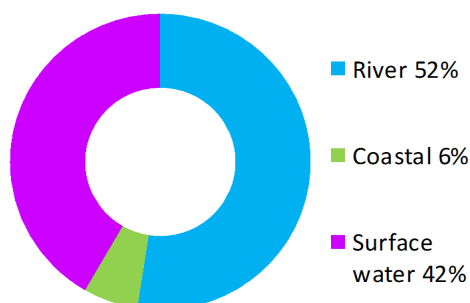


## Dornoch (Potentially Vulnerable Area 01/07)

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

### Summary of flooding impacts



### At risk of flooding

- <10 residential properties
- 20 non-residential properties
- £64,000 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>
Flood protection study	<i>Natural flood management study</i>	Maintain flood warning	Awareness raising	<i>Surface water plan/study</i>	Emergency plans/response
<i>Maintain flood protection scheme</i>	<i>Strategic mapping and modelling</i>	Flood forecasting	Self help	Maintenance	Planning policies

Actions

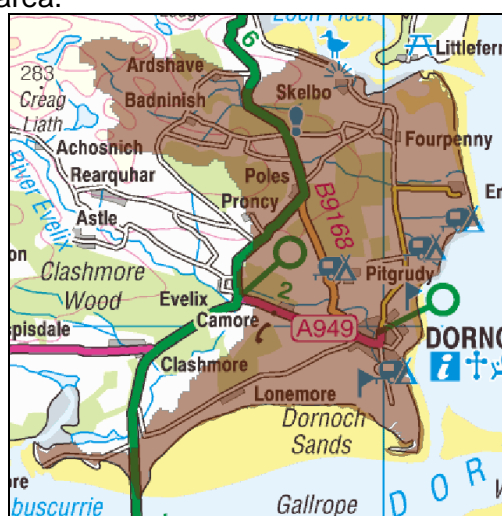
## Dornoch (Potentially Vulnerable Area 01/07)

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

### Background

This Potentially Vulnerable Area is approximately 60km<sup>2</sup>. It includes Dornoch and the surrounding mainly rural areas including the settlements of Embo, Skelbo and Hilton (shown below).

The A9 and A949 pass through the area.

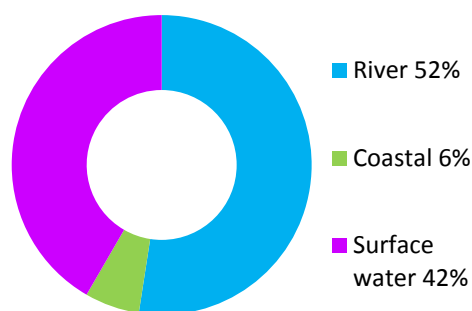


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The main rivers in the area are the River Evelix and the Skelbo Burn.

There are fewer than 10 residential properties and approximately 20 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £64,000 with the majority caused by river and surface water flooding.



**Figure 1: Annual Average Damages by flood source**

### Summary of flooding impacts

Coastal flood risk in the area is found to the south of Dornoch in the vicinity of the Dornoch Links and the airstrip. The main river flood risk is to Dornoch from the Dornoch Burn and to property at Skelbo and Bridgend from the Skelbo 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.

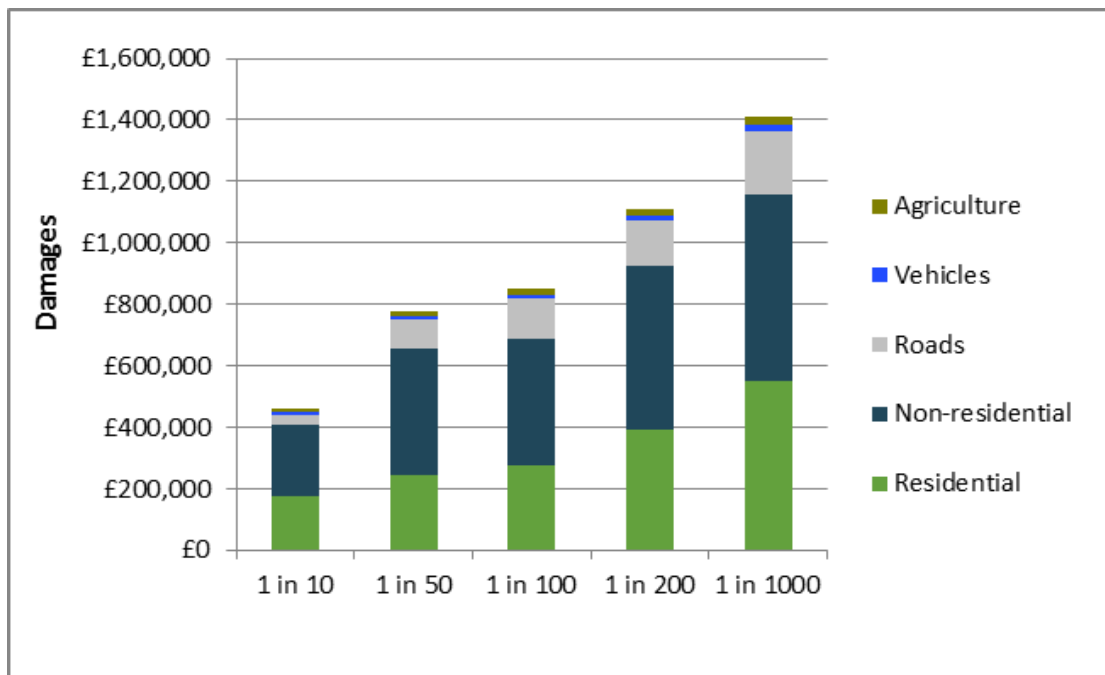
Roads potentially affected by flooding include the A9 and A949. Seven designated cultural heritage sites and large areas of environmental importance are also at risk. The sites affected include Special Areas of Conservation, Special Protection Areas, and Sites of Special Scientific Interest at Dornoch Firth, Morrich More and Loch Fleet.

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.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 1,200)	<10	<10	10
Non-residential properties (total 240)	10	20	30
People	<10	20	30
Community facilities	0	0	0
Utilities assets	<10	<10	<10
Transport links (excluding minor roads)	Roads at 40 locations	Roads at 60 locations	Roads at 70 locations
Environmental designated areas (km <sup>2</sup> )	3	3	3
Designated cultural heritage sites	6	7	7
Agricultural land (km <sup>2</sup> )	0.4	0.7	0.9

**Table 1:** Summary of flooding impacts<sup>1</sup>



**Figure 2:** Damages by flood likelihood

<sup>1</sup> Some receptors are counted more than once if flooded from multiple sources

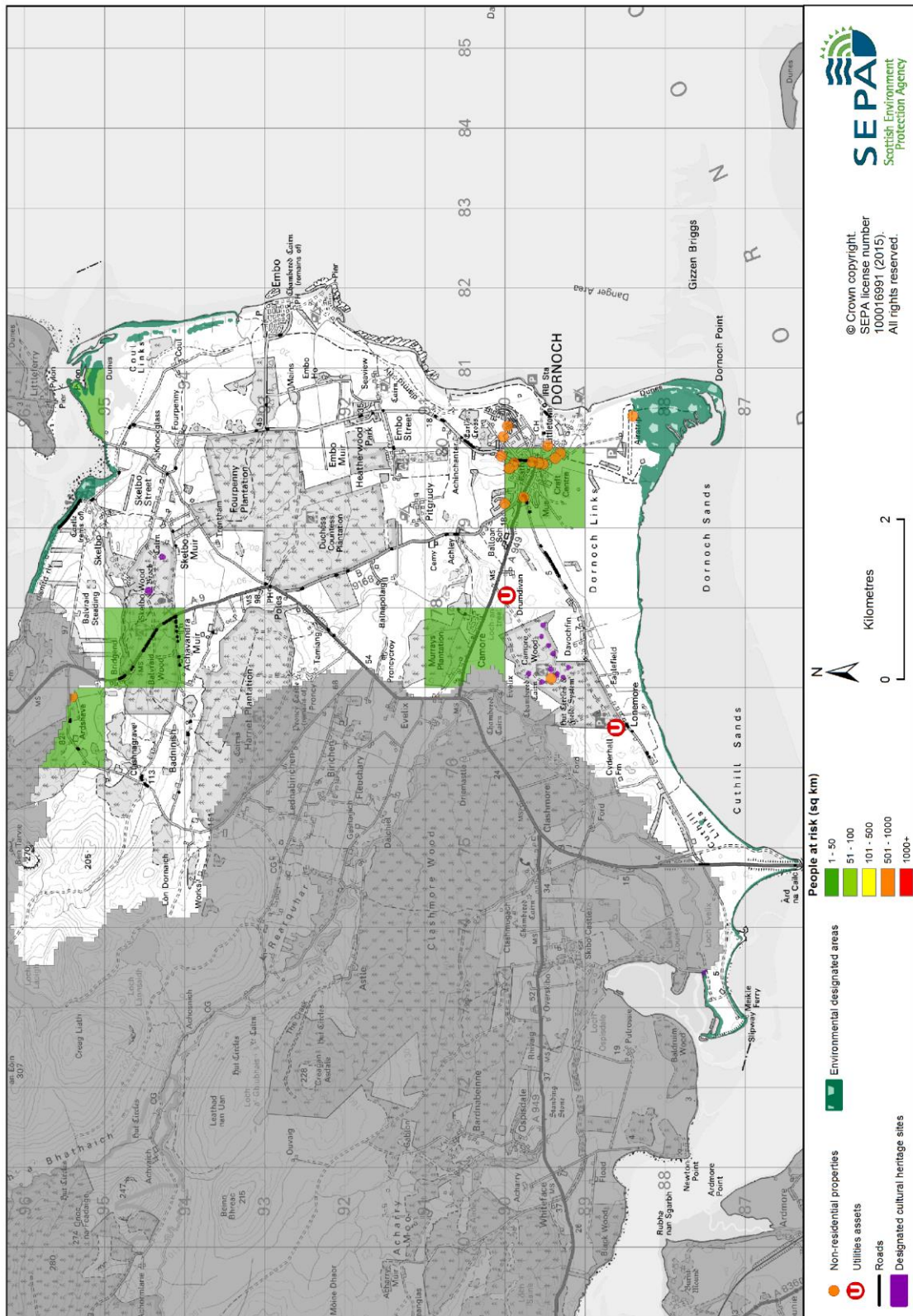


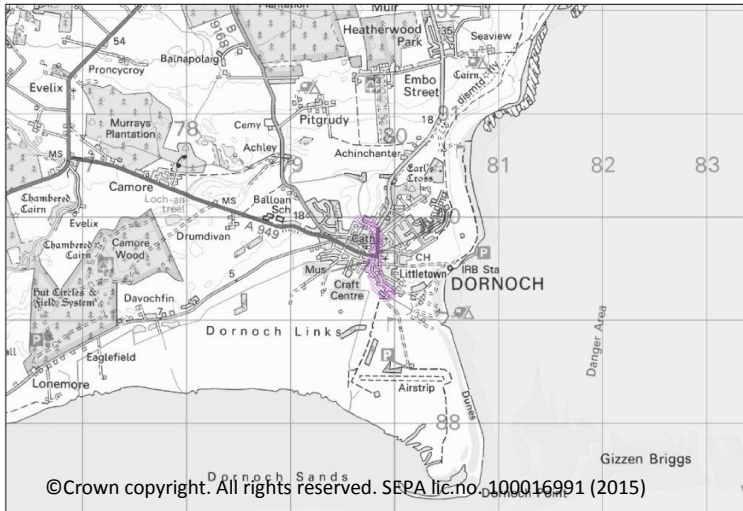
Figure 3: Impacts of flooding

## History of flooding

Five floods have been recorded since 1997. Most of these have been associated with the Dornoch Burn overflowing and affected roads and property. The caravan park by the golf links in Dornoch was notably affected by the coastal storms in December 2012.

## Objectives to manage flooding in Potentially Vulnerable Area 01/07

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 Dornoch Potentially Vulnerable Area.

Reduce flood risk in Dornoch from the Dornoch Burn	
Indicators:	Target area:
<ul style="list-style-type: none"> <li>£7,700 Annual Average Damages from residential properties</li> <li>£12,000 Annual Average Damages from non-residential properties</li> </ul>	 <p style="font-size: small; text-align: center;">© Crown copyright. All rights reserved. SEPA lic.no. 100016991 (2015)</p>
Objective ID: 100701	

Target area	Objective	ID	Indicators within PVA
Dornoch	Reduce the physical or disruption risk related to the transport network for roads	1301	<ul style="list-style-type: none"> <li>5 locations on the A9 with a total length of 130m</li> </ul>
Applies across Highland and Argyll Local Plan District	Avoid an overall increase in flood risk	100001	<ul style="list-style-type: none"> <li>&lt;10 residential properties</li> <li>£64,000 Annual Average Damages</li> </ul>
Applies across Highland and Argyll Local Plan District	Reduce overall flood risk	100002	<ul style="list-style-type: none"> <li>&lt;10 residential properties</li> <li>£64,000 Annual Average Damages</li> </ul>
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.		

## Actions to manage flooding in Potentially Vulnerable Area 01/07

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 Dornoch Potentially Vulnerable Area.

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

<b>Action (ID):</b>	<b>FLOOD PROTECTION SCHEME/WORKS (1301021)</b>		
<b>Objective (ID):</b>	Reduce the physical or disruption risk related to the transport network for roads (1301)		
<b>Delivery lead:</b>	Transport Scotland		
<b>Status:</b>	<b>Under development</b>	Indicative delivery:	<b>2022-2027</b>
<b>Description:</b>	Transport Scotland will carry out civil engineering work which will reduce flood risk to identified sections of the A9.		

<b>Action (ID):</b>	<b>FLOOD PROTECTION STUDY (1007010005)</b>		
<b>Objective (ID):</b>	Reduce flood risk in Dornoch from the Dornoch Burn (100701)		
<b>Delivery lead:</b>	The Highland Council		
<b>Priority:</b>	National:	Within local authority:	
	<b>150 of 168</b>	<b>19 of 23</b>	
<b>Status:</b>	<b>Not started</b>	Indicative delivery:	<b>2022-2027</b>
<b>Description:</b>	A study is required for Dornoch to investigate the impact on flood risk of structures crossing the burn and potential blockage scenarios. The study should primarily focus on modification of conveyance (removal or replacement of structures), installation/modification of river control structures (trash screens), direct defences (flood walls), and consideration of property level protection for any residual risk. Other actions may also be considered to develop the most sustainable		

	range of options. The study should look to confirm the type and extent of defences required and the business case for flood protection works.
Potential impacts	
<b>Economic:</b>	The flood protection study should confirm the economic impacts and number of properties at risk. Currently it is estimated that two residential and five non-residential properties could benefit from the study, with potential damages avoided of up to £650,000. The history of flooding however suggests that the potential benefits are likely to be higher.
<b>Social:</b>	The social benefits including to people and to community facilities will be confirmed once the hydraulic study has been carried out. Negative impacts through disturbance to the local community during the construction phase should be considered.
<b>Environmental:</b>	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Opportunities to mitigate any environmental impacts may include design and timing of works. There is potential for impacts on habitats and changes to channel morphology. There are unlikely to be any significant impacts on the Moray Firth Special Area of Conservation and Special Protection Area due to the distance upstream of the works compared to the coastal designated areas.

<b>Action (ID):</b>	<b>MAINTAIN FLOOD WARNING (1000020030)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	Continue to maintain the 'Helmsdale to Embo' flood warning area which is part of the Moray Firth coastal flood warning scheme.		

<b>Action (ID):</b>	<b>FLOOD FORECASTING (1000020009)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<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. The Potentially Vulnerable Area is within the 'Caithness and Sutherland' flood alert area.		



<b>Action (ID):</b>	<b>SELF HELP (1000020011)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<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 (1000020013)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<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 (1000020007)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<b>Delivery lead:</b>	The Highland 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 (1000020014)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (100002)		
<b>Delivery lead:</b>	Category 1 and 2 Responders		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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>		

<b>Action (ID):</b>	<b>PLANNING POLICIES (1000010001)</b>		
<b>Objective (ID):</b>	Avoid an overall increase in flood risk (100001) Reduce overall flood risk (100002)		
<b>Delivery lead:</b>	Planning authority		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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>		