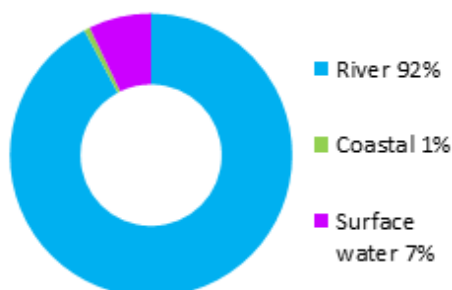


## Bridge of Earn (Potentially Vulnerable Area 08/17)

Local Plan District	Local authority	Main catchment
Tay	Fife Council, Perth and Kinross Council	River Earn

### Summary of flooding impacts



#### At risk of flooding

- 50 residential properties
- 20 non-residential properties
- £410,000 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

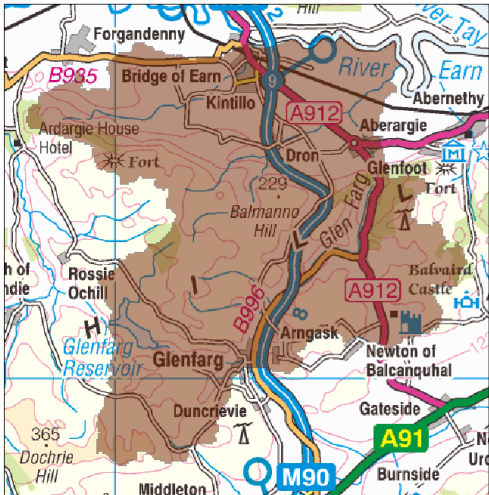
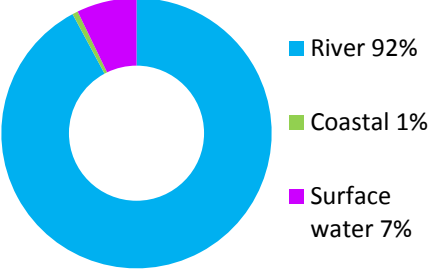
The actions below have been selected to manage flood risk.

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

Actions

## Bridge of Earn (Potentially Vulnerable Area 08/17)

Local Plan District	Local authority	Main catchment
Tay	Fife Council, Perth and Kinross Council	River Earn

Background							
<p>This Potentially Vulnerable Area is 66km<sup>2</sup> and part of the River Earn catchment (shown below). It is situated on the south bank at the mouth of the River Earn where it flows into the Firth of Tay. It includes Bridge of Earn and Glenfarg and the main watercourses are the River Earn and River Farg.</p>  <p style="font-size: small; margin-top: 5px;">© Crown copyright. SEPA licence number 100016991 (2015). All rights reserved.</p>	<p>The majority of flood damages are caused by river flooding, however, the interaction between river and coastal flooding where the River Earn meets the Firth of Tay influences flooding in Bridge of Earn.</p> <p>There are approximately 50 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £410,000.</p> <div style="text-align: center;">  <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="color: #00a0e3;">■</td> <td>River 92%</td> </tr> <tr> <td style="color: #92d050;">■</td> <td>Coastal 1%</td> </tr> <tr> <td style="color: #c00080;">■</td> <td>Surface water 7%</td> </tr> </table> </div> <p><b>Figure 1: Annual Average Damages by flood source</b></p>	■	River 92%	■	Coastal 1%	■	Surface water 7%
■	River 92%						
■	Coastal 1%						
■	Surface water 7%						

### Summary of flooding impacts

The highest risk of flooding is in Bridge of Earn from the River Earn, Deich Burn and Yellow Burn.

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.

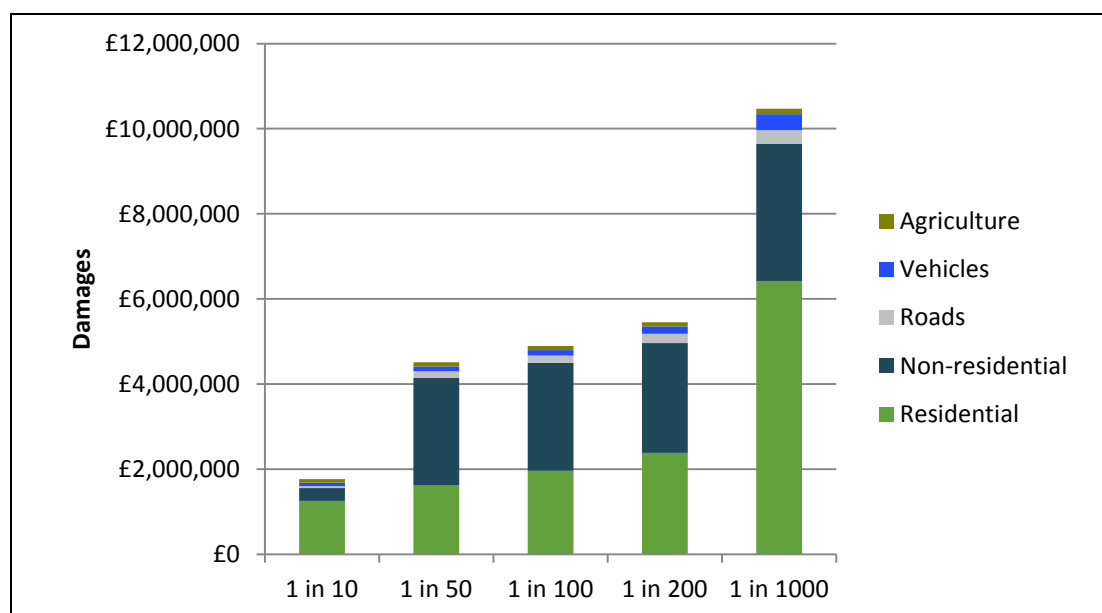
The damages associated with floods of different likelihood are shown in Figure 2. For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. The location of the impacts of flooding is shown in Figure 3.

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

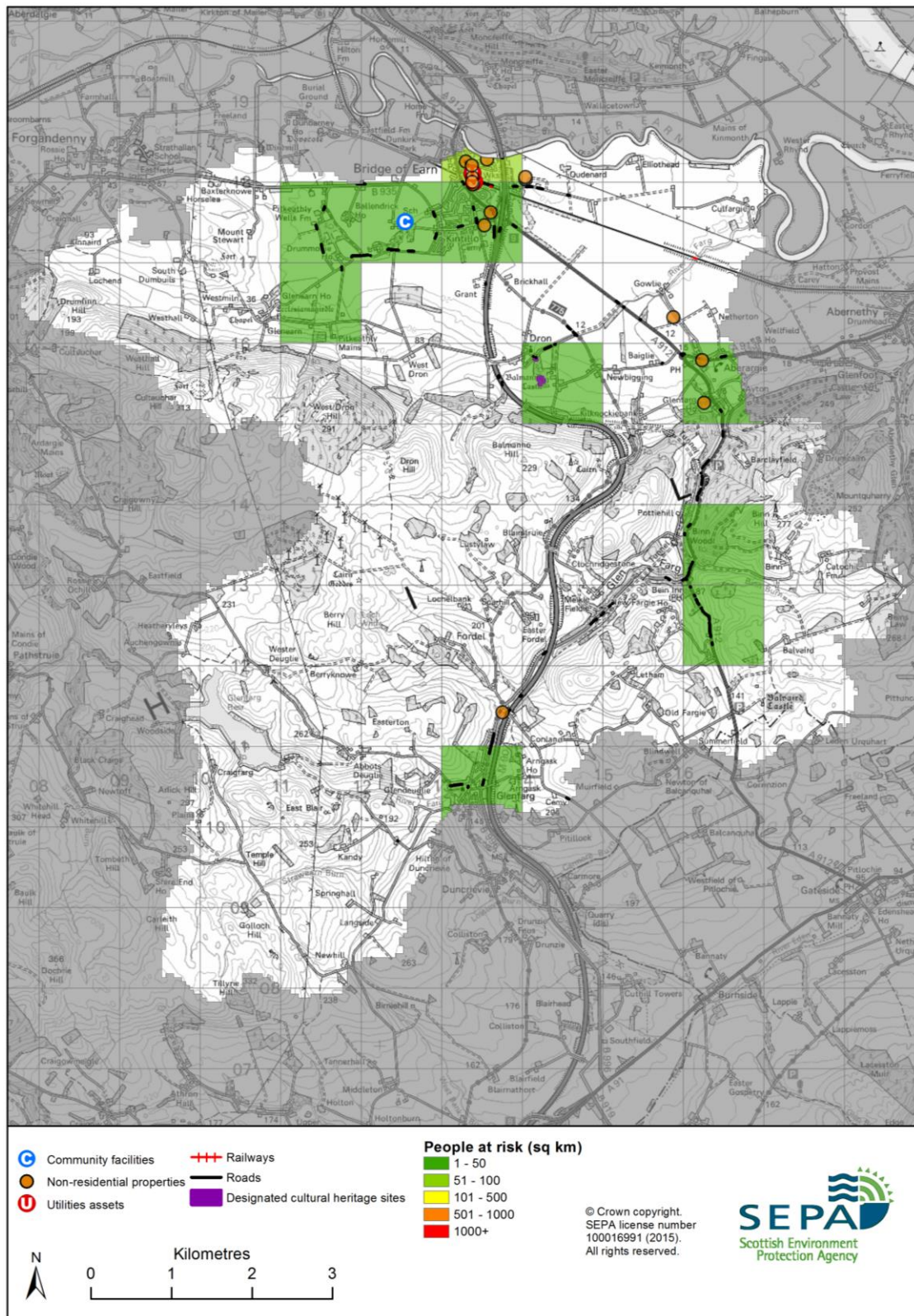
The risk of flooding to utilities in Table 1 does not include Scottish Water data. Scottish Water undertook a national assessment of above ground assets at medium likelihood of flooding (including water treatment works, wastewater treatment works and pumping stations). Within this Potentially Vulnerable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

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,700)	30	50	140
Non-residential properties (total 330)	<10	20	30
People	70	120	300
Community facilities	0	<10 Educational buildings	<10 Educational buildings
Utilities assets	0	<10	<10
Transport links (excluding minor roads)	1 M road (M90), 2 A roads, 2 B roads at 41 locations  1 Railway route at 3 locations: Perth to Thornton Junctions	1 M road (M90), 2 A roads, 2 B roads at 48 locations  1 Railway route at 3 locations: Perth to Thornton Junctions	1 M road (M90), 2 A roads, 2 B roads at 51 locations  1 Railway route at 3 locations: Perth to Thornton Junctions
Environmental designated areas (km <sup>2</sup> )	0	0	0
Designated cultural heritage sites	2	3	3
Agricultural land (km <sup>2</sup> )	1.3	1.6	2.0

**Table 1:** Summary of flooding impacts



**Figure 2:** Damages by flood likelihood



**Figure 3: Impacts of flooding**

## History of flooding

One flood has been recorded as significant in this area, which occurred in January 1993. Widespread flooding across the Tay catchment resulted in over £20 million of damage. The flooding is known to have affected Bridge of Earn.

## Objectives to manage flooding in Potentially Vulnerable Area 08/17

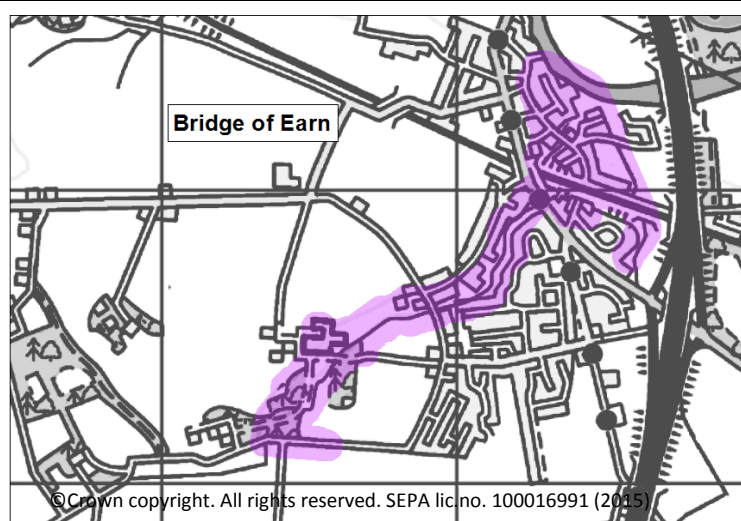
Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target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

**Accept that significant flood risk in Bridge of Earn is being managed appropriately. Maintain existing actions that reduce risk of flooding on the River Earn, Deich Burn and Yellow Burn.**

Indicators:

Target area:

- 23 residential properties protected
- £1.9 million damages avoided



Objective ID: 8040

Target area	Objective	ID	Indicators within PVA
Applies across Tay Local Plan District	Avoid an overall increase in flood risk	8001	<ul style="list-style-type: none"> <li>• 50 residential properties</li> <li>• £410,000 Annual Average Damages</li> </ul>
Applies across Tay Local Plan District	Reduce overall flood risk	8041	<ul style="list-style-type: none"> <li>• 50 residential properties</li> <li>• £410,000 Annual Average Damages</li> </ul>
Applies across Tay 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 08/17

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 Bridge of Earn Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	<i>New flood warning</i>	Community flood action groups	<i>Property level protection scheme</i>	<i>Site protection plans</i>
<i>Flood protection study</i>	<i>Natural flood management study</i>	Maintain flood warning	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

<b>Action (ID):</b>	<b>STRATEGIC MAPPING AND MODELLING (80410016)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Not started</b>	Indicative delivery:	<b>2016-2021</b>
<b>Description:</b>	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk, to be completed early in the first flood risk management cycle. Approximately 900km <sup>2</sup> of improved surface water data is currently available within this Local Plan District. SEPA will seek to develop flood mapping in the Lower Earn area to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.		

<b>Action (ID):</b>	<b>STRATEGIC MAPPING AND MODELLING (80410019)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Scottish Water		
<b>Status:</b>	<b>Not started</b>	Indicative delivery:	<b>2016-2021</b>
<b>Description:</b>	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.		

<b>Action (ID):</b>	<b>MAINTAIN FLOOD PROTECTION SCHEME (80400017)</b>		
<b>Objective (ID):</b>	Accept that significant flood risk in Bridge of Earn is being managed appropriately. Maintain existing actions that reduce risk of flooding on the River Earn, Deich Burn and Yellow Burn. (8040)		
<b>Delivery lead:</b>	Perth and Kinross Council		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	Continue to maintain the existing flood protection scheme along the Deich Burn and Yellow Burn. This includes the Bridge of Earn Flood Protection Scheme completed in 2006.		

<b>Action (ID):</b>	<b>MAINTAIN FLOOD WARNING (80410030)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	Continue to maintain the Bridge of Earn and the Bridge of Earn to the River Tay flood warning areas which are part of the Earn river flood warning scheme.		

<b>Action (ID):</b>	<b>FLOOD FORECASTING (80410009)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		



<b>Action (ID):</b>	<b>COMMUNITY FLOOD ACTION GROUPS (80400012)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Community		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	Glenfarg Community Council operates in this area. The community council have prepared a community resilience plan to help prepare for and respond to emergencies.		

<b>Action (ID):</b>	<b>SELF HELP (80410011)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	—		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		

<b>Action (ID):</b>	<b>AWARENESS RAISING (80410013)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Responsible authorities		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		

<b>Action (ID):</b>	<b>MAINTENANCE (80410007)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Fife Council and Perth and Kinross Council, asset / land managers		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		

<b>Action (ID):</b>	<b>EMERGENCY PLANS/RESPONSE (80410014)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Category 1 and 2 Responders		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		

<b>Action (ID):</b>	<b>PLANNING POLICIES (80010001)</b>		
<b>Objective (ID):</b>	Avoid an overall increase in flood risk (8001) Reduce overall flood risk (8041)		
<b>Delivery lead:</b>	Planning authority		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	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.		