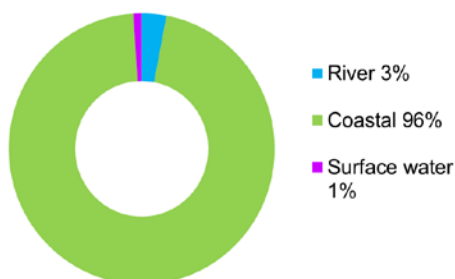


Great Cumbrae Island (Potentially Vulnerable Area 12/02)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Great Cumbrae coastal

Summary of flooding impacts



At risk of flooding

- local studies identify 800 residential and non-residential properties
 - £2.2 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.

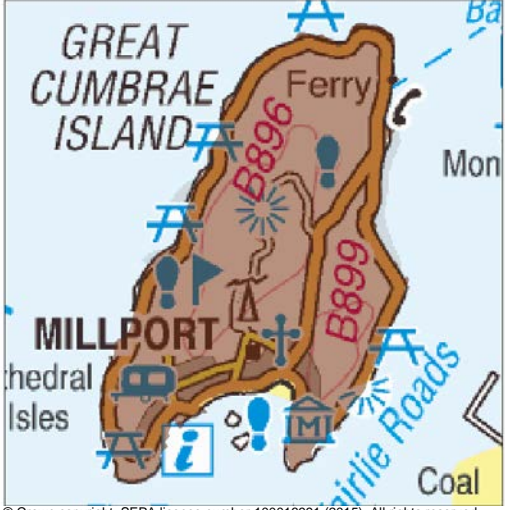
Flood protection scheme/works	<i>Natural flood management works</i>	<i>New flood warning</i>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising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

Great Cumbrae Island (Potentially Vulnerable Area 12/02)

Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Great Cumbrae coastal

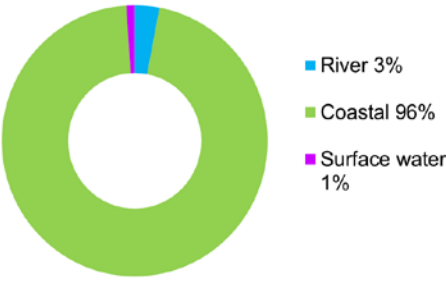
Background

This Potentially Vulnerable Area is approximately 10km². It encompasses all of Great Cumbrae Island located in the Firth of Clyde, to the west of Largs (shown below).



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Local studies have shown approximately 800 residential properties to be at risk. The Annual Average Damages are approximately £2.2 million.



Flood Source	Percentage
Coastal	96%
River	3%
Surface water	1%

Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The national assessment shows that flooding within the area is primarily from coastal sources with a limited impact from surface water; however, there have also been reports of river flooding from the Mill Burn. The catchment size threshold used for the river study however, means that no watercourses on the island were modelled.

Due to the limitations of the national modelling approach the risk identified by the national assessment underestimated the risk in the area. North Ayrshire Council has undertaken further studies which identified a risk to approximately 780 properties from coastal flooding, including wave overtopping and erosion. A further 30 properties were identified at risk of river flooding from the Mill Burn. Coastal flooding is also likely to impact sections of road infrastructure including the B896.

Due to the discrepancy between the values from the national assessment and the local study no tables or figures from the national assessment have been provided. The information from areas studied by North Ayrshire Council will be reviewed for use when updating the national mapping. Objectives and actions have been identified to reduce the identified flood risk.

There are only a small number of areas at risk of surface water flooding. These areas tend to coincide with the locations of small reservoirs and lochs. There is one location, to the north of Kames Bay, which indicates that surface water flooding may impact residential properties.

History of flooding

The Millport area has suffered severe coastal flooding dating back to 1912. The most recent report of coastal floods occurred in late December 2012 and early January 2013, which included significant seafront erosion. Annual coastal floods have been reported to affect approximately 20 residential properties. The largest coastal event occurred in January 1991 which caused extensive flooding of Millport, damage to shops, the promenade and the seafront infrastructure.

River flooding in the area has been reported from the Mill Burn in Millport. The largest impact was reported on the 22 May 2014 when the burn overtopped its banks and caused flooding to Golf Road, Crawford Street and Miller Street which resulted in flooding to five residential properties and a non-residential property. The event also caused severe damage to the road surface, culverts and masonry garden walls. On the 8 January 2004 the Mill Burn overtopped its banks and flooded Golf Road near Nether Kirkton Farm causing some flood water to flow onto Cardiff Street. On the 10 August 2004 the Mill Burn overflowed onto Golf Road, flooding the road and preventing access. On the 4 October 2004 floodwaters flowed down Cardiff Street threatening multiple properties. There were multiple events in December 1999 when the Mill Burn overflowed at Nether Kilkton, flooding gardens and streets.

Surface water floods were reported in Millport on the 27 February 2007 when blocked road gullies in Glasgow Street caused the flooding of properties.

Objectives to manage flooding in Potentially Vulnerable Area 12/02

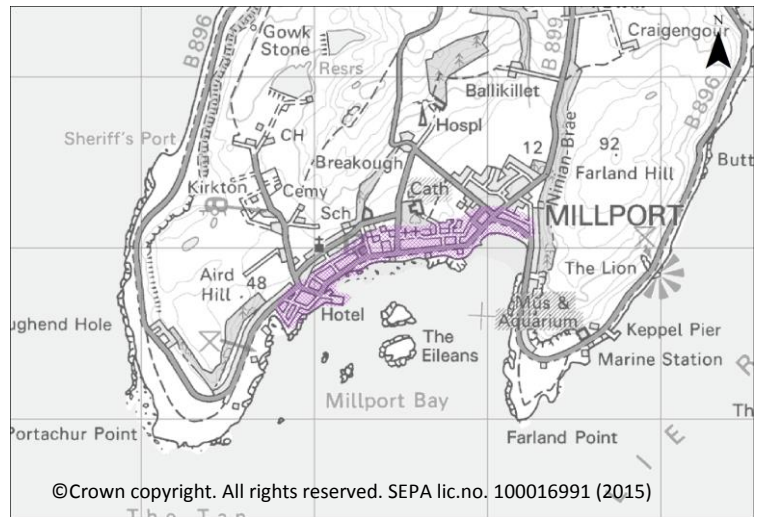
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

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

Indicators:

- 710 properties
- £1.8 million Annual Average Damages

Target area:



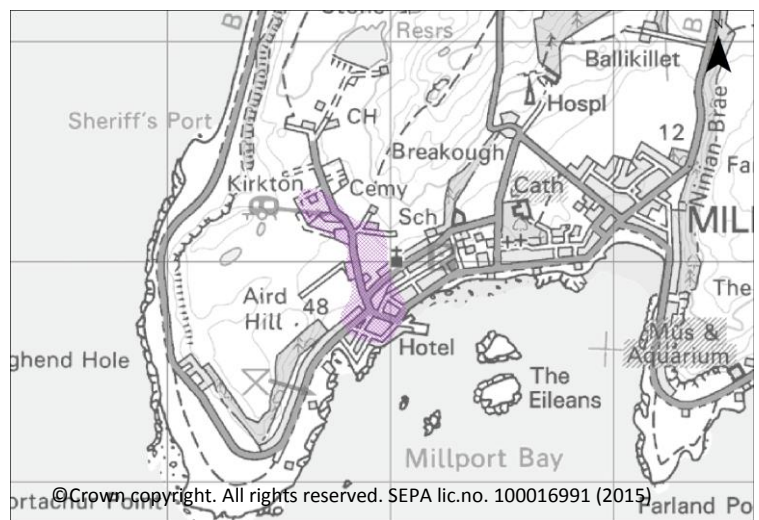
Objective ID: 12002

Reduce the risk of river flooding to residential properties in Millport along the Mill Burn

Indicators:

- 30 residential properties
- Caravan park

Target area:



Objective ID: 12003

Target area	Objective	ID	Indicators within PVA
Applies across Ayrshire Local Plan District	Avoid an overall increase in flood risk	12039	Local studies show: <ul style="list-style-type: none"> • 800 properties at risk • £2.2 million Annual Average Damages
Applies across Ayrshire Local Plan District	Reduce overall flood risk	12082	Local studies show: <ul style="list-style-type: none"> • 800 properties at risk • £2.2 million Annual Average Damages
Applies across Ayrshire 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 12/02

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 Great Cumbrae Island Potentially Vulnerable Area.

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

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120020006)				
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)				
Delivery lead:	North Ayrshire Council				
Priority:	National:		Within local authority:		
	10 of 42		1 of 3		
Status:	Under development	Indicative delivery:	2016-2021		
Description:	It is recommended that the council progress work on the proposed coastal flood protection scheme for Millport. A flood risk assessment and economic appraisal have been developed which have identified options to manage flooding in the area. The current option includes the creation of a breakwater with flood walls. These will also protect against wave overtopping and erosion. It is recommended that the options are further developed including an assessment of property level protection included to supplement the primary actions.				
Potential impacts					
Economic:	The proposed scheme may benefit 730 residential and non-residential properties at risk of flooding in this location, damages avoided are estimated to be £65 million. The flood protection scheme has an estimated benefit cost ratio of 5.2.				
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. The scheme has the potential to impact on Kames Bay Site of Special Scientific Interest and consultation with Scottish Natural Heritage is recommended during scheme design.				

Action (ID):	FLOOD PROTECTION SCHEME/WORKS (120030006)		
Objective (ID):	Reduce the risk of river flooding to residential properties in Millport along the Mill Burn (12003)		
Delivery lead:	North Ayrshire Council		
Priority:	National:	Within local authority:	
	30 of 42	3 of 3	
Status:	Under development	Indicative delivery:	2016-2021
Description:	It is recommended that the council progress work on the proposed flood protection work on the Mill Burn in Millport. The Mill Burn Flood Risk Assessment has provided information along with an economic appraisal which identifies potential options to mitigate flooding. Initial remedial work has helped to reduce the level of risk in the area however further analysis should be carried out to establish the remaining level of risk and the most sustainable combination of actions to manage this risk.		
Potential impacts			
Economic:	The proposed scheme may benefit 31 residential properties and 9 non-residential properties in this location, damages avoided are estimated to be £1.9 million. The flood protection scheme has an estimated benefit cost ratio of 1.8.		
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.		

Action (ID):	FLOOD PROTECTION STUDY (121030005)		
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)		
Delivery lead:	North Ayrshire Council and South Ayrshire Council		
Priority:	National:	Within local authority:	
	8 of 168	1 of 5	
Status:	Not started	Indicative delivery:	2016-2021
Description:	A shoreline management plan is recommended, this study is not limited to Potentially Vulnerable Areas but should cover the whole of the Ayrshire coastline and any areas beyond this which may be influenced by changes in coastal processes. The study should investigate flooding and coastal erosion, wave overtopping and the current coastal protection offered. The study will help to develop an understanding of coastal issues and identify where further work may be required to mitigate against flooding.		
Potential impacts			

Economic:	The study should consider how to reduce flood risk along the Ayrshire coastline. For the entire study area potential damages avoided are estimated to be up to £26 million.
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the coastline. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary should be considered by coordinating with river basin management planning.

Action (ID):	STRATEGIC MAPPING AND MODELLING (120820016)		
Objective (ID):	Reduce overall flood risk (12082)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km 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 and Scottish Water Integrated Catchment Management Studies will be considered as these projects are completed.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (120020017)		
Objective (ID):	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)		
Delivery lead:	North Ayrshire Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	There is a combination of manmade defences, including seawalls, revetments and breakwaters along Millport Bay which provide some protection to Millport. The planned works along Millport Bay will look at altering the current defences, until this time these defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. If the defences remain the same levels of flood risk are likely to increase over time as a consequence of climate change.		

Action (ID):	MAINTAIN FLOOD WARNING (120820030)		
Objective (ID):	Reduce overall flood risk (12082)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Millport Seafront flood warning area which is part of the Firth of Clyde coastal flood warning scheme.		

Action (ID):	FLOOD FORECASTING (120820009)		
Objective (ID):	Reduce overall flood risk (12082)		
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 (120820011)		
Objective (ID):	Reduce overall flood risk (12082)		
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 (120820013)		
Objective (ID):	Reduce overall flood risk (12082)		
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 communities and promote Floodline using most the appropriate mix of methods for the area. These could include direct mailings, education activities, participation in local events and relevant flooding messages in the media. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (120820007)		
Objective (ID):	Reduce overall flood risk (12082)		
Delivery lead:	North Ayrshire 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 (120820014)		
Objective (ID):	Reduce overall flood risk (12082)		
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 (120390001)		
Objective (ID):	Avoid an overall increase in flood risk (12039) Reduce overall flood risk (12082)		
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.		