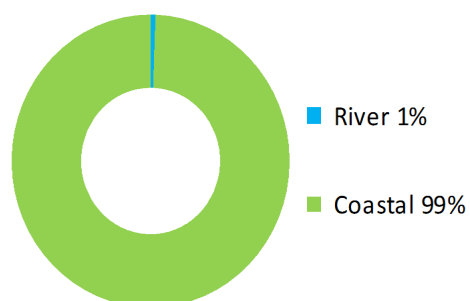


South Ronaldsay (Candidate Potentially Vulnerable Area 03/07c)

Local Plan District	Local authority	Main catchment
Orkney	Orkney Islands Council	Orkney coastal

Summary of flooding impacts



At risk of flooding

- 50 residential properties
- <10 non-residential properties
- £85,000 Annual Average Damages

(damages by flood source shown left)

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.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

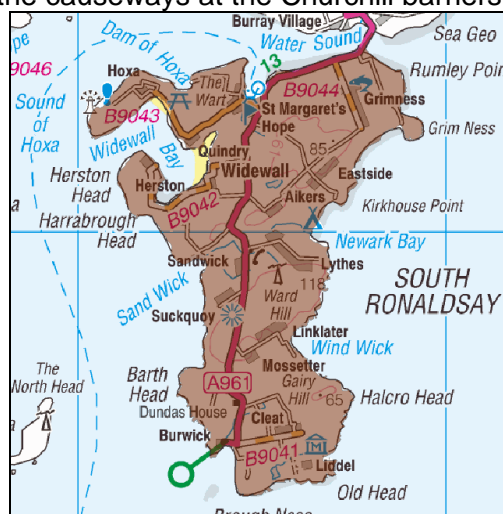
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	New flood warning	<i>Community flood action groups</i>	<i>Property level protection scheme</i>	<i>Site protection plans</i>
Flood protection study	<i>Natural flood management study</i>	<i>Maintain flood warning</i>	Awareness raising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

South Ronaldsay (Candidate Potentially Vulnerable Area 03/07c)

Local Plan District	Local authority	Main catchment
Orkney	Orkney Islands Council	Orkney coastal

Background

This candidate Potentially Vulnerable Area comprises the island of South Ronaldsay (shown below). It is approximately 50km². South Ronaldsay is connected to Burray and the Orkney mainland by the A961, which crosses the causeways at the Churchill barriers.



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The main centre of population is St Margaret's Hope. There is a vital ferry connection from St Margaret's Hope to the Scottish mainland.

There are approximately 50 residential and fewer than 10 non-residential properties at risk of flooding.

The Annual Average Damages are estimated to be £85,000 with nearly all caused by coastal flooding.

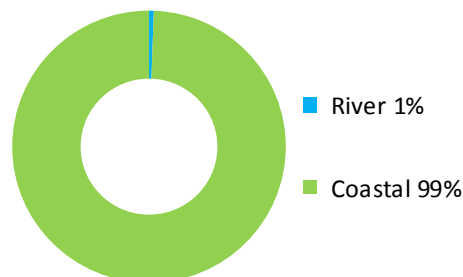


Figure 1: Annual Average Damages by flood source

Summary of impacts of all sources of flooding

Coastal flood risk in this area is focused around St Margaret's Hope and on the A961 which connects Burray and South Ronaldsay to the mainland. Wave overtopping is the major contributing factor to flooding in these two locations.

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 at risk of flooding are concentrated on the northern coast and in St Margaret's Hope including the access to Hope Primary School. St. Margaret's Hope is a major ferry connection to the Scottish mainland and the access road to the port is at risk of flooding. The ferry port at Burwick provides a foot passenger ferry to John O'Groats and the road leading to it is also at risk. The A961 Churchill Barriers are at risk of disruption due to wave overtopping with several road closures occurring each year.

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 roads and non-residential properties. 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 630)	20	50	70
Non-residential properties (total 210)	<10	<10	10
People	30	110	150
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 20 locations	Roads at 20 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	0.2	0.2

Table 1: Summary of flooding impacts¹

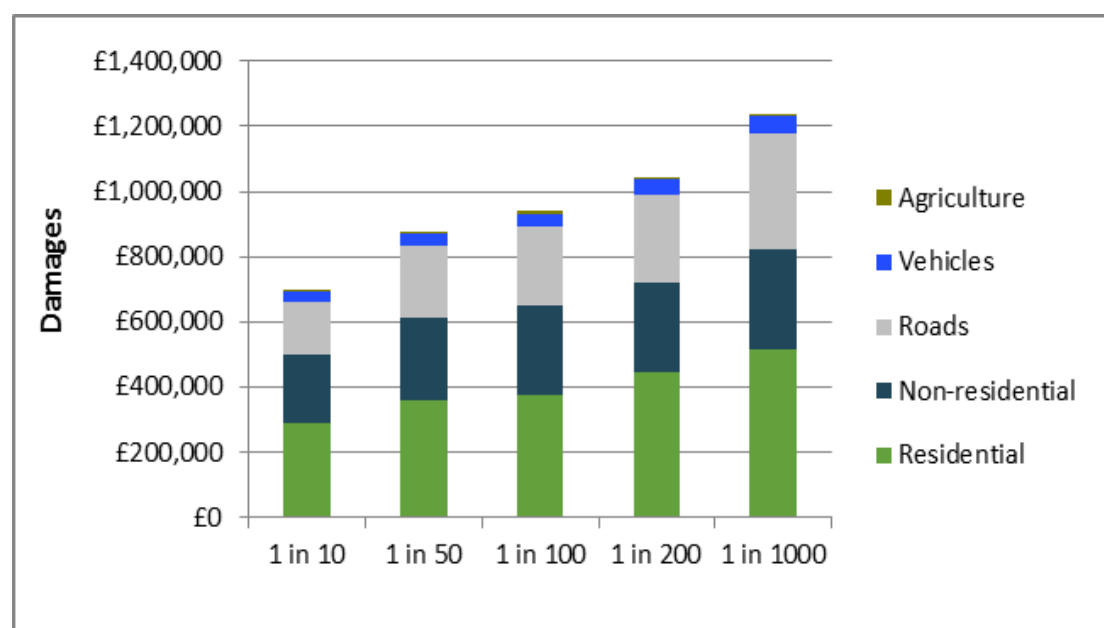


Figure 2: Damages by flood likelihood

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

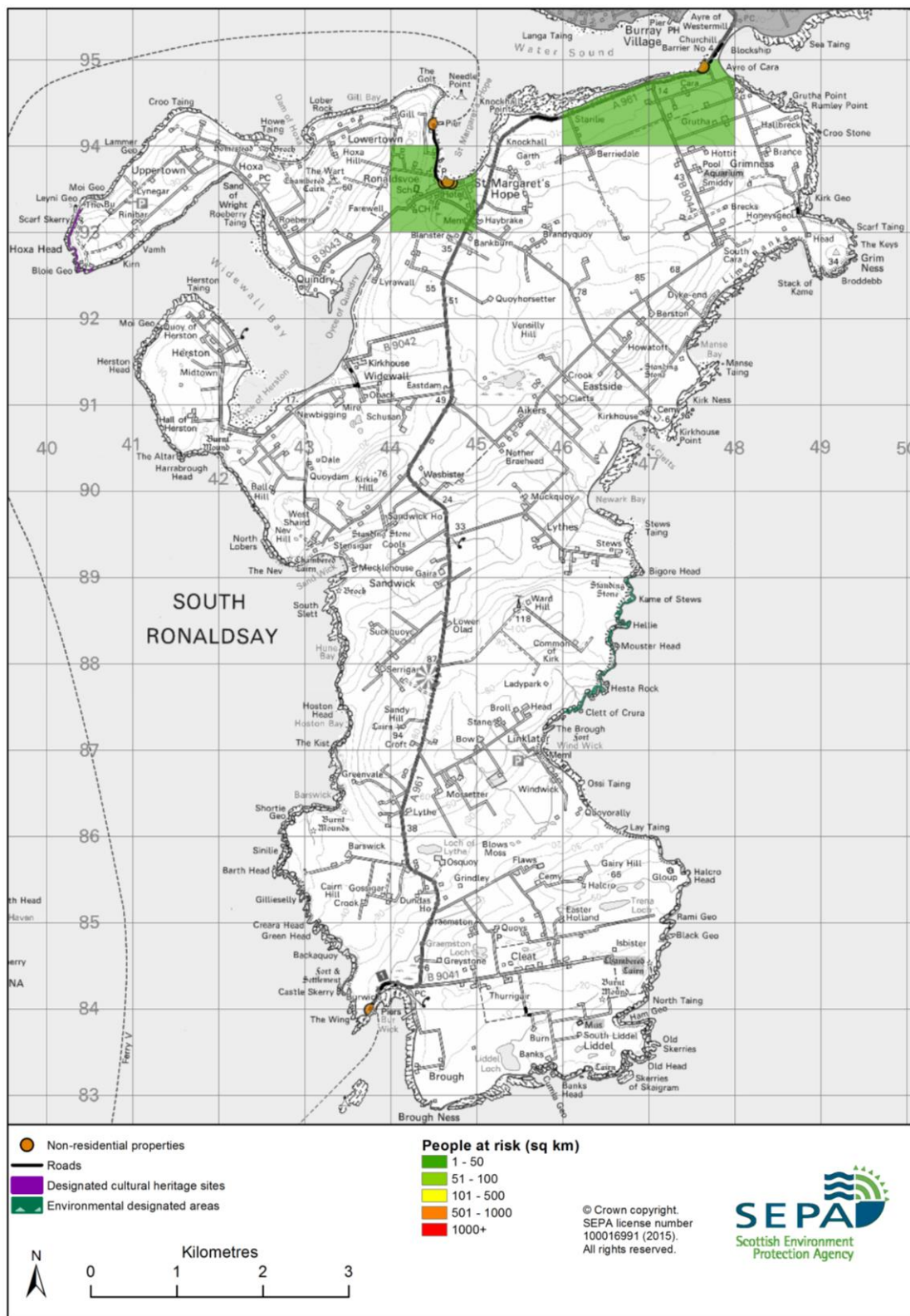


Figure 3: Impacts of flooding

History of flooding

There is a long history of flooding in St Margaret's Hope, with records of floods in 1914, 1953, during the 1980s and 1990s, in January 2005 and more recently December 2013. The centre of the village is known to be at risk of coastal flooding, which is exacerbated by wave overtopping.

Between 1997 and 2009 the Cromarty Square area and coastal roads in St Margaret's Hope were occasionally affected by flooding due to high tides, heavy rainfall and blocked culverts. In 2009 a new access road into the village was built, the culvert upgraded and a regular inspection maintenance programme for the culvert was initiated, leaving the major threat to the village from coastal flooding.

A recorded coastal flood in January 2005 resulted in approximately 20 properties within the St Margaret's Hope Conservation Area being flooded together with many properties in the wider area of the village. This flood also closed off the access road to the ferry terminal.

The closure of the A961 causeway along the Churchill Barriers (in particular Barrier No.2) from wave action and overtopping is a major issue to those residents and businesses on South Ronaldsay and Burray. These conditions result in several road closures every year.

Information on flood hazard and risk

The national flood maps do not take account of wave overtopping and as a result the damages attributed to this candidate Potentially Vulnerable Area are considered to be significantly underestimated. The number of properties and people at risk has 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 Candidate Potentially Vulnerable Area 03/07c

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 South Ronaldsay Candidate Potentially Vulnerable Area.

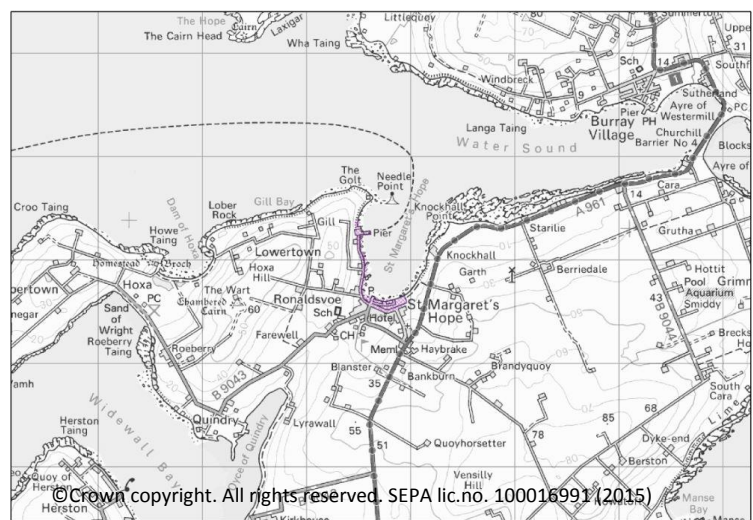
Reduce coastal flood risk in St Margaret's Hope, including the access road to Hope school

Indicators:

- 40 people
- £98,000 Annual Average Damages from residential properties
- Front Road
- Back Road
- Cromarty Square

Objective ID: 300701

Target area:



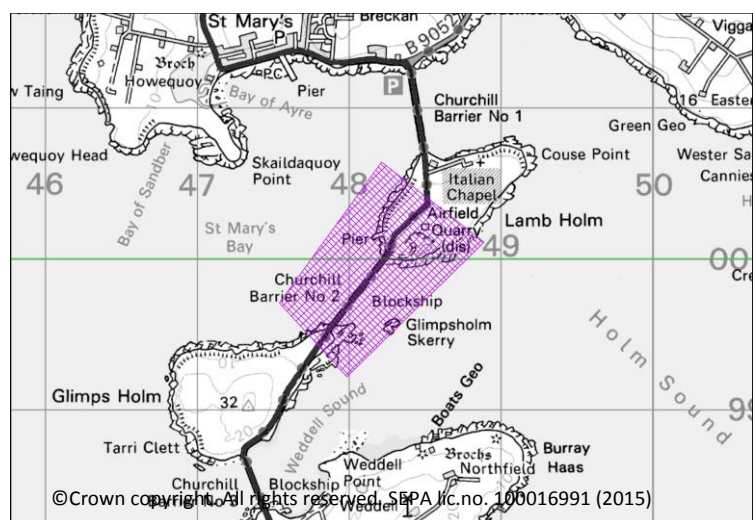
Reduce coastal flood risk to Churchill Barrier number 2

Indicators:

- Churchill Barrier number 2

Objective ID: 300702

Target 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"> • 50 residential properties • £85,000 Annual Average Damages
Applies across Orkney Local Plan District	Reduce overall flood risk	300002	<ul style="list-style-type: none"> • 50 residential properties • £85,000 Annual Average Damages
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 Candidate Potentially Vulnerable Area 03/07c

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 South Ronaldsay Candidate Potentially Vulnerable Area.

Selected actions					
<i>Flood protection scheme/works</i>	<i>Natural flood management works</i>	New flood warning	<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>	<i>Maintain flood warning</i>	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

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

Action (ID):	FLOOD PROTECTION STUDY (3007010005)		
Objective (ID):	Reduce coastal flood risk in St Margaret's Hope, including the access road to Hope school (300701)		
Delivery lead:	Orkney Islands Council		
Priority:	National:	Within local authority:	
	110 of 168	2 of 6	
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	A flood protection study is required to consider flood protection works for St Margaret's Hope. The study should primarily focus on coastal management actions, direct defences and property level protection, but other actions may also be considered in order to develop the most sustainable range of options. The investigation will assess the impact from wave overtopping to confirm the existing risk and define the height and extent of flood protection works required.		

Potential impacts	
Economic:	The study could benefit 50 residential and 10 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £2.9 million.
Social:	The development of flood protection works following the proposed study would potentially reduce risk to 110 people. The action could also reduce the impact of flooding on access to Hope school. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Negative impacts through disturbance to the local community during the construction phase should be considered.
Environmental:	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 may be impacts on coastal habitats through any potential increased disruption of natural processes, coastal squeeze and possible increase to coastal erosion risk. The study should also minimise the visual impacts of the actions for the local community.

Action (ID):	FLOOD PROTECTION STUDY (3007020005)		
Objective (ID):	Reduce coastal flood risk to Churchill Barrier number 2 (300702)		
Delivery lead:	Orkney Islands Council		
Priority:	National:	Within local authority:	
	162 of 168	5 of 6	
Status:	Ongoing	Indicative delivery:	2016-2021
Description:	A flood protection study is progressing to reduce flooding to Churchill Barrier number 2 from high likelihood floods. The study is primarily focusing on coastal management actions and natural flood management through wave attenuation to minimise the impact of waves, but other actions may also be considered in order to develop the most sustainable range of options.		
Potential impacts			
Economic:	Reducing the impacts of flooding for Churchill Barrier number 2 during high likelihood floods would result in damages avoided of £37,000 due to reduced flood damages to the road. There are wider benefits that have not yet been quantified and should be considered within the ongoing study.		
Social:	The recommended actions from the ongoing flood protection study would improve access from South Ronaldsay to Mainland Orkney and reduce risk to life from using the access road in stormy weather. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism. Negative impacts through disturbance to the local community during the construction phase should be considered.		

Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. Opportunities to mitigate any environmental impacts may include design and timing of works. The ongoing study should consider the effects on coastal habitats through any potential increased disruption of natural processes, coastal squeeze and possible increase to coastal erosion risk.
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Action (ID):	FLOOD FORECASTING (3000020009)		
Objective (ID):	Reduce overall flood risk (300002)		
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 'Orkney' flood alert area.</p>		

Action (ID):	SELF HELP (3000020011)		
Objective (ID):	Reduce overall flood risk (300002)		
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>		

Action (ID):	AWARENESS RAISING (3000020013)		
Objective (ID):	Reduce overall flood risk (300002)		
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 (3000020007)		
Objective (ID):	Reduce overall flood risk (300002)		
Delivery lead:	Orkney Islands 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 (3000020014)		
Objective (ID):	Reduce overall flood risk (300002)		
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> <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. If the predicted tide level and surge combined are predicted to threaten the known flood defence level threshold in St Margaret's Hope, warnings are issued and mobile modular barriers are deployed along with sandbags.</p>		

Action (ID):	PLANNING POLICIES (3000010001)		
Objective (ID):	Avoid an overall increase in flood risk (300001) Reduce overall flood risk (300002)		
Delivery lead:	Planning authority		
Status:	Existing	Indicative delivery:	Ongoing
Description:	<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>		