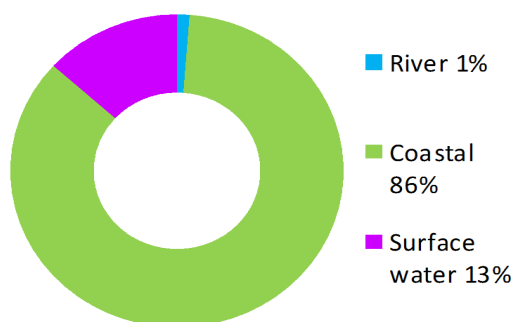


Kirkcudbright (Potentially Vulnerable Area 14/22)

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

Summary of flooding impacts



At risk of flooding

- 90 residential properties
- 40 non-residential properties
- £240,000 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	Natural flood management study	Maintain flood warning	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

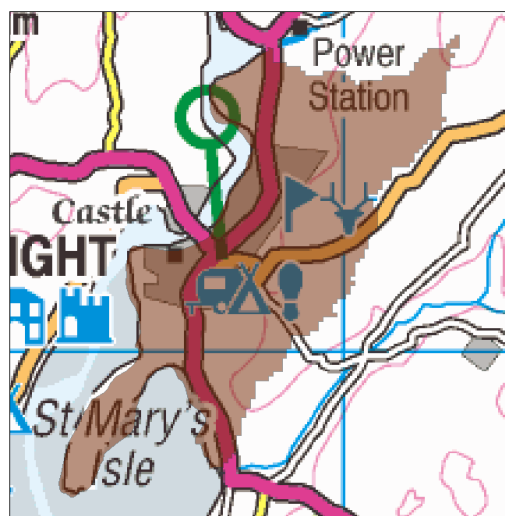
Actions

Kirkcudbright (Potentially Vulnerable Area 14/22)

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

Background

This Potentially Vulnerable Area is located on the south coast of the Solway Local Plan District and includes the town of Kirkcudbright (shown below). It is approximately 10km².



There are approximately 90 residential properties and 40 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £240,000.

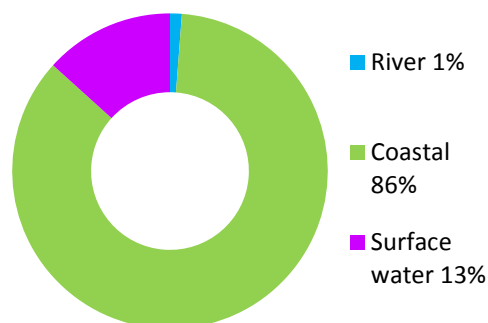


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The main settlement in this Potentially Vulnerable Area is Kirkcudbright, which is situated on the banks of the River Dee. The River Dee is tidal in this area and flows along the western boundary and discharges to Kirkcudbright Bay in the Solway Firth. Coastal flooding is predicted to affect residential properties along the River Dee, transport routes, notably the A711 and A755, and agricultural land to the north of Mutehill. The Buckland Burn/Gribdae Burn flows outwith the Potentially Vulnerable Area in a south westerly direction and discharges into Kirkcudbright Bay at Mutehill, on the southern boundary. There are privately owned coastal defences of rock armour in Doon Bay/Mill Hall.

River flooding within the area is identified along the western boundary and is attributed to the River Dee. The Dee is a managed watercourse and flows may be affected by the storage and release of water by Scottish Power in their operation of the Galloway Hydro Scheme; this is likely to have a positive contribution to managing flood risk within the area. The Mill Burn is known to have previously overflowed onto Millburn Street and onto school grounds.

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. Most of the receptors at risk lie within Kirkcudbright and include properties, utilities and roads; one designated cultural heritage site is also at risk.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 90 to 200 and the number of non-residential properties from approximately 40 to 50.

The damages associated with floods of different likelihood are shown in Figure 2. Residential properties experience the highest economic impact (75%) of the damages followed by non-residential properties. The location of the impacts of flooding is shown in Figure 3.

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
Residential properties (total 1,600)	40	90	140
Non-residential properties (total 180)	20	40	50
People	100	200	310
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	10
Transport links - roads (km)	0.4	0.8	0.9
Designated cultural heritage sites	1	1	1
Agricultural land (km ²)	0.3	0.5	0.6

Table 1: Summary of flood impacts¹

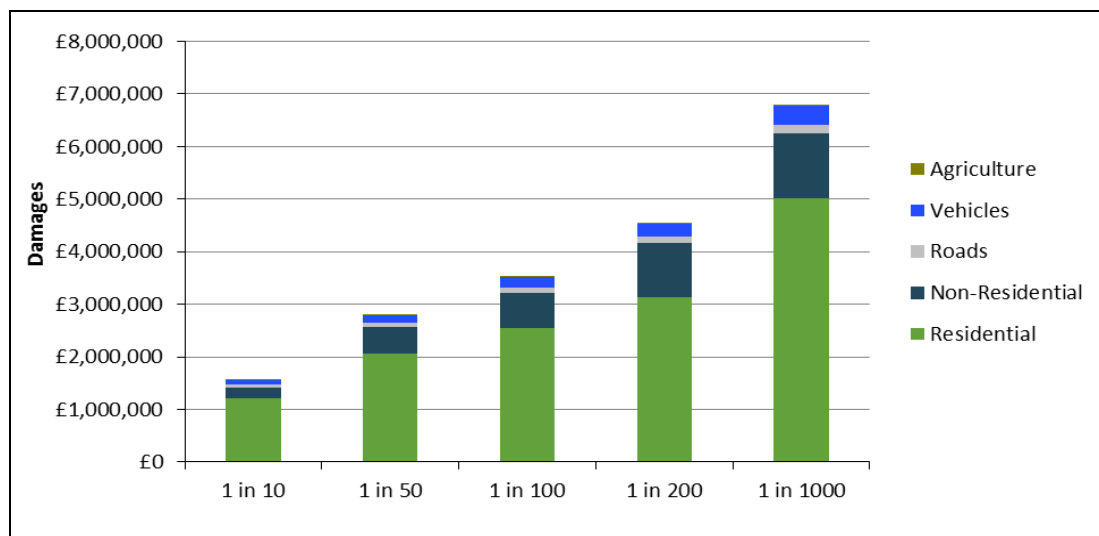


Figure 2: Damages by flood likelihood

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

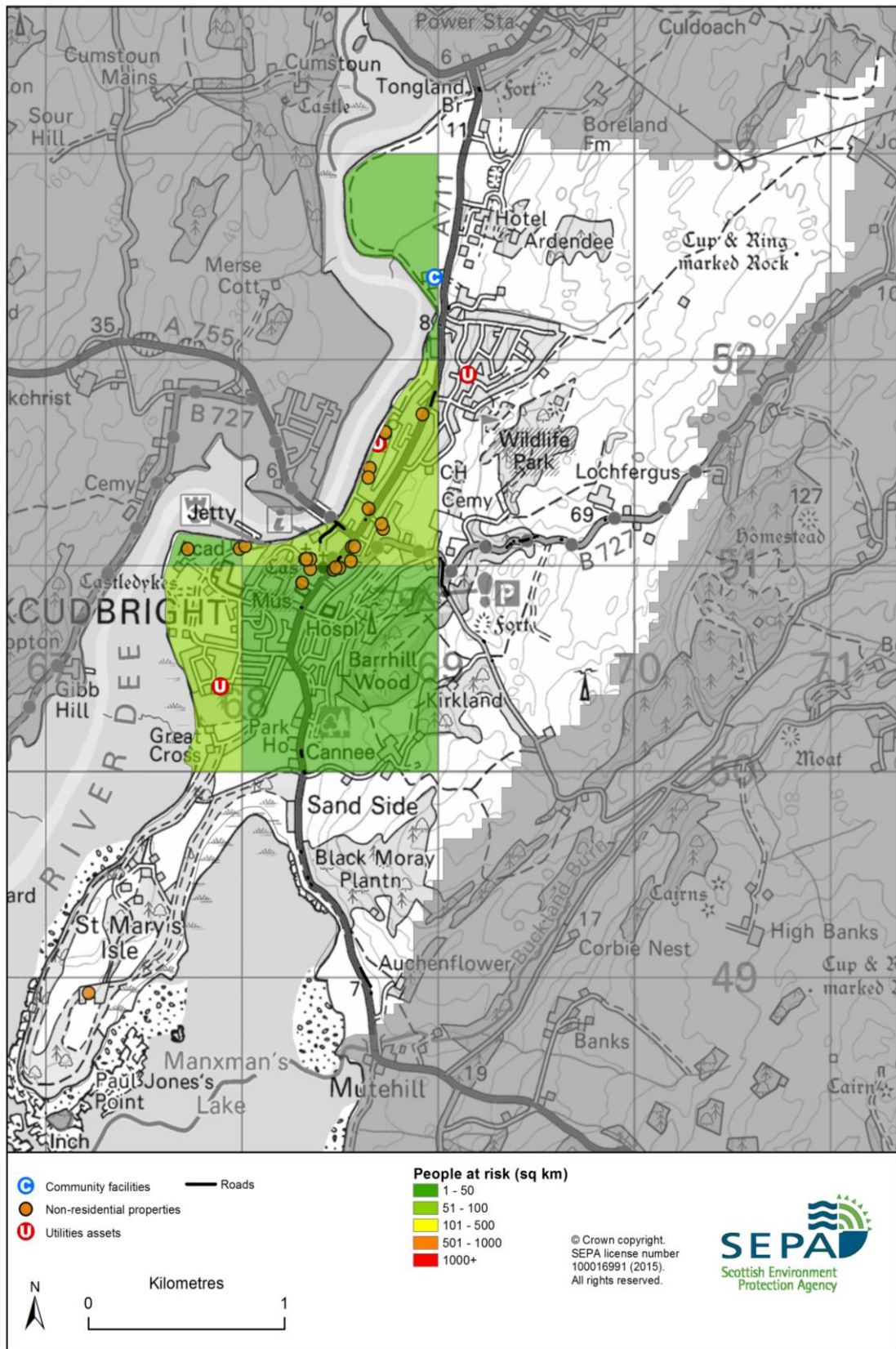


Figure 3: Impacts of flooding

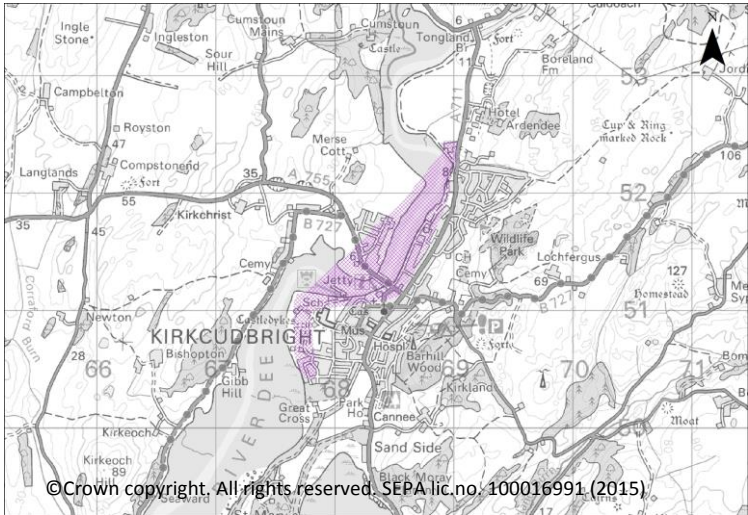
History of flooding

The majority of reported floods within this area are thought to have occurred due to the drainage system being overwhelmed during some storms. This has caused the A711 trunk road and numerous properties to flood. There have been occasional reports of river and coastal flooding throughout this area.

Coastal flooding was recorded at Janefield on 3 January 2014 when an embankment/bund was overtopped during a storm surge. This also caused flooding in and around the harbour area. The Harbour area regularly floods due to high tides and storm surges but the infrastructure is designed to accommodate these impacts.

Objectives to manage flooding in Potentially Vulnerable Area 14/22

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 Kirkcudbright Potentially Vulnerable Area.

Reduce the risk of coastal flooding to properties in Kirkcudbright	
Indicators:	Target area:
<ul style="list-style-type: none"> 90 residential properties 20 non-residential properties £200,000 Annual Average Damages 	
Objective ID: 14029	

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"> 90 residential properties £240,000 Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	<ul style="list-style-type: none"> 90 residential properties £240,000 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 14/22

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 Kirkcudbright 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	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 (141220020)		
Objective (ID):	Reduce the risk of coastal flooding to properties in Kirkcudbright (14029)		
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 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.
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Action (ID):	FLOOD PROTECTION STUDY (140290005)		
Objective (ID):	Reduce the risk of coastal flooding to properties in Kirkcudbright (14029)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National: 61 of 168	Within local authority: 5 of 10	
Status:	Not started	Indicative delivery:	2022-2027
Description:	Initial assessment of coastal flooding and erosion issues will be made within the Solway coastal study ID(141220020). Depending on the identified levels of risk from the Shoreline Management study a further detailed studies may be required to investigate actions which would help to reduce the risk in Kirkcudbright. The study should take into account the interaction of the River Dee with coastal levels downstream, and the Scottish Water hydro scheme upstream. This study should consider how natural flood management actions could help reduce the impact of coastal flooding along with property level protection on its own and in combination with other actions.		
Potential impacts			
Economic:	There are 85 residential properties and 19 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.4 million.		
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. In addition there are two utilities which have been identified as potentially benefitting from 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 are no international or national level environmental designations that are likely to be impacted by this action, provided the defences are set back from the estuary. There is likely to be a loss of natural mudflat habitat in the footprint and vicinity of the defences, unless they are set back from the estuary. This action has the potential for negative impacts on the setting of numerous heritage buildings, Kirkcudbright Castle Scheduled Monument, Maclellens Castle property in state care and Scheduled Monument, Broughton House garden and designed landscape and Kirkcudbright Heritage Conservation Area.		

Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (140400003)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Dumfries and Galloway Council		
Status:	Not started	Indicative delivery:	2016-2021
Description:	As part of the wider Galloway Glens Landscape Partnership Scheme, Dumfries and Galloway Council propose to investigate whether Natural Flood Management measures can be utilised on the small tributaries of the Dee to reduce flood risk to settlements in the Dee catchment and provide other ecological and habitat benefits.		
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:	Social impacts will depend on the outcome of the study and recommended actions. 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. To be in accord with the flood risk management strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Loch Ken and River Dee Marshes Special Protection Area. Sites of Special Scientific Interest are also present in the study area and could be positively or negatively impacted.		

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):	STRATEGIC MAPPING AND MODELLING (140400019)		
Objective (ID):	Reduce overall flood risk (14040)		
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 WARNING (140400030)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Kirkcudbright Bay 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 Kirkcudbright Bay 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:	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 (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:	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.		