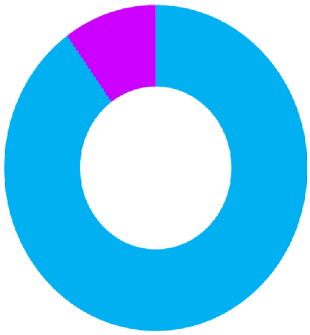
Castle Douglas (Potentially Vulnerable Area 14/11)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	River Dee (Solway)

Summary of flooding impacts



At risk of flooding

- 180 residential properties
- 30 non-residential properties
- £430,000 Annual Average Damages

(damages by flood source shown left)

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.

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

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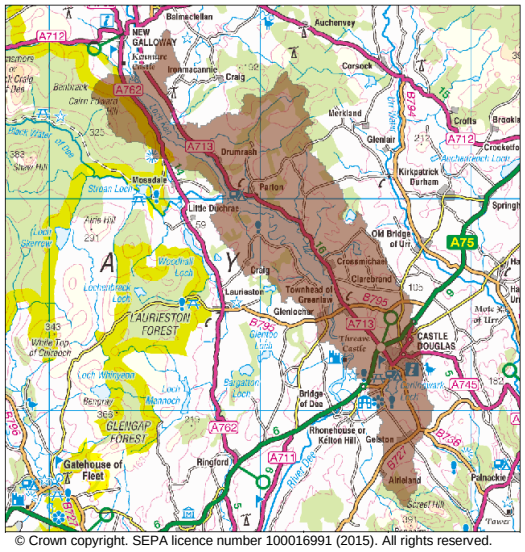
Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	River Dee (Solway)

Background

This Potentially Vulnerable Area is located in the middle of the Solway Local Plan District. It incorporates the settlements of Gelston, Castle Douglas and New Galloway, and has an area of 100km^2 (shown below).



There are approximately 180 residential properties and 30 non-residential properties at risk of flooding. The Annual Average Damages are approximately £430,000.

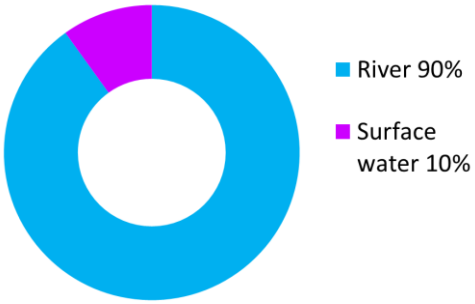


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding in this area is primarily attributed to the River Dee which enters Loch Ken at Little Duchrae in the north east and flows in a southerly direction. The Water of Ken also flows into the Loch from the north. The water levels in Loch Ken are controlled by the Glenlochar Barrage, as part of a hydro-electric scheme. There have been reports of flooding at Loch Ken Caravan Park, situated at the River Dee and Loch Ken confluence.

In the south of the area, flooding to Castle Douglas is influenced by Carlingwark Loch and Blackpark pumping station on Carlingwark Lane. A flood risk assessment carried out by Dumfries and Galloway Council shows that the national flood mapping does not accurately represent flood risk in this area. The flood risk assessment shows there is limited flooding from Carlingwark Loch into Castle Douglas, with only a localised affect in low lying areas. Therefore the flood risk is overestimated in this area.

Isolated pockets of surface water flooding are predicted to occur in areas within Castle Douglas with the highest flood depths in the south of the town.

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 of flooding lie within Castle Douglas. Sections of the A75 road are at risk from surface water flooding.

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 70% of the damages. 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 2,600)	20	180	250
Non-residential properties (total 340)	<10	30	40
People	40	380	550
Community facilities	<10 Emergency services	<10 Includes: emergency services and healthcare facilities	<10 Includes: emergency services and healthcare facilities
Utilities assets	<10	<10	<10
Transport links - roads (km)	6.7 (of which 0.1 is primary road)	10.3 (of which 0.3 is primary road)	12.0 (of which 0.3 is primary road)
Environmental designated areas (km^2)	12.1	12.8	13.0
Designated cultural heritage sites	8	9	9
Agricultural land (km^2)	5.3	6.6	7.4

Table 1: Summary of flood impacts[1]

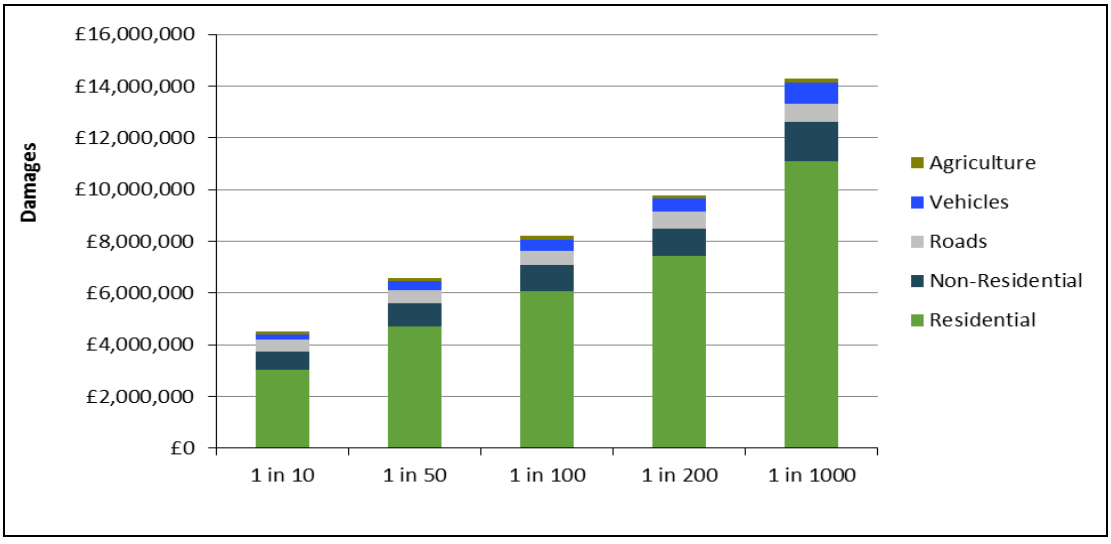


Figure 2: Damages by flood likelihood

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

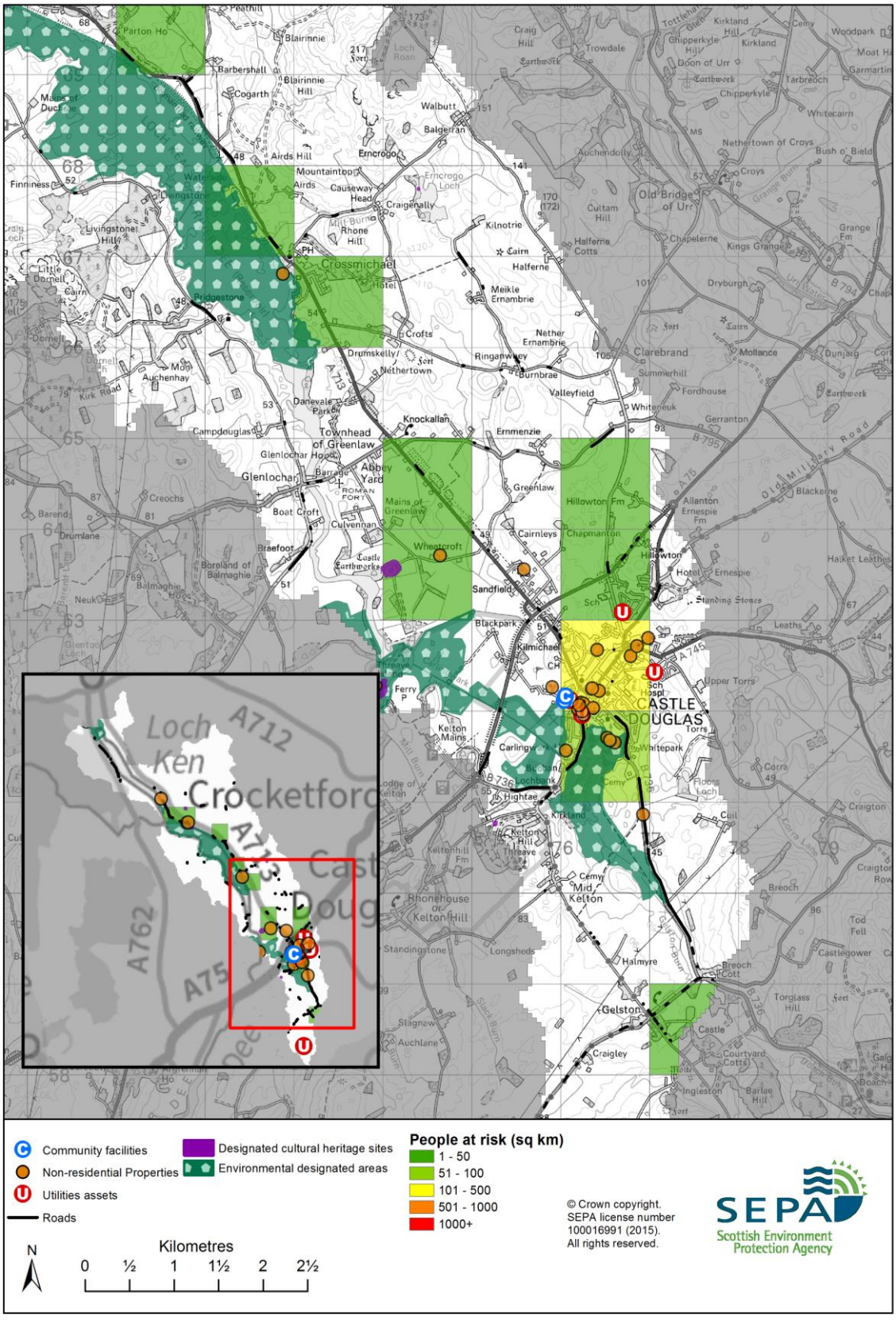


Figure 3: Impacts of flooding

History of flooding

River flooding has been the main source of floods in the Gelston, Hillowton, Greenlaw and Castle Douglas areas. Floods were recorded between October 2002 and December 2008 and impacted major trunk roads such as the A713 and A745. It should be noted that due to a recently upgraded culvert, flood risk in Gelston has been reduced significantly.

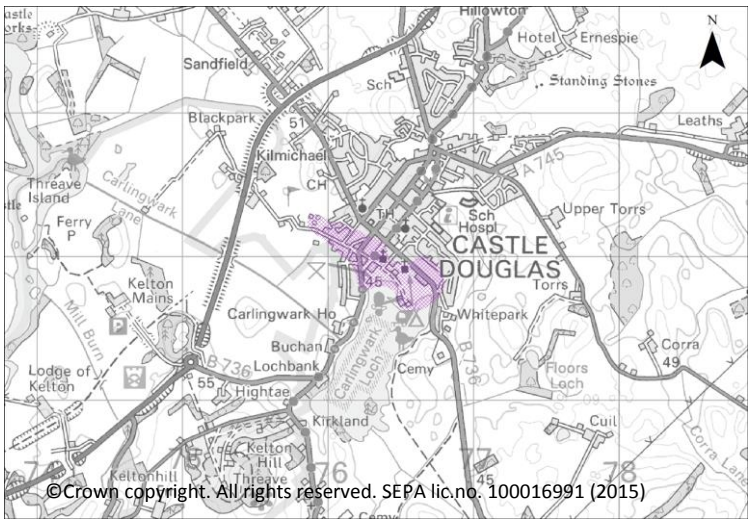
River floods with the highest damages to properties and people occurred in Parton in March 1881 and in Castle Douglas in December 1872. In the mid-1930s, the Scottish Power hydro scheme was commissioned and as a result of the scheme, the level of risk was alleviated making these events less likely in the future.

Surface water flooding impacted the Castle Douglas area in 2002, 2003 and from September to December 2008. These floods also affected major trunk roads.

Objectives to manage flooding in Potentially Vulnerable Area 14/11

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 the Castle Douglas Potentially Vulnerable Area.

Reduce the risk of river and surface water flooding to properties in Castle Douglas

Indicators:	Target area:
• 110 residential properties • £320,000 Annual Average Damages	
Objective ID: 14015	

Target area	Objective	ID	Indicators within PVA
Applies across Solway Local Plan District	Avoid an overall increase in flood risk	14033	• 180 residential properties • £430,000 Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	• 180 residential properties • £430,000 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 14/11

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 the Castle Douglas 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):	**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** (140150016)		
Objective (ID):	Reduce the risk of river and surface water flooding to properties in Castle Douglas (14015)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will review existing modelling and data for this area, to determine if any improvements can be made to the flood maps. SEPA will support the local authority if further detailed study beyond a strategic scale is required.		

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 review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

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:	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. From 2016 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** (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:	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. 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.		

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.		