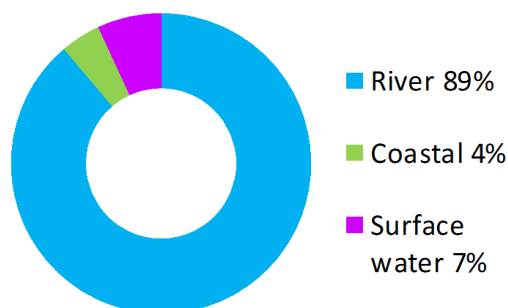


Dumfries Nith (Potentially Vulnerable Area 14/05)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	Dumfries Whitesands to Blackshaw coastal

Summary of flooding impacts



At risk of flooding

- 600 residential properties
- 240 non-residential properties
- £2.3 million 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.

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

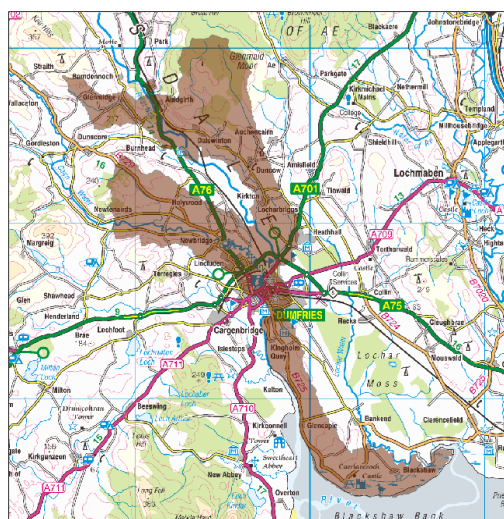
Actions

Dumfries Nith (Potentially Vulnerable Area 14/05)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	Dumfries Whitesands to Blackshaw coastal

Background

This Potentially Vulnerable Area is located towards the east of the Solway Local Plan District and extends to the north and south of Dumfries (shown below). It is almost 120km² and incorporates part of the town of Dumfries.



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There are approximately 600 residential properties and 240 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £2.3 million.

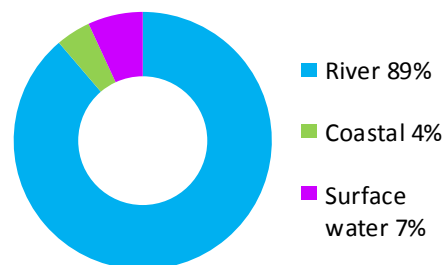


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The primary sources of river flooding within the area are the Cluden water and the River Nith which flows in from the north and discharges into the Solway Firth. These two watercourses converge north of the centre of Dumfries, where residential and non-residential properties are predicted to flood. Downstream, the Whitesands area of town is another notable area of flood risk, and a number of residential properties are also affected by river flooding in Kirkton and Newbridge.

The south of this Potentially Vulnerable Area has a coastline with frontage onto the Solway Firth, where coastal flooding is predicted around Blackshaw. At Kingholm and Glencaple there is potential for coastal flooding to combine with river flooding, which was evident in January 2014.

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. There are approximately 210 residential properties at risk of surface water flooding, as well as impacts to non-residential properties and roads, notably the A710, A75 and A76. There are 29 designated cultural heritage sites at risk, including several scheduled monuments and listed buildings. Small areas of designated environmental sites are shown to be at risk within this area.

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 950 and the number of non-residential properties from approximately 240 to 340.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to non-residential properties (45%) followed by damages to residential properties (40%). The location of the impacts of flooding is shown in Figures 3.

The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works, and pumping stations). Within this Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

History of flooding

There has been regular flooding in this area for a number of years. River flooding from the River Nith accounts for the majority of these records; the Nith can also be subject to tidal surge from the Solway. Nithsdale and Duncow have been particularly affected over the years with records dating back to 1795. River floods occurred in Dumfries on 2 December 1848 and 11 March 1881. More recently, on 31 October 1977, river flooding in Dumfries resulted in residents being rescued by boats from Brewery Street. The impacts included flooding of properties and considerable financial losses to the local business community. Flooding has been reported in the area at least once every year from 2003, with flooding of the A781, Whitesands Car Park and numerous properties.

Surface water flooding has been reported throughout the area. These events have impacted various locations including Auldirth in 2006; Nithsdale B729 road at Cluden Lodge; Duncow and Dumfries town centre and the B725 road in Glencaple December 2008.

Coastal flooding has been recorded in the Nithside area and further south of the town centre at Kingholm Quay, Glencaple. This occurred most recently in 2014 when car parks, roads and properties were damaged.

Significant flooding occurred in the Nith catchment on November 2009 which resulted in flooding to properties in Dumfries and the surrounding areas.

On the 3 January 2014 coastal flooding occurred in Glencaple, Kelton and the road to the north, affecting approximately 10 properties.

	1 in 10	1 in 200	1 in 1000
	High likelihood	Medium likelihood	Low likelihood
Residential properties (total 12,500)	230	600	960
Non-residential properties (total 1,400)	90	240	370
People	500	1,300	2,100
Community facilities	<10 Includes: educational buildings and emergency services	<10 Includes: educational buildings, emergency services and healthcare facilities	<10 Includes: educational buildings, emergency services and healthcare facilities
Utilities assets	10	20	20
Transport links – roads (km)	3.2 (of which 0.2 is A road)	11.3 (of which 0.8 is A road)	19.9 (of which 1.9 is A road)
Transport links – rail (km)	0.9	2.4	4.9
Environmental designated areas (km ²)	25.0	30.0	30.5
Designated cultural heritage sites	17	29	34
Agricultural land (km ²)	12.7	15.7	16.1

Table 1: Summary of flood impacts¹

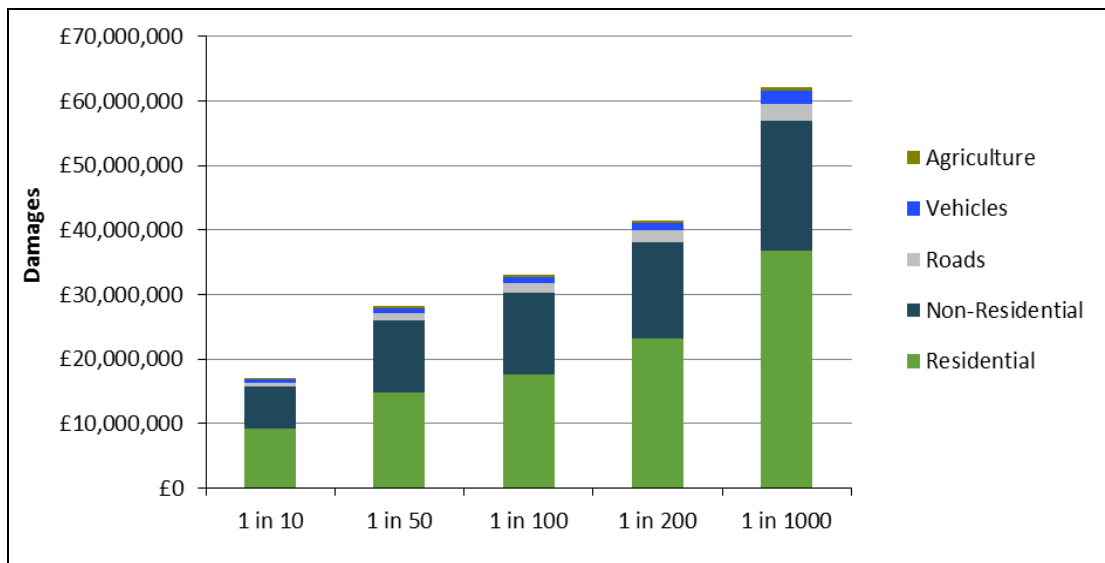


Figure 2: Damages by flood likelihood

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

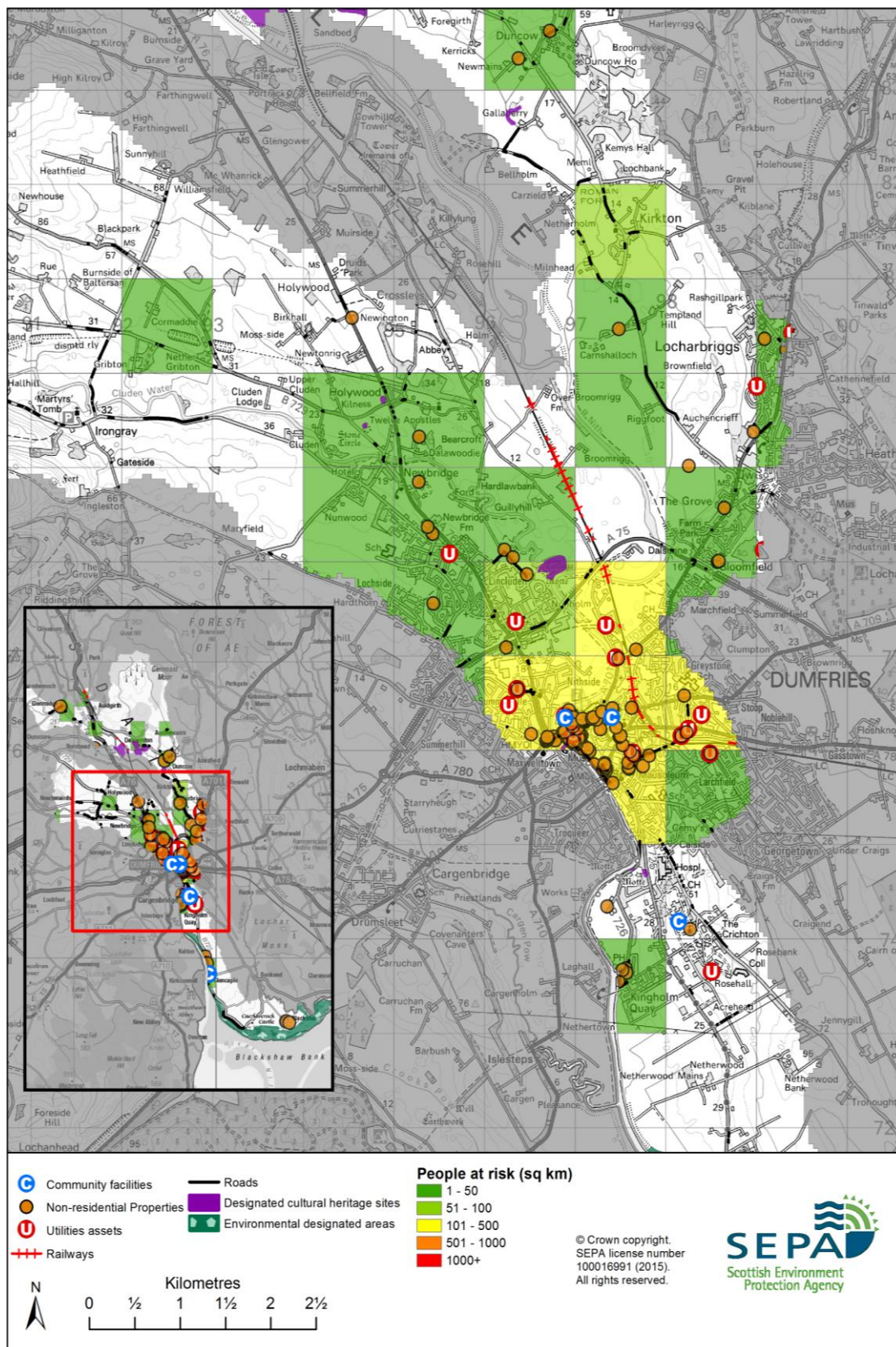


Figure 3: Impacts of flooding

Objectives to manage flooding in Potentially Vulnerable Area 14/05

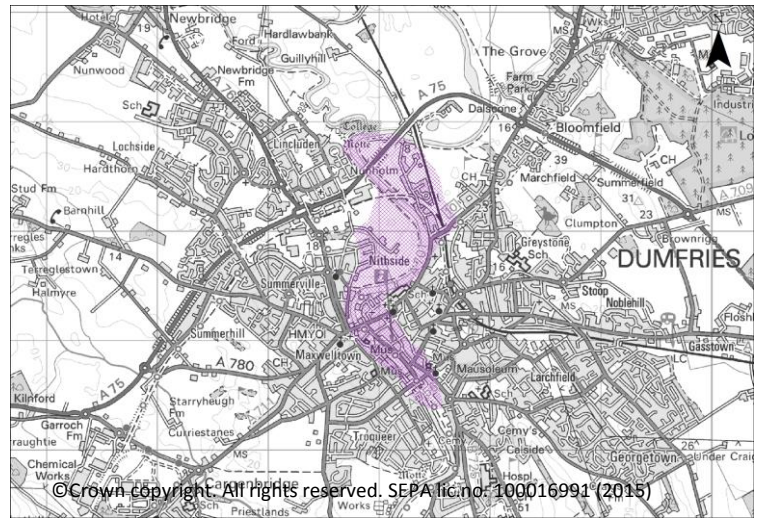
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

Reduce the risk of river flooding to properties in Dumfries

Indicators:

Target area:

- 310 residential properties
- 120 non-residential properties
- £1.6 million Annual Average Damages



Objective ID: 14006

Target area	Objective	ID	Indicators within PVA
Dumfries	Reduce the economic damages and risk to people from surface water flooding in Dumfries	14035	* See note below
Applies across Solway Local Plan District	Avoid an overall increase in flood risk	14033	<ul style="list-style-type: none"> • 600 residential properties • £2.3 million Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	<ul style="list-style-type: none"> • 600 residential properties • £2.3 million 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.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 14/05 there are 210 residential properties at risk and Annual Average Damages of £150,000.

Actions to manage flooding in Potentially Vulnerable Area 14/05

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 Dumfries Nith 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 SCHEME/WORKS (140060006)		
Objective (ID):	Reduce the risk of river flooding to properties in Dumfries (14006)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National:		Within local authority:
	18 of 42		1 of 4
Status:	Under development	Indicative delivery:	2016-2021
Description:	It is recommended that the council progress work on the proposed flood protection scheme in Whitesands, Dumfries. Over a number of years Dumfries and Galloway council have commissioned a number of studies to examine and understand the flooding issues along with potential mitigation options. The Whitesands Project (Flood Protection Scheme and Public Realm) identified potential works within Dumfries. Further work on the design of the scheme is still being carried out. The identified design should look to promote the most sustainable combination of actions, enhance the local amenity value of the river while taking account of the local concerns including construction of flood defences along the River Nith in Dumfries.		
Potential impacts			
Economic:	The proposed scheme may benefit 59 residential properties and 107 non-residential properties at risk of flooding in this location, damages avoided are estimated to be £79 million. The flood protection scheme has an estimated benefit cost ratio of 2.7.		
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. This flood protection scheme is proposed for part of the River Nith (water body IDs 10603 and 200316). The physical condition of this river and estuary is identified by river basin management planning to be at less than good status. Future works could improve the condition of the river and estuary or degrade them. Opportunities to improve the condition of the river and estuary should be considered by coordinating with river basin management planning. There are no international or national level environmental designations that are likely to be impacted by this action. There is likely to be a loss of semi-natural habitat in the footprint and vicinity of the defences; however, this can be replanted and re-establish. There is the potential for the direct defences to have negative impacts on settings of the Dumfries Heritage Conservation Area, the Dumfries Old Bridge Scheduled Monument and the numerous listed buildings and structures in the area.
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Action (ID):	NEW FLOOD WARNING (140400010)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	The area under consideration includes properties affected by flooding from the Upper River Nith (from Kirkconnel downstream). Forecasting capability is currently under development in this area.		

Action (ID):	SURFACE WATER PLAN/STUDY (140350018)		
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Dumfries (14035)		
Delivery lead:	Dumfries and Galloway 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 (140400016)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	2016-2021
Description:	<p>SEPA will seek to develop flood mapping in the Middle and Lower River Nith area to improve understanding of flood risk. 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.</p> <p>SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,100km² 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 studies will be considered as these projects are completed.</p>		

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:	<p>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.</p>		

Action (ID):	MAINTAIN FLOOD WARNING (140400030)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>Continue to maintain the Whitesands flood warning area which is part of the Nith river flood warning scheme. Continue to maintain the Upper Solway Firth and Nith Tidal flood warning areas which are part of the Solway coastal flood warning scheme.</p>		

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:	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. 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.		

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 Upper Solway Firth and Nith Tidal coastal flood warning areas. This will be achieved through enhanced direct mailings for flood warning areas and education events.</p> <p>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>		