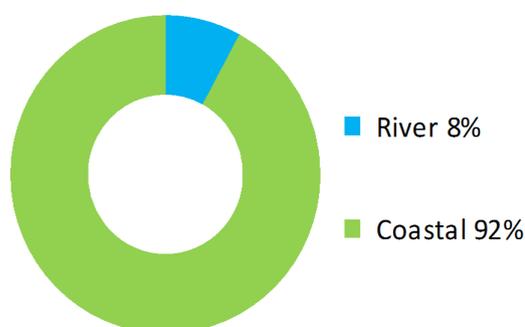


## Stromness (Potentially Vulnerable Area 03/04)

Local Plan District	Local authority	Main catchment
Orkney	Orkney Islands Council	Loch of Stenness Orkney coastal

### Summary of flooding impacts



#### At risk of flooding

- 90 residential properties
- 40 non-residential properties
- £220,000 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>	<b>New flood warning</b>	<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>	<b>Awareness raising</b>	<i>Surface water plan/study</i>	<b>Emergency plans/response</b>
<i>Maintain flood protection scheme</i>	<b>Strategic mapping and modelling</b>	<b>Flood forecasting</b>	<b>Self help</b>	<b>Maintenance</b>	<b>Planning policies</b>

Actions

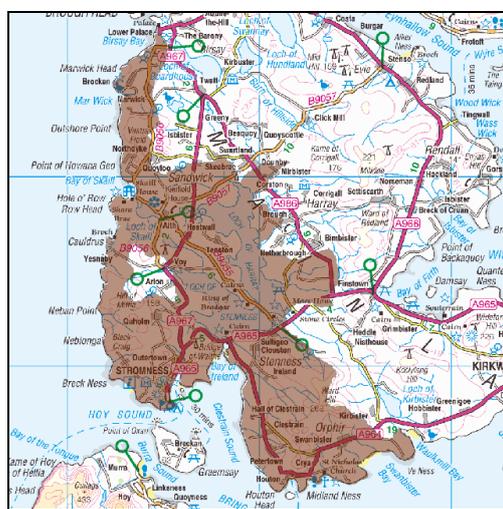
# Stromness (Potentially Vulnerable Area 03/04)

Local Plan District	Local authority	Main catchment
Orkney	Orkney Islands Council	Loch of Stenness, Orkney coastal

## Background

This Potentially Vulnerable Area is located on the south-west coast of Orkney Mainland (shown below). It is approximately 148km<sup>2</sup>.

The area includes Stromness, the Parishes of Stenness and Sandwick and Orphir Village.

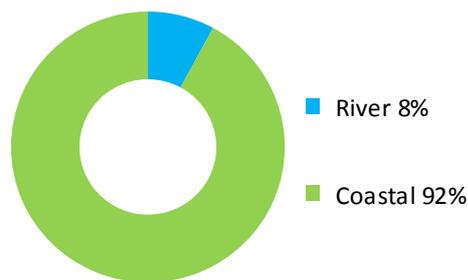


© Crown copyright. SEPA licence number 100016991 (2015). All rights reserved.

The area extends from Birsay Bay in the north to Waulkmill Bay in the south and includes the Bay of Skail. It also includes the Loch of Stenness, Loch of Harray, Loch of Skail, and numerous smaller lochs and burns.

There are approximately 90 residential and 40 non-residential properties at risk of flooding.

The Annual Average Damages are estimated to be £220,000 with the majority caused by coastal flooding.



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

## Summary of flooding impacts

Coastal flood risk affects parts of Stromness however many of the properties within the harbour area of Stromness have their floor levels raised on piers. Parts of Stenness village may also be at coastal flood risk.

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 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 four assets identified as being at risk of flooding.

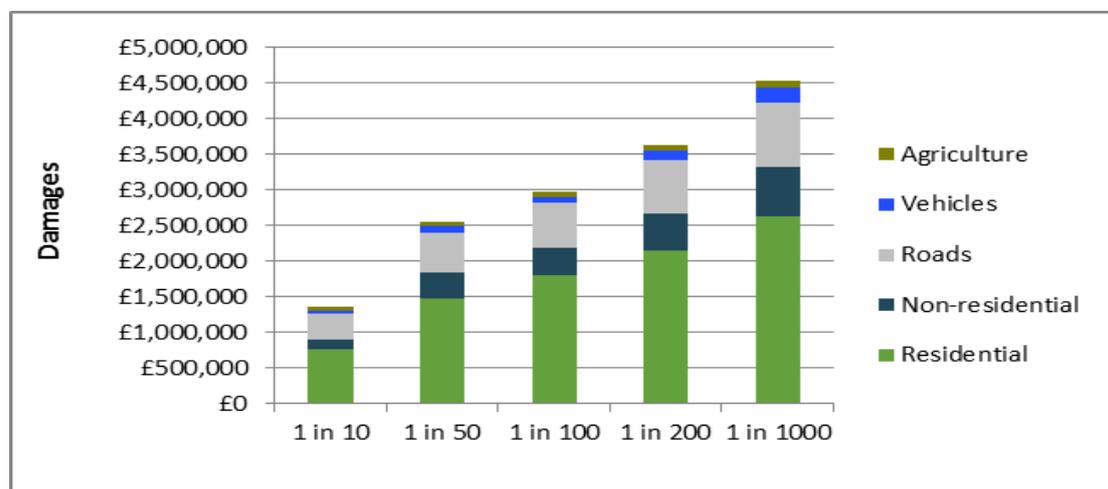
Roads potentially affected by flooding include the A964, A965, A967, A986, B9056, B9055 and the B9057. There are a large number of cultural heritage sites at risk of flooding including The Heart of Neolithic Orkney World Heritage Site which is a major and vital driver of the Orkney economy, and also the conservation areas of Stromness and Brodgar / Stenness. Large areas of environmental importance and agricultural land are also at risk of flooding.

The damages associated with floods of different likelihood are shown in Figure 2. The highest damages are to residential properties, followed by damages to roads. Note that cultural heritage and environmental sites are not included in the estimation of the economic impact of flooding due to the difficulty in placing an economic value on these impacts.

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 1,900)	20	90	110
Non-residential properties (total 460)	10	40	50
People	40	190	230
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 50 locations	Roads at 80 locations	Roads at 90 locations
Environmental designated areas (km <sup>2</sup> )	52	52	52
Designated cultural heritage sites	36	44	45
Agricultural land (km <sup>2</sup> )	3	4	5

**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

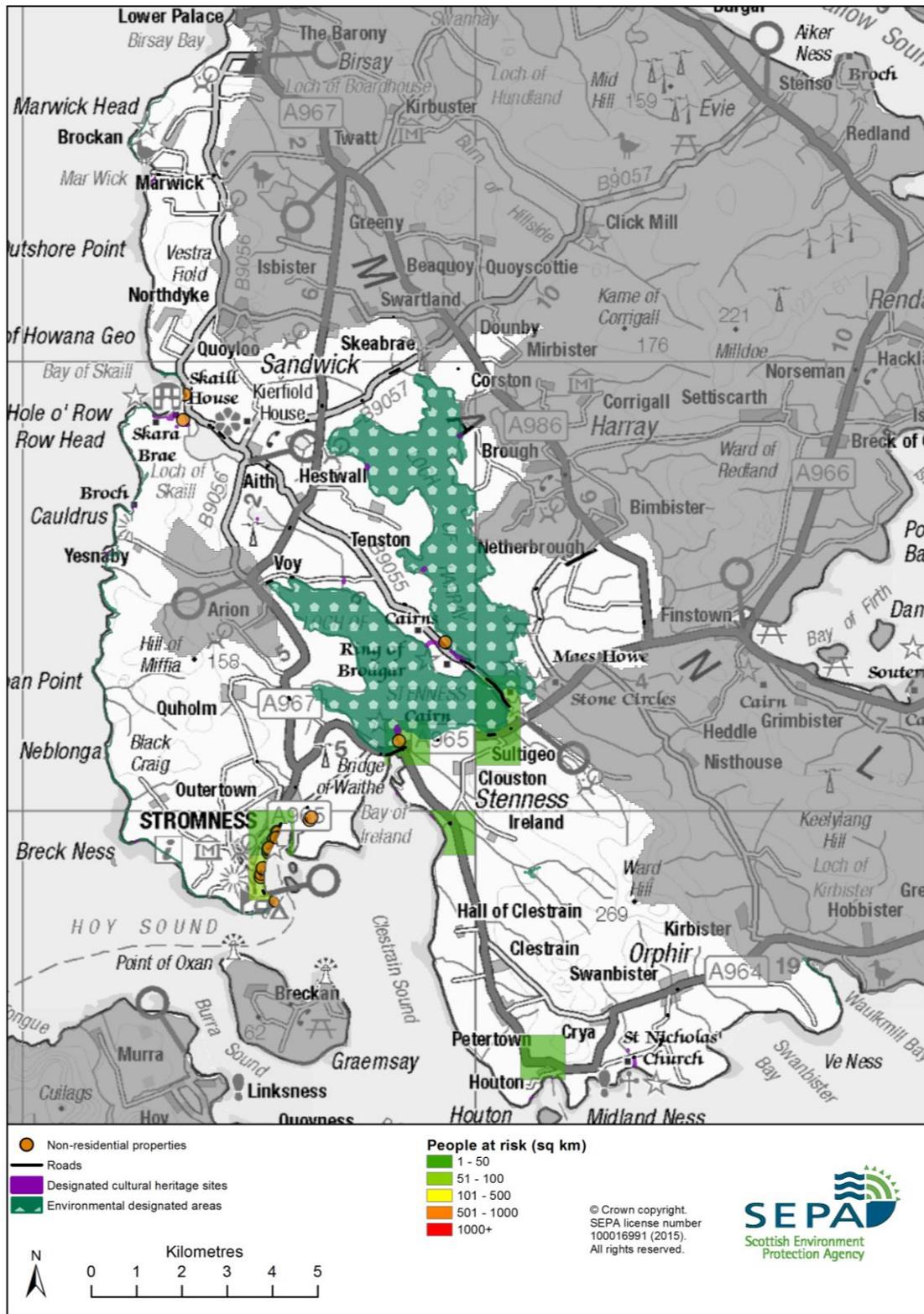


Figure 3: Impacts of flooding

## History of flooding

Floods within this Potentially Vulnerable Area have been recorded at regular intervals over the last 100 years, particularly in the town of Stromness, which is the second largest settlement in the Orkney Local Plan District and a vital ferry connection to the Scottish mainland.

The earliest recorded flood for Stromness was in 1909, when a river flood caused considerable damage to roads, crops and infrastructure. Other floods from rivers were recorded in 2004 when the May Burn flooded after heavy rain, inundating properties in Stromness town centre. In October 2006, extremely heavy rainfall resulted in the Mill Burn bursting its banks and drainage systems being overwhelmed causing flooding to roads, property and agricultural land.

Coastal flooding has been a consistent threat to Stromness due to its proximity to the sea. The 1953 North Sea flood resulted in flooding to the golf course and debris being washed-up along the coastline. More recently in January 2005, there was coastal flooding which affected properties in the town centre and along the sea front. Several minor coastal flood events have been noted in Stromness since 2005 causing flooding to roads and properties.

## Further information on flood hazard and risk

Statistics for the number of properties and number of people at risk have been updated based on evidence provided by Orkney Islands Council. There is however no suitable information available to update the estimated economic damages at this stage.

## Objectives to manage flooding in Potentially Vulnerable Area 03/04

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 Stromness Potentially Vulnerable Area.

Target area	Objective	ID	Indicators within PVA
Applies across Orkney Local Plan District	Avoid an overall increase in flood risk	300001	<ul style="list-style-type: none"> <li>• 90 residential properties</li> <li>• £220,000 Annual Average Damages</li> </ul>
Applies across Orkney Local Plan District	Reduce overall flood risk	300002	<ul style="list-style-type: none"> <li>• 90 residential properties</li> <li>• £220,000 Annual Average Damages</li> </ul>
Applies across Orkney 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 03/04

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 Stromness Potentially Vulnerable Area.

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

<b>Action (ID):</b>	<b>NEW FLOOD WARNING (3000020010)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Not started</b>	Indicative delivery:	<b>2016-2021</b>
<b>Description:</b>	The area under consideration covers the coastline of the Orkney Islands. Forecasting capability is currently under development.		

<b>Action (ID):</b>	<b>STRATEGIC MAPPING AND MODELLING (3000020016)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Not started</b>	Indicative delivery:	<b>2016-2021</b>
<b>Description:</b>	<p>SEPA will be seeking to incorporate additional surface water hazard mapping information into the flood maps to improve understanding of flood risk. Approximately 200km<sup>2</sup> of improved data is currently available within this Local Plan District .</p> <p>SEPA will be seeking to develop the flood hazard mapping in the Orkney Mainland area to improve understanding of the coastal flood risk. The extent and timing of the completed improvements will be dependent on detailed scoping and data availability.</p>		

<b>Action (ID):</b>	<b>STRATEGIC MAPPING AND MODELLING (3000020019)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<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>FLOOD FORECASTING (3000020009)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	SEPA		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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 'Orkney' flood alert area.</p>		

<b>Action (ID):</b>	<b>SELF HELP (3000020011)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	—		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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>		

<b>Action (ID):</b>	<b>AWARENESS RAISING (3000020013)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	Responsible authorities		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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>		

<b>Action (ID):</b>	<b>MAINTENANCE (3000020007)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<b>Delivery lead:</b>	Orkney Islands Council, asset / land managers		
<b>Status:</b>	<b>Existing</b>	Indicative delivery:	<b>Ongoing</b>
<b>Description:</b>	<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>		

<b>Action (ID):</b>	<b>EMERGENCY PLANS/RESPONSE (3000020014)</b>		
<b>Objective (ID):</b>	Reduce overall flood risk (300002)		
<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> <p>Orkney Islands Council monitors the flood risk daily by comparing forecast tide and surge levels with land levels. This enables advanced warning of coastal flood events to be provided.</p>		

<b>Action (ID):</b>	<b>PLANNING POLICIES (3000010001)</b>		
<b>Objective (ID):</b>	Avoid an overall increase in flood risk (300001) Reduce overall flood risk (300002)		
<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>		