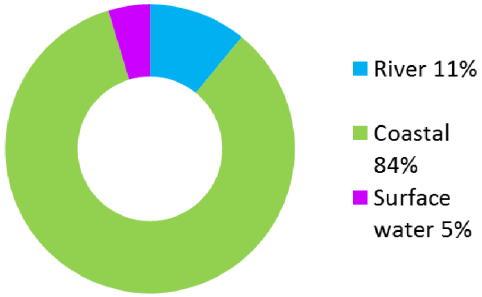
Lochs Bi and Druidibeag (Potentially Vulnerable Area 02/07)

Local Plan District	Local authority	Main catchment
Outer Hebrides	Comhairle nan Eilean Siar	South Uist coastal

Summary of flooding impacts



At risk of flooding

- 30 residential properties
- <10 non-residential properties
- £240,000 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.

Flood protection scheme/works	*Natural flood management works*	New flood warning	Community flood action groups	*Property level protection scheme*	*Site protection plans*
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

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Outer Hebrides	Comhairle nan Eilean Siar	South Uist coastal

Background

This Potentially Vulnerable Area covers the north and north west of South Uist from Tobha Mor on the west coast to Loch Eynort on the east (shown below). It is approximately 130km² and contains numerous lochs in the north and west notably Loch Bi and Loch Druidibeag. The west coast is dominated by machair.

The A865 main road passes through the western side. Most of the settlements are located to the west of this road.

There are approximately 30 residential properties and fewer than 10 non-residential properties at risk of flooding.

The Annual Average Damages are estimated to be £240,000, with the majority caused by coastal flooding.

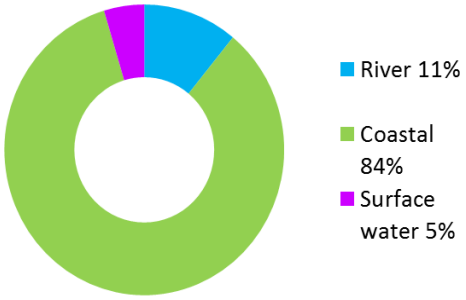


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

Coastal and river flooding in the area are concentrated in low lying areas of the lochs, particularly Loch Bi. In the north, the barrier system at Gualan Island is vulnerable to breaching leading to a build-up of water in the South Ford area.

The dune systems on the west coast are vulnerable to erosion and breaching leading to flooding on the machair. The machair is also susceptible to surface water flooding caused by an elevated groundwater table. There is flood risk associated with the loch systems which drain via the Howmore River.

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.

Ten designated cultural heritage sites are at risk of flooding as are extensive areas of environmental importance. These include Howmore Estuary, Lochs Roag and Fada Site of Special Scientific Interest (SSSI), Loch Druidibeg SSSI, South Uist Machair

Special Area of Conservation, South Uist Machair and Lochs Special Protection Area.

The damages associated with floods of different likelihood are shown in Figure 2.

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 250)	20	30	40
Non-residential properties (total 90)	<10	<10	<10
People	50	70	80
Community facilities	0	0	0
Utilities assets	0	0	0
Transport links (excluding minor roads)	Roads at 60 locations	Roads at 70 locations	Roads at 80 locations
Environmental designated areas (km^2)	32	32	32
Designated cultural heritage sites	4	10	10
Agricultural land (km^2)	6.4	7.3	7.5

Table 1: Summary of flooding impacts[1]

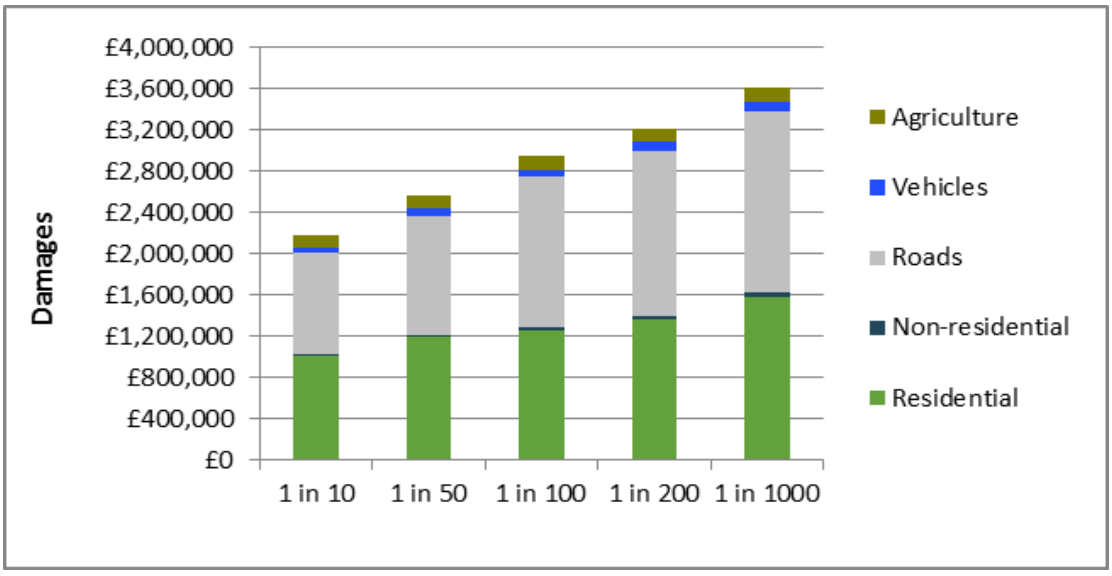


Figure 2: Damages by flood likelihood

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

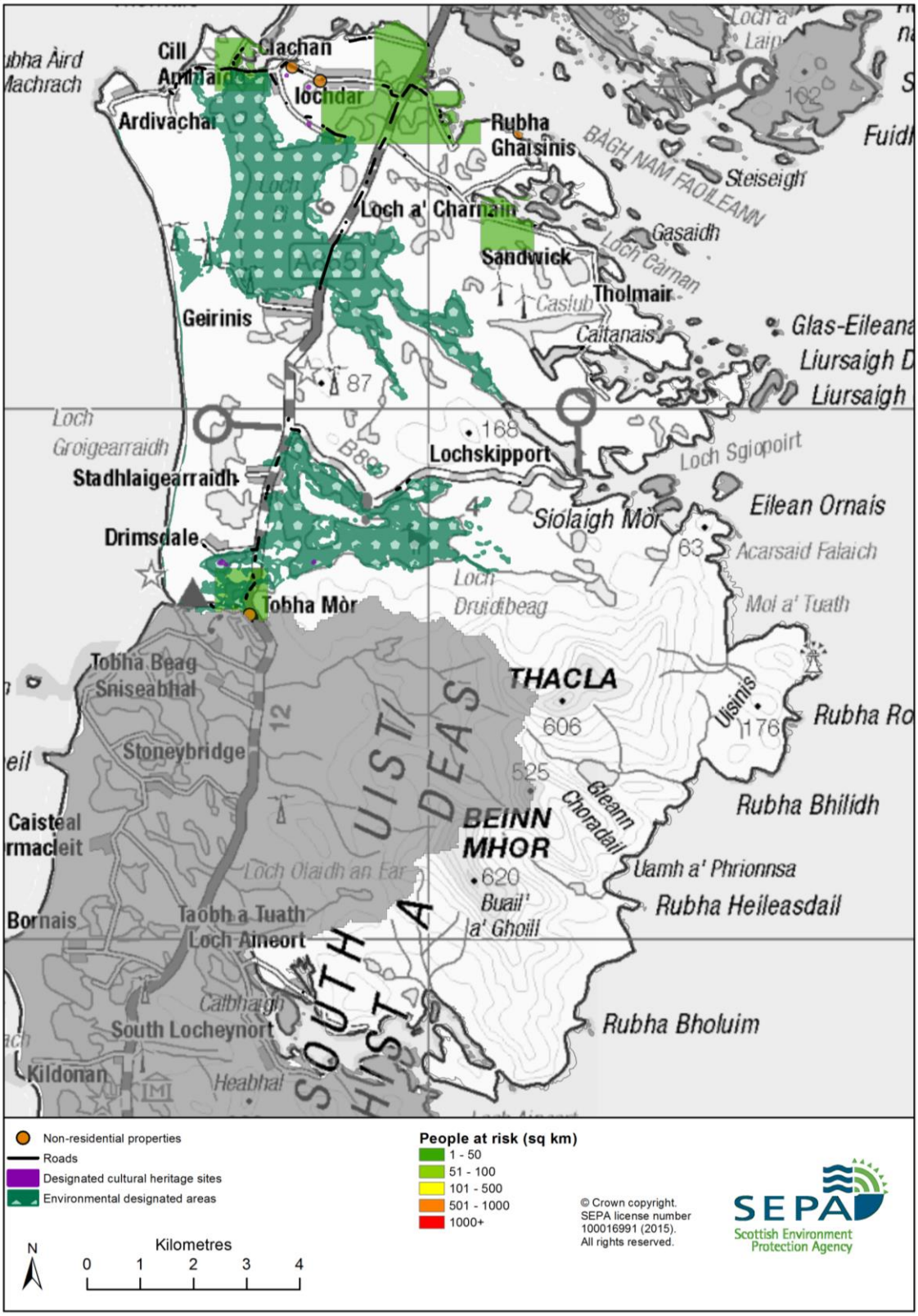


Figure 3: Impacts of flooding

History of flooding

In January 2005 a severe storm hit the west coast of Scotland including the Outer Hebrides. During the storm five people from the same family died when their cars were swept from a coastal road in South Uist as they were trying to escape from flood waters. Widespread flooding occurred in many locations, particularly in the Iochdar area, and along the west coast, with roads, agricultural land, houses and other buildings being inundated with seawater. The South Ford Hydrodynamics Study provides a detailed account of this flood.

Although there are no other officially recorded floods in this area, coastal flooding has occurred on numerous occasions when storm surge and high tides coincide. If high rainfall also occurs during these conditions this causes the Howmore River to flood over an extensive land area. An added risk factor is that when coastal flooding occurs it is usually accompanied by high strength winds, which can create waves and cause additional damage.

Objectives to manage flooding in Potentially Vulnerable Area 02/07

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 Lochs Bi and Druidibeag Potentially Vulnerable Area.

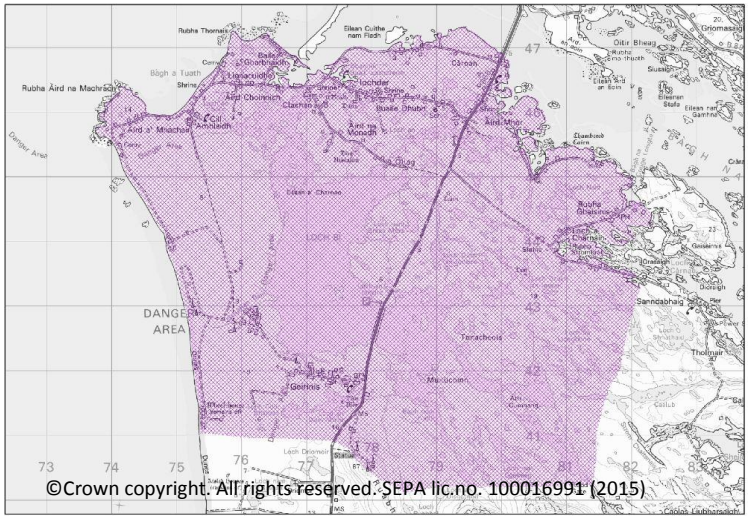
Reduce risk to the area surrounding Loch Bi from river and coastal flooding

Indicators:

- 60 people
- £110,000 Annual Average Damages from residential properties
- A865

Objective ID: 200701

Target area:



Target area	Objective	ID	Indicators within PVA
Applies across Outer Hebrides Local Plan District	Avoid an overall increase in flood risk	200001	• 30 residential properties • £240,000 Annual Average Damages
Applies across Outer Hebrides Local Plan District	Reduce overall flood risk	200002	• 30 residential properties • £240,000 Annual Average Damages
Applies across Outer Hebrides 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 02/07

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 Lochs Bi and Druidibeag Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/works	*Natural flood management works*	New flood warning	Community flood action groups	*Property level protection scheme*	*Site protection plans*
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 SCHEME/WORKS** (2007010006)		
Objective (ID):	Reduce risk to the area surrounding Loch Bi from river and coastal flooding (200701)		
Delivery lead:	Comhairle nan Eilean Siar		
Priority:	National:	Within local authority:	
	14 of 42	**1 of 1**	
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	Detailed design for a flood protection scheme for the South Ford area is progressing. The South Ford Scheme aims to reduce flood risk on South Uist as well as the southern coast of Benbecula. The scheme will likely include the construction of embankments, beach recharge at Gualan Island, sand dune/machair restoration and may also include property level protection for any residual risk. The flood protection scheme would be constructed to a standard of 1 in 100 years (locally 1 in 200 years) and will include an allowance for climate change. An option to relieve flooding by creating larger openings in the South Ford causeway is also being considered by the local authority with the encouragement of local community groups. The viability and funding for this option is being investigated outwith the flood risk management process.		
Potential impacts			
Economic:	The scheme would reduce risk to an estimated 58 properties and would achieve an estimated £7.8 million damages avoided. The benefit-cost ratio of the proposed works is 3.97.		
Social:	The flood protection scheme would have a positive benefit to the health and wellbeing of the community and to socially vulnerable people. A scheme could also reduce the significant flood impacts on		

Social:	a rural community including key local facilities and transport links. The last major storm in 2005 led to five fatalities as a family attempted to escape the floods. Climate change is likely to have a significant impact in this area and the scheme should be designed to help reduce long term impacts of sea level rise.
Environmental:	Flood protection works can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. There is potential for both positive impacts such as restoring coastal habitats at Gualan Island, as well as negative impacts such as impacting on coastal habitats and landscapes at Lionacleit. There are potential adverse effects on biodiversity , active coastal processes, and even coastal flood risk if sediment extraction allows greater wave attack. To be in accord with the FRM Strategy, the responsible authority (and where applicable, the licensing authority) should seek to ensure that the works will not have an adverse effect on the integrity of the South Uist Machair and Lochs Special Protection Area and South Uist Machair Special Area of Conservation. Opportunities to mitigate any environmental impacts should be identified as part of the on-going studies through the design and timing of works.

Action (ID):	**NEW FLOOD WARNING** (2000020010)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The area under consideration covers the coastline of the Outer Hebrides. A flood forecasting system will be required before flood warnings can be implemented for this area.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (2000020016)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will be seeking to develop the flood hazard mapping in the South Uist to North Uist 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.		

Action (ID):	**FLOOD FORECASTING** (2000020009)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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 'Western Isles' flood alert area.		

Action (ID):	**COMMUNITY FLOOD ACTION GROUPS** (2000020012)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	Community		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	The Iochdar Flood Action Group and the Middle District Flood Action Group were formed in the immediate aftermath of the January 2005 storm. Public workshops and meetings have been held to discuss coastal erosion and flooding issues.		

Action (ID):	**SELF HELP** (2000020011)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	—		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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.		

Action (ID):	**AWARENESS RAISING** (2000020013)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	Responsible authorities		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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.		

Action (ID):	**MAINTENANCE** (2000020007)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	Comhairle nan Eilean Siar, asset / land managers		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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. Loch Bi to the north of the Potentially Vulnerable Area is an extensive freshwater/brackish water body which drains mainly to the sea on the east of the island to Loch Sgioport and also to the north at Clachan. Sea water is excluded from Loch Bi by a flap valve discharging at Loch Sgioport. It is planned during 2015 to install flap valves on the stone culverts at the Clachan Mor to the north west of Loch Bi. Freshwater lochs located in the south of the Potentially Vulnerable Area are interconnected by a system of drainage ditches and they drain to the sea through a drainage canal (the Leacach How) and the Howmore River.		

Action (ID):	**EMERGENCY PLANS/RESPONSE** (2000020014)		
Objective (ID):	Reduce overall flood risk (200002)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	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.		

Action (ID):	**PLANNING POLICIES** (2000010001)		
Objective (ID):	Avoid an overall increase in flood risk (200001) Reduce overall flood risk (200002)		
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.		