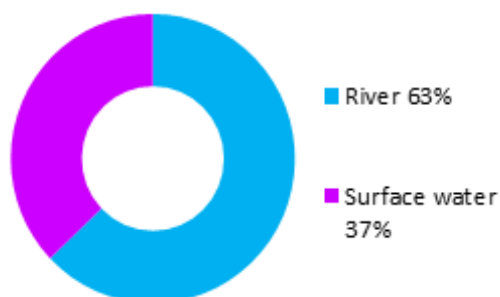


Brechin (Potentially Vulnerable Area 07/05)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	River South Esk (Tayside)

Summary of flooding impacts



At risk of flooding

- 100 residential properties
- 70 non-residential properties
- £670,000 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>	Natural flood management works	<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>	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

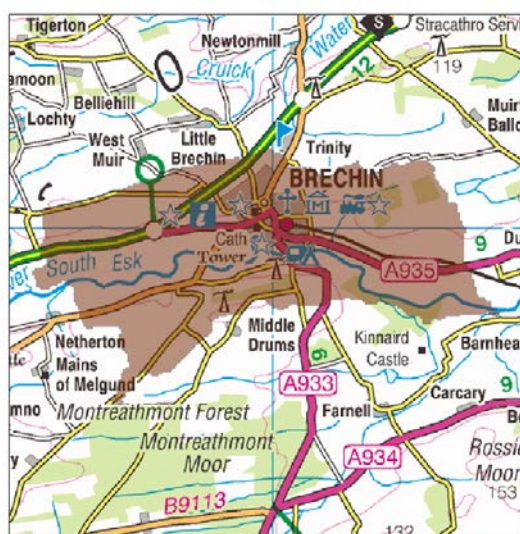
Brechin (Potentially Vulnerable Area 07/05)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	River South Esk (Tayside)

Background

This Potentially Vulnerable Area is 36km² and includes Brechin (shown below). It is situated near the mouth of the River South Esk where it flows into the Montrose Basin. The main sources of flooding are river and surface water.

There are approximately 100 residential properties and 70 non-residential properties at risk of flooding. The Annual Average Damages are approximately £670,000.



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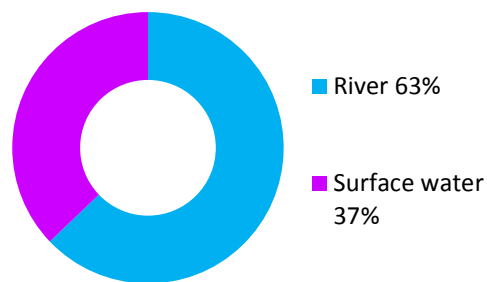


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

The highest risk of flooding is in Brechin from the River South Esk. Brechin is also notably impacted by surface water flooding.

The risk of flooding to people, property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1.

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 followed by damages to residential properties. The location of the impacts of flooding is shown in Figure 3.

The figures presented for Annual Average Damages include damages to residential properties, non-residential properties, transport and agriculture.

In Brechin, Angus Council has undertaken detailed studies for the design and build of the Brechin Flood Protection Scheme. The information in this report uses SEPA data which may be different from the flooding information held by the local authority.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 4,100)	10	100	220
Non-residential properties (total 460)	50	70	80
People	20	210	480
Community facilities	0	0	<10 Healthcare facilities
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	3 A roads, 1 B road at 35 locations	3 A roads, 1 B road at 51 locations	4 A roads, 1 B road at 59 locations
Environmental designated areas (km ²)	0.7	0.8	0.8
Designated cultural heritage sites	8	11	12
Agricultural land (km ²)	1.8	2.2	2.4

Table 1: Summary of flooding impacts

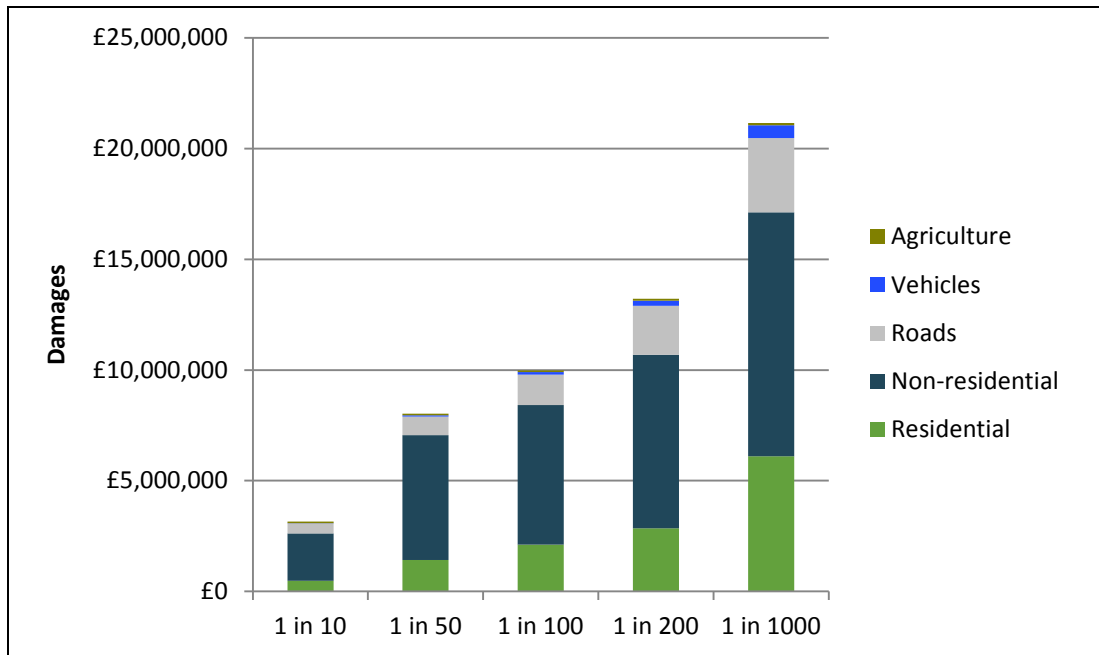


Figure 2: Damages by flood likelihood

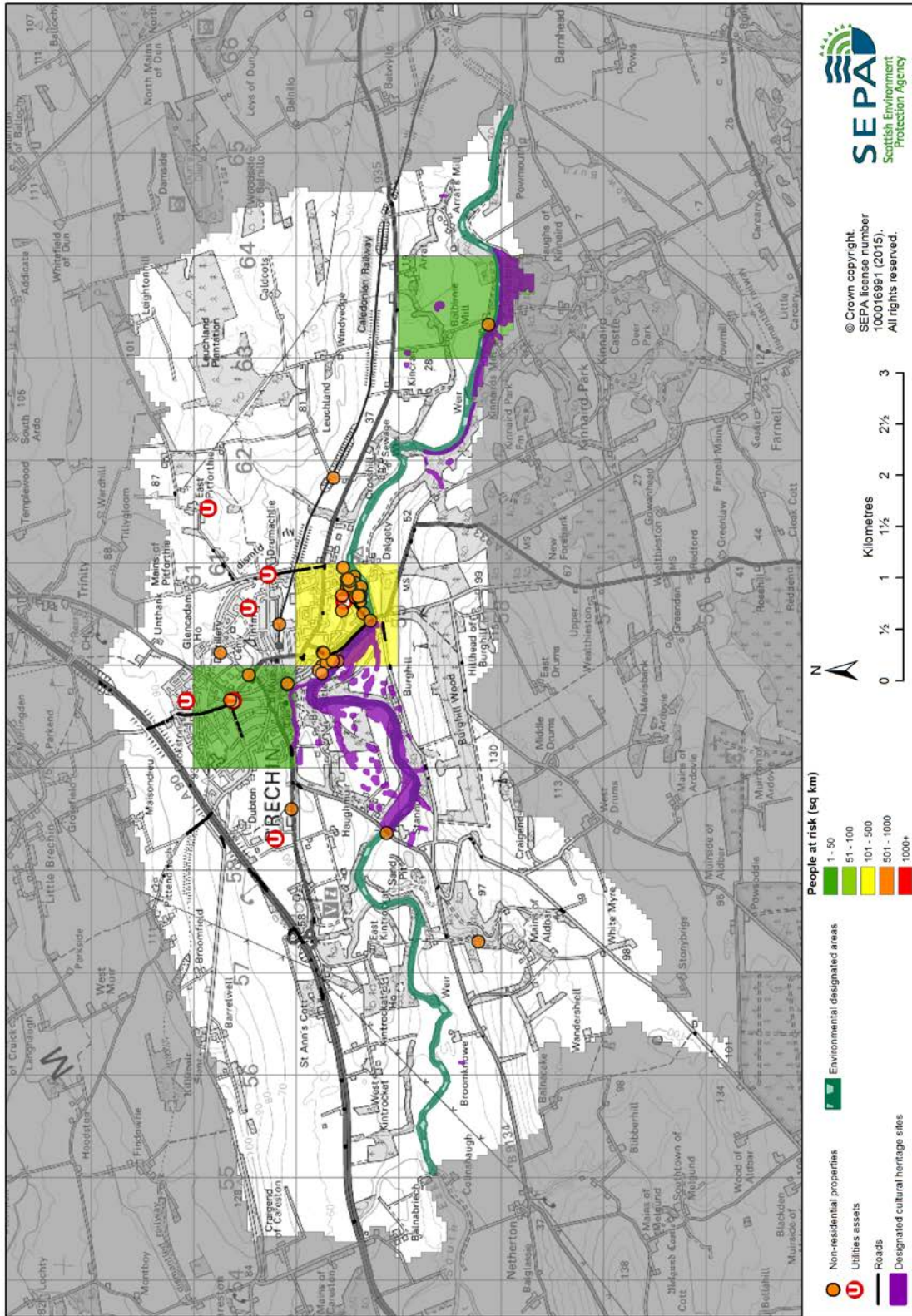


Figure 3: Impacts of flooding

History of flooding

This area has a long history of flooding. All the floods described below occurred in and around the town of Brechin:

- 21 November 2002: Evacuation and temporary relocation of families after defences were overtopped on the River South Esk. Thirty properties flooded and roads were closed.
- October 1982: Flooding to a property on River Street.
- 1960: River flooded to 18 inches.
- 13 December 1957: Houses flooded for first time since 1951. Up to 1.5 feet along River Street.
- November 1951: Flood event similar to that in 1921 with flooding to the top of railings.
- October 1939: Bottom flats inundated through doors and windows.
- 1921: Flood level to the height of the railings situated along the walkway adjacent to the river.
- 5 October 1920: River level 8-9 feet above normal levels. River Street flooded from Fordmouth to the bridge and up to a depth of 5 inches. Not as prolific as the 1913 flood but waters extended up to Nursery Lane. There were 58 houses inundated up to a depth of 3 feet.
- 9 May 1913: River levels reached approximately 0.8m above the current road level on River Street.
- 21 November 1891: Reports quote that approximately 4.6 inches of rain fell over the course of two days causing very serious flooding.
- 25 February 1872: Flood levels exceeded that of the 1829 and 1860 floods with levels rising to several feet. Paper Mill and Inch completely inundated.
- 1860: Great flood recorded. Cottages on River Street inundated by floodwaters up to a level of 3 feet.
- December 1853: Inch inundated by flood water and property beside the river flooded up to a level of 4.5 feet.
- 1829: River Street flooded up to levels of between 2-3 feet.
- 1774: House inundated by flood water on River Street.

Objectives to manage flooding in Potentially Vulnerable Area 07/05

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 Brechin Potentially Vulnerable Area.

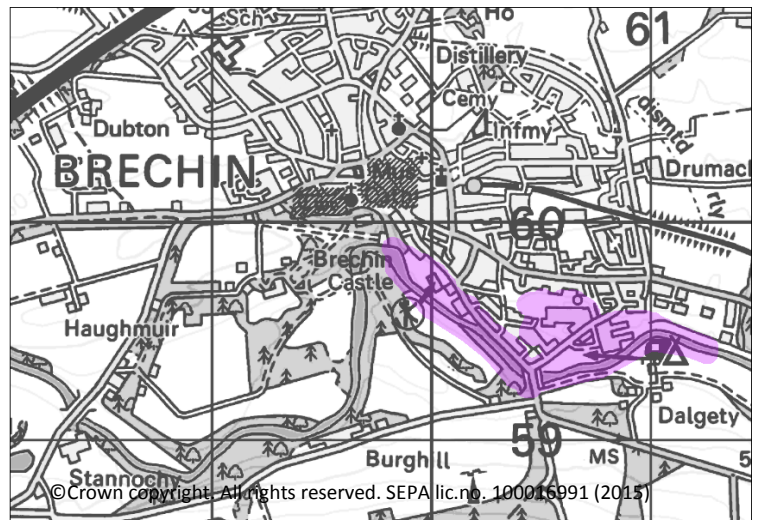
Reduce economic damages to residential and non-residential properties and risk to people in Brechin caused by flooding from the River South Esk

Indicators:

Target area:

- 190 people
- £98,000 Annual Average Damages from residential properties
- £260,000 Annual Average Damages from non-residential properties

Objective ID: 7011, 7012



Target area	Objective	ID	Indicators within PVA
Brechin	Reduce economic damages and number of residential properties at risk of surface water flooding in Brechin where practical	7009	* See note below
Applies across Tay Estuary and Montrose Basin Local Plan District	Avoid an overall increase in flood risk	7001	<ul style="list-style-type: none"> • 100 residential properties • £670,000 Annual Average Damages
Applies across Tay Estuary and Montrose Basin Local Plan District	Reduce overall flood risk	7054	<ul style="list-style-type: none"> • 100 residential properties • £670,000 Annual Average Damages
Applies across Tay Estuary and Montrose Basin 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 07/05 there are 10 residential properties at risk and Annual Average Damages of £250,000.

Actions to manage flooding in Potentially Vulnerable Area 07/05

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 Brechin Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	Natural flood management works	<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>	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 WORKS (70110004)				
Objective (ID):	Reduce economic damages to residential and non-residential properties and risk to people in Brechin caused by flooding from the River South Esk (7011, 7012)				
Delivery lead:	Angus Council				
Status:	Ongoing	Indicative delivery:	2016-2021		
Description:	Natural flood management works are continuing following completion of the Brechin Flood Protection Scheme. The works include upland reforestation.				
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. Eighty-four residential and non-residential properties could potentially benefit from natural flood management actions in this location.				
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 natural flood management works area. 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.				

Action (ID):	NATURAL FLOOD MANAGEMENT STUDY (70120003)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and risk to people in Brechin caused by flooding from the River South Esk (7011, 7012)		
Delivery lead:	SEPA		
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	The South Esk pilot catchment project aims to identify and prioritise opportunities for delivering improvements to river habitats whilst helping to reduce flood risk. Phase 1 of the study has been completed and SEPA is currently in discussion with landowners with regard to taking forward some sites to options appraisal and outline design.		
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. The following rivers in the study area are identified by SEPA to be at less than good status for their physical condition: Melgund Burn and Lemno Burn (Water body IDs 5804 and 5806). Opportunities to improve the condition of this river should be considered by coordinated with river basin management planning.		

Action (ID):	SURFACE WATER PLAN/STUDY (70090018)		
Objective (ID):	Reduce economic damages and number of residential properties at risk of surface water flooding in Brechin where practical (7009)		
Delivery lead:	Angus 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 (70540019)		
Objective (ID):	Reduce overall flood risk (7054)		
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):	MAINTAIN FLOOD PROTECTION SCHEME (70110017)		
Objective (ID):	Reduce economic damages to residential and non-residential properties and risk to people in Brechin caused by flooding from the River South Esk (7011, 7012)		
Delivery lead:	Angus Council		
Status:	Not started	Indicative delivery:	Ongoing
Description:	Maintain the Brechin Flood Protection Scheme once completed in January 2016. The Brechin Flood Protection Scheme is an integrated urban drainage and river flood protection scheme and has been designed to provide a current-day standard of protection of 1 in 200 years.		

Action (ID):	MAINTAIN FLOOD WARNING (70540030)		
Objective (ID):	Reduce overall flood risk (7054)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Brechin, Kinnaird/Bridge of Dun and the Finavon and Tannadice flood warning areas which are part of the South Esk river flood warning scheme.		

Action (ID):	FLOOD FORECASTING (70540009)		
Objective (ID):	Reduce overall flood risk (7054)		
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 (70540011)		
Objective (ID):	Reduce overall flood risk (7054)		
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. Angus Council has provided door guards and air brick covers for locations in Brechin.		

Action (ID):	AWARENESS RAISING (70540013)		
Objective (ID):	Reduce overall flood risk (7054)		
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 and promote Floodline participation in education partnership events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	MAINTENANCE (70540007)		
Objective (ID):	Reduce overall flood risk (7054)		
Delivery lead:	Angus 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 (70540014)		
Objective (ID):	Reduce overall flood risk (7054)		
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. Angus Council operates an emergency response plan in areas of high flood risk.		

Action (ID):	PLANNING POLICIES (70010001)		
Objective (ID):	Avoid an overall increase in flood risk (7001) Reduce overall flood risk (7054)		
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.		