



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.

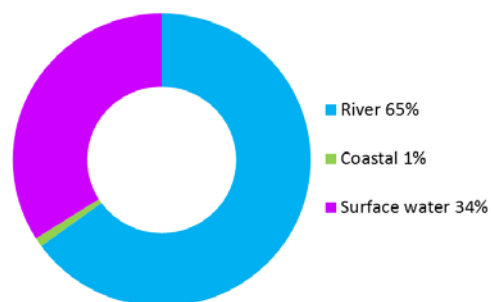


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding is from the River Clyde and the Cityford Burn. The Cityford Burn has sections of open channel and sections of culvert as it flows in a northerly direction through Castlemilk, Croftfoot and Rutherglen and into the Clyde. The majority of river flooding is from the Cityford Burn, which primarily affects residential properties, but also non-residential properties, community facilities, utilities and sections of the road network (notably the A730).

The Clyde flows in a north-westerly direction along the northern boundary of the area. There are two locations where river flooding is attributed to the Clyde in the vicinity of the Dalmarnock Road and also Richmond Park. At both of these locations a number of non-residential properties and sections of the road network are predicted to be affected. In the latter location there is an interaction with tidal flooding.

Interaction between surface water flooding and river flooding is a potential problem within the area. Surface water flooding is mainly located along the line of the Cityford Burn, which is an indication of the low lying topography of the river corridor, but also areas which have been historically culverted. Surface water flooding is also predicted at isolated locations with a large number of residential and non-residential properties, transport routes (notably railway lines, A728 and A730), community facilities and

utilities impacted. The areas at highest risk from surface water flooding will require the preparation of surface water management plans.

Scottish Water and local authorities have completed a number of studies, including strategic and detailed assessments of the risk from surface water flooding and interaction with river flooding along with mitigation measures. 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.

Coastal flooding does not contribute significantly to the overall risk within the Potentially Vulnerable Area, with only a small area adjacent to the River Clyde predicted to be at risk. At this location, Richmond Park, the adjacent sports ground, the A728 and a number of industrial units are affected. This location, opposite Glasgow Green, has a tidal weir which limits tidal influence further up the River Clyde.

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. Non-residential properties affected by river flooding experience the highest economic impacts.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 1,800 to 2,100 and the number of non-residential properties from approximately 280 to 360.

The location of the impacts of flooding is shown in Figure 3. Flooding impacts are widespread within this area, with concentrations of flooding around Castlemilk and Croftfoot.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 22,000)	510	1,800	2,400
Non-residential properties (total 2700)	70	280	380
People	1,100	4,000	5,300
Community facilities	<10 Healthcare facilities	<10 Includes: educational buildings, emergency services and healthcare facilities	<10 Includes: educational buildings, emergency services and healthcare facilities
Utilities assets	<10	30	40
Transport links - roads (km)	1.4	5.6	7.1
Transport links - rail (km)	0.5	1.5	1.9
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	0.01	0.04	0.04

Table 1: Summary of flooding impacts¹

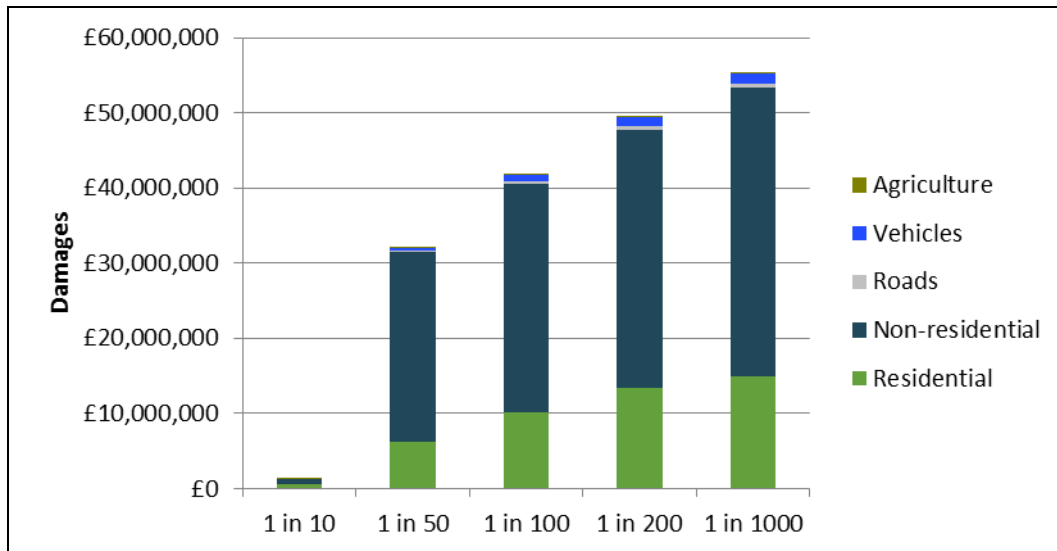


Figure 2: Damages by flood likelihood

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

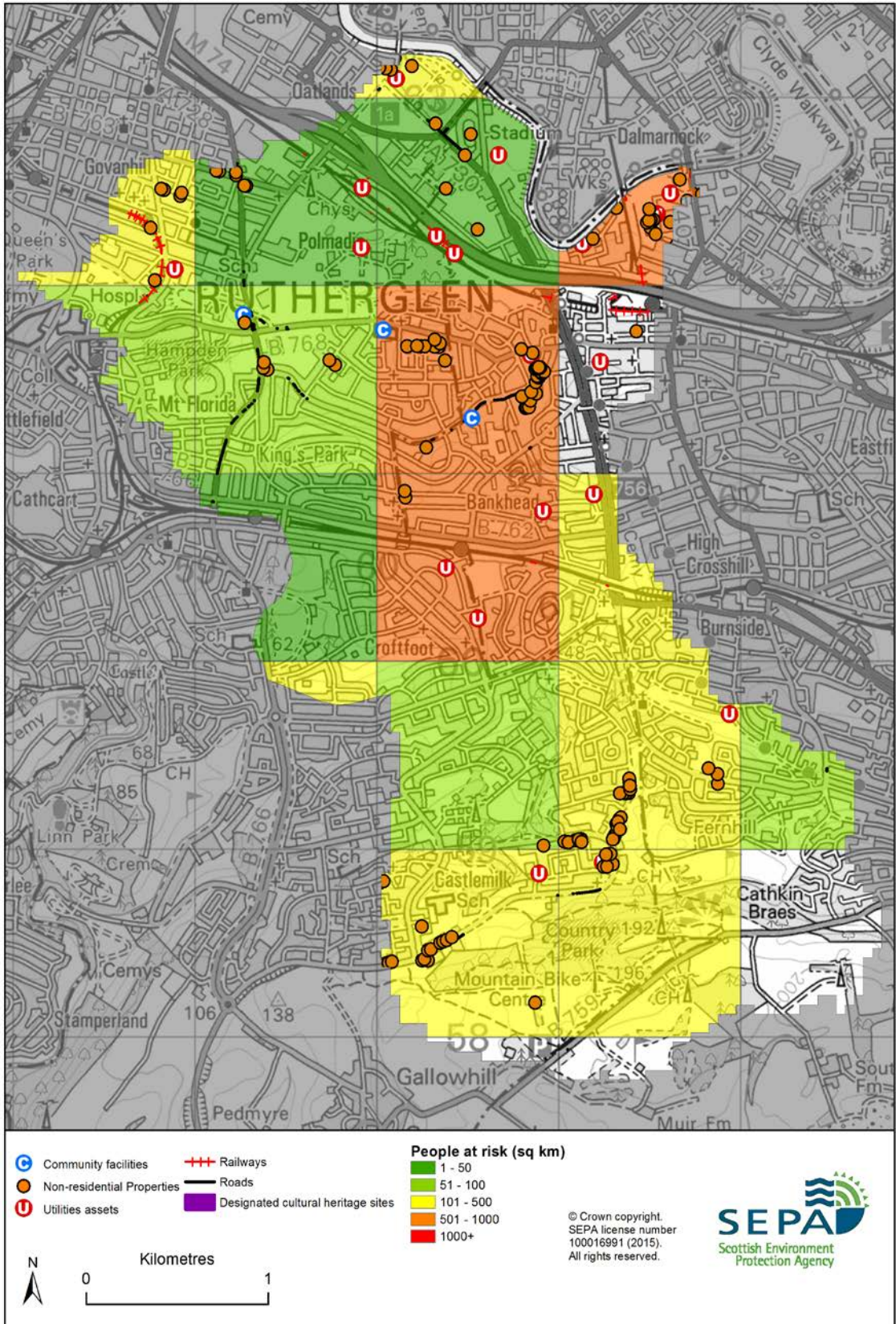


Figure 3: Impacts of flooding

History of flooding

There have been 40 reported incidents of flooding in this Potentially Vulnerable Area. The majority of records are from river flooding from the River Clyde. Major floods from this river occurred in 1864 and 1903. In September 1948 the Clyde flooded, resulting in one fatality. The river is tidally influenced and these floods were a combined effect of high tides and river flooding.

In December 1994 flooding throughout the area affected properties, roads and land in the Shawfield area and Rutherglen. This flood promoted greater awareness of the potential risk in the area and was a driver for the South Lanarkshire Council flooding programme. The River Clyde was thought to have reached its highest level in 150 years, covered an area of 50km² and resulted in damages estimated at £100 million. Sewer flooding was also recorded in this event.

On 10 May 2004 flooding in Mill Street, Rutherglen affected major roads and properties. A combination of river and surface water flooding was recorded on 30 July 2002 in Toryglen, Carrick Road, Abbotsford, Dryburgh, Rosslyn Avenue and Cathcart Road. On 17 July 2011, flooding to Street Level on Cathkin Road and Inchmurrin Drive affected properties, gardens and roads. This flood was associated with heavy surface runoff and watercourse overtopping.

Surface water flooding has been recorded in Rutherglen at Toryglen Road and Mill Street in December 1999, affecting multiple properties and roads.

Objectives to manage flooding in Potentially Vulnerable Area 11/14

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

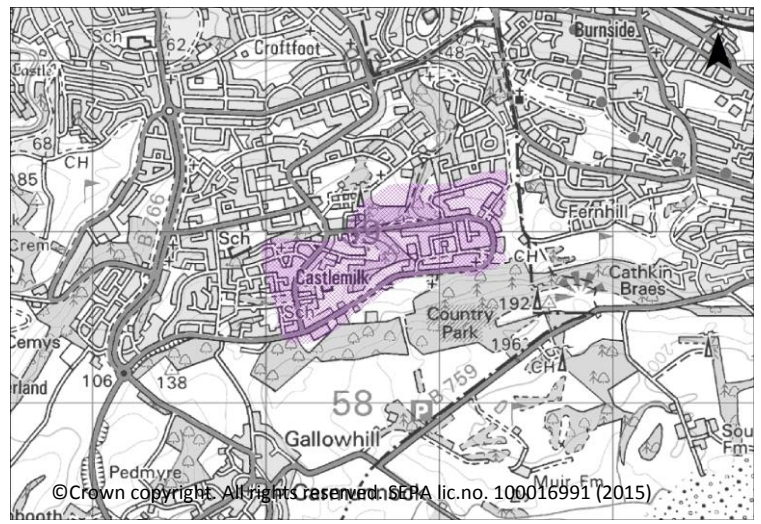
Reduce the risk of flooding from the Spittal Burn and surface water to residential properties in Castlemilk

Indicators:

- 500 residential properties
- £600,000 Annual Average Damages

Objective ID: 11020

Target area:



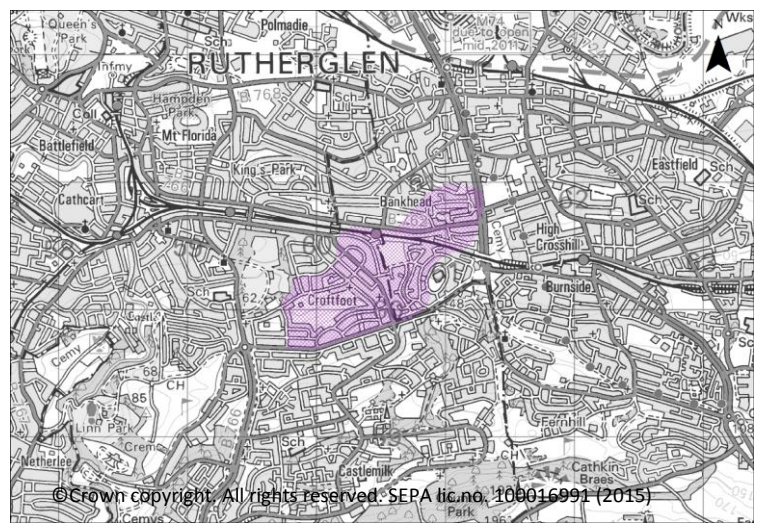
Reduce the risk of river and surface water flooding to residential properties in Croftfoot

Indicators:

- 550 residential properties
- £880,000 Annual Average Damages

Objective ID: 11021

Target area:

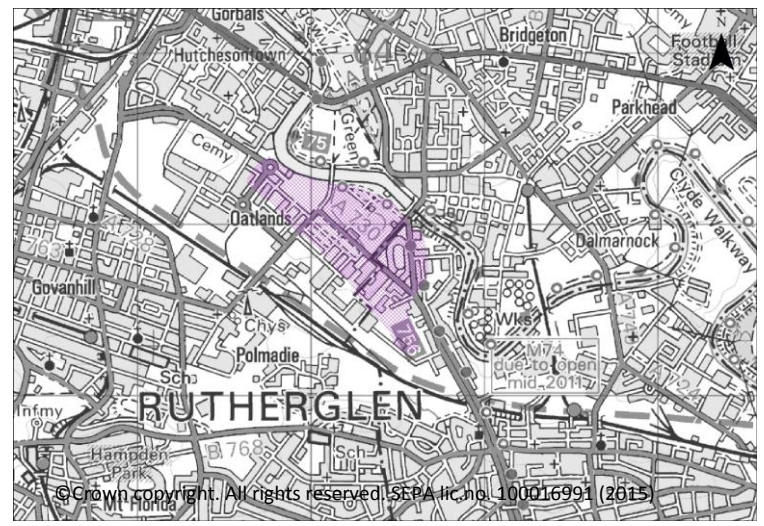


Reduce the risk of flooding to residential properties and non-residential properties in Shawfield

Indicators:

- 180 residential properties
- 110 non-residential properties
- £440,000 Annual Average Damages

Target area:



Objective ID: 11022

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
Kings Park, Glasgow	Reduce the economic damages and risk to people from surface water flooding in Kings Park	11097	* See note below
Overwood Drive and Aikenhead, Glasgow	Reduce the economic damages and risk to people from surface water flooding in Overwood Drive / Aikenhead	11100	* See note below
Croftfoot	Reduce the economic damages and risk to people from surface water flooding in Croftfoot	11107	* See note below
Muirbank	Reduce the economic damages and risk to people from surface water flooding in Muirbank	11123	* See note below
Castlemilk	Reduce the economic damages and risk to people from surface water flooding in Castlemilk	11129	* See note below
Applies across Clyde and Loch Lomond Local Plan District	Avoid an overall increase in flood risk	11127	<ul style="list-style-type: none"> • 1,800 residential properties • £3.2 million Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Reduce overall flood risk	11132	<ul style="list-style-type: none"> • 1,800 residential properties • £3.2 million 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 11/14 there are 930 residential properties at risk and Annual Average Damages of £1.1 million.

Actions to manage flooding in Potentially Vulnerable Area 11/14

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

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

Action (ID):	FLOOD PROTECTION STUDY (110210005)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Croftfoot (11107) Reduce the risk of river and surface water flooding to residential properties in Croftfoot (11021)		
Delivery lead:	Glasgow City Council		
Priority:	National:	Within local authority:	
	16 of 168	2 of 8	
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	<p>A flood protection study should be carried out 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 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. These studies are being promoted via the City Deals project and are awaiting confirmation that funding will be approved.</p> <p>The Cathkin Road bypass project, which lies outwith the Target Area, involves attenuation and storage. It is being promoted via the City Deals and is awaiting confirmation that funding will be approved.</p>		
Potential impacts			
Economic:	There are 210 residential properties at risk of flooding in this location, with potential damages avoided of up to £33 million. The economic impact of natural flood management actions is difficult to define.		

Economic:	However, these actions can reduce flood risk for high likelihood events. In this location, it has been estimated that 60 residential and non-residential properties could potentially benefit from natural flood management actions.
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition there are two community facilities, one educational building and two utilities which have been identified as potentially benefitting from this action. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. This study includes the Cityford Burn (water body ID 10930). The physical condition of this river is identified by river basin management planning to be at less than good status. Future works could improve the condition of the river or degrade it. Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. There are no international, national or local level environmental designations that are likely to be impacted by this action. There may be a loss of recreational land and natural and semi-natural habitats in the footprint of the storage areas and direct defences. There is the potential for creation of new wetland habitats. Downstream of the storage and culvert action there may be negative impacts on water quality through increased erosion and sedimentation. There are likely to be short term negative impacts on water quality during construction from increased sediment. There is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area.

Action (ID):	FLOOD PROTECTION STUDY (110200005)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Castlemilk (11129) Reduce the risk of flooding from the Spittal Burn and surface water to residential properties in Castlemilk (11020)		
Delivery lead:	Glasgow City Council and South Lanarkshire Council		
Priority:	National:		Within local authority:
	19 of 168		4 of 8
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	A study is recommended to further investigate the feasibility of a flood protection scheme on the Cityford / Spittal Burn. The study should 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. This study is linked to the Castlemilk and Croftfoot 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.		

Potential impacts	
Economic:	The flood protection study should consider how to reduce flooding to 250 residential properties and 30 non-residential properties in this location. The potential damages avoided are estimated to be up to £46 million. The economic impact of natural flood management actions is difficult to define. However, these actions can reduce flood risk for high likelihood events. In this location, it has been estimated that 150 residential and non-residential properties could potentially benefit from natural flood management actions.
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. There may be negative impacts through disturbance to the local community during the construction phase and changes in visual amenity and land use as a result of this action.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. This study includes the Cityford Burn (water body ID 10930). The physical condition of this river is identified by river basin management planning to be at less than good status. Future works could improve the condition of the river or degrade it. Opportunities to improve the condition of the river should be considered by coordinating with river basin management planning. There are no international, national or local level environmental designations that are likely to be impacted by this action. There may be a loss of recreational land and natural and semi-natural habitats in the footprint of the storage areas and footprint and vicinity of the defences. There is the potential for creation of new wetland habitats. Downstream of the storage and culvert action there may be negative impacts on water quality through increased erosion and sedimentation. There are likely to be short term negative impacts on water quality during construction from increased sediment. There is the potential for slight positive impacts on water quality from the implementation of sustainable drainage systems in the area.

Action (ID):	FLOOD PROTECTION STUDY (110220005)		
Objective (ID):	Reduce the risk of flooding to residential properties and non-residential properties in Shawfield (11022)		
Delivery lead:	Glasgow City Council		
Priority:	National:	Within local authority:	
	41 of 168	6 of 8	
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	It is recommended that a review of the Clyde Gateway masterplan at Shawfield is carried out to assess if further work is required to assess the level of flood risk. It is recommended that this review is coordinated between Glasgow City Council and South Lanarkshire Council for Rutherglen / Shawfield areas.		

	If the review identifies further investigation of actions may be required, sustainable drainage systems and property level protection should be considered.
Potential impacts	
Economic:	This study should investigate how to reduce flooding to 140 residential properties and 60 non-residential properties in this location, with potential damages avoided of up to £9.7 million.
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition there are two utilities which have been identified as potentially benefitting from this action.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment.

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 (110970018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Kings Park (11097)		
Delivery lead:	Glasgow City Council		
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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 (111070018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Croftfoot (11107)		
Delivery lead:	Glasgow City Council		
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives. 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 (111230018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Muirbank (11123)		
Delivery lead:	South Lanarkshire Council		
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	SURFACE WATER PLAN/STUDY (111290018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Castlemilk (11129)		
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):	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):	MAINTAIN FLOOD PROTECTION SCHEME (110210017)		
Objective (ID):	Reduce the risk of river and surface water flooding to residential properties in Croftfoot (11021)		
Delivery lead:	Glasgow City Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	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.		

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):	COMMUNITY FLOOD ACTION GROUPS (110210012)		
Objective (ID):	Reduce the risk of river and surface water flooding to residential properties in Croftfoot (11021)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	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 it's activities.		

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:	<p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with 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>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

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.		