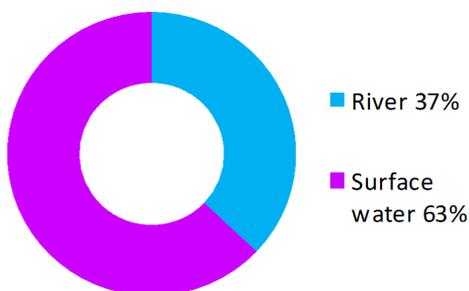


Smithton and Culloden (Potentially Vulnerable Area 01/20)

Local Plan District	Local authority	Main catchment
Highland and Argyll	The Highland Council	Inverness coastal

Summary of flooding impacts



At risk of flooding

- 30 residential properties
- 10 non-residential properties
- £33,000 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.

Flood protection scheme/works	<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>
<i>Flood protection study</i>	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising	Surface water plan/study	Emergency plans/response
<i>Maintain flood protection scheme</i>	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

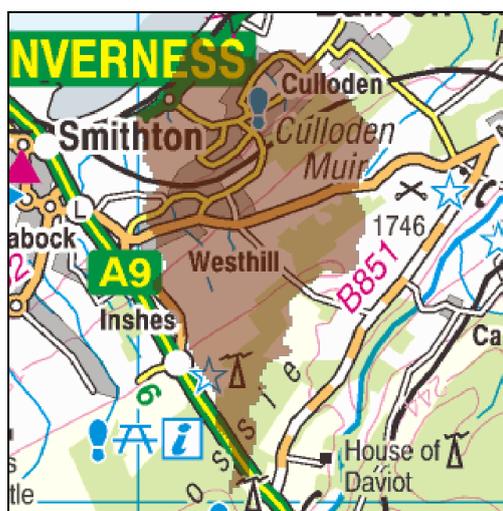
Actions

Smithton and Culloden (Potentially Vulnerable Area 01/20)

Local Plan District	Local authority	Main catchment
Highland and Argyll	The Highland Council	Inverness coastal

Background

This Potentially Vulnerable Area is approximately 14km². It includes Smithton, Culloden and Westhill (shown below). The A96, A9 and B9006 pass through the area.



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There are a series of small rivers in this area. These generally flow north and discharge into the Moray Firth.

There are approximately 30 residential and 10 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £33,000 with the majority caused by surface water.

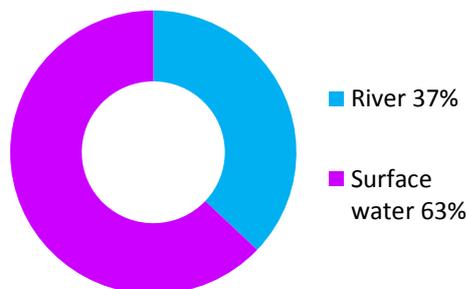


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Some of the smaller watercourses in Smithton and Culloden were not included in the assessment of river flooding due to their small catchment size. Flood risk from these burns is included in the assessment of surface water flooding. Considering historic flooding in Smithton and Culloden, it is likely that overall flood risk is currently underestimated.

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.

Roads, including the A96 and the A9, and both the Inverness to Aberdeen and the Inverness to Perth railway lines have a risk of flooding in several locations.

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 roads.

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 4,600)	<10	30	40
Non-residential properties (total 180)	<10	10	10
People	20	60	80
Community facilities	0	0	0
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 40 locations Rail at 10 locations	Roads at 70 locations Rail at 10 locations	Roads at 80 locations Rail at 10 locations
Environmental designated areas (km ²)	0	0	0
Designated cultural heritage sites	4	4	4
Agricultural land (km ²)	0.1	0.1	0.2

Table 1: Summary of flooding impacts¹

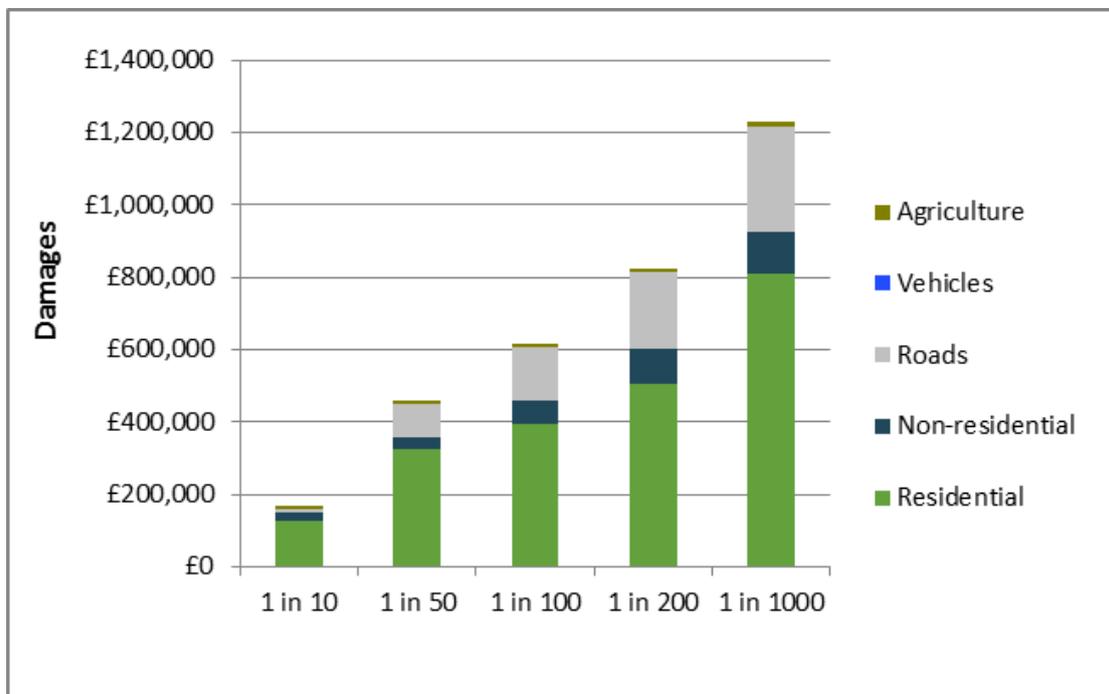


Figure 2: Damages by flood likelihood

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

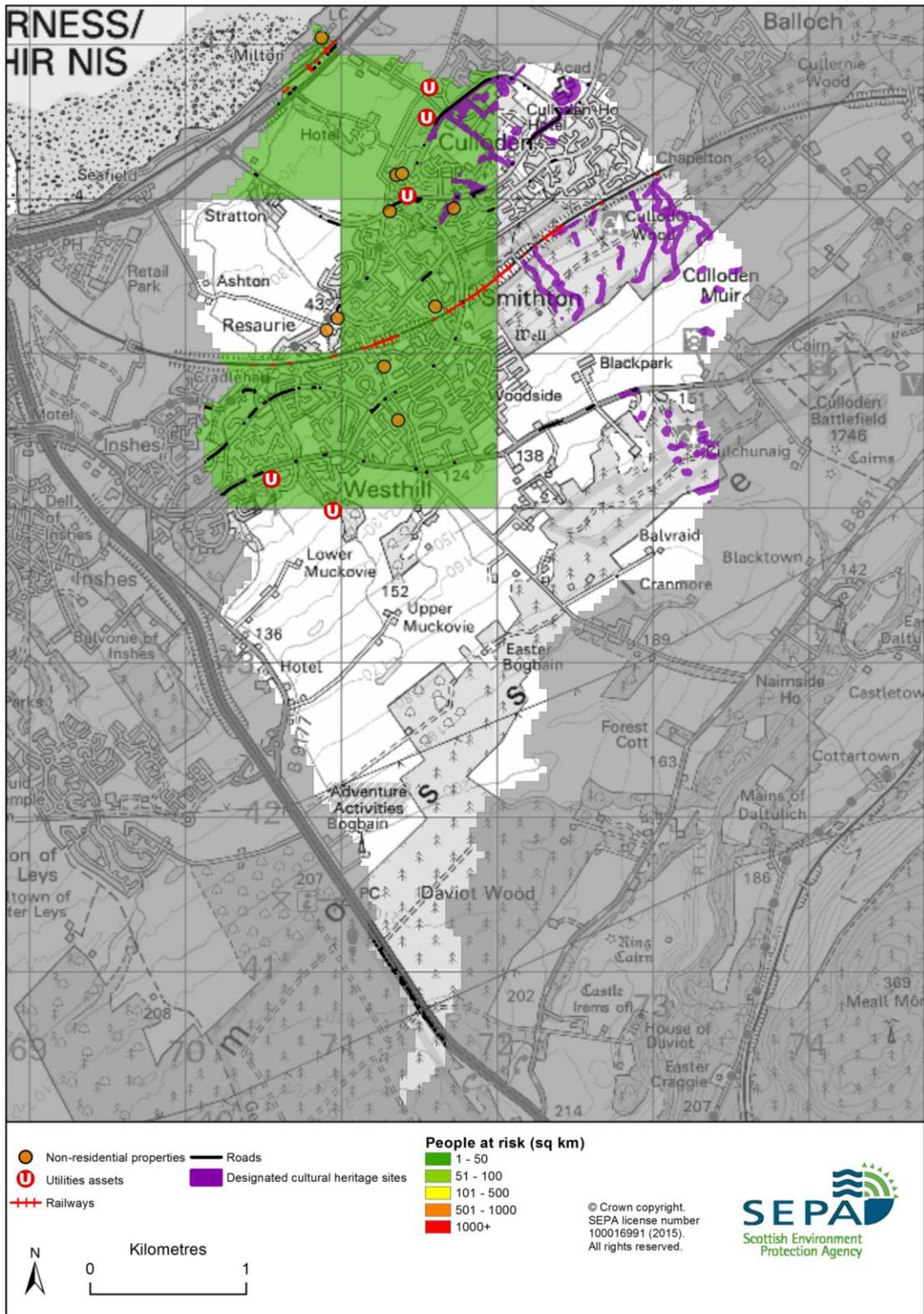


Figure 3: Impacts of flooding

History of flooding

There have been 12 recorded floods since 1993, including 2002, 2004, 2005, 2006, 2007 and 2011.

The sources of flooding include the Scretan Burn, a tributary of Cairnlaw Burn, a tributary of Culloden East Burn, Smithton Burn, Culloden Burn West, Culloden Burn South and Tower Burn. The flooding was exacerbated in many instances due to blockages of culverts with debris and gravel from bed and bank erosion during high flows.

Objectives to manage flooding in Potentially Vulnerable Area 01/20

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 Smithton and Culloden Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Smithton and Culloden	Reduce risk from surface water flooding in Smithton and Culloden	102001	* See note below
Applies across Highland and Argyll Local Plan District	Avoid an overall increase in flood risk	100001	<ul style="list-style-type: none"> • 30 residential properties • £33,000 Annual Average Damages
Applies across Highland and Argyll Local Plan District	Reduce overall flood risk	100002	<ul style="list-style-type: none"> • 30 residential properties • £33,000 Annual Average Damages
Applies across Highland and Argyll 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 01/20 there are 30 residential properties at risk and Annual Average Damages of £21,000.

Actions to manage flooding in Potentially Vulnerable Area 01/20

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 Smithton and Culloden 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 (1020010006)				
Objective (ID):	Reduce risk from surface water flooding in Smithton and Culloden (102001)				
Delivery lead:	The Highland Council				
Priority:	National:		Within local authority:		
	20 of 42		1 of 3		
Status:	Under development	Indicative delivery:	2016-2021		
Description:	The Smithton and Culloden Flood Protection Scheme is undergoing detailed design and consists of the replacement of culverts, sediment and debris management and temporary flood storage. The scheme will protect communities affected by flooding on a number of occasions in recent years and is being designed to a 1 in 200 year standard of protection including an allowance for climate change.				
Potential impacts					
Economic:	The proposed works would result in a potential reduction in flood risk to 132 residential properties and could potentially avoid damages of £19 million. The benefit cost ratio of the proposed works is 2.4.				
Social:	Approximately 290 people may directly benefit from the Smithton and Culloden Flood Protection Scheme. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.				
Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. There is potential for impacts on habitats and changes to channel morphology. Opportunities to mitigate any environmental				

Environmental:	impacts should be identified as part of the study through the design and timing of works.
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Action (ID):	SURFACE WATER PLAN/STUDY (1020010018)		
Objective (ID):	Reduce risk from surface water flooding in Smithton and Culloden (102001)		
Delivery lead:	The Highland Council		
Status:	Ongoing	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. An integrated catchment study will be carried out to support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding e.g. with the sewer network, watercourses and the sea.		

Action (ID):	STRATEGIC MAPPING AND MODELLING (1000020019)		
Objective (ID):	Reduce overall flood risk (100002)		
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 (1000020009)		
Objective (ID):	Reduce overall flood risk (100002)		
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. The Potentially Vulnerable Area is within the 'Easter Ross and Great Glen' flood alert area.		

Action (ID):	SELF HELP (1000020011)		
Objective (ID):	Reduce overall flood risk (100002)		
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.		

Action (ID):	AWARENESS RAISING (1000020013)		
Objective (ID):	Reduce overall flood risk (100002)		
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. 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. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (1000020007)		
Objective (ID):	Reduce overall flood risk (100002)		
Delivery lead:	The Highland 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 (1000020014)		
Objective (ID):	Reduce overall flood risk (100002)		
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>The Highland Council has two flood monitors in this area. One is on the Tower Burn and the other is on the Smithton Burn. Both monitors are in locations where culverts are prone to blockage. The flood monitors provide early warning of increasing water depths, which could lead to flooding.</p>		

Action (ID):	PLANNING POLICIES (1000010001)		
Objective (ID):	Avoid an overall increase in flood risk (100001) Reduce overall flood risk (100002)		
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>		