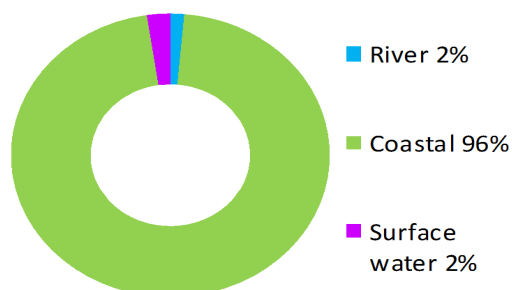


Southernness and Carsethorn (Potentially Vulnerable Area 14/21)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	Southernness coastal

Summary of flooding impacts



At risk of flooding

- 50 residential properties
- <10 non-residential properties
- £210,000 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	<i>Surface water plan/study</i>	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

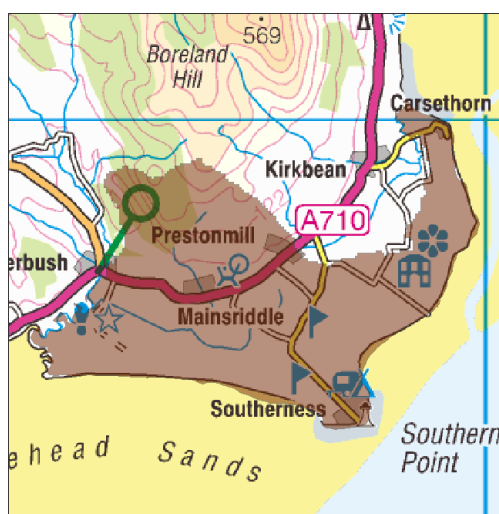
Actions

Southernness and Carsethorn (Potentially Vulnerable Area 14/21)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	Southernness coastal

Background

This Potentially Vulnerable Area is located on the south coast of the Solway Local Plan District and incorporates the village of Southernness (shown below). It is approximately 20km².



There are approximately 50 residential properties at risk of flooding. The Annual Average Damages are approximately £210,000.

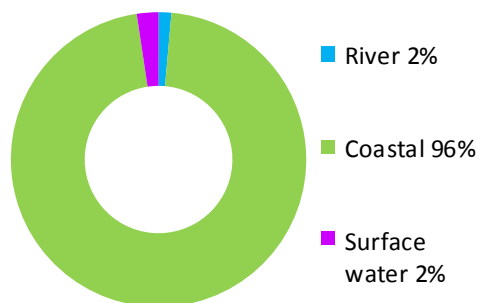


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

There are a number of small settlements including Carsethorn, Southernness and Mainsriddle within this Potentially Vulnerable Area. The Southwick Burn flows south along the western edge of the area and discharges to the Solway Firth at Mersehead, while the Prestonmill Burn flows east to the north of the area and discharges to the Solway Firth at Carsethorn. The lower reaches of the Southwick Burn and Prestonmill Burn are tidal.

Coastal flooding may inundate a large area in the west, bound on two sides by the Southwick Burn and the Solway Firth. Residential properties will be affected in Southernness and Carsethorn; this is supported by historical reports of wave overtopping in Southernness and tidal/drainage issues in Carsethorn.

River flooding within this Potentially Vulnerable Area is concentrated in the west and is primarily attributed to the Southwick Burn. Flooding affects a large area of mainly agricultural land and a network of existing drainage channels, which drain into the Southwick Burn, may exacerbate the extent of flooding.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 50 to 80.

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. Three designated cultural heritage sites are at risk of flooding, and small areas of environmental importance 4.2km² are also at risk.

The damages associated with floods of different likelihood are shown in Figure 2. Residential properties affected by coastal flooding experience the greatest economic impact at approximately 85% of the damages. The location of the impacts of flooding is shown in Figure 3. It shows that there is some flooding to properties in the Southerness, Carsethorn and Mersehead.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 260)	20	50	80
Non-residential properties (total 30)	<10	<10	<10
People	40	100	180
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links - roads (km)	0.8	1.0	1.1
Transport links - rail (km)	0	0	0
Environmental designated areas (km ²)	3.3	4.2	4.6
Designated cultural heritage sites	3	3	3
Agricultural land (km ²)	2.07	3.8	4.2

Table 1: Summary of flood impacts¹

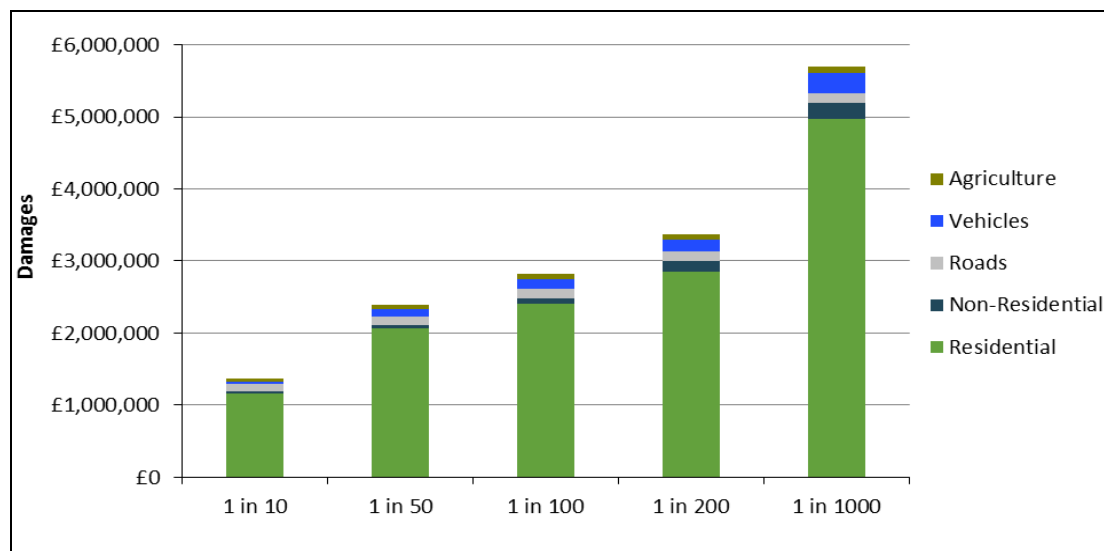


Figure 2: Damages by flood likelihood

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

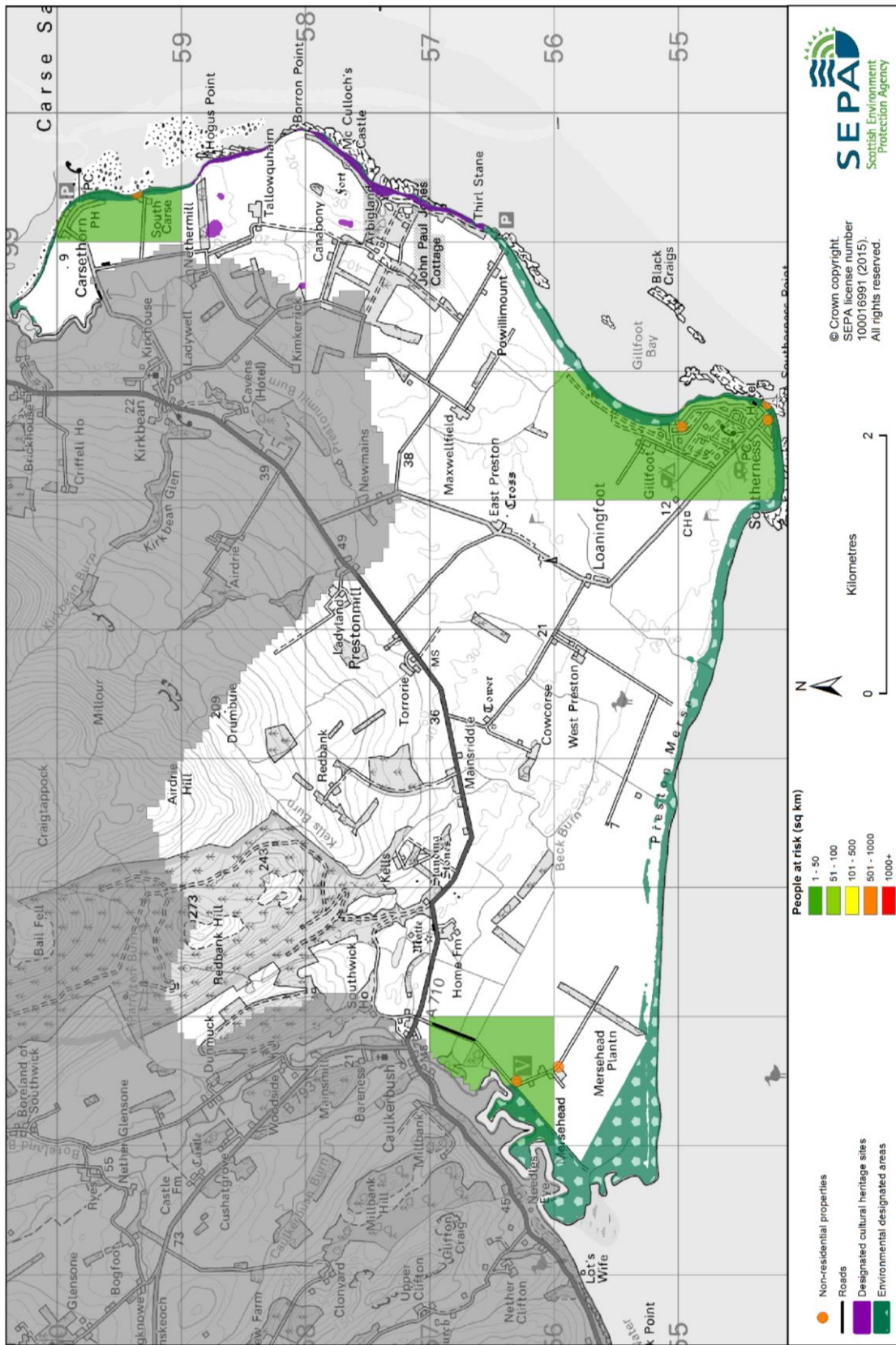


Figure 3: Impacts of flooding

History of flooding

The majority of flooding records report a limited impact on people and properties in terms of the numbers affected.

Surface water flooding was reported in 2006 and 2008 along the A710 near Mainsriddle, causing minor flooding of the road and nearby properties.

Tidal surges from the Solway Firth caused flooding of roads, properties and agricultural land at Carsethorn and Southernness in 1886, 1900, 1902, 1967, 1979 and 2014. Approximately 10 residential properties were reported flooded in Southernness on 03 January 2014.

Objectives to manage flooding in Potentially Vulnerable Area 14/21

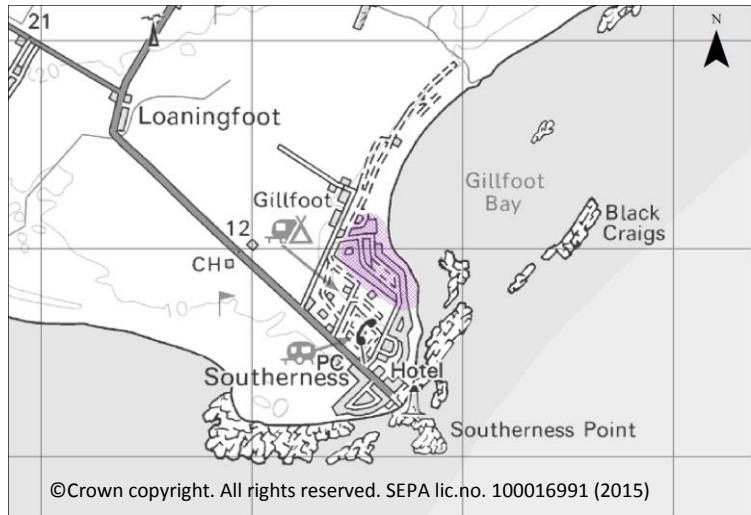
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

Reduce the risk of coastal flooding to residential properties in Southerness

Indicators:

- 30 residential properties
- £120,000 Annual Average Damages

Target area:



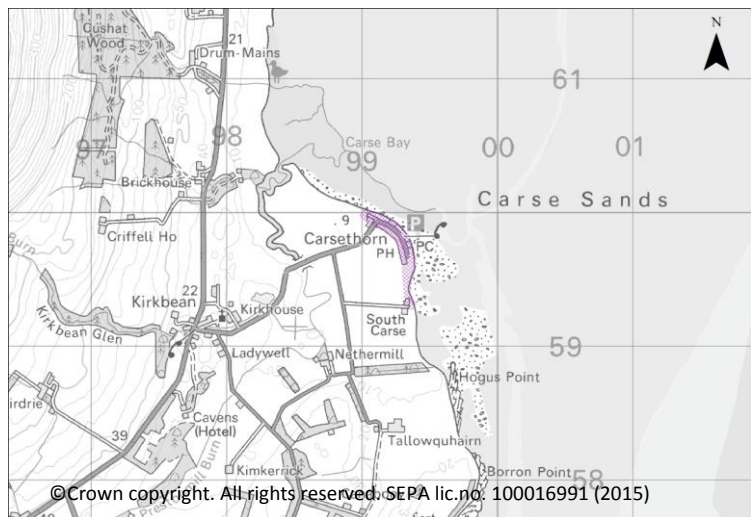
Objective ID: 14028

Reduce the risk of coastal flooding to residential properties in Carsethorn

Indicators:

- £58,000 Annual Average Damages

Target area:



Objective ID: 14120

Target area	Objective	ID	Indicators within PVA
Applies across Solway Local Plan District	Avoid an overall increase in flood risk	14033	<ul style="list-style-type: none"> • 50 residential properties • £210,000 Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	<ul style="list-style-type: none"> • 50 residential properties • £210,000 Annual Average Damages
Applies across Solway 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 14/21

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 Southernness and Carsethorn 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	<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 STUDY (141220020)		
Objective (ID):	Reduce the risk of coastal flooding to residential properties in Carsethorn (14120) Reduce the risk of coastal flooding to residential properties in Southernness (14028)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National:		Within local authority:
	1 of 168		1 of 10
Status:	Not started	Indicative delivery:	2016-2021
Description:	<p>A study is recommended to further develop the understanding of coastal flooding along the Solway coastline. This study should build on from the previous shoreline management plan to investigate flooding and coastal erosion, wave overtopping and the current coastal protection offered. The study may focus in detail on Potentially Vulnerable Areas however it could also look at the risk to other areas.</p> <p>The study will help to develop an understanding of coastal issues and identify where further work may be required to mitigate against flooding.</p>		
Potential impacts			
Economic:	There are 259 residential properties and 64 non-residential properties at risk of flooding over the extent of this study. The potential damages avoided over this area are estimated to be up to £26.1 million.		
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		

Social:	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. To be in accord with the flood risk management strategy, the responsible authority should seek to ensure as part of the study that the Solway coastal study will not have an adverse effect on the integrity of the Loch of Inch and Torrs Warren Special Protection Area, Upper Solway Flats and Marshes Special Protection Area, Luce Bay and Sands Special Area of Conservation, and Solway Firth Special Area of Conservation. There is the potential for impacts on several coastal Sites of Special Scientific Interest.

Action (ID):	STRATEGIC MAPPING AND MODELLING (140400016)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	SEPA will seek to develop flood mapping in the Gretna to Portpatrick area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	MAINTAIN FLOOD PROTECTION SCHEME (140280017)		
Objective (ID):	Reduce the risk of coastal flooding to residential properties in Southernness (14028)		
Delivery lead:	Dumfries and Galloway Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Southernness Flood Protection Scheme was completed in 1983 and consisted of a diversion pipe and field drainage system (pluvial flooding). The standard of protection is not known. Maintenance should be continued. Dumfries and Galloway Council also owns erosion defences of rock armour protecting roads in Carsthorn. There are also privately owned coastal defences in Carsethorn and Southernness including rock armour and stone walls.		

Action (ID):	MAINTAIN FLOOD WARNING (140400030)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Southerness Point flood warning area which is part of the Solway coastal flood warning scheme.		

Action (ID):	FLOOD FORECASTING (140400009)		
Objective (ID):	Reduce overall flood risk (14040)		
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 (140400011)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p> <p>Dumfries and Galloway Council has a Pilot Flood Product Subsidy Scheme in place, it is recommended that this should be continued. Residential or business properties that are identified as being at risk of flooding are eligible for the scheme. There are various products to reduce the impact of flooding to properties which can be purchased as part of the scheme.</p>		

Action (ID):	AWARENESS RAISING (140400013)		
Objective (ID):	Reduce overall flood risk (14040)		
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>SEPA will engage with the community and promote Floodline in the Southernness Point coastal flood warning area. This will be achieved through direct mailing for flood warning areas and education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p>		

Action (ID):	MAINTENANCE (140400007)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Dumfries and Galloway 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 (140400014)		
Objective (ID):	Reduce overall flood risk (14040)		
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> <p>Dumfries and Galloway Council along with the Scottish Fire and Rescue Service, SEPA and the Scottish Flood Forum have procured a Flood Pod. The Pod can be deployed to an area at risk of a flood emergency and is filled with flood protection equipment which is issued to the public.</p>		

Action (ID):	PLANNING POLICIES (140330001)		
Objective (ID):	Avoid an overall increase in flood risk (14033) Reduce overall flood risk (14040)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p>		