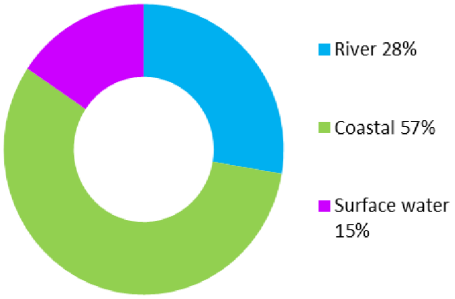
Isle of Bute (Potentially Vulnerable Area 11/06)

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

Summary of flooding impacts



At risk of flooding

- 600 residential properties
- 420 non-residential properties
- £2.3 million 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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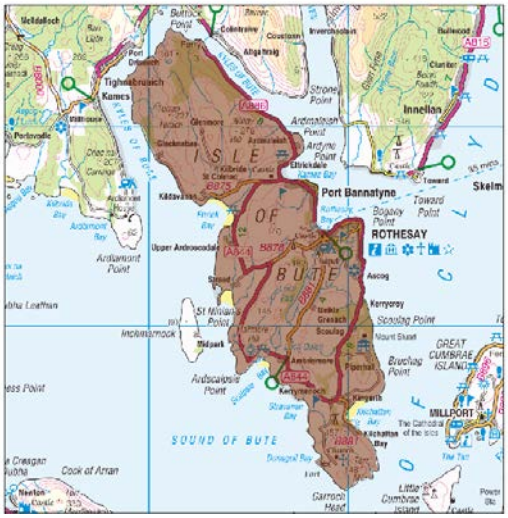
Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Isle of Bute

Background

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 120km^2 (shown below).



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.

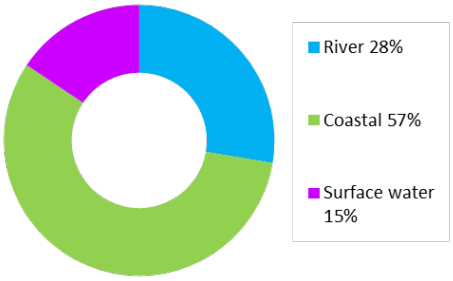


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Coastal flooding has the greatest impact in Rothesay, although areas of Port Bannatyne, Kingarth, Kilchattan Bay, St Ninian's point and to the south of Kerrycroy are also predicted to be at risk. In relation to Rothesay the predicted coastal flood risk is likely to be largely mitigated by the existing flood defence scheme, which consists of approximately 910m of seawall from Argyle Street, along the Esplanade to East Princes Street. These defences are not currently incorporated within the national flood mapping used in the analysis. Around the coastline there are sections of the A844 which have historically suffered from erosion problems whilst the A886 has also been identified to have sections at risk of flooding.

River flooding within the area is primarily attributed to the Loch Fad and the Lade, which flows from the loch, through Rothesay and downstream into the Firth of Clyde, affecting both residential and non-residential properties. There are no records of river flooding from this source in Rothesay. There are also areas of predicted river flooding in Ettrick Bay from the Drumachloy Burn. Small areas of agricultural land are also at risk from river flooding from the various burns that cross the island.

There are approximately 70 residential properties at risk of surface water flooding distributed across this Potentially Vulnerable Area. The areas at highest risk from surface water will require the preparation of surface water management plans.

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 coastal flooding experience the highest economic impact at approximately 25% 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 600 to 900 and the number of non-residential properties from approximately 420 to 480.

The location of the impacts of flooding is shown in Figure 3. Most of impacts are within Port Bannatyne and Rothesay, with flooding to people and non-residential properties. The A886 north of Port Bannatyne is also at risk of flooding. Eleven designated cultural heritage sites are at risk as well as small areas of environmentally designated sites.

History of flooding

In January 1991, Rothesay suffered significant coastal flooding which caused damages of approximately £4 million. There have been no reported incidents of surface water or river floods within the area.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 4,500)	160	600	860
Non-residential properties (total 600)	170	420	470
People	350	1,300	1,900
Community facilities	<10 Healthcare facilities	<10 Healthcare facilities	<10 Healthcare facilities
Utilities assets	<10	<10	<10
Transport links-roads (km)	8.4	12.4	15.4
Environmental designated areas (km²)	0.9	1.0	1.0
Designated cultural heritage sites	9	11	15
Agricultural land (km²)	1.0	1.6	1.9

Table 1: Summary of flooding impacts[1]

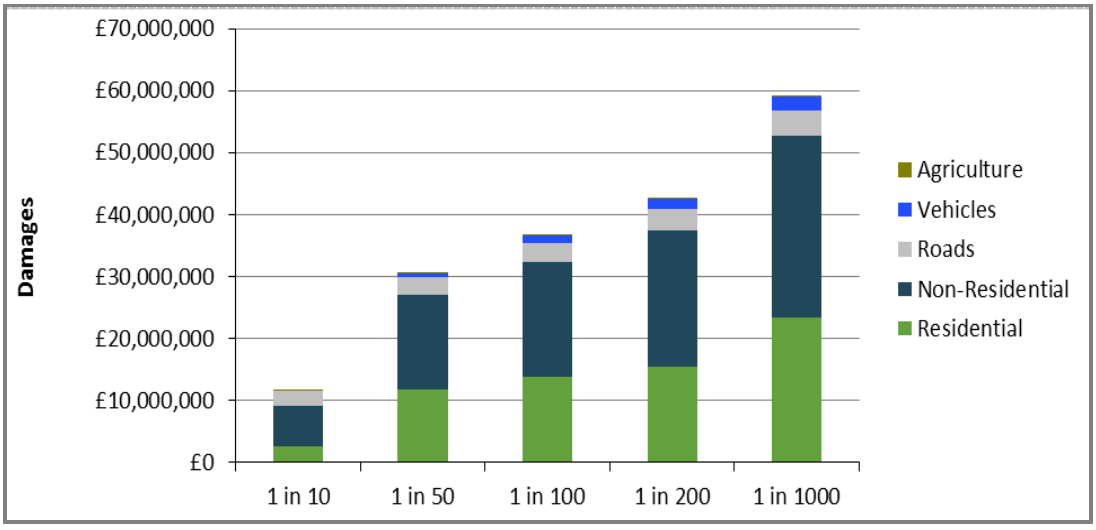


Figure 2: Damages by flood likelihood

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

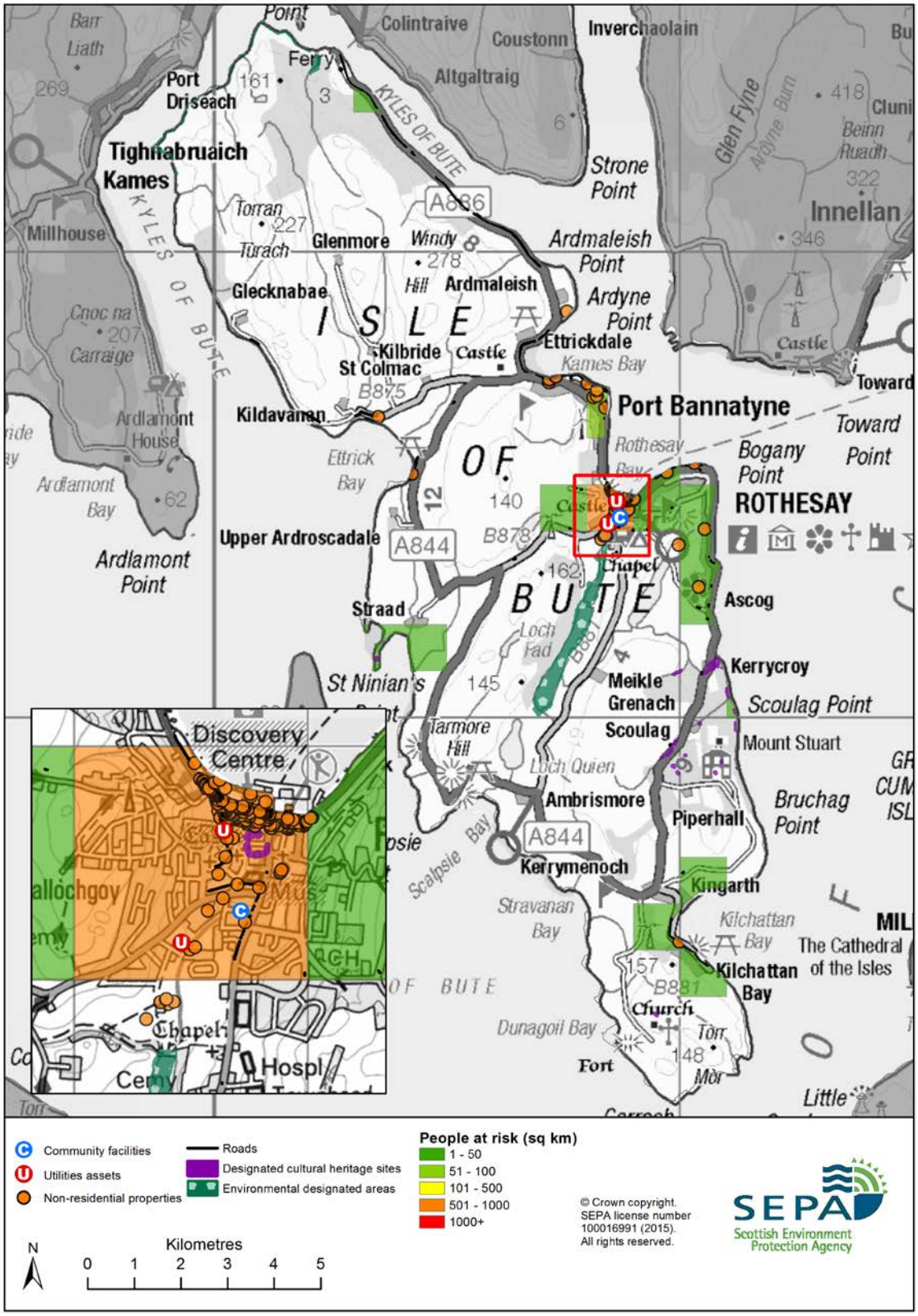
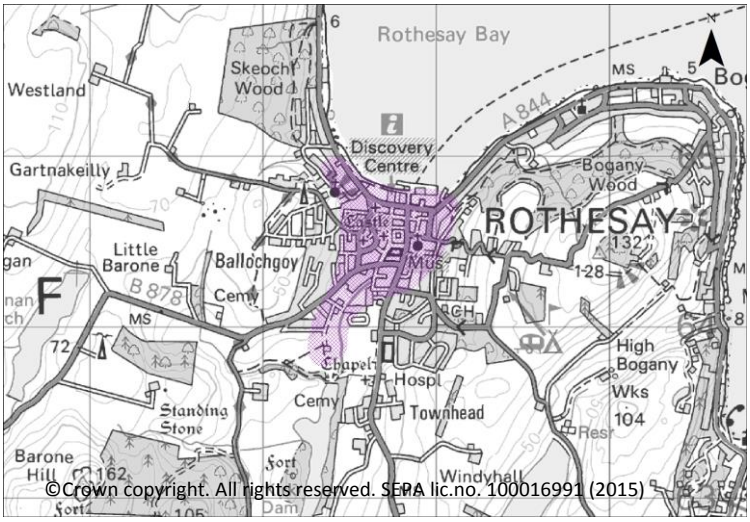


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 11/06

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. 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 the Isle of Bute Potentially Vulnerable Area.

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

Indicators:	Target area:
• 480 residential properties • 400 non-residential properties • £1.8 million Annual Average Damages	
Objective ID: 11004	

Target area	Objective	ID	Indicators within PVA
Applies across Clyde and Loch Lomond Local Plan District	Avoid an overall increase in flood risk	11127	• 600 residential properties • £2.3 million Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Reduce overall flood risk	11132	• 600 residential properties • £2.3 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.		

Actions to manage flooding in Potentially Vulnerable Area 11/06

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 the Isle of Bute 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):	**FLOOD PROTECTION STUDY** (110040005)		
Objective (ID):	Reduce the risk of combined flooding to residential properties and non-residential properties in Rothesay (11004)		
Delivery lead:	Argyll and Bute Council		
Priority:	National:	Within local authority:	
	142 of 168	**6 of 9**	
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A study is recommended to further investigate the feasibility of a flood protection scheme in Rothesay, focusing on the potential to use Kirk Dam for storage, the potential for natural flood management actions to reduce flooding in the area and the benefits of a property level protection scheme in the town. The existing Rothesay Town Centre coastal flood warning area would support property level protection to increase the overall benefit.		
Potential impacts			
Economic:	The flood protection study should consider how to reduce flooding to 160 residential properties and 110 non-residential properties. The potential damages avoided are estimated to be up to £630,000. 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 20 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 and socially vulnerable people located within the flood protection study area. In addition there are two utilities which have been identified as potentially benefitting from		

Social:	this action. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. There may be 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. There is the potential for permanent impacts to the Bute Central Lochs Site of Special Scientific Interest during construction and through loss of habitat, displacement of species and changes in hydrology. There is the potential for negative impacts to the Thom's Water Cuts Scheduled Monument from this action during construction.

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):	**MAINTAIN FLOOD PROTECTION SCHEME** (110040017)		
Objective (ID):	Reduce the risk of combined flooding to residential properties and non-residential properties in Rothesay (11004)		
Delivery lead:	Argyll and Bute Council		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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.		

Action (ID):	**MAINTAIN FLOOD WARNING** (111320030)		
Objective (ID):	Reduce overall flood risk (11132)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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.		

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:	Argyll & Bute Council, 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.		