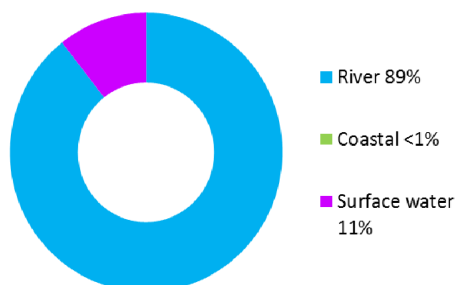


Aberdeen City - Denmore (Potentially Vulnerable Area 06/16)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City Council	Buchan coastal

Summary of flooding impacts



At risk of flooding

- 140 residential properties
- 40 non-residential properties
- £570,000 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>	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
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

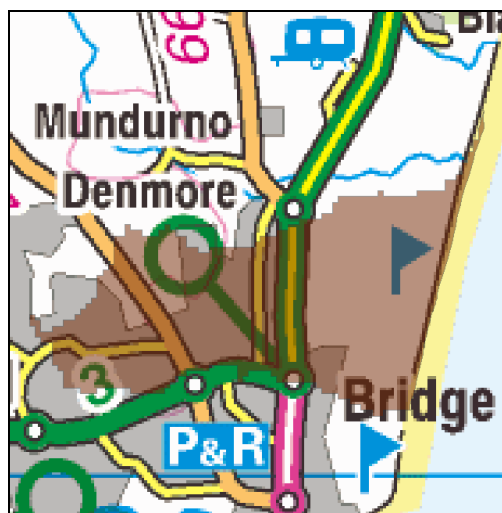
Actions

Aberdeen City – Denmore (Potentially Vulnerable Area 06/16)

Local Plan District	Local authority	Main catchment
North East	Aberdeen City council	Buchan coastal

Background

This Potentially Vulnerable Area is located on the northern edge of Aberdeen City. It includes the Denmore and Middleton Park areas of Aberdeen City and covers an area of approximately 5km².



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There are no major rivers, however the Glashieburn and Silverburn both pass through culverts in the urban areas.

There are approximately 140 residential and 40 non-residential properties at risk of flooding.

The Annual Average Damages are approximately £570,000 with the majority caused by river flooding.

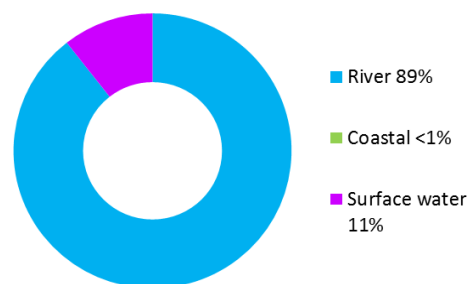


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Flood risk in Aberdeen City is complex due to the interaction between the main rivers, small often culverted watercourses, sewerage systems, patterns of surface water runoff and tide levels. In order to better understand these complex interactions, a more detailed flood model has been developed which has helped to inform the assessment of flood risk reported below.

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.

A number of schools and an emergency services facility are at risk of flooding. Transport links affected by flooding in several locations include the A90 and B997.

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 2,500)	50	140	220
Non-residential properties (total 230)	10	40	60
People	110	300	470
Community facilities	<10 Educational buildings	<10 Educational buildings	<10 Educational buildings
Utilities assets	<10	<10	10
Transport links (excluding minor roads)	Roads at 10 locations	Roads at 30 locations	Roads at 30 locations
Environmental designated areas (km ²)	0.1	0.1	0.1
Designated cultural heritage sites	0	0	0
Agricultural land (km ²)	0.1	0.1	0.2

Table 1: Summary of flooding impacts¹

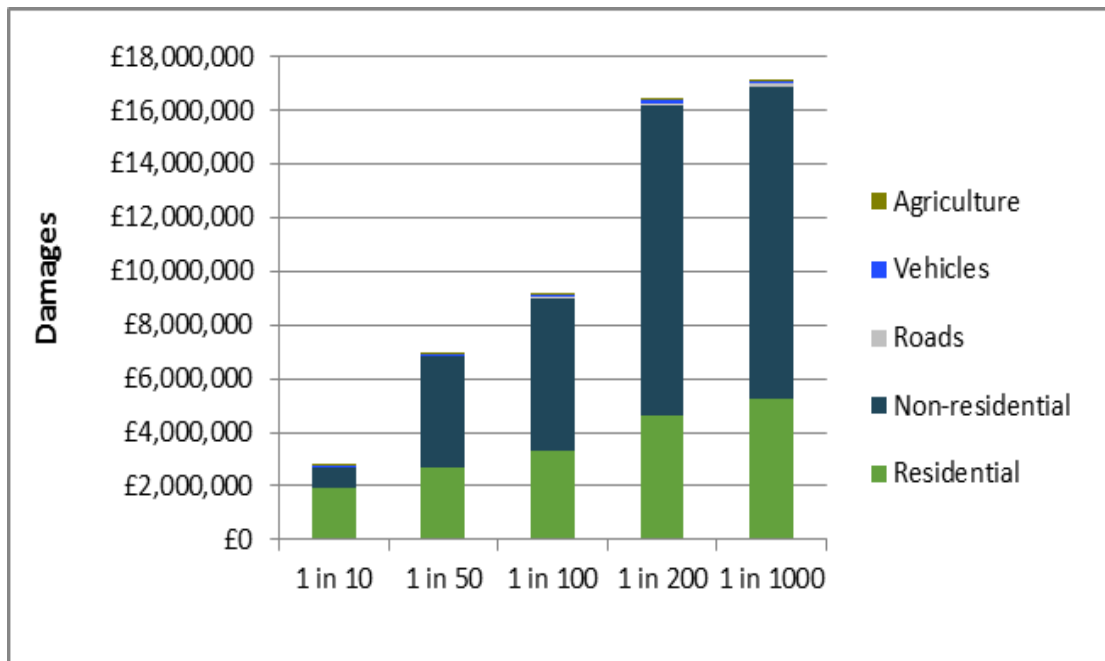


Figure 2: Damages by flood likelihood

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

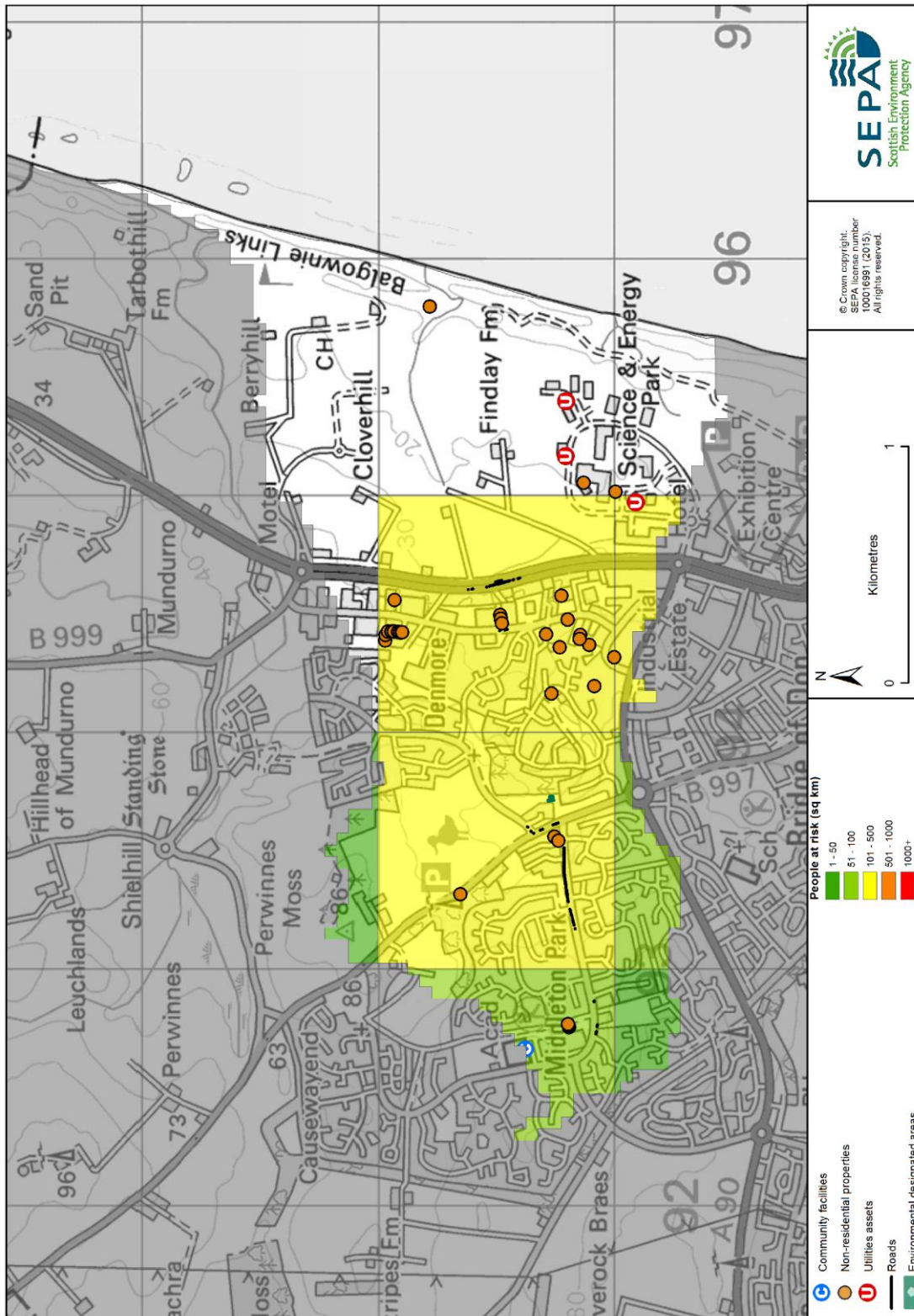


Figure 3: Impacts of flooding

History of flooding

The Bridge of Don area experienced flooding in 2000 and 2001, when problems with the drainage system resulted in ponding. This was exacerbated by gullies unable to function due to the high water level in the Glashieburn. Properties in Lochside Drive, Jesmond Drive and Brook Crescent were affected. Regular flooding of the combined sewer in Jesmond Drive has been reported. Flooding has also been reported at Ellon Road due to debris building up and blocking the watercourse.

Large parts of Aberdeen were affected by surface water flooding in July 2015. Manhole covers were dislodged by the force of the water. Many roads were affected by flooding, including Ellon Road.

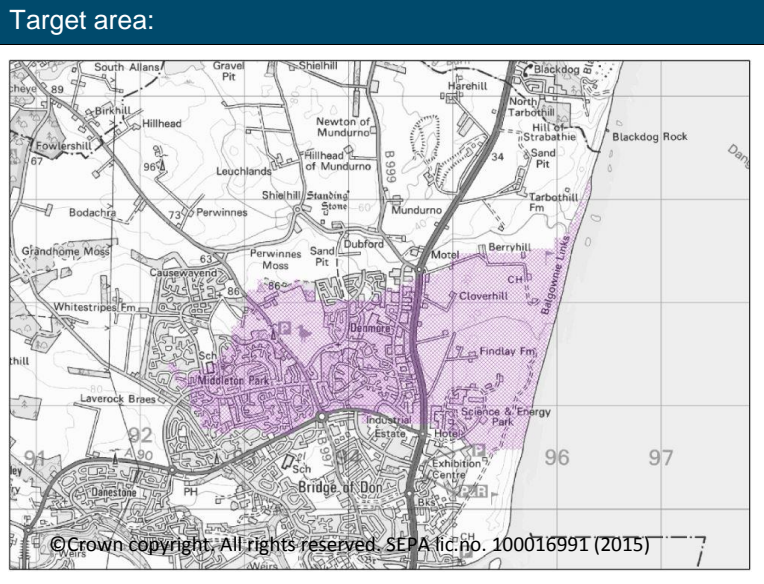
Objectives to manage flooding in Potentially Vulnerable Area 06/16

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 Aberdeen City - Denmore Potentially Vulnerable Area.

Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore)

Indicators:

- 300 people
- £250,000 Annual Average Damages from residential properties
- £280,000 Annual Average Damages from non-residential properties



Objective ID: 601601

Target area	Objective	ID	Indicators within PVA
Applies across North East Local Plan District	Avoid an overall increase in flood risk	600001	<ul style="list-style-type: none"> • 140 residential properties • £570,000 Annual Average Damages
Applies across North East Local Plan District	Reduce overall flood risk	600002	<ul style="list-style-type: none"> • 140 residential properties • £570,000 Annual Average Damages
Applies across North East 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 06/16

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 Aberdeen City - Denmore Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<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	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 STUDY (6016010005)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City Council		
Priority:	National:		Within local authority:
	5 of 168		2 of 4
Status:	Not started	Indicative delivery:	2016-2021
Description:	The Bridge of Don flood protection study should address flood risk from small watercourses and surface water in this area. The study should identify the most sustainable range of options. It should be based on the outputs from the Aberdeen Integrated Catchment Study and coordinated with the surface water management plan to take a comprehensive approach to flood risk management in Aberdeen.		
Potential impacts			
Economic:	Considering all three study areas in Aberdeen City, a total of 10,500 residential and 1,800 non-residential properties could benefit, with potential damages avoided of up to £520 million. In reality the studies should look to identify flooding hotspots, where actions should be targeted. Further study will identify the true benefits of these actions.		
Social:	Thirteen educational buildings, 14 health care facilities, 33 utilities, and one emergency service could benefit from any actions taken. However, this will depend on locations identified for actions. Around 23,000 people could benefit from flood protection works. However, this will depend on locations identified for actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people.		

Environmental:	To be in accord with the FRM Strategy, the responsible authority should seek to ensure, as part of the studies, that the action will not have an adverse effect on the integrity of the River Dee Special Area of Conservation. Cultural heritage sites, including one garden and designed landscape site, could benefit from flood protection works identified in the studies. However, this will depend on the final location and extent of the works. The flood protection studies should consider how to avoid/minimise potential impacts through good design and timing of works and consider how to avoid or minimise potential negative effects such as loss or disturbance of sediment, disruption to natural processes and loss of habitat. The following rivers are identified by river basin management planning to be at less than good status for their physical condition: River Don, River Dee and Bucks Burn (water body IDs 23265, 23315 and 23266). Future works could improve the condition of the rivers or degrade them. Opportunities to improve the condition of the rivers should be considered by coordinating with river basin management planning.
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Action (ID):	SURFACE WATER PLAN/STUDY (6016010018)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City 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 has been 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 (6000020019)		
Objective (ID):	Reduce overall flood risk (600002)		
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 (6016010017)		
Objective (ID):	Reduce the risk of flooding from surface water and burns in Aberdeen (Denmore) (601601)		
Delivery lead:	Aberdeen City Council		
Status:	Existing	Indicative delivery:	Ongoing
Description:	Continue to maintain the Glashie Burn Flood Protection Scheme (attenuation pond and culverts) which reduce the risk of flooding to Lochside Drive from the Glashie Burn.		

Action (ID):	FLOOD FORECASTING (6000020009)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	SEPA		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p> <p>The Potentially Vulnerable Area is within the 'Aberdeenshire and Aberdeen City' flood alert area.</p>		

Action (ID):	SELF HELP (6000020011)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	—		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p> <p>Aberdeen City Council provides grants towards the fitting of flood guards on individual properties.</p>		

Action (ID):	AWARENESS RAISING (6000020013)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Responsible authorities		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p> <p>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.</p>		

Action (ID):	MAINTENANCE (6000020007)		
Objective (ID):	Reduce overall flood risk (600002)		
Delivery lead:	Aberdeen City Council, asset / land managers		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<p>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.</p>		

Action (ID):	EMERGENCY PLANS/RESPONSE (6000020014)		
Objective (ID):	Reduce overall flood risk (600002)		
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>		

Action (ID):	PLANNING POLICIES (6000010001)		
Objective (ID):	Avoid an overall increase in flood risk (600001) Reduce overall flood risk (600002)		
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.		