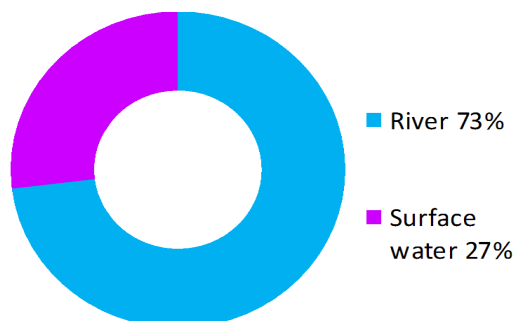


Moffat (Potentially Vulnerable Area 14/02)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	River Annan

Summary of flooding impacts



At risk of flooding

- 370 residential properties
- 50 non-residential properties
- £680,000 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>	New flood warning	Community flood action groups	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	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

Moffat (Potentially Vulnerable Area 14/02)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	River Annan

Background

This Potentially Vulnerable Area is located in the north east of the Solway Local Plan District. It is approximately 20km² (shown below).



This is a steep, largely rural area covering the Birnock Water and part of the River Annan catchment.

There are approximately 370 residential properties and 50 non-residential properties at risk of flooding. The Annual Average Damages are approximately £680,000 with the majority caused by river flooding.

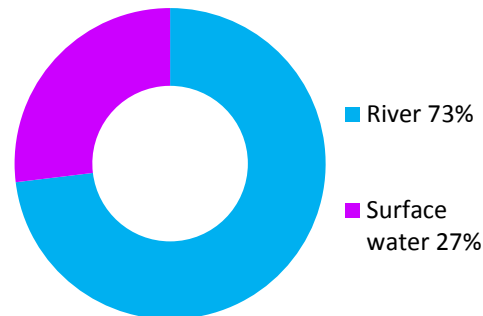


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The primary source of river flooding within the area is the River Annan and the Birnock Water. A study undertaken in 2006 indicated that water overtopping the banks of the Birnock Water, would flow away from the river and pond in low-lying areas. The confluence of these two watercourses is to the south of Moffat with extensive flooding shown as the two rivers converge. This area of the town is where the majority of the flood damage to residential and non-residential properties is predicted to occur.

Almost all of the surface water risk within Moffat originates as runoff from the Gallow Hill area of the town. This steep hill has caused flooding problems in areas of Moffat to both the east and west of Gallow Hill. There are properties on the hillside that have been previously affected by surface water runoff which is made worse by a lack of storage capacity within existing culverts which may also become blocked.

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 50 residential properties at risk from surface water flooding and the main transport route, the A74 (M), is also at risk. Nine designated cultural heritage sites are at risk 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 370 to 450 and the number of non-residential properties from approximately 50 to 60.

The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties.

The location of the impacts of flooding is shown in Figure 3.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,400)	80	370	510
Non-residential properties (total 150)	30	50	60
People	190	820	1,100
Community facilities	<10 Emergency service	<10 Includes: emergency services and educational buildings	10 Includes: emergency services and educational buildings
Utilities assets	<10	10	10
Transport links - roads (km)	1.4 (of which 0.1 is motorway)	3.3 (of which 0.2 is motorway)	4.1 (of which 0.2 is motorway)
Environmental designated areas (km²)	0	0	0
Designated cultural heritage sites	7	9	10
Agricultural land (km²)	1.7	2.5	2.8

Table 1: Summary of flooding impacts¹

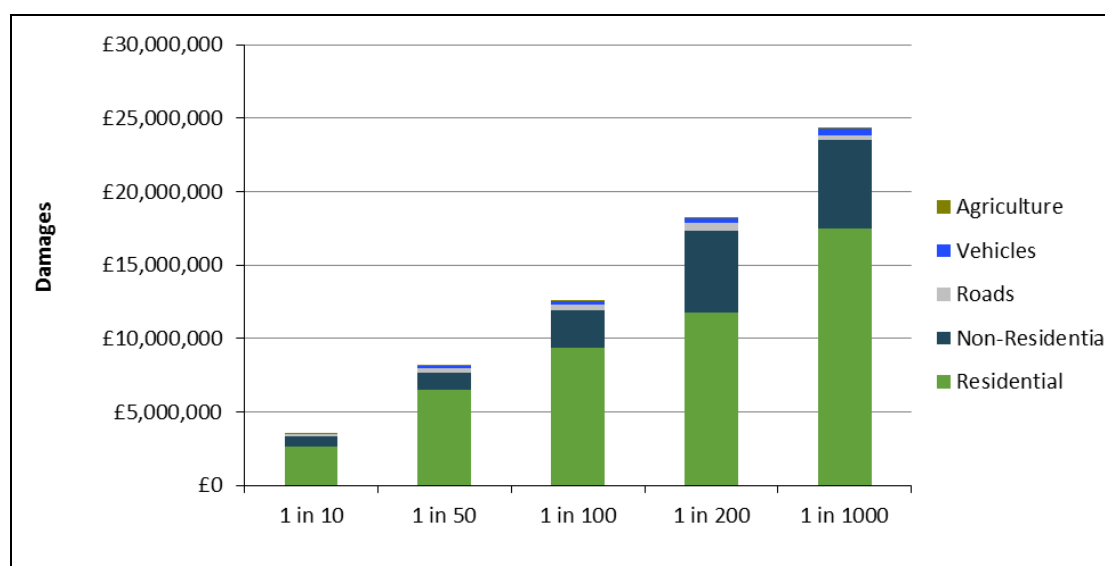


Figure 2: Damages by flood likelihood

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

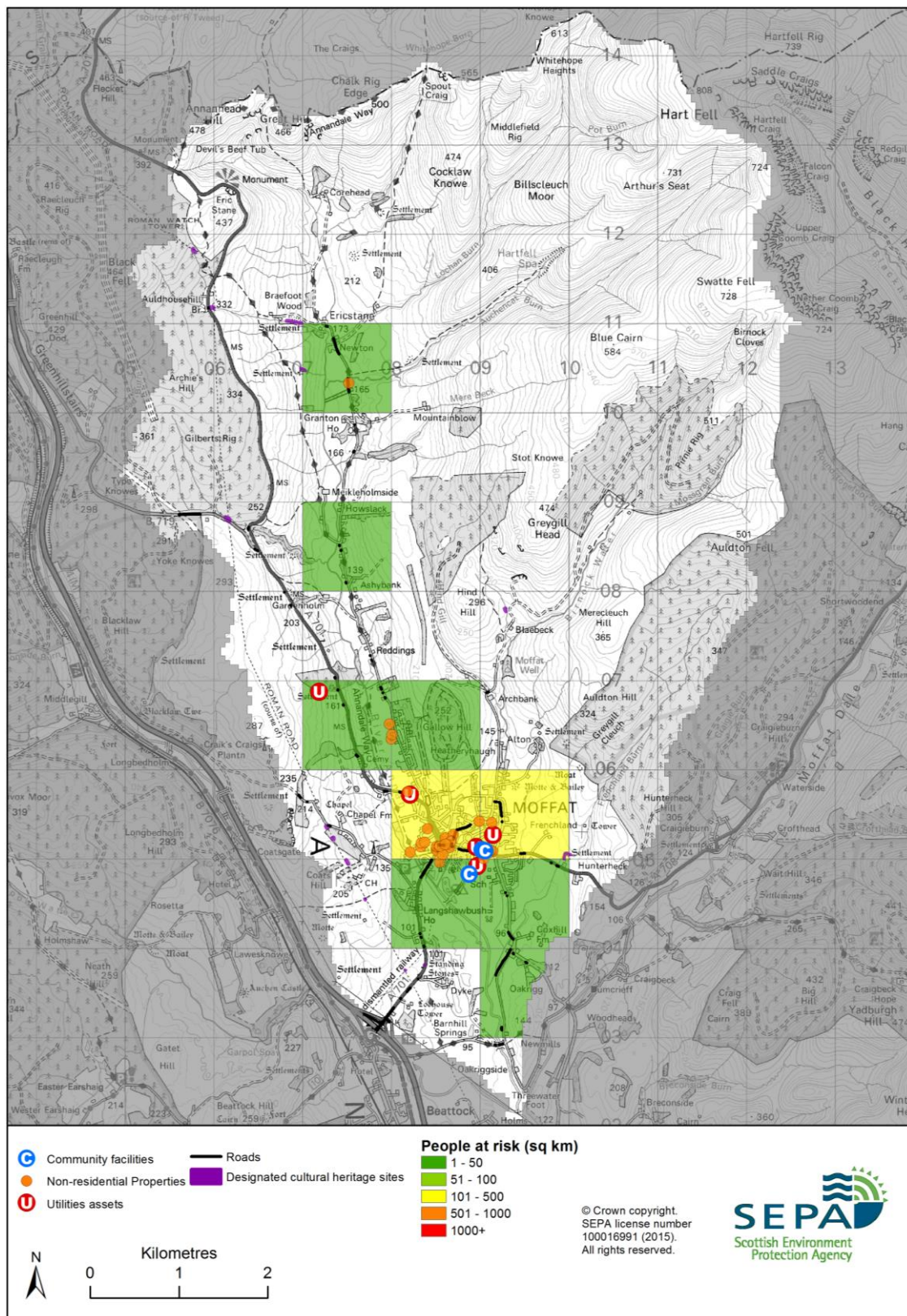


Figure 3: Impacts of flooding

History of flooding

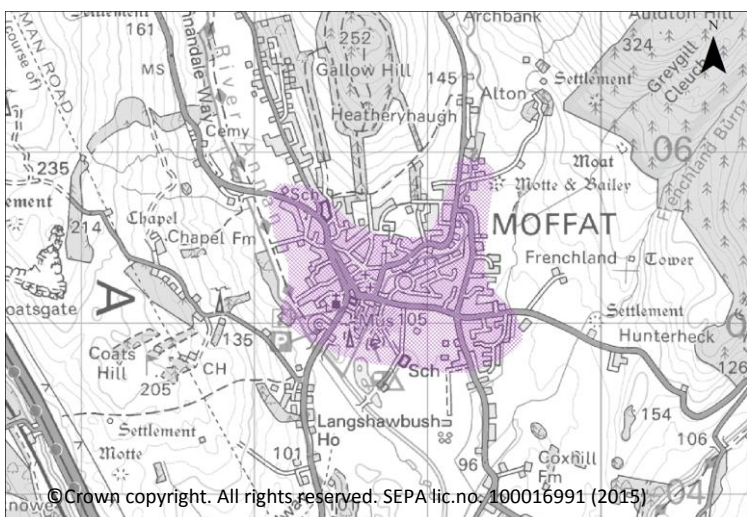
The earliest recorded flood in Moffat occurred in 1852. Since then, flooding from the River Annan and surface water flooding have been periodically reported.

River flooding was reported in August 1999, November 2003 and January 2009 and affected roads, including the A701, and public streets.

Drainage issues caused flooding in Moffat in 2003, 2006, 2008 and 2009, and impacted on the road network, including the A701, residential properties and garages. In December 2013, flooding affected a community sports facility as well as residential properties near the A701.

Objectives to manage flooding in Potentially Vulnerable Area 14/02

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 Moffat Potentially Vulnerable Area.

Reduce the risk of river flooding to properties in Moffat	
Indicators:	Target area:
<ul style="list-style-type: none"> 310 residential properties 30 non-residential properties £460,000 Annual Average Damages 	
Objective ID: 14002	

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"> 370 residential properties £680,000 Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	<ul style="list-style-type: none"> 370 residential properties £680,000 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 14/02

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 Moffat Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	New flood warning	Community flood action groups	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	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):	NEW FLOOD WARNING (140400010)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	Not started	Indicative delivery:	post 2021
Description:	The area under consideration includes properties affected by flooding from the River Annan. Full scoping will be required before a flood warning service can be developed and implemented in this area and further assessment will help to determine appropriate timescales for delivery.		

Action (ID):	FLOOD PROTECTION STUDY (140020005)		
Objective (ID):	Reduce the risk of river flooding to properties in Moffat (14002)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National:	Within local authority:	
	25 of 168	2 of 10	
Status:	Not started	Indicative delivery:	2016-2021
Description:	Moffat Flood Study which was completed in 2006, identified potential works within Moffat including improvements to culverts and construction of flood defences. Since this study further information has been gathered which has increased the confidence in the modelling. The new modelling should be used to identify potential actions to manage flooding in the area.		

	The study should also investigate the potential for natural flood management actions to reduce runoff locally and the wider Birnock Water catchment. Other actions may also be considered to select the most sustainable combination of actions.
Potential impacts	
Economic:	The flood protection study should consider how to reduce flood risk to 306 residential properties and 41 non-residential properties in this location, with potential damages avoided of up to £11 million.
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. There may be changes in visual amenity and land use as a result of this action.
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 action will not have an adverse effect on the integrity of the Moffat Hills Special Area of Conservation. There is likely to be a loss of natural and semi-natural habitat in the direct footprint and vicinity of the defences. Increasing conveyance in these watercourses may increase erosion downstream of the action. Modification of the existing culverts is unlikely to damage habitats and ecosystems in this generally urban environment. There are listed buildings on Well Road and a listed bridge (New Bridge) that have the potential to be negatively impacted by direct defences.

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 PROTECTION SCHEME (140020017)		
Objective (ID):	Reduce the risk of river flooding to properties in Moffat (14002)		
Delivery lead:	Dumfries and Galloway Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	A Flood Protection Scheme was constructed on Well Road, Moffat in 1989 which consisted of replacing an old mill piped scheme on the banks of the Birnock Water. The standard of protection is 5 years. The flood study should investigate the potential enhancement of these defences. Maintenance of this scheme should be continued.		

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):	COMMUNITY FLOOD ACTION GROUPS (140020012)		
Objective (ID):	Reduce the risk of river flooding to properties in Moffat (14002)		
Delivery lead:	Community		
Status:	Existing	Indicative delivery:	Ongoing
Description:	The local community set up the Moffat Flood Action group, to raise awareness of flood risk in the area. An informal flood warning scheme run by the group is currently in place.		

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 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 undertake flood risk education and awareness raising activities. In addition, SEPA will engage with community resilience groups and participate in property level protection events delivered by the Scottish Flood Forum where possible.</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> <p>Scheduled works of clearance and repair are carried out on existing culverted watercourses and drains. Two hydro-logic water level gauges are in place on small culverted watercourses at key locations (eg screens). DGFirst, who are responsible for areas such as maintenance of roads, facilities management and community safety, receive an SMS warning when the water level reaches a certain height, indicating that screen clearance may be urgently required.</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>		