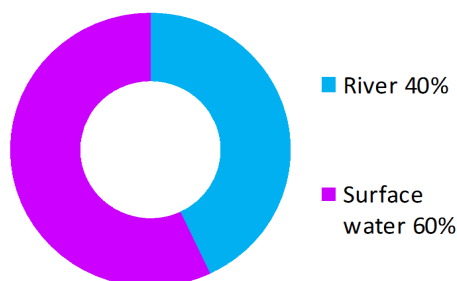


Kilmacolm (Candidate Potentially Vulnerable Area 11/21c)

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

Summary of flooding impacts



At risk of flooding

- 30 residential properties
- 40 non-residential properties
- £96,000 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.

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

Actions

Kilmacolm (Candidate Potentially Vulnerable Area 11/21c)

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

Background

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.



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.

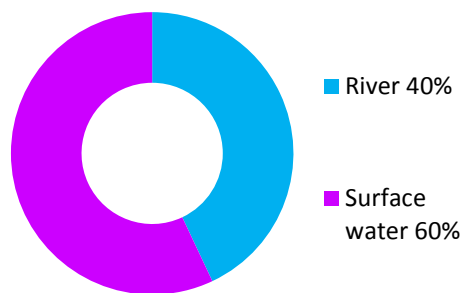


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

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

The main risk to residential properties is from the Gryfe Water and the Green Water. These rivers both originate in the north west of the area and flow towards Kilmacolm, with the confluence of the two rivers to the south of the town. The Gryfe Water originates at the Gryfe Reservoir which could offer some attenuation of flows, depending on the management of the reservoir.

There are isolated patches of surface water flooding distributed across the area which impact residential properties and some sections of main road including the B786 and B788.

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. For this area the highest damages are to residential properties followed by damages to non-residential properties.

Within this candidate Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 30 to 50.

The location of the impacts of flooding is shown in Figure 3. Most of flooding impacts are within Kilmacolm.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 2,000)	10	30	40
Non-residential properties (total 260)	<10	40	40
People	30	70	100
Community facilities	<10 Educational buildings	<10 Includes: educational buildings and healthcare facilities	<10 Includes: educational buildings and healthcare facilities
Utilities assets	0	0	0
Transport links - roads (km)	0.7	1.6	2.0
Transport links - rail (km)	0	0	0
Environmental designated areas (km ²)	2.0	2.0	2.0
Designated cultural heritage sites	6	6	6
Agricultural land (km ²)	1.1	1.4	1.4

Table 1: Summary of flooding impacts¹

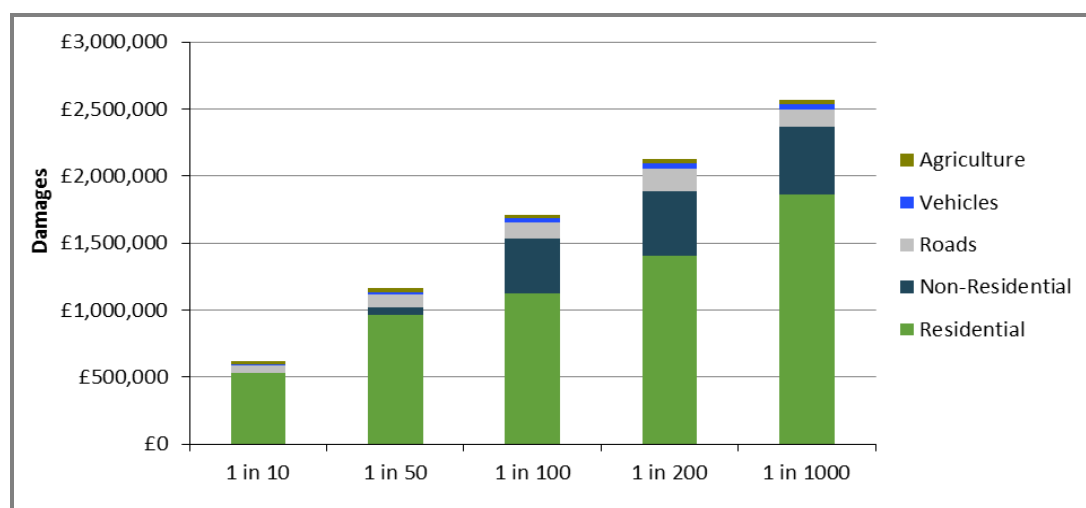


Figure 2: Damages by flood likelihood

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

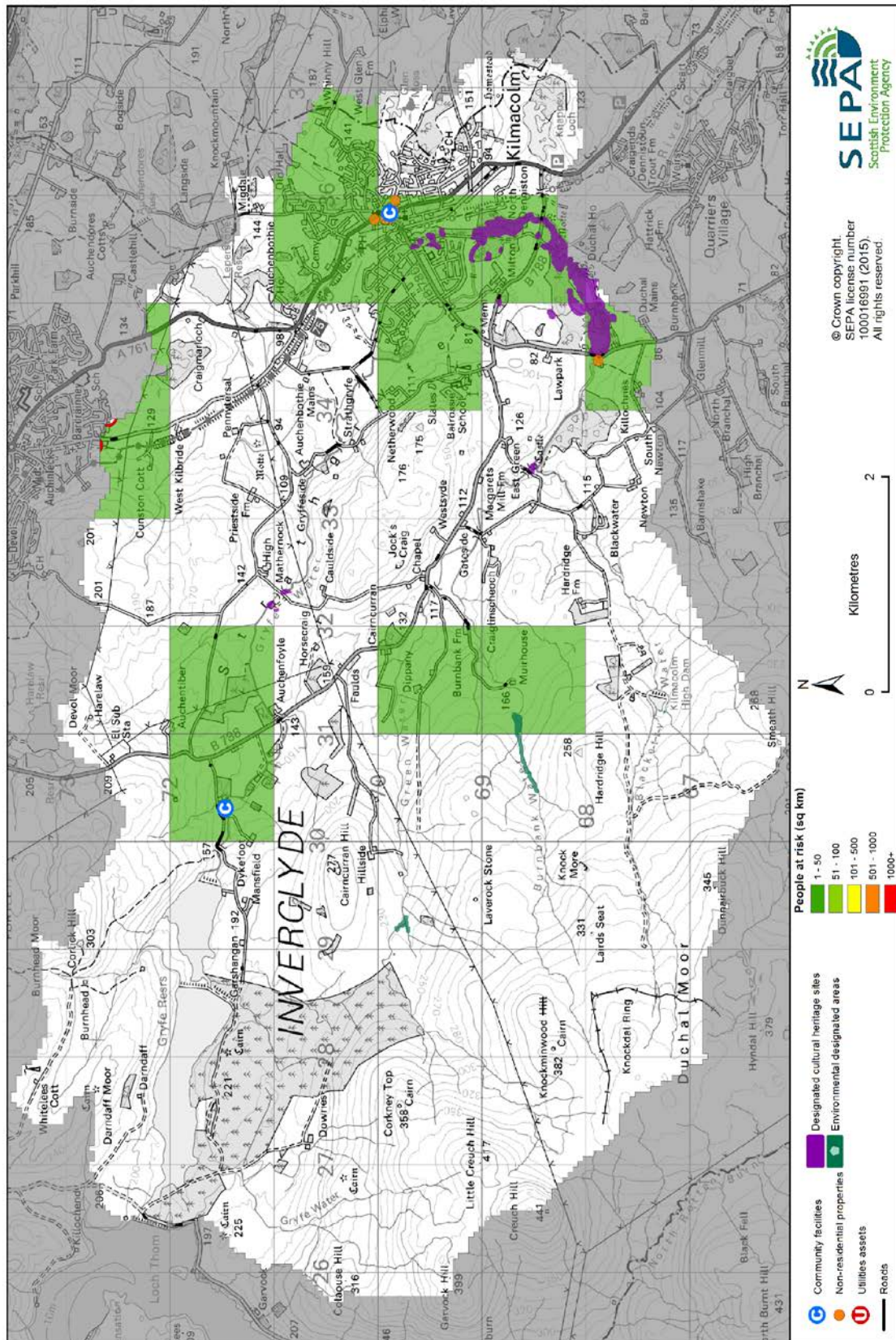


Figure 3: Impacts of flooding

History of flooding

Glenmosston Burn is known to overtop its banks along Gowkhouse Road resulting in flooding of properties on Glencairn Road. There are limited reports of flooding in this area. Flooding in February 1998 in Strathgryfe was reported when the River Gryfe flooded the surrounding land with up to 18 inches of water.

Objectives to manage flooding in Potentially Vulnerable Area 11/21c

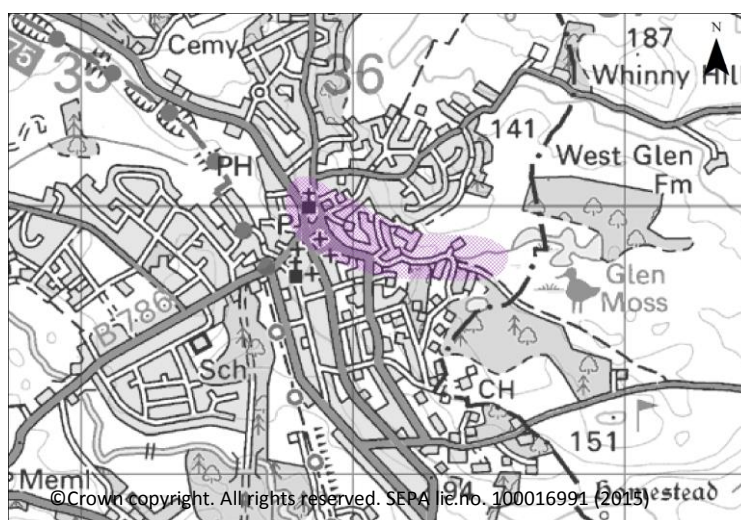
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

Reduce the risk of flooding from the Glenmosston Burn to residential properties and non-residential properties in Kilmacolm

Indicators:

Target area:

- £170,000 Annual Average Damages
- Historic record of flooding to residential properties and main transport links



Objective ID: 11034

Target area	Objective	ID	Indicators within PVA
Applies across Clyde and Loch Lomond Local Plan District	Avoid an overall increase in flood risk	11127	<ul style="list-style-type: none"> • 30 residential properties • £96,000 Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Reduce overall flood risk	11132	<ul style="list-style-type: none"> • 30 residential properties • £96,000 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.		

Actions to manage flooding in Potentially Vulnerable Area 11/21c

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 Kilmacolm Candidate Potentially Vulnerable Area.

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

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (110340006)				
Objective (ID):	Reduce the risk of flooding from the Glenmosston Burn to residential properties and non-residential properties in Kilmacolm (11034)				
Delivery lead:	Inverclyde Council				
Priority:	National:		Within local authority:		
	3 of 42		1 of 4		
Status:	Under development	Indicative delivery:	2016-2021		
Description:	<p>It is recommended that the council look 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 Gowkhouse 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>				
Potential impacts					
Economic:	The scheme will reduce flooding to trunk roads and properties with a potential economic benefit of £5.1 million. The flood protection scheme has an estimated benefit cost ratio of 10.2.				
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community.				
Environmental:	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. There is the potential for temporary construction impacts to the Glen Moss Site of Special Scientific Interest. There is likely to be a loss of habitat and displacement of species in the vicinity of these works; however, these may re-establish and return to the area. Downstream of these conveyance				

Environmental:	works there may be negative impacts on water quality through localised increased erosion and sedimentation.
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Action (ID):	NEW FLOOD WARNING (111320010)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	post 2021
Description:	The area under consideration includes properties affected by flooding from the River Gryfe. A review of the flood risk in this location is required to assess the potential for flood warning delivery and subsequent to that appropriate timescales for delivery.		

Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (110340003)		
Objective (ID):	Reduce the risk of flooding from the Glenmosston Burn to residential properties and non-residential properties in Kilmacolm (11034)		
Delivery lead:	Inverclyde Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	A natural flood management study should be carried out to further investigate the potential benefit for floodplain restoration at Glen Moss in Kilmacolm. These actions should 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 should look to engage with land owners early in the process to establish the potential for any works.		

Potential impacts	
Economic:	The economic impact of natural flood management actions is difficult to define. However, these actions can reduce flood risk for high likelihood events.
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.
Environmental:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. There is the potential for permanent impacts to the Glen Moss Site of Special Scientific Interest as the existing ecosystems in the area for restoration may be impacted through a potential change in vegetation, management and local hydrology. There may, however, be improvements in biodiversity and water quality through this action.

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 carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	FLOOD FORECASTING (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:	<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 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.</p>		

Action (ID):	MAINTENANCE (111320007)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	Inverclyde Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p>		

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:	<p>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.</p>		

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.		