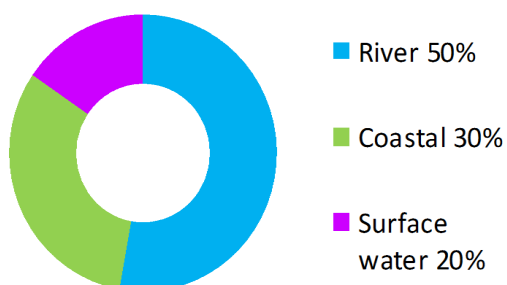


Dunoon (Potentially Vulnerable Area 11/07)

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Cowal / Clyde Sealochs coastal

Summary of flooding impacts



At risk of flooding

- 140 residential properties
- 80 non-residential properties
- £480,000 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.

<i>Flood protection scheme/works</i>	<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	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Actions

Dunoon (Potentially Vulnerable Area 11/07)

Local Plan District	Local authority	Main catchment
Clyde and Loch Lomond	Argyll and Bute Council	Cowal / Clyde Sealochs coastal

Background

This Potentially Vulnerable Area is located in the north west of the Clyde and Loch Lomond Local Plan District, along the coast between Holy Loch and Port Bannatyne, and is approximately 40km² (shown below).

The area has a risk of river, surface water and coastal flooding. The majority of damages are caused by river flooding.

There are approximately 140 residential properties and 80 non-residential properties at risk of flooding. The Annual Average Damages are approximately £480,000.

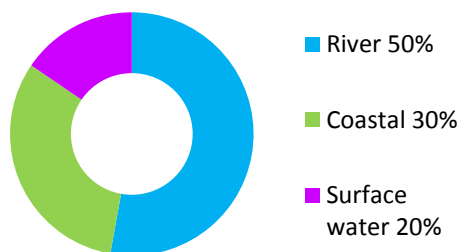
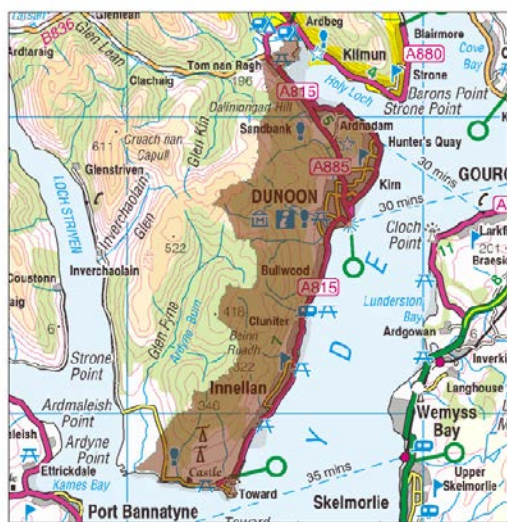


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding within the area is primarily attributed to the Blagaidh and Milton Burns which flow through Dunoon. River flooding in Dunoon impacts residential properties, community services and utilities. In the north, the Little Eachaig River may affect agricultural areas near Dalinlongart. The main transport route (A815) is also affected by river flooding at a number of locations in the area.

Despite the eastern and southern boundaries of the area fronting onto the Firth of Clyde there are relatively few locations affected by coastal flooding. Potentially affected areas include a small number of properties in the south off the A815, properties in the vicinity of the Blagaidh Burn within Dunoon and properties at Sandbank near the marina.

There are approximately 40 residential properties at risk of surface water flooding with the highest impact in Toward and Dunoon, where deep flooding may occur. Scottish Water has reported drainage issues within Dunoon and there has been surface water flooding. The areas at highest risk from surface water flooding 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 river flooding experience the highest economic impact at approximately 35% 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 140 to 260 and the number of non-residential properties from approximately 80 to 150.

The location of the impacts of flooding is shown in Figure 3. Most of impacts are within Dunoon with flooding to people, non-residential properties, community facilities and utilities. The A815 floods both north and south of Dunoon.

History of flooding

River flooding from the Milton Burn has been recorded in Dunoon on the 9 August 2004 and 28 October 1996. Also within Dunoon, Scottish Water have reported drainage issues.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 5,800)	40	140	240
Non-residential properties (total 1,300)	40	80	140
People	90	300	530
Community facilities	<10 Includes: educational buildings, emergency services and healthcare facilities	<10 Includes: educational buildings, emergency services and healthcare facilities	<10 Includes: educational buildings, emergency services and healthcare facilities
Utilities assets	<10	10	20
Transport links - roads (km)	4.0	5.9	7.3
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	4	5	6
Agricultural land (km ²)	0.3	0.5	0.7

Table 1: Summary of flooding impacts¹

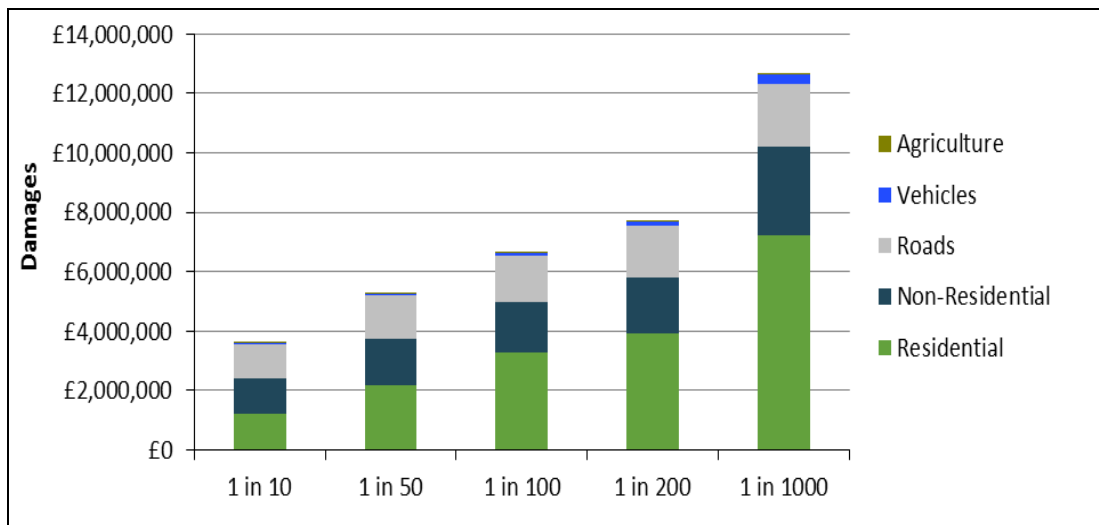


Figure 2: Damages by flood likelihood

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

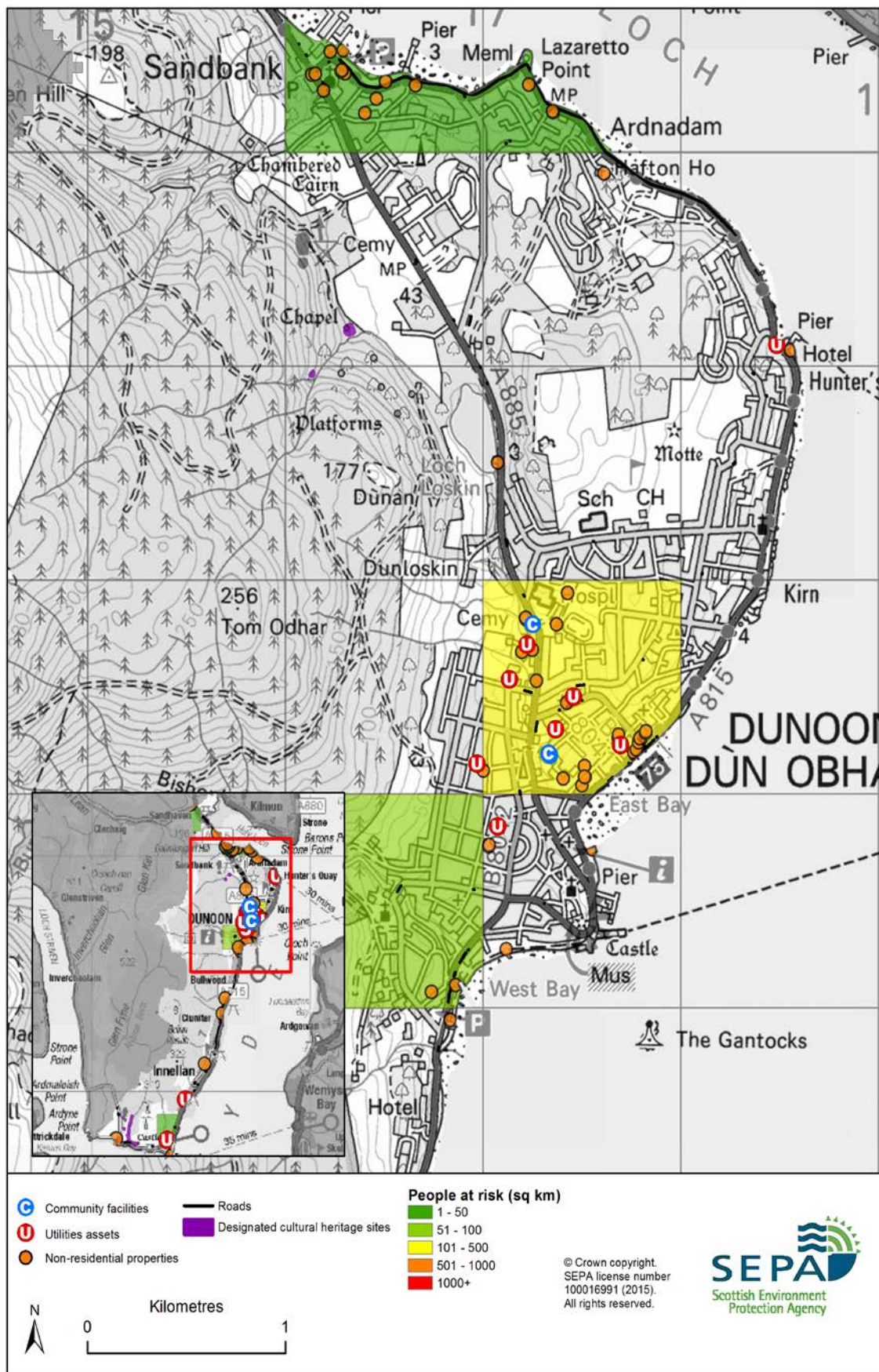


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 11/07

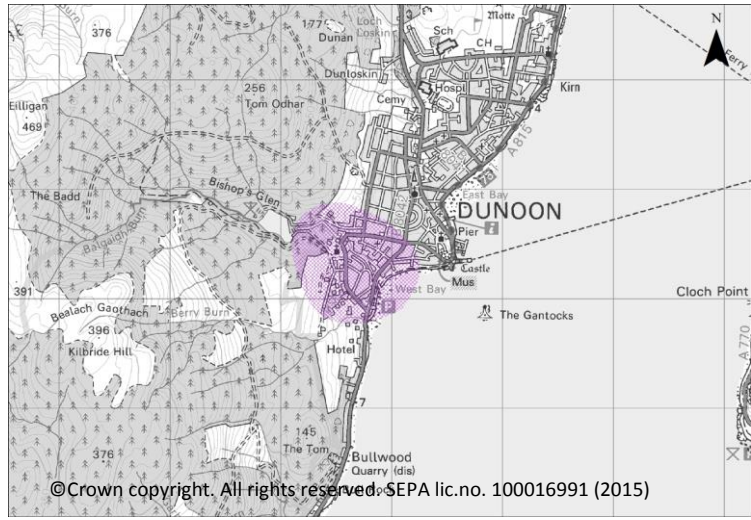
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

Accept that current and future significant flood risks in the Kilbride Road and Crochan Road area are being managed appropriately

Indicators:

- 20 residential properties
- £35,000 Annual Average Damages

Target area:



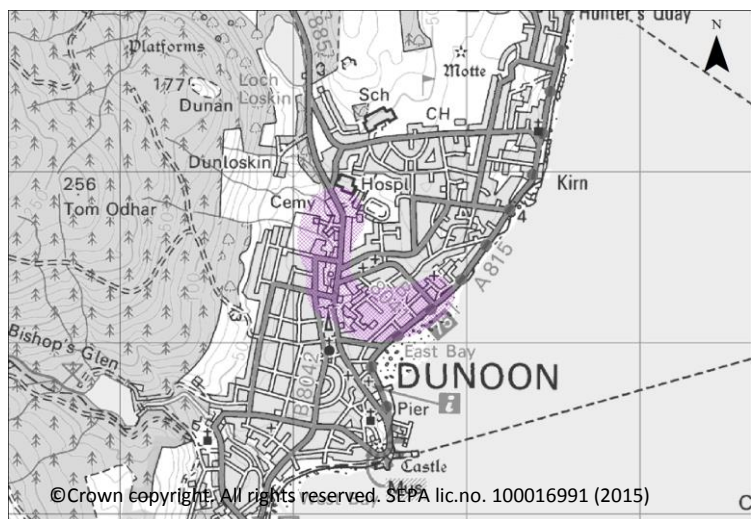
Objective ID: 11005

Reduce the risk of Milton Burn flooding to residential properties in Dunoon

Indicators:

- 60 residential properties
- £130,000 Annual Average Damages

Target area:



Objective ID: 11006

Target area	Objective	ID	Indicators within PVA
Dunoon	Reduce the economic damages and risk to people from surface water flooding in Dunoon	11083	* 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"> • 140 residential properties • £480,000 Annual Average Damages
Applies across Clyde and Loch Lomond Local Plan District	Reduce overall flood risk	11132	<ul style="list-style-type: none"> • 140 residential properties • £480,000 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 11/07 there are 40 residential properties at risk and Annual Average Damages of £74,000.

Actions to manage flooding in Potentially Vulnerable Area 11/07

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 Dunoon Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<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	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 (110060005)		
Objective (ID):	Reduce the risk of Milton Burn flooding to residential properties in Dunoon (11006)		
Delivery lead:	Argyll and Bute Council		
Priority:	National:		Within local authority:
	103 of 168		3 of 9
Status:	Not started	Indicative delivery:	2022-2027
Description:	<p>A study is recommended to further investigate the feasibility of increasing the level of protection in Dunoon, focusing on extending and enhancing the Milton Burn Flood Protection Scheme and property level protection for the residual risk. The study should also look at the potential for Natural Flood Management actions such as land management and runoff control near the town to reduce the impact flooding in the town.</p> <p>There is also a surface water management plan being developed for the area which will look at surface run off and mitigation measures. These two studies should complement each other to develop the most sustainable combination of actions.</p> <p>The flood protection study will therefore be progressed in cycle 2 in order that the assessment of options is informed by the outcome of the surface water management plan.</p>		
Potential impacts			
Economic:	<p>The flood protection study should consider how to reduce flooding to 30 residential properties and 20 non-residential properties. The potential damages avoided are estimated to be up to £3.3 million. The economic impact of natural flood management actions is difficult</p>		

Economic:	to define. However, these actions can reduce flood risk for high likelihood events. In this location, it has been estimated that 30 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 three community facilities, two educational buildings 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. 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; however, these would be localised impacts.
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 are no international or national level environmental designations that are likely to be directly impacted by this action. There is likely to be a loss of semi-natural habitat in the footprint and vicinity of the defences.

Action (ID):	SURFACE WATER PLAN/STUDY (110830018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Dunoon (11083)		
Delivery lead:	Argyll and Bute 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.		

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 (110050017)		
Objective (ID):	Accept that current and future significant flood risks in the Kilbride Road and Crochan Road area are being managed appropriately (11005)		
Delivery lead:	Argyll and Bute Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the existing defences in Dunoon.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (110060017)		
Objective (ID):	Reduce the risk of Milton Burn flooding to residential properties in Dunoon (11006)		
Delivery lead:	Argyll and Bute Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The Milton Burn Flood Protection Scheme was completed in 2012 which consists of a 1.4m bypass pipe, flood wall improvements and the raising of a pedestrian bridge. This scheme reduces the impact of flooding in Dunoon and provides a standard of protection to a 1 in 100 year flood plus climate change in the St Mun's area. These defences will be maintained, and will continue to manage flooding according to the design standard at the time of construction. Unless actions are put in place to enhance the standard of protection, 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 Dunoon Pier and Hunter's Grove 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. 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.		